The NUBASE2026 Evaluation of Fundamental Nuclear Physics Properties

F.G. Kondev [1,*], R. Chakma [1], W.J. Huang (黄文嘉)[2,3], M. Wang (王猛)[3,4], S. Naimi[5]

[1] Physics Division, Argonne National Laboratory, Lemont, IL 60439, USA
[2] Advanced Energy Science and Technology Guangdong Laboratory, Huizhou 516007, China
[3] State Key Laboratory of Heavy Ion Science and Technology, Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou 730000, China
[4] School of Nuclear Science and Technology, University of Chinese Academy of Sciences, Beijing 100049, China
[5] Université Paris-Saclay, CNRS/IN2P3, IJCLab, 91405 Orsay, France

Abstract: The NUBASE2026 evaluation provides recommended values for the fundamental nuclear physics properties of all nuclei in their ground states and in excited isomeric states with half-lives that generally exceed 100 ns. It incorporates experimental results reported in the scientific literature, together with the corresponding bibliographical information. When experimental data are unavailable for a given nuclide, estimates are derived from systematic trends in the properties of neighboring nuclei. The evaluation procedures and policies adopted in developing NUBASE2026 are described, and the resulting recommended values and their uncertainties are presented in a comprehensive tabulation.

Keywords: NUBASE2026 evaluation, nuclear properties, atomic masses, isomers, isomer excitation energies, spins and parities, half-lives, decay modes.

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1 Introduction

NUBASE2026 is an evaluated nuclear data library that contains the recommended values of the fundamental nuclear physics properties of all known nuclei in their ground and excited isomeric states with half-lives generally exceeding 100 ns. These properties include masses, excitation energies of isomers, half-lives, spins and parities, and decay modes with their intensities. The evaluation also provides information for as-yet unobserved nuclides, based on systematic trends in the properties of neighboring nuclei. The present publication supersedes the corresponding values reported in previous versions of the library [1–5]. The newly recommended data are presented in Table I.

One of the principal applications of NUBASE2026 is the *Atomic Mass Evaluation* (AME2026) [6, 7], for which the unambiguous identification of all nuclear states involved in a decay, reaction, or mass-spectrometry measurement is essential. This close connection is the main reason for coupling the two evaluations in the present issue. Furthermore, rapid advances in modern mass-spectrometry techniques, together with the availability of intense stable- and rare-isotope beams, now make it possible to produce large numbers of short-lived nuclei in a single experiment and to determine their masses with high precision. In this context, NUBASE2026 provides a reliable and internally consistent source of information for experiments that require the unambiguous identification of specific nuclides in complex mass-spectrometry data.

More broadly, the information compiled in NUBASE2026 provides essential input for modern nuclear physics, especially for experimental and theoretical studies of nuclear structure and nuclear astrophysics, where complete, up-to-date, and reliable data across the chart of nuclides are required. The evaluation is expected to be particularly useful for present and future investigations at major nuclear physics facilities worldwide, including ATLAS and FRIB in the United States; ISAC and ARIEL in Canada; FAIR, ISOLDE, JYFL, and SPIRAL2 in Europe; HIAF in China; RIBF at RIKEN in Japan; and RAON in the Republic of Korea.

NUBASE2026 is also a valuable resource for specialists in applied nuclear science. Its recommended data support work in safeguards, nuclear forensics, reactor engineering, waste management, material analysis, medical diagnostics, and radiotherapy, as well as other applications that require reliable nuclear physics information for specific nuclides. In addition, it serves as a trusted source for many general and specialized nuclear data libraries worldwide (see, for example, Ref. [8] and resources provided therein).

The recommendations presented in NUBASE2026 are intended to satisfy several key user requirements. In particular, they are designed to be: a) *complete*, by including all measured quantities and their uncertainties; b) *up-to-date*,

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* kondev@anl.gov (F.G. Kondev); corresponding author
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by incorporating results from recent publications; c) *credible and reliable*, by identifying and resolving contradictory results found in the scientific literature and in other nuclear databases; and d) *properly referenced*, by providing comprehensive bibliographical information for the included properties.

In general, NUBASE2026 evaluation was updated through three different routes: a) by direct compilation and evaluation of data reported in the literature, including both *primary* sources (nuclear-physics journals) and *secondary* sources (arXiv, abstracts, conference proceedings, private communications, Ph.D. and M.Sc. theses, and laboratory reports); b) by consulting, and when merited by adopting, recommended values from topical evaluations that cover nuclear properties included in NUBASE; and c) by consulting, and when merited by adopting, recommended values from the *Evaluated Nuclear Structure Data File* (ENSDF) database [9].

It is important to emphasize that the content adopted from ENSDF and other topical evaluations was carefully examined, and only results considered *valid* and *up-to-date* were retained. ENSDF is an extensive and indispensable resource, covering complex nuclear structure and decay properties for all nuclei in their ground and excited states. Because maintaining such a comprehensive database requires substantial effort, some older data may occasionally be missing or misrepresented, and some recent results may not yet be included. When such cases were identified during the present work, the relevant data were re-evaluated, and the corresponding conclusions were added as comments in Table I.

The content of NUBASE2026, together with the policies adopted in developing this nuclear physics data library, is described below. All experimental information available to the authors as of June 1, 2026, was considered.

2 Content of NUBASE2026

The NUBASE2026 evaluation contains recommended properties for the ground state of 3725 nuclides and for 2436 excited isomeric states (generally having half-lives of $T_{1/2} \geq 100$ ns), derived from all available experimental data, including information on as-yet unobserved nuclei, whose properties were estimated from systematic *Trends in Neighboring Nuclei* (TNN; see Section 3.1).

For each nuclide and for each state (ground or isomeric), the following properties were compiled and, when necessary, evaluated: mass excess; excitation energy of the excited isomeric state; half-life; spin and parity; decay modes and their intensities; isotopic abundance, for stable nuclides; and bibliographical information for all experimental values of these quantities.

2.1 Mass excess

Knowledge of atomic masses provides important insight into other fundamental nuclear properties, especially the lifetimes and decay modes of nuclear states, as well as the β-delayed particle-decay probabilities for nuclei far from the line of stability. For nuclei in their ground states, the mass-excess values and their uncertainties listed in Table I were adopted from AME2026 [6, 7]. Figure 1 displays the uncertainties of the mass-excess values as a function of the neutron number, N, and the proton number, Z.

For excited isomeric states, the recommended mass-excess values and their uncertainties were generally obtained by adding the excitation energy of each isomer to the ground-state mass-excess value. The isomer excitation energies were determined using either the *internal* or *external* relation, as described in Section **2.2**. In 28 cases, however, the mass of the isomer was instead used to determine the mass of the ground state. One example is the mass of the ^{149}Er ground state, which was derived from the more precise mass of the ^{149}Er^{m} isomeric state, measured by Kootte *et al.* [2025Ko14], together with the known isomer excitation energy of 741.69(23) keV; see Table I.

2.2 Isomers

Nuclear isomers are excited states of single-particle (intrinsic) origin with lifetimes ranging from nanoseconds - or even shorter - to years. Several compilations and review articles discussing the physics of nuclear isomers in detail are available - see Refs. [10–14] and references therein.

Following the policy introduced in NUBASE2003 [2], the present evaluation generally includes isomeric states with half-lives longer than 100 ns. Although this threshold is somewhat arbitrary, it was chosen to include short-lived isomers that can be produced directly at current and future accelerator beam facilities, survive the time-of-flight through recoil mass separators, and thus have their decay properties and/or masses measured directly.

Figure 2 shows a compilation of all known nuclear isomers with half-lives longer than 100 ns as a function of neutron number, N, and proton number, Z.

Compared with previous NUBASE releases [1–5], the current edition provides more comprehensive coverage of so-called fission (shape) isomers (see Refs. [15–18] and references therein). Figure 3 shows a compilation of all known fission isomers. Although some of these states have half-lives shorter than 100 ns, they are included in Table I for completeness. A noteworthy exception is the absence of the 2.6 ns isomer in ^{239}Pu [19]. This state was classified as a fission isomer in ENSDF and in Ref. [18]; however, it is assigned in the present work as a K isomer that decays via internal transitions to the known ^{239}Pu^{n} fission isomer ($T_{1/2}$= 7.3 μs).

Isomers are listed in Table I in order of increasing excitation energy and are identified by the letters 'm', 'n', 'p', 'q', or 'r', appended to the nuclide name. For example, ^{90}Nb denotes the ground state; ^{90}Nb^{m} the first excited isomer; and ^{90}Nb^{n}, ^{90}Nb^{p}, ^{90}Nb^{q}, and ^{90}Nb^{r} the second through fifth excited isomers, respectively. In four cases - ^{98}Y, ^{174}Lu, ^{179}Ta,

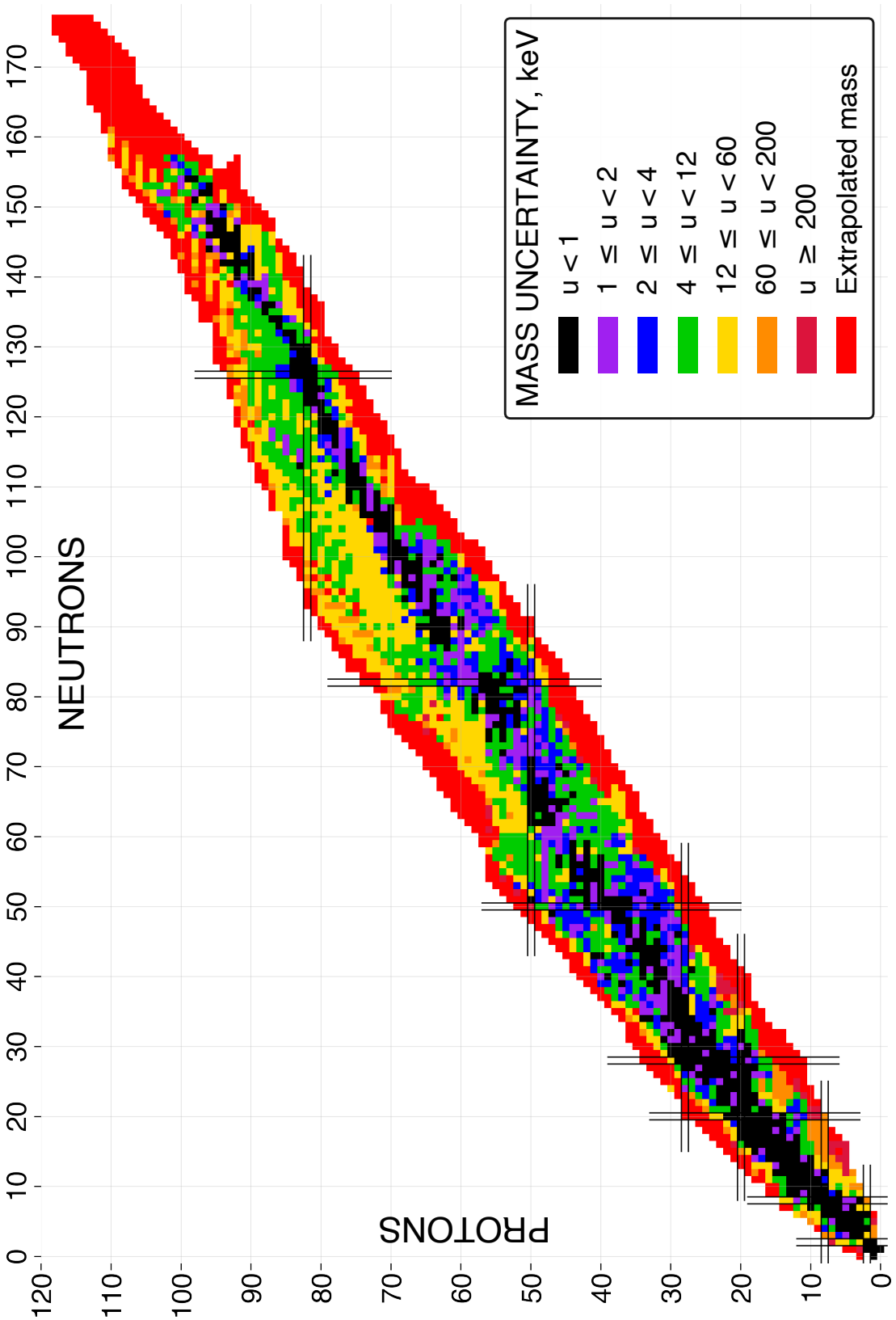


Fig. 1. Nuclear chart displaying the mass-excess uncertainties (u) for all nuclei in their ground states.

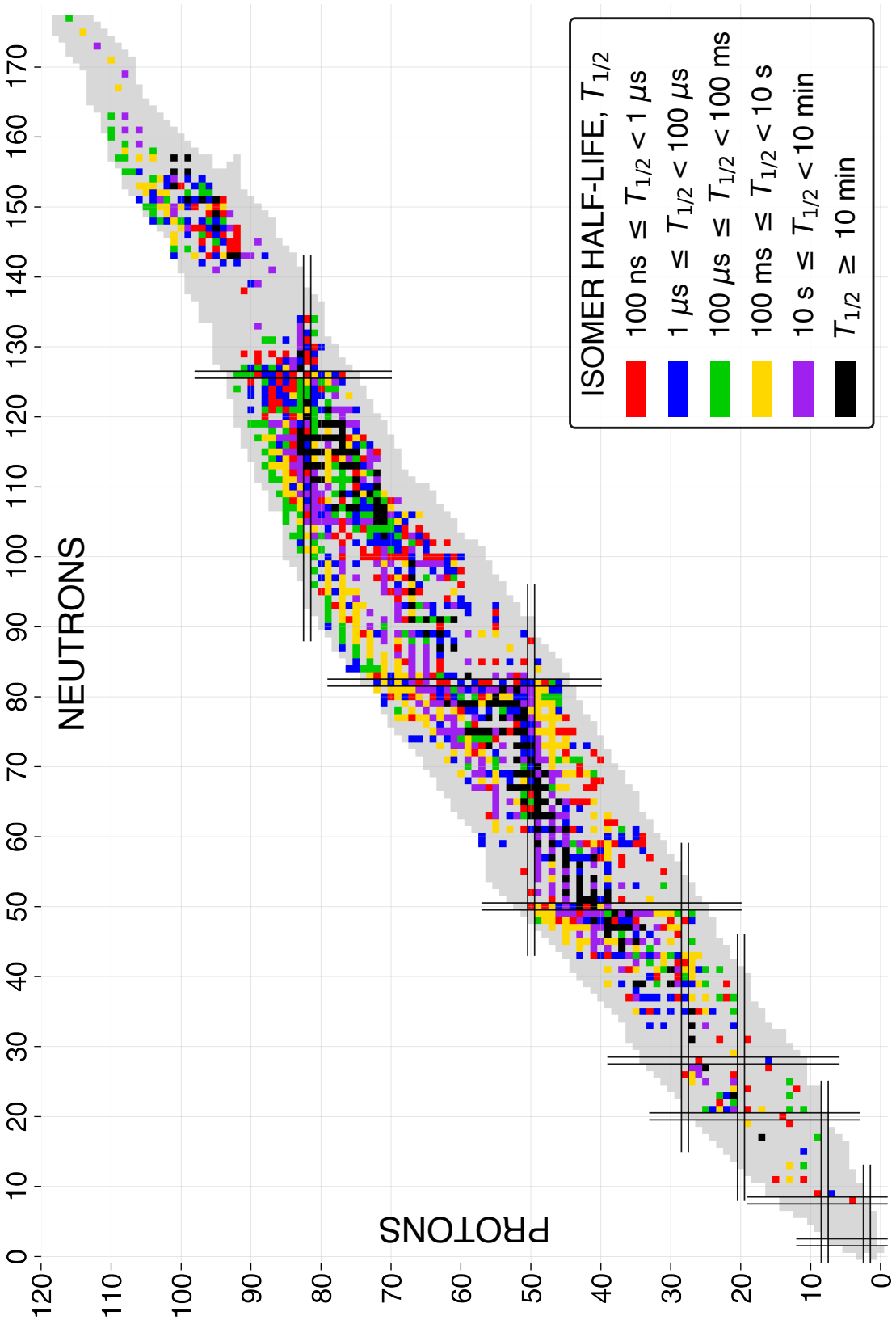


Fig. 2. Nuclear chart displaying isomeric states with $T_{1/2} \geq 100$ ns. For a given isotope where multiple isomers exist, only the longest-lived state is plotted.

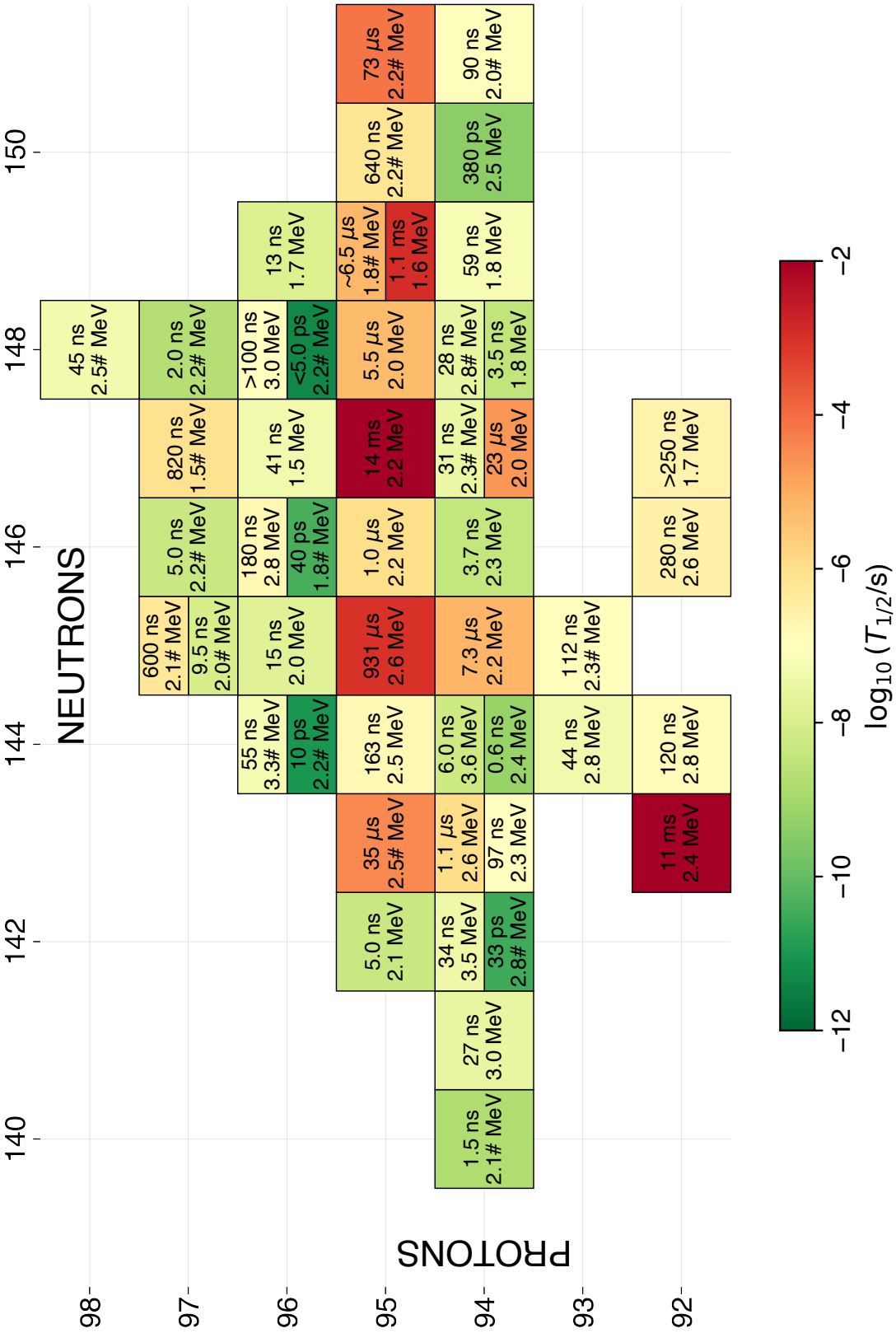


Fig. 3. Nuclear chart displaying the fission isomers. For a given isotope, the isomer half-life and the excitation energy in MeV are given.

and ^{214}Ra - a sixth isomer is included and is labeled with the letter 'x' (see the Explanation of Table I for details).

The excitation energy of an isomeric state can be determined by various experimental methods, generally categorized as *internal* or *external* relations. A typical *internal* relation involves the energy of a γ ray, or of a cascade of γ rays, associated with the isomeric decay. The most-accurate excitation-energy values obtained by this approach are derived from a least-squares fit to the energies of all γ rays observed along the decay path of a particular isomer. In cases where *internal* relations cannot be established, connections to other nuclides (*external* relations) can be used to deduce the mass difference, and hence the excitation energy, between the ground state and the isomer. In these cases, the excitation energies are adopted from AME2026.

The method used to establish an *external* relation for a given isomer is indicated by a two-letter *origin* code listed next to its excitation energy in Table I (see the Explanation of Table I for details). For *internal* relations, the *origin* field is left blank. In such cases, the excitation-energy values are adopted either from ENSDF or from updates in the literature and, whenever possible, are based on a least-squares fit to measured γ-ray energies. The energy difference between an isomer and its ground state can also be determined from both an *internal* relation and one or more *external* relations with comparable accuracy. In such instances, the excitation energy of the isomer is adopted from AME2026, and the *origin* code '*IT*' is used.

In contrast to ENSDF, where isomer excitation energies may not be quantified and are often given as floating levels, denoted '$+X$', '$+Y$', etc., NUBASE2026 always provides estimated values based on theoretical considerations or Trends in Neighboring Nuclei (TNN). Such values are considered non-experimental quantities and are flagged with the symbol '#'.

When the existence of an isomer is uncertain or remains under discussion, it is flagged with 'EU' ("Existence Uncertain") in the *origin* field. A comment is usually added to explain why the existence of this state is questioned or to identify where the issue is discussed in greater detail. The following twenty one isomers are treated in this way in the present evaluation: ^{34}Si^m, ^{38}Al^m, ^{123}Ag^n, ^{133}Sm^m, ^{138}Pm^m, ^{140}I^n, ^{141}Tb^m, ^{142}Nd^m, ^{144}Cs^n, ^{152}Pm^n, ^{156}Tm^m, ^{162}Lu^n, ^{174}W^m, ^{174}W^n, ^{190}Tl^n, ^{238}Np^m, ^{244}Am^p, ^{245}Pu^n, ^{255}Db^m, ^{256}Md^m, and ^{256}Mt^m. Nevertheless, mass-excess and excitation-energy values are provided for all these states, except for ^{133}Sm^m, ^{138}Pm^m, ^{142}Nd^m, ^{144}Cs^n, ^{152}Pm^n, ^{174}W^m, ^{174}W^n, and ^{190}Tl^n, whose existence is strongly doubted.

When an isomer was initially reported as "discovered" but was subsequently shown to be non-existent, it is flagged with 'RN' ("Reported Non-existent") in the *origin* field. Nine isomers are treated in this way: ^{84}Ga^m, ^{84}As^m, ^{85}Nb^n, ^{86}Nb^n, ^{181}Pb^m, ^{185}Bi^n, ^{196}Pb^m, ^{197}Bi^n, and ^{220}Pa^n. No mass-excess or excitation-energy values are provided for these states. Similarly to the 'EU' cases, a "non-exist" label is also added. The use of the 'EU' and 'RN' flags was also extended to cases where the discovery of a nuclide is questioned, such as ^{260}Fm, ^{293}Og, and ^{295}Og. In these cases, an estimated ground-state mass, derived from Trends in the Mass Surface (TMS), is nevertheless provided in AME2026 and NUBASE2026.

When upper and lower limits are available for the excitation energy of the isomeric state, the corresponding value is treated assuming uniform probability distribution, as explained in Section 3.2. For example, experimental observations indicate that the excitation energy of the ^{162}Tm^m isomer lies between the 66.9 keV and 192.0 keV levels [1974De47]. After rounding, this information is presented in Table I as $E_x = 130(40)$ keV.

When it is unclear whether a state is the ground state or an excited isomer, it is flagged with an asterisk ('$*$') in Table I. Likewise, if the uncertainty in the isomer excitation energy, ΔE_x, is larger than half of the excitation energy itself, $\Delta E_x > E_x/2$, the assignment as ground or isomeric state is considered uncertain and is also flagged with an asterisk.

On the basis of new experimental information, the ordering of several ground and excited isomeric states was reversed in the present evaluation relative to the ENSDF recommendations. Such cases are flagged with the symbol '&' in Table I. In a few additional cases, evidence was found for a state lying below the level adopted in ENSDF as the ground state. These states are likewise flagged with the symbol '&' in Table I. Owing to the coupling between NUBASE2026 and AME2026, all changes in the ordering of nuclear levels are considered firmly established and are synchronized between the two evaluations.

2.2.1 Isobaric analog states

NUBASE2026 contains information on 212 Isobaric Analog States (IAS), which are labeled in Table I with the isospin quantum number T. Their excitation energies were determined using either *internal* or *external* relations. The IAS entries are generally denoted by the superscripts i or j, except for eight excited isomers: ^{16}N^m, ^{26}Al^m, ^{34}Cl^m, ^{38}K^m, ^{46}V^m, ^{50}Mn^m, ^{54}Co^m, and ^{70}Br^m. The isospin multiplet value is not given for most nuclei in their ground states, for which T=$|\,T_z\,|=\frac{1}{2}|\,(N-Z)\,|$. However, it is included for the ground states of the $N = Z$, odd-odd nuclides ^{34}Cl, ^{42}Sc, ^{46}V, ^{50}Mn, ^{54}Co, ^{62}Ga, ^{66}As, ^{70}Br, ^{74}Rb, and ^{78}Y, for which $T = 1$, and ^{30}P, ^{38}K, and ^{58}Cu, for which $T = 0$.

Detailed experimental information about IAS may be found in Refs. [20, 21].

2.3 Half-life

The lifetime of a nuclear level is related to its total decay width, Γ, which is the sum of all partial decay widths (γ ray, conversion electrons, α decay, β decay, fission, etc.):

$$\Gamma = \sum \Gamma_i = \frac{\hbar}{\tau} \tag{1}$$

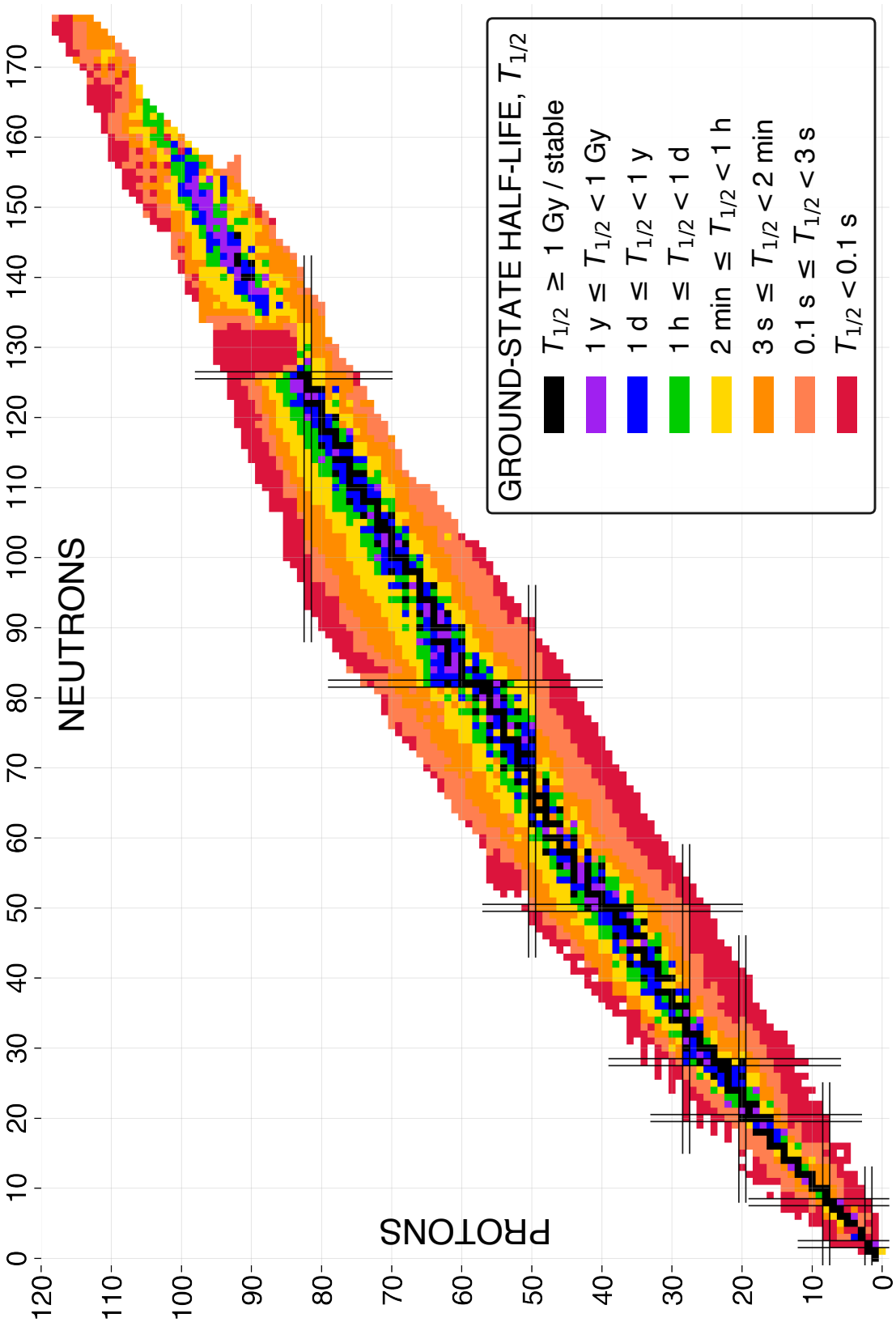


Fig. 4. Nuclear chart displaying the ground-state half-lives for all nuclei.

where τ=$T_{1/2}$/ln(2) is the mean lifetime of the level and $T_{1/2}$ is the half-life.

Figure 4 displays the ground-state half-lives as a function of N and Z for all nuclei included in Table I.

For some light nuclei (A<30) beyond the particle drip lines, only the total level width can be measured. In such cases, the half-life in seconds follows from Eq. 1, with Γ expressed in MeV

$$T_{1/2}\ [\mathrm{s}] \simeq 4.562 \times 10^{-22}/\Gamma\ [\mathrm{MeV}] \qquad (2)$$

For convenient presentation of half-lives, NUBASE2026 uses seconds (s) and their sub-multiples, minutes (m), hours (h), days (d) and years (y), and their multiples (see Explanation of Table I for details). The conversion from years to days to seconds is based on the tropical year:

$$1\ y \simeq 365.2422\ \mathrm{d} \simeq 31556926\ \mathrm{s}$$

When multiple half-life values are available for a particular level, a statistical analysis is performed according to the policies outlined in Section 3.2. In some cases, experimental half-lives are reported as intervals bounded by lower and upper limits. Such values are treated by assuming a uniform probability distribution, as explained in Section 3.2. For example, the half-life of ^{97}In^{m} is reported as 1.3 μs$\leq T_{1/2} \leq$230 μs in Ref. [2018Pa20]. The recommended value in NUBASE2026 is $T_{1/2}$=116(66) μs. Half-lives with asymmetric uncertainties are also frequently reported in the literature. Because NUBASE2026 is intended for use by specialists in a variety of application fields, such values are symmetrized before any statistical analysis is performed, as described in Section 3.3.

In the evaluation of the half-life data, particular attention was given to ensuring that the uncertainties associated with the individual measurements included in the statistical analysis were expressed at the 68% confidence level (CL); see Section 3.2. When this condition was not satisfied, the corresponding input data were adjusted accordingly. For example, in the evaluation of the ^{234}Th half-life, the uncertainties reported for the individual measurements [1948Kn23,2018Pa45] were given at the 95% CL, and were converted to 68% CL before the statistical analysis was carried out.

For experiments involving rare events, such as studies of superheavy nuclei, the half-lives reported in different publications were not always averaged directly. When sufficient details were available in the literature, the time information associated with individual events was instead combined and analyzed, according to the prescription by Schmidt [1984Sc13]. In several review articles on the properties of superheavy nuclei [2014Kh04,2016Fo10,2016Ho09,2017Og01], as well as in recent individual publications, events from several experiments were combined to determine the reported values. These half-life values were adopted in NUBASE2026, rather than the simple averages of the individual published results.

For 58 long-lived nuclides of importance to metrology and other applications, all available experimental data were carefully examined, including values published by various metrology laboratories over many years. In the evaluation of these data, uncertainties reported in Ref. [1980Ho17] were replaced by values recommended by Pommé [2024Po10]. As a matter of policy, the most recent value reported by each laboratory was adopted and used in the statistical analysis, including the latest results published by Unterweger and Fitzgerald [22], which supersede their earlier assessments [23]. The half-life data for these nuclides are cited in Table I with the reference 'FGKyym', where 'yym' denotes the year and month when the assessment was completed. Although the individual measurements are not listed in NUBASE2026, the completed analyses are available upon request.

Upper or lower half-life limits are provided in Table I for nuclei identified using time-of-flight techniques. The following policies were adopted: a) For *observed* nuclides, the lower half-life limit is given in the uncertainty field. This value should be used with caution, since it can be much shorter than the actual half-life of the level. To avoid confusion, a more realistic estimate derived from TNN and flagged with # is also provided when possible (see, for example, the entry for ^{44}Si). The same notation is used for half-life limits of very long-lived (stable) nuclei (see, for example, the entry for ^{188}Os); b) For nuclides that were searched for but *not observed*, the upper half-life limit is given in the uncertainty field. For example, upper limits were estimated for several unobserved nuclides by Pougheon [1993Po.A], based on the time-of-flight information and production yields expected from TNN (see, for example, the entry for ^{21}Al).

In cases of double-β-decaying nuclides, the two-neutrino ground-state-to-ground-state transitions are the dominant decay mode, and hence, experimental half-life values, or lower limits, for these decays are included in NUBASE2026. In a few instances, partial half-life data for other transitions are compiled and provided as comments in Table I. No attempt was made to convert the half-life values reported by different authors to a common statistical confidence level. The reviews by Barabash [2020Ba63] and Pritichenko [2025Pr02] were consulted in compiling these data.

For ground and excited isomeric states whose half-lives have not been measured directly, estimates based on TNN were included in Table I, whenever possible. Such values are flagged with the symbol '#'.

2.4 Spin and parity

Spin and parity values are presented with or without parentheses depending on the strength of the supporting arguments, following the convention adopted in ENSDF [24]: parentheses denote assignments based on "*weak*" arguments, whereas their absence indicates "*strong*" arguments. NUBASE2026, however, introduces one important exception. To preserve a clear distinction

between experimental and non-experimental information, parentheses are used only when the "*weak*" arguments are nevertheless based on experimental observations. When assignments rely on theoretical predictions or TNN, the values are presented without parentheses and are instead marked with the symbol "#". This differs from ENSDF, where values inferred from theoretical considerations or systematics are also presented in parentheses. Consequently, ENSDF does not always allow tentative assignments based on theory or systematics to be distinguished from those based on limited experimental evidence. It should also be noted that, despite well-defined evaluation policies [24], some inconsistencies remain in ENSDF spin and parity assignments. In some cases, the proposed values may reflect not only established policy rules but also the judgment of an individual ENSDF evaluator. As a result, similar states in neighboring nuclei may be assigned and presented differently by different evaluators, even when the available experimental evidence is comparable.

A substantial body of experimental data on directly measured nuclear spins is available in the literature. In recent years, particular attention has been devoted to nuclei far from the line of stability, where both "*in-source*" laser-spectroscopy techniques, such as RILIS at ISOLDE (CERN) and TRILIS at ISAC (TRIUMF), and "*collinear*" laser-spectroscopy techniques, such as CRIS at ISOLDE (CERN), have been applied.

In the present work, we compiled experimentally measured spins for 1165 states, comprising 898 ground states and 267 isomers. These values are flagged in Table I with the symbol '*' after the recommended spin value. We consulted previous compilations by Fuller [25], Otten [1989Ot.A], and MacDonald [26], together with recently reported measurements in the literature; detailed bibliographical information is also provided.

One exception concerns the spin of the ^{133}Pr ground state, for which a directly measured value of J=5/2 was reported by Ekström [1972Ek04]. However, the established decay of the ^{133}Pr^{m} isomer, with J^{π}=(11/2-), proceeds through a cascade consisting of an E3 transition to an excited J^{π}=(5/2^{+}) state, followed by a ΔJ=1, M1 transition to the ground state [1995Br24]. This decay pattern implies a ground-state spin of J=3/2 for ^{133}Pr.

Figures 5 and 6 show the directly measured spins of the ground and isomeric states, respectively, as functions of N and Z.

In general, the experimental methods used for spin determination do not provide direct information on the parity of a given state. In such cases, we have assigned parities on the basis of additional spectroscopic information, including l values from transfer reactions, hindrance factors in α decay, measured magnetic moments, and other relevant spectroscopic data.

2.5 Decay modes and their intensities

Figure 7 displays the main ground-state decay modes for all nuclei included in Table I.

The guiding principle in assembling the information on decay modes and their intensities was to distinguish unambiguously between decays that are energetically allowed but have not been experimentally observed and decays that have been observed but whose intensities have not been determined. The former are denoted by a question mark alone, '?' (e.g., 'IT ?' or 'α ?'), where the question mark refers to the decay mode. The latter are denoted by '=?' (e.g., 'IT =?' or 'α=?'), where the question mark refers to the branching intensity. As a result, for nuclei with multiple decay modes, the primary intensities listed in Table I were not always normalized to 100%. Such normalization was, however, carried out in the distributed ASCII-formatted file, **nubase.mas26**; see Section 2.7.

In accordance with previous versions of NUBASE [1–5], β^{+} denotes the combined electron-capture (ε) and positron-emission (e^{+}) decay mode, i.e., $\beta^{+} = \varepsilon + e^{+}$. This differs from the notation used in ENSDF, where the combination of these two modes is written as $\varepsilon + \beta^{+}$. For decay energies below $2m_e c^2 \simeq 1022$ keV, only electron capture is allowed; above that threshold electron capture and positron emission compete. Since separated intensities are not always measured and are often inferred from model calculations, Table I includes only experimentally determined values for β^{+}, ε and e^{+}. Similarly, both electron-capture-delayed fission (εSF) and positron-delayed fission (e^{+}SF) are denoted by the same symbol β^{+}SF.

For β-delayed particle emission, intensity relations were treated with particular care. By definition, the intensity of a given β-delayed particle branch is expressed as a percentage of the main β-decay mode. For example, if the decay of the (A, Z) nuclide is written as 'β^{-}=100; β^{-}n=20', this means that, for 100 decays of the parent nuclide, 80 (A, Z+1) daughters and 20 (A–1, Z+1) daughters are produced, together with the emission of 100 electrons and 20 delayed neutrons.

The same notation applies to more complex β-delayed particle emissions. For example, a decay written as 'β^{-}=100; β^{-}n=30; β^{-}2n=20; $\beta^{-}\alpha$=10' corresponds to the emission of 100 electrons, 70 delayed neutrons (30+2×20), and 10 delayed α particles. The corresponding residual nuclei are 40 (A, Z+1), 30 (A–1, Z+1), 20 (A–2, Z+1), and 10 (A–4, Z–1).

In general, the number of neutrons emitted per 100 β^{-} decays, $P_{\rm n}$, is given by

$$P_{\rm n} = \sum_i i \times \beta^{-}_{i\rm n};$$

with analogous expressions for β^{-}-delayed α- and proton-emission channels. The number of residual daughter nuclides (A, Z+1) produced in β^{-} decay is therefore:

$$\beta^{-} - \sum_i \beta^{-}_{i\rm n} - \sum_j \beta^{-}_{j\alpha} - \ldots$$

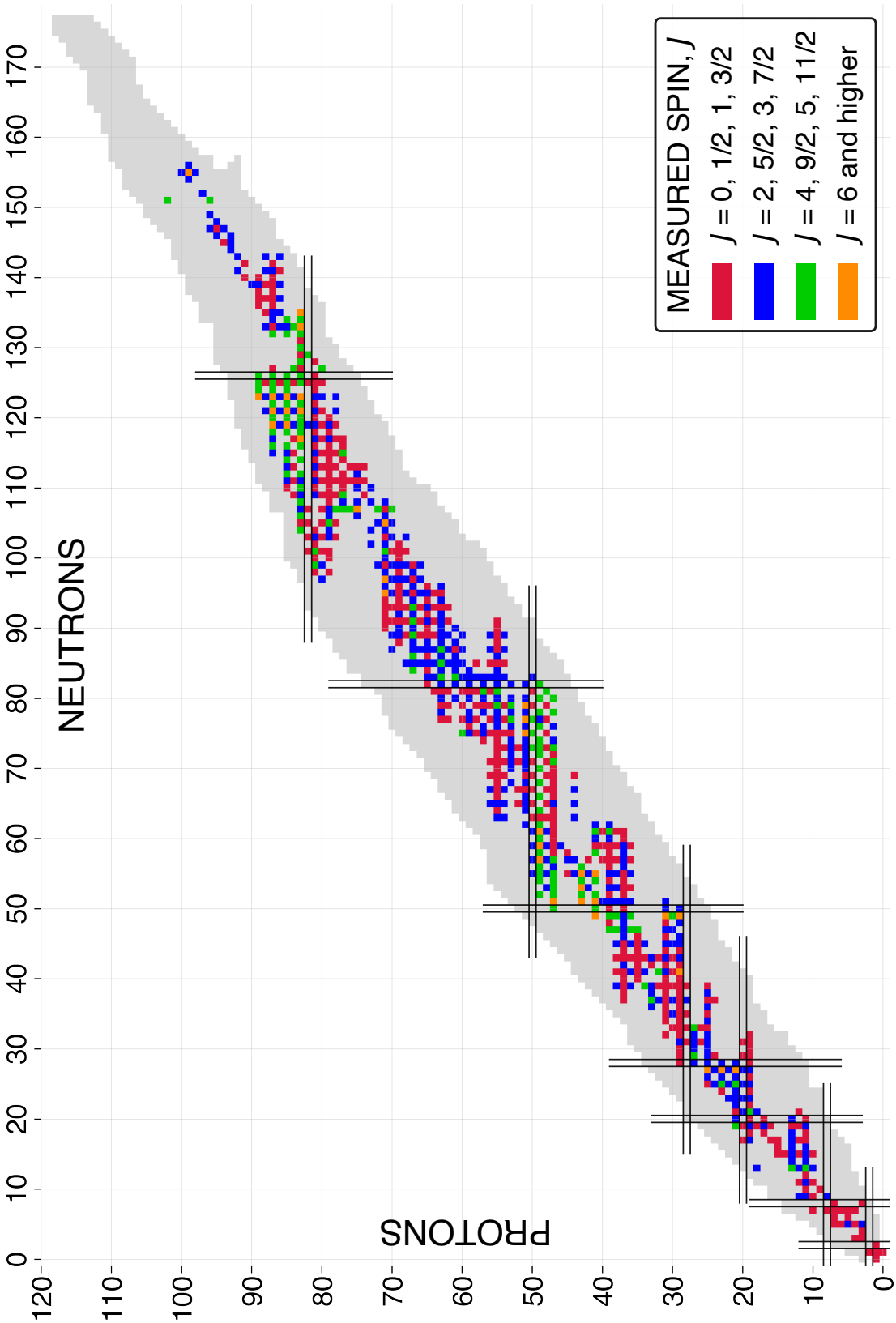


Fig. 5. Nuclear chart displaying the measured ground-state spins.

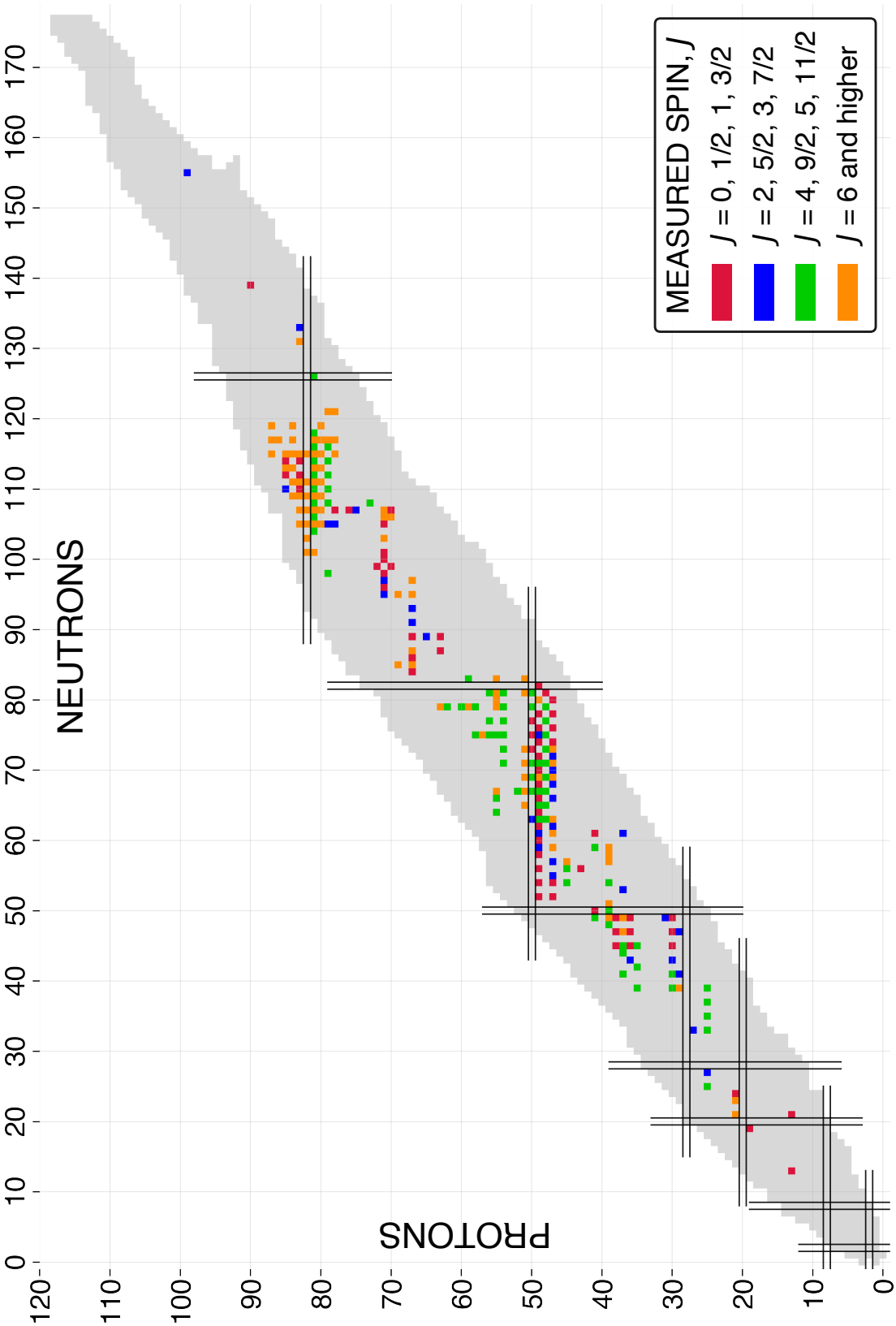


Fig. 6. Nuclear chart displaying the measured isomeric-state spins.

In some cases, the β-decaying nucleus populates several excited states in the daughter nuclide, which may subsequently decay by particle emission. However, when the daughter ground state decays through the same particle-emission channel, some authors have included that contribution in the reported β-delayed particle intensity. NUBASE2026 does not adopt this approach for two main reasons: a) delayed particles emitted from excited states generally have much higher energies than those emitted from the ground state, implying different subsequent processes; and b) emissions from excited states are characterized by decay times associated with the parent nuclide, whereas decays from the daughter ground state are properties of the daughter nuclide itself. For example, ^{9}C decays via β^+ emission to the ground state of the proton-unbound ^{9}B nuclide, with a feeding intensity of 54.1(1.5)% [2001Be51]. It also decays to several excited states that are unbound with respect to proton and/or α emission. Using the β^+-feeding intensities to the excited states of ^{9}B reported in Ref. [2000Ge09], and renormalizing these values to 100 decays of the parent ^{9}C, one obtains β^+p=7.5(0.6)% and $\beta^+\alpha$=38.4(1.6)% for ^{9}C. A related case is ^{8}B, which decays exclusively by β^+ emission to two excited states in ^{8}Be, both of which are α-unbound, with no direct feeding to the ^{8}Be ground state. Accordingly, one may write β^+=100% and $\beta^+\alpha$=100%, implying zero net population of the ^{8}Be ground state.

It should be noted that the percentages listed in Table I are expressed per 100 decays of the parent nuclide rather than relative to the corresponding primary decay branch (partial branching probabilities). Therefore, whenever possible, reported partial branching probabilities were converted to absolute branching intensities. As an example, for the decay of ^{228}Np, the delayed-fission probability was reported in the original article as 0.020(9)% [1994Kr13]. This value, however, is given relative to the β^+ decay branch, whose intensity is β^+=60(6)%. After renormalization to 100 decays of the parent nuclide, the corresponding delayed-fission intensity is 0.020(9)% $\times$ 0.60(6) = 0.012(6)%.

In addition to direct updates from the literature, the present evaluation of delayed-particle emission data made use of specialized compilations prepared by other authors. In particular, delayed proton and α-particle branching intensities were assessed with reference to the compilations of Hardy [1989Ha.A], Jonson [27], Blank [28], Pfützner [29], and Batchelder [30]. Recommended values for β-delayed neutron emission probabilities from the IAEA Coordinated Research Project [31] were likewise taken into account.

2.6 Isotopic abundances

Isotopic abundances are given in the 'Decay Modes and Intensities' field of Table I under the symbol *IS*. The adopted values were taken from the publication by Meija *et al.* [32] and from the most recent updates in Ref. [33]. In several cases, the *IS* values are listed in Refs. [32, 33] as an interval $[a,b]$; in Table I, however, they are reported as $IS = (a+b)/2$ with variance $\sigma^2 = (b-a)^2/12$ (see Section 3.2).

2.7 Bibliography and dissemination

NUBASE2026 provides comprehensive bibliographical information [7] for all included properties using the keynumber format of the *Nuclear Science References* (NSR) database [34]. In Table I, however, the references are given in abbreviated form, obtained by omitting the first two digits of the publication year from the NSR keynumbers. They are followed by up to three one-letter codes indicating the physical quantities that were added or modified (see the Explanation of Table I).

When more than one article was required to document a particular update, the additional references were included in the comments field of Table I. No references are given for estimated values.

The initials of present and former evaluators, e.g., GAU (G. Audi), RCH (R. Chakma), HWJ (W. Huang), FGK (F.G. Kondev), MMC (M. MacCormick), SAR (S. Naimi), WGM (M. Wang), and AHW (A. Wapstra), are used as reference keys in cases where it might otherwise be unclear that the re-evaluation or reinterpretation of the data was carried out by the NUBASE evaluators.

The cut-off date in the history record of the ENSDF archival file, consulted during the development of NUBASE2026, is also given in Table I. The entry is left blank if no ENSDF information was available for a particular nuclide.

The recommended values for the fundamental nuclear physics properties compiled in NUBASE2026 are distributed in the ASCII-formatted file, **nubase.mas26**, available from the collaboration dissemination websites [35]. The only difference relative to the printed version concerns nuclides with multiple decay modes for which some branches were either unobserved (denoted by '?' in the printed version) or had intensities that were not directly measured (denoted by '=?' in the printed version). In such cases, the intensities of the primary decay branches were normalized to 100% in the ASCII file. In addition, the very precise values for the excitation energies of the ^{229}Th^{m} and ^{235}U^{m} isomers were truncated in the ASCII file and the readers are referred to the printed version for the exact values. NUBASE2026 data are also distributed through various software tools and online resources (see Ref. [35]), including the *Nucleus*++ software suite [36].

3 Policies of NUBASE2026

3.1 Trends in neighboring nuclei (TNN)

In general, NUBASE2026 compiles numerical and bibliographical information for all known nuclei for which at least one property has been measured experimentally. It also includes entries for as-yet unobserved nuclides and for properties that have not yet been measured, most commonly excita-

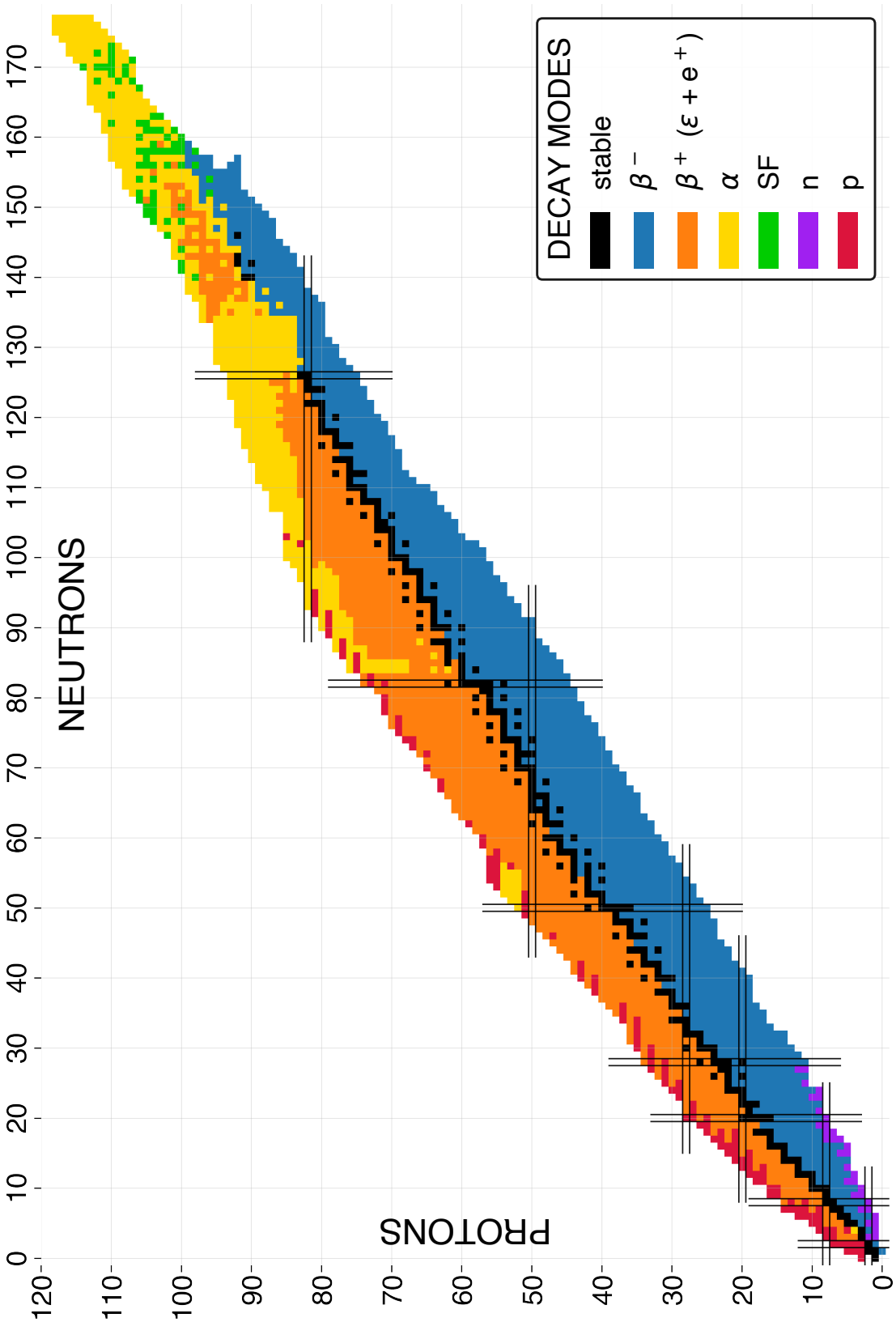


Fig. 7. Nuclear chart displaying the main decay mode for nuclei in their ground state.

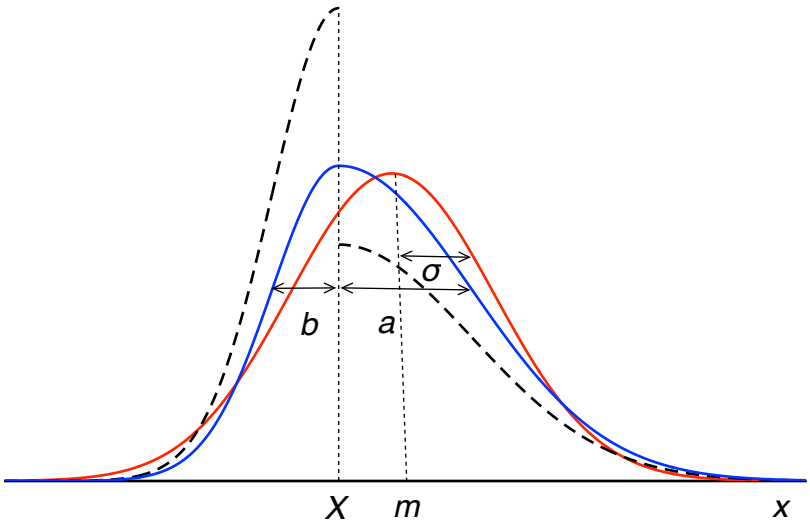


Fig. 8. Dashed black: original Normal distributions, $N(X,b)$ (left on X) and $N(X,a)$ (right on X), associated with the measured quantity X^{+a}_{-b}; solid blue: a two-piece Normal distribution $TN(X,a,b)$; solid red: the equivalent Normal (symmetric) distribution, $N(m,\sigma)$; see Section 3.3 for details.

tion energies of isomers, half-lives, and spins and/or parities. These values are estimated from systematic trends in the corresponding properties among neighboring nuclei, with continuity enforced in N, Z, A, and $N-Z$. This procedure provides a consistent description of the evolution of a given property with proton and neutron numbers and has proven useful for inferring other relevant quantities. As in AME2026, where masses estimated from Trends in the Mass Surface (TMS) are marked by the symbol '#', NUBASE2026 uses the same symbol to denote non-experimental information inferred from Trends in Neighboring Nuclei (TNN). It should be noted, however, that deviations from TNN systematics are to be expected in the presence of nuclear-structure effects, such as deformation or shape changes. Such effects have been taken into account to the best of the authors' knowledge.

3.2 Averaging procedure and uncertainties

NUBASE2026 adopts the policy that uncertainties associated with the recommended values are quoted as one standard deviation, corresponding to a 68% confidence level. In practice, however, the meaning of uncertainties reported in the literature is not always explicitly specified; in such cases, they are assumed to correspond to one standard deviation. When no uncertainty is reported, an estimated value is assigned by the NUBASE2026 evaluators on the basis of the limitations of the experimental method. If both statistical and systematic uncertainties are provided in the literature, they are combined in quadrature by the evaluators.

When only lower (l) and upper (u) limits are reported for a quantity q, such that $q\in[l,u]$, NUBASE2026 assumes a uniform probability distribution over this interval. The corresponding recommended value is taken as the mean, $m=(l+u)/2$, with standard deviation $\sigma=(u-l)/\sqrt{12}\simeq 0.29\times(u-l)$.

When two or more independent measurements are available in the literature, the corresponding values are combined by means of an uncertainty-weighted average. The recommended value $\bar{x}$ and its uncertainty $\Delta\bar{x}$ are given by:

$$\bar{x}\pm\Delta\bar{x}=\sum_{i=1}^{N}w_i x_i\Big/\sum_{i=1}^{N}w_i\pm\sqrt{1\Big/\sum_{i=1}^{N}w_i} \tag{3}$$

where w_i=$1/\Delta x_i^2$ and x_i and Δx_i are the value and its associated uncertainty, respectively, reported in the i^{th} measurement; the sums run over all N measurements.

For each weighted average, the NORMALIZED CHI, χ_n (also referred to as the 'consistency factor' or 'Birge ratio'), is also evaluated according to

$$\chi_n=\sqrt{\frac{1}{N-1}\sum_{i=1}^{N}w_i(x_i-\bar{x})^2}. \tag{4}$$

NUBASE2026 adopts the weighted average of Eq. 3 when χ_n is smaller than or equal to 2.5. For $2.5<\chi_n<4$, a departure from the purely statistical result of Eq. 3 is permitted, and the average value is assigned an *external* uncertainty

$$\bar{x}\pm\Delta\bar{x}=\sum_{i=1}^{N}w_i x_i\Big/\sum_{i=1}^{N}w_i\pm\chi_n\times\sqrt{1\Big/\sum_{i=1}^{N}w_i} \tag{5}$$

In the rare cases where $\chi_n \geq 4$, the individual uncertainties are considered unreliable, and the recommended value is taken as an arithmetic (unweighted) mean

$$\bar{x} \pm \Delta\bar{x} = \frac{1}{N}\sum_{i=1}^{N} x_i \pm \sqrt{\frac{1}{N(N-1)}\sum_{i=1}^{N}(x_i-\bar{x})^2} \quad (6)$$

The values included in the statistical analysis of a given quantity are listed in the comments to Table I. When contradictory (discrepant) results were identified in the literature, particular attention was devoted to determining the origin of the discrepancies, and where appropriate, to rejecting or correcting unreliable data prior to the statistical analysis. The reasons for such decisions are also provided in the comments to Table I.

3.3 Symmetrization of asymmetric uncertainties

Experimental results are sometimes reported in the literature with asymmetric uncertainties, e.g., X^{+a}_{-b}. In NUBASE, such uncertainties are symmetrized. The asymmetric uncertainty is represented by a two-piece normal distribution (also called "split-normal distribution" or "Fechner distribution"), $TN(X,a,b)$. The symmetrization is then performed by mapping this distribution onto a normal (symmetric) distribution, $N(\mu,\sigma)$, where μ and σ are the mean and standard deviation, respectively.

The probability density function of the two-piece normal distribution is defined as

$$f(x) = \begin{cases} A \times \exp[-(x-X)^2/2a^2] & \text{if x} > \text{X}, \\ A \times \exp[-(x-X)^2/2b^2] & \text{if x} < \text{X} \end{cases} \quad (7)$$

with $A = [\sqrt{\pi/2} \times (a+b)]^{-1}$. It has mode X, standard deviation a for $x > X$ and standard deviation b for $x < X$ (see Figure 8). The new distribution is obtained by joining the left half of a normal distribution $N(X,b)$ and the right half of a normal distribution $N(X,a)$, rescaled so that both branches have the common value of $f(X)$=A (see Figure 8).

The mean value and variance of this distribution are derived in Ref. [37]:

$$\mu = X + \sqrt{2/\pi} \times (a-b) \quad (8)$$

$$\sigma^2 = (1-2/\pi) \times (a-b)^2 + a \times b \quad (9)$$

The median value m, which divides the distribution into two equal areas is

$$m = \begin{cases} X + a\sqrt{2} \times \text{erf}^{-1}\left(\frac{a-b}{2a}\right) & \text{if a} > \text{b}, \\ X + b\sqrt{2} \times \text{erf}^{-1}\left(\frac{a-b}{2b}\right) & \text{if b} > \text{a}. \end{cases} \quad (10)$$

Using the approximation $\text{erf}^{-1}(z) \simeq \sqrt{\pi}z/2$, one obtains:

$$m - X \simeq \sqrt{\pi/8} \times (a-b) \simeq 0.6267 \times (a-b) \quad (11)$$

To allow for the small nonlinearity appearing at larger values of $m-X$, Eq. 11 is replaced by:

$$m \simeq X + 0.64 \times (a-b) \quad (12)$$

As a result, a quantity reported in the literature with an asymmetric uncertainty, X^{+a}_{-b}, is symmetrized to $m \pm \sigma$, where m and σ are given by Eqs. 12 and 9, respectively. This prescription is adopted in NUBASE2026. The experimentally reported value and its asymmetric uncertainty are always given in the comments to Table I.

3.4 Rounding policy

Experimental values adopted in NUBASE2026, together with their uncertainties, are generally rounded, even if unrounded values are given in the literature or in ENSDF. For some highly precise data, however, as well as for data considered essential for traceability purposes (e.g., isotopic abundances), the precision quoted in the original publication is retained.

When the two leftmost significant digits of the uncertainty exceeded a prescribed limit, the adopted value and its corresponding uncertainty were rounded accordingly. This limit was set to *30* for the mass excesses and excitation energies of isomers, in order to maintain consistency with AME, and to *25* for half-lives and branching ratios, in accordance with a common ENSDF practice.

4 Conclusions

The NUBASE2026 evaluated nuclear data library contains the recommended values of the fundamental nuclear physics properties for all known nuclei, including mass excesses, excitation energies of excited isomeric states, half-lives, spins and parities, decay modes and their intensities, isotopic abundances (for stable nuclei), and the corresponding bibliographical information. It also includes information for as-yet unobserved nuclei whose properties were estimated from systematic trends in neighboring nuclei.

One of the main objectives in the development of NUBASE2026 was to achieve the most complete possible coverage of the available experimental data and to provide appropriate references to all experimental results, in particular for cases not yet included in ENSDF or in other topical evaluations. Such traceability allows users to review the recommended data promptly and, if necessary, to undertake a re-evaluation.

NUBASE2026 is an integral part of AME2026, and the synchronization of the two libraries enables better homogenization of the experimental data. Furthermore, the assignment of isomeric states and determination of their excitation energies were placed on a firm basis, and the corresponding data were significantly improved.

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References in the text, such as [1989Ot.A] or [1974De47], are listed under "References used in the AME2026 *and the* NUBASE2026 *evaluations" [7].*

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Table I. The NUBASE2026 table of fundamental nuclear physics properties

EXPLANATION OF TABLE I

Data are presented in groups ordered by increasing mass number, A.

Nuclide

Nuclide name: mass number $A = N + Z$ and element symbol. Superscript suffixes 'm', 'n', 'p', 'q', 'r' and 'x' denote assignments to excited isomeric states; see Section **2.2**. The suffixes 'p' and 'q' may also denote non-isomeric excited levels, as adopted in AME2026. The suffix 'r' may additionally denote a state associated with a proton resonance in (p,γ) reactions (e.g., ^{28}Si^{r}). The suffix 'x' may denote a mixture of levels with a relative ratio, R, given in the 'Half-life' column. They occur in spallation reactions or fission and are labeled as 'spmix' or 'fsmix', respectively, in the 'J^{π}' column. Suffixes 'i' and 'j' denote Isobaric Analog States; see Section 2.2.1.

Mass excess

Mass excess [M(in u)$-A$] and its uncertainty in keV, as recommended in AME2026.

Rounding policy: in cases where the leftmost significant digit of the uncertainty exceeds 3, values are rounded, but by not more than tens of keV. (Examples: $2345.67 \pm 2.78 \rightarrow 2345.7 \pm 2.8, 2345.67 \pm 4.68 \rightarrow 2346 \pm 5$, but $2346.7 \pm 468.2 \rightarrow 2350 \pm 470$).

\# Indicates that the 'Mass excess' value and its uncertainty are not derived from experimental data, but are based, at least in part, on Trends in the Mass Surface (TMS); see the AME2026 publication for details.

Excitation energy

The energy difference between the excited isomer and the ground state, and its uncertainty in keV. Values are derived using the *internal* or *external* relation; see Section **2.2**. Rounding follows the 'Mass excess' convention, except for the very precise values of ^{229}Th^{m} and ^{235}U^{m}, which are given in the comments.

\# Indicates that the 'Excitation energy' value and its uncertainty are not derived from experimental data, but are based on Trends in Neighboring Nuclei (TNN); see Section 3.1.

When the excitation energy is determined by an *external* relation, it is followed by a one- or two-letter origin code indicating the method used to establish that relation. The field is left blank when the value is derived from γ-ray spectroscopy data (*internal* relation):

MD	mass spectrometry data
RQ	reaction Q value data
AD	α-decay energy data
BD	β-decay end-point energy data
p, 2p	one-, two-proton decay energy data
IT	combination of *external* (AME2026) and *internal* (γ-ray spectroscopy) data

When the existence of a nuclide or an isomer is questionable the following codes are used:

EU Existence Uncertain. Indicates that the existence of the state is under discussion (e.g., ^{162}Lu^{n}). When existence is strongly doubted, excitation energy and mass excess values are not listed and are replaced by "non-exist" (e.g., ^{142}Nd^{m}).

RN Reported Non-existent. Indicates that the isomer has been shown not to exist (e.g., ^{181}Pb^{m}). Excitation energy and mass excess values are replaced by "non-exist".

Remark: codes EU and RN are also used when the discovery of a nuclide is questioned (e.g., ^{260}Fm and ^{289}Lv). In such cases, a ground-state mass excess value based on the Trends in the Mass Surface (TMS) is always given; see the AME2026 publication for details.

Ambiguous ground state and isomer assignments:

- * Indicates that the available experimental information is insufficient to determine unambiguously which state is the ground state and which is the excited isomer. An asterisk is also appended when the uncertainty in the excitation energy, ΔE_x, exceeds half the excitation energy value, $\Delta E_x > E_x/2$; see, for example, ^{114}Tc and ^{114}Tc^m.
- & Indicates that the ordering of the ground state and the excited isomer is reversed relative to the assignment adopted in ENSDF; see, for example, ^{100}Y and ^{100}Y^m.

Half-life

Half-life value; see Section 2.3.

s = seconds; m = minutes; h = hours; d = days; y = years; 1 y = 365.2422 d = 31 556 926 s.

STABLE = stable nuclide or nuclide for which no finite half-life value was established.

- # Indicates non-experimental value based on Trends in Neighboring Nuclei (TNN); see Section 3.1.

subunits:

ms	:	10^{-3}	s	millisecond	ky	:	10^{3}	y	kiloyear
μs	:	10^{-6}	s	microsecond	My	:	10^{6}	y	megayear
ns	:	10^{-9}	s	nanosecond	Gy	:	10^{9}	y	gigayear
ps	:	10^{-12}	s	picosecond	Ty	:	10^{12}	y	terayear
fs	:	10^{-15}	s	femtosecond	Py	:	10^{15}	y	petayear
as	:	10^{-18}	s	attosecond	Ey	:	10^{18}	y	exayear
zs	:	10^{-21}	s	zeptosecond	Zy	:	10^{21}	y	zettayear
ys	:	10^{-24}	s	yoctosecond	Yy	:	10^{24}	y	yottayear

J^π

Spin and parity; see Section 2.4:

- () uncertain assignment based on *weak* experimental arguments.
- * directly measured spin; see Section 2.4.
- # non-experimental value based on Trends in Neighboring Nuclei (TNN) (see Section 3.1) or theoretical predictions.
- am same J^π as the α-decaying parent nuclide.
- T isospin multiplet value for Isobaric Analog States; see Section 2.2.1.

Ens

Year of the ENSDF file archive. To reduce the table width, the century digits are omitted.

Reference

Reference keynumbers; see Section 2.7. To reduce the table width, the century digits are omitted from the NSR reference keynumber. A complete list of references, together with the corresponding NSR keynumbers, is provided in the second AME2026 publication in this volume.

- 10Cr01 Indicates an update derived from a *primary* reference (journal article) with the keynumber assigned from the "Nuclear Science Reference" (NSR) database; see Section 2.7. When no keynumber is available, the provisional format 10Cr.a, where a=1,2,3,..., is used.
- 10Cr.X where X=A,B,C,..., indicates an update derived from a *secondary* reference (arXiv, abstracts, conference proceedings, private communications, Ph.D. and M.Sc. theses, and laboratory reports).
- AHWyym (or GAU, RCH, HWJ, FGK, MMC, SAR, WGM), indicates that the result is based on an interpretation by one of the NUBASE evaluators. 'yym' denotes the year and month when the assessment was completed.
- Mirror Indicates that the quantity is derived from the properties of the mirror nucleus.

The reference keynumbers are followed by codes containing up to three letters, indicating which physical quantity was added or modified:

M	mass excess
E	isomer excitation energy
T	half-life
J	spin and/or parity
D	decay mode and/or its intensity
I	identification

Decay modes and intensities

Decay modes are listed together with their intensities and associated uncertainties, both expressed in %; see Section 2.5. They are ordered by decreasing intensity. Uncertainties are given in the ENSDF format, for example, α=25.9 23 denotes α=25.9 % $\pm$ 2.3 %. The notation 1.8e–12 represents 1.8×10^{-12}.

α ? indicates that the α-decay mode is energetically allowed but has not been observed experimentally.

α=? indicates that the α-decay mode has been observed, but its intensity has not been determined experimentally.

α	α emission
p, 2p, 3p	1-proton emission, 2-proton emission, 3-proton emission
n, 2n, 3n	1-neutron emission, 2-neutron emission, 3-neutron emission
ε	electron capture
e^+	positron emission
β^+	β^+ decay ($\beta^+ = \varepsilon + e^+$)
β^-	β^- decay
$2\beta^-$	double β^- decay
$2\beta^+$	double β^+ decay
β^-n	β^--delayed neutron emission
β^-2n	β^--delayed 2-neutron emission
β^-3n	β^--delayed 3-neutron emission
β^-4n	β^--delayed 4-neutron emission
β^-d	β^--delayed deuteron emission
β^-t	β^--delayed triton emission
$\beta^-\alpha$	β^--delayed α emission
β^+p	β^+-delayed proton emission
β^+2p	β^+-delayed 2-proton emission
β^+3p	β^+-delayed 3-proton emission
β^+pα	β^+-delayed proton + α emission
$\beta^+\alpha$	β^+-delayed α emission
$\beta^+3\alpha$p	β^+-delayed 3-α + 1-proton emission
IT	internal transition
2γ	2-γ emission
SF	spontaneous fission
β^+SF	β^+-delayed fission
β^-SF	β^--delayed fission
^{24}Ne	heavy ion (cluster) emission

For stable or long-lived nuclei:

IS	Isotopic abundance adopted from Refs. [32, 33]; see Section 2.6.

*	Indicates a comment associated with a nuclide, given below the block of data for the same the *A*. The asterisk is also included at the end of the corresponding data line. Each comment begins with a letter code, similar to that following the reference keynumber (see above), indicating the physical quantity to which the remark applies. The comment may contain: *(i)* information explaining how a specific value was derived; *(ii)* reasons for modifying or rejecting a value or its uncertainty; *(iii)* additional references to updated data; and *(iv)* individual values used in the statistical data analysis.

Table I. The NUBASE2026 table of fundamental nuclear physics properties

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{1}n	8071.3181	0.0004				608.84 s 0.17	$1/2^+$*	05	25Mu06	T	β^-=100	*
^{1}H	7288.9710	0.0001				STABLE	$1/2^+$*	05			IS=99.9855 78	*
*^{1}n	T : average 25Mu06=608.47(0.20) [τ=877.83(0.22,stat)(+0.20-0.17,syst)], supersedes 21Go24=608.43(0.24)											**
*^{1}n	T : [τ=877.83(0.28,stat)(+0.20-0.16,syst)], 24Fu.A=608(3) [τ=877.2(1.7,stat,+4.0-3.6,syst)] 18Ez.1=608.8(1.3)											**
*^{1}n	T : [τ=877.83(1.6,stat)(1.0,syst)] 18Pa53=608.5(0.6) [τ=877.7(0.7,stat)(+0.4-0.2,syst)] 18Se09=611.0(0.6) [τ=881.5(0.5,stat)(0.6,syst)],											**
*^{1}n	T : supersedes 05Se01=608.9(0.6) [τ=878.5(0.7,stat)(0.3,syst)], 15Ar07=610.1(0.8) [τ=880.2(1.2)] 12St10=611.7(1.5)											**
*^{1}n	T : [τ=882.5(1.4,stat)(1.5,syst)] 10Pi07=610.5(1.2) [τ=880.7(1.3,stat)(1.2,syst)]; Birge ratio=1.9; 24Na22(PDG,evaluation)=608.86(0.35)											**
*^{1}n	T : [τ=878.4(0.5)]											**
*^{1}n	J : 54St90,50Ha67,37Sc09=1/2											**
*^{1}H	M : rounded from 7288.971064(0.000013) keV											**
*^{1}H	J : 30He02,29Mu01,27De01=1/2											**
*^{1}H	D : from IS=[99.972,99.999] in 24Ci.A											**
^{2}H	13135.7229	0.0001				STABLE	1^+*	03			IS=0.0145 78	*
*^{2}H	M : rounded from 13135.722895(0.000015) keV											**
*^{2}H	J : 50Le06,34Mu03,33Le02=1											**
*^{2}H	D : IS from 100% - IS(^{1}H); IS=[0.001,0.028] in 24Ci.A											**
^{3}H	14949.8109	0.0001				12.32 y 0.02	$1/2^+$*	15			β^-=100	*
^{3}He	14931.2189	0.0001				STABLE	$1/2^+$*	15			IS=0.0002 2	*
^{3}Li	28670#	2000#					$3/2^-$#	15			p ?	
*^{3}H	M : rounded from 14949.81090(0.00008) keV											**
*^{3}H	J : 49Di31,47Bl32,47Bl31=1/2											**
*^{3}He	M : rounded from 14931.21888(0.00006) keV											**
*^{3}He	J : 53We01,49Do24,49An11=1/2											**
^{4}H	24620	100				139 ys 10	2^-	91	03Me11	T	n=100	*
^{4}He	2424.9163	0.0001				STABLE	0^+	91			IS=99.9998 2	*
^{4}Li	25320	210				91 ys 9	2^-	91	65Ce02	T	p=100	
*^{4}H	T : from width=3.28(0.23) MeV; other: 91Go19=4.7(1.0), downweighted											**
*^{4}He	M : rounded from 2424.91636(0.00004) keV											**
^{5}H	32940	90				86 ys 6	$(1/2^+)$	19	17Wu03	T	2n=100	*
^{5}He	11231	20				602 ys 22	$3/2^-$	01			n=100	*
^{5}Li	11680	50				370 ys	$3/2^-$	01	02Ti10	TJ	p=100	*
^{5}Be	37140#	2000#					$1/2^+$#	18			p ?	
*^{5}H	T : from width=5.3(0.4) MeV in 17Wu03											**
*^{5}H	J : from angular distribution data consistent with $l=0$ in 01Ko52											**
*^{5}He	T : from width=758(28) keV, average 12Lu01=767(10) keV 09Ak03=670 (12, stat) (30, syst) keV; Birge ratio=2.9											**
*^{5}Li	T : from width=1.23 MeV in 02Ti10; other: width=1.50 MeV in 18Ch23											**
^{6}H	41820	240				287 ys 60	2^-#	17	25Sh16	T	n ?;3n ?	*
^{6}He	17592.10	0.05				807.12 ms 0.15	0^+	01	22Ka42	T	β^-=100;β^-d=0.000278 18	*
^{6}Li	14086.8804	0.0014				STABLE	1^+*	01			IS=4.85 170	*
^{6}Li^{i}	17649.76	0.10	3562.88	0.10		55.8 as 1.2	0^+ T=1	01	81Ro02	E	IT=100	*
^{6}Be	18375	5				5.0 zs 0.3	0^+	01	02Ti10	T	2p=100	
^{6}B	47320#	2000#					2^-#	22			2p ?	
*^{6}H	T : from width=1.59(0.33) MeV, average 25Sh16=1.9(1.0,stat)(0.4,syst) 84Al08=1.8(0.5) MeV 86Be35=1.3(0.5) MeV; other: 03Gu12=5.5(2.0)											**
*^{6}He	D : %β^-d from 15Pf01=2.78(0.18)e-4; other: 09Ra33=1.65(0.10)e-6, but with 525-keV threshold											**
*^{6}He	T : average 22Ka42=807.25(0.16, stat)(0.11, syst) 12Kn01,12Kn02=806.89 (0.11, stat)(+0.23-0.19, syst); others: 02Ti10=806.7(1.5)											**
*^{6}He	T : 82Al17=805.4(2.0) 81Ba58=798.1(1.0) 74Wi14=808.1(2.0) 62Bi14=797(3) 54Kl36=799(3)											**
*^{6}Li	J : 51Sc07,37Ma06=1											**
*^{6}Li	D : from IS=[1.9,7.8]											**
*^{6}Li^{i}	T : from width=8.17(0.14, stat)(0.11, syst) eV in 21Fr01											**
^{7}H	49180#	1000#				1.0 zs 0.6	$1/2^+$	23	22Ca10	T	2n ?	*
^{7}He	26073	7				2.51 zs 0.07	$(3/2)^-$	01	12Ca05	T	n=100	*
^{7}Li	14907.105	0.004				STABLE	$3/2^-$*	01			IS=95.15 170	*
^{7}Li^{i}	26202	10	11295	10	RQ		$3/2^-$ T=3/2	01				
^{7}Be	15769.061	0.023				53.18 d 0.04	$3/2^-$*	01	FGK255	T	ε=100	*
^{7}Be^{i}	26750	30	10980	30	RQ		$3/2^-$ T=3/2	01			p ?;^{3}He ?;α ?	
^{7}B	27677	26				570 ys 14	$(3/2^-)$	14	11Ch32	T	p=100	*
*^{7}H	T : from average widths 22Ca10=0.18(+47-16) MeV 08Ca22=0.09(+94-6) MeV											**
*^{7}He	T : from width 12Ca05=182(5) keV; others: 25Kh09=145(50) 09Ak03=190(30) 08De29=125(+40-15) 02Me07=150(80) 69St02=160(30) (downweighted)											**
*^{7}Li	J : 69Vi02,66Ra29,35Fo03,32Gr03,30Ha01=3/2											**
*^{7}Li	D : from IS=[92.2,98.1]											**
*^{7}Be	T : unweighted average of all world data; Birge ratio=22.66											**
*^{7}Be	J : 17Kr.1=3/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^7$B	T : from width=801(20) keV in 11Ch32											**
^{8}He	31609.71	0.10				119.5 ms 1.5	0^+	04	15Bi05	TD	β^-=100;β^-n=16 1;β^-t=0.9 1	*
^{8}Li	20945.80	0.05				838.7 ms 0.3	2^+*	04	10Fl01	T	β^-=100;$\beta^-\alpha$=100	*
^{8}Li^i	31768	5	10822	5	RQ		0^+ T=2	04				
^{8}Be	4941.67	0.04				81.9 as 3.7	0^+	04			α=100	
^{8}Be^i	21568	3	16626	3			2^+ frg. T=1		04Ti06	E	α=100	
^{8}Be^j	32436.0	2.0	27494.3	2.0	RQ		0^+ T=2	04			n=39.4;d=27.0;^{3}H=11.7;α=7.9; p=6.9;^{3}He=6.6;IT=0.60	*
^{8}B	22921.6	1.0				771.9 ms 0.9	2^+	04	20Vi03	T	β^+=100;$\beta^+\alpha$=100	*
^{8}B^i	33544	7	10623	7	RQ		0^+ T=2	04	14Br15	D	2p=100	
^{8}C	35064	18				3.5 zs 1.4	0^+	18			2p=100	*
$*^8$He	D : %β^-t from 86Bo41											**
$*^8$Li	D : β^- decay to the first 2^+ state in ^{8}Be, which decays 100% by two α											**
$*^8$Li	T : average 10Fl01=838.40(0.36) 03Wi17=839.60(1.06) 90Sa16=840.3(0.9)											**
$*^8$Li	J : 73Ne10,71OtZZ,67Gu14,62Co08,59Co68=2											**
$*^8$B	T : average 20Vi03=771.9(1.7),773.9(1.8),770.9(1.7), uncertainty in the last value from priv. comm. with the authors (from 2.7 to 1.7 ms),											**
$*^8$B	T : 73McZW=772(4) 71Wi05=762(5) 64Ma35=774(4)											**
$*^8$C	T : from width=130(50) keV in 11Ch32											**
^{9}He	40940	50				2.5 zs 2.3	$1/2(^+)$	04	16Ub01	J	n=100	*
^{9}Li	24954.91	0.19				178.2 ms 0.4	$3/2^-$	04	15Bi05	TD	β^-=100;β^-n=50.5 10	
^{9}Be	11348.425	0.003				STABLE	$3/2^-*$	04			IS=100	*
^{9}Be^i	25738.8	1.7	14390.3	1.7	RQ	1.25 as 0.10	$3/2^-$ T=3/2	04				
^{9}B	12416.5	0.9				800 zs 300	$3/2^-$	04			p=100	
^{9}B^i	27071.0	2.3	14654.5	2.5	RQ		$3/2^-$ T=3/2	04				
^{9}C	28911.0	2.1				126.5 ms 0.9	$3/2^-$	20	01Be51	D	β^+=100;$\beta^+\alpha$=38.4 16;β^+p=7.5 6	*
^{9}N	45100	210				0.79 zs 0.60	$1/2^+$#		23Ch46	IDT	p ?;2p ?	*
$*^9$He	T : from width=180(100) keV in 13Al14; other: width=100(60) keV in 99Bo26											**
$*^9$Be	J : 17Kr.1,69Be50,69Vi02,66Ra29,65Gr18=3/2; also: 56Br48,53Kn50,51Sc17,51Ha50=3/2											**
$*^9$C	D : %β^+p from %β^+(to ^{9}B gs)=54.1(1.5) from 01Be51 and %β^+(to ^{9}B exc) from 00Ge09, but renormalized in order to have %β^+(^{9}C)=100, and %p/%α from											**
$*^9$C	D : 00Ge09; %$\beta^+\alpha$=100 - %β^+(to ^{9}B gs) - %β^+p											**
$*^9$C	J : from 04Ti06											**
$*^9$N	T : from width=0.58(0.44) MeV in 23Ch46											**
^{10}He	49200	90				260 ys 40	0^+	04			2n=100	*
^{10}Li	33053	13				2.0 zs 0.5	$(1^-,2^-)$	04	94Yo01	TJ	n=100	
^{10}Li^p	33250	40	200	40	RQ	3.7 zs 1.5	1^+		97Zi04	T	IT=100	*
^{10}Li^q	33530	40	480	40	RQ	1.35 zs 0.24	(2^+)		94Yo01	T	IT=100	*
^{10}Be	12607.46	0.05				1.387 My 0.012	0^+	04	10Ch18	T	β^-=100	*
^{10}Be^i	33787	21	21179	21	RQ		(2^-) T=2	04			n ?;p ?;^{3}H ?	
^{10}B	12050.611	0.015				STABLE	3^+*	04			IS=19.65 43	*
^{10}B^i	13790.66	0.04	1740.05	0.04			0^+ T=1	04			IT=100	
^{10}C	15698.67	0.07				19.3017 s 0.0015	0^+	04	16Du10	T	β^+=100	*
^{10}N	38480	180				313 ys 15	$(2)^-$	17	21Ch54	TJ	p=100	*
$*^{10}$He	D : most probably 2 neutron emitter from S_{2n}=-1440(90) keV											**
$*^{10}$He	T : from width=1.76(0.27) MeV, average 12Ko43=1.8(0.4) 10Jo06=1.73(0.36), the latter average of 1.11(0.76), assuming a single narrow resonance,											**
$*^{10}$He	T : and 1.91(0.41), assuming two overlapping resonances; others: width=2 MeV in 12Si07, 100-500 keV in 94Os04, <1.2 MeV in 94Ko16											**
$*^{10}$Li^p	T : average width=120(+100-50) keV in 97Zi04 and 100(70) keV in 99Bo26											**
$*^{10}$Li^q	T : average from width=358(23) keV in 94Yo01 width=150(70) keV in 93Bo03; Birge ratio=2.8											**
$*^{10}$Be	T : average 10Ch18=1.386(0.016) 10Ko19=1.388(0.018); other: 07Ni16=1.36(0.07)											**
$*^{10}$B	J : 69Vi02,66Ra29,50We03,50Go10=3											**
$*^{10}$B	D : from IS=[18.9,20.4]											**
$*^{10}$C	T : average 16Du10=19.2969(0.0074),19.3009(0.0017) 09Ba06=19.282(0.011) 08Ia01=19.310(0.004) 90Ba02=19.294(0.016),19.300(0.041)											**
$*^{10}$C	T : 74Az01=19.280(0.020) 63Ba52=19.27(0.08); others (discrepant): 74Ro21=19.151(0.026) 62E_α02=19.48(0.05)											**
$*^{10}$N	T : from width=1.46(0.07) MeV in 21Ch54 for J$^\pi$=2$^-$; others: width=1.11(0.04) MeV for J$^\pi$=1$^-$ in 21Ch54l, width=2.0(+0.7-0.5) MeV for J$^\pi$=2$^-$ and											**
$*^{10}$N	T : width=2.5(+2.0-1.5) MeV for J$^\pi$=1$^-$ in 17Ho10, width=1.9(0.9) MeV in 02Le16											**
^{11}Li	40728.3	0.6				8.75 ms 0.06	$3/2^-*$	11	12Ke01	D	β^-=100;β^-n=86.3 9;β^-2n=4.1 4; β^-3n=1.9 2;$\beta^-\alpha$=1.7 3; β^-d=0.0130 13;β^-t=0.0093 8	*
^{11}Be	20177.6	0.6				13.76 s 0.07	$1/2^+*$	11	19Re03	D	β^-=100;$\beta^-\alpha$=3.3 1;β^-p=0.0013 3	*
^{11}Be^i	41336	20	21158	20	RQ	0.93 zs 0.13	$3/2^-$ T=5/2		MMC162J		IT ?	*
^{11}B	8667.708	0.012				STABLE	$3/2^-*$	11			IS=80.35 43	*
^{11}B^i	21228	9	12560	9	RQ		$1/2^+$ T=3/2	11				*
^{11}B^j	42230	80	33570	80	2p		$3/2^-$ T=5/2		MMC146J			

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{11}C	10649.40	0.06				20.3402 m 0.0053	$3/2^-$*	11	18Va04	T	β^+=100	*
^{11}C^i	22810	40	12160	40	RQ		$1/2^+$ T=3/2	11	71Wa21	D	p=?	
^{11}N	24366	5				585 ys 7	$1/2^+$	11	19We11	T	p=100	*
^{11}N^m	25110	60	740	60		690 ys 80	$1/2^-$		96Ax01	ETJ	p=100	
^{11}O	47740	60				198 ys 12	$(3/2^-)$	19	20We08	TJ	2p=100	*
*^{11}Li	T : average 97Mo35=8.99(0.10) 96Mu19=8.2(0.2) 95Re.A=8.4(0.2) 81Bj01=8.83(0.12) 74Ro31=8.5(0.2)											**
*^{11}Li	J : 87Ar22=3/2											**
*^{11}Be	D : %$\beta^-\alpha$ from 19Re03=3.30(0.10); others: 24So16=3.27(0.46) 81Al03=2.9(0.4); %β^-p from 19Ay03=0.0013(0.0003); others (indirect):											**
*^{11}Be	D : 14Ri01=0.00083(0.00009) 20Ri02<0.00022%, 24So16<0.0002%											**
*^{11}Be	J : 17Kr.1,14Ta10=1/2											**
*^{11}Be^i	T : from width=490(70) keV in 97Te07											**
*^{11}B	J : 69Vi02,66Ra29,65Gr18,50Go10=3/2											**
*^{11}B	D : from IS=[79.6,81.1]											**
*^{11}B^i	J : $(3/2^+)$ alternative also suggested in ENSDF2012											**
*^{11}C	T : from 18Va04 using world data											**
*^{11}C	J : 61Sn01=3/2											**
*^{11}N	T : from width=780(10) keV in 19We11											**
*^{11}O	T : from width=2.31 (0.14) MeV in 20We08; other: width=2.46 MeV in 19Fo10											**
^{12}Li	49010	30				150# ys	$(1^-,2^-)$	17	74Bo05	I	n ?	
^{12}Be	25077.8	1.9				21.46 ms 0.05	0^+	17			β^-=100;β^-n=0.50 3	
^{12}Be^m	27328.8	2.1	2251	1		233 ns 7	0^+	17			IT=100	*
^{12}B	13369.4	1.3				20.20 ms 0.02	1^+*	17			β^-=100;$\beta^-\alpha$=0.60 2	*
^{12}B^i	26088	19	12719	19	RQ		0^+ T=2	17	08Ch28	J		
^{12}C	0.0	0.0				STABLE	0^+	17			IS=98.94 6	*
^{12}C^i	15108	3	15108	3	RQ		1^+ T=1	17			IT=?;α ?	
^{12}C^j	27595.0	2.4	27595.0	2.4	RQ		0^+ T=2	17				
^{12}N	17338.1	1.0				11.000 ms 0.016	1^+*	17	09Hy01	D	β^+=100;$\beta^+\alpha$=1.93 4	*
^{12}N^i	29580	4	12242	4	2p	> 5 zs	(0^+) T=2	17	MMC142J			*
^{12}O	31912.6	2.0				4.3 zs 0.5	0^+	17	23Ch47	T	2p=100	*
*^{12}Be^m	T : average 07Sh34=229(8) 13Jo06=247(15); other: 18Ch31=270(+12-120)											**
*^{12}B	J : 71Mi06,71WiZB,70Su04,70Wi17,68PfZZ,68Su05=1; also 67Su03=1											**
*^{12}C	D : from IS=[98.84,99.04]											**
*^{12}N	T : from 78Al01; other: 20Bi15=10.92(0.11,stat)(0.01,syst)											**
*^{12}N	J : 71Mi06,68Su05,67Su09=1											**
*^{12}N^i	T : from width<100 keV in 19We11											**
*^{12}O	T : from width=107(13) keV in 23Ch47, supersedes 51(19) keV in 19We11; others: 12Ja11<72 keV 09Su14=600(500) keV 95Kr03=578(205) keV											**
^{13}Li	56980	70				3.3 zs 1.2	$3/2^-$#	24	08Ak03	D	2n=100	*
^{13}Be	33659	10				1.0 zs 0.7	$1/2^-$	24	19Co02	J	n=100	*
^{13}Be^p	35160	50	1500	50	RQ	1.14 as 0.14	$(5/2^+)$				n=100	
^{13}B	16561.9	1.0				17.30 ms 0.17	$3/2^-$	24			β^-=100;β^-n=0.276 37	
^{13}C	3125.0092	0.0002				STABLE	$1/2^-$*	24			IS=1.06 6	*
^{13}C^i	18233.8	1.1	15108.8	1.1	RQ	83 zs 4	$3/2^-$ T=3/2	24			IT=0.82 7;n ?;α ?	
^{13}N	5345.48	0.27				597.41 s 0.14	$1/2^-$*	24	22Lo14	T	β^+=100	*
^{13}N^i	20410.59	0.18	15065.1	0.3	RQ		$3/2^-$ T=3/2	24			IT=4.9 3;p ?;α ?	
^{13}O	23115	10				8.55 ms 0.04	$3/2^-$	24	24Bi01	T	β^+=100;β^+p=11.2 14; $\beta^+3\alpha$p=0.078 6	*
^{13}F	42030#	500#					$1/2^+$#	24			p ?	
*^{13}Li	T : from width=125(+60-40) keV in 13Ko03											**
*^{13}Be	T : from width=450(30) keV in 10Ko17; other: width=300(200) keV in 95Pe12											**
*^{13}Be	J : from 10Ko17,19Co02; others: 01Th01,08Ch07,13Ak02,14Ra07=1/2$^+$											**
*^{13}C	J : 54Ro34,48Je21=1/2											**
*^{13}C	D : from IS=[0.96,1.16]											**
*^{13}N	T : average 22Lo14=597.05(0.19) 80An40=598.0(0.6) 77Az01=597.9(0.6) 68Ri15=597.8(0.5) 60Ja12=597.9(0.3); other: 23Ke11=595.68(2.28)											**
*^{13}N	J : 64Be24,61Sn01=1/2											**
*^{13}O	D : %$\beta^+3\alpha$p from 23Bi03=0.078(0.006); %β^+p from 100 - %β^+(to ^{13}N gs), where %β^+(to ^{13}N gs)=88.8(1.4), average 70Es03=88.1(3.4) 90As01=89.2(2.2)											**
*^{13}O	D : 05Kn02=88.7(2.0)											**
*^{13}O	T : average 24Bi01=8.55(0.09) 90As01=8.55(0.05); others: 70Es03=8.95(0.20) 65Mc09=8.7(0.4)											**
^{14}Be	39830	70				4.53 ms 0.27	0^+	90	15Bi05	TD	β^-=100;β^-n=86 6;β^-2n=5 2; β^-t=0.02 1;$\beta^-\alpha$<0.004	*
^{14}Be^p	41470	60	1640	90	RQ		(2^+)		95Bo10	I		
^{14}B	23665	21				12.36 ms 0.29	2^-	90	15Bi05	TD	β^-=100;β^-n=6.04 23;β^-2n ?	
^{14}B^i	40729	20	17064	29	RQ	4.2 zs 1.9	0^+ T=3		MMC162J		IT ?	*
^{14}C	3019.893	0.004				5697 y 19	0^+	98			β^-=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{14}C^{i}	25120 100	22100 100		(2$^-$) T=2	98		IT=100	
^{14}N	2863.4167 0.0002		STABLE	1$^+$*	90		IS=99.6205 245	*
^{14}N^{i}	5176.007 0.010	2312.590 0.010		0$^+$ T=1	90	01Ba06 E	IT=100	
^{14}O	8007.781 0.025		70.620 s 0.006	0$^+$	90	22Sh26 T	β^+=100	*
^{14}F	31960 40		500 ys 60	2$^-$	14	10Go16 TJ	p ?	*
*^{14}Be	D : %β^-t, %$\beta^-\alpha$ from 02Je11							**
*^{14}B^{i}	T : from width=110(50) keV in 01Ta23							**
*^{14}C	T : average 72Em01,68ReZZ=5736(56) 68Be47=5660(30) 64Hu09=5745(50) 62Ol04=5680(40) 61Wa16=5780(65); others: 52Je11=5100(85) 49Jo07=5589(75)							**
*^{14}C	T : 49Ha52=6360(200) 48Ya02=7200(500) 48No02=5100(200) 46Re10=4700(400)							**
*^{14}N	J : 47To16,48To10,46Co10,28Or01=1							**
*^{14}N	D : from IS=[99.578,99.663]							**
*^{14}O	T : average 22Sh26=70.6192(0.0076) 13La23=70.610(0.030),70.632(0.094) 12Ta.B=70.623(0.053) 06Bu12=70.696(0.052) 04Ba78=70.641(0.020)							**
*^{14}O	T : 01Ga59=70.560(0.049) 78Be61=70.684(0.077) 78Wi04=70.613(0.025) 73Cl12=70.588(0.028); others (downweighted): 74Az01=70.43(0.18)							**
*^{14}O	T : 72Al01=70.48(0.15) 72Si50=70.32(0.12)							**
*^{14}F	T : from width=910(100) keV in 10Go16							**
^{15}Be	49624 20		1.2 zs 0.7	3/2$^+$#	15	24Ku30 TDJ	n=100	*
^{15}B	28957 21		10.18 ms 0.35	3/2$^-$	90	15Bi05 TD	β^-=100;β^-n=98.7 10;β^-2n=0.8 4	*
^{15}C	9873.1 0.8		2.449 s 0.005	1/2$^+$	90		β^-=100	
^{15}N	101.4381 0.0006		STABLE	1/2$^-$*	90		IS=0.3795 245	*
^{15}N^{i}	11717 4	11615 4 RQ		1/2$^+$ T=3/2	90		n ?;p ?;IT=0.00523 19	
^{15}O	2855.6 0.5		122.266 s 0.043	1/2$^-$*	90	20Bu02 T	β^+=100	*
^{15}O^{i}	13790 60	10932 61		(1/2$^+$) T=3/2	90	25Ch72 E	p=100	
^{15}F	16567 14		1.1 zs 0.3	1/2$^+$	16	04Go15 J	p=100	*
^{15}Ne	40220 70	2p	770 ys 300	(3/2$^-$)	14	14Wa09 JTD	2p=100	*
*^{15}Be	T : from width<200 keV in 24Ku30; others (width): 13Sn02=575(200) keV 21Co07>200 keV associated with excited 5/2$^+$ state in 25Se.2							**
*^{15}B	D : %β^-n symmetrized from 91Ha25=99.68(+0.08-1.58); other: 95Re.A=93.6(1.2); %β^-2n from 84Du15<1.5							**
*^{15}N	J : 40Wo10,39Kr11=1/2							**
*^{15}N	D : from IS=[0.337,0.422]							**
*^{15}O	T : average 20Bu02=122.308(0.049) 77Az01=122.23(0.23) 60Ja12=122.1(0.1)							**
*^{15}O	J : 63Co17=1/2							**
*^{15}F	T : from width=370(70)(+200-0) keV in 16De15							**
*^{15}Ne	T : from width=590(230) keV in 14Wa09							**
^{16}Be	56820 80		1.4 zs 0.4	0$^+$	14	24Mo02 TD	2n=100	*
^{16}B	37112 25		> 4.6 zs	0$^-$#	16	09Le02 T	n ?	*
^{16}C	13694 4		750 ms 6	0$^+$	92		β^-=100;β^-n=99.0 3	*
^{16}N	5683.9 2.3		7.13 s 0.02	2$^-$	92	18Ki12 D	β^-=100;$\beta^-\alpha$=0.00154 5	*
^{16}N^{m}	5804.3 2.3	120.42 0.12	5.25 μs 0.06	0$^-$ T=1	92	83Mi20 D	IT=99.999611 25;β^-=0.000389 25	*
^{16}N^{i}	15613 7	9929 7 RQ		0$^+$ T=2	92			
^{16}O	−4737.0024 0.0004		STABLE	0$^+$	92		IS=99.757 11	*
^{16}O^{p}	8231.6 0.3	12968.6 0.3		2$^-$		64Bo13 E	p=78 4;α=22 4;IT=0.28 3	
^{16}O^{i}	8059 4	12796 4 RQ		0$^-$ T=1	92		IT=100	
^{16}O^{j}	17984 4	22721 4 RQ		0$^+$ T=2	92			
^{16}F	10675 5		21 zs 5	0$^-$	92	18Ch25 T	p=100	*
^{16}F^{i}	20831 18	10156 17		(0$^+$) T=2		25Ch72 E	p=100	
^{16}Ne	24016 12		> 5.7 zs	0$^+$	20	14Br19 T	2p=100	*
*^{16}Be	T : from width=0.32(0.08) MeV in 24Mo02; other: width=0.8(+0.1-0.2) MeV in 12Sp01							**
*^{16}B	T : from width<100 keV in 09Le02; other: 96Kr05<190 ps							**
*^{16}C	T : average 01Gr06=753(8) 76Al02=747(8)							**
*^{16}N	D : %$\beta^-\alpha$ average 18Ki12=0.00159(0.00006) 16Re01=0.00149(0.00005,stat)(+0-0.00010,syst)							**
*^{16}N^{m}	D : %β^- average 83Mi20=4.35(0.50)e-4 5.10(0.65)e-4 83Ga18=3.42(0.37)e-4, supersedes 82Ga05=3.13(0.43)e-4, 75Pa01=3.3(0.7)e-4							**
*^{16}O	D : from IS=[99.738,99.776]							**
*^{16}F	T : from width=21.3(5.1) keV in 18Ch25							**
*^{16}Ne	T : from width<80 keV in 14Br19 (3σ upper limit)							**
^{17}B	43720 200		5.08 ms 0.05	3/2$^-$	92	88Du09 D	β^-=100;β^-n=63 1;β^-2n=12 2; β^-3n=3.5 7;β^-4n=0.4 3	*
^{17}C	21032 17		193 ms 6	3/2$^+$	17		β^-=100;β^-n=28.4 13;β^-2n ?	
^{17}N	7870 15		4.173 s 0.004	1/2$^-$	92	94Do08 D	β^-=100;β^-n=95.1 7;$\beta^-\alpha$=0.0025 4	*
^{17}O	−808.7643 0.0007		STABLE	5/2$^+$*	21		IS=0.0384 10	*
^{17}O^{i}	10270.02 0.17	11078.78 0.17 RQ		1/2$^-$ T=3/2	21		β^- ?;n ?;IT=0.42 14	
^{17}F	1951.70 0.25		64.370 s 0.027	5/2$^+$	92	16Br01 T	β^+=100	*
^{17}F^{i}	13144.7 1.9	11193.0 1.9 RQ		1/2$^-$ T=3/2	92			
^{17}Ne	16500.4 0.4		109.2 ms 0.6	1/2$^-$*	18	02Mo19 D	β^+=100;β^+p=94.4 29;$\beta^+\alpha$=3.51 1; β^+pα=0.014 4	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
^{17}Na	34720	60						$(1/2^+)$	17	17Br07	IJD	p=100	
$*^{17}$N	D : %β^-n from 76Al02												**
$*^{17}$O	J : 52Ge26,52Mi26,51Al08=5/2												**
$*^{17}$O	D : from IS=[0.0367,0.0400] in 24Ci.A												**
$*^{17}$F	T : average 16Br01=64.402(0.042) 15Gr14=64.347(0.035)												**
$*^{17}$Ne	J : 05Ge06=1/2												**
^{18}B	51790	200					<26ns	(2^-)	16	10Sp02	IJ	n=100	*
^{18}C	24920	30				92 ms	2	0^+	17			β^-=100;β^-n=31.5 15;β^-2n ?	
^{18}N	13113	19				619.3 ms	1.9	1^-	21	05Li60	TD	β^-=100;$\beta^-\alpha$=12.2 6;β^-n=7.0 15; β^-2n ?	*
^{18}O	−782.8163	0.0006				STABLE		0^+	94			IS=0.205 10	*
^{18}O^i	15495	20	16278	20				1^- T=2		AHWe			*
^{18}F	873.1	0.5				109.734 m	0.008	1^+	94	FGK204	T	β^+=100	
^{18}F^m	1994.5	0.5	1121.36	0.15		162 ns	7	5^+	94			IT=100	
^{18}F^i	1914.7	0.5	1041.55	0.08				0^+ T=1	94			IT=100	
^{18}Ne	5317.6	0.4				1664.20 ms	0.47	0^+	94	15La19	T	β^+=100	*
^{18}Na	25169	20				> 11 zs		1^-#	15	25Ni11	TD	p=100	*
^{18}Mg	42030	30				4.0 zs	3.4	0^+	22	21Ji15	TD	2p=100	*
$*^{18}$B	TI : 93Po.A<26 ns; 84Mu27 proposes that ^{18}B is n-unstable												**
$*^{18}$N	D : %$\beta^-\alpha$ from 89Zh04; %β^-n from 05Li60,07Lo05=7.0(1.5); others: 94Sc01=2.2(0.4) 95Re.A=10.9(0.9) 91Re02=14.3(2.0) (same as 95Re.A)												**
$*^{18}$N	T : average 05Li60=619(2) 99Og03=620(14) 94Sc01=630(20) 82Ol01=624(12) 64Ch19=630(30); others: 95Re.A=660(35) 07Lo05=625(30),635(40),609(60)												**
$*^{18}$N	T : 91Re02=790(210)												**
$*^{18}$O	D : from IS=[0.187,0.222]												**
$*^{18}$O^i	E : assuming 16399(5), 17025(10) levels to be IAS's of 114.90(0.18), 747(10) levels in ^{18}N (see 95Ti07)												**
$*^{18}$Ne	T : average 15La19=1664.00(+0.57-0.48) 13Gr03=1664.8(1.1), supersedes 07Gr18=1665.6(1.9); others (downweighted): 75Al27=1669(4) 75Ha21=1687(9)												**
$*^{18}$Na	T : from width<40 keV in 25Ni11; other: at variance with width=480(140) keV in 04Ze05												**
$*^{18}$Mg	T : from width 115(100) keV in 21Ji15												**
^{19}B	59770	530				2.92 ms	0.13	$(3/2^-)$	18	03Yo02	TD	β^-=100;β^-n=71 9;β^-2n=17 5; β^-3n=4.6 26	*
^{19}C	32410	100				46.2 ms	2.3	$1/2^+$	17	88Du09	TD	β^-=100;β^-n=47 3;β^-2n=7 3	*
^{19}N	15855	16				336 ms	3	$1/2^-$	18	06Su12	TJD	β^-=100;β^-n=41.8 9	
^{19}O	3332.9	2.6				26.470 s	0.006	$5/2^+$	94	13Uj01	T	β^-=100	*
^{19}F	−1487.4452	0.0008				STABLE		$1/2^+*$	94			IS=100	*
^{19}F^i	6052.2	0.9	7539.6	0.9				$5/2^+$ T=3/2	94			IT=100	
^{19}Ne	1752.04	0.16				17.2561 s	0.0018	$1/2^+*$	94	17Fo24	T	β^+=100	*
^{19}Ne^i	9253	9	7501	9		8.0 zs	1.7	$5/2^+$ T=3/2	94	25Se.1	ETJ		*
^{19}Na	12929	11				> 11 zs		$(5/2^+)$	15	10Mu12	T	p=100	*
^{19}Mg	31872	10				5 ps	3	$1/2^-$#	14	09Mu17	TD	2p=100	*
$*^{19}$B	D : %β^-n, %β^-2n symmetrized from 03Yo02=71.8(+8.3-9.1), 16.0(+5.6-4.8); %β^-3n from 03Yo02<9.1												**
$*^{19}$C	T : average 88Du09=49(4) 95Re.A=44(4) 95Oz02=45.5(4.0)												**
$*^{19}$C	J : from 01Ma08,99Na27,95Ba28=1/2$^+$												**
$*^{19}$O	T : average 13Uj01=26.476(0.009) 94It.A=26.464(0.009)												**
$*^{19}$F	J : 49Gi28,33Ca04,29Ga01=1/2												**
$*^{19}$Ne	T : average 17Fo24=17.2569(0.0019,stat)(0.0009,syst) 13Uj01=17.254(0.005) 12Tr06=17.262(0.007) 84Pi.A=17.237(0.014) 75Az01=17.219(0.017); others												**
$*^{19}$Ne	T : (outliers): 14Br06=17.283(0.008) 94Ko.A=17.296(0.005) 92Ge08=18.5(0.6) for q=10$^+$ (bare ion)												**
$*^{19}$Ne	J : 05Ge06,63Co22=1/2												**
$*^{19}$Ne^i	J : possible IAS of ^{19}O gs (J^π=5/2$^+$)												**
$*^{19}$Na	T : from width<40 keV in 10Mu12, dominated by resolution of <1 eV												**
$*^{19}$Mg	T : symmetrized from 09Mu17=6(+2-4); supersedes 07Mu15=4.0(1.5)												**
^{20}B	69400	550				> 912 ys		$(1^-,2^-)$	19	18Le18	TJ	n=100;β^-n ?;β^-2n ?	*
^{20}C	37500	230				16 ms	3	0^+	17	90Mu06	TD	β^-=100;β^-n=70 11;β^-2n=9 5	*
^{20}N	21770	80				136 ms	3	(2^-)	18	06Su12	TD	β^-=100;β^-n=42.9 14;β^-2n ?	
^{20}O	3796.2	0.9				13.51 s	0.05	0^+	97			β^-=100	*
^{20}F	−17.463	0.030				11.0062 s	0.0080	2^+	97	19Bu01	T	β^-=100	*
^{20}F^i	6503	3	6521	3	RQ			0^+ T=2	97				
^{20}Ne	−7041.9382	0.0001				STABLE		0^+	97			IS=90.48 3	
^{20}Ne^i	3230.5	2.0	10272.5	2.0	RQ			2^+ T=1	97			IT=100	
^{20}Ne^j	9690.9	2.8	16732.8	2.8	RQ			0^+ T=2	97			IT=100	
^{20}Na	6850.5	1.1				447.9 ms	2.3	2^+*	97	89Cl02	D	β^+=100;$\beta^+\alpha$=25.0 4	*
^{20}Na^i	13348.9	1.2	6498.4	0.5	p			0^+ T=2	97			p=100	
^{20}Mg	17477.7	1.9				90.4 ms	0.5	0^+	19	17Su05	T	β^+=100;β^+p=30.3 12	*
^{20}Al	41940#	200#				> 1.1 zs		1^-#		25Xu03	ITD	3p≈100	*
$*^{20}$B	T : from width<0.5 MeV in 18Le18												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{20}$C	D : %β^-n average 03Yo02=65(+19-18) 90Mu06=72(14); %β^-2n from 03Yo02<18.6											**
$*^{20}$C	T : average 90Mu06=14(+6-5), supersedes 89Le16=16(+14-7) same group, 95Re.A=16.7(3.5); other: 03Yo02=21.8(+15.0-7.4)											**
$*^{20}$O	T : average 74Al10=13.49 (0.05) 70Ma42=13.57(0.10)											**
$*^{20}$F	T : evaluated in 19Bu01 using the world data											**
$*^{20}$Na	J : 75Sc20,71OtZZ,70BoYV=2											**
$*^{20}$Na	D : %$\beta^+\alpha$ other: 21Wa06=20.3(0.6)											**
$*^{20}$Mg	T : average 17Su05=90.0(0.6) 16Lu13=91.4(1.0)											**
$*^{20}$Al	T : from width<400 keV in 25Xu03											**
^{21}B	78380	560				> 760 ys	$(3/2^-)$	19	18Le18	TJI	2n=100	*
^{21}C	45640#	300#				<30ns	$1/2^+$#	22	93Po.A	IT	n ?	
^{21}N	25230	130				85 ms 5	$(1/2^-)$	15	09Li51	TD	β^-=100;β^-n=87 3;β^-2n ?	*
^{21}O	8062	12				3.42 s 0.10	$5/2^+$	15	23Is02	J	β^-=100;β^-n ?	
^{21}F	−47.6	1.8				4.158 s 0.020	$5/2^+$	15			β^-=100	
^{21}Ne	−5731.78	0.04				STABLE	$3/2^+$*	15			IS=0.27 1	*
^{21}Ne^i	3129.0	0.3	8860.8	0.3			$5/2^+$ T=3/2	15				
^{21}Na	−2184.86	0.04				22.4550 s 0.0054	$3/2^+$*	15	18Sh27	T	β^+=100	*
^{21}Na^i	6789	4	8974	4	p		$5/2^+$ T=3/2	15				
^{21}Mg	10903.9	0.8				121.0 ms 0.3	$5/2^+$*	15	24Je01	TD	β^+=100;β^+p=22.5 5;$\beta^+\alpha$=0.124 4; β^+pα=0.016 3	*
^{21}Al	26050	14				11 ys 11	$(5/2^+)$	15	25Ph02	TDJ	p=100	*
^{21}Al^p	32050	50	6000	50		617 ys 83	$(1/2^+,7/2^+)$		25Ni12	TDJ	3p=100	*
^{21}Si	49870#	200#				10# ms	$1/2^-$#				p ?	
$*^{21}$B	T : from width<0.6 MeV in 18Le18											**
$*^{21}$N	T : average 09Li51=83(8), supersedes 08Lo06=82.9(1.9), 90Mu06=95(+15-11) 95Re.A=83.6(6.7), supersedes 91Re02=61(23)											**
$*^{21}$N	D : %β^-n average 09Li51=90.5(4.2) 90Mu06=84(9) 95Re.A=78(7), supersedes 91Re02=76(15)											**
$*^{21}$Ne	J : 05Ge06,56Hu70,49Ko21=3/2$^+$											**
$*^{21}$Na	T : average 18Sh27=22.4615(0.0040) 17Fi07=22.4056(0.0033); others: 15Gr05=22.422(0.010) 75Az01=22.47(0.03) 74Al03=22.55(0.10)											**
$*^{21}$Na	J : 71OtZZ,69Ko10,65Am01=3/2											**
$*^{21}$Mg	J : 09Kr05=5/2											**
$*^{21}$Mg	T : average 24Je01=120.5(0.4), supersedes 15Lu12=118.6(0.5), 18Wa20=121.9(0.6) 92Go10=120(5) 73Se08=123.1(3.3) 65Ha20=121(5)											**
$*^{21}$Mg	D : %β^+p from 24Je01=22-23%; others: 18Wa20=19.2(3.0) 15Lu13=21.0(3.0) 73Se08=32.6(1.0); %β^+pα from 15Lu13; %$\beta^+\alpha$ from FGK258 using											**
$*^{21}$Mg	D : $\beta^+\alpha/\beta^+$p=0.553(0.015)% in 15Lu12 and %β^+p=22.5(0.5)											**
$*^{21}$Al	T : from width=40(40) keV, symmetrized from 25Ph02=16(+52-16) keV; others: 93Po.A<35 ns 86La17<200 ns 24Ko22<10 ps											**
$*^{21}$Al^p	T : from width=0.74(0.10) MeV in 25Ni12											**
^{22}C	53610	230				6.2 ms 1.3	0^+	15	03Yo02	TD	β^-=100;β^-n=61 14;β^-2n=19 11	*
^{22}N	31760	210				22.8 ms 0.2	0^-#	15	25Pe11	T	β^-=100;β^-n=34.1 24;β^-2n=12 3	*
^{22}O	9280	60				2.25 s 0.09	0^+	15			β^-=100;β^-n=11 6	*
^{22}F	2793	12				4.23 s 0.04	(4^+)	15			β^-=100;β^-n=6 3	*
^{22}Ne	−8024.7302	0.0024				STABLE	0^+	15			IS=9.25 3	
^{22}Ne^i	5855	10	13880	10			4^+ T=2	15	04Go03	E		*
^{22}Na	−5181.40	0.13				2.6027 y 0.0003	3^+*	15	FGK259	T	β^+=100;e$^+$=90.33 4;ε=9.67 4	*
^{22}Na^m	−4598.35	0.16	583.05	0.10		243 ns 2	1^+	15			IT=100	
^{22}Na^i	−4524.40	0.19	657.00	0.14		19.6 ps 0.7	0^+ T=1	15			IT=100	
^{22}Mg	−400.00	0.16				3.8745 s 0.0007	0^+	15	17Du11	T	β^+=100	*
^{22}Mg^i	13646	4	14046	4	p		$(4)^+$ T=2	15	21Wu10	D	IT ?;p=1.41 10;2p=1.24 7; α=0.12 1	*
^{22}Al	18092.49	0.27				91.1 ms 0.5	$(4)^+$	15	06Ac04	T	β^+=100;β^+p=55 3;β^+2p=1.10 11; $\beta^+\alpha$=0.038 17	*
^{22}Al^i	26930#	410#	8837#	406#			0^+ T=3		17Xu01	D	2p=100	
^{22}Si	31830	50				28.7 ms 1.1	0^+	15	20Le16	TD	β^+=100;β^+p=62 5;β^+2p=0.7 3	*
$*^{22}$C	T : symmetrized from 03Yo02=6.1(+1.4-1.2)											**
$*^{22}$C	D : %β^-n symmetrized from 03Yo02=61(+14-13); %β^-2n from 03Yo02<37											**
$*^{22}$N	T : others: 10Su03=24(3),22(4),21(7) 03Yo02=16.5(+8.5-4.8) 90Mu06=24(+7-6) 01Pe14=31(5) 95Re.A=14(5.6) (downweighted)											**
$*^{22}$N	D : %β^-n: average 10Su03=33(3) 08ReZZ=34(14) 03Yo02=41(+12-10) 01Pe14=37(14) 90Mu06=35(5);%β^-2n: from 10Su03=12(3); other: 03Yo02<13											**
$*^{22}$O	D : %β^-n from 91Re02<22											**
$*^{22}$F	D : %β^-n from 91Re02<11											**
$*^{22}$Ne^i	E : from 16Ma.A, but T=2 assignment is not firm											**
$*^{22}$Na	D : from e$^+/\varepsilon$=0.1071(0.0005) in ENSDF2015											**
$*^{22}$Na	J : 49Da01=3											**
$*^{22}$Mg	T : average 17Du11=3.87400(0.00079) 03Ha20=3.8755(0.0012)											**
$*^{22}$Mg^i	J : IAS of ^{22}Al gs [J^π=(4)$^+$]											**
$*^{22}$Al	T : other: 21Wu10=86.1(0.6), at variance with 06Ac04 but in agreement with the continuous beam-mode result in 06Ac04											**
$*^{22}$Si	T : average 22Ci04=24(+4-3) 20Le16=28.6(1.4) supersedes 17Xu01=27.8(3.5) 96Bl11=29(2)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{22}$Si	D : %β^+p from 20Le16, based on %I(p)=5.3(1.0), 43.0(4.6) and 13.5(2.1); %β^+2p from 17Xu01; other: %β^+p=95(+14-12), %β^+2p=3(+4-2) in 22Ci04											**
^{23}C	64170#	500#					3/2$^+$#				n ?	
^{23}N	36720	420				13.9 ms 1.4	1/2$^-$#		20 03Yo02	TD	β^-=100;β^-n=42 6;β^-2n=8 4; β^-3n=1.7 10	*
^{23}O	14620	120				97 ms 8	1/2$^+$		20 07Su05	TD	β^-=100;β^-n=7 2	*
^{23}F	3290	30				2.23 s 0.14	5/2$^+$		20 95Re.A	D	β^-=100;β^-n=7 4	*
^{23}Ne	−5154.06	0.10				37.15 s 0.03	5/2$^+$*		20 15La19	T	β^-=100	*
^{23}Na	−9529.8535	0.0018				STABLE	3/2$^+$*		20		IS=100	*
^{23}Na^i	−1638.7	0.3	7891.2	0.3			5/2$^+$ T=3/2		20		IT=100	
^{23}Na^j	10060.5	2.0	19590.4	2.0		240 zs 120	T=5/2		20 85Ev01	T		*
^{23}Mg	−5473.67	0.03				11.3039 s 0.0032	3/2$^+$*		20 17Yo05	J	β^+=100	
^{23}Mg^i	2329.6	0.4	7803.3	0.4			5/2$^+$ T=3/2		20 00Pe28	DE	IT=99.83 8;p=0.17 8	*
^{23}Al	6748.1	0.3				452 ms 3	5/2$^+$		20 24Go.A	T	β^+=100;β^+p=1.22 5	*
^{23}Al^i	18470	40	11720	40	p		(5/2)$^+$ T=5/2		20		2p=100	
^{23}Si	23363	5				42.3 ms 0.4	5/2$^+$		20 22Ci04	TD	β^+=100;β^+p=81.8 11; β^+2p=7.73 35;β^+3p=0.029 +38-19; β^+pα=0.014 +33-12	*
$*^{23}$N	T : symmetrized from 03Yo02=14.1(+1.2-1.5)											**
$*^{23}$N	D : %β^-n and %β^-2n symmetrized from 03Yo02=42.2(+6.3-6.5) and 8.0(+3.8-3.4); %β^-3n from 03Yo02<3.4											**
$*^{23}$O	T : others: 90Mu06=82(+45-28) 08ReZZ=89(76)											**
$*^{23}$O	D : β^-n others: 90Mu06=31(7) 08ReZZ=28(30) 91Re01<29											**
$*^{23}$F	T : from 74Go17=2.23(0.14)											**
$*^{23}$F	D : %β^-n from 95Re.A<14											**
$*^{23}$Ne	T : average 15La19=37.148(0.032) 07Gr18=37.11(0.06) 74Al03=37.24(0.12); others: 57Pe12=37.6(0.1) 58Nu41=38.0(0.3) 59Al10=37.5(0.1)											**
$*^{23}$Ne	T : 67Yu01=38.7(0.4) 50Br78=40.2(0.4)											**
$*^{23}$Ne	J : 05Ge06=5/2											**
$*^{23}$Na	J : 20Ha38,34Ra01,34El02,33Jo04,33Gr03=3/2											**
$*^{23}$Na^j	T : from width=1.9(0.8) keV in 85Ev01											**
$*^{23}$Mg	T : average 17Ma18=11.3027(0.0033) 77Az01=11.317(0.011); others: 75Az01=11.327(0.014) 74Az01=11.26(0.08) 74Al03=11.36(0.04) 68Go10=11.41(0.05)											**
$*^{23}$Mg	T : 58Mi85=12.2(0.1)											**
$*^{23}$Mg^i	E : from 24Go.A=7803.29(0.40); others: 00Pe28=7801(2) ENSDF2021=7803.0(0.6)											**
$*^{23}$Al	D : %β^+p from 11Sa15											**
$*^{23}$Al	T : average 24Go.A=454.3(3.7) 06Ia03=446(6), supersedes same value in 12Tr08; others: 01Wa54=476(45) 00Pe28=350(100) 72Go03=470(30)											**
$*^{23}$Si	T : from 97Bl04=42.3(0.4); others: 18Wa05=40.17(1.86) for delayed proton events > 300 keV and 22Ci04=47(1), probably missed some decay events											**
$*^{23}$Si	J : L=2 in ^{9}Be(^{24}Si,^{23}Si) in 08Ga10 and J$^\pi$=5/2$^+$ in the mirror nucleus ^{23}F											**
^{24}N	46940#	400#				<52ns			22 93Po.A	IT	n ?	
^{24}O	18500	160				126 ms 4	0$^+$		22 24Ne06	TD	β^-=100;β^-n=39 3	*
^{24}F	7540	100				384 ms 16	(3$^+$)		22 07Su05	T	β^-=100;β^-n=3.0 17	*
^{24}Ne	−5951.7	0.5				3.38 m 0.02	0$^+$		22 56Dr11	T	β^-=100[gs=0,m=100]	
^{24}Na	−8417.901	0.017				14.9560 h 0.0028	4$^+$*		22 FGK259	T	β^-=100	*
^{24}Na^m	−7945.694	0.017	472.2074	0.0008		20.18 ms 0.07	1$^+$		22		IT=100	*
^{24}Na^i	−2451.66	0.17	5966.24	0.17			0$^+$ T=2		22			
^{24}Mg	−13933.578	0.013				STABLE	0$^+$		22		IS=78.965 49	*
^{24}Mg^i	−4417.40	0.05	9516.18	0.05			4$^+$ T=1		22			
^{24}Mg^j	1503.9	0.6	15437.5	0.6			0$^+$ T=2		22			
^{24}Al	−48.81	0.23				2.054 s 0.004	4$^+$		22		β^+=100;$\beta^+\alpha$=0.035 6; β^+p=0.0016 3	*
^{24}Al^m	377.00	0.25	425.81	0.10		130.7 ms 1.2	1$^+$		22		IT=69.6 7;β^+=30.4 7; $\beta^+\alpha$=0.028 6	*
^{24}Al^i	5900	3	5949	3	p		0$^+$ T=2		22			
^{24}Si	10754	4				141.4 ms 1.2	0$^+$		22 15Su15	T	β^+=100;β^+p=32.9 9	*
^{24}P	32410#	300#					1$^+$#				p ?;β^+ ?;β^+p ?	
$*^{24}$O	T : others: 25Pe11=138(12) 15Ca09=80(5) 01Pe14=67(10) 90Mu06=61(+32-19) 99Re16=65(5)											**
$*^{24}$O	D : %β^-n: average 24Ne06=30(5) 15Ca09=43(4) 90Mu06=58(12); others: 01Pe14=12(8) 99Re16=18(6)											**
$*^{24}$F	T : others: 15Ca09=390(70) 95Re.A=440(70) 86Du07=340(80)											**
$*^{24}$F	D : %β^-n from 95Re.A<5.9											**
$*^{24}$Na	J : 00Ke09,78Hu12,53Be19=4											**
$*^{24}$Na^m	T : average 80Jo11=20.22(0.10) 72Br53=20.21(0.14) 70Ch37=20.1(0.2) 61Sc09=19.9(0.3)											**
$*^{24}$Mg	D : from IS=[78.88,79.05]											**
$*^{24}$Al	T : average 85Ad10=2.053(0.004) 71Go18=2.054(0.009) 53Gl32=2.10(0.04); others: 94Ba54=1.9(0.1),2.5(1.0) 52Bi12=2.3(0.2) 69St14=2											**
$*^{24}$Al	D : %β^+p from β^+p/$\beta^+\alpha$=0.047(0.002) in 94Ba54; %$\beta^+\alpha$ from 79Ho08											**
$*^{24}$Al^m	T : average 11Ni18,11Ma88=130.9(1.3) 88Bu12=132.7(4.1) 79Sh11=128(6) 79Ho08=127(6) 71To12=133(10) 66Ar02,68Ar03=129(5)											**
$*^{24}$Al^m	D : %IT and %B from 11Ni18,11Ma88; others: %IT=82.5(3.0) %β^+=17.5(3.0) in 79Ho08 and %IT=78(3) %β^+=22(3) in 79Sh11; %$\beta^+\alpha$ from 79Ho08											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{24}$Si	T : average 15Su15=143.3(2.2) 09Ic05=140.5(1.5) 97Cz02=140(8) 98Ba53=139(18); others: 80Le18=103(42) 81Ay01=100(+90-45)											**
$*^{24}$Si	D : %β^+p average 15Su15,16Su22=31.3(1.3) 11Ic06=33.3(1.6) 98Cz01=37.6(2.5)											**
^{25}N	55980#	500#				<260ns	$1/2^-$#	25	99Sa06	I	n ?	*
^{25}O	27330	170				5.18 zs 0.35	$(3/2^+)$	25	16Ko11	T	n=100	*
^{25}F	11330	100				142.6 ms 1.2	$(5/2^+)$	25	25Pe11	TD	β^-=100;β^-n=38 7;β^-2n ?	*
^{25}Ne	−2024	8				602 ms 8	$1/2^+$*	25	73Go11	T	β^-=100	*
^{25}Na	−9357.8	1.2				59.3 s 0.9	$5/2^+$*	25			β^-=100	*
^{25}Mg	−13192.78	0.05				STABLE	$5/2^+$*	25			IS=10.01 1	*
^{25}Mg^i	−5405.93	0.06	7786.85	0.04			$5/2^+$ T=3/2	25				
^{25}Al	−8915.97	0.06				7.1666 s 0.0023	$5/2^+$	25	17Lo09	T	β^+=100	*
^{25}Al^i	−1014.3	1.1	7901.7	1.1	IT		$5/2^+$ T=3/2	25	21Su03	E		
^{25}Si	3827	10				218.6 ms 1.0	$5/2^+$	25	24St06	T	β^+=100;β^+p=37.9 7	*
^{25}P	19310#	400#				<30ns	$1/2^+$#	25	93Po.A	IT	p ?	
^{25}S	40650#	300#				1# ns	$5/2^+$#				p ?	
$*^{25}$N	I : searched for in 99Sa06 and 04Lu19, but not observed; probably neutron unbound											**
$*^{25}$O	T : from width=88(6) keV in 16Ko11; other: width=20(+60-20) keV in 13Ca18											**
$*^{25}$F	T : average 25Pe11=142.6(1.2) [β-n(t)], 149(6) [$\beta\gamma(t)$], other: 138(5) [β(t)]; others: 05Pa74=90(9) 01Pe14=70(10) 99Re16=50(6)											**
$*^{25}$F	T : 91Re02=59(40)											**
$*^{25}$F	D : others (not trusted): 05Pa74=23.1(4.5) 99Re16=14(5) 91Re02=15(10)											**
$*^{25}$Ne	J : 05Ge06=1/2											**
$*^{25}$Ne	T : others: 08ReZZ=606(42) 82Mu08=780(180)											**
$*^{25}$Na	J : 75De11=5/2											**
$*^{25}$Mg	J : 19Yo06,17Yo05,57We13,49Cr18=5/2											**
$*^{25}$Mg	D : rounded from IS=10.011(0.013) from IS=[9.988,10.034] in 24Ci.A											**
$*^{25}$Al	T : average 17Lo09=7.1657(0.0024) 75Az01=7.174(0.007)											**
$*^{25}$Si	T : average 24St06=217(2) 21Su03=218.9(+1.0-1.4) 93Ro06=223(6) 92Ha28=232(15) 66Re07=218(4) 65Mc01=225(6)											**
$*^{25}$Si	D : %β^+p average 21Su03=39.3(1.5) 04Th09=35.2(1.2) 93Ro06=37.7(1.5) 92Ha28=40.5(1.4)											**
^{26}O	34660	160				4.2 ps 3.3	0^+	16	13Ko10	T	2n=100	*
^{26}F	18670	110				9.08 ms 0.10	1^+	16	13Le03	TD	β^-=100;β^-n=13.5 28;β^-2n ?	*
^{26}F^m	19310	110	643.4	0.1		2.2 ms 0.1	(4^+)	16	13Le03	TD	EIT=82 11;β^-=?;β^-n=12 8	
^{26}Ne	460	7				197 ms 2	0^+	16			β^-=100;β^-n=0.13 3	
^{26}Na	−6861	4				1071.28 ms 0.25	3^+*	16			β^-=100	*
^{26}Na^m	−6779	4	82.40	0.04		4.35 μs 0.16	1^+	16	14NiZZ	ET	IT=100	*
^{26}Mg	−16214.544	0.029				STABLE	0^+	16			IS=11.025 38	*
^{26}Al	−12210.14	0.07				717 ky 17	5^+*	16			β^+=100	*
^{26}Al^m	−11981.83	0.07	228.306	0.013	MD	6346.0 ms 0.5	0^+* T=1	16	13Ch51	T	β^+=100	*
^{26}Si	−7141.00	0.11				2.2453 s 0.0007	0^+	16	10Ia01	T	β^+=100	*
^{26}Si^i	5914.0	2.0	13055.0	2.0	p		(3^+) T=2	16				
^{26}P	10997	10				43.6 ms 0.3	$(3)^+$	16	17Ja05	DT	β^+=100;β^+p=35.1 14; β^+2p=1.99 21	*
^{26}P^m	11161	10	164.4	0.1		115 ns 8	(1^+)	16	17Pe09	ET	IT=100	*
^{26}S	26680#	200#				<79ns	0^+	16	11Fo08	IT	2p ?	
$*^{26}$O	T : symmetrized from 13Ko10=4.5(+1.1-1.5,stat)(3,syst)											**
$*^{26}$F	D : %β^-n average 13Le03=16(4) 99Re16=11(4)											**
$*^{26}$F	T : average 25Pe11=9.1(0.1) 13Le03=7.8(0.6) 99Re16=10.2(1.4) 99Dl01=9.6(0.8)											**
$*^{26}$Na	J : 20Ha38,00Ke09,78Hu12=3											**
$*^{26}$Na^m	T : other: 87DuZU=9(2)											**
$*^{26}$Mg	D : from IS=[10.96,11.09]											**
$*^{26}$Al	J : 23Pl01=5											**
$*^{26}$Al	T : average 84Th04=780(50) 83Mi33=702(56) 83No14=705(24) 72Sa02=716(32)											**
$*^{26}$Al^m	T : average 13Ch51=6345.30(0.90) 11Fi01=6346.54(0.46,stat)(0.60,syst) 11Sc22=6347.8(2.5) 83Ko22=6346.2(2.6) 77Al11=6339.5(4.5) 75Az01=6346(5)											**
$*^{26}$Al^m	T : 72Ha82=6351(10) 69Fr08=6346(5)											**
$*^{26}$Al^m	J : 23Pl01=0											**
$*^{26}$Si	T : other: 08Ma39=2.2283(0.0027), discrepant; see discussions in 10Ia01											**
$*^{26}$P	D : %β^+2p average 17Ja05=1.5(0.4) 04Th09=2.16(0.24); %β^+p + %β^+2p average 17Ja05=35(2) 04Th09=39(2)											**
$*^{26}$P	T : average 20Li06=43.6(0.3) 07Th09=43.7(0.6); others: 17Ja05=50(+23-12) 83Ca06,84Ca29=20(+35-15)											**
$*^{26}$P^m	T : average 14NiZZ=120(9) 17Pe09=104(14)											**
^{27}O	43800	170				> 2.5 zs	$3/2^+$#		23Ko15	ITD	n=100;2n ?	*
^{27}F	25130	120				5.0 ms 0.2	$5/2^+$#	10			β^-=100;β^-n=77 21;β^-2n ?	*
^{27}Ne	7050	90				30.9 ms 1.1	$(3/2^+)$	10	17Ha23	T	β^-=100;β^-n=2.0 5;β^-2n ?	*
^{27}Na	−5518	4				301 ms 6	$5/2^+$*	10			β^-=100;β^-n=0.098 24	*
^{27}Mg	−14586.59	0.05				9.435 m 0.027	$1/2^+$*	10	15ZaZY	T	β^-=100	*
^{27}Al	−17196.86	0.05				STABLE	$5/2^+$*	10	21He04	J	IS=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{27}Al^i	−10383.1	0.7	6813.8	0.7			1/2$^+$ T=3/2	10			IT=100	
^{27}Si	−12384.51	0.11				4.116 s 0.014	5/2$^+$	10	17Ma18	T	β^+=100	*
^{27}Si^i	−5746.5	1.0	6638.0	1.0			1/2$^+$ T=3/2	10	16Mc09	E	IT ?	
^{27}P	−670.7	0.6				260 ms 1	1/2$^+$	10	24St06	TD	β^+=100;β^+p=0.1222 4	*
^{27}P^i	12030	14	12701	14	p		5/2$^+$ T=5/2	10			IT ?	
^{27}S	17437	24				16.3 ms 0.2	(5/2$^+$)	10	19Su14	TD	β^+=100;β^+p=60.5 21;β^+2p=2.6 4	*
*^{27}O	T : from width<0.18 MeV in 23Ko15 (68% confidence interval)											**
*^{27}F	T : average 99Re16=6.5(1.1) 97Ta22=5.3(0.9) 99Dl01=5.2(0.3) 98NoZW=4.9(0.2)											**
*^{27}F	D : %β^-n symmetrized from 99Re16=90(+10-30)											**
*^{27}Ne	T : average 17Ha23=29.3(2.1) 06Tr02=31.5(1.3); other: 99Dl01=22(6)											**
*^{27}Na	J : 20Ha38,00Ke09,78Hu12=5/2											**
*^{27}Na	D : %β^-n average 84Gu19=0.13(0.04) 74Ro31=0.08(0.03)											**
*^{27}Mg	T : average 15ZaZY=9.408 (0.012) 70Re13=9.462 (0.012); Birge ratio=3.18											**
*^{27}Mg	J : 08Ko05=1/2											**
*^{27}Al	J : 21He04,71DeXU,67St01,56Br48,50Po66,49Le15,39Mi08,38He06=5/2											**
*^{27}Si	T : average 17Ma18=4.1117(0.0020) 75Az01=4.109(0.004) 76Ge06=4.206(0.008); Birge ratio=8.19											**
*^{27}P	T : other: 85Ay02=260(80)											**
*^{27}P	D : β^+p others: 96Og01∼0.07 85Ay02∼0.05											**
*^{27}S	T : others: 21Sh23=16.3(2.7),17(4) 17Ja05=15.5(1.6) 01Ca60=15.5(1.5) 91Bo32=21(4)											**
*^{27}S	D : %β^+2p average 21Sh23=2.4(0.5) 17Ja05=3.0(0.6) 91Bo32=2(1); other: 01Ca60=1.1(0.5). %β^+p average 19Su14=60(3) [from summed I(p)] 17Ja05=61(3)											**
*^{27}S	D : [from %β^+p + %β^+2p=64(3) and %β^+2p=3.0(0.6)]											**
^{28}O	51250	170				> 650 ys	0$^+$	22	23Ko15	ITD	2n=100	*
^{28}F	33400	120				46 zs	(4$^-$)	13	20Re06	JD	n=100	
^{28}Ne	11300	130				18.8 ms 0.2	0$^+$	13	17Ha23	T	β^-=100;β^-n=12 1;β^-2n=3.7 5	*
^{28}Na	−988	10				34.5 ms 0.5	1$^+$*	13	17Ha23	T	β^-=100;β^-n=0.58 12	*
^{28}Mg	−15019.95	0.26				20.915 h 0.009	0$^+$	13			β^-=100	
^{28}Al	−16850.72	0.05				2.2411 m 0.0023	3$^+$*	13	25Li64	T	β^-=100	*
^{28}Al^i	−10858.14	0.11	5992.58	0.10			0$^+$ T=2	13				
^{28}Si	−21492.7973	0.0006				STABLE	0$^+$	13			IS=92.255 37	*
^{28}Si^r	−8951.75	0.05	12541.04	0.05	RQ		(3$^+$)					
^{28}Si^i	−12176.88	0.10	9315.92	0.10		1.5 fs 0.6	3$^+$ T=1	13				
^{28}Si^j	−6265.8	1.0	15227	1			(0$^+$) T=2	13	68Mc12	D	α=90 11;p=10 11	
^{28}P	−7147.8	1.2				270.3 ms 0.5	3$^+$	13	79Ho27	D	β^+=100;β^+p=0.0013 4; $\beta^+\alpha$=0.00086 25	
^{28}P^i	−1261	20	5887	20	p		0$^+$ T=2	13				
^{28}S	4181	12				125 ms 10	0$^+$	13			β^+=100;β^+p=20.7 19	
^{28}Cl	26930#	300#				11# ms >100ns	1$^+$#		18Mu18	TD	p=100	
*^{28}O	T : from width<0.7 MeV in 23Ko15											**
*^{28}Ne	T : average 17Ha23=19.2(0.6) 15Le17=18.6(0.2) 06Tr02=20.0(0.5)											**
*^{28}Na	T : average 17Ha23=34.6(1.0) 84Gu19=34.1(0.6) 72Kl04=35.7(1.0), reanalysis of 69Kl08=34(1); other (discrepant): 74Ro31=30.2(0.4) [β(t)], 26(5)											**
*^{28}Na	T : [n(t)]											**
*^{28}Na	J : 20Ha38,00Ke09,78Hu12=1											**
*^{28}Al	T : unweighted average of 25Li64=2.24053(0.00057) 13Za.1=2.233(0.009), 2.228(0.005) 78Be61=2.2488(0.0002) 72Em01=2.243(0.005)											**
*^{28}Al	T : 71Sc.1=2.2405(0.0003) 70Ry05=2.247(0.018) 70Al21=2.252(0.006) 69Wy01=2.240(0.007) 63We19=2.238(0.006);Birge ratio=8.4											**
*^{28}Al	J : 21He04=3											**
*^{28}Si	D : from IS=[92.191,92.318]											**
^{29}F	40150	530				2.80 ms 0.23	(5/2$^+$)	12	17Ma77	J	β^-=100;β^-n=60 40;β^-2n ?	*
^{29}Ne	18400	150				14.7 ms 0.4	(3/2$^-$)	12	16Ko05	J	β^-=100;β^-n=28 5;β^-2n=4 1	*
^{29}Na	2680	7				43.2 ms 0.4	3/2$^+$*	12	17Ha23	T	β^-=100;β^-n=22 3;β^-2n ?	*
^{29}Mg	−10612.4	0.3				1.30 s 0.12	3/2$^+$*	12			β^-=100	*
^{29}Al	−18207.8	0.3				6.56 m 0.06	5/2$^+$*	12	21He04	J	β^-=100	
^{29}Si	−21895.0818	0.0006				STABLE	1/2$^+$*	12			IS=4.672 16	*
^{29}Si^i	−13605	5	8290	5			5/2$^+$ T=3/2	12			IT=100	
^{29}P	−16952.8	0.4				4.102 s 0.004	1/2$^+$	12	20Lo01	T	β^+=100	*
^{29}P^i	−8571.0	2.5	8381.8	2.4	RQ		5/2$^+$ T=3/2	12			IT=100	
^{29}S	−3094	13				188 ms 4	5/2$^+$#	12	79Vi01	D	β^+=100;β^+p=46.4 10	
^{29}Cl	13730#	100#				5.4 zs 1.9	(1/2$^+$)	16	15Mu13	I	p=100	*
^{29}Ar	36120#	200#				1# ms >100ns	5/2$^+$#		18Mu18	TD	2p=100	
*^{29}F	D : %β^-n from 99Dl01											**
*^{29}F	T : average 22Cr03=3.4(0.4,stat)(0.1,syst) 98No.A=2.6(0.4) 99Dl01=2.4(0.4), supersedes 97Ta22=2.4(0.8) and 99Re16=2.9(0.8)											**
*^{29}Ne	T : average 05Tr13=13.8(0.5) 06Tr02=15.1(2.6) 97No.A=15.6(0.5); others: 06Tr02=16.4(1.3) 01Pe14=15(3) 99Dl01=15(4) 99Re16=19(9) 97Ta22=15(3)											**
*^{29}Ne	D : %β^-n average 06Tr02=29(7) 99Re16,99Dl01=27(9) 01Pe14=27(9); other: 01Be53=17 5											**
*^{29}Na	D : %β^-n average 95Re.A=27.1(1.6) 84La03=21.5(3.0) 74Ro31=15.1(1.8) 79De02=21(4); Birge ratio=2.88											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{29}$Na	T : average 17Ha23=42.8(0.5) 84Gu19=44.9(1.2) 84La03=44(1) 74Ro31=42.9(1.5)											**
$*^{29}$Na	J : 20Ha38,00Ke09,78Hu12=3/2											**
$*^{29}$Mg	J : 19Yo06,08Ko05=5/2											**
$*^{29}$Si	J : 24Ko07,54Og01,54Wi08,53Wh39=1/2											**
$*^{29}$Si	D : from IS=[4.645,4.699]											**
$*^{29}$P	T : average 20Lo01=4.1055(0.0044) 80Wi13=4.084(0.022) 75Az01=4.083(0.012); other (not used): 73Ta04=4.149(0.005)											**
$*^{29}$Cl	T : from width=85(30) keV in 16Go.1											**
^{30}F	48690	530				0.77 zs 0.35		24	24Ka32	TD	n=100	*
^{30}Ne	23280	250				7.22 ms 0.18	0^+	24	07Tr08	TD	β^-=100;β^-n=13 4;β^-2n=8.9 23	*
^{30}Na	8475	5				45.9 ms 0.7	2^+*	24	17Ha23	T	β^-=100;β^-n=28.6 22; β^-2n=1.24 19;$\beta^-\alpha$=5.5e-5 2	*
^{30}Mg	−8881.4	1.3				316.6 ms 2.8	0^+	24	84La03	D	β^-=100;β^-n=0.030 17	*
^{30}Al	−15864.1	1.9				3.685 s 0.032	3^+*	24	74Al04	T	β^-=100	*
^{30}Si	−24432.963	0.022				STABLE	0^+	24			IS=3.074 21	*
^{30}P	−20200.86	0.07				2.5000 m 0.0017	1^+* T=0	24	18Ia01	T	β^+=100	*
^{30}P^i	−19523.75	0.12	677.11	0.10			0^+ T=1	24				
^{30}S	−14059.25	0.21				1.1798 s 0.0003	0^+	24	18Ia01	T	β^+=100	*
^{30}Cl	4560	30				60# ms >100ns	(3^+)	24	18Mu18	TD	p=100	*
^{30}Ar	21180	80				< 10 ps	0^+	24	15Mu13	IDT	2p=100	
$*^{30}$F	T : from width=477(+358-177) keV in 24Ka32											**
$*^{30}$Ne	T : average 15St14=7.18(0.22) 07Tr08=7.3(0.3); others: 01Pe14=7(2) 99Dl01=7.5(1.5)											**
$*^{30}$Na	T : average 17Ha23=44.1(0.8) 84La02=48(2) 84Gu19=50(3) 79De02=53(3) 74Ro01=53(3) 99Dl01=50(4) 97Ta22=48(5)											**
$*^{30}$Na	J : 20Ha38,00Ke09,78Hu12=2											**
$*^{30}$Na	D : %β^-2n average 80De26=1.15(0.25) and 1.35(0.28), from P_n=32.2(2.6), average 84La03=33(5) 84Gu19=30(5) 74Ro01=33.1(3.8) and P_{2n}/P_n=0.042(0.008)											**
$*^{30}$Na	D : in 80De26; %β^-n average 79De02=26(4) and 29.7(2.6), from P_n-2×β^-2n=32.2(2.6)-2×1.24(0.19); %$\beta^-\alpha$ from 83De23											**
$*^{30}$Mg	T : average 17Ha23=311(8) 16Ol06=335(10) 08Hi05=314(5),316(5),314(7) 86Du11=335(40) 86Du07=340(20) 79De02=325(30)											**
$*^{30}$Mg	D : %β^-n from 84La03<0.06											**
$*^{30}$Al	T : others: 74Kl07=3.56(0.02) 61Ro12=3.27(0.20)											**
$*^{30}$Al	J : 21He04=3											**
$*^{30}$Si	D : from IS=[3.037,3.110]											**
$*^{30}$P	T : average 18Ia01=2.501(0.002) 80Wi13=2.498(0.004) 74Al04=2.499(0.008) 63Mc02=2.497(0.005)											**
$*^{30}$P	J : 68Ph02=1											**
$*^{30}$S	T : average 18Ia01=1.17992(0.00034) 11So11=1.1759(0.0017) 80Wi13=1.1783(0.0048)											**
$*^{30}$Cl	J : from 22Gi04=(3^+)											**
^{31}F	56840#	540#				2# ms >260ns	$5/2^+$#	22	99Sa06	I	β^- ?;β^-n ?;β^-2n ?	
^{31}Ne	31180	270				3.4 ms 0.8	$(3/2^-)$	22	98NoZW	T	β^-=100;β^-n ?;β^-2n ?	
^{31}Na	12245.3	2.6				16.8 ms 0.3	$3/2^+*$	22	19Ni04	D	β^-=100;β^-n=36.0 35;β^-2n=0.73 9; β^-3n=0.025 14	*
^{31}Mg	−3125.8	2.4				270 ms 2	$1/2^+*$	22	17Ha23	T	β^-=100;β^-n=1.72 27	*
^{31}Al	−14950.7	2.2				645 ms 22	$5/2^+*$	22	21He04	J	β^-=100;β^-n=0.8 5	*
^{31}Si	−22949.04	0.04				157.16 m 0.20	$3/2^+$	22	17Da28	T	β^-=100	*
^{31}P	−24440.5447	0.0008				STABLE	$1/2^+*$	22			IS=100	*
^{31}P^i	−18059.7	2.0	6380.8	2.0			$3/2^+$ T=3/2	22			IT=100	
^{31}S	−19042.56	0.23				2.5534 s 0.0018	$1/2^+$	22	12Ba54	T	β^+=100	
^{31}S^p	−12763.46	0.26	6279.10	0.13			$3/2^+$ T=3/2					
^{31}S^i	−12652.10	0.28	6390.46	0.16			$3/2^+$ T=1/2	22	22Bu14	D	IT≈100;p=0.0295 24	*
^{31}Cl	−7035	3				190 ms 1	$3/2^+$	22	11SaZM	TD	β^+=100;β^+p=2.07 12	*
^{31}Cl^i	5256	3	12291	5	RQ		$3/2^+$ T=5/2	22				
^{31}Ar	11294	13				15.0 ms 0.3	$5/2^+*$	22	15Li20	D	β^+=100;β^+p=68.3 3;β^+2p=9.0 2; β^+pα<0.38;β^+3p=0.07 2;$\beta^+\alpha$<0.03; 2p<0.0006	*
^{31}K	32700#	400#				< 10 ps	$3/2^+$#	22	19Ko18	IT	p=100	
$*^{31}$Na	D : %β^-2n average 19Ni04=0.7(0.1) and 0.86(0.20) from P_n=37.5(3.5), average of 74Ro31=30(8) 84La03=38(6) 19Ni04=40(5), and P_{2n}/P_n=0.023(0.005) in											**
$*^{31}$Na	D : 80De26. %β^-n from P_n-2×P_{2n}=37.5(3.5)-2×0.73(0.09); %β^-3n from 84Gu19<0.05											**
$*^{31}$Na	T : average 17Ha23=16.6(0.4) 84La03=17.0(0.4) 74Ro31=16.9(0.7) 01Pe14=18(2)											**
$*^{31}$Na	J : 20Ha38,00Ke09,78Hu12=3/2											**
$*^{31}$Mg	D : %β^-n average 25Ni09=1.8(0.6) 84La03=1.7(0.3); other (conflicting): 08ReZZ=6.2(1.9)											**
$*^{31}$Mg	J : 08Ko05,05Ne01=1/2											**
$*^{31}$Al	J : 21He04,16He09=5/2											**
$*^{31}$Al	D : %β^-n from 08ReZZ,95Re.A<1.6											**
$*^{31}$Al	T : average 73Go22=644(25) 08ReZZ=646(45); other: 82Mu08=940(430)											**
$*^{31}$Si	T : other: 89Ab05=157.474(0.012), the small uncertainty is not justified											**
$*^{31}$P	J : 33As01,49Cr31,54Fl41,49Gi28=1/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{31}$S^i	J : from 16Be05=3/2$^+$											**
$*^{31}$Cl	T : other: 82Ay01=150(+25-20)											**
$*^{31}$Cl	D : %β^+p from I(p, all protons)/I(2234g)=0.0389(0.0012) in 11SaZM and %I_γ(2234)=53.2(2.7)% in ENSDF2022; other: %β^+p=8.3(+1.2-0.9)E-4 for 260 keV											**
$*^{31}$Cl	D : protons in 22Bu14.											**
$*^{31}$Ar	T : average 14Ko17=15.1(0.3) 00Fy01=14.1(0.7) 92Ba01=15.1(+1.3-1.1) 87Bo36=15(3); others: 69Kl08=16.5(4.0) 72Kl04=17.7(1.0)											**
$*^{31}$Ar	D : %2p from 98Ax02; other: %β^+p=55(7), %β^+2p=2.48(0.15), %β^+3p=2.1(1.0) in 92Ba01 with $\beta^+\alpha$ and β^+pA not observed											**
$*^{31}$Ar	J : 02Fy01,99Th09,98Ax01=5/2											**
^{32}F			*non − exist*		RN			24	19Ah07	I	n ?	*
^{32}Ne	37000#	500#				4.1 ms 0.6	0$^+$	24	22Cr03	T	β^-=100;β^-n ?;β^-2n ?	*
^{32}Na	18549	5				12.9 ms 0.3	(3$^-$)	24	08Tr04	TJ	β^-=100;β^-n=26 6;β^-2n=7.6 15	*
^{32}Na^m	18666	3	118	6	MD	> 2# ms	0$^-$#		25Ly01	ET	β^- ?;IT ?	*
^{32}Na^n	19174	5	625.0	1.4		24 μs 2	(0$^+$)	24	23Gr04	ETJ	IT=100	*
^{32}Mg	−829.1	1.6				80.4 ms 0.4	0$^+$	24	17Ha23	T	β^-=100;β^-n=5.5 5	*
^{32}Al	−11099	7				31.75 ms 0.22	1$^+$*	24	24Ja.A	TD	β^-=100;β^-n=0.42 9	*
^{32}Al^m	−10142	7	956.7	0.5		186.9 ns 0.7	4$^+$#	24	08KaZQ	T	IT=100	*
^{32}Si	−24077.69	0.30				160 y 6	0$^+$	24			β^-=100	*
^{32}P	−24304.88	0.04				14.269 d 0.007	1$^+$*	24	FGK204	T	β^-=100	*
^{32}P^i	−19232.35	0.09	5072.53	0.08			0$^+$ T=2	24			IT=100	
^{32}S	−26015.5374	0.0013				STABLE	0$^+$	24			IS=94.856 235	*
^{32}S^i	−19014.41	0.22	7001.13	0.22			1$^+$ T=1	24			IT=100	
^{32}S^j	−13967.70	0.20	12047.84	0.20			0$^+$ T=2	24			IT=100	
^{32}Cl	−13334.1	1.2				298.1 ms 1.0	1$^+$	24	79Ho27	D	β^+=100;$\beta^+\alpha$=0.054 8;β^+p=0.026 5	*
^{32}Cl^i	−8288.0	1.2	5046.17	0.24		22.8 as 5.7	0$^+$ T=2	24	08Bh08	D	p=91.6 6;IT=8.4 6	*
^{32}Ar	−2200.4	1.8				98 ms 2	0$^+$	24	08Bh08	DT	β^+=100;β^+p=35.58 22	*
^{32}K	21130#	300#					1$^+$#				p ?	
$*^{32}$F	I : searched for in 19Ah07, but not observed; probably neutron unbound											**
$*^{32}$Ne	T : average 22Cr03=4.5(0.4,stat)(0.6,syst) 98NoZW=3.5(0.9)											**
$*^{32}$Na	T : average 08Tr04=13.1(0.5), 11.5(1.2) 84La03=13.2(0.4) 98No.A=11.5(0.8)											**
$*^{32}$Na	D : %β^-n average 84Gu19=32(13) 84La03=24(7), from P_n=39(6) and %β^-2n=7.6(1.5); other: 80De26=10(4); %β^-2n average 84Gu19=8(3) 84La03=9.4(2.4)											**
$*^{32}$Na	D : 80De26=5.5(2.5)											**
$*^{32}$Na^m	T : 25Ly01 estimates at least a few ms											**
$*^{32}$Na^n	E : from 224(1) keV and 401(1) keV γ rays in a cascade											**
$*^{32}$Na^n	J : 0$^+$ for a deformed shape; other: 6$^-$ for a spherical shape											**
$*^{32}$Mg	T : others: 04Gr08=86(5) 95Re.A=85(13) 84La03=120(20)											**
$*^{32}$Mg	D : %β^-n from 04Gr08=5.5(0.5); other: 84La03=2.4(0.5)											**
$*^{32}$Al	T : average 24Ja.A=31.7(0.1),31.5(0.1) 17Ha23=31.7(0.3) 95ReZZ,08ReZZ=31.7(0.8) 05Ue01=33.0(0.2); Birge ratio=3.38; others: 86Du07=31(6)											**
$*^{32}$Al	T : 82Mu08=35(5)											**
$*^{32}$Al	J : 18Xu05,21He04=1											**
$*^{32}$Al	D : %β^-n other: 95ReZZ=0.7(0.5)											**
$*^{32}$Al^m	T : supersedes 07TaZJ=196(16); other: 97IwZX=185(15) 96Ro02=200(20)											**
$*^{32}$Si	T : average 15HeZY=159.4(5.6) 98Ni19=178(10) 93Ch10=128(20),134(16) 90Ho27=135(10), 132(9) 136(13) 86Al10=172(4), Birge ratio=2.29; others:											**
$*^{32}$Si	T : 80El01=108(18) 80Ku11=101(18) 80De46=276(32) 73Cl15=330(40)											**
$*^{32}$P	J : 57Fe32=1											**
$*^{32}$S	D : IS from 100% - IS(^{33}S) - IS(^{34}S) - IS(^{36}S); other: IS=94.85(0.25) from [94.41,95.29] in 24Ci.A											**
$*^{32}$Cl	T : average 68Ar03=298(1) 71Go18=281(8) 66An01=294(6) 53Gl32=306(4); others: 54Br12=320(10) 54 Ty33=280											**
$*^{32}$Cl^i	D : other: %p=92.3(2.0), %IT=7.7(2.0) in 21Bl02											**
$*^{32}$Cl^i	T : from width=20(5) eV in 00Ga61											**
$*^{32}$Ar	D : %β^+p from 08Bh08=35.58(0.05,stat)(0.21,syst); others: 85Bj01=43(3)											**
$*^{32}$Ar	T : others: 08Bh08=100.5(0.3) [quoted from unpublished work by A. Garcia] 77Ha29=75(+75-30)											**
^{33}F			*non − exist*		RN		5/2$^+$#	24	19Ah07	I	n ?	*
^{33}Ne	46130#	600#				<180ns	7/2$^-$#	24	07Ba71	I	n ?	*
^{33}Na	23599	4				8.00 ms 0.19	3/2$^+$#	24			β^-=100;β^-n=47 6;β^-2n=13 3	*
^{33}Mg	4959.8	2.1				92.0 ms 0.3	3/2$^-$*	24	24Ja.A	TD	β^-=100;β^-n=7.9 13;β^-2n ?	*
^{33}Al	−8497	7				41.62 ms 0.08	5/2$^+$*	24	24Ja.A	TD	β^-=100;β^-n=8.6 6	*
^{33}Si	−20514.3	0.7				6.11 s 0.21	3/2$^+$	24	73Go33	T	β^-=100	
^{33}P	−26337.4	1.1				25.38 d 0.06	1/2$^+$	24			β^-=100	
^{33}S	−26585.8585	0.0014				STABLE	3/2$^+$*	24			IS=0.763 20	*
^{33}S^i	−21106.14	0.13	5479.72	0.13			1/2$^+$ T=3/2	24			IT=100	
^{33}Cl	−21003.3	0.4				2.5038 s 0.0022	3/2$^+$	24	15Gr14	T	β^+=100	
^{33}Cl^i	−15454.9	0.5	5548.4	0.4	RQ		1/2$^+$ T=3/2	24			IT=100	
^{33}Ar	−9384.3	0.4				174.3 ms 1.1	1/2$^+$	24	10Ad03	D	β^+=100;β^+p=38.7 8	*
^{33}K	7370#	200#				<25ns	3/2$^+$#	24	93Po.A	IT	p ?	
^{33}Ca	29800#	400#				10# fs	5/2$^+$#				p ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
*^{33}F	I : searched for in 19Ah07, but not observed; probably neutron unbound											**
*^{33}Ne	I : not seen in 07Ba71, 02No11, 97Sa14, 02Lu09, 02Lu19; also 02Le.A $<$ 1.5 μs; probably neutron unbound											**
*^{33}Na	T : average 02Ra16=7.9(0.4),8.0(0.7),8.1(0.4) 01Nu02=8.0(0.3) 84La03=8.0(0.6); others: 98No.A=8.5(0.4) 81ThZV=8.2(0.4) 95Re.A=6.3(4.6)											**
*^{33}Mg	T : average 24Ja.A=92.0(0.4),93.2(0.6) 17Ha23=93.9(1.8) 08Tr07=89(1) 02Mo29=90.5(1.6); others: 06AnZW=93(11) 95Re.A=63(25) 84La03=90(20)											**
*^{33}Mg	D : %β^-n others: 06AnZW=14(2) 95ReZZ,08ReZZ=25(13) 84La03,84Gu19=17(5)											**
*^{33}Mg	J : 19Yo06,07Yo06=3/2											**
*^{33}Al	T : average 24Ja.A=42.0(0.2),42.6(0.3) 17Ha23=41.4(0.1) 02Mo29=41.7(0.2) 95ReZZ,08ReZZ=40.5(2.8)											**
*^{33}Al	D : average 24Ja.A=9.0(1.3) 95ReZZ,08ReZZ=8.5(0.7)											**
*^{33}Al	J : 16He09=5/2											**
*^{33}S	J : 84To13,52Es07,48To13=3/2											**
*^{33}S	D : from IS=[0.729,0.797]											**
*^{33}Ar	D : %β^+p average 10Ad03=38.8(1.3) 87Bo21=38.7(1.0)											**
^{34}Ne	52840#	510#				2# ms	$>$1.5us	0^+	12	02Le.A	I	β^- ?;β^-2n ?;β^-n ?	
^{34}Na	31680	600				5.5 ms	1.0	1^+	12	GAu03	D	β^-=100;β^-2n$\approx$50;β^-n$\approx$15	*
^{34}Mg	8316.4	2.2				44.9 ms	0.4	0^+	12	17Li03	TD	β^-=100;β^-n=21 7;β^-2n=0.05 3	*
^{34}Al	−2997.6	2.1				53.73 ms	0.13	4^-	12	19Li41	T	β^-=100;β^-n=26 4;β^-2n ?	
^{34}Al^m	−2951.1	2.1	46.47	0.17		22.1 ms	0.2	1^+*		19Li41	TD	$\beta^-\approx$100;β^-n=11 4;β^-2n ?	*
^{34}Si	−19991.7	0.8				2.69 s	0.17	0^+	12	22Mi.1	T	β^-=100	*
^{34}Si^m	−15735.6	0.9	4256.1	0.4	EU	$<$ 210 ns		(3^-)		89Ba50	T	IT=100	*
^{34}P	−24548.7	0.8				12.43 s	0.10	1^+	12			β^-=100	
^{34}S	−29931.69	0.04				STABLE		0^+	12			IS=4.365 234	*
^{34}Cl	−24440.09	0.05				1.5267 s	0.0004	0^+ T=1	12	06Ia05	T	β^+=100	*
^{34}Cl^m	−24293.73	0.05	146.360	0.027	MD	31.99 m	0.03	3^+ T=0	12			β^+=55.4 6;IT=44.6 6	
^{34}Ar	−18378.29	0.08				846.46 ms	0.35	0^+	12	20Ia01	T	β^+=100	*
^{34}Ar^i	−10444	5	7934	5	RQ			1^+# T=2	12			IT ?	
^{34}K	−1487	17					$<$40ns	1^+#	12	24Dr01	D	p=?	*
^{34}Ca	14200#	300#					$<$35ns	0^+	12	93Po.A	IT	2p ?	
*^{34}Na	D : %β^-n, %β^-2n estimated from $P_n = \beta^-\text{n} + 2\times\beta^-\text{2n}$ = 115(20)% in 84La03 by assuming β^-n/β^-2n=0.3 from trends in neighboring nuclei											**
*^{34}Mg	D : %β^-2n from 17Li03$<$0.1											**
*^{34}Al^m	E : from a least-squares fit to data in 17Li03 by NUBASE											**
*^{34}Al^m	J : 18Xu05=1											**
*^{34}Si	T : average 22Mi.1=2.5(0.3) 77Na05=2.77(0.20)											**
*^{34}Si^m	T : isomeric nature of this state needs confirmation											**
*^{34}S	D : from IS=[3.96,4.77] in 24Ci.A											**
*^{34}Cl	T : average 06Ia05=1.5268(0.0005) 83Ko22=1.5277(0.0022) 76Wi08=1.5252(0.0011) 73Ry01=1.526(0.002) 72Ha82=1.534(0.003)											**
*^{34}Ar	T : others: 06Ia05=843.8(0.4) 74Ha26=844.5(3.4)											**
*^{34}K	IT : 93Po.Ai$<$40 ns											**
^{35}Na	37830#	670#				2.1 ms	0.3	$3/2^+$#	25	22Cr03	TD	β^-=100;β^-n ?;β^-2n ?	*
^{35}Mg	15529	6				11.3 ms	0.6	$(3/2^-,5/2^-)$	25	17Mo26	J	β^-=100;β^-n=52 46;β^-2n ?	
^{35}Al	−224	7				38.16 ms	0.21	$(5/2)^+$	25	14St18	J	β^-=100;β^-n=35.8 17;β^-2n ?	*
^{35}Si	−14390	40				780 ms	120	$(7/2)^-$	25	95Re.A	D	β^-=100;β^-n=2.5 14	*
^{35}P	−24857.8	1.9				47.3 s	0.8	$1/2^+$	25			β^-=100	
^{35}S	−28846.21	0.04				87.37 d	0.03	$3/2^+$*	25			β^-=100	*
^{35}S^i	−19710	6	9136	6	RQ			$1/2^+$ T=5/2	25				
^{35}Cl	−29013.53	0.04				STABLE		$3/2^+$*	25			IS=75.80 17	*
^{35}Cl^i	−23359.05	0.22	5654.48	0.22				$3/2^+$ T=3/2	25			IT=100	
^{35}Ar	−23047.3	0.7				1.7755 s	0.0014	$3/2^+$	25			β^+=100	
^{35}Ar^i	−17474.6	0.7	5572.67	0.15				$3/2^+$ T=3/2	25			IT=100	
^{35}K	−11172.9	0.5				175.2 ms	1.9	$3/2^+$	25	06Me04	J	β^+=100;β^+p=0.37 15	*
^{35}K^i	−2110	40	9060	40	2p			$3/2^+$ T=5/2	25				
^{35}Ca	4780	110				25.7 ms	0.2	$1/2^+$	25	99Tr04	TD	β^+=100;β^+p=95.8 14;β^+2p=4.2 3	*
^{35}Sc	25700#	400#						$7/2^-$#				p ?	
*^{35}Na	T : average 22Cr03=2.4(0.3,stat)(0.2,syst) 83La12=1.5(0.5)											**
*^{35}Na	D : β^-n was observed by 83La12, but it was not quantified											**
*^{35}Al	T : average 17Ha23=38.4(0.3) 05Ti11=36.8(0.5) 01Nu01=38.6(0.4); others: 95Re.A=30(4) 89Le16=170(+90-50) 88Mu08=130(+100-50)											**
*^{35}Al	D : %β^-n average 05Ti11=38(2) 01Nu01=41(13) 95Re.A=26(4) 89Le16=40(10); other: 88Mu08=87(+37-25)											**
*^{35}Si	D : %β^-n from 95Re.A$<$5											**
*^{35}S	J : 51We11,49Co12=3/2											**
*^{35}S	T : average 99Pa18=87.38(0.03) 69La34=87.48(0.40) 68Wo06=87.39(0.10) 65Fl02=87.9(0.3) 58Se49=87.16(0.10); others: 61Oz01=87.1(0.9)											**
*^{35}S	T : 61Wy01=89.0(0.5) 59Ca12=88.8(1.0) 59Co56=86.35(0.17) 43He01=87.1(1.2)											**
*^{35}Cl	D : from IS=[75.5,76.1]											**
*^{35}Cl	J : 49Da14,49To17,48To10,47To16=3/2											**
*^{35}K	T : average 18Sa.A=175(2) 98Sc19=178(8)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{35}$Ca	J : 23La09=1/2$^+$ from L value transfer											**
^{36}Na	45900#	690#				<180ns		11	07Ba71	T	n ?	*
^{36}Mg	20380	690				7.2 ms 0.5	0^+	21	22Cr03	TD	β^-=100;β^-n=48 12;β^-2n ?	*
^{36}Mg^m	21210	690	833.0	1.4		0.32 μs 0.26	(0^+)		24Ma28	TEJ	IT=100	*
^{36}Al	5950	150				12 ms 2	4^-#	11	23Lu07	TJ	β^-=100;β^-n=16 9;β^-2n ?	*
^{36}Al^m	6050#	180#	100#	100#		6.6 ms 0.7	2^-#		23Lu07	TJ	IT=?	*
^{36}Si	−12440	70				503 ms 2	0^+	11	95Re.A	D	β^-=100;β^-n=12 5	*
^{36}P	−20251	13				5.6 s 0.3	4^-	11	15Ch56	J	β^-=100;β^-n ?	
^{36}S	−30664.14	0.19				STABLE	0^+	11			IS=0.0158 17	*
^{36}Cl	−29522.01	0.04				301.3 ky 1.5	2^+*	11	25Ni.A	D	β^-=98.1 1;ε=1.9 1; e$^+$=1.65e-3 9	*
^{36}Cl^i	−25222.34	0.04	4299.667	0.014			(0)$^+$ T=2	11			IT=100	
^{36}Ar	−30231.543	0.027				STABLE >15Zy	0^+	11	24Ag03	T	IS=0.3336 210;2β^+ ?	*
^{36}Ar^i	−23620.5	0.3	6611.0	0.3			2^+ T=1	11			IT=100	
^{36}Ar^j	−19379.4	1.2	10852.2	1.2	RQ		0^+ T=2	11			IT=100	
^{36}K	−17417.1	0.3				341 ms 3	2^+*	11			β^+=100;β^+p=0.048 14; $\beta^+\alpha$=0.0034 13	*
^{36}K^i	−13134.5	2.4	4282.6	2.4	p		0^+ T=2	11			p=100	*
^{36}Ca	−6484	6				100.9 ms 1.3	0^+	11	15Su01	T	β^+=100;β^+p=51.2 10	*
^{36}Sc	15500#	300#									p ?	
$*^{36}$Na	IT : also 02Le.A<1.5 μs											**
$*^{36}$Mg	T : average 22Cr03=7.2(0.1,stat)(1.2,syst) 23Lu07=6.8(1.0) 13StZY=7.6(+0.5-0.8); other: 04Gr20=3.9(1.3) 99YoZW∼5											**
$*^{36}$Mg	D : %β^-n from 99YoZW											**
$*^{36}$Mg^m	T : symmetrized from 24Ma28=90(+410-50) ns											**
$*^{36}$Mg^m	E : from 24Ma28=168(1) keV and 665(1) keV γ rays in a cascade											**
$*^{36}$Al	T : from $\beta\gamma$(t) in 23Lu07; others: 23Lu07=14.7(1.0) from β(t) 95Re.A=90(40)											**
$*^{36}$Al	D : from 95Re.A<31; other: %P_n 99YoZW=55(11)											**
$*^{36}$Al^m	T : average 23Lu07=6.6(1.1) and 6.5(1.0)											**
$*^{36}$Si	T : from 17Ha23											**
$*^{36}$S	D : from IS=[0.0129,0.0187] in 24Ci.A											**
$*^{36}$Cl	D : %e$^+$: average 25Ni.A=1.52(0.15)e-3 67Pi04=1.66(0.11)e-3; others: 62Do07=1.2(0.5-0.2)e-3 65To05=1e-3 62Be29,63Be38=2.3(0.9)e-3. %ε from											**
$*^{36}$Cl	D : P[ε(K)]/P[β^-]=1.7(0.1)% in 55Dr35											**
$*^{36}$Cl	T : from partial $T_{1/2}(\beta^-)$=307.1(1.5), average 66Go07=310(4),306(2) 57Wr37=260(40),250(40) 55Ba93=308(3) 49Wu15=440(50) and %β^-=98.1(0.1)											**
$*^{36}$Cl	J : 55Aa23,52Gi04,51Jo21,49To10=2											**
$*^{36}$Ar	D : other: [0.00,2.07] in 24Ci.A											**
$*^{36}$K	J : 75Sc20=2											**
$*^{36}$K^i	E : ENSDF2012 reports 4281.9(0.8) as IAS of ^{36}Ca gs, but the small uncertainty is not justified											**
$*^{36}$Ca	T : average 15Su01=100.0(2.4) 07Do17=100.1(2.3) 95Tr02,97Tr05=102(2)											**
^{37}Na	53130#	690#				1# ms >1.5us	$3/2^+$#	12	02Le.A	I	β^- ?;β^-n ?;β^-2n ?	
^{37}Mg	28210	700				6.4 ms 1.5	$(3/2^-)$	12	14Ko14	J	β^-=100;β^-n ?;β^-2n ?	*
^{37}Al	9810	180				11.4 ms 0.3	$5/2^+$#	12	19Ab06	TD	β^-=100;β^-n=52 5;β^-2n>1	*
^{37}Si	−6570	110				144 ms 5	$(5/2^-)$	15	19Ab06	TJ	β^-=100;β^-n=16 7;β^-2n ?	*
^{37}P	−19000	40				2.31 s 0.13	$(1/2^+)$	12	15Ch56	J	β^-=100;β^-n ?	*
^{37}S	−26896.42	0.20				5.05 m 0.02	$7/2^-$	12			β^-=100	
^{37}Cl	−31761.56	0.05				STABLE	$3/2^+*$	12			IS=24.20 17	*
^{37}Cl^i	−21539.7	0.3	10221.8	0.3	RQ		$7/2^-$ T=5/2	12			IT=100	
^{37}Ar	−30947.68	0.21				35.011 d 0.019	$3/2^+*$	12			ε=100	*
^{37}Ar^j	−25956	6	4992	6	RQ		$3/2^+$ T=3/2	12				
^{37}K	−24800.20	0.09				1.2365 s 0.0009	$3/2^+*$	12	14Sh25	T	β^+=100	*
^{37}K^i	−19749.9	0.8	5050.3	0.8	RQ		$3/2^+$ T=3/2	12			IT=100	
^{37}Ca	−13136.1	0.6				181.0 ms 0.9	$3/2^+*$	12	19Kl06	J	β^+=100;β^+p=76.8 7	*
^{37}Sc	3500	410					$7/2^-$#		24Dr01	D	p=?	
^{37}Ti	23350#	400#					$1/2^+$#				p ?;2p ?	
$*^{37}$Mg	T : from 22Cr03=6.4(0.4,stat)(1.4,syst)											**
$*^{37}$Al	T : average 19Ab06=11.3(0.4) 15St14=11.5(0.4); other: 04Gr20=10.7(1.3)											**
$*^{37}$Al	D : %β^-n others: 99YoZW=55(11) 15St14>29(3); %β^-2n from 15St14>1(1)											**
$*^{37}$Si	T : average 19Ab06=135(8) [$\beta-\gamma$(t)] 17Ha23=150(7); other: 19Ab06=138(4) [β(t)] 95ReZZ=90(60)											**
$*^{37}$Si	D : %β^-n average 99YoZW=15(8) 95ReZZ=17(13)											**
$*^{37}$P	T : from 86Du07=2.31(0.13)											**
$*^{37}$Cl	D : from IS=[23.9,24.5]											**
$*^{37}$Cl	J : 49Da14,49To17,48To10,47To16=3/2											**
$*^{37}$Ar	J : 65Ro13=3/2											**
$*^{37}$K	J : 14Kr04,71Vo03,68Be19=3/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{37}$Ca	T : average 15Su01=180.5(2.1) 07Do17=181.7(3.6) 97Tr05=181.1(1.0)											**
$*^{37}$Ca	D : %β^+p average 15Su01=70.6(1.8) 07Do17=72.2(4.3) 97Tr05=78.4(0.8) 74Se11=75(2). ENSDF2012 gives 97Tr05=82.1(0.7), which differs from											**
$*^{37}$Ca	D : 97Tr05=78.4(0.8) quoted in the present evaluation											**
^{38}Na	61910#	720#				<400ns			19Ah07	IT	n ?	*
^{38}Mg	34070#	500#				3.1 ms 0.5	0^+	17	22Cr03	TD	β^-=100;β^-n ?;β^-2n ?	*
^{38}Al	16470#	200#				7.6 ms 0.6	0^-#	17	15St14	IJ	β^-=100;β^-n=84 19;β^-2n ?	*
^{38}Al^m	16770#	280#	300#	200#	EU	9.0 ms 0.7	5^-#	17	15St14	JTD	β^-=?;IT ?	*
^{38}Si	−4170	100				63 ms 8	0^+	17	17Tr02	TD	β^-=100;β^-n=27 6	*
^{38}P	−14620	70				640 ms 140	(2^-)	17	15Ch56	J	β^-=100;β^-n=12 5	
^{38}S	−26861	7				170.3 m 0.7	0^+	17			β^-=100	
^{38}Cl	−29798.12	0.10				37.230 m 0.014	2^-	17			β^-=100	
^{38}Cl^m	−29126.75	0.10	671.365	0.008		715 ms 3	5^-	17			IT=100	
^{38}Cl^i	−21590	24	8208	24	RQ		0^+ T=3	17				
^{38}Ar	−34714.83	0.19				STABLE	0^+	17			IS=0.0629 70	*
^{38}Ar^i	−24083.9	0.9	10630.9	0.9			(2^-) T=2	17				
^{38}Ar^j	−15940	30	18780	30	RQ		0^+ T=3	17				
^{38}K	−28800.76	0.20				7.651 m 0.019	3^+* T=0	17			β^+=100	*
^{38}K^m	−28670.61	0.20	130.15	0.04	MD	924.35 ms 0.12	0^+* T=1	17	14Pa45	J	β^+=99.9670 43;IT=0.0330 43	*
^{38}K^n	−25342.66	0.26	3458.10	0.17		21.95 μs 0.11	$(7)^+$	17			IT=100	
^{38}Ca	−22058.51	0.19				443.70 ms 0.25	0^+	17	15Bl02	T	β^+=100	*
^{38}Sc	−4656	14				<43ns	2^-#	17	25Su.A	T	p=?	*
^{38}Ti	10380#	300#				<120ns	0^+	17	96Bl21	IT	2p ?	
$*^{38}$Na	I : no events observed in 19Ah07											**
$*^{38}$Mg	T : from 22Cr03=3.1(0.4,stat)(0.2,syst)											**
$*^{38}$Al	IJ : two β decaying states proposed in 15St14, based on shell-model with J^π=0^- being the ground state											**
$*^{38}$Al	T : from 04Gr20=7.6(0.6) [β(t)], probably including the gs and the isomer, but should have significant β^- gs to gs (0^- to 0^+) component;											**
$*^{38}$Al	T : other: 15St14=9.0(0.7) from $\beta\gamma$(t) by gating on cascade γs associated with the decay of the J^π=5^- isomer											**
$*^{38}$Al	D : %β^-n from 99YoZW=84(19)											**
$*^{38}$Al^m	T : from 15St14 using $\beta\gamma$(t) by gating on cascade γs associated with the decay of the higher-spin, J^π=5^- isomer											**
$*^{38}$Si	D : %β^-n average 17Tr02=25(10) 99YoZW=28(7)											**
$*^{38}$Ar	D : other: [0.0,4.3] in 24Ci.A											**
$*^{38}$K	J : 19Ko19,14Kr04,14Pa45,65Ph02=3											**
$*^{38}$K^m	T : average 10Ba43=924.46(0.14) 00Bb01=924.4(0.6) 83Ko22=924.15(0.31) 78Th02=928.8(2.0) 78Wi04=921.71(0.65) 76Wi08=922.3(1.1) 72Ha82=929.2(3.5)											**
$*^{38}$K^m	T : 75Sq01=925.6(0.7)											**
$*^{38}$Ca	T : average of 15Bl02=443.63(0.35) 11Pa38=443.77(0.36) 10Bl09=443.8(1.9)											**
$*^{38}$Sc	D : from 24Dr01											**
^{39}Na	69980#	740#				1# ms	>400ns	$3/2^+$#		19Ah07	I	β^- ?;β^-n ?;β^-2n ?	*
^{39}Mg	42780#	510#					<180ns	$7/2^-$#	18	07Ba71	T	n ?;β^- ?	
^{39}Al	21490#	300#				7.22 ms 0.31	$5/2^+$#	18	22Cr03	TD	β^-=100;β^-n=97 22;β^-2n ?	*
^{39}Si	2320	140				45.1 ms 1.7	$(5/2^-)$	18	19Ab06	TDJ	β^-=100;β^-n=33 5;β^-2n ?	*
^{39}P	−12770	110				282 ms 24	$(1/2^+)$	18	19Ab06	J	β^-=100;β^-n=26 8	*
^{39}S	−23160	50				11.5 s 0.5	$(7/2)^-$	18			β^-=100	
^{39}Cl	−29800.2	1.7				56.2 m 0.6	$3/2^+$	18			β^-=100	
^{39}Ar	−33242	5				302 y 10	$7/2^-$*	18	25Ad02	T	β^-=100	*
^{39}Ar^i	−24161	7	9081	9	RQ		$3/2^+$ T=5/2	18	MMC149J			*
^{39}K	−33807.200	0.004				STABLE	$3/2^+$*	18			IS=93.2581 44	*
^{39}K^i	−27260.8	1.9	6546.4	1.9			$7/2^-$ T=3/2	18			IT=100	
^{39}Ca	−27282.7	0.6				860.3 ms 0.8	$3/2^+$*	18	19Kl06	J	β^+=100	*
^{39}Ca^i	−20917#	9#	6366#	9#			$3/2^+$ T=3/2		MMC12e			
^{39}Sc	−14173	24				<25ns	$7/2^-$#	18	25Su.A	T	p ?	*
^{39}Sc^i	−5050	40	9120	50	2p		$(3/2^+)$ T=5/2	18				
^{39}Ti	2100#	200#				28.5 ms 0.9	$3/2^+$#	18	07Do17	TD	β^+=100;β^+p=93.7 28;β^+2p=?	*
^{39}V	20720#	400#					$7/2^-$#				p ?	
$*^{39}$Na	I : one event observed in 19Ah07 and 9 events in 22Ah02											**
$*^{39}$Al	T : from 22Cr03=7.22(0.08,stat)(0.30,syst); others: 04Gr20=7.6(1.6) 99YoZW=8(2)											**
$*^{39}$Al	D : %β^-n from 99YoZW=97(22)											**
$*^{39}$Si	T : average 19Ab06=39.2(3.1) [$\beta\gamma$(t)] 04Gr20=47.5(2.0); other: 19Ab06=38.6(1.3) [β(t)]											**
$*^{39}$Si	D : %β^-n other: 99YoZW=60(13)											**
$*^{39}$P	T : average 04Gr20=250(80) 98WiZV=320(30) 95Re.A=190(50)											**
$*^{39}$Ar	T : from 25Ad02=302(8,stat)(6,syst); others: 96Ba.1=276(3) 65St09=269(3,stat)(8,syst) 52Ze01=265(30)											**
$*^{39}$Ar	J : 67Tr12=7/2											**
$*^{39}$Ar^i	J : from IAS appurtenance; $3/2^+$,$5/2^+$ in ENSDF2018											**
$*^{39}$K	J : 19Ko19,14Kr04,14Pa45,13Pa11,37Ja02,35Fo03=3/2; also: 35Mi08=3/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{39}$Ca	T : average 10Bl09=860.7(1.0) 77Az01=859.4(1.6) 73Al11=860.4(3.0)												**
$*^{39}$Sc	D : most likely a proton emitter from S_p=-597(24) keV												**
$*^{39}$Ti	D : %β^+p includes contribution from ^{39}Sc gs (%p=100); β^+2p decay was observed in 92Mo15, but was not quantified												**
^{40}Mg	49550#	500#				3# ms	>170ns	0^+	21	14Cr02	I	β^- ?;β^-n ?;β^-2n ?	*
^{40}Al	28820#	300#				5.7 ms	0.4		15	22Cr03	TD	β^-=100;β^-n ?;β^-2n ?	*
^{40}Si	5670	120				31.2 ms	2.6	0^+	15	17Tr02	TD	β^-=100;β^-n=38 5;β^-2n ?	*
^{40}P	−8140	80				150 ms	8	$(2^-,3^-)$	15			β^-=100;β^-n=15.8 21;β^-2n ?	
^{40}S	−22838	4				8.8 s	2.2	0^+	15			β^-=100	
^{40}Cl	−27560	30				1.35 m	0.03	2^-	15			β^-=100	
^{40}Ar	−35039.9042	0.0019				STABLE		0^+	15			IS=99.6035 250	*
^{40}K	−33535.50	0.06				1.266 Gy	0.004	4^-*	15	23St09	TD	IS=0.0117 1;β^-=89.59 5; ε=10.41 5	*
^{40}K^m	−31891.86	0.06	1643.638	0.011		336 ns	12	0^+	15			IT=100	
^{40}K^i	−29151.5	0.3	4384.0	0.3				0^+ T=2	15			IT=100	
^{40}Ca	−34846.394	0.012				STABLE	>9.9Zy	0^+	15	16An14	T	IS=96.941 156;2β^+ ?	
^{40}Ca^i	−27188.21	0.05	7658.18	0.05				4^- T=1	15	AHW	E	IT=100	*
^{40}Ca^j	−22858.4	1.0	11988	1				0^+ T=2	15			IT=100	
^{40}Sc	−20523.3	2.8				182.3 ms	0.7	4^-*	15	25Ba15	J	β^+=100;β^+p=0.44 7;$\beta^+\alpha$=0.017 5	
^{40}Sc^i	−16164	6	4359	6	RQ			0^+ T=2	15			IT=100	
^{40}Ti	−8990	70				52.4 ms	0.3	0^+	15	07Do17	TD	β^+=100;β^+p=95.8 13	
^{40}V	11120#	300#						2^-#				p ?	
$*^{40}$Mg	I : 5 events observed in direct two-proton removal from ^{42}Si												**
$*^{40}$Al	T : from 22Cr03=5.7(0.3,stat)(0.2,syst)												**
$*^{40}$Si	T : average 17Tr02=27.6(1.4) 04Gr20=33(1); Birge ratio=3.14												**
$*^{40}$Si	D : %β^-n other: 99YoZW=53(12)												**
$*^{40}$Ar	D : other: [93.6,100.0] in 24Ci.A												**
$*^{40}$K	J : 14Kr04,49Da01=4												**
$*^{40}$K	D : using $\varepsilon(0^+$,gs)/e^+=215.0(3.1) from 18Mo04, $\varepsilon(0^+$ gs)/$\varepsilon(2^+$ lvl)=0.0095(0.0022,stat)(0.0010,syst) from 23St09,23Ha25 and												**
$*^{40}$K	D : $\varepsilon(2^+$ lvl)/β^-=0.1151(0.0006) from $T_{1/2}(\beta^-)$=1.4134(0.0055)Gy and $T_{1/2}(\varepsilon,2^+$ lvl)=12.277(0.035)Gy in 22Ko22												**
$*^{40}$K	T : from $T_{1/2}(\beta^-)$=1.4134(0.0055), $T_{1/2}(\varepsilon,2^+$ lvl)=12.277(0.035) in 22Ko22, and $\varepsilon(0^+$ gs)/$\varepsilon(2^+$ lvl)=0.0095(0.0022,stat)(0.0010,syst) in 23St09,												**
$*^{40}$K	T : 23Ha25; others: 1.2521(0.027) recommended in 22Ko22, based on 22Ko22=1.2536(0.0027), supersedes 04Ko09=1.248(0.003), 02Gr01=1.249(0.004)												**
$*^{40}$K	T : 65Le15=1.253(0.010) 55Su38=1.23(0.04)												**
$*^{40}$Ca^i	E : originally 7658.23(0.05), recalibrated -0.05 keV for ^{27}Al+p resonances												**
^{41}Mg	58100#	500#						3/2$^-$#				β^- ?;β^-n ?	
^{41}Al	34590#	400#				3.5 ms	0.9	5/2$^+$#	15	22Cr03	TD	β^-=100;β^-n ?;β^-2n ?	*
^{41}Si	13200#	300#				20.0 ms	2.5	(3/2$^-$)	15	24Ga26	J	β^-=100;β^-n>55;β^-2n ?	*
^{41}P	−4980	120				101 ms	5	1/2$^+$#	15	89Le16	TD	β^-=100;β^-n=30 10;β^-2n ?	*
^{41}S	−19009	4				1.99 s	0.05	5/2$^-$#	15			β^-=100;β^-n ?	*
^{41}Cl	−27310	70				38.4 s	0.8	(1/2$^+$)	15			β^-=100	
^{41}Ar	−33067.5	0.3				109.61 m	0.04	7/2$^-$	15			β^-=100	
^{41}K	−35559.553	0.004				STABLE		3/2$^+*$	15			IS=6.7302 44	*
^{41}K^i	−27210	15	8349	15	RQ			7/2$^-$ T=5/2	15	75Me10	J	IT ?	*
^{41}Ca	−35137.93	0.05				100.3 ky	1.3	7/2$^-*$	15	12Jo04	T	ε=100	*
^{41}Ca^i	−29320.8	0.5	5817.1	0.5		< 28 fs		3/2$^+$ T=3/2	15			IT=100	
^{41}Sc	−28642.49	0.08				596.3 ms	1.7	7/2$^-*$	15			β^+=100	*
^{41}Sc^r	−25760.18	0.08	2882.30	0.05	RQ			7/2$^+$				p=59 2;IT=41 2	
^{41}Sc^i	−22704	3	5939	3	RQ			3/2$^+$ T=3/2	15			p=100	
^{41}Ti	−15716	16				81.9 ms	0.4	3/2$^+$	15	07Do17	TD	β^+=100;β^+p=93.0 5	*
^{41}V	−130#	200#						7/2$^-$#				p ?	
^{41}Cr	19000#	400#						3/2$^+$#				p ?	
$*^{41}$Al	T : from 22Cr03=3.5(0.8,stat)(0.4,syst)												**
$*^{41}$Si	D : %β^-n: from 99YoZW=103(48)												**
$*^{41}$Si	T : from 04Gr20=20.0(2.5)												**
$*^{41}$P	T : average 04Gr20=100(5) 89Le16=120(20)												**
$*^{41}$P	D : %β^-n other: 99YoZW=71(21)												**
$*^{41}$S	T : from 98WiZV=1.99(0.05); other: 95ReZZ=2.6(1.4)												**
$*^{41}$K	J : 14Kr04,36Ma03=3/2												**
$*^{41}$K^i	J : l=3 in (^{3}He,d); IAS of ^{41}Ar gs (J^π=7/2$^-$)												**
$*^{41}$Ca	T : average 12Jo04=99.4(1.5) 91Kl06=103(7), supersedes 90Fi13=103(14), 91Pa10=101(10) 74Ma30=103(4) 89Ku33=103(4)												**
$*^{41}$Ca	J : 62Br30=7/2												**
$*^{41}$Sc	J : 25Ba15,23Ko19,22Po01=7/2												**
$*^{41}$Ti	T : average 07Do17=82.6(0.5) 98Bh12=81.3(2.0) 98Li46=82(3) 96Fa09=81(4) 97Tr11=80.1(0.9) 74Se11=80(2)												**
$*^{41}$Ti	D : %β^+p average 07Do17=91.1(0.6) 98Bh12=95.3(2.3) 98Li46=98(5) 97Tr11=100.3(2.2) 74Se11=100.0(1.5); Birge ratio=3.35												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{42}Al	41990#	500#				3# ms >170ns		16			β^- ?;β^-n ?;β^-2n ?	
^{42}Si	17500#	300#				14.9 ms 1.5	0^+	16	22Cr03	TD	β^-=100;β^-n ?;β^-2n ?	*
^{42}P	1090	100				48.3 ms 1.1	$(2^-,3^-)$	16	22Tr03	TDJ	β^-=100;β^-n=39 6;β^-2n ?	*
^{42}S	−17637.7	2.8				1.016 s 0.015	0^+	16	06Wi10	D	β^-=100;β^-n=0.5 3	*
^{42}Cl	−24830	60				6.8 s 0.3	(2^-)	16			β^-=100;β^-n ?	
^{42}Ar	−34423	6				34.5 y 1.7	0^+	16	24Sc06	T	β^-=100	*
^{42}K	−35022.03	0.11				12.355 h 0.007	2^-*	16			β^-=100	*
^{42}K^i	−28570	100	6450	100			(0^+) T=3	16				
^{42}Ca	−38547.684	0.013				STABLE	0^+	16			IS=0.647 23	
^{42}Ca^i	−28798	10	9750	10			(2^-) T=2	16				
^{42}Sc	−32121.35	0.05				680.72 ms 0.26	0^+* T=1	16	25Ba15	J	β^+=100	*
^{42}Sc^m	−31504.56	0.06	616.79	0.06	MD	61.7 s 0.4	7^+*	16			β^+=100	*
^{42}Sc^r	−26045.04	0.08	6076.31	0.07	RQ		$(2^+,3^+,4^+)$				IT=100	
^{42}Ti	−25104.71	0.23				208.3 ms 0.4	0^+	16	15Mo01	T	β^+=100	*
^{42}V	−8220#	200#				<29ns	2^-#	16	25Su.A	T	β^+ ?;p ?	
^{42}Cr	6260#	300#				13.3 ms 1.0	0^+	16			β^+≈100;β^+p=94.4 50;2p ?	
*^{42}Si	T : average 22Cr03=15.5(0.4,stat)(1.6,syst) 04Gr20=12.5(3.5); other: 99YoZW=20(10)											**
*^{42}P	T : average 22Tr03=47.1(2.0),49.5(2.5) 04Gr20=48.5(1.5); other: 89Le16=110(+40-20)											**
*^{42}P	D : %β^-n others: 89Le16=50(20) 99YoZW=57(13)											**
*^{42}S	D : %β^-n from 06Wi10<1											**
*^{42}Ar	T : average 24Sc06=39.5(3.6) 65St09=32.9(1.1,stat)(1.7,syst), based on 6% total (stat and syst) unc; others: 52Ka44>3.5 y 64Ho31∼30 y											**
*^{42}K	J : 19Ko19,14Kr04,14Pa45,53Be19=2											**
*^{42}Sc	T : average 97Ko65=680.67(0.28) 76Wi08=680.98(0.62)											**
*^{42}Sc^m	J : 25Ba15,21Ko26=7											**
*^{42}Ti	T : average 15Mo01=211.7(1.9), 209.5(5.2) 09Ku19=208.14(0.45)											**
^{43}Al	48270#	600#				4# ms >170ns	$5/2^+$#	15			β^- ?;β^-n ?;β^-2n ?	
^{43}Si	24910#	400#				13 ms 5	$3/2^-$#	15	22Cr03	TD	β^-=100;β^-n ?;β^-2n ?	*
^{43}P	5500#	300#				36.3 ms 1.2	$(1/2^+)$	15	22Tr03	TD	β^-=100;β^-n=100;β^-2n ?	*
^{43}S	−12195	5				251.9 ms 2.2	$3/2^-$	15	20Mo32	J	β^-=100;β^-n=40 10	*
^{43}S^m	−11874	5	320.7	0.5		415.0 ns 2.6	$(7/2^-)$	15	09Ga05	TJ	IT=100	*
^{43}Cl	−24114.5	1.8				3.13 s 0.09	$(3/2^+)$	15	06Wi10	JT	β^-=100;β^-n ?	*
^{43}Ar	−32010	5				5.37 m 0.06	$5/2(^-)$	15			β^-=100	
^{43}K	−36575.4	0.4				22.3 h 0.1	$3/2^+$*	15			β^-=100	*
^{43}K^m	−35837.1	0.4	738.30	0.06		200 ns 5	$7/2^-$	15			IT=100	
^{43}Ca	−38409.28	0.16				STABLE	$7/2^-$*	15			IS=0.135 10	*
^{43}Ca^i	−30414	14	7995	14	RQ		$(3/2)^+$ T=5/2	15				
^{43}Sc	−36188.5	1.9				3.891 h 0.012	$7/2^-$*	15			β^+=100	*
^{43}Sc^m	−36036.7	1.9	151.79	0.08		438 μs 7	$3/2^+$	15	64Ho14	T	IT=100	*
^{43}Sc^n	−33064.8	1.9	3123.73	0.15		472 ns 3	$19/2^-$	15	08Fe02	T	IT=100	*
^{43}Sc^i	−31957	3	4232	4	RQ		$7/2^-$ T=3/2	15				
^{43}Ti	−29306	4				509 ms 5	$7/2^-$	15			β^+=100;β^+p ?	
^{43}Ti^m	−28993	4	313.0	1.0		11.9 μs 0.3	$(3/2^+)$	15			IT=100	*
^{43}Ti^n	−26240	4	3066.4	1.0		556 ns 4	$(19/2^-)$	15			IT=100	*
^{43}Ti^i	−24600#	50#	4710#	50#			$7/2^-$# T=3/2					
^{43}V	−17905	25				79.3 ms 2.4	$7/2^-$#	15	07Do17	DT	β^+=100;β^+p=1.3 7	*
^{43}V^i	−9705	15	8200	30	RQ		$3/2^+$ T=5/2					
^{43}Cr	−2090#	200#				21.1 ms 0.3	$(3/2^+)$	15	11Po01	T	β^+=100;β^+p=79.3 30; β^+2p=11.6 10;β^+3p=0.19 13; $\beta^+\alpha$?	*
^{43}Mn	16120#	400#					$5/2^-$#				p ?	
*^{43}Si	T : from 22Cr03=13(4,stat)(2,syst)											**
*^{43}P	T : average 22Tr03=37.5(2.2) 04Gr20=36.5(1.5) 95So03=33(3)											**
*^{43}P	D : %β^-n from 22Tr03,95So03; other: 99YoZW=84(47)											**
*^{43}S	T : average 25Ze04=300(40) 24Tr01=250.2(2.5) [$\beta\gamma$(t)], 256(5) [β(t)] 04Gr20=282(27) 98WiZV=260(15) 89Le16=220(+80-50)											**
*^{43}S^m	T : average 12Ch16=415(3) 09Ga05=415(5); others: 20Mo32=391(14) 12Ka36=200(+140-70) 00Sa21=478(48)											**
*^{43}Cl	T : from 06Wi10, supersedes 98WiZX=3.07(0.07); others: 81Vo04=3.3(0.2) 81HuZT=3.4(0.3)											**
*^{43}K	J : 14Kr04,59Pe26=3/2											**
*^{43}Ca	J : 15Ru02,54Ke14,53Je06=7/2											**
*^{43}Sc	J : 25Ba15,11Av01,66Co13=7/2											**
*^{43}Sc^m	T : average 65De15=470(20) 64Ho14=435(7)											**
*^{43}Sc^n	T : average 08Fe02=481(9) 81Da06=469(4) 78Ha07=473(5)											**
*^{43}Ti^m	T : average 11Ho02=11.7(0.3) 78Me15=12.6(0.6)											**
*^{43}Ti^n	T : average 11Ho02=551(7) 81Da06=553(21) 78Ha07=560(6) 78Me09=560(35)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{43}$V	D : %β^+p from 07Do17<2.5											**
$*^{43}$Cr	T : average 11Po01=20.6(0.9) 07Do17=21.1(0.4) 01Gi01=21.6(0.7)											**
$*^{43}$Cr	D : %β^+3p symmetrized from 12Au08=0.13(+0.18-0.08)											**
^{44}Si	30230#	500#				4# ms >360ns	0^+	23			β^- ?;β^-n ?;β^-2n ?	
^{44}P	11550#	400#				18.2 ms 0.8	0^-#	23	22Tr03	TDJ	β^-=100;β^-n=75 18;β^-2n ?	*
^{44}S	−9204	5				124.1 ms 2.2	0^+	23	22Tr03	TD	β^-=100;β^-n=38 5	*
^{44}S^m	−7839	5	1365.0	1.0		2.619 μs 0.026	0^+	23	10Fo04	TJE	IT=100	*
^{44}Cl	−20450	10				677 ms 13	(2^-)	23	24Co.A	T	β^-=100;β^-n=4.0 23	*
^{44}Ar	−32673.3	1.6				11.87 m 0.05	0^+	23	70Hu11	T	β^-=100	
^{44}K	−35781.5	0.4				22.13 m 0.19	2^-*	23			β^-=100	*
^{44}Ca	−41468.482	0.013				STABLE	0^+	23			IS=2.086 110	
^{44}Ca^i	−29618	10	11850	10			2^- T=3	23	MMC143J			*
^{44}Sc	−37816.4	1.7				4.0421 h 0.0023	2^+*	23	22Du13	T	β^+=100	*
^{44}Sc^m	−37748.5	1.7	67.8680	0.0014		154.8 ns 0.8	1^-	23			IT=100	
^{44}Sc^n	−37670.2	1.7	146.1915	0.0020		51.0 μs 0.3	0^-	23			IT=100	
^{44}Sc^p	−37545.2	1.7	271.241	0.010		58.61 h 0.09	6^+*	23	22Du13	T	IT=?;β^+=1.23 1	*
^{44}Sc^i	−35038.2	2.5	2778	3	RQ		0^+ T=2	23				
^{44}Ti	−37548.6	0.7				59.1 y 0.3	0^+	23	06Ah10	T	ε=100	*
^{44}Ti^i	−30942.3	0.9	6606.3	0.5			2^+ T=1	23			IT=100	
^{44}Ti^j	−28210.6	2.1	9338	2			0^+ frg. T=2	23			IT=100	
^{44}V	−23804	5				111 ms 7	$(2)^+$	23	97Ha04	T	β^+=100;$\beta^+\alpha$=?;β^+p ?	
^{44}V^m	−23536	4	268	7	MD	150 ms 3	$(6)^+$	23	97Ha04	T	β^+=100	
^{44}V^i	−21109	12	2695	13	p		0^+# T=2	23	92Bo37	D	p=100	
^{44}Cr	−13420	50				42.8 ms 0.6	0^+	23	07Do17	TD	β^+=100;β^+p=12 2	*
^{44}Mn	6300#	300#				<72ns	2^-#	23	25Su.A	T	p ?	
$*^{44}$P	T : average 22Cr03=18.8(0.8,stat)(1.5,syst) 22Tr03=18(1) 04Gr20=18.5(2.5)											**
$*^{44}$S	T : average 25Ze04=119(8) 22Tr03=125.5(2.5),119(6) 95So03=123(10); others: 04Gr20,03Gr22=100(1) 89Le16=200(+50-30)											**
$*^{44}$S	D : %β^-n average 22Tr03=40(5) 89Le16=30(10); other: 95So03=18(3)											**
$*^{44}$S^m	T : other: 05Gr30=2.3(0.3), superseded by 10Fo04											**
$*^{44}$Cl	T : average 25Ze04=700(70) 24Co.A=681(20) 16Wi.A=672(18), supersedes 98WiZV=640(40) 99WiZX=650(50); other: 95So03=434(60)											**
$*^{44}$Cl	D : %β^-n from 95So03<8											**
$*^{44}$K	J : 19Ko19,14Kr04,14Pa45,82To02,82Du06=2											**
$*^{44}$K	T : average 73In02=22.15(0.20) 54Co70=22.0(0.5)											**
$*^{44}$Ca^i	J : from (e,e') in 84Ra04; IAS candidate											**
$*^{44}$Sc	T : average 22Du13=4.042(0.007) 16Ga24=4.0420(0.0025) 69Sa34=4.05(0.03). others (not used): 69Ra16=3.927(0.008) 66Ta01=4.00(0.02)											**
$*^{44}$Sc	J : 25Ba15,11Av01,66Co13=2											**
$*^{44}$Sc^p	J : 25Ba15,11Av01,66Co13=6											**
$*^{44}$Sc^p	T : average 22Du13=58.7(0.3) 69Ra16=58.6(0.1) 56Ru45=58.6(0.5) 45Hi05=58.6(0.7)											**
$*^{44}$Sc^p	D : %β^+=1.23(0.01) using %I_γ(1001.8)/%I_γ(1157.0+2656.5+3301.4) in 76Co06											**
$*^{44}$Ti	T : average 06Ah10=58.9(0.3), supersedes 98Ah03=59(2), 01Ha21=59(2) 99Wi01=60.7(1.2) 98Go05=60.3(1.3) 98No06=62(2), supersedes 97No06=63(3);											**
$*^{44}$Ti	T : others (outliers): 96Me22=39.0(1.8),58(10) 90Al11=66.6(1.6) 83Fr27=54.2(2.1) 65Mo07=48.2(0.9) 65Wi05=46.4(1.7)											**
$*^{44}$Cr	T : others: 14Po05=25(+6-4) 92Bo37=53(+4-3)											**
$*^{44}$Cr	D : %β^+p average 07Do17=14.0(0.9) 14Po05=10(1); Birge ratio=2.97; other: 96Fa09>7(3)											**
^{45}Si	37550#	600#				4# ms	$3/2^-$#		24Yo09	I	β^- ?;β^-n ?;β^-2n ?	*
^{45}P	16550#	500#				24 ms 11	$1/2^+$#	07	22Cr03	TD	β^-=100;β^-n ?;β^-2n ?	*
^{45}S	−3340#	300#				69.2 ms 0.9	$(3/2^-)$	07	24Tr01	TDJ	β^-=100;β^-n=60 10;β^-2n ?	*
^{45}Cl	−18240	4				438 ms 8	$(3/2^+)$	07	12Ri08	J	β^-=100;β^-n=25 4	*
^{45}Ar	−29770.8	0.5				21.48 s 0.15	$(7/2)^-$	07	80Hu01	T	β^-=100	*
^{45}K	−36615.6	0.5				17.8 m 0.6	$3/2^+*$	07			β^-=100	*
^{45}Ca	−40811.98	0.17				162.61 d 0.09	$7/2^-*$	07			β^-=100	*
^{45}Sc	−41072.3	0.7				STABLE	$7/2^-*$	07			IS=100	*
^{45}Sc^m	−41059.9	0.7	12.3896	0.0002		326 ms 4	$3/2^+*$	07	23Sh24	E	IT=100	*
^{45}Sc^i	−34373	15	6699	15			$7/2^-$ T=5/2	07				
^{45}Ti	−39010.3	0.8				184.8 m 0.5	$7/2^-*$	07			β^+=100	*
^{45}Ti^m	−38973.8	0.8	36.53	0.15		3.0 μs 0.2	$3/2^-$	07			IT=100	
^{45}Ti^i	−34291	3	4719	3	RQ		$7/2^-$ T=3/2	07				
^{45}V	−31886.4	0.9				547 ms 6	$7/2^-$	07			β^+=100	
^{45}V^m	−31829.6	1.1	56.8	0.6		512 ns 13	$(3/2^-)$	07	11Ho02	T	IT=100	*
^{45}V^i	−27090	9	4797	9	RQ		$7/2^-$ T=3/2	07			p=100	
^{45}Cr	−19478	10				60.9 ms 0.4	$7/2^-$#	07			β^+=100;β^+p=34.4 8	
^{45}Cr^m	−19371	10	107	1		> 80 μs	(3/2)		11Ho02	ETJ	IT=100	
^{45}Mn	−5100#	300#				<42ns	$5/2^-$#	07	25Su.A	T	p ?	
^{45}Fe	13630#	200#				2.66 ms 0.20	$3/2^+$#	07	07Mi36	TD	2p=70 4;β^+=30 4;β^+p=18.9 35;	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
												β^+2p=7.8 23;β^+3p=3.3 15	
$*^{45}$Si	I : first identification reported by the same group in 21SuZZ												**
$*^{45}$P	T : from 22Cr03=24(7,stat)(9,syst)												**
$*^{45}$S	T : average 25Ze04=75(5) 24Tr01=69(1) [β(t)], 74(5) [$\beta\gamma$(t)] 04Gr20=68(2) 95So03=82(13)												**
$*^{45}$S	D : other: %β^-n 95So03∼54												**
$*^{45}$Cl	T : average 25Ze04=416(28) 24Co.A=439(9), supersedes 24Co05=451(14), 23Bh05=513(36) 93So06=400(43) 98WiZV=420(30)												**
$*^{45}$Cl	D : β^-n average of 24Co.A=37(13), supersedes 24Co05=28(8), 93So06=24(4)												**
$*^{45}$Ar	T : others: 78Pe04=20.8(0.5) 74TiZW=21(1)												**
$*^{45}$Ar	J : L=3 in 10Le03, 11Le01, 13Lu10, 08Ga28												**
$*^{45}$K	J : 14Kr04,68Ga28,67Ga08=3/2												**
$*^{45}$Ca	J : 15Ru02,79Be47=7/2												**
$*^{45}$Sc	J : 23Ko19,22Po01,11Av01,34Ko01,34Sc01=7/2												**
$*^{45}$Sc^m	T : from 67Bl17=326(4), supersedes 64Ho14=305(17)												**
$*^{45}$Sc^m	E : from 23Sh24=12.38959(0.00015,stat)(0.00012,syst)												**
$*^{45}$Sc^m	J : 25Ba15=3/2												**
$*^{45}$Ti	J : 66Co19=7/2												**
$*^{45}$V^m	T : average 11Ho02=468(23) 87Ha.B=430(80) 82Ho11=539(18) 82Al.C=610(80) 80Gr.A=510(50)												**
$*^{45}$Fe	T : average 12Au08=3.6(+1.6-0.8) 07Mi40=2.6(0.2) (2p gated), supersedes 07Mi36=2.8(0.4) (β-only gated), 02Pf02=3.2(+2.6-1.0)												**
$*^{45}$Fe	T : 02Gi09=4.7(+3.4-1.4), supersedes 01Gi01=6(+17-3), 5.98(2.49), and 4.22(1.88); others (not used): 25Or05=1.22(+0.39-0.24) 05Do20=1.6(+0.5-0.3)												**
$*^{45}$Fe	D : %2p others: 25Or05=68(+12-26) 12Au08=78(+14-22) 05Do20=57(10)												**
^{46}Si	43360#	400#				400#	μs	>360ns	0^+		24Yo09	I	β^- ?;β^-n ?	*
^{46}P	23030#	500#				9#	ms	>200ns		00	90Le03	I	β^- ?;β^-n ?;β^-2n ?	
^{46}S	640#	400#				43.5	ms	2.3	0^+	10	22Tr03	TD	β^-=100;β^-n=80 16;β^-2n ?	*
^{46}Cl	−13730	100				237	ms	3	$(1^-,2^-)$	12	25Tr01	TJD	β^-=100;β^-n=64 8;β^-2n ?	*
^{46}Ar	−29771.3	2.3				8.4	s	0.6	0^+	00			β^-=100	
^{46}K	−35413.9	0.7				96.30	s	0.08	2^-*	00	14Ku.A	T	β^-=100	*
^{46}Ca	−43137.790	0.014				STABLE			0^+	00			IS=0.004 3;2β^- ?	*
^{46}Sc	−41761.6	0.7				83.773	d	0.015	4^+*	00	FGK259	T	β^-=100	*
^{46}Sc^m	−41709.6	0.7	52.011	0.001		9.4	μs	0.8	6^+	00			IT=100	
^{46}Sc^n	−41619.1	0.7	142.528	0.007		18.75	s	0.04	1^-	00			IT=100	
^{46}Sc^i	−36747	3	5015	3	RQ				0^+ T=3	00				
^{46}Ti	−44128.29	0.09				STABLE			0^+	00			IS=8.25 3	
^{46}Ti^i	−34962	7	9166	7	RQ				4^+ T=2	00				
^{46}Ti^j	−29977	6	14151	6	RQ				0^+ T=3	00				
^{46}V	−37075.92	0.13				422.62	ms	0.05	0^+ T=1	00	12Pa07	T	β^+=100	*
^{46}V^m	−36274.46	0.16	801.46	0.10		1.02	ms	0.07	3^+ T=0	00			IT=100	
^{46}Cr	−29477.2	2.6				224.3	ms	1.3	0^+	10	15Mo01	T	β^+=100	*
^{46}Cr^i	−20328	13	9149	13	RQ				(4^+) T=2	10			p=?	
^{46}Mn	−12420	90			*	36.2	ms	0.4	(4^+)	10	07Do17	TD	β^+=100;β^+p=57.0 8;β^+2p ?;$\beta^+\alpha$?	*
^{46}Mn^m	−12270#	140#	150#	100#	*	1#	ms		1^-#				β^+ ?	
^{46}Mn^i	−7350	30	5070	90	p				T=3					
^{46}Fe	710#	300#				13.2	ms	1.6	0^+	10	07Do17	TD	β^+=100;β^+p=78.7 38;β^+2p=?	*
$*^{46}$Si	I : first identification reported with one event by the same group in 21SuZZ												**
$*^{46}$S	T : average 25Ze04=44(3) 22Tr03=41(4) 04Gr20,03Gr22=50(8)												**
$*^{46}$Cl	T : average 25Ze04=238(3) [β(t)], 244(27) [γ gated] 25Tr01=201(16), supersedes 24Co.A=216(23), 95So03=223(37); other: 04Gr20=232(2), uncertainty												**
$*^{46}$Cl	T : not trusted												**
$*^{46}$Cl	D : β^-n average 25Tr01=74(15) 95So03=60(9)												**
$*^{46}$K	J : 19Ko19,14Kr04,14Pa45,82To02=2												**
$*^{46}$K	T : other: 19Po06=96.5(0.4)												**
$*^{46}$Ca	T : 99Be64 : 0ν-$\beta\beta$>100 Ey												**
$*^{46}$Sc	J : 25Ba15,11Av01,62Pe21=4												**
$*^{46}$V	T : average 12Pa07=422.66(0.06) 97Ko65=422.57(0.13) 77Ba01=422.28(0.23) 77Al11=422.47(0.39); others: 74Ha59=423.4(2.0) 73Al02=425.3(2.0)												**
$*^{46}$Cr	T : others (downweighted): 15Mo01=223.9(9.9) 05On03=240(140) 72Zi02=260(60)												**
$*^{46}$Mn	T : others: 92Bo37=41(+7-6) 01Gi01=34.0(+4.5-3.5), superseded by 07Do17												**
$*^{46}$Fe	T : average 14Po05=16.4(+4.2-2.8) 07Do17=13.0(2.0) 01Gi01=9.7(+3.5-4.3)												**
$*^{46}$Fe	D : other %β^+p: 14Po05=66(4)% 01Gi01=36(20)%; β^+2p, 1 event in 14Po05												**
^{47}P	28980#	600#				4#	ms	>400ns	$1/2^+$#	25	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{47}S	7200#	400#				41	ms	10	$3/2^-$#	25	25Ze04	TD	β^-=100;β^-n ?;β^-2n ?	
^{47}Cl	−9580#	200#				110.3	ms	1.7	$(3/2^+)$	25	25Tr01	TJD	β^-=100;β^-n=98 12;β^-2n=?	*
^{47}Ar	−25367.3	1.2				1.32	s	0.05	$(3/2)^-$	25	04We09	TD	β^-=100;β^-n=0.10 6	*
^{47}K	−35712.0	1.4				17.38	s	0.03	$1/2^+*$	25	20Sm02	T	β^-=100	*
^{47}Ca	−42342.05	0.10				4.5352	d	0.0019	$7/2^-*$	25	22Ab01	T	β^-=100	*
^{47}Sc	−44334.9	1.0				3.3488	d	0.0006	$7/2^-*$	25	22Ab01	T	β^-=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{47}Sc^m	−43568.1	1.0	766.83	0.09		272 ns 8	$(3/2)^+$	25			IT=100	
^{47}Ti	−44937.63	0.08				STABLE	$5/2^-$*	25			IS=7.44 2	*
^{47}Ti^i	−37588.6	0.7	7349.0	0.7			$7/2^-$ T=5/2	25				
^{47}V	−42007.09	0.11				32.6 m 0.3	$3/2^-$*	25	73Fi02	T	β^+=100	*
^{47}V^i	−37856.74	0.16	4150.35	0.11			$5/2^-$ T=3/2	25			IT=100	
^{47}Cr	−34561	5				461.6 ms 1.5	$3/2^-$	25			β^+=100	*
^{47}Mn	−22562	16				88.0 ms 1.3	$5/2^-$#	25	07Do17	TD	β^+=100;β^+p=0.9 5	*
^{47}Mn^i	−15196	13	7366	21	RQ		$7/2^-$# T=5/2	25	07Do17	D	p=100	
^{47}Fe	−6930#	200#				21.9 ms 0.2	$7/2^-$#	25	07Do17	TD	β^+=100;β^+p=88.4 9;β^+2p ?;$\beta^+\alpha$?	*
^{47}Co	9600#	300#					$7/2^-$#		Mirror	I	p ?	
*^{47}Cl	T : average 25Ze04=111(3) [β(t)], 117(7) [γ gated] 26On.1=108.9(+4.3-4.1) 25Tr01=109.5(2.5), supersedes 24Co.A=100(20); other: 04Gr20=101(6)											**
*^{47}Cl	D : β^-n from 25Tr01=98(12); other: 93So06<3											**
*^{47}Ar	T : average 25Ze04=1.41(0.03) [β(t)], 1.32(0.07) [γ gated] 04We09=1.23(0.03) 04Gr20=1.25(0.15); Birge ratio=2.5											**
*^{47}Ar	D : %β^-n from 04We09<0.2											**
*^{47}K	J : 19Ko19,14Kr04,14Pa45,13Pa11,82To02=1/2											**
*^{47}Ca	J : 15Ru02,82An15=7/2											**
*^{47}Ca	T : average 22Ab01=4.531(0.005) [liquid-scintillation counting], 4.534(0.008) [γ(t)] 69Bu14=4.540(0.003) 68Re04=4.530(0.004) 64Gi04=4.535(0.004)											**
*^{47}Sc	J : 25Ba15,22Ba15,66Co13=7/2											**
*^{47}Sc	T : average 22Ab01=3.350(0.002) 86Re12=3.3492(0.0006) 80Mo26=3.341(0.003) 68Me07=3.345(0.003); other: 69Ra16=3.422(0.004)											**
*^{47}Ti	J : 62Wa03,61Ga16,53Je16=5/2											**
*^{47}V	J : 78Re03,67Re06=3/2											**
*^{47}Cr	T : average 77Ed01=460.0(1.5) 77Ho25=452(18) 85Bu07=508(10) 88HaZB=472.0(6.3) 85HoZS=520(40) 17Ku12=460(80)											**
*^{47}Mn	D : %β^+p from 07Do17<1.7; other: 96Fa09 =3.4(0.9)											**
*^{47}Fe	T : average 07Do17=21.9(0.2) 01Gi01=21.8(0.7);other: 92Bo37=27(+32-10)											**
*^{47}Fe	D : %β^+p other: 01Gi01=87(6), superseded by 07Do17											**
^{48}S	12390#	500#				10# ms >200ns	0^+	21			β^- ?;β^-n ?;β^-2n ?	
^{48}Cl	−4280#	500#				36.7 ms 1.3	0^-#	21	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{48}Ar	−22324	4				471 ms 4	0^+	21	12We08	TD	β^-=100;β^-n=38 6	*
^{48}K	−32284.5	0.8				6.83 s 0.14	1^-*	21			β^-=100;β^-n=1.14 15	*
^{48}Ca	−44224.874	0.014				60 Ey 10	0^+	21	16Ar19	T	IS=0.187 21;2β^-=?;β^- ?	*
^{48}Sc	−44503.5	0.5				43.71 h 0.08	6^+*	21	25Ba15	J	β^-=100	*
^{48}Ti	−48492.97	0.07				STABLE	0^+	21			IS=73.72 3	
^{48}Ti^i	−37511	6	10982	6			4^+ T=3	21	78Ko27	E		
^{48}Ti^j	−31114	12	17379	12			0^+ T=3	21	78Ko27	EJ		
^{48}V	−44478.0	1.0				15.9742 d 0.0024	4^+*	21			β^+=100	*
^{48}V^i	−41459.18	0.23	3018.8	0.9	RQ		$(0)^+$ T=2	21			IT=100	
^{48}Cr	−42821	7				21.56 h 0.03	0^+	21			β^+=100	*
^{48}Cr^i	−37028	7	5792.7	0.3			4^+ T=1	21			IT=100	
^{48}Cr^j	−34061	15	8760	17	RQ		0^+ frg. T=2	21				*
^{48}Mn	−29290.7	2.8				158.1 ms 2.2	4^+	21	91Sz03	TD	β^+=100;β^+p=0.28 4;$\beta^+\alpha$=6e-4	
^{48}Mn^i	−26254.0	2.9	3036.7	0.9			0^+ T=2	21	16Or03	D	IT=?;p=14 2	
^{48}Fe	−18010	90				45.3 ms 0.6	0^+	21	07Do17	TD	β^+=100;β^+p=15.3 5	
^{48}Co	1210#	200#				<84ns	6^+#	21	25Su.A	T	p ?	
^{48}Ni	16570#	300#				2.3 ms 0.6	0^+	21	11Po09	TD	2p=55 13;β^+=?;β^+p=30 16; β^+3p=30 30	*
*^{48}Cl	T : average 26On.1=36.6(+2.9-2.0) 25Ze04=36.5(1.5)											**
*^{48}Ar	T : average 25Ze04=473(4) [β(t)], 485(10) [γ gated] 12We08=381(35),412(19) 04Gr20=475(40)											**
*^{48}K	J : 14Kr04,14Pa45=1											**
*^{48}K	T : average 75Mu08=6.8(0.2) 81HuZT=6.9(0.2) 78De17=6(1)											**
*^{48}K	D : %β^-n from 82Ca04=1.14(0.15)											**
*^{48}Ca	T : average 16Ar19=64(+7-6,stat)(+12-9,syst) 00Br63=42(+33-13) 96Ba80=43(+24-11,stat)(14,syst); others (evaluation): 25Pr02=60(+14-11)											**
*^{48}Ca	T : 20Ba63=53(+12-8) 0ν-$\beta\beta$: 16Ar19>1.5 Zy (90% C.L.) β^-: 26Ka.A=509(5) Ey 14Ha06=520(+170-130) Ey											**
*^{48}Sc	J : 25Ba15,67Re06=6											**
*^{48}Sc	T : average 69Ra16=43.67(0.09) 63Hi02=44.1(0.3), 43.9(0.6), 45.2(1.5) 59Po64=44.0(0.9) 45Hi04=43.4(0.5) 40Wa01=44(1); other: 63Ho17=43.2											**
*^{48}V	T : average 74Ts01=15.976(0.003) 72Em01=15.971(0.004); others: 75Al23=16.23(0.03) 66Va26=15.94(0.01) 57Va08=16.15(0.17)											**
*^{48}V	J : 78Re03,66Ca04,66Re06=4											**
*^{48}Cr	T : average 74Ts01=21.56(0.03) 79PrZU=21.55(0.15); other: 63Ho17=22.96(0.05) (discrepant)											**
*^{48}Cr^j	E : strongly fragmented state; other: 10(15) keV lower											**
*^{48}Fe	D : %β^+p average 07Do17=15.9(0.6) 16Or03=14.4(0.7); other: 96Fa09>3.6(1.1)											**
*^{48}Fe	T : others: 16Or03=51(3) 96Fa09=44(7)											**
*^{48}Ni	T : average 25Or05=1.32(+1.06-0.41) 05Do20=2.1(+2.1-0.7) 11Po09,14Po05=2.1(+1.4-0.4)											**
*^{48}Ni	D : %2p average 25Or05=60(+25-30) 11Po09=70(20) 05Do20=25(+29-19) %β^+p average 25Or05=20(+32-17) 11Po09=30(20) %β^+3p symmetrized from											**
*^{48}Ni	D : 25Or05=20(+32-17)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{49}S	20390#	580#				4# ms >400ns	1/2−#	23	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{49}Cl	740#	400#				41 ms 4	(3/2+)	08	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{49}Ar	−16974	4				248 ms 4	3/2−#	08	12We08	TD	β^-=100;β^-n=29 6;β^-2n ?	*
^{49}K	−29611.5	0.8				1.21 s 0.03	1/2+*	11			β^-=100;β^-n=86 9	*
^{49}Ca	−41299.95	0.07				8.718 m 0.006	3/2−*	08			β^-=100	*
^{49}Sc	−46562.5	2.3				57.18 m 0.13	7/2−*	08			β^-=100	*
^{49}Ti	−48564.03	0.08				STABLE	7/2−*	08			IS=5.41 2	*
^{49}V	−47962.2	0.8				330 d 15	7/2−*	08			ε=100	*
^{49}V^i	−41531	4	6432	4	RQ		7/2− T=5/2					
^{49}Cr	−45332.4	2.2				42.3 m 0.1	5/2−*	08			β^+=100	*
^{49}Cr^i	−40568	5	4764	5			(7/2)− T=3/2	08	85Fu03	E	IT=100	*
^{49}Mn	−37619.9	2.2				382 ms 7	5/2−	08			β^+=100	*
^{49}Mn^i	−32803	18	4817	18	p		(7/2−) T=3/2	08			p=100	
^{49}Fe	−24672	8				64.7 ms 0.3	(7/2−)	08	96Fa09	J	β^+=100;β^+p=56.7 4	
^{49}Co	−9720#	100#				<1.1us	7/2−#	08	25Su.A	T	p ?	
^{49}Ni	7800#	300#				7.5 ms 1.0	7/2−#	08			β^+=100;β^+p=83 13	
*^{49}Cl	T : average 26On.1=35.7(+6.2-5.0) 25Ze04=44(5)											**
*^{49}Cl	J : 21Li58=3/2+, using the momentum distribution in one-proton knockout reaction											**
*^{49}Ar	T : average 25Ze04=252(5) [β(t)], 253(12) [γ gated] 12We08=236(8)											**
*^{49}K	J : 14Kr04,14Pa45,13Pa11=1/2											**
*^{49}K	T : average 25Ze04=1.17(0.04) 82Ca04=1.26(0.05); other: 78De12=1.1(0.3)											**
*^{49}Ca	J : 15Ru02,16Ga34=3/2											**
*^{49}Sc	J : 25Ba15,22Ba15=7/2											**
*^{49}Ti	J : 62Mc05,62Wa03,61Ga16,53Je16=7/2											**
*^{49}V	J : 57We17=7/2											**
*^{49}Cr	T : other: 18Tu03=44.0(2.7) for q=24+ (bare ion)											**
*^{49}Cr	J : 70Jo27,65Sa22=5/2											**
*^{49}Cr^i	E : strongest component surrounded by several weak l=3 lines. 85Fu03 cannot confirm IAS identity and fragmentation											**
*^{49}Mn	T : average 80Ha12=384(17) 87Ha.A=381.7(7.4) 17Ku12=380(30)											**
^{50}Cl	7700#	400#				18 ms 4		19	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{50}Ar	−13168	8				134 ms 6	0+	19	12We08	TD	β^-=100;β^-n=37 7;β^-2n ?	*
^{50}K	−25728	8				471 ms 4	0−*	19	25Ze04	T	β^-=100;β^-n=28.6 24;β^-2n ?	*
^{50}K^m	−25556	8	172.0	0.4		125 ns 40	(2−)	19	10Da06	T	IT=100	
^{50}Ca	−39589.2	1.6				13.45 s 0.05	0+	19			β^-=100	
^{50}Sc	−44537.1	2.5				102.5 s 0.5	5+	19			β^-=100	
^{50}Sc^m	−44280.2	2.5	256.894	0.010		350 ms 40	2+	19	17Ga25	D	IT≈100;β^-<1	*
^{50}Ti	−51431.89	0.08				STABLE	0+	19			IS=5.18 2	
^{50}V	−49223.26	0.09				271 Py 13	6+*	19	20Da12	T	IS=0.250 10;β^+≈100;β^- ?	*
^{50}V^i	−44410.73	0.28	4812.53	0.27	RQ		0+ T=3	19				
^{50}Cr	−50261.38	0.09				STABLE >1.3Ey	0+	19			IS=4.345 13;2β^+ ?	*
^{50}Cr^i	−41836	7	8425	7	RQ		6+ T=2	19				
^{50}Cr^j	−37039	6	13222	6	RQ		0+ T=3	19				
^{50}Mn	−42626.90	0.11				283.21 ms 0.07	0+* T=1	19	06Ba33	T	β^+=100	*
^{50}Mn^m	−42401.59	0.11	225.31	0.07	MD	1.75 m 0.03	5+* T=0	19			β^+=100	
^{50}Fe	−34475.9	2.7				152.0 ms 0.6	0+	19	15Mo01	T	β^+=100;β^+p≈0	*
^{50}Fe^i	−25999	10	8477	11	RQ		(6+) T=2	19				
^{50}Co	−17590	130				38.8 ms 0.2	(6+)	19			β^+=100;β^+p=70.5 7;β^+2p ?	
^{50}Co^i	−12741	13	4850	130	2p		(0)+ T=3	19			p=100	
^{50}Ni	−3880#	200#				18.5 ms 1.2	0+	19	07Do17	TD	β^+=100;β^+p=73 6;β^+2p=14 5	*
*^{50}Cl	T : symmetrized from 26On.1=17.3(+5.0-3.9)											**
*^{50}Ar	T : average 26On.1=128.6(+13.0-12.6) 25Ze04=136(8) [β(t)], 134(10) [γ gated]; other: 12We08=106(6)											**
*^{50}K	J : 14Kr04,14Pa45=0											**
*^{50}K	D : %β^-n average 83La23=28(4) 82Ca04=29(3)											**
*^{50}K	T : average 25Ze04=467(9) 83La23=472(4) 81HuZT=470(20)											**
*^{50}Sc^m	E : from E_γ=256.894(0.010) keV in 84Al18											**
*^{50}V	T : average 20Da12=277(+20-19) 19La09=267(+16-18); 20Da12>8900 Py (β^-)											**
*^{50}V	J : 53Ki41,52Ba63=6											**
*^{50}Cr	T : 03Bi05>1.3 Ey 85No03>0.18 Ey											**
*^{50}Mn	T : average 06Ba33=283.10(0.14) 97Ko65=283.29(0.08) 76Wi08=282.72(0.26) 75Fr02=282.8(0.3) 74Ha59=284.0(0.4)											**
*^{50}Fe	T : average 15Mo01=152.1(0.6) [β(t)], 150.1(2.9) [$\beta\gamma$(t)]; others (downweighted): 17Ku12=145(13) 97Ko46=155(11)											**
*^{50}Ni	T : other: 03Ma34=12(+3-2)											**
*^{50}Ni	D : %β^+p from %Pp=86.7(3.9) and %β^+2p=14(5) in 07Do17; other %Pp: 03Ma34=70(20)											**
^{51}Cl	14290#	700#				9 ms 4	3/2+#	16	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{51}Ar	−6490#	400#				54 ms 7	(1/2−)	16	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{51}K	−22506	5				369 ms 4	3/2+*	16			β^-=100;β^-n=65 6;β^-2n ?	*
^{51}Ca	−36332.3	0.5				10.0 s 0.8	3/2−*	16			β^-=100;β^-n ?	*
^{51}Sc	−43250.4	2.5				12.4 s 0.1	(7/2)−	16			β^-=100;β^-n ?	
^{51}Ti	−49733.1	0.5				5.76 m 0.01	3/2−	16			β^-=100	
^{51}V	−52203.12	0.09				STABLE	7/2−*	16			IS=99.750 10	*
^{51}Cr	−51450.73	0.16				27.7008 d 0.0013	7/2−*	16	FGK259	T	ε=100	*
^{51}Cr^i	−44838	5	6613	5	RQ		7/2− T=5/2	16				
^{51}Mn	−48243.2	0.3				45.59 m 0.07	5/2−*	16	17Gr12	T	β^+=100	*
^{51}Mn^i	−43792.6	1.5	4450.6	1.5	RQ		7/2− T=3/2	16			IT=100	
^{51}Fe	−40189.2	1.4				305.4 ms 2.3	5/2−	16	15Sh16	T	β^+=100	*
^{51}Co	−27377	5				68.8 ms 1.9	7/2−	16	07Do17	TD	β^+=100;β^+p=1.9 11	*
^{51}Co^i	−20674	16	6703	17	p		7/2−# T=5/2		07Do17	D	p=100	
^{51}Ni	−11850#	200#				23.8 ms 0.2	7/2−#	16	07Do17	TD	β^+=100;β^+p=87.2 8;β^+2p=0.5 2	*
*^{51}Cl	T : symmetrized from 26On.1=8.2(+4.4-2.7)											**
*^{51}Ar	T : average 26On.1=48.9(+12.1-9.9) 25Ze04=56(9)											**
*^{51}Ar	J : from comparison between expt and theor (p,2p) cross sections in 21Ju02											**
*^{51}K	D : %β^-n average 06Pe16=63(8) 83La23=68(10); other: 82Ca04=47(5)											**
*^{51}K	J : 14Pa45,14Kr04,06Pe16,13Pa11=3/2											**
*^{51}K	T : average 25Ze04=372(5) 83La23=365(5); other: 81HuZT=380(30)											**
*^{51}Ca	J : 06Pe16,15Ru02,16Ga34=3/2											**
*^{51}V	J : 52Ba63,51Bl43,36Ko04=7/2											**
*^{51}Cr	J : 25La10,65Sa22,59Ch24=7/2											**
*^{51}Mn	J : 15Ba49,68Jo19,65Sa22=5/2											**
*^{51}Mn	T : others: 70E_r01=46.2(0.1) 66Gl02=46.5(0.2) 50Bu32=44.3(0.5)											**
*^{51}Fe	T : average 15Sh16=308(5) 13Su07=301(4) 87Ha.B=305(5) 84Ay01=310(5); other: 17Ku12=288(6) is ∼7σ away from the average value											**
*^{51}Co	D : %β^+p from 07Do17<3.8											**
*^{51}Ni	D : %β^+2p from 12Au08											**
^{52}Cl	22360#	700#				2# ms >400ns	1−#,2−#	21	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{52}Ar	−1380#	400#				23 ms 3	0+	21	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{52}K	−17198	6				114.4 ms 2.4	2−	15	06Pe16	TD	β^-=100;β^-n=72.2 93;β^-2n=2.3 3	*
^{52}Ca	−34266.3	0.7				4.6 s 0.3	0+	15	83La23	D	β^-=100;β^-n=1.0 6	*
^{52}Sc	−40524	3				8.2 s 0.2	3(+)	15			β^-=100;β^-n ?	
^{52}Ti	−49478.8	1.8				1.7 m 0.1	0+	15			β^-=100	
^{52}V	−51443.04	0.16				3.7400 m 0.0022	3+	15	13Za.1	T	β^-=100	*
^{52}Cr	−55419.54	0.11				STABLE	0+	15			IS=83.789 18	
^{52}Cr^i	−44154.6	0.4	11264.9	0.4			3+ T=3	15			IT=100	
^{52}Mn	−50711.41	0.13				5.591 d 0.003	6+*	15			β^+=100	*
^{52}Mn^m	−50333.66	0.13	377.749	0.005		21.1 m 0.2	2+*	15			β^+=98.22 5;IT=1.78 5	*
^{52}Mn^i	−47785	5	2926	5	RQ		0+ T=2	15			IT=100	
^{52}Fe	−48332.12	0.18				8.275 h 0.008	0+	15			β^+=100	*
^{52}Fe^m	−41374.6	0.5	6957.5	0.5	IT	45.9 s 0.6	12+	15	03Ax01	E	β^+=?;IT=0.021 5	*
^{52}Fe^i	−42677.6	0.4	5654.5	0.4			6+ T=1	15			IT=100	
^{52}Fe^j	−39775	6	8557	6	RQ		0+ frg. T=2	15				*
^{52}Co	−34348	4				111.7 ms 2.1	6+	15	16Or08	TJ	β^+=100;β^+p ?	*
^{52}Co^m	−33969	6	379	7	MD	102 ms 5	2+		16Or08	TJ	$\beta^+\approx$100;IT ?;β^+p ?	*
^{52}Co^i	−31421	6	2927	8	IT		0+ T=2		16Or03	D	IT=75 23;p=?	
^{52}Ni	−22474.8	1.7				41.8 ms 1.0	0+	15	16Or03	TD	β^+=100;β^+p=31.1 5	*
^{52}Cu	−2500#	400#					3+#		Mirror	I	p ?	
*^{52}Ar	T : average 26On.1=22.6(+3.5-3.1) 25Ze04=22(10)											**
*^{52}K	T : average 25Ze04=117(3) 06Pe16=118(6) 85Hu03=110(30) 83La23=105(5)											**
*^{52}K	J : from comparison between expt and theor. (p,2p) cross sections in 21Ju02; also 21Ko08=2											**
*^{52}Ca	D : %β^-n from 83La23<2											**
*^{52}V	T : average 13Za.1=3.734(0.003) 89Ab05=3.743(0.005) 69Wy01=3.746(0.007) 68Re04=3.73(0.01) 65Ko09=3.78(0.04) 65Bo42=3.75(0.01) 63Ma41=3.76(0.02)											**
*^{52}V	T : 54Ko07=3.77(0.01) 53Sa11=3.76(0.02)											**
*^{52}Mn	J : 70Ni11,66Ad03,61Je04,58Po59,57Hu80=6											**
*^{52}Mn^m	T : other: 95Ir01=22.7(3.0) for q=25+ (bare ion)											**
*^{52}Mn^m	J : 65Ph04,65Sa22=2											**
*^{52}Fe	T : other: 95Ir01=12.5(+1.5-1.2) for q=26+ (bare ion) 67Pa22=8.23(0.04)											**
*^{52}Fe^m	D : %IT from 05Ga20; other: 79Ge02<0.4											**
*^{52}Fe^m	E : others: 17Ne05=6960.7(0.9); ENSDF2015=6958.0(0.4) from a least-squares fit to E_γ, but uncertainty of 0.3 keV is assumed for the 465.0-keV and											**
*^{52}Fe^m	E : 597.1-keV γs, depopulating the isomer											**
*^{52}Fe^j	E : probably fragmented, unresolved doublet separated by 4 keV											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{52}$Co	T : average 17Ku12=111(4) 16Or08=112(3) 15Sh16=112(4)											**
$*^{52}$Co^m	T : average 16Or08=102(6) 13Su07=103(7)											**
$*^{52}$Ni	T : unweighted average 16Or03=42.8(0.3) 07Do17=40.8(0.2); Birge ratio=5.55; other: 94Fa06=38(5)											**
$*^{52}$Ni	D : %β^+p others: 07Do17=31.4(1.5) 94Fa06=17.0(1.4)											**
^{53}Ar	6790#	500#				8 ms 7	$5/2^-$#	11	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{53}K	−12322	6				42.8 ms 1.6	$(3/2^+)$	07	06Pe16	D	β^-=100;β^-n≈64 11;β^-2n≈10 5	*
^{53}Ca	−29390	40				550 ms 28	$(1/2^-)$	21	19Ch43	J	β^-=100;β^-n=40 10	*
^{53}Sc	−38770	18				2.4 s 0.6	$(7/2^-)$	14	10Cr02	TJ	β^-=100;β^-n ?	
^{53}Ti	−46881.4	2.9				32.7 s 0.9	$(3/2)^-$	07			β^-=100	
^{53}V	−51852	3				1.543 m 0.014	$7/2^-$	07			β^-=100	
^{53}Cr	−55287.67	0.11				STABLE	$3/2^-*$	07			IS=9.501 17	*
^{53}Mn	−54690.3	0.3				3.7 My 0.4	$7/2^-*$	07	71Ho24	T	ε=100	*
^{53}Mn^i	−47717	4	6973	4	RQ		$3/2^-$ T=5/2	07				
^{53}Fe	−50946.7	1.2				8.51 m 0.02	$7/2^-$	07	76Bo19	T	β^+=100	*
^{53}Fe^m	−47906.3	1.2	3040.4	0.3		2.540 m 0.016	$19/2^-$	07			IT=100	*
^{53}Fe^i	−46697	3	4250	3			$7/2^-$ T=3/2	07				*
^{53}Co	−42658.6	1.3				244.6 ms 2.8	$7/2^-$#	07	17Ku12	T	β^+=100	*
^{53}Co^m	−39484.3	1.2	3174.3	0.9	MD	248 ms 9	$(19/2^-)$	07	23Sa59	DT	β^+=?;p=1.33 10	*
^{53}Co^i	−38333.6	2.4	4325.0	2.0	IT		$(7/2^-)$ T=3/2	07	16Su10	ED	IT≈100;p<0.9 3	
^{53}Ni	−29614	6				55.2 ms 0.7	$(7/2^-)$	13	16Su10	D	β^+=100;β^+p=22.7 7	*
^{53}Cu	−13700#	300#				<74ns	$3/2^-$#	13	25Su.A	T	p ?	
$*^{53}$Ar	T : symmetrized from 26On.1=6.5(+8.0-5.4)											**
$*^{53}$K	J : from comparison between expt and theor (p,2p) cross sections in 20Su06											**
$*^{53}$K	T : average 26On.1=43.3(2.6) 25Ze04=42.5(2.1); other: 83La23=30(5)											**
$*^{53}$K	D : from 06Pe16: %β^-n is lower limit and %β^-2n is upper limit											**
$*^{53}$Ca	D : %β^-n 83La23=40(10) is a lower limit											**
$*^{53}$Ca	T : average 25Ze04=560(30) 10Cr02=461(90); others: 08Ma01=230(60) 83La23=90(15)											**
$*^{53}$Cr	J : 25La10,71ThZM,54Ha39,52Bo66,51Bl74=3/2											**
$*^{53}$Mn	J : 16Ba44,15Ba49,56Do45=7/2											**
$*^{53}$Fe	T : average 76Bo19=8.51(0.25) 65Eb01=8.51(0.02) 68De27=8.45(0.12) 61Ra06=8.80(0.24); other: 18Tu03=8.47(0.19) 97Ge11,95Ir01=8.5(0.3) for q=26$^+$											**
$*^{53}$Fe	T : (bare ion)											**
$*^{53}$Fe^m	T : average 68De27=2.51(0.02) 67Es06=2.58(0.03) 74FiZI=2.65(0.06). other: 97Ge11,95Ir01=2.48(0.05) for q=26$^+$ (bare ion)											**
$*^{53}$Fe^i	E : from 79Su01=4250(3); others: 68Tr01=4256(15) 72Oh05=4235(20)(same group)											**
$*^{53}$Co	T : average 17Ku12=245(3) 02Lo13=240(9) 89Ho13=240(20) 73Ko10=262(25); values may contain small contribution from ^{53m}Co decay											**
$*^{53}$Co^m	D : %p from 23Sa59=1.3(0.1) to 0^+ and 0.025(0.004) to 2^+ in ^{52}Fe; other: 72Ce01∼1.5											**
$*^{53}$Co^m	T : average 23Sa59=239(21) 15Sh16=237(48) 76Vi02=260(20) 72Ce01=247(12)											**
$*^{53}$Ni	D : %β^+p average 16Su10=22(1) 07Do17=23.4(1.0); other: 76Vi02∼45											**
^{54}Ar	12560#	500#				5# ms >400ns	0^+	23	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{54}K	−5414	13				13.3 ms 0.6	2^-#	14	26On.1	TD	β^-=100;β^-n=?;β^-2n ?	*
^{54}Ca	−25119	12				110 ms 6	0^+	14	25Ze04	T	β^-=100;β^-n ?;β^-2n ?	*
^{54}Sc	−34439	18				526 ms 15	$(3)^+$	14			β^-=100;β^-n=16 9	
^{54}Sc^m	−34328	18	110.6	0.3		2.764 μs 0.017	(4^+)	14	25Og04	TJ	IT=100	*
^{54}Ti	−45742	14				2.1 s 1.0	0^+	14			β^-=100	
^{54}V	−49899	8				49.8 s 0.5	3^+	14			β^-=100	
^{54}V^m	−49791	8	108.0	1.0		900 ns 500	$(5)^+$	14			IT=100	
^{54}Cr	−56935.48	0.13				STABLE	0^+	14			IS=2.365 7	
^{54}Mn	−55558.3	1.0				312.081 d 0.032	3^+*	14	FGK204	T	ε=100;β^-=0.93e-4; e$^+$=1.28e-7 25	*
^{54}Mn^i	−49412.0	2.8	6146.3	3.0	RQ		0^+ T=3					
^{54}Fe	−56254.0	0.4				STABLE	0^+	14			IS=5.845 105;2β^+ ?	
^{54}Fe^m	−49726.9	1.2	6527.1	1.1		363.3 ns 3.5	10^+	14	23Bo25	T	IT=100	*
^{54}Fe^j	−41387	20	14867	20	RQ		0^+ T=3	14				
^{54}Co	−48009.4	0.4				193.27 ms 0.06	0^+ T=1	14	97Ko65	T	β^+=100	*
^{54}Co^m	−47811.8	0.4	197.57	0.10	IT	1.48 m 0.02	7^+ T=0	14			β^+=100	
^{54}Ni	−39283.6	2.3				114.1 ms 0.3	0^+	14	17Ku12	T	β^+=100;β^+p ?	*
^{54}Ni^m	−32826.2	2.5	6457.4	0.9		154.5 ns 2.7	10^+	14	21Gi18	DT	IT=50.5 23;p=49.5 23;2p<0.001	*
^{54}Cu	−21740#	200#				<31ns	3^+#	14	25Su.A	T	p ?	
^{54}Zn	−6417	20				1.5 ms 0.4	0^+	14	11As08	TD	2p=87 7;p ?	*
$*^{54}$K	T : from 26On.1=13.3(0.6); others: 25Ze04=11.6(2.1) 83La23=10(5)											**
$*^{54}$K	D : β^-n has been observed by 83La23 but not quantified											**
$*^{54}$Ca	T : average 25Ze04=112(12) [β(t)], 110(7) [$\beta\gamma$(t)] 10Cr02=107(14); other: 08Ma01=86(7)											**
$*^{54}$Sc^m	E : average 12Ka36=110.7(0.5) 98Gr14=110.5(0.3)											**
$*^{54}$Sc^m	T : average 25Og04=2.75(0.03) 12Ka36=2.78(+0.31-0.26) 10Cr02=2.77(0.02); other: 98Gr14=7(5)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{54}$Mn	D : %e$^+$ average 98Wu01=1.20(0.26)e-7 97Za07=2.2(0.9)e-7											**
$*^{54}$Fe^m	T : average 23Bo25=363(4) 78Da09=364(7); other: 78BoZT=358(31)											**
$*^{54}$Co	T : average 97Ko65=193.28(0.07) 74Ha59=193.4(0.4) 74Ho21=193.0(0.3) 77Al11=193.28(0.18); other (downweighted): 02Lo13=172(23)											**
$*^{54}$Ni	T : average 17Ku12=110(2) 15Mo01=114.2(0.3),114.3(1.8) 13Su07=113(9) 08Fu04=114(5) 02Lo13=103(9) 99Re06=106(12)											**
$*^{54}$Ni^m	T : average 21Gi18=156.6(3.6) 08Ru09=152(4)											**
$*^{54}$Ni^m	D : same in 22Ru03											**
$*^{54}$Zn	T : average 25Ku.B=1.08(+0.68-0.37) 11As08=1.59(+0.60-0.35); other: 05Bl15=3.2(+1.8-0.8)											**
$*^{54}$Zn	D : %2p average 11As08=92(+6-13) 05Bl15=87(+10-17)											**
^{55}K	300#	500#				6.5 ms	0.6	(3/2$^+$)	22	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{55}Ca	−18650	160				21.9 ms	0.7	(5/2$^-$)	22	22Ko06	J	β^-=100;β^-n ?;β^-2n ?	*
^{55}Sc	−30833	22				96.6 ms	1.8	(7/2)$^-$	22	10Cr02	TJD	β^-=100;β^-n=17 7;β^-2n ?	*
^{55}Ti	−41826	5				1.33 s	0.10	(1/2)$^-$	22	03Ma56	T	β^-=100;β^-n ?	*
^{55}V	−49138	7				6.54 s	0.15	7/2$^-$#	22	77Na17	T	β^-=100	
^{55}Cr	−55110.42	0.23				3.497 m	0.003	3/2$^-$	07			β^-=100	
^{55}Mn	−57711.8	0.3				STABLE		5/2$^-$*	07			IS=100	*
^{55}Fe	−57480.7	0.4				2.7562 y	0.0004	3/2$^-$	07	FGK259	T	ε=100	
^{55}Fe^i	−49847	6	7633	6	RQ			5/2$^-$ T=5/2	07				
^{55}Co	−54029.4	0.4				17.53 h	0.03	7/2$^-$*	07			β^+=100	*
^{55}Co^i	−49308.0	0.4	4721.44	0.10				3/2$^-$ frg. T=3/2	07			IT=100	*
^{55}Ni	−45335.3	0.7				203.9 ms	1.3	7/2$^-$	22	17Ku12	T	β^+=100	*
^{55}Ni^i	−40736.3	1.2	4599	1				7/2$^-$ frg. T=3/2	13Tr09		E		*
^{55}Cu	−31807	25				55.9 ms	1.5	3/2$^-$#	22	20Gi02	T	β^+=100;β^+p=4.3 6	*
^{55}Zn	−14810#	200#				18.9 ms	0.9	5/2$^-$#	22	25Ku.B	TD	β^+=100;β^+p=88.7 21;β^+2p=6.4 14	*
$*^{55}$K	T : average 26On.1=6.4(+0.7-0.6) 25Ze04=7(3)												**
$*^{55}$K	J : from comparison between expt and theor (p,2p) cross sections in 22Ko06												**
$*^{55}$Ca	T : average 25Ze04=22.8(1.8) 26On.1=21.5(+1.0-0.8) 08Ma01=22(2)												**
$*^{55}$Sc	T : average 25Ze04=95(5) 10Cr02=96(2) 04Li75=115(15) 02Sh43=103(7) 98So03=120(40)												**
$*^{55}$Ti	T : from 03Ma56=1.32(0.10),1.34(0.10) [$\beta\gamma$(t)]; others: 03Ma56=1.2(0.4) [β(t)] 98Am04=0.32(0.06) 96Do23=0.60(0.04) 95So.A=0.545(0.095)												**
$*^{55}$Ti	J : from L(n)=1 in 09Ma16												**
$*^{55}$Mn	J : 16Ba44,15Ba49,15He28,79De19,57Wo46,54Ja16=5/2; also: 51Bl30,30Wh01=5/2												**
$*^{55}$Co	J : 73Ca06=7/2												**
$*^{55}$Co^i	E : strongly fragmented state, other 26.69(0.15) keV higher												**
$*^{55}$Ni	T : average 17Ku12=203(2) 02Lo13=196(5) 99Re06,97Wo06=204(3) 87Ha.A=212.1(3.8) 84Ay01=208(5) 77Ho25=189(5) 76Ed.A=219(6)												**
$*^{55}$Ni	J : l=3 in 14Sa46												**
$*^{55}$Ni^i	E : strongly fragmented state, other 20 keV lower												**
$*^{55}$Cu	T : average 20Gi02=55.5(1.8) 13Tr09=57(3); others: 25Ku.B=44(+18-10) 07Do17=27(8), conflicting												**
$*^{55}$Cu	D : %β^+p from 25Ku.B=4.3(0.6); other: 07Do17=15.0(4.3), probably a contaminant given the short and conflicting half-life; not confirmed in 13Tr09												**
$*^{55}$Cu	D : and 20Gi02												**
$*^{55}$Zn	T : average 25Ku.B=17.9(+1.3-1.1) 07Do17=19.8(1.3)												**
$*^{55}$Zn	D : %β^+p average 25Ku.B=84.6(2.3) 07Do17=91.0(5.1); %β^+2p from 25Ku.B												**
^{56}K	7980#	400#				5# ms	>620ns	2$^-$#	22	09Ta24	I	β^- ?;β^-n ?;β^-2n ?	
^{56}Ca	−13510	250				12.7 ms	0.6	0$^+$	23	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	
^{56}Sc	−25520	260			*	34.0 ms	2.3	(1$^+$)	22	10Cr02	JT	β^-=100;β^-n=6 3;β^-2n ?	*
^{56}Sc^m	−25520#	280#	0#	100#	*	75 ms	6	(6$^+$,5$^+$)	22	10Cr02	JTD	β^-=100;β^-n>12;β^-2n ?	
^{56}Sc^n	−24750	260	775.0	0.1		290 ns	17	(4$^+$)	22	20Mi13	TE	IT=100	*
^{56}Ti	−39406	7				200 ms	5	0$^+$	22	03Ma56	T	β^-=100;β^-n ?	*
^{56}V	−46261	6				216 ms	4	1$^+$	22	03Ma02	T	β^-=100;β^-n ?	*
^{56}Cr	−55284.5	0.6				5.94 m	0.10	0$^+$	22	60Dr03	TD	β^-=100	
^{56}Mn	−56911.0	0.4				2.5789 h	0.0001	3$^+$*	09			β^-=100	*
^{56}Fe	−60606.6	0.3				STABLE		0$^+$	09			IS=91.754 106	
^{56}Fe^i	−49102.9	0.4	11503.7	0.3				3$^+$ T=3	09				
^{56}Co	−56039.9	0.5				77.236 d	0.026	4$^+$*	09			β^+=100	*
^{56}Co^i	−52447	9	3593	9	RQ			(0$^+$) frg. T=2	09				*
^{56}Ni	−53907.1	0.4				6.075 d	0.010	0$^+$	09			β^+=100	
^{56}Ni^p	−44171.6	1.9	9735.5	1.9				7				p≈100	
^{56}Ni^i	−47475.2	0.8	6431.9	0.7				4$^+$ T=1	09				
^{56}Ni^j	−43963	4	9944	4	RQ			0$^+$ frg. T=2					*
^{56}Cu	−38626	4				80.8 ms	0.6	(4$^+$)	22	01Bo54	TJD	β^+=100;β^+p=0.40 12	*
^{56}Cu^i	−35098	10	3528	11	p			0$^+$ T=2		16Or03	D	IT=51 6;p=49 6	
^{56}Zn	−25630#	200#				32.0 ms	0.7	0$^+$	22	25Ku.B	TD	β^+=100;β^+p=83.2 16	*
^{56}Zn^i	−21770#	550#	3860#	510#				3$^+$# T=3				p ?	
^{56}Ga	−4890#	300#						3$^+$#				p ?	
$*^{56}$Ca	T : average 25Ze04=12.4(1.9) 26On.1=12.9(+0.7-0.6) 08Ma01=11(2)												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{56}$Sc	T : average 25Ze04=36.1(2.7) [β(t)], 32(6) [γ gated] 10Cr02=26(6); other: 23He.A=43(4),43(1) for gs+m											**
$*^{56}$Sc	D : %β^-n from 23He.A=6(3) for gs+m											**
$*^{56}$Sc^n	T : average 20Mi13=290(20) 10Cr02=290(30); other: 12Ka36=350(+260-120)											**
$*^{56}$Ti	T : others: 98Am04=190(40) 96Do23=150(30)											**
$*^{56}$V	T : others: 98Am04=240(40) 98So03=230(25) 95Am.A=300(30)											**
$*^{56}$Mn	J : 61Ch05,60Ba06=3											**
$*^{56}$Co	J : 56Ba69,56Jo06=4											**
$*^{56}$Co^i	E : strongly fragmented state, other 70(9) keV lower											**
$*^{56}$Ni^j	E : strongly fragmented state; others: 68(6) and 98(6) keV higher											**
$*^{56}$Cu	T : average 20Gi02=80.2(0.7) 17Ku12=80(2) 02Lo13=82(9) 01Bo54=93(3) 98Ra15=78(15)											**
$*^{56}$Zn	T : average 25Ku.B=28.2(2.2) 14Or04=32.9(0.8) 07Do17=30.0(1.7)											**
$*^{56}$Zn	D : %β^+p average 25Ku.B=78.9(2.2) 14Or04=88.5(2.6) 07Do17=86.0(4.9)											**
^{57}K	14130#	500#				2# ms	>400ns	$3/2^+$#	23	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{57}Ca	−6560#	400#				6.3 ms	0.6	$(5/2^-)$	10	22Ko06	J	β^-=100;β^-n ?;β^-2n ?	*
^{57}Sc	−21380	180				18.66 ms	0.28	$7/2^-$#	10	26On.1	TD	β^-=100;β^-n=12 4;β^-2n ?	*
^{57}Ti	−34400	210				94.0 ms	1.0	$5/2^-$#	10	23He.A	TD	β^-=100;β^-n=2.5 14	*
^{57}V	−44380	7				350 ms	10	$(7/2^-)$	10	03Ma02	T	β^-=100;β^-n ?	*
^{57}Cr	−52524.9	1.8				21.1 s	1.0	$(3/2)^-$	10			β^-=100	
^{57}Mn	−57486.2	1.5				85.4 s	1.8	$5/2^-*$	98			β^-=100	*
^{57}Fe	−60181.4	0.3				STABLE		$1/2^-*$	98			IS=2.119 29	*
^{57}Co	−59345.1	0.5				271.81 d	0.05	$7/2^-*$	98	FGK259	T	ε=100	*
^{57}Co^i	−52091.7	0.5	7253.3	0.6	RQ			$1/2^-$ T=5/2		MMC120J			
^{57}Ni	−56083.4	0.6				35.60 h	0.06	$3/2^-$	98			β^+=100	
^{57}Ni^i	−50844.6	0.9	5238.8	0.7				$7/2^-$ frg. T=3/2	98				*
^{57}Cu	−47308.4	0.5				196.4 ms	0.7	$3/2^-*$	98	17Ku12	T	β^+=100	*
^{57}Cu^i	−42009	25	5299	25	p			$7/2^-$ T=3/2					
^{57}Zn	−32690#	100#				43.8 ms	0.6	$7/2^-$#	98	22Sa20	TD	β^+=100;β^+p=84.7 14	*
^{57}Ga	−16090#	300#						$1/2^-$#				p ?	
$*^{57}$Ca	T : average 25Ze04=11(6) 26On.1=6.1(+0.7-0.5)											**
$*^{57}$Sc	T : average 25Ze04=23.1(2.5) [β(t)], 20.7(2.1) [γ gated] 26On.1=18.3(0.3) 23He.A=21(2),20(1) 10Cr02=22(2); other: 03So21=13(4)											**
$*^{57}$Sc	D : %β^-n from 23He.A=12(4)											**
$*^{57}$Ti	T : average 23He.A=95(7),94(1) 05Li53=98(5) 99So20=67(25) 96Do23=56(20); other: 98Am04=180(30), conflicting (not used)											**
$*^{57}$Ti	D : %β^-n from 23He.A<5											**
$*^{57}$V	J : 05Li53=7/2$^-$; others: 98So03,03Ma02=3/2$^-$											**
$*^{57}$V	T : others: 98Am04=340(80) 98So03=323(30)											**
$*^{57}$Mn	J : 16Ba44,15Ba49=5/2											**
$*^{57}$Fe	J : 58Lu64,57Ga16=1/2											**
$*^{57}$Co	J : 72Ni01,56Ba69=7/2											**
$*^{57}$Ni^i	E : strongly fragmented state; others: 98(7) keV lower 128(7) keV higher in 79Ik04 and 104(5) keV lower, 129(5) keV higher in 78Na11											**
$*^{57}$Cu	T : average 17Ku12=195(4) 02Lo13=183(17) 96Se01=196.3(0.7) 87Ha.A=199.4(3.2) 84Sh28=223(16)											**
$*^{57}$Cu	J : 10Co01=3/2											**
$*^{57}$Zn	T : average 22Sa20=43.6(0.2) 20Gi02=45.7(0.6); others (downweighted): 20Ci04=27(3) 07Bl09=48(3) 02Lo13=37(5) 76Vi02=40(10)											**
$*^{57}$Zn	D : %β^+p others: 20Ci04=90(10) 07Bl09=78(17)											**
^{58}K	21930#	600#				2# ms	>400ns	2^-#				β^- ?;β^-n ?;β^-2n ?	
^{58}Ca	−1530#	500#				5 ms	3	0^+	23	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{58}Sc	−15480	190				10.1 ms	0.1	3^+#	10	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{58}Sc^m	−15070	190	412.5	0.3		1.19 ms	0.24			21Wi05	ET	IT=100	*
^{58}Sc^n	−14900	190	580.0	0.5		0.78 ms	0.21			21Wi05	ET	IT=100	*
^{58}Sc^p	−14060	190	1420.7	2.2		0.60 μs	0.13			20Mi13	ET	IT=100	*
^{58}Ti	−31442	4				52.6 ms	0.9	0^+	14	26On.1	T	β^-=100;β^-n=1.5 9	*
^{58}V	−40306	6				191 ms	10	(1^+)	10			β^-=100;β^-n ?	
^{58}Cr	−51995.3	2.4				7.0 s	0.3	0^+	10			β^-=100	
^{58}Mn	−55827.8	2.5				3.0 s	0.1	1^+*	10	15He28	J	β^-=100	
^{58}Mn^m	−55756.0	2.5	71.77	0.05		65.4 s	0.5	4^+*	10	15He28	J	$\beta^-\approx$100;IT ?	
^{58}Fe	−62154.7	0.4				STABLE		0^+	10			IS=0.282 12	
^{58}Co	−59846.7	1.2				70.82 d	0.03	2^+*	15	FGK259	T	β^+=100;ε=85.21 24;e$^+$=14.79 24	*
^{58}Co^m	−59821.8	1.2	24.95	0.06		8.853 h	0.023	5^+	15	19Mo11	TD	IT=99.99880 5;ε=0.00120 5	
^{58}Co^n	−59793.6	1.2	53.15	0.07		10.5 μs	0.3	4^+	15			IT=100	
^{58}Co^i	−54094	8	5752	8	RQ			0^+ frg. T=3	15				*
^{58}Ni	−60228.3	0.4				STABLE	>700Ey	0^+	10	93Va19	T	IS=68.0769 190;2β^+ ?	
^{58}Ni^i	−51400	40	8830	40	RQ			2^+ T=2	10				
^{58}Ni^j	−45690	7	14539	7	RQ			0^+ T=3	10	MMC12	J		
^{58}Cu	−51667.3	0.6				3.204 s	0.007	1^+* T=0	10			β^+=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{58}Cu^{i}	−51464.3	0.6	202.99	0.24			0^+ T=1	10				
^{58}Zn	−42265	29				86.0 ms 1.9	0^+	14	20Ci04	D	β^+=100;β^+p=0.7 1	*
^{58}Ga	−24050#	200#			*	<32ns	2^+#		25Su.A	T	p ?	
^{58}Ge	−8580#	300#				5# ms	0^+		Mirror	I	p ?	
*^{58}Ca	T : symmetrized 26On.1=5.2(+2.9-2.5)											**
*^{58}Sc	T : average 25Ze04=13.0(1.2) 26On.1=10.1(0.1); others: 05Ga01,03So21=12(5)											**
*^{58}Sc^{m}	T : from τ=1.71(0.35) in 21Wi05											**
*^{58}Sc^{n}	T : from τ=1.12(0.30) in 21Wi05											**
*^{58}Sc^{p}	T : average 20Mi13=0.6(0.2) 1.3(0.8) 0.9(0.5) 0.5(0.2) from γ(t)											**
*^{58}Sc^{p}	E : 20Mi13=180.5(0.6),247(2),412.3(0.6),580.9(0.4) keV γs in a cascade											**
*^{58}Ti	T : average 25Ze04=54(6) [β(t)], 57(13) [$\beta\gamma$(t)] 26On.1=57.7(+4.9-3.8) 23He.A=53(2),52(1) 11Da08=57(10) 03So21=59(9), supersedes											**
*^{58}Ti	T : 99So20=47(10)											**
*^{58}Ti	D : %β^-n from 23He.A<3											**
*^{58}Co	J : 57Do38=2											**
*^{58}Co	D : from 71GoYM											**
*^{58}Co^{i}	E : strongly fragmented state, other 20(8) keV lower											**
*^{58}Cu	J : 11Vi03,10Co01=1											**
*^{58}Zn	T : average 17Ku12=86(2) 09Fu15=90(8) 05Ka46=83(10) 02Lo13=83(10) 98Jo18=86(18)											**
^{59}K	28750#	700#				1# ms >400ns	$3/2^+$#	23	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{59}Ca	5810#	600#				5# ms >400ns	$5/2^-$#	23	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{59}Sc	−10830	250				7.68 ms 0.24	$7/2^-$#	18	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{59}Ti	−25880#	300#				29.1 ms 0.7	$5/2^-$#	18	26On.1	T	β^-=100;β^-n=4 2;β^-2n ?	*
^{59}Ti^{m}	−25770#	300#	108.5	0.5		615 ns 11	$1/2^-$#	18	19Wi04	TJE	IT=100	*
^{59}V	−37801.8	2.9				92.5 ms 1.3	$(5/2^-)$	18	23He.A	TD	β^-=100;β^-n=3 2	*
^{59}Cr	−48115.9	0.7				1050 ms 90	$(1/2^-)$	18	05Li53	TJ	β^-=100	*
^{59}Cr^{m}	−47613.2	1.3	502.7	1.1		96 μs 20	$(9/2^+)$	18			IT=100	
^{59}Mn	−55525.3	2.2				4.59 s 0.05	$5/2^-$*	18			β^-=100	*
^{59}Fe	−60664.4	0.4				44.500 d 0.013	$3/2^-$*	18	FGK259	T	β^-=100	*
^{59}Co	−62229.3	0.4				STABLE	$7/2^-$*	18			IS=100	*
^{59}Ni	−61156.3	0.4				80 ky 5	$3/2^-$*	18	24Mu06	J	β^+=100	*
^{59}Ni^{i}	−53814.3	2.1	7341.9	2.1	RQ		$7/2^-$ frg. T=5/2					*
^{59}Cu	−56357.9	0.5				81.5 s 0.5	$3/2^-$*	18			β^+=100	*
^{59}Cu^{i}	−52472.4	2.2	3885.5	2.1			$3/2^-$ frg. T=3/2	18			IT=100	*
^{59}Zn	−47215.1	0.8				182.4 ms 0.4	$3/2^-$	18	21Or01	T	β^+=100;β^+p=0.10 2	*
^{59}Ga	−33960#	100#				<43ns	$3/2^-$#	18	05St29	T	p ?	
^{59}Ge	−16850#	400#				13.3 ms 1.7	$7/2^-$#	18	20Gi02	TD	$\beta^+\approx$100;β^+p=93 7;2p<0.2	*
*^{59}Sc	T : average 25Ze04=8.9(0.8) 26On.1=7.5(+0.3-0.2)											**
*^{59}Ti	T : average 25Ze04=34.4(2.8) 26On.1=32.8(+1.5-1.2) 23He.A=31(2),26(1) 11Da08=27.5(2.5) 03So21=30(3), supersedes 99So20=58(17)											**
*^{59}Ti	D : %β^-n from 23He.A=4(2)											**
*^{59}Ti^{m}	T : average 20Mi13=610(20) 19Wi04=618(13) 12Ka36=587(+57-51); other: 05Ga01=590(130)											**
*^{59}Ti^{m}	E : other: 20Mi13=108.9(0.4)											**
*^{59}V	T : average 23He.A=82(5),91(2) 05Li53=97(2) 99So20=75(7), supersedes 98So03=70(40); other: 98Am04=130(20), conflicting (not used)											**
*^{59}V	D : %β^-n from 23He.A=3(2); other: 05Li53>3											**
*^{59}Cr	T : others: 96Do23=460(50), 88Bo06=600(300), 85Bo49=1000(400)											**
*^{59}Mn	J : 16Ba44,15Ba49=5/2											**
*^{59}Fe	J : 70Ts04,65Do11=3/2											**
*^{59}Co	J : 23Ko31,35Ko05,51Bl38,35Mo07=7/2											**
*^{59}Ni	T : average 94Ru19=108(13) 81Ni08=76(5); other: 94Ru19(meteorite)=120(22)											**
*^{59}Ni	J : 24Mu06=3/2											**
*^{59}Ni^{i}	E : strongest fragmented state; others: 40.1(0.3) keV higher, 17.7(0.3) keV higher and 36.3(0.2) keV lower											**
*^{59}Cu	J : 11Vi03,11Ko36,10Co01=3/2											**
*^{59}Cu^{i}	E : strongest fragmented state, other 21(6) keV higher											**
*^{59}Zn	T : others: 17Ku12=174(2) 14Ro14=210(34) 02Lo13=173(14) 84Ar12=182.2(1.8) 81Ho19=210(20)											**
*^{59}Ge	T : other: 16Go26 (same as 20Gi02)											**
*^{59}Ge	D : 2p not observed in 20Gi02 and 16Go26; limit from 16Go26 based on the assumption that one event is not β^+p											**
^{60}Ca	11000#	700#				2# ms >400ns	0^+	23	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{60}Sc	−4550#	300#				6.4 ms 0.7	3^+#	12	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{60}Ti	−22100	240				22.3 ms 0.4	0^+	14	26On.1	T	β^-=100;β^-n=10 6;β^-2n ?	*
^{60}V	−33060	170			*	135 ms 16	3^+#	12	23He.A	TD	β^-=100;β^-n=8 2;β^-2n ?	*
^{60}V^{m}	−33000#	180#	60#	50#	*	40 ms 15	1^+#	12	03So21	TD	β^-=?;IT ?;β^-n=8 2;β^-2n ?	*
^{60}V^{n}	−32960	170	103.2	0.1		203 ns 4	4^+#	12	21Wi05	ET	IT=100	*
^{60}Cr	−46908.5	1.1				490 ms 10	0^+	12			β^-=100;β^-n ?	
^{60}Mn	−52968.0	2.3				280 ms 20	1^+*	12	15He28	J	β^-=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{60}Mn^m	−52696.1	2.3	271.90	0.10		1.77 s 0.02	4^+*	12	15He28	J	β^-=88.5 8;IT=11.5 8	*
^{60}Fe	−61413	3				2.60 My0.05	0^+	12	26Ru03	T	β^-=100	*
^{60}Co	−61649.9	0.4				5.2713 y 0.0008	5^+*	12	FGK259	T	β^-=100	*
^{60}Co^m	−61591.3	0.4	58.59	0.01		10.467 m 0.006	2^+*	12			IT=99.75 3;β^-=0.25 3	*
^{60}Ni	−64472.7	0.4				STABLE	0^+	13			IS=26.2231 150	
^{60}Ni^i	−53346	4	11126	4	RQ		5^+ T=3					
^{60}Cu	−58344.7	1.6				23.7 m 0.4	2^+*	12	11Vi03	J	β^+=100	*
^{60}Cu^i	−55804	5	2541	5			(0^+) T=2	12	77Ba50	E	IT=100	
^{60}Zn	−54173.9	0.6				2.38 m 0.05	0^+	12			β^+=100	
^{60}Zn^i	−49321.9	0.6	4852.0	0.2			(2^+) T=1	12	21Or01	E	IT=100	*
^{60}Zn^j	−46806	24	7367	24	RQ		0^+ T=2	12				
^{60}Ga	−40015	13				69.44 ms 0.20	(2^+)	12	25Ow01	T	β^+=100;β^+p=1.6 7;$\beta^+\alpha$<0.023 20	*
^{60}Ga^i	−37404	13	2611.8	0.9			T=2		21Or01	E		*
^{60}Ge	−27730#	200#				25.0 ms 0.3	0^+	12	21Or01	TD	β^+=100;β^+p=67 3;β^+2p=7 4	*
^{60}As	−6850#	200#					5^+#		Mirror	I	p ?	
*^{60}Sc	T : average 25Ze04=8(3) 26On.1=6.2(+0.8-0.7)											**
*^{60}Ti	T : average 25Ze04=22.6(0.8) 26On.1=22.3(0.6) 23He.A=21(4),20(2) 11Da08=22.4(2.5) 03So21=22(2)											**
*^{60}Ti	D : %β^-n from 23He.A<19											**
*^{60}V	T : average 99So20=122(18) 98Am04=200(40); others: 23He.A=69(3),77(1) 03So21=68.0(4.5), include both gs+m											**
*^{60}V	D : %β^-n from 23He.A=8(2), includes both gs+m											**
*^{60}V^m	T : using β-decay data of ^{60}Ti (J^π=0^+) in 03So21											**
*^{60}V^m	D : %β^-n from 23He.A=8(2), include both gs+m											**
*^{60}V^n	E : 103.2(0.1) and 99.1(0.1) keV in parallel to gs; at variance with 12Ka36											**
*^{60}V^n	T : average τ=294(6),292(9) in 21Wi05; others: 12Ka36=229(+25-23) 10Da06=320(90) 99Da.A=320(90)											**
*^{60}Mn^m	I : other isomer T=1.0(+0.3-0.2) μs decays by 114 keV g-ray (not placed)											**
*^{60}Fe	T : average 26Ru03=2.61(0.05), supersedes 09Ru08=2.62(0.04), 17Os02=2.69(0.28) 15Wa06=2.50(0.12); others: 84Ku28=1.49(0.27) 57Ro54=0.3											**
*^{60}Co	J : 72Ni01,56Do08,55Wh42,55Po17,54Bl07=5											**
*^{60}Co^m	J : 69HuZY,68Ro08=2											**
*^{60}Cu	J : 11Vi03,58Re10=2											**
*^{60}Zn^i	E : uncertainty estimated by NUBASE; 4851.99(0.05) keV using E_γ in 21Or01											**
*^{60}Ga	T : average 25Ow01=57.7(9.8) 21Or01=69.4(0.2) 20Gi02=70.8(2.0) 17Ku12=76(3) 02Lo13=70(13) 01Ma96=70(15)											**
*^{60}Ga^i	E : from 1775-keV and 837-keV γ rays in a cascade											**
*^{60}Ge	T : other: 16Ci01=20(+7-5)											**
*^{60}Ge	D : %β^+2p from 16Ci01<14											**
^{61}Ca	19010#	800#				1# ms	$1/2^-$#				β^- ?;β^-n ?;β^-2n ?	
^{61}Sc	500#	400#				3.2 ms 2.3	$7/2^-$#	19	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{61}Ti	−16180	450				15.2 ms 0.3	$1/2^-$#	19	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{61}Ti^m	−16060	450	125.0	0.5		200 ns 28	$5/2^-$#	19	19Wi04	TEJ	IT=100	*
^{61}Ti^n	−15480	450	700.1	0.7		354 ns 69	$9/2^+$#	19	19Wi04	TEJ	IT=100	*
^{61}V	−30180	230				47.4 ms 0.5	$(3/2^-)$	19	23He.A	TD	β^-=100;β^-n=15.0 17;β^-2n ?	*
^{61}Cr	−42496.5	1.9				243 ms 9	$1/2^-$*	19	09Cr02	T	β^-=100;β^-n ?	*
^{61}Mn	−51742.1	2.3				709 ms 8	$5/2^-$*	19			β^-=100;β^-n ?	*
^{61}Fe	−58920.5	2.6				5.98 m 0.06	$(3/2^-)$	15			β^-=100	
^{61}Fe^m	−58058.8	2.6	861.67	0.11		238 ns 5	$9/2^+$	15			IT=100	
^{61}Co	−62897.7	0.8				1.649 h 0.005	$7/2^-$	15			β^-=100	
^{61}Ni	−64221.5	0.4				STABLE	$3/2^-$*	20			IS=1.1399 13	*
^{61}Cu	−61983.8	1.0				3.344 h 0.011	$3/2^-$*	15	19Gy04	T	β^+=100;e$^+$=51 4;ε=?	*
^{61}Cu^i	−55610	7	6374	7	RQ		$3/2^-$ frg. T=5/2					*
^{61}Zn	−56355.9	1.1				89.1 s 0.2	$3/2^-$	15			β^+=100	
^{61}Zn^i	−53200#	100#	3160#	100#			$3/2^-$# T=3/2					
^{61}Zn^j	−46370	70	9990	70			$3/2^-$ T=5/2	15				
^{61}Ga	−47127	11				165.9 ms 2.5	$3/2^-$	15	17Ku12	T	β^+=100;β^+p=0.13 7	*
^{61}Ga^i	−43770	30	3350	30	p		$(3/2^-)$ T=3/2	15			p=100	
^{61}Ge	−34030#	100#				40.7 ms 0.4	$3/2^-$#	15	20Gi02	TD	β^+=100;β^+p=87 3	
^{61}As	−17980#	200#					$3/2^-$#		Mirror	I	p ?	
*^{61}Sc	T : symmetrized from 26On.1=2.8(+2.6-2.0)											**
*^{61}Ti	T : average 25Ze04=16.3(1.7) 26On.1=15.1(+0.3-0.2); others: 11Da08,02Ma.A=15(4)											**
*^{61}Ti^m	E : other: 20Mi13=125.2(0.6)											**
*^{61}Ti^m	T : other: 20Mi13=300(100)											**
*^{61}Ti^n	E : other: 20Mi13=701.3(0.7)											**
*^{61}Ti^n	T : other: 20Mi13=200(100)											**
*^{61}V	T : average 23He.A=46(2),46(1) 20On01=48(1) 14Su07=49(1) 11Da08=52.6(4.2) 05Ga01=47(1) 03So02=47.0(1.2), supersedes 99So20=43(7)											**
*^{61}V	D : %β^-n: average 23He.A=16(3) 18On.A=14.5(2.0), supersedes 20On01=15(+3-2) (misprint); other: 03So02∼6											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{61}$Cr	J : 25La10=1/2											**
$*^{61}$Cr	T : average 09Cr02=233(11) 99So20=251(22) 98Am04=270(20)											**
$*^{61}$Mn	D : β^-n observed by 99Ha05; 13Ra17 quotes $\%\beta^-$n=0.6(0.1) (unpublished)											**
$*^{61}$Mn	J : 16Ba44,15Ba49=5/2											**
$*^{61}$Ni	J : 58Wo52=3/2											**
$*^{61}$Cu	T : average 19 Gy04=3.321(0.025) 15Cv01=3.323(0.010) 06Ab30=3.36(0.06) 82Gr10=3.333 (0.005) 72Cr02=3.37(0.02) 73Ne02=3.39(0.04)											**
$*^{61}$Cu	T : 69Ri04=3.408(0.010) 54Be84=3.32(0.03); Birge ratio 2.79											**
$*^{61}$Cu	J : 24Mu06,10Vi07,58Re10,57Ni09=3/2											**
$*^{61}$Cu	D : $\%\varepsilon^+$ from 56Nu02											**
$*^{61}$Cu^i	E : strongly fragmented state, other 18(7) keV higher											**
$*^{61}$Ga	T : average 17Ku12=163(5) 14Ro14=162(10) 02We07=168(3) 02Lo13=148(19) 99Oi01=140(70) 93Wi18=150(30)											**
$*^{61}$Ga	D : $\%\beta^+$p from 02We07<0.25											**
^{62}Sc	7310#	390#				2# ms	>400ns		23	18Ta17	I	β^- ?;β^-n ?;β^-2n ?	
^{62}Ti	−12200#	400#				10.0 ms	0.6	0^+	23	26On.1	TD	β^-=100;β^-n ?;β^-2n ?	*
^{62}V	−25210	260				32.6 ms	1.3	1^+#	23	23He.A	TD	β^-=100;β^-n=10 5;β^-2n ?	*
^{62}Cr	−40853	3				206 ms	4	0^+	23	24On02	TD	β^-=100;β^-n=0.5 3	*
^{62}Mn	−48524	7				108 ms	6	1^+*	23	15He28	J	β^-=100;β^-n ?	*
^{62}Mn^m	−48181.0	2.6	343	6		671 ms	5	4^+*	23	15He28	J	β^-=100;β^-n ?	*
^{62}Fe	−58878.1	2.8				68 s	2	0^+	23			β^-=100	
^{62}Co	−61424	19				1.54 m	0.10	$(2)^+$	23			β^-=100	
^{62}Co^m	−61402	20	22	5		13.86 m	0.09	$(5)^+$	23	70Jo12	D	$\beta^-\approx$100;IT<0.5	
^{62}Ni	−66746.0	0.4				STABLE		0^+	23			IS=3.6345 40	
^{62}Cu	−62787.1	0.6				9.672 m	0.008	1^+*	23	14Un01	T	β^+=100	*
^{62}Cu^i	−58174	6	4614	6	RQ			$(0)^+$ T=3	23				*
^{62}Zn	−61167.6	0.6				9.193 h	0.015	0^+	23			β^+=100	
^{62}Ga	−51986.6	0.6				116.122 ms	0.021	0^+ T=1	23	13Da16	T	β^+=100	*
^{62}Ga^j	−51415.4	0.6	571.2	0.1				$1(^+)$ T=2	23	98Vi06	EJ	IT=100	
^{62}Ge	−42290	40				73.5 ms	0.1	0^+	23	21Or01	T	β^+=100;β^+p ?	*
^{62}As	−25320#	200#						1^+#	23			p ?	
^{62}Se	−10370#	300#				5# ms		0^+	23			β^+ ?	
$*^{62}$Ti	T : average 25Ze04=12(3) 26On.1=9.9(0.6)											**
$*^{62}$V	T : average 23He.A=31(4),32(2) 03So02=33.5(2.0),supersedes 99So20=65(31)											**
$*^{62}$Cr	T : average 24On02=206(5) 05Ga01=209(12) 02So.A=209(12), supersedes 99So20=187(15), 98Am04=190(30)											**
$*^{62}$Cr	D : $\%\beta^-$n from 24On02<1											**
$*^{62}$Mn	T : average 24On02=112(7) 05Ga01=92(13)											**
$*^{62}$Mn	D : $\%\beta^-$n 99So20∼0 99Ha05>0											**
$*^{62}$Mn^m	E : symmetrized from 15Ga38=346(+3-8) keV											**
$*^{62}$Cu	J : 10Vi07,68Ph01,66Do01=1											**
$*^{62}$Cu^i	E : other: ENSDF2012=4628(10) keV											**
$*^{62}$Ga	T : average 13Da16=116.15(0.13) 08Gr03=116.100(0.025) 05Hy04=116.01(0.19) 05Ca06=116.09(0.17) 04Bl03=116.19(0.04) 03Hy02=115.84(0.25)											**
$*^{62}$Ga	T : 79Da04=116.34(0.35) 78Al23=115.95(0.30); others (downweighted): 02Bl17,02Lo13=114(2) 78Ch11=116.4(1.5) 93Wi03,93Wi18=113(+6-5)											**
$*^{62}$Ga	T : 93Wi03,93Wi18=113(+6-5)											**
$*^{62}$Ge	T : others: 14Gr10=82.9(1.4) 17Ku12=76(6) 14Ro14=54(5) 02Lo13=129(35) 113(+6-5) ms in 93Wi03 (table 1) is a misprint for ^{62}Ga											**
^{63}Sc	13070#	400#				1# ms		$7/2^-$#		25Ta21	I	β^- ?;β^-n ?;β^-2n ?	
^{63}Ti	−5860#	500#				5 ms	4	$1/2^-$#	23	26On.1	TD	β^-=100;β^-n>29;β^-2n ?	*
^{63}V	−21740	340				19.6 ms	0.9	$(3/2^-,5/2^-)$	23	14Su07	TJD	β^-=100;β^-n>35;β^-2n ?	*
^{63}Cr	−36204	18				128.9 ms	1.9	$1/2^-$#	23			β^-=100;β^-n ?	*
^{63}Mn	−46887	4				275 ms	4	$5/2^-*$	23	99Ha05	TD	β^-=100;β^-n= ?	*
^{63}Fe	−55636	3				6.1 s	0.6	$(5/2^-)$	23	85Ru05	T	β^-=100	
^{63}Co	−61851	19				26.9 s	0.2	$7/2^-$	23	94It.A	T	β^-=100	*
^{63}Ni	−65512.4	0.4				100.8 y	1.2	$1/2^-*$	23	08Co01	T	β^-=100	*
^{63}Ni^m	−65425.2	0.4	87.220	0.028		1.69 μs	0.04	$5/2^-$	23			IT=100	
^{63}Cu	−65579.4	0.4				STABLE		$3/2^-*$	23			IS=69.15 15	*
^{63}Zn	−62213.1	1.6				38.41 m	0.04	$3/2^-*$	23	21Ha10	T	β^+=100	*
^{63}Zn^i	−56723	6	5490	6	RQ			$3/2^-$ T=5/2	23				
^{63}Ga	−56547.1	1.3				32.6 s	0.4	$3/2^-*$	23	71GiZS	T	β^+=100	*
^{63}Ge	−46971	14				152.6 ms	0.3	$3/2^-$	23	25Ag12	TDJ	β^+=100;β^+p ?	*
^{63}As	−33730#	100#					<43ns	$3/2^-$#	23	05St29	IT	p ?	
^{63}Se	−18000#	200#				13.2 ms	3.9	$3/2^-$#	23	20Gi02	TD	β^+=100;β^+p=89 11;2p<0.5	*
$*^{63}$Ti	T : symmetrized from 26On.1=3.6(+5.1-2.6)											**
$*^{63}$V	T : average 14Su07=20(1) 11Da08=19.2(2.4) 03So02=17(3)											**
$*^{63}$V	D : $\%\beta^-$n other: 03So02∼35											**
$*^{63}$Cr	T : average 11Da08=128(8) 05Ga01,03So21=129(2),supersedes 99So20=113(16); other: 98Am04=110(70)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{63}$Mn	D : β^-n observed by 99Ha05, but not quantified											**
$*^{63}$Mn	J : 16Ba44,15Ba49=5/2											**
$*^{63}$Mn	T : others: 99So20,99Le67=322(23) 95Am.A=290(20) 85Bo49=250(40)											**
$*^{63}$Co	T : average 94It.A=26.41(0.27) 72Jo08=27.5(0.3) 69Wa15=26(1)											**
$*^{63}$Ni	J : 24Mu06,17Dy01=1/2											**
$*^{63}$Ni	T : average 71Ba89=100.1(2.0) 08Co01=101.2(1.5), supersedes 96Co25=101.1(1.4); others (outliers): 56Mc95=125(6) 62Ho05=91.6(3.1)											**
$*^{63}$Cu	J : 20De21,10Vi07,11Ko36,10Co01,36Sc07,32Ri02=3/2											**
$*^{63}$Zn	J : 19Xi07,17Wr01,69La05,67Mc17=3/2											**
$*^{63}$Zn	T : average 21Ha10=38.71(0.25,stat)(0.10,sys) 15BoZY=38.84(0.15) 00Le02=38.1(0.8) 82Gr10=38.47(0.05) 69Bo15=38.5(0.1) 61Cu02=38.4(0.2)											**
$*^{63}$Zn	T : 68Go10=38.4(0.1) 59Ri38=38.1(0.3) 39De01=38.5(0.8) 38St05=38.3(0.5) 74Co16=38.0(0.1) 69Bo11=37.9(0.2); others: 61Ra06=39.9(0.8) 60Pr05=36(2)											**
$*^{63}$Zn	T : 39Bo05=38											**
$*^{63}$Ga	J : 12Pr11=3/2											**
$*^{63}$Ga	T : average 71GiZS=32.4(0.5) 70Du05=31.4(0.8) 65Nu02=33(4) 64Fi01=35(1)											**
$*^{63}$Ge	T : others: 20Gi02=153.6(1.1) 19Ru07=153.3(0.6) (same as 20Gi02) 17Ku12=156(11) 14Ro14=149(4) 02Lo13=150(9) 93Wi03=95(+23-20)											**
$*^{63}$Se	T : other: 16Go26, same as 20Gi02											**
$*^{63}$Se	D : %2p not observed in 20Gi02 and 16Go26; limit from 16Go26 based on the assumption that one event is not β^+p											**
^{64}Ti	−1480#	600#				5# ms	>620ns	0^+	21	13Ta14	I	β^- ?;β^-n ?;β^-2n ?	
^{64}V	−16320#	400#				15 ms	2	$(1,2)$	21	14Su11	TJ	β^-=100;β^-n ?;β^-2n ?	*
^{64}V^m	−16240#	400#	82.0	0.3		571 μs	58		21	Wi05	ET	IT≈100	*
^{64}Cr	−33573	26				42.9 ms	0.9	0^+	21			β^-=100;β^-n ?	*
^{64}Mn	−42989	4				91.8 ms	0.8	1^+*	21	24Vo03	TD	β^-=100;β^-n=1.37 14	*
^{64}Mn^m	−42815	4	174.5	0.4		439 μs	31	$(4^+)*$	21	11Li50	TD	EIT=100	*
^{64}Fe	−54970	4				2.36 s	0.04	0^+	21	24Vo03	T	β^-=100	*
^{64}Co	−59792	20				304 ms	9	1^+	21	85Ru05	T	β^-=100	*
^{64}Co^m	−59686	4	106	20	MD	> 280 ms		5^+#	21	10Fe01	TJ	β^- ?;IT ?	
^{64}Ni	−67098.6	0.5				STABLE		0^+	21			IS=0.9256 19	
^{64}Cu	−65424.0	0.4				12.7004 h	0.0013	1^+*	21	FGK204	T	β^+=61.52 26;β^-=38.48 26	*
^{64}Cu^i	−58598	6	6826	6				0^+ frg. T=4	21	71Be29	E		
^{64}Zn	−66003.8	0.6				STABLE	>60Py	0^+	21	03Ki08	T	IS=49.17 75;2β^+ ?	*
^{64}Ga	−58832.8	1.4				157.6 s	0.5	0^+	21			β^+=100	*
^{64}Ga^m	−58789.9	1.4	42.86	0.08		21.9 μs	0.7	(2^+)	21	99Ta29	T	IT=100	
^{64}Ga^i	−56925.7	2.5	1907.1	2.2	RQ			(0^+) T=2	21				
^{64}Ge	−54316	4				63.7 s	2.5	0^+	21	74Ro16	T	β^+=100	*
^{64}Ge^i	−49353	4	4962.6	0.2				0^+ T=1		25Ag12	E	IT=100	
^{64}As	−39630	30				63.0 ms	0.3	0^+	21	25Ag12	TDJ	β^+=100;β^+p=4.4 1	*
^{64}As^i	−37670	30	1956.50	0.20				0^+ T=2		25Ag12	ED	p=61.7 25;IT=38.3 25	
^{64}Se	−27460#	200#				22.6 ms	0.2	0^+	21	25Ag12	TD	β^+=100;β^+p=48.0 9	*
$*^{64}$V	T : other: 11Da08=19(8)											**
$*^{64}$V^m	E : other: 14Su11=81.0(0.7)											**
$*^{64}$Cr	T : average 11Li50=44(3) 11Da08=42(2) 05Ga01,03So21=43(1), supersedes 99So20=44(12)											**
$*^{64}$Mn	T : average 24On02=92.1(0.8), supersedes 24Vo03=90.5(2.0), 11Da08=90(9) 02So.A=91(4) 99So20=85(5) 99Ha05=89(4); others: 98Am04=140(30)											**
$*^{64}$Mn	J : 15He28=1											**
$*^{64}$Mn	D : %β^-n others: 24On02=1.5(0.6) 12Pa39=2.7(0.6) 00HaZL=33(2); 24Vo03 also quotes unpublished value of 1.56(0.06) using the NERO detector											**
$*^{64}$Mn^m	T : average 11Li50=400(40) 05Ga.B=500(50)											**
$*^{64}$Mn^m	J : 15He28=(4); M2 and E1 γs to 1^+											**
$*^{64}$Fe	T : other: 85Ru05=2.0(0.2)											**
$*^{64}$Co	T : average 85Ru05=300(10) 74Ra31=300(30) 69Wa15=400(50)											**
$*^{64}$Cu	J : 20De21,10Vi07,54Le40=1											**
$*^{64}$Cu	D : from 12Be24											**
$*^{64}$Zn	T : for 2ν-$\varepsilon\varepsilon$; 0ν-$\beta^+\varepsilon$>28 Py											**
$*^{64}$Ga	T : average 90SuZR=157.6(0.7) 73Da01=157.4(0.7) 72Mo08=159(2); others: 67Ko02=2.7(0.1) m 53Cr15=2.6(0.1) m 80Na15=2.6 m 53Co14=2.5 m											**
$*^{64}$Ge	T : other: 73Da01=70(7)											**
$*^{64}$As	T : others: 20Gi02=69.0(1.4) 19Ru07=63.4(1.2) 14Ro14=72(6) 02Lo13=18(+43-7)											**
$*^{64}$Se	T : average 25Ag12=22.5(0.6) 19Ru07=22.6(0.2)											**
^{65}Ti	5210#	700#				1# ms		$1/2^-$#		25Ta21	I	β^- ?;β^-n ?;β^-2n ?	
^{65}V	−12110#	500#				14# ms	>620ns	$5/2^-$#	25	09Ta24	I	β^- ?;β^-n ?;β^-2n ?	
^{65}Cr	−28210	40				27.5 ms	2.1	$1/2^-$#	25	11Da08	T	β^-=100;β^-n ?;β^-2n ?	*
^{65}Mn	−40967	4				91.9 ms	0.7	$(5/2^-)$	25	13Ol06	TJD	β^-=100;β^-n=7.9 12	*
^{65}Fe	−51217	4				805 ms	10	$(1/2^-)$	25	13Ol06	TJD	β^-=100;β^-n=0.5 3	*
^{65}Fe^m	−50823	4	393.64	0.18		1.12 s	0.15	$(9/2^+)$	25	09Pa16	T	β^-=?;IT ?	
^{65}Fe^n	−50819	4	397.56	0.07		419 ns	12	$(5/2^+)$	25	13Ol06	TJ	IT=100	*
^{65}Co	−59185.2	2.1				1.16 s	0.03	$(7/2)^-$	25			β^-=100	
^{65}Ni	−65125.3	0.5				2.5175 h	0.0005	$5/2^-*$	25	24Mu06	J	β^-=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{65}Ni^m	−65061.9	0.5	63.38	0.04		69 μs 3	1/2−	25	20Po12	E	IT=100	*
^{65}Cu	−67263.5	0.6				STABLE	3/2−*	25	10Vi07	J	IS=30.85 15	*
^{65}Zn	−65911.8	0.6				243.94 d 0.04	5/2−*	25	FGK204	T	β^+=100;ε=98.579 7;e$^+$=1.421 7	*
^{65}Zn^m	−65857.9	0.6	53.927	0.010		1.59 μs 0.04	1/2−	25	13Ru10	T	IT=100	*
^{65}Ga	−62657.3	0.8				15.133 m 0.028	3/2−*	25	19Gy04	T	β^+=100	*
^{65}Ge	−56478.2	2.1				30.9 s 0.4	3/2−	25	87Vi01	D	β^+=100;β^+p=0.011 3	*
^{65}As	−46830	40				130.3 ms 0.6	3/2−#	25	20Gi02	T	β^+=100;β^+p ?	*
^{65}As^i	−43448	9	3380	40	p		(3/2−) T=3/2	25	11Ro47	J	p=100	
^{65}Se	−33420#	100#				34.2 ms 0.7	3/2−#	25	20Gi02	T	β^+=100;β^+p=94 5	*
^{65}Br	−17450#	500#				<410ns	5/2−#	25	16Bl05	IT	p ?	
*^{65}Cr	T : average 11Da08=28(3) 03So21=27(3); other: 22Si20=23(12)											**
*^{65}Mn	T : average 13Ol06=91.9(0.9) 03So21=92(1); others: 11Da08=84(8), downweighted (not used), 99Ha05=88(4) 99So20=100(8) 98Am04=110(20)											**
*^{65}Mn	D : %β^-n other: observed by 99Ha05, but not quantified											**
*^{65}Fe	T : 19Ol02=805(10); others: 09Pa16=810(50) 99So20=1320(280) 95Am.A=760(50) supersedes 94Cz02=450(150)											**
*^{65}Fe	D : %β^-n from 24On02<1											**
*^{65}Fe^n	T : average 18St18=409(+29-27) 13Ol06=437(55) 10Da06=420(13); other: 98Gr14=430(130)											**
*^{65}Ni^m	T : average 78Ho06=67(4) 78Mu05=73(5)											**
*^{65}Ni^m	E : average 20Po12=64.46(0.04) 78Mu05=63.36(0.05)											**
*^{65}Cu	J : 20De21,10Co01,10Vi07,32Ri02=3/2											**
*^{65}Zn	J : 19Xi07,17Wr01,64By01=5/2											**
*^{65}Zn	D : e$^+$ from I_γ(511γ)=2.842(0.013)% in 06Be34											**
*^{65}Zn^m	T : average 13Ru10=1.51(0.07) 75Ro25=1.52(0.09) 60Au03=1.65(0.05)											**
*^{65}Ga	T : from 19 Gy04=15.133 (0.016 stat) (0.023 syst); other: 57Da07=15.2(0.2)											**
*^{65}Ga	J : 17Fa09=3/2											**
*^{65}Ge	T : average 00Gi11=30.8(0.7) 81Ha44,76Ha29=30.8(1.0) 74Ro16=30.0(1.2) 73Jo12=31.2(0.7)											**
*^{65}As	T : others (downweighted): 14Ro14=126(7) 02Lo13=126(16) 95Mo26=190(11)											**
*^{65}Se	T : other: 11Ro47=33(4)											**
*^{65}Se	D : %β^+p average 17GoZT=94(+6-4) 11Ro47=88(+12-13)											**
^{66}Ti	10080#	700#				1# ms >620ns	0+		25Ta21	I	β^- ?;β^-n ?;β^-2n ?	
^{66}V	−6300#	500#				10# ms >620ns		09	09Ta24	I	β^- ?;β^-n ?;β^-2n ?	
^{66}Cr	−25140#	200#				23.8 ms 1.8	0+	15	11Li50	T	β^-=100;β^-n ?;β^-2n ?	*
^{66}Mn	−36750	10				63.8 ms 0.9	(1+)	09	18St18	TDJ	β^-=100;β^-n=7.4 14;β^-2n ?	*
^{66}Mn^m	−36286	10	464.5	0.4		780 μs 40	(5−)		11Li50	ETJ	IT≈100;β^- ?	*
^{66}Fe	−50067	4				467 ms 29	0+	09	18St18	T	β^-=100;β^-n ?	*
^{66}Co	−56409	14				194 ms 17	(1+)	09	12Li02	J	β^-=100;β^-n ?	*
^{66}Co^m	−56234	14	175.1	0.3		824 ns 22	(3+)	09	12Li02	EJ	IT=100	*
^{66}Co^n	−55767	15	642	5		> 100 μs	(8−)	09	98Gr14	E	IT=100	
^{66}Ni	−66006.3	1.4				54.6 h 0.3	0+	09			β^-=100	
^{66}Cu	−66258.1	0.7				5.073 m 0.005	1+*	09	20De21	J	β^-=100	*
^{66}Cu^m	−65103.9	1.6	1154.2	1.4		600 ns 17	(6)−	09	11Lo01	T	IT=100	*
^{66}Zn	−68898.9	0.7				STABLE	0+	09			IS=27.73 98	
^{66}Ga	−63723.4	1.1				9.304 h 0.008	0+*	09	10Se16	T	β^+=100	*
^{66}Ga^i	−59873	6	3850	6	RQ		0+ T=3					
^{66}Ge	−61607.0	2.4				2.26 h 0.05	0+	09			β^+=100	
^{66}As	−52025	6				95.77 ms 0.23	0+ T=1	09	MMC156J		β^+=100	*
^{66}As^m	−50668	6	1356.63	0.17		1.14 μs 0.04	5+	09	13Ru10	TJ	IT=100	*
^{66}As^n	−49002	6	3022.77	0.10		7.98 μs 0.26	9+	09	13Ru10	TJ	IT=100	*
^{66}Se	−41980	60				54 ms 4	0+	13	14Ro14	T	β^+=100;β^+p ?	
^{66}Br	−24500#	400#				<45ns	0+#		25Su.A	T	p ?	
*^{66}Cr	T : average 11Li50=24(2) 11Da08=23(4); other: 05Ga01,03So21=10(6)											**
*^{66}Mn	J : 11Li50=(1+) due to large ground-state feeding from ^{66}Cr (J$^\pi$=0+); large direct β^- feeding to ^{66}Fe gs (J$^\pi$=0+) in 18St18											**
*^{66}Mn	T : average 18St18=64.1(1.1) 17Ol08=70(15) 13Li04=60(3) 03So21=64(2) 99Ha05=66(4); other: 11Pa.A=64.2(0.8) is superseded by 18St18											**
*^{66}Mn	D : %β^-n symmetrized from 18St18=7.3(+1.4-1.3)											**
*^{66}Mn^m	T : other: 05Ga.B=750(250)											**
*^{66}Fe	T : average 18St18=485(+39-34) 99Le67=440(60) 98Am04=440(60)											**
*^{66}Co	J : also large direct β^- feeding to ^{66}Ni gs (J$^\pi$=0+) in 18St18											**
*^{66}Co^m	T : symmetrized 18St18=823(+22-21)											**
*^{66}Cu	J : 20De21,10Vi07,69Cu09,64Ro04=1											**
*^{66}Cu	T : average 13Za.1=5.061(0.006) 92KaZM=5.080(0.012) 90KaZW=5.063(0.020) 89Ab18=5.10(0.02) 74Ry01=5.13(0.03) 74Ar22=5.1(0.1) 54Ko07=5.20(0.05)											**
*^{66}Cu	T : 53Sa11=5.10(0.02) 53Ba48=5.07(0.02) 51Sc56=5.12(0.05) 51Ro22=5.17(0.07) 51Fr19=5.2(0.1) 50Ca01=5.18(0.10) 46Me01=5.05(0.05); other:											**
*^{66}Cu	T : 65Bo42=5.3(0.1)											**
*^{66}Cu^m	T : average 11Lo01=601(30) 72Bl16=600(20)											**
*^{66}Ga	T : others (downweighted): 12 Gy01=9.312(0.032) ENSDF2010=9.49(0.03)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{66}$Ga	J : 57Wo35=0											**
$*^{66}$As	T : average 88Bu12=95.77(0.28) 78Al23=95.78(0.39); other (recent): 14Ro14=93(4) 02Lo13=97(2) (downweighted)											**
$*^{66}$As	J : super-allowed β^+-decay emitter; see also 98Gr12											**
$*^{66}$As^m	T : average 13Ru10=1.15(0.04) 01Gr07=1.1(0.1), supersedes 98Gr12=1.9(0.5)											**
$*^{66}$As^n	T : average 13Ru10=7.9(0.3) 01Gr07=8.2(0.5), supersedes 98Gr12=17.5(1.5)											**
$*^{66}$As^n	E : from 24Jo06=3022.77(0.10) using delayed γ rays											**
^{67}V	−1740#	600#				8# ms	>620ns	$5/2^-$#	13	13Ta14	I	β^- ?;β^-n ?;β^-2n ?	
^{67}Cr	−19270#	200#				11# ms	>300ns	$1/2^-$#	22	97Be70	I	β^- ?;β^-n ?;β^-2n ?	
^{67}Mn	−33870	40				46.7 ms	2.3	$5/2^-$#	05	11Da08	TD	β^-=100;β^-n=10 5;β^-2n ?	*
^{67}Fe	−46015	10				394 ms	9	$(1/2^-)$	05	02So.A	TD	β^-=100;β^-n ?	*
^{67}Fe^m	−45612	13	403	9		64 μs	17	$(5/2^+,7/2^+)$	05	11Da08	EJ	IT=100	*
^{67}Fe^n	−45570#	100#	450#	100#		75 μs	21	$(9/2^+)$	05	08Bl05	TJ	IT=100	
^{67}Co	−55322	6				329 ms	28	$(7/2^-)$	05	08Pa33	TJ	β^-=100;β^-n ?	
^{67}Co^m	−54830	6	491.55	0.11		496 ms	33	$(1/2^-)$		09Pa16	E	IT>80;β^- ?	*
^{67}Ni	−63742.7	2.9				21 s	1	$1/2^-*$	05	24Mu06	J	β^-=100	
^{67}Ni^m	−62736.1	2.9	1006.6	0.2		13.34 μs	0.19	$9/2^+$	05	14Di08	ETJ	IT=100	*
^{67}Cu	−67319.4	0.9				61.761 h	0.004	$3/2^-*$	05	21Me.1	T	β^-=100	*
^{67}Zn	−67880.1	0.8				STABLE		$5/2^-*$	05			IS=4.04 16	*
^{67}Zn^m	−67786.8	0.8	93.312	0.005		9.15 μs	0.04	$1/2^-$	05	15Ch57	T	IT=100	*
^{67}Zn^n	−67275.6	0.8	604.48	0.05		333 ns	14	$9/2^+$	05			IT=100	
^{67}Ga	−66879.0	1.2				3.2618 d	0.0005	$3/2^-*$	05	FGK259	T	ε=100	*
^{67}Ge	−62673	4				18.9 m	0.3	$1/2^-$	05			β^+=100	
^{67}Ge^m	−62655	4	18.20	0.05		13.7 μs	0.9	$5/2^-$	05			IT=100	
^{67}Ge^n	−61921	4	751.70	0.06		109.0 ns	1.3	$9/2^+$	05	00Ch07	T	IT=100	*
^{67}As	−56587.2	0.4				42.5 s	1.2	$(5/2^-)$	05			β^+=100	
^{67}Se	−46552	19				133 ms	4	$5/2^-$#	22	14Ro14	T	β^+=100;β^+p=0.5 1	*
^{67}Br	−33030#	300#				100# ns		$1/2^-$#	22			p ?	
^{67}Kr	−17150#	100#				7.4 ms	2.9	$3/2^-$#	22	20Gi02	TD	β^+ ?;2p=37 14	*
$*^{67}$Mn	T : average 11Da08=51(4) 03So21=47(4) 99Ha05=42(4)												**
$*^{67}$Fe	T : others (recent): 11Da08=304(81) 08Pa33=416(29), downweighted (not used)												**
$*^{67}$Fe^m	T : average 03Sa02=75(21) 98Gr14=43(30), same authors, different experiment												**
$*^{67}$Fe^m	E : less than 30 keV above 387.7-keV level												**
$*^{67}$Co^m	D : %IT from 08Pa33												**
$*^{67}$Ni^m	T : average 14Di08=13.7(0.6) 98Gr14=13.3(0.2); other: 02Ge16=13(1)												**
$*^{67}$Cu	J : 20De21,10Vi07=3/2												**
$*^{67}$Cu	T : others: 74Ro14=62.01(0.14) 72La14=61.83(0.07) 70Ma56=61.00(0.25) 68Re04=61.88(0.44)												**
$*^{67}$Zn	J : 19Xi07,17Wr01,16Ya02,53We51,48Ar06,37Ly07=5/2												**
$*^{67}$Zn^m	T : average 15Ch57=9.37(0.04) 14Di03=9.157(0.021) 98At04=9.34(0.20) 96Hw03=9.01(0.03) 75Ro25=9.1(0.4) 73Le18=9.20(0.07) 72Le37=9.15(0.05); Birge												**
$*^{67}$Zn^m	T : ratio=2.99												**
$*^{67}$Ga	J : 17Fa09,10Bi.A,10Ch16,57Hu86=3/2												**
$*^{67}$Ge^n	T : average 00Ch07=101(3) 79Al04=110.9(1.4) 78Na10=102(10)												**
$*^{67}$Se	D : %β^+p from 95Bl23												**
$*^{67}$Kr	T : other: 16Go26=7.4(3.0) (same as 20Gi02)												**
^{68}V	4570#	600#				5# ms	>620ns			25Ta21	I	β^- ?;β^-n ?;β^-2n ?	
^{68}Cr	−15690#	300#				10# ms	>620ns	0^+	12	09Ta24	I	β^- ?;β^-n ?;β^-2n ?	
^{68}Mn	−29020	30				33.7 ms	1.5	(3)	12	15Be32	TD	β^-=100;β^-n=18 10;β^-2n ?	*
^{68}Fe	−44101	6				188 ms	4	0^+	12			β^-=100;β^-n>0	*
^{68}Co	−51652.4	0.9				237 ms	17	(7^-)	12	00Mu10	T	β^-=100;β^-n ?	*
^{68}Co^m	−51572.9	2.2	79.5	2.1	MD	1.6 s	0.3	(2^-)	12	00Mu10	TJ	β^-=100;β^-n>2.6	*
^{68}Co^n	−51524.5	2.3	127.9	2.1		101 ns	10	(1^+)	12	10Da06	TE	IT=100	*
^{68}Ni	−63463.8	3.0				29 s	2	0^+	12			β^-=100	
^{68}Ni^m	−61860	3	1603.51	0.28		268 ns	5	0^+	12	15Fl01	E	IT=100	*
^{68}Ni^n	−60615	3	2849.1	0.3		851 μs	27	5^-	12	15Wi02	T	IT=100	*
^{68}Cu	−65567.0	1.6				30.9 s	0.6	1^+*	12	20De21	J	β^-=100	*
^{68}Cu^m	−64845.7	1.6	721.26	0.08		3.75 m	0.05	6^-*	12	20De21	J	IT=86 2;β^-=14 2	*
^{68}Zn	−70007.1	0.8				STABLE		0^+	12			IS=18.45 63	
^{68}Ga	−67086.0	1.4				67.821 m	0.013	1^+*	12	FGK259	T	β^+=100	*
^{68}Ge	−66978.8	1.9				271.05 d	0.08	0^+	12	18Be03	T	ε=100	*
^{68}As	−58894.5	1.8				151.6 s	0.8	3^+	12			β^+=100	
^{68}As^m	−58469.4	1.8	425.1	0.2		111 ns	20	1^+	12			IT=100	*
^{68}Se	−54189.4	0.5				35.5 s	0.7	0^+	12			β^+=100	
^{68}Br	−38760#	250#				130 ns	50	3^+#	22	25Su.A	T	p ?	*
^{68}Kr	−26890#	500#				21.6 ms	3.3	0^+	22	20Gi02	TD	$\beta^+\approx$100;p ?;β^+p=90 11	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{68}$Mn	T : average 15Be32=38.3(3.6), 35.2(2.0) 11Da08=29(4) 03So21=28(8) 99Ha05=28(4)											**
$*^{68}$Mn	D : β^-n observed by 99Ha05, but not quantified											**
$*^{68}$Mn	J : direct β^- feeding to 2^+ and 4^+ in 15Be32 (incomplete decay scheme)											**
$*^{68}$Fe	T : average 12Li02=189(6) 11Da08=180(19) 03So21=187(6); others: 99So20=155(50) 91Be33=100(60)											**
$*^{68}$Co	T : 00Mu10=230(30) 99So20=170(30) 95Am.A=310(30), supersedes 91Be33=180(100) from the same group											**
$*^{68}$Co^m	J : 15Fl01=(2^-); others: 12Li02=(1^+) 00Mu10=(3^+)											**
$*^{68}$Co^m	D : %β^-n: 15Fl01>3.0(0.4)											**
$*^{68}$Co^n	J : strong feeding in ^{68}Fe (J^π=0^+) β^- decay and possible γ-ray decay to 2^- in 12Li02											**
$*^{68}$Co^n	E : 10Da06=48.4 keV above ^{68}Co^m											**
$*^{68}$Ni^m	E : average 15Fl01=1603.6(0.8) 13Re18=1603.5(0.3) from E_γ differences											**
$*^{68}$Ni^m	T : average 02So03=270(5) 14Su05=268(12) 15Fl01=235(23); others: 13Re18=210(50),350(50) 98Gr14=340(30) 84Be42=211(50)											**
$*^{68}$Ni^n	T : average 15Wi02=840(40) 98Gr14=860(50) 95Br10=860(50)											**
$*^{68}$Cu	J : 20De21,10Vi07=1											**
$*^{68}$Cu^m	J : 20De21,10Vi07=6											**
$*^{68}$Ga	J : 58Hu14=1											**
$*^{68}$Ge	T : average 18Be03=271.14(0.15,NaI), 271.07(0.12,IC) 94Sc44=270.99(0.19) 81Wa26=270.82(0.27)											**
$*^{68}$As^m	T : symmetrized from 94Ba50=107(+23-16)											**
$*^{68}$Br	T : symmetrized from 25Su.A=105(+62-25); other: 19Wi08∼40 ns											**
$*^{68}$Kr	D : %β^+p symmetrized from 20Gi02=89(+11-10)											**
^{69}Cr	−9630#	400#				6# ms	>620ns	$7/2^+$#	23	13Ta14	I	β^- ?;β^-n ?;β^-2n ?	
^{69}Mn	−25520#	200#				24.9 ms	1.9	$5/2^-$#	23	15Be32	TD	β^-=100;β^-n=40 20;β^-2n ?	*
^{69}Fe	−39504	11				162 ms	7	$1/2^-$#	23	22Po02	J	β^-=100;β^-n ?;β^-2n ?	*
^{69}Fe^m	−39282	9	222	14	MD	150 ms	29	$7/2^+$#		22Po02	ET	β^- ?;IT ?	*
^{69}Co	−50367	14				212 ms	7	$(7/2^-)$	23	17Sp03	T	β^-=100;β^-n ?	*
^{69}Co^m	−50213	13	153	5	MD	750 ms	250	$1/2^-$#	23	15Li33	TD	β^-=100	
^{69}Ni	−59979	4				11.4 s	0.3	$9/2^+$	23	25Ce04	J	β^-=100	*
^{69}Ni^m	−59658	4	321	2		3.5 s	0.4	$1/2^-$	23	25Ce04	J	β^-≈100;IT ?	*
^{69}Ni^n	−57279	4	2700.1	1.4		439 ns	3	$(17/2^-)$	23	98Gr14	T	IT=100	
^{69}Cu	−65736.2	1.4				2.85 m	0.07	$3/2^-$*	23	20De21	J	β^-=100	*
^{69}Cu^m	−62994.7	1.5	2741.5	0.4		357 ns	2	$(13/2^+)$	23	16Ku11	T	IT=100	*
^{69}Zn	−68417.9	0.8				56.4 m	0.7	$1/2^-$*	23	17Wr01	J	β^-=100	*
^{69}Zn^m	−67979.3	0.8	438.636	0.017		13.749 h	0.010	$9/2^+$*	23	17Wr01	J	IT=99.967 3;β^-=0.033 3	*
^{69}Ga	−69327.9	1.1				STABLE		$3/2^-$*	23			IS=60.108 50	*
^{69}Ge	−67100.7	1.3				38.91 h	0.08	$5/2^-$*	23	21Ha10	T	β^+=100	*
^{69}Ge^m	−67013.9	1.3	86.77	0.02		5.10 μs	0.24	$1/2^-$	23	70Mu03	T	IT=100	*
^{69}Ge^n	−66702.8	1.3	397.94	0.02		2.78 μs	0.04	$9/2^+$	23	13Ru10	T	IT=100	*
^{69}As	−63136.8	2.9				15.23 m	0.16	$5/2^-$*	23			β^+=100	*
^{69}Se	−56434.8	1.5				27.4 s	0.2	$1/2^-$	23	77Ma24	T	β^+=100;β^+p=0.052 8	
^{69}Se^m	−56395.9	1.5	38.92	0.20		2.0 μs	0.2	$5/2^-$	23	95Po01	T	IT=100	
^{69}Se^n	−55859.9	1.5	574.9	0.3		951 ns	15	$9/2^+$	23	00Ch07	T	IT=100	*
^{69}Br	−46260	40				< 24 ns		$(5/2^-)$	23	96Pf01	T	p=100	
^{69}Br^i	−43097	14	3160	40	p			$(5/2^-)$ T=3/2	23	11Ro47	I	p=100	
^{69}Kr	−32580#	300#				27.9 ms	0.8	$(5/2^-)$	23	20Gi02	DT	β^+=100;β^+p=93 7	*
$*^{69}$Mn	T : average 15Be32=25.8(2.8) [$\beta\gamma$(t)], 24.1(2.6) [β(t)]; others: 11Da08=18(4) 99Ha05=14(4) [β_n(t)]											**
$*^{69}$Fe	T : from $\beta\gamma$(t) in 15Li33; others: 13Ma87=102(10) 11Da08=110(6) 03So21=109(9)											**
$*^{69}$Fe^m	T : from 22Po02=100-200 ms											**
$*^{69}$Fe^m	J : FGK239=$7/2^+$, based on deformed Nilsson model; 22Po02=$9/2^+$ corresponding to a spherical shape											**
$*^{69}$Co	T : average 17Sp03=216(15) 15Li33=180(20) [$\beta\gamma$(t)],206(20) [β(t)] 11Da08=229(24) 02So.A=232(17) 99Mu17=220(20) 99So20=170(30)											**
$*^{69}$Co	T : 91Be33=270(50) 99Le67=187(38)											**
$*^{69}$Ni	T : average 99Pr10=11.7(0.6) 01Fr21,98Fr15=11.2(0.9) 85Bo49=11.4(0.3); other: 85Ru05=10(3)											**
$*^{69}$Ni^m	T : average 99Mu17=3.5(0.5) 99Pr10=3.4(0.7)											**
$*^{69}$Ni^m	E : from 98Gr14=321(2)											**
$*^{69}$Cu	J : 20De21,10Vi07=3/2											**
$*^{69}$Cu	T : average 85Ru05=2.7(0.1) 66Va12=3.0(0.1)											**
$*^{69}$Cu^m	T : average 16Ku11=351(14) 12Di03=360(20) 02Ge16=357(2) 98Gr14=360(50) 97Is13=360(30)											**
$*^{69}$Zn	J : 19Xi07,17Wr01=1/2											**
$*^{69}$Zn	T : average 69Zo01=55.6(1.6) 68Ma12=55(1) 56Ru45=58.5(1.2) 39Li02=57(2)											**
$*^{69}$Zn^m	J : 19Xi07,17Wr01=9/2											**
$*^{69}$Zn^m	T : average 17Kr01=13.742(0.014) 77He20=13.756(0.018) 74Ro18=13.76(0.03)											**
$*^{69}$Ga	J : 17Fa09,10Bi.A,10Ch16,33Ca02,32Ja04=3/2											**
$*^{69}$Ge	T : average 21Ha10=38.82(0.07,stat)(0.04,sys) 75Bu07=38.4(0.8) 69Zo01=39.05(0.10) 63Sc27=38.5(0.5) 48Mc32=39.6(0.5); others: 65Te02=35.5(0.8)											**
$*^{69}$Ge	T : 57Nu20=40.4(0.3)											**
$*^{69}$Ge	J : 24Wa45,20Ka58,70Ol02=5/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{69}Ge^m$	T : average 70Mu03=5.1(0.3) 64Br27=5.1(0.4)											**
$*^{69}Ge^n$	T : average 13Ru10=2.70(0.08) 80KiZT,83Fu21,83Sh47=2.79(0.06) 70Ch05=2.84(0.07)											**
$*^{69}As$	J : 76He21=5/2											**
$*^{69}As$	T : average 79Su02=15.1(0.3) 78TeZY=15.3(0.2) 74Ro14=16(1) 71Do01=13.0(1.5) 70Bo19=14.9(0.9) 70Mu03=15.5(1.0)											**
$*^{69}Se^n$	T : average 00Ch07=950(21) 95Po01=960(23) 88Ra06=853(78); other: 89Ar13=1023(110)											**
$*^{69}Kr$	T : average 20Gi02=27.8(1.6) 14De41=28(1) 11Ro47=27(3); other: 97Xu01=32(10)											**
$*^{69}Kr$	D : $\%\beta^+$p symmetrized from 20Gi02=93(+7-6), superseded 11Ro47=99(+1-11)											**
^{70}Cr	−5640#	400#				6# ms	>620ns	0^+	16	13Ta14	I	β^- ?;β^-n ?;β^-2n ?	
^{70}Mn	−20450#	300#				19.9 ms	1.7	(4,5)	16	15Be32	TD	β^-=100;β^-n ?;β^-2n ?	
^{70}Fe	−37053	12				61.4 ms	0.7	0^+	16	17Mo02	T	β^-=100;β^-n ?	*
^{70}Co	−46508.8	1.9			&	508 ms	7	(1^+)	16	17Mo02	JT	β^-=100;β^-n=9.4 17;β^-2n ?	*
$^{70}Co^m$	−46240	5	269	5	MD &	113 ms	4	(7^-)	16	FGK205	J	β^-=100;β^-n=6.3 7;β^-2n ?	*
^{70}Ni	−59213.9	2.1				6.0 s	0.3	0^+	16			β^-=100	
$^{70}Ni^m$	−56353.0	2.1	2860.91	0.08		232 ns	1	8^+	16			IT=100	
^{70}Cu	−62976.4	1.1				44.5 s	0.2	6^-*	16	02We03	T	β^-=100	*
$^{70}Cu^m$	−62875.3	1.1	101.1	0.3		33 s	2	3^-*	16	04Va08	TD	β^-=52 9;IT=48 9	*
$^{70}Cu^n$	−62733.8	1.2	242.6	0.5		6.6 s	0.2	1^+*	16	04Va08	TD	β^-=93.2 9;IT=6.8 9	*
^{70}Zn	−69565.0	1.5				STABLE	>3.8Ey	0^+	16			IS=0.61 10;2β^- ?	*
^{70}Ga	−68910.2	1.1				21.14 m	0.05	1^+*	16			β^-=99.59 5;ε=0.41 5	*
^{70}Ge	−70562.0	0.8				STABLE		0^+	16			IS=20.52 19	
^{70}As	−64334.0	1.4				52.6 m	0.3	4^+*	16			β^+=100	*
$^{70}As^m$	−64302.0	1.4	32.046	0.023		96 μs	3	2^+	16			IT=100	
^{70}Se	−61928.9	1.4				41.1 m	0.3	0^+	16			β^+=100	
^{70}Br	−51934#	16#				78.9 ms	0.3	0^+ T=1	16	22Wa34	T	β^+=100;β^+p ?	*
$^{70}Br^m$	−49642#	16#	2292.3	0.8		2.22 s	0.03	9^+ T=0	16	22Wa34	T	β^+=100;β^+p ?	*
^{70}Kr	−41320	140				45.19 ms	0.14	0^+	16	22Vi03	TD	β^+=100;β^+p=0.545 23	*
$*^{70}Fe$	T : others (not used): 14XuZZ=66(7) 13Ma87=61(5) 11Da08=71(10) 03So21=94(17)											**
$*^{70}Co$	T : others (not used): 15Pr10=470(50) 00Mu10=500(180)											**
$*^{70}Co$	J : 17Mo02=(1^+) based on the strong β-decay feeding to 0^+ and 2^+ in ^{70}Ni and the proposed π1/2[321]$\otimes\nu$1/2[301] configuration; others: $J^\pi=(3^+)$ in											**
$*^{70}Co$	J : 15Pr10 and 00Mu10 based on shell model											**
$*^{70}Co$	D : $\%\beta^-$n 24Si12=9.4(1.7); other: 20MoZS=6.1(0.8)											**
$*^{70}Co^m$	T : average 24Si12=113(7) 15Pr10=100(10) 11Da08=108(7) 03So21=121(8) 03Sa40=110(9) 00Mu10=120(30) 98Am04=150(20); others: 99So20=190(40)											**
$*^{70}Co^m$	T : 99Le67=92(25)											**
$*^{70}Co^m$	D : $\%\beta^-$n average 24Si12=7.1(1.5) 20MoZS=6.1(0.8)											**
$*^{70}Co^m$	J : direct β-decay feeding to 6^+ level in ^{70}Ni and the expected conf=$\pi f_{7/2}^{-1}\nu g_{9/2}^{+1}$ (shell model)											**
$*^{70}Cu$	J : 20De21,10Vi07,16Bi08=6											**
$*^{70}Cu$	T : from 02We03=44.5(0.2); others: 99Pr10=42(7) 75Re09=52(4) 71Ta03=42(3)											**
$*^{70}Cu^m$	J : 20De21,10Vi07,16Bi08=3											**
$*^{70}Cu^n$	J : 20De21,10Vi07,16Bi08=1											**
$*^{70}Zn$	T : 2ν-$\beta\beta$>3.8 Ey 0ν-$\beta\beta$>32 Ey in 11Be39; 0ν-$\beta\beta$>6.8 Ey in 16Eb03 0ν-$\beta\beta$>1.6 Zy in 20Az05											**
$*^{70}Ga$	J : 12Pr11,62Eh01=1											**
$*^{70}Ga$	T : others: 16Ak04=21.1(0.9) 22Te02=21.1(0.2)											**
$*^{70}As$	J : also 76He24,69PhZZ=4											**
$*^{70}Br$	T : average 22Wa34=79.1(0.6) 17Mo18=78.42(0.51) 88Bu12=78.54(0.59) 78Al23=80.2(0.8); other: 19Si33=79.7(2.4) (downweighted)											**
$*^{70}Br^m$	T : unweighted average 22Wa34=2.3(0.5) 17Mo18=2.157(+0.053-0.049) 81Vo04=2.2(0.2) 02Ro25=2.2(0.3)											**
$*^{70}Kr$	T : from 22Vi03 supersedes 20Vi02=44.99(0.14,stat)(0.06,syst) 45.16(0.68,stat)(0.20,syst); others (downweighted): 22Vi03=44.9(1.1)											**
$*^{70}Kr$	T : 16De29=31(+13-7) 14Ro14=40(6) 02Bl17=42(31) 00Oi02=57(21)											**
^{71}Cr	740#	500#				1# ms		$7/2^+$#				β^- ?;β^-n ?	
^{71}Mn	−16620#	400#				16# ms	>400ns	$5/2^-$#	23	10Oh02	I	β^- ?;β^-n ?;β^-2n ?	
^{71}Fe	−31930#	100#				35.7 ms	1.6	$7/2^+$#	23	13Ma87	T	β^-=100;β^-n ?;β^-2n ?	*
^{71}Co	−44370	470				80 ms	3	$(7/2^-)$	23	12Ra10	TJD	β^-=100;β^-n=16 2	*
^{71}Ni	−55406.2	2.2				2.56 s	0.03	$(9/2^+)$	23	21Pe08	T	β^-=100	*
$^{71}Ni^m$	−54907.7	2.3	498.5	0.7		2.3 s	0.3	$(1/2^-)$	23	09St07	T	β^-=100	*
^{71}Cu	−62711.1	1.5				19.4 s	1.4	$3/2^-*$	23			β^-=100	*
$^{71}Cu^m$	−59955.0	1.6	2756.1	0.4		271 ns	13	$(19/2^-)$	23	98Gr14	TJ	IT=100	*
^{71}Zn	−67326.3	1.5				2.40 m	0.05	$1/2^-*$	23	17Kr01	T	β^-=100	*
$^{71}Zn^m$	−67170.7	1.5	155.62	0.06		4.148 h	0.012	$9/2^+*$	23	17Kr01	T	$\beta^-\approx$100;IT ?	*
^{71}Ga	−70139.1	0.8				STABLE		$3/2^-*$	23			IS=39.892 50	*
^{71}Ge	−69906.6	0.8				11.4695 d	0.0026	$1/2^-*$	23	26Ca02	T	ε=100	*
$^{71}Ge^m$	−69708.2	0.8	198.371	0.012		20.22 ms	0.12	$9/2^+$	23			IT=100	
^{71}As	−67893	4				65.30 h	0.07	$5/2^-*$	23	90Me01	T	β^+=100	*
^{71}Se	−63146.5	2.8				4.74 m	0.05	$(5/2^-)$	23	80Te01	T	β^+=100	
$^{71}Se^m$	−63097.7	2.8	48.78	0.05		5.6 μs	0.7	$(1/2^-)$	23	82Ha32	TJ	IT=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
^{71}Se^n	−62886.0	2.8	260.48	0.10		19.0	μs 0.5	$(9/2^+)$	23	00Ch07	T	IT=100	
^{71}Br	−56502	5				21.5	s 0.4	$(5/2)^-$	23			β^+=100	*
^{71}Kr	−46056	24				94.62	ms 0.19	$(1/2)^-$	23	25Al08	TDJ	β^+=100;β^+p=2.85 17	*
^{71}Rb	−32080#	200#			*			$5/2^-$#				p ?	
*^{71}Fe	T : average 14XuZZ=34.7(3.6),36.6(2.0) 13Ma87=42(6) 11Da08=28(5)												**
*^{71}Co	D : %β^-n from 20MoZS; others: 12Ra10<2.7(0.9) and 05Ma95>3(1)												**
*^{71}Co	T : others: 19Ly02=86(10) 12Ra10=10RaZY=80(3) 04Sa59=79(5) 03So21=97(2) 98Am04=210(40) 95Am.A=200(50)												**
*^{71}Ni	T : average 21Pe08=2.49(0.18) 01Fr21,98Fr15=2.56(0.03); other: 90Be13=1.86(0.35)												**
*^{71}Ni^m	E : from E_γ=252.6(0.4) + 812.8(0.5) - 566.9(0.2) in 12Ra10												**
*^{71}Cu	T : average 99Pr10=19(3) 83Ru06=19.5(1.6)												**
*^{71}Cu	J : 20De21,10Vi07,09Fl03=3/2												**
*^{71}Cu^m	T : average 98Is11=250(30) 98Gr14=275(14)												**
*^{71}Zn	T : average 17Kr01=2.36(0.08) 61Th04=2.45(0.10)												**
*^{71}Zn	J : 19Xi07,17Wr01=1/2												**
*^{71}Zn^m	J : 19Xi07,17Wr01=9/2												**
*^{71}Zn^m	T : average 17Kr01=4.155(0.004) 12Re05=4.127(0.007); Birge ratio=3.47												**
*^{71}Zn^m	D : the 156 keV depopulating transition was not observed experimentally and only a limit of %IT<0.05 is given in 70Zo01												**
*^{71}Zn^m	E : 15BaZY=155.62(0.06)												**
*^{71}Ga	J : 17Fa09,10Ch16,10Bi.A,33Ca02,32Ja04=3/2												**
*^{71}Ge	T : average 26Ca02=11.476(0.004,stat) 25De26=11.4645(0.0036,stat) 24No04=11.4683(0.0017,stat)(0.0082,syst); others: 23Co07=11.46(0.04)												**
*^{71}Ge	T : 22Ba21=11.11(0.69),11.05(0.72) 85Ha06=11.43(0.03) 71Ge02=11.15(0.15)												**
*^{71}Ge	J : 24Wa45,20Ka58,70Be29,66Ch02,63Ch12=1/2												**
*^{71}As	J : 71He06=5/2												**
*^{71}Br	T : average 82Ha32=21.4(0.6) 81Vo04=21.5(0.5)												**
*^{71}Kr	T : average 25Al08=94.50(0.06,stat)(+0.21-0.23,syst) 22Wa34=94.9(0.34,stat)(0.11,syst); others: 19Si33=98.8(0.3) 14Ro14=92(9) 97Oi01=100(3)												**
*^{71}Kr	T : 81Ew01=97(9) 95Bl23=64(+8-5) 25Al08=94.7(0.5,stat)(+1.6-1.5,syst),94.08(0.22,stat)(0.33,syst)												**
*^{71}Kr	D : %β^+p average 25Al08=2.77(0.24) 22Wa34=3.06(0.27) 97Oi01=2.1(0.7); other: 95Bl23=5.2(0.6) conflicting not trusted												**
*^{71}Kr	J : other: 22Wa34=(5/2)-												**
^{72}Cr	5570#	600#				1#	ms >300ns	0^+		26Sh.1	I	β^- ?;β^-n ?	
^{72}Mn	−11170#	500#				12#	ms >620ns		13	13Ta14	I	β^- ?;β^-n ?;β^-2n ?	
^{72}Fe	−29250#	200#				17.0	ms 1.0	0^+	09	13Ma87	TD	β^-=100;β^-n ?;β^-2n ?	*
^{72}Co	−40300#	300#			*	51.5	ms 0.3	$(6^-,7^-)$	09	16Mo07	T	β^-=100;β^-n=11.2 14; β^-2n=1.34 16	*
^{72}Co^m	−40100#	360#	200#	200#	*	47.8	ms 0.5	$(0^+,1^+)$		16Mo07	TJ	β^-=100	
^{72}Ni	−54226.1	2.2				1.57	s 0.05	0^+	09			β^-=100;β^-n ?	
^{72}Cu	−59783.0	1.4				6.63	s 0.03	2^-*	09	20De21	J	β^-=100	*
^{72}Cu^m	−59512.7	1.7	270.3	1.0		1.76	μs 0.03	(6^-)	09	98Gr14	ETJ	IT=100	*
^{72}Zn	−68145.5	2.1				46.5	h 0.1	0^+	09			β^-=100	
^{72}Ga	−68588.2	0.8				14.05	h 0.03	3^-*	09	24Do05	T	β^-=100	*
^{72}Ga^m	−68468.5	0.8	119.66	0.05		39.68	ms 0.13	(0^+)	09			IT=100	
^{72}Ge	−72585.91	0.08				STABLE		0^+	09			IS=27.45 15	
^{72}Ge^m	−71894.48	0.09	691.43	0.04		444.2	ns 0.8	0^+	09	24Fr05	TE	IT=100	*
^{72}As	−68242.32	0.11				26.0	h 0.1	2^-*	09			β^+=100	*
^{72}Se	−67868.2	2.0				8.40	d 0.08	0^+	09			ε=100	
^{72}Br	−59061.8	1.0				78.6	s 2.4	1^+	09			β^+=100	
^{72}Br^m	−58961.0	1.0	100.76	0.15		10.6	s 0.3	(3^-)	09			IT≈100;β^+ ?	
^{72}Kr	−53941	8				17.16	s 0.18	0^+	09	03Pi03	T	β^+=100	*
^{72}Rb	−38100#	200#			*	103	ns 22	1^+#	21	17Su31	T	p ?	*
^{72}Rb^m	−38000#	220#	100#	100#	*			3^-#				p ?	
*^{72}Fe	T : average 14XuZZ=16.9(1.0) 13Ma87=19(4)												**
*^{72}Co	T : others: 14Xu07=52.8(1.6) 14Ra20=55(4) 05Ma59=59(2) 03Sa40=62(3)												**
*^{72}Co	J : β^- feeding of the 6^+ level in ^{72}Ni and shell model												**
*^{72}Co	D : %β^-n,%β^-2n from 20MoZS; %β^-n other: 05Ma95>6(2)												**
*^{72}Cu	J : 20De21,10Fl02,10Vi07=2												**
*^{72}Cu^m	D : no β-decay branch observed in 05Th.A												**
*^{72}Ga	T : unweighted average 24Do05=13.94(0.02) 12Kr07=14.025(0.010) 89Ab05=14.095(0.003) 61Wy01=14.12(0.02) 50Bi20=14.08(0.02); Birge ratio=5.06;												**
*^{72}Ga	T : others: 74BaZB=14.3(0.3) 50Si02=14.25(0.10) 43Ma03=14.25(0.20) 39Sa02=14.1(0.2)												**
*^{72}Ga	J : 13Ma15,11Ma45,10Bi.A,60Ch13=3												**
*^{72}Ge^m	E : other (mass measurement): 24Fr05=692.8(1.9)												**
*^{72}Ge^m	T : from 84Br24=444.2(0.8); other (recent): 24Fr05=23.9(0.6) ms for q=32^+												**
*^{72}As	J : 69PhZZ=2												**
*^{72}Kr	T : average 03Pi03=17.1(0.2) 73Da22=17.4(0.4)												**
*^{72}Rb	J : from 19Si33=π3/2[321]⊗ν1/2[321],$K^\pi=1^+$; similarity with the mirror ^{72}Br												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{73}Mn	−6700#	600#				10# ms >410ns	5/2−#	19	17Su15	I	β^- ?	
^{73}Fe	−23990#	300#				12.9 ms 1.6	7/2+#	19	14XuZZ	T	β^-=100;β^-n ?;β^-2n ?	
^{73}Co	−37640#	300#				42.0 ms 0.8	(7/2−)	19	20Go10	JTD	β^-=100;β^-n=18 3;β^-2n=3.9 4	*
^{73}Ni	−50107.8	1.5				836 ms 28	(9/2+)	19	21Pe08	T	β^-=100;β^-n ?	*
^{73}Cu	−58987.7	1.5				4.20 s 0.12	3/2−*	19	00KoZH	TD	β^-=100;β^-n=0.029 6	*
^{73}Zn	−65593.4	1.9				24.5 s 0.2	1/2−*	19	17Ve05	T	β^-=100	*
^{73}Zn^m	−65397.9	1.9	195.5	0.2		13.0 ms 0.2	5/2+*	19	18Ya11	J	IT=100	
^{73}Ga	−69699.3	1.7				4.86 h 0.03	1/2−*	19			β^-=100	*
^{73}Ga^m	−69699.2	1.7	0.15	0.09		< 200 ms	3/2−		17Ve05	E	β^- ?;IT ?	*
^{73}Ge	−71297.53	0.06				STABLE	9/2+*	19			IS=7.76 8	*
^{73}Ge^m	−71284.25	0.06	13.2845	0.0015		2.91 μs 0.03	5/2+	19			IT=100	
^{73}Ge^n	−71230.80	0.06	66.725	0.009		499 ms 11	1/2−	19			IT=100	
^{73}As	−70953	4				80.30 d 0.06	3/2−	19			ε=100	
^{73}As^m	−70525	4	427.902	0.021		5.7 μs 0.2	9/2+	19			IT=100	
^{73}Se	−68227	7				7.17 h 0.02	9/2+*	19	88Be39	J	β^+=100	*
^{73}Se^m	−68201	7	25.71	0.04		39.8 m 1.7	3/2−	19			IT=72.6 3;β^+=27.4 3	
^{73}Br	−63642	5				3.4 m 0.2	1/2−	19			β^+=100	
^{73}Br^m	−63615	5	26.92	0.09		1.7 μs 0.4	(5/2)−		90He08	TD	IT=100	*
^{73}Kr	−56552	7				27.3 s 1.0	(3/2)−	19			β^+=100;β^+p=0.25 3	
^{73}Kr^m	−56118	7	433.55	0.13		107 ns 10	(9/2+)	19			IT=100	
^{73}Kr^i	−53350#	120#	3204#	118#			T=3/2		20Ho17	E		
^{73}Rb	−46010	40				<81ns	3/2−#	19			p≈100;β^+ ?	
^{73}Rb^i	−42809	20	3200	40	p		(5/2−) T=3/2	19	20Ho06	JD	p=100	*
^{73}Sr	−31950#	400#				23.5 ms 1.4	(5/2−)	19	20Ho06	TDJ	β^+=100;β^+p=63 3	*
*^{73}Co	D : %β^-n,%β^-2n from 20MoZS; others: 20Go10=6(3) 12Ra10<22(8) 05Ma95>9(4) 10Ho12<7.9											**
*^{73}Co	T : average 20Go10=43(1), supersedes 12Ra10=42(3), 14Xu07=40.4(1.3), supersedes 14Xu.A=40.5(3.3), 11Da08,04Sa59=41(4) 10Ho12=41(6)											**
*^{73}Ni	T : average 98Fr15,01Fr21=840(30) 21Pe08=810(80)											**
*^{73}Cu	T : average 00KoZH=4.22(0.15) 98Hu20=4.4(0.3) 83Ru06=3.9(0.3)											**
*^{73}Cu	J : 20De21,17De30,10Vi07,09Fl03=3/2											**
*^{73}Zn	J : 19Xi07,17Wr01,18Ya11=1/2											**
*^{73}Ga	J : 10Ch16,10Bi.A=1/2											**
*^{73}Ga^m	E : from <0.3 keV in 17Ve05											**
*^{73}Ga^m	T : from 10Ch16											**
*^{73}Ge	J : 24Wa45,49To09=9/2											**
*^{73}Se	T : average 21Ha10=7.18(0.02,stat)(0.004,sys) 76Bo19=7.08(0.15) 69Ma21=7.18(0.09) 67Ra08=7.0(0.1) 60Ri09=7.1(0.2); other: 56Ha10=7.1											**
*^{73}Br^m	T : from τ=1.4-9.1 μs from intensity balance in 90He08											**
*^{73}Rb^i	J : other: 93Ba61=1/2−, T=3/2											**
*^{73}Sr	T : average 20Ho06=23.1(1.4) 19Si33=28(+5-4); others: 20Ho06=23.5(1.8) 19Si33=24.3(5.3) using a least-squares fit analysis											**
^{74}Mn	−470#	600#				6# ms >300ns			26Sh.1	I	β^- ?;β^-n ?	
^{74}Fe	−20660#	400#				5 ms 5	0+	17	10Oh02	I	β^-=100;β^-n ?;β^-2n ?	*
^{74}Co	−33300#	400#				31.3 ms 1.3	7−#	17	10Ho12	TD	β^-=100;β^-n=16 15;β^-2n=2.5 5	*
^{74}Ni	−48448.0	2.8				502.9 ms 1.8	0+	17	24Pe.A	T	β^-=100;β^-n ?	*
^{74}Cu	−56010	5				1.606 s 0.009	2−*	17	00KoZH	TD	β^-=100;β^-n=0.075 16	*
^{74}Zn	−65756.7	2.5				95.6 s 1.2	0+	17			β^-=100	
^{74}Ga	−68049.6	3.0				8.12 m 0.12	(3−)*	17			β^-=100	*
^{74}Ga^m	−67990	3	59.571	0.014		9.5 s 1.0	(0)(+#)	17			IT=75 25;β^- ?	
^{74}Ge	−73422.452	0.013				STABLE	0+	06			IS=36.52 12	
^{74}As	−70860.1	1.7				17.778 d 0.017	2−	06	12Ba12	T	β^+=66 2;β^-=34 2	*
^{74}Se	−72213.212	0.015				STABLE >2.3Ey	0+	06	20Ba08	T	IS=0.86 3;2β^+ ?	
^{74}Br	−65288	6				25.4 m 0.3	(0−)	06			β^+=100	
^{74}Br^m	−65274	6	13.58	0.21		46 m 2	4+*	06			β^+=100	*
^{74}Kr	−62331.8	2.0				11.50 m 0.11	0+	06			β^+=100	
^{74}Rb	−51916	3				64.78 ms 0.03	0+* T=1	06	11Ma66	J	β^+=100;β^+p ?	*
^{74}Sr	−40970	30				27.6 ms 2.6	0+	15	19Si33	T	β^+=100;β^+p ?	*
*^{74}Fe	T : symmetrized from 14XuZZ=8.2(+2.6-7.1)											**
*^{74}Co	T : average 14Xu07=31.6(1.5) 05Ma95=30(3) 10Ho12=34(+6-9); other (discrepant): 11Da08=19(7)											**
*^{74}Co	D : %β^-n,%β^-2n from 20MoZS; others: 10Ho12=18(15) 05Ma95>26(9)											**
*^{74}Ni	T : average 24Pe.A=502(2) 14Xu07=507.7(4.6); others: 98Fr15=900(200) 98Am04=540(160)											**
*^{74}Cu	T : average 22Na07,19Le05=1.62(0.05) 05Va19=1.75(0.06) 00KoZH=1.68(0.03) 91Kr15=1.594(0.010) 90Be13=1.51(0.27) 89Wi11=1.59(0.05)											**
*^{74}Cu	J : 20De21,17De30,10Fl02,10Vi07=2											**
*^{74}Ga	J : 13Ma15,11Ma45,10Bi.A=(3)											**
*^{74}As	T : average 12Ba12=17.94(0.09) 72Em01=17.77(0.02),17.93(0.06) 68Bo25=17.7(0.2) 62Ei02=17.74(0.05) 53Wa40=17.82(0.13) 48Mc31=17.5(0.1)											**
*^{74}Br^m	J : 80Ek02=4											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{74}$Rb	T : average 01Ba12=64.761(0.031) 02Oi02,01Oi04=64.90(0.09); other (recent): 19Si33=65.1(0.5) (downweighted)											**
$*^{74}$Sr	T : average 19Si33=27.7(2.8) 14He29=27(8)											**
^{75}Mn	4800#	600#				8# ms	>300ns	$5/2^-$#		26Sh.1	I	β^- ?;β^-n ?	
^{75}Fe	−14700#	500#				9# ms	>620ns	$9/2^+$#	13	13Ta14	I	β^- ?;β^-n ?;β^-2n ?	
^{75}Co	−30260#	400#				26.5 ms	1.2	$(7/2^-)$	13	14Xu07	T	β^-=100;β^-n>15;β^-2n ?	*
^{75}Co^m	−28350#	400#	1914	2		13 μs	6	$(1/2^-)$		21Es05	ETJ	IT=100	
^{75}Ni	−44047	6				331.6 ms	3.2	$9/2^+$#	13	14Xu07	T	β^-=100;β^-n=6.2 8	*
^{75}Cu	−54470.2	0.7				1.224 s	0.003	$5/2^-$*	13	22Na07	T	β^-=100;β^-n=2.7 4	*
^{75}Cu^m	−54408.2	0.8	62.0	0.3		310 ns	8	$1/2^-$	13	16Pe14	ET	IT=100	*
^{75}Cu^n	−54403.8	0.8	66.4	0.3		148 ns	5	$3/2^-$	13	16Pe14	ET	IT=100	*
^{75}Zn	−62683.5	1.2				10.2 s	0.2	$7/2^+$*	13	26Mu.A	IE	β^-=100	*
^{75}Zn^m	−62556.6	1.2	126.94	0.09		> 5# s		$1/2^-$*		26Mu.A	IT	β^- ?;IT ?	*
^{75}Ga	−68460.6	0.7				126 s	2	$3/2^-$*	13			β^-=100	*
^{75}Ge	−71856.97	0.05				82.78 m	0.04	$1/2^-$*	13			β^-=100	*
^{75}Ge^m	−71717.28	0.06	139.69	0.03		47.7 s	0.5	$7/2^+$	13			IT=99.970 6;β^-=0.030 6	
^{75}Ge^n	−71664.78	0.08	192.19	0.06		216 ns	5	$5/2^+$	13			IT=100	
^{75}As	−73035.53	0.04				STABLE		$3/2^-$*	13			IS=100	*
^{75}As^m	−72731.61	0.04	303.9243	0.0008		17.62 ms	0.23	$9/2^+$	13			IT=100	
^{75}Se	−72169.49	0.07				119.78 d	0.03	$5/2^+$*	13	FGK259	T	ε=100	*
^{75}Br	−69107	4				96.7 m	1.3	$3/2^-$*	13			β^+=100	*
^{75}Kr	−64324.5	2.5				4.60 m	0.07	$5/2^+$*	13	95Ke04	J	β^+=100	
^{75}Rb	−57218.7	1.2				19.0 s	1.2	$3/2^-$*	13			β^+=100	*
^{75}Sr	−46273	10				85.2 ms	2.3	$(3/2^-)$	13	19Si33	T	β^+=100;β^+p=5.2 9	*
^{75}Y	−32290#	300#				100# μs		$5/2^+$#				β^+ ?;β^+p ?;p ?	
$*^{75}$Co	D : %β^-n from 21Es05>15; other: 11Ho21<16											**
$*^{75}$Co	T : from 14Xu07=26.5(1.2); others: 20Go10=27(13) 11Ho21=30(11)											**
$*^{75}$Ni	D : %β^-n from 25To04=6.20(0.83); other: 10Ho12=10.0(2.8)											**
$*^{75}$Ni	T : others: 14Xu.A=334.3(4.8) 05Ho08=344(+20-24) 98Am04=600(200)											**
$*^{75}$Cu	T : average 22Na07=1.23(0.04) 11Il01=1.222(0.008) 91Kr15=1.224(0.003) 00KoZH=1.225(0.007)											**
$*^{75}$Cu	D : %β^-n average 00KoZH=2.2(0.5) 85Re01=3.5(0.6)											**
$*^{75}$Cu	J : 20De21,17De30,11Ko36,10Vi07,09Fl03=5/2											**
$*^{75}$Cu^m	J : from 19Ic02											**
$*^{75}$Cu^m	E : average 16Pe14=61.7(0.4) 12Ka36=62.5(0.5); other: 10Da06=61.8(0.5)											**
$*^{75}$Cu^m	T : other: 10Da06=370(40)											**
$*^{75}$Cu^n	J : from 19Ic02											**
$*^{75}$Cu^n	E : average 16Pe14=66.2(0.4) 12Ka36=66.8(0.5); other: 10Da06=66.5(0.5)											**
$*^{75}$Cu^n	T : average 16Pe14=149(5) 12Ka36=134(+25-20); other: 10Da06=170(15)											**
$*^{75}$Zn	J : 19Xi07,17Wr01=7/2											**
$*^{75}$Zn	I : 26Mu.A based on production yield arguments argues wheather the $7/2^+$ or the $1/2^-$ state should be associated with the gs. Systematics in ^{77}Ge											**
$*^{75}$Zn	I : and ^{79}Se isotones suggest J^π=$7/2^+$ for the gs											**
$*^{75}$Zn^m	J : 19Xi07,17Wr01=1/2											**
$*^{75}$Zn^m	I : 26Mu.A based on production yield arguments argues wheather the $7/2^+$ or the $1/2^-$ state should be associated with the isomer. Systematics in											**
$*^{75}$Zn^m	I : ^{77}Ge and ^{79}Se isotones suggest J^π=$1/2^-$ is isomer											**
$*^{75}$Ga	J : 17Fa09,10Bi.A,10Ch16=3/2											**
$*^{75}$Ge	J : 70Ol02=1/2											**
$*^{75}$As	J : 54Fl41,52Je05,48Da08,32To01=3/2											**
$*^{75}$Se	J : 55Aa06=5/2											**
$*^{75}$Br	J : 80Ek02=3/2											**
$*^{75}$Rb	J : 11Ma66=3/2											**
$*^{75}$Sr	T : average 19Si33=81.7(3.4) 03Hu01=88(3); other: 01Ki13=71(+71-24) and 80(+400-40)											**
^{76}Fe	−10590#	600#				3# ms	>410ns	0^+	24	17Su15	I	β^- ?;β^-n ?	
^{76}Co	−25430#	500#			*	23 ms	6	(8^-)	24	14Xu07	TD	β^-=100;β^-n ?;β^-2n ?	*
^{76}Co^m	−25330#	510#	100#	100#	*	16 ms	4	(1^-)	24	15So23	TJD	β^-=100;β^-n ?;β^-2n ?	
^{76}Co^n	−24690#	510#	740#	100#		2.99 μs	0.27	(3^+)	24	15So23	TJD	IT=100	*
^{76}Ni	−42000#	200#				238.7 ms	1.6	0^+	24	24Pe.A	T	β^-=100;β^-n=8.8 8	*
^{76}Ni^m	−39580#	200#	2418.2	0.5		547.8 ns	3.3	(8^+)	24	15So23	TE	IT=100	
^{76}Cu	−51011.5	2.0			&	645 ms	9	6^-#	24	25Ol02	T	β^-=100	*
^{76}Cu^m	−50946.6	1.4	64.8	2.5	MD &	643 ms	4	3^-*	24	24Ca11	ETD	$\beta^-\approx$100;IT ?;β^-n=7.0 4	*
^{76}Zn	−62303.0	1.5				6.44 s	0.04	0^+	24	25Ol02	T	β^-=100	*
^{76}Ga	−66296.6	2.0				30.6 s	0.6	2^-*	24			β^-=100	*
^{76}Ge	−73212.899	0.018				2.022 Zy	0.042	0^+	24	23Ag05	T	IS=7.75 12;2β^-=100	*
^{76}As	−72292.70	0.05				26.254 h	0.011	2^-*	24	14Do08	D	$\beta^-\approx$99.973;$\varepsilon\approx$0.027	*
^{76}As^m	−72248.27	0.05	44.4254	0.0007		1.84 μs	0.06	$(1)^+$	24			IT=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{76}Se	−75251.960	0.016			STABLE	0^+	24			IS=9.23 7	
^{76}Br	−70289	9			16.16 h 0.12	1^-*	24			β^+=100	*
^{76}Br^m	−70186	9	102.590	0.028	1.316 s 0.019	$(4)^+$	24	80Ha23	TDEIT=?;β^+=0.30 25		*
^{76}Kr	−69014	4			14.79 h 0.05	0^+	24			β^+=100	
^{76}Rb	−60479.1	0.9			36.21 s 0.20	1^-*	24	78Ha08	D	β^+=100;$\beta^+\alpha$=3.8e-7 10	*
^{76}Rb^m	−60162.1	0.9	316.96	0.08	3.050 μs 0.007	(4^+)	24	00Ch07	T	IT=100	
^{76}Sr	−54256	9			7.89 s 0.07	0^+	24	04De24	TD	β^+=100;β^+p=3.4e-3 8	*
^{76}Y	−38720#	300#			28 ms 9	1^-#	24	19Si33	TJ	β^+ ?;p ?;β^+p ?	*
*^{76}Co	T : symmetrized from 14Xu07=21.7(+6.5-4.9)										**
*^{76}Co	J : from 15So23										**
*^{76}Co^n	E : 15So23=638.4(0.8) above ^{76}Co^m										**
*^{76}Co^n	T : symmetrized from 15So23=2.96(+0.29-0.25)										**
*^{76}Ni	D : from 25To04=8.78(0.82); other: 10Ho12=14.0(3.6)										**
*^{76}Ni	T : average 24Pe.A=241(2) 14Xu07=234.6(2.7), supersedes 14Xu.A=237.8(9.9); others: 10Ho12=238(18), supersedes 05Ho08=238(+15-18),										**
*^{76}Ni	T : 98Am04=240(+550-190)										**
*^{76}Cu	I : existence of two β-decaying states was proposed in 90Wi12, but was rebuffed by the same authors in 22Si25. Existence established in 24Ca11										**
*^{76}Cu	I : via direct PI-ICR mass measurements.										**
*^{76}Cu	T : from 25Ol02=630-660 ms, in disagreement with 90Wi12=1.27(0.30) s. 22Si25 (same as 90Wi12) stated that 90Wi12=1.27(0.30) s was in error and that										**
*^{76}Cu	T : the gs half-life is similar to that for the isomer. 24Ca11 suggests that the ground state is longer-lived than the isomer										**
*^{76}Cu	J : from the proposed direct β feeding to the 6^+ level at 2349.7 keV in ^{76}Zn in 22Si25 and to the 2634-keV level (possible 6^-) in 21Ch56										**
*^{76}Cu^m	T : average 22Si25=637(20) 10Ho12=599(18) 05Va19=653(24) 91Kr15=641(6) 00KoZH=647(5); others: 24Ca11=672(110) 86ReZR=610(100) 87LuZX=350(80)										**
*^{76}Cu^m	J : 20De21,17De30=3										**
*^{76}Cu^m	D : %β^-n: average 25To04=6.65(0.55) 09Wi03=7.2(0.5); others: 00KoZH=2.2(0.5) 10Ho12<7.2 86ReZR=3(2); %IT 24Ca11=10-17%, but it is not trusted										**
*^{76}Cu^m	D : since the ^{76}Cu half-life is not well established										**
*^{76}Zn	T : others: 81Ru07=4.9(0.6) 74Gr29=5.7(0.3) 70OsZZ=5.4(0.3) 81Gi17=5.7										**
*^{76}Ga	T : average 16Do05=30.6(0.3) 85Ta01=32.6(0.6) 74Gr29=29.8(0.4); Birge ratio=2.7; others: 81Ru07=23.9(1.9) 71Ca39=27.1(0.2) 70OsZZ=29.0(0.3)										**
*^{76}Ga	T : 61Ta08=32(3)										**
*^{76}Ga	J : 11Ma45,10Bi.A=2										**
*^{76}Ge	T : 2ν-$\beta\beta$ from 23Ag05=2.022(0.018,stat)(0.038,syst); others(experiment): 05Ba60=1.78(0.01,stat)(+0.07-0.09,syst)(0.01,syst) 99Mo40=1.45(0.15)										**
*^{76}Ge	T : 96Aa02=1.1(0.2) 90Mi23=1.13(+0.31-0.15) 90Va18=0.9(0.1) others (evaluations): 25Pr02=1.75(0.09) 20Ba63=1.88(0.08); 0ν-$\beta\beta$: 26Ac01>100 Yy;										**
*^{76}Ge	T : others: 23Ar02>83 Yy 24Zh47>0.1 Yy 22Da13>56.2 Zy 20Ag05>180 Yy, supersedes 20Da08>90 Yy 18Ag03>80 Yy and 13Ag11>30 Yy, 19Al24>27 Yy										**
*^{76}Ge	T : 18Aa02>19 Yy 05Ba60>15.5 Yy all at (90% C.L.);										**
*^{76}As	J : 61Ch10,58Pi43=2										**
*^{76}Br	J : 60Li11=1										**
*^{76}Br	T : average 12Ba12 = 16.1(1.4) 71La01=16.1(0.2) 60Bu22=16.3(0.3) 59Gi46=16.1(0.2) 51Ho42=16.5(0.5)										**
*^{76}Br^m	T : average 80Ha23=1.31(0.02) 81Vo04=1.35(0.05); other: 78Sc30=1.49(0.02)										**
*^{76}Rb	J : 11Ma66,78Bo38,78Fi01=1										**
*^{76}Rb	T : average 93Al03=36.2(0.2) 75Ra03=36.8(1.5); other: 75Bo52=39.1(0.6)										**
*^{76}Sr	T : other (discrepant): 92Gr09=8.9(0.3)										**
*^{76}Y	T : symmetrized from 19Si33=24(+12-6)										**
*^{76}Y	J : analogous to the mirror nucleus ^{76}Br (J^π=1^-)										**
^{77}Fe	−3140#	600#			2# ms >300ns	5/2$^+$#		26Sh.1	I	β^- ?;β^-n ?	
^{77}Co	−21910#	600#			15 ms 6	7/2$^-$#	20			β^-=100;β^-n ?;β^-2n ?;β^-3n ?	*
^{77}Ni	−37250#	300#			158.9 ms 4.2	9/2$^+$#	20	14Xu07	T	β^-=100;β^-n=18.4 15;β^-2n ?	*
^{77}Cu	−48862.7	1.2			469.9 ms 1.6	5/2$^-*$	20	20De21	J	β^-=100;β^-n=30.5 9	*
^{77}Zn	−58789.2	2.0			2.08 s 0.05	7/2$^+*$	20			β^-=100	*
^{77}Zn^m	−58016.8	2.0	772.440	0.015	1.05 s 0.10	1/2$^-*$	20			β^-=66 7;IT=34 7	*
^{77}Ga	−65992.4	2.4			13.2 s 0.2	3/2$^-*$	20			β^-=100[gs=12,m=88]	*
^{77}Ge	−71212.87	0.05			11.211 h 0.003	7/2$^+$	20			β^-=100	
^{77}Ge^m	−71053.16	0.08	159.71	0.06	53.7 s 0.6	1/2$^-$	20			β^-=81 2;IT=19 2	
^{77}As	−73915.01	0.08			38.79 h 0.05	3/2$^-$	20			β^-=100	
^{77}As^m	−73439.53	0.09	475.48	0.04	114.0 μs 2.5	9/2$^+$	20			IT=100	
^{77}Se	−74599.48	0.05			STABLE	1/2$^-*$	20			IS=7.60 7	*
^{77}Se^m	−74437.56	0.05	161.9223	0.0010	17.36 s 0.05	7/2$^+$	20			IT=100	
^{77}Br	−73234.8	2.8			57.04 h 0.12	3/2$^-*$	20			β^+=100	*
^{77}Br^m	−73128.9	2.8	105.86	0.08	4.28 m 0.10	9/2$^+*$	20			IT=100	*
^{77}Kr	−70169.5	2.0			72.6 m 0.9	5/2$^+*$	20	19Ze02	T	β^+=100	*
^{77}Kr^m	−70103.0	2.0	66.50	0.05	118 ns 12	3/2$^-$	20			IT=100	
^{77}Rb	−64830.5	1.3			3.78 m 0.04	3/2$^-*$	20	93Al03	T	β^+=100	*
^{77}Sr	−57803	8			9.0 s 0.2	5/2$^+*$	20	13Ma15	J	β^+=100;β^+p=0.08 3	*
^{77}Y	−46908	4			63 ms 17	5/2$^+$#	20	00We.A	D	$\beta^+\approx$100;p ?;β^+p ?	*
^{77}Zr	−32220#	400#			100# μs	3/2$^-$#	20	17Su31	I	β^+ ?;β^+p ?;p ?	
*^{77}Co	T : symmetrized from 14Xu07=13.0(+7.2-4.3)										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{77}$Ni	D : %β^-n from 25To04=18.4(1.5); others: 10Ho12=30(24) 14XuZZ=24(16)										**
$*^{77}$Cu	J : 20De21,17De30,11Ko36=5/2										**
$*^{77}$Cu	D : %β^-n average 25To04=30.8(1.3) 18Ra27=29.2(3.0) 10Ho12=31.0(3.8) 09Il01=30.3(2.0) 09Wi03=30.0(2.7); other: 02Pf04=15(+10-5)										**
$*^{77}$Cu	T : average 14XuZZ=476.8(3.4) 09Pa35=467.4(2.1) 09Il01=480(9) 00KoZH=466(5) 91Kr15=469(8); others: 18Ra27=471(25) 10Ho12=466(+21-20), supersedes										**
$*^{77}$Cu	T : 05Ho08=450(+13-21)										**
$*^{77}$Zn	J : 19Xi07,17Wr01=7/2										**
$*^{77}$Zn^m	J : 19Xi07,17Wr01=1/2										**
$*^{77}$Ga	J : 10Ch16,10Bi.A=3/2										**
$*^{77}$Se	J : 54Da05,50Ge05,49St07=1/2										**
$*^{77}$Br	J : 80EkZY,59Gr92=3/2										**
$*^{77}$Br^m	J : 80EkZY,80Ek02=9/2										**
$*^{77}$Kr	T : average 19Ze02=71.25(0.42) 73Ba22=75(3) 71Bo30=74.7(0.4) 60Bu22=71.1(0.5) 57Be46=69(6); Birge ratio=3.46										**
$*^{77}$Kr	J : 95Ke04=5/2										**
$*^{77}$Rb	J : 78Ek05,78Ek04,76EkZX=3/2										**
$*^{77}$Sr	J : 13Ma15,92Li11=5/2										**
$*^{77}$Y	T : symmetrized from 01Ki13=57(+22-12)										**
^{78}Co	−15320#	700#			11# ms	>410ns		22	17Su15	I β^- ?;β^-n ?;β^-2n ?	
^{78}Ni	−34880#	400#			122.2 ms	5.1	0^+	09	14Xu07	T β^-=100;β^-n=25.8 38;β^-2n ?	*
^{78}Cu	−44787	6			330.7 ms	2.0	$(6^-)*$	09	14Xu07	T β^-=100;β^-n=40.5 14;β^-2n ?	*
^{78}Cu^m	−43590#	50#	1200#	50#	3.8 ms	0.4	(0^-)		23Pe06	ETJ IT=100	*
^{78}Zn	−57483.2	1.9			1.47 s	0.15	0^+	09		β^-=100;β^-n ?	
^{78}Zn^m	−54809.5	2.0	2673.7	0.6	320 ns	6	(8^+)	09	12Ka36	ET IT=100	*
^{78}Ga	−63704.1	1.1			5.09 s	0.05	2^-*	09		β^-=100	*
^{78}Ga^m	−63205.2	1.2	498.9	0.5	110 ns	3		09	10Da06	ET IT=100	*
^{78}Ge	−71862	4			88.0 m	1.0	0^+	09		β^-=100	
^{78}As	−72817	10			90.7 m	0.2	2^-	09		β^-=100	
^{78}Se	−77025.92	0.17			STABLE		0^+	09		IS=23.69 22	
^{78}Br	−73452	4			6.34 m	0.03	1^+*	09	73Hi01	DT $\beta^+\approx$100;$\beta^-<$0.01	*
^{78}Br^m	−73271	4	180.89	0.13	119.3 μs	0.6	(4^+)	09		IT=100	*
^{78}Kr	−74178.3	0.3			22 Zy	11	0^+	09	20Ba63	T IS=0.355 3;2β^+ ?	*
^{78}Rb	−66935	3			17.66 m	0.03	0^+*	09		β^+=100	*
^{78}Rb^m	−66888	3	46.84	0.14	910 ns	40	(1^-)	09		IT=100	
^{78}Rb^n	−66824	3	111.19	0.22	5.74 m	0.03	4^-*	09		β^+=91 2;IT=9 2	*
^{78}Rb^x	−66861	12	74	12	$R=2.0\sim0.5$		*spmix*				
^{78}Sr	−63171	6			156.1 s	2.7	0^+	09	11Pe29	T β^+=100	*
^{78}Y	−52335	3			54 ms	5	(0^+) T=1	09	01Ga24	TJ β^+=100;β^+p ?	*
^{78}Y^m	−51958.6	0.9	376	3	5.8 s	0.6	(5^+)	09		β^+=100;β^+p ?	
^{78}Zr	−41410#	400#			31 ms	13	0^+	09	25Zi02	TD β^+=100;β^+p ?	*
$*^{78}$Ni	D : %β^-n from 25To04=25.8(3.8)										**
$*^{78}$Ni	T : other: 05Ho08=110(+100-60)										**
$*^{78}$Cu	D : %β^-n average 25To04=40.2(1.5) 10Ho12=44.0(5.4); other: 09Wi03=65(8)										**
$*^{78}$Cu	J : 20De21,17De30,11Ko36=(6); other: 12Ko29=(5)										**
$*^{78}$Cu	T : others: 14Xu.A=335.0(10.9) 12Ko29=338(11) 10Ho12=335(17), supersedes 05Ho08=323(+11-19), 05Va19=290(100) 91Kr15=342(11)										**
$*^{78}$Cu^m	E : estimated 50 keV above the 2^+ level at 1143 keV										**
$*^{78}$Zn^m	E : from 12Ko29; other: 12Ka36=2675.3(1.0)										**
$*^{78}$Zn^m	T : average 12Ka36=320(+9-8) 00Da07=319(9)										**
$*^{78}$Ga	J : 11Ma45,10Bi.A=2										**
$*^{78}$Ga^n	ET : other: E=559.6(0.7) keV, $T_{1/2}<$500 ns in ENSDF2009										**
$*^{78}$Br	T : average 25Ja06=6.34(0.08),5.82(0.07) 24An09=7.22(0.79),6.08(0.81) 73Hi01=6.46(0.04) 73ArZI=6.4(0.3) 62Va27=6.4(0.4) 61Sc11=6.47(0.10)										**
$*^{78}$Br	T : 61Ri02=6.5(0.1) 60Pi06=6.25(0.20) 51Ho42=6.5(0.5) 38Bu04=6.3(0.2) 37Sn02=6.4(0.1)										**
$*^{78}$Br	J : 80Ek02,80EkZY=1										**
$*^{78}$Br^m	T : average 82Be03=120(1) 70De46=119.2(1.0) 61Sc11=118.0(1.5); others: 69Ru10=111(10) 68Io01=123(25) 67Iv03,67Iv04=124(25) 71In04=80(2)										**
$*^{78}$Br^m	T : 65Mc03∼127										**
$*^{78}$Kr	T : 2ν-2K symmetrized from 20Ba63=19(+13-8); other (evaluation): 25Pr02=19(+13-8)										**
$*^{78}$Rb	J : 11Ma66,80EkZY,78Ek05,78Ek04,76EkZX=0										**
$*^{78}$Rb^n	J : 11Ma66,78Ek05,78Ek04,76EkZX=4										**
$*^{78}$Sr	T : average 11Pe29=155(3) 97Mu02=168(12) 92Gr09=159(8)										**
$*^{78}$Y	T : average 01Ga24=50(8) 01Ki13=55(+9-6); other: 25Zi02=42(+29-13)										**
$*^{78}$Zr	T : symmetrized from 25Zi02=25(+17-8)										**
^{79}Co	−9500#	700#			15# ms	>300ns	$7/2^-$#		26Sh.1	I β^- ?;β^-n ?	
^{79}Ni	−28160#	500#			44 ms	8	$5/2^+$#	16		β^-=100;β^-n ?;β^-2n ?	
^{79}Cu	−42410	100			241.9 ms	2.1	$(5/2^-)*$	16	25Si04	T β^-=100;β^-n=59.9 24;β^-2n ?	*
^{79}Zn	−53432.0	1.8			839.1 ms	7.5	$9/2^+*$	16	25To04	TD β^-=100;β^-n=0.62 17	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{79}Zn^m	−52490	7	942	7	MD	> 200 ms	1/2$^+$∗	16	17Wr01	J	β^- ?;IT ?	∗
^{79}Ga	−62548.4	1.2				2.848 s 0.003	3/2$^-$∗	16			β^-=100;β^-n=0.089 19	∗
^{79}Ge	−69472.3	0.7				18.98 s 0.03	(1/2)$^-$	16			β^-=100	
^{79}Ge^m	−69286.4	0.7	185.95	0.04		39.0 s 1.0	7/2$^+$#	16			β^-=96 1;IT=4 1	
^{79}As	−73636	5				9.01 m 0.15	3/2$^-$	16			β^-=100	
^{79}As^m	−72863	5	772.81	0.06		1.21 μs 0.01	(9/2)$^+$	16	98Gr14	T	IT=100	
^{79}Se	−75917.43	0.22				326 ky 18	7/2$^+$∗	16	14Do20	T	β^-=100	∗
^{79}Se^m	−75821.66	0.22	95.77	0.03		3.900 m 0.018	1/2$^-$	16	88Kl03	D	IT=99.945 13;β^-=0.055 13	∗
^{79}Br	−76068.0	0.9				STABLE	3/2$^-$∗	16			IS=50.65 9	∗
^{79}Br^m	−75860.4	0.9	207.61	0.09		4.85 s 0.04	9/2$^+$	16			IT=100	
^{79}Kr	−74442	3				34.969 h 0.025	1/2$^-$∗	16	21Te06	T	β^+=100	∗
^{79}Kr^m	−74312	3	129.77	0.05		50 s 3	7/2$^+$∗	16	95Ke04	J	IT=100	
^{79}Rb	−70802.9	2.0				22.9 m 0.5	5/2$^+$∗	16			β^+=100	∗
^{79}Sr	−65474.9	2.5				2.25 m 0.10	3/2$^-$∗	16			β^+=100	∗
^{79}Y	−57988.5	0.4				14.8 s 0.6	5/2$^+$#	16			β^+=100	
^{79}Zr	−46805.5	2.3				56 ms 30	5/2$^+$#	16			β^+=100;β^+p ?	
^{79}Nb	−32800#	500#				100# ns	9/2$^+$#				p ?;β^+ ?;β^+p ?	
∗^{79}Cu	J : 17De30=(5/2)											∗∗
∗^{79}Cu	T : average 25Si04=252.2(9.0) 14Xu07=241.3(2.1); others: 10Ho12=257(+29-26) 91Kr15=188(25)											∗∗
∗^{79}Cu	D : %β^-n from 25To04=59.9(2.4); others: 10Ho12=72(12) 91Kr15=55(17)											∗∗
∗^{79}Zn	J : 19Xi07,17Wr01,16Ya02=9/2											∗∗
∗^{79}Zn	D : %β^-n from 25To04; others: 10Ho12=2.2(1.4) 91Kr15=1.3(0.4)											∗∗
∗^{79}Zn	T : others: 10Ho12=746(42) 91Kr15=995(19) 76Ru01=2630(90) 68Ek01=1000(10) 74Gr29=3000(90)											∗∗
∗^{79}Zn^m	J : 19Xi07,17Wr01,16Ya02=1/2											∗∗
∗^{79}Ga	J : 17Fa09,10Ch16,10Bi.A=3/2											∗∗
∗^{79}Se	T : average 14Do20=278(18), supersedes 02Ji07=295(38), 02He19=280(36) and 01Ji04=290(50), 10Jo09=327(8) 07Bi01=377(19), Birge ratio=2.67											∗∗
∗^{79}Se	J : 53Ha50=7/2											∗∗
∗^{79}Se^m	T : average 19De24=3.884(0.009) (quoted in the text in hours is a typo) 90Ab02=3.92(0.01); Birge ratio=2.68											∗∗
∗^{79}Se^m	D : symmetrized from β^-=0.056(+0.012-0.013), determined from IT/β^--=1780(+560-310) in 88Kl03											∗∗
∗^{79}Br	J : 54Ki11,47To16,48To10,32To02,30Br01=3/2											∗∗
∗^{79}Br	D : from IS=[50.5,50.8] in 24Ci.A											∗∗
∗^{79}Kr	T : average 21Te06=34.98(0.03) 74Co05=35.04(0.10) 64Bo25=34.92(0.05); others: 52Ra13=34.5(0.2) 52Be55=36(1) 40Cr06=34.5(1.0)											∗∗
∗^{79}Kr	J : 95Ke04=1/2											∗∗
∗^{79}Rb	J : 80EkZY,78Th04,78Ek05,78Ek04,76EkZX=5/2											∗∗
∗^{79}Sr	J : 90Li28,90Bu12,87Bu11=3/2											∗∗
^{80}Co	−2300#	700#				8# ms >300ns			26Sh.1	I	β^- ?;β^-n ?	
^{80}Ni	−23240#	500#				30 ms 22	0$^+$	14			β^-=100;β^-n ?;β^-2n ?	∗
^{80}Cu	−36680#	300#				114.0 ms 2.4		14	25To04	TD	β^-=100;β^-n=56.5 28; β^-2n=0.28 16	∗
^{80}Zn	−51652.2	2.2				562.2 ms 3.0	0$^+$	14	14Xu07	T	β^-=100;β^-n=1.23 8	∗
^{80}Ga	−59223.7	2.9				1.91 s 0.03	(6$^-$)∗	14	25Li18	T	β^-=100;β^-n=0.86 7	∗
^{80}Ga^m	−59201.3	2.9	22.45	0.10		1.57 s 0.01	3$^-$∗	14	25Li18	T	β^-≈100;IT ?;β^-n ?	∗
^{80}Ge	−69535.3	2.1				29.5 s 0.4	0$^+$	05			β^-=100	
^{80}As	−72214	3				15.2 s 0.2	1$^+$	05			β^-=100	
^{80}Se	−77759.4	0.9				STABLE	0$^+$	05			IS=49.80 36;2β^- ?	
^{80}Br	−75888.9	0.9				17.68 m 0.02	1$^+$∗	05	25Ja06	T	β^-=91.7 2;β^+=8.3 2	∗
^{80}Br^m	−75803.1	0.9	85.843	0.004		4.4205 h 0.0008	5$^-$∗	05			IT=100	
^{80}Kr	−77893.1	0.7				STABLE	0$^+$	05			IS=2.286 10	
^{80}Rb	−72173.6	1.7				33.4 s 0.7	1$^+$∗	05	93Al03	T	β^+=100	∗
^{80}Rb^m	−71679.7	1.8	493.9	0.5		1.63 μs 0.04	(6$^+$)	05	92Do10	E	IT=100	
^{80}Sr	−70311	3				106.3 m 1.5	0$^+$	05			β^+=100	
^{80}Y	−61148	6				30.1 s 0.5	4$^-$	05			β^+=100	
^{80}Y^m	−60920	6	228.5	0.1		4.8 s 0.3	1$^-$	05	01No07	J	IT=81 2;β^+=19 2	∗
^{80}Y^n	−60835	6	312.6	0.9		4.7 μs 0.3	(2$^+$)	05			IT=100	
^{80}Zr	−54355.9	1.5				4.6 s 0.6	0$^+$	05	01Ki13	T	β^+=100	∗
^{80}Nb	−39000#	400#				20# μs	4$^-$#				p ?;β^+ ?;β^+p ?	
∗^{80}Ni	T : symmetrized from 14Xu07=23.9(+26.0-17.2)											∗∗
∗^{80}Cu	T : 25To04=114.0(2.4), supersedes 14Xu07=113.3(6.4); other: 10Ho12=170(+110-50)											∗∗
∗^{80}Cu	D : %β^-n from 25To04=56.5(2.8), supersedes 14XuZZ=58(9); %β^-2n from 25To04<0.55											∗∗
∗^{80}Zn	D : %β^-n average 25To04=1.10(0.12) 19To09=1.36(0.12); others: 91Kr15=1.0(0.5) 10Ho12<1.8											∗∗
∗^{80}Zn	T : others: 14Xu.A=559.5(8.6) 10Ho12=578(21) 91Kr15=540(30) 86Gi07=550(20) 86Ek01=530(20)											∗∗
∗^{80}Ga	T : from 25Li18=1.91(0.03); other: 13Ve03=1.9(0.1)											∗∗
∗^{80}Ga	D : %β^-n is probably a mixture of values for ^{80}Ga and ^{80}Ga^m											∗∗

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{80}$Ga	J : 10Ch50=(6)										**
$*^{80}$Ga^m	E : from a least-squares fit to E_γ in 14Li32										**
$*^{80}$Ga^m	T : from 25Li18=1.57(0.01); other: 13Ve03=1.3(0.2)										**
$*^{80}$Ga^m	J : 10Ch50=3										**
$*^{80}$Br	T : average 25Ja06=17.12(0.60),18.24(0.67) 72Co26=17.68(0.02)										**
$*^{80}$Br	J : 59Li21=1										**
$*^{80}$Br^m	J : 59Li21=5										**
$*^{80}$Rb	J : 77CoZP,74NeZI=1										**
$*^{80}$Y^m	J : 228.5 keV M3 to 4$^-$										**
$*^{80}$Zr	T : average 01Ki13=5.3(+1.1-0.9) 00Re03=4.1(+0.8-0.6)										**
^{81}Ni	−16090#	500#			30# ms	>410ns	$3/2^+$#	24	17Su15	I	β^- ?	
^{81}Cu	−31910#	300#			75.8 ms	3.8	$5/2^-$#	24	25To04	TD	β^-=100;β^-n=71.1 57;β^-2n=2.2 13	*
^{81}Zn	−46202	4			299.4 ms	2.1	$(1/2^+,5/2^+)$	24	20Pa26	TDJ	β^-=100;β^-n=18.88 73;β^-2n ?	*
^{81}Ga	−57627	3			1.218 s	0.003	$5/2^-$*	24	20Pa26	T	β^-=100;β^-n=12.4 5	*
^{81}Ge	−66291.7	2.1			6.4 s	0.2	$(9/2^+)$	24	22De07	TJ	β^-=100	*
^{81}Ge^m	−65612.6	2.1	679.14	0.04	9 s	2#	$(1/2^+)$	24	22De07	T	$\beta^-\approx$100;IT<1	*
^{81}As	−72533.3	2.6			33.3 s	0.8	$3/2^-$	24			β^-=100	
^{81}Se	−76388.9	0.9			18.45 m	0.08	$1/2^-$	24			β^-=100	*
^{81}Se^m	−76285.9	0.9	102.968	0.010	57.280 m	0.019	$7/2^+$	24			IT=99.913 15;β^-=0.087 15	*
^{81}Br	−77977.0	1.0			STABLE		$3/2^-$*	24			IS=49.35 9	*
^{81}Br^m	−77440.7	1.0	536.291	0.015	36 μs	3	$9/2^+$	24			IT=100	
^{81}Kr	−77696.2	1.1			207 ky	21	$7/2^+$*	24			ε=100	*
^{81}Kr^m	−77505.7	1.1	190.53	0.04	13.10 s	0.02	$1/2^-$*	24	87Lo06	T	IT=99.9975 4;ε=0.0025 4	*
^{81}Rb	−75457	5			4.571 h	0.004	$3/2^-$*	24			β^+=100	*
^{81}Rb^m	−75371	5	86.31	0.06	30.5 m	0.3	$9/2^+$*	24			IT=97.9 4;β^+=2.1 4	*
^{81}Sr	−71528	3			22.3 m	0.4	$1/2^-$*	24			β^+=100	
^{81}Sr^m	−71449	3	79.20	0.04	390 ns	60	$(5/2)^-$	24			IT=100	
^{81}Sr^n	−71439	3	89.02	0.07	6.4 μs	0.5	$(7/2^+)$	24	89Wu01	T	IT=100	
^{81}Y	−65719.1	2.5			70.4 s	1.1	$(5/2^+)$	24			β^+=100	
^{81}Zr	−57556	10			5.20 s	0.16	$(3/2^-)$	24	09St04	T	β^+=100;β^+p=0.12 2	*
^{81}Nb	−46360#	400#				<44ns	$9/2^+$#	24	00We.A	IT	p ?;β^+ ?;β^+p ?	*
^{81}Mo	−32200#	300#			1# ms	>400ns	$5/2^+$#	24	13Su23	IT	β^+ ?;β^+p ?	
$*^{81}$Cu	T : from 25To04=75.8(3.8), supersedes 14Xu07=73.2(6.8)										**
$*^{81}$Zn	D : %β^-n from 25To04=18.88(0.73); others: 20Pa26=23(4) 12Ma37=12(4) 91Kr15=7.5(3.0) 10Ho12=30(13)										**
$*^{81}$Zn	T : average 20Pa26=290(4) 14Xu07=303.2(2.6) 10Pa33=304(13); others: 14Xu.A=305.5(8.0) 10Ho12=474(+93-83) 07Ve08=390(70) 91Kr15=290(50)										**
$*^{81}$Ga	J : 17Fa09,10Bi.A,10Ch16=5/2										**
$*^{81}$Ga	D : %β^-n average 19To09=11.2(2.6) 93Ru01=12.9(0.8) 81Ho07=12.7(1.2) 86ReZU=11.7(1.2), supersedes 86Wa17=10.6(0.4), 80Lu04=12.0(0.9); other:										**
$*^{81}$Ga	D : 10Ho12<21										**
$*^{81}$Ga	T : average 20Pa26=1.25(0.03) 91Kr15=1.221(0.005) 93Ru01=1.211(0.006), supersedes 76Ru01=1.23(0.01), 86ReZU=1.218(0.004), supersedes										**
$*^{81}$Ga	T : 86Wa17=1.22(0.01); others: 23Ni.1=1.44(0.31) 10Ho12=0.959(+0.037-0.029) 82FoZZ=1.23(0.10) 81Ho07=1.23 80Lu04=1.23										**
$*^{81}$Ge	T : others: 81Ho24=7.6(0.6) 72De43=10.1(0.8) for a mixture of gs and isomer										**
$*^{81}$Ge^m	T : estimated from 22De07=6.4(0.2) for gs; 81Ho24=7.6(0.6) and 72De43=10.1(0.8) for a mixture of gs and isomer; 81Ho24 suggests that gs and										**
$*^{81}$Ge^m	T : isomer have identical $T_{1/2}$=7.6(0.6)										**
$*^{81}$Se	T : average 71Do09=17.9(0.5) 75Fe07=18.2(0.2) 57Ap46=18.6(0.1) 54Yt03=18.2(0.2)										**
$*^{81}$Se^m	T : average 89Ab18=57.28(0.02) 71Do09=57.28(0.05); other: 67Ra08=56.6(0.6)										**
$*^{81}$Br	J : 54Ki11,47To16,48To10,32To02,30Br01=3/2										**
$*^{81}$Br	D : from IS=[49.2,49.5] in 24Ci.A										**
$*^{81}$Kr	T : symmetrized from 64E_α05=213(+16-26)										**
$*^{81}$Kr	J : 95Ke04=7/2										**
$*^{81}$Kr^m	J : 95Ke04=1/2										**
$*^{81}$Rb	J : 56Ho52=3/2										**
$*^{81}$Rb^m	J : 56Ho52,56Hu69=9/2										**
$*^{81}$Zr	T : average 09St04=5.0(0.2),4.8(0.5) 97Hu15=5.3(0.5) 76Fa.A=5.9(0.6) 76HaWO=6.3(0.5); other (not used): 82De36=15(5)										**
$*^{81}$Zr	D : %β^+p 99Hu05=0.12(0.02)										**
$*^{81}$Nb	I : also 99Ja02<80 ns 01Ki13<200 ns										**
^{82}Ni	−10720#	500#			16# ms	>410ns	0^+	19	17Su15	I	β^- ?	
^{82}Cu	−25730#	400#			34 ms	7		19	10Oh02	I	β^-=100;β^-n ?;β^-2n ?	*
^{82}Zn	−42313.7	2.8			177.9 ms	2.5	0^+	19	14Xu07	T	β^-=100;β^-n=62.3 24;β^-2n ?	*
^{82}Ga	−52930.9	2.3			599.1 ms	1.8	2^-*	19	12Ch51	J	β^-=100;β^-n=23.0 7;β^-2n ?	*
^{82}Ga^m	−52790.2	2.3	140.7	0.3	93.5 ns	6.7	(4^-)		16Al10	TJ	IT=100	*
^{82}Ge	−65414.1	0.9			4.31 s	0.19	0^+	19			β^-=100	*
^{82}As	−70106.6	2.4			19.1 s	0.5	(2^-)	19	04Ga44	J	β^-=100	
^{82}As^m	−69974.5	2.4	132.10	0.20	13.6 s	0.4	(5^-)	19	14Mi16	E	β^-=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{82}Se	−77593.9	0.5				87.2 Ey 0.9	0^+	19	23Az05	T	IS=8.82 15;$2\beta^-$=100	*
^{82}Br	−77498.7	1.0				35.282 h 0.007	5^-*	19			β^-=100	*
^{82}Br^m	−77452.8	1.0	45.9492	0.0010		6.13 m 0.05	2^-	19			IT=97.6 3;β^-=2.4 3	
^{82}Kr	−80591.796	0.006				STABLE	0^+	19			IS=11.593 31	
^{82}Rb	−76188	3				1.2575 m 0.0002	1^+*	19	81Th04	J	β^+=100	
^{82}Rb^m	−76118.8	2.6	69.0	1.5	IT	6.472 h 0.006	5^-*	19			$\beta^+\approx$100;IT ?	*
^{82}Sr	−76013	4				25.35 d 0.03	0^+	19			ε=100	
^{82}Y	−68064	5				8.30 s 0.20	1^+	19			β^+=100	
^{82}Y^m	−67661	5	402.63	0.14		258 ns 22	4^-	19	94Mu02	T	IT=100	*
^{82}Y^n	−67557	5	507.50	0.13		148 ns 6	6^+	19			IT=100	
^{82}Zr	−63615.4	1.3				32 s 5	0^+	19			β^+=100	
^{82}Nb	−52314.4	2.2				51 ms 5	(0^+)	19			β^+=100;β^+p ?	
^{82}Nb^m	−51134.4	2.4	1180	1		93 ns 20	(5^+)		09Ga40	ETJ	IT=100	*
^{82}Mo	−41040#	300#				30# ms >400ns	0^+	19	13Su23	I	β^+ ?;β^+p ?	
*^{82}Cu	T : symmetrized from 14Xu07=33(+7-6)											**
*^{82}Zn	T : others: 16Al10=155(26) 12Ma37=228(10), downweighted (not used)											**
*^{82}Zn	D : %β^-n average 25To04=61.4(2.5) 16Al10=69(7)											**
*^{82}Ga	D : %β^-n average 25To04=25.2(1.1) 17Ve01=22(2) 16Te09=22.2(2.0) 86Wa17=19.8(1.7) 80Lu04=21.4(2.2); other: 93Ru01=31.1(4.4)											**
*^{82}Ga	T : average 16Te09=604(11) 15Et01=592(9) 91Kr15=599(2) 86Wa17=602(6) other: 10Ho12=610(+83-72)											**
*^{82}Ga^m	T : average 16Al10=89(9) 12Ka36=98(+10-9); other: 09Fo05<500 ns											**
*^{82}Ge	T : average 15Et01=4.04(0.27) 80Ze.A=4.5(0.4) 72De43=4.60(0.35); other (not used): 73Kr.A=5(1)											**
*^{82}As^m	E : other: 15Et01=131.2(0.6) from 553.1(0.4)-329.3(0.3)-92.6(0.4) keV g's											**
*^{82}Se	T : 2ν-$\beta\beta$ average 23Az05=86.9(0.5,stat)(+0.9-0.6,syst), supersedes 19Az04=86.0(0.3,stat)(+1.9-1.3,syst), 18Ar06=93.9(1.7,stat)(5.8,syst),											**
*^{82}Se	T : supersedes 12Si23=96(1,stat)(10,syst) and 05Ar27=96(3,stat)(10,syst), 99Pi08,98Ar10=83(10,stat)(7,syst); others (experiment):											**
*^{82}Se	T : 92El07=108(+26-6) 88Li11=120(10)(geochemical) 85Ma57=120(30) 73Sr05=276(88); others (evaluation): 25Pr02=91.6(4.5) 20Ba63=87(+2-1)											**
*^{82}Se	T : 15Ba11=92(7) 0ν-$\beta\beta$: 22Az02>4.6 Yy, supersedes 19Az02>3.5 Yy and 18Az05>2.4 Yy, 18Ar06>0.25 Yy 12Si23>0.32 Yy 11Ba55>0.36 Yy											**
*^{82}Br	J : 71HiZO,59Ga12=5											**
*^{82}Rb^m	J : 56Ho52=5											**
*^{82}Y^m	T : average 94Mu02=220(50) 93Wo04=268(25)											**
*^{82}Nb^m	T : 09Ga40 superseded 08Ga04=92(17); other: 07Ca26=80(50)											**
^{83}Cu	−20390#	500#				21# ms >410ns	$5/2^-$#	22	17Su15	I	β^- ?;β^-n ?;β^-2n ?	
^{83}Zn	−36311	17				100 ms 3	$3/2^+$#	14	14XuZZ	T	β^-=100;β^-n=57.4 29; β^-2n=2.17 44	*
^{83}Ga	−49257.6	2.5				309.6 ms 0.7	$5/2^-$#	14	17Ve01	TD	β^-=100;β^-n=85 3;β^-2n ?	*
^{83}Ge	−60976.5	2.4				1.85 s 0.06	$(5/2^+)$	14			β^-=100;β^-n ?	
^{83}As	−69669.3	2.8				13.4 s 0.4	$5/2^-$#	14			β^-=100	
^{83}Se	−75341	3				22.25 m 0.04	$9/2^+$	14	15Kr02	T	β^-=100	
^{83}Se^m	−75112	3	228.92	0.07		70.1 s 0.4	$1/2^-$	14			β^-=100	
^{83}Br	−79014	4				2.374 h 0.004	$3/2^-$	14			β^-=100	
^{83}Br^m	−75945	4	3069.2	0.4		729 ns 77	$(19/2^-)$	14	11Ru.A	T	IT=100	*
^{83}Kr	−79990.645	0.009				STABLE	$9/2^+$*	14			IS=11.500 19	*
^{83}Kr^m	−79981.239	0.009	9.4059	0.0002		156.3 ns 0.7	$7/2^+$	14	23In01	E	IT=100	*
^{83}Kr^n	−79949.088	0.009	41.5575	0.0007		1.828 h 0.012	$1/2^-$*	14	22Fe02	T	IT=100	*
^{83}Rb	−79070.6	2.3				86.2 d 0.1	$5/2^-$*	14			ε=100	*
^{83}Rb^m	−79028.5	2.3	42.0780	0.0020		7.8 ms 0.7	$9/2^+$	14	68Et01	T	IT=100	
^{83}Sr	−76798	7				32.41 h 0.03	$7/2^+$*	14	82Gr07	T	β^+=100	*
^{83}Sr^m	−76539	7	259.15	0.09		4.95 s 0.12	$1/2^-$*	14			IT=100	*
^{83}Y	−72206	19				7.08 m 0.08	$(9/2^+)$	14	92Bu10	J	β^+=100	
^{83}Y^m	−72144	19	62.04	0.10		2.85 m 0.02	$(3/2^-)$	14			β^+=60 5;IT=40 5	
^{83}Zr	−65916.5	0.6				42 s 2	$1/2^-$#	14			β^+=100;β^+p=?	
^{83}Zr^m	−65863.8	0.6	52.72	0.05		530 ns 120	$(5/2^-)$	14			IT=100	
^{83}Zr^n	−65839.5	0.6	77.04	0.07		1.8 μs 0.1	$(7/2^+)$	14			IT=100	
^{83}Nb	−57649	3				3.9 s 0.2	$9/2^+$#	14			β^+=100	
^{83}Mo	−46300#	300#				23 ms 19	$3/2^-$#	14	01Ki13	TD	β^+=100;β^+p ?	*
^{83}Tc	−32000#	500#					$1/2^-$#				p ?;β^+ ?;β^+p ?	
*^{83}Zn	T : average 16Al10=122(28) 14XuZZ=99.4(3.0) 12Ma37=117(20)											**
*^{83}Zn	D : %β^-n from 25To04=57.4(2.9), supersedes 14XuZZ=71(29); %β^-2n from 25To04=2.17(0.44)											**
*^{83}Ga	T : average 26Al05=308.3(1.9) 17Ve01=312(1) 16Al10=309(6) 14Xu.A=296.1(6.4) 06Pe20=317(17),319(24) 93Ru01=307(7) 91Kr15=308(1)											**
*^{83}Ga	T : 86Wa17,80Lu04,76Ru01=310(10)											**
*^{83}Ga	D : %β^-n average 25To04=84.7(4.4) 17Ve01=85(4); others: 16Ma50=56(7) 09Wi03=62.8(2.5) 80Lu04=43(7) 93Ru01=14.9(1.8)											**
*^{83}Br^m	T : average 11Ru.A=862(148) 97Is13=700(100) 89Wi01=600(200)											**
*^{83}Kr	J : 95Ke04,61Ku07,55Ra46,46Ke05,38Ko02,38Sc10=9/2; also: 32Mu06=9/2											**
*^{83}Kr^m	E : average 23In01=9.4063(0.0005) 12Sl01=9.4058(0.0003) 93Ko45=9.396(0.003) 92Pi10=9.4059(0.0008) others: 76Va03=9.39(0.01) 72De67=9.40(0.03)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{83}Kr^m$	E : 72Ko35=9.40(0.01) 71Ru17=9.40(0.02)											**
$*^{83}Kr^m$	T : average 22Zh04=154.5(0.6) 09Ka30=156.94(0.34) 95Ah04=155.1(1.2), Birge ratio=2.6; other: 63Ru03=147(4)											**
$*^{83}Kr^n$	T : average 22Fe02=1.80(0.05) 10Li13=1.82(0.02) 09Ka30=1.85(0.03) 71Ru17=1.83(0.02)											**
$*^{83}Kr^n$	J : 95Ke04=1/2											**
$*^{83}Rb$	J : 56Ho52=5/2											**
$*^{83}Sr$	J : 90Li28,87Bu11=7/2											**
$*^{83}Sr$	T : others: 21Ha10=31.87(1.16,stat)(0.42,sys) 64Do02=32.4(0.2) 72Ch13=31.4 61Ku08=32.9											**
$*^{83}Sr^m$	J : 90Li28,87Bu11=1/2											**
$*^{83}Mo$	T : symmetrized from 01Ki13=6(+30-3)											**
^{84}Cu	−13720#	500#				12# ms	>300ns				β^- ?;β^-n ?	
^{84}Zn	−31830#	200#				54 ms	8	0^+	22	14XuZZ T	β^-=100;β^-n=64.0 59;β^-2n=1.0 6	*
^{84}Ga	−44089	7				97.1 ms	1.1	0^-#	22	25To04 D	β^-=100;β^-n=37.3 22;	*
											β^-2n=1.61 13	
$^{84}Ga^m$			*non − exist*		RN	< 85 ms		$(3^-,4^-)$		09Le26 TD	β^- ?;IT ?	*
^{84}Ge	−58148.2	2.2				951 ms	9	0^+	09	13Ma22 T	β^-=100;β^-n=10.6 6	*
^{84}As	−65853.5	2.5				3.16 s	0.58	(2^-)	09	16Ko24 J	β^-=100;β^-n=0.28 4	*
$^{84}As^m$			*non − exist*		RN	650 ms	150			74KrZG IT	β^-=100	*
^{84}Se	−75948.4	1.8				3.26 m	0.10	0^+	09		β^-=100	
^{84}Br	−77767.1	1.6				31.76 m	0.08	2^-	09		β^-=100	
$^{84}Br^m$	−77573.6	2.2	193.6	1.5	MD	6.0 m	0.2	$(6)^-$	09		β^-=100	
$^{84}Br^n$	−77358.9	1.6	408.2	0.4		< 140 ns		1^+		70Ei02 T	IT=100	
^{84}Kr	−82439.347	0.004				STABLE		0^+	09		IS=56.987 15	
$^{84}Kr^m$	−79203.28	0.18	3236.07	0.18		1.83 μs	0.04	8^+	09		IT=100	
^{84}Rb	−79758.9	2.2				32.82 d	0.07	2^-*	09		β^+=96.1 20;β^-=3.9 20	*
$^{84}Rb^m$	−79295.3	2.2	463.59	0.08		20.26 m	0.04	6^-*	09		IT≈100;β^+ ?	*
^{84}Sr	−80649.23	0.04				STABLE		0^+	09		IS=0.56 2;2β^+ ?	
^{84}Y	−73894	4				39.5 m	0.8	(6^+)	09		β^+=100	
$^{84}Y^m$	−73827	4	67.0	0.2		4.6 s	0.2	1^+	09		β^+=100	
$^{84}Y^n$	−73684	4	210.42	0.16		292 ns	10	(4^-)	09		IT=100	
^{84}Zr	−71422	5				25.8 m	0.5	0^+	09		β^+=100	
^{84}Nb	−61193.8	0.4				9.8 s	0.9	(1^+)	09	09St04 J	β^+=100	
$^{84}Nb^m$	−61145.8	1.1	48	1		176 ns	46	(3^+)	09	09Ga40 ETJ	IT=100	
$^{84}Nb^n$	−60856.1	0.6	337.7	0.4		92 ns	5	(5^-)		09Ga40 T	IT=100	
^{84}Mo	−54137	22				2.3 s	0.3	0^+	09		β^+=100;β^+p ?	
^{84}Tc	−38430#	400#				10# μs		1^+#			p ?;β^+ ?;β^+p ?	
$*^{84}Zn$	D : %β^-n from 25To04=64.0(5.9), supersedes 14XuZZ=73(26); %β^-2n from 25To04<2											**
$*^{84}Ga$	D : %β^-n from 25To04=37.3(2.2), supersedes 19Yo03=44(4) 23Yo04=37.0(0.4,stat)(1.1,syst); others: 16Ma50=40(7) 17Ve01=53(20) 10Wi03=74(14)											**
$*^{84}Ga$	D : 09Gr06=80(15) 91Kr15=70(15); %β^-2n from 25To04=1.61(0.13), supersedes 19Yo03=1.6(0.2) 23Yo04=1.88(0.06,stat)(0.11,syst).											**
$*^{84}Ga$	T : from 23Yo04=97.1(1.1), supersedes 19Yo03=97.6(1.2) 14XuZZ=92.7(0.7); others: 13Ko32=84(7) 09Le26=76(48) 09Ve11=75(33) 06Pe20=70(35)											**
$*^{84}Ga$	T : 91Kr15=85(10)											**
$*^{84}Ga^m$	I : proposed in 09Le26 (and ENSDF2009), but not confirmed in 10Wi03 data of much bigger statistics											**
$*^{84}Ge$	T : average 13Ma22=942(17) 93Ru01=947(11) 91Kr15=984(23)											**
$*^{84}Ge$	D : %β^-n average 93Ru01=10.8(0.6) 91Kr15=9.5(2.0) 91Om01=9(3)											**
$*^{84}As$	T : from 13Ma22; others: 96WaZX=3.24(0.26) 93Ru01=4.02(0.03) 91Om01=4.5(0.2) 81Ho10=4.5(0.2) 75Kr08=5.3(0.4) 68De19=5.8(0.5)											**
$*^{84}As$	D : %β^-n from 91Ru01; others: 02Pf04=0.18(0.10) 73Kr06=0.13(0.06)											**
$*^{84}As^m$	I : from 74KrZG (also 75Kr08), but not confirmed in 81Ho10											**
$*^{84}Rb$	J : 14Ya28=1.9(0.1);56Ho52=2											**
$*^{84}Rb^m$	J : 14Ya28=6.2(0.2);78Ek05,78Ek04,76EkZX=6											**
^{85}Cu	−7930#	600#				15# ms	>300ns	$5/2^-$#		26Sh.1 I	β^- ?;β^-n ?	
^{85}Zn	−25100#	200#				40# ms	>400ns	$5/2^+$#	13	10Oh02 I	β^- ?;β^-n ?;β^-2n ?	
^{85}Ga	−39723	12				95.3 ms	1.0	$(5/2^-)$	13	23Yo04 TD	β^-=100;β^-n=71.0 22;	*
											β^-2n=1.90 16	
^{85}Ge	−53121	3				495 ms	5	$(3/2^+)$	13	17Ko11 J	β^-=100;β^-n=19.0 10;β^-2n ?	*
^{85}As	−63197.3	1.0				2.022 s	0.007	$(5/2^-)$	13	12Ku06 J	β^-=100;β^-n=62.6 9	*
^{85}Se	−72415.1	1.5				32.9 s	0.3	$(5/2)^+$	13		β^-=100	
^{85}Br	−78577.1	3.0				2.90 m	0.06	$3/2^-$	15		β^-=100	
^{85}Kr	−81480.3	2.0				10.728 y	0.007	$9/2^+*$	13	FGK209 T	β^-=100	*
$^{85}Kr^m$	−81175.4	2.0	304.871	0.020		4.483 h	0.003	$1/2^-*$	13	21Te06 T	β^-=78.8 5;IT=21.2 5	*
$^{85}Kr^n$	−79488.5	2.0	1991.8	0.2		1.82 μs	0.05	$(17/2^+)$	13	11Ru.A T	IT=100	
^{85}Rb	−82167.342	0.005				STABLE		$5/2^-*$	15		IS=72.17 2	*
$^{85}Rb^m$	−81653.336	0.005	514.0065	0.0022		1.015 μs	0.001	$9/2^+$	15	19Ta19 T	IT=100	*
^{85}Sr	−81103.2	2.8				64.846 d	0.008	$9/2^+*$	13	FGK259 T	ε=100	*
$^{85}Sr^m$	−80864.4	2.8	238.79	0.05		67.63 m	0.04	$1/2^-*$	13	21Ha10 T	IT=86.6 4;β^+=13.4 4	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{85}Y	−77842	19				2.68 h 0.05	$(1/2)^-$	13			β^+=100	
^{85}Y^m	−77822	19	19.68	0.17		4.86 h 0.20	$(9/2)^+$	13			$\beta^+\approx$100;IT ?	
^{85}Y^n	−77576	19	266.18	0.10		178 ns 7	$(5/2)^-$	13			IT=100	
^{85}Zr	−73175	6				7.86 m 0.04	$(7/2^+)$	13			β^+=100	
^{85}Zr^m	−72883	6	292.2	0.3		10.9 s 0.3	$1/2^-$#	13			IT=?;β^+=?	
^{85}Nb	−66280	4				20.5 s 0.7	$9/2^+$#	13			β^+=100	*
^{85}Nb^m	−66130#	80#	150#	80#		3.3 s 0.9	$(1/2^-)$	13	05Ka39	JIE	β^+=?;IT=?	*
^{85}Nb^n			*non − exist*		RN	12 s 5		13	98Oi02	IT	β^- ?;IT ?	*
^{85}Mo	−57510	16				3.2 s 0.2	$(1/2^+)$	13	05Xu04	J	β^+=100;β^+p=0.14 2	
^{85}Tc	−45990#	400#				<110ns	$1/2^-$#	13	00We.A	IT	p ?	*
^{85}Ru	−31900#	500#				1# ms >400ns	$3/2^-$#	15	13Su23	I	β^+ ?;β^+p ?;p ?	
*^{85}Ga	T : average 23Yo04=95.6(1.0), supersedes 19Yo03=95.3(1.0), 13Mi19=92(4) 12Ma37=93(7)											**
*^{85}Ga	D : %β^-n average 25To04=71.2(2.5), supersedes 23Yo04=75.8(1.8,stat)(2.4,syst) and 19Yo03=90(7), 18Mi03=70(5); %β^-2n from 25To04=1.90(0.16),											**
*^{85}Ga	D : supersedes 23Yo04=1.58(0.13,stat)(0.09,syst) and 19Yo03=1.3(0.2)											**
*^{85}Ge	D : %β^-n average 25To04=21.4(1.4) 18Mi03=15(5) 14Ag12=17.2(1.8) 91Kr15=14(3)											**
*^{85}Ge	T : average 14XuZZ=495(6) 13Ma22=494(8);others: 91Kr15=535(47) 91Om01=580(50)											**
*^{85}As	D : %β^-n average 14Ag12=63.1(1.0) 93Ru01=59.3(2.5); other: 25Pe09=40.5(2.5), limited by the detector threshold											**
*^{85}As	T : average 13Ma22=2.08(0.14) 93Ru01=2.002(0.013) 91Kr15=2.032(0.012) 68To19=2.028(0.012); others: 73Kr06=2.05(0.05), superseded by 91Kr15											**
*^{85}As	T : 76Ru01=2.08(0.05),superseded by 93Ru01 91Om01=2.0(0.1) 78Cr03=1.9(0.1)											**
*^{85}Kr	J : 95Ke04,55Ra13=9/2											**
*^{85}Kr^m	T : average 21Te06=4.483(0.003) 70Wo08=4.480(0.008); others: 50Ho02=4.5 49Ko13,49Su14=4.36(0.09) 48Wo07=4.6(0.2) 37Sn02=4.5(0.1)											**
*^{85}Kr^m	J : 95Ke04=1/2											**
*^{85}Kr^m	D : from 80Me06											**
*^{85}Rb	J : 14Ya28=2.5(0.1); 36Mi01,36Ko05,33Ko01=5/2											**
*^{85}Rb^m	T : average 19Ta19=1.0202(0.0060) 72Mi23=1.015(0.001)											**
*^{85}Sr	J : 90Li28=9/2											**
*^{85}Sr^m	J : 90Li28=1/2											**
*^{85}Sr^m	T : average 21Ha10=68.24(0.84,stat)(0.11,sys) 82Gr07=67.55(0.07) 72Em01=67.66(0.07),67.92(0.25) 71Bu08=67.3(0.3) 70LyZZ=67.66(0.07); others:											**
*^{85}Sr^m	T : 66Ka24=69.5(0.5) 64Gu08=69.5(0.5) 40Du05=70											**
*^{85}Nb	T : average 05Ka39=17(2) 88Ku14=20.9(0.7)											**
*^{85}Nb^m	E : from 05Ka39 > 69 keV											**
*^{85}Nb^n	I : activity reported in 98Oi02 and adopted in ENSDF2014 as a new isomer; not confirmed in 05Ka39 (the same laboratory as 98Oi02)											**
*^{85}Tc	I : also 99Ja02<100 ns; estimated $T_{1/2}$=100# ms for β^+ decay											**
^{86}Zn	−20060#	300#				20# ms	0^+		24Sh17	I	β^- ?;β^-n ?	
^{86}Ga	−33769	19				51 ms 2	0^-#	25	23Yo04	TD	β^-=100;β^-n=57.6 40; β^-2n=16.2 19	*
^{86}Ga^m	−33671	19	97.8	0.4		0.32 μs 0.03	2^-#	25	23Yo04	TD	IT=100	
^{86}Ge	−49596.8	1.1				221.6 ms 1.1	0^+	25	14XuZZ	T	β^-=100;β^-n=24.5 12	*
^{86}As	−58964.4	1.4				945 ms 8	$(1^-,2^-)$	25	93Ru01	TD	β^-=100;β^-n=35.5 6;β^-2n ?	*
^{86}Se	−70502.9	0.7				14.3 s 0.3	0^+	25			β^-=100;β^-n ?	
^{86}Br	−75637.3	1.3				55.1 s 0.4	(1^-)	25			β^-=100	
^{86}Kr	−83265.677	0.004				STABLE	0^+	25			IS=17.279 41;2β^- ?	
^{86}Rb	−82747.00	0.20				18.668 d 0.007	2^-*	25	25Ko04	T	β^-=99.9948 5;ε=0.0052 5	*
^{86}Rb^m	−82190.95	0.27	556.05	0.18		1.017 m 0.003	6^-*	25	67Yu01	T	IT$\approx$100;β^-<0.3	*
^{86}Sr	−84523.101	0.005				STABLE	0^+	25			IS=9.86 20	
^{86}Sr^m	−81567.36	0.10	2955.74	0.10		455 ns 7	8^+	25			IT=100	
^{86}Y	−79283	14				14.74 h 0.02	4^-*	25	22Ud01	D	β^+=100;ε=72.8 2;e$^+$=27.2 2	*
^{86}Y^m	−79065	14	218.21	0.09		47.4 m 0.4	(8^+)	25			IT=99.31 4;β^+=0.69 4	
^{86}Y^n	−78981	14	302.18	0.09		125.3 ns 5.5	6^+	25	10Ru07	TJ	IT=100	*
^{86}Zr	−77969	4				16.5 h 0.1	0^+	25	64Aw02	T	β^+=100	
^{86}Nb	−69134	5			*	88 s 1	(6^+)	25	85Wa10	T	β^+=100	
^{86}Nb^m	−69030#	80#	100#	80#	*	20# s	$(0^-,1^-,2^-)$	25	05Ka39	J	β^+=100	*
^{86}Nb^n			*non − exist*		RN	56.3 s 8.3		25	94Sh07	IT	β^+= ?;IT ?	*
^{86}Mo	−64110.9	2.9				19.1 s 0.3	0^+	25	05Ka39	T	β^+=100	
^{86}Tc	−51570#	300#				55 ms 6	(0^+)	25			β^+=100;β^+p ?	*
^{86}Tc^m	−50050#	300#	1524.0	1.7		1.10 μs 0.12	(6^+)	25	09Ga40	TEJ	IT=100	*
^{86}Ru	−40900#	400#				50# ms >400ns	0^+	25	13Su23	I	β^+ ?;β^+p ?	
*^{86}Ga	T : from 23Yo04=51(2), supersedes 19Yo03=49(2); other: 13Mi19=43(+21-15)											**
*^{86}Ga	D : %β^-n from 25To04=57.6(4.0), supersedes 23Yo04=59.5(2.1,stat)(1.8,syst) 19Yo03=74(2,stat)(8,syst); other: 13Mi19=60(10). %β^-2n from											**
*^{86}Ga	D : 25To04=16.2(1.9) supersedes 23Yo04=14.7(0.9,stat)(1.1,syst) 19Yo03=16.2(0.9,stat)(0.6,syst); other: 13Mi19=20(10)											**
*^{86}Ge	T : other: 13Ma22=226(21), supersedes 12Ma.A=219(40)											**
*^{86}Ge	D : %β^-n from 25To04=24.5(1.2); other: 12Ma.A=45(15)											**
*^{86}As	D : %β^-n from 14Ag12; other: 25Pe09=23.5(1.4), limited by the detector threshold, 93Ru01=33(4) 73Kr06=3.8(+1.7-1.0) 78Cr03=10.5(2.2)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{86}$As	T : others: 13Ma22=861(64) 73Kr06=900(200)											**
$*^{86}$Rb	J : 14Ya28=1.9(0.2),53Be19=2											**
$*^{86}$Rb	T : average 25Ko04=18.646(0.023),18.61(0.11) 16Ma49=18.684(0.009) 81Mi10=18.631(0.018) 72Em01=18.82(0.11) 71Ba28=18.61(0.04) 67Gl05=18.82(0.11)											**
$*^{86}$Rb	T : 57Wr37=18.68(0.07) 55Ni09=18.64(0.04) 55Em20=18.66(0.03); others: 58Ro62=18.7(0.5) 48Za02=19.5 41He02=19.5 37Sn02=18											**
$*^{86}$Rb^m	T : others: 69Sc10=1.020(0.017) 53Sc39=1.02(0.03) 51Fl17=1.06(0.02)											**
$*^{86}$Rb^m	J : 81Th04=6											**
$*^{86}$Y	J : 07Ch07=4											**
$*^{86}$Y^n	T : average 10Ru07=127(14) 00Io02=125(6); ENSDF2025 quotes erroneously 10Ru07=127(4)											**
$*^{86}$Nb^m	I : from 94Sh07 and 05Ka39, populated in β^+ decay of ^{86}Mo (J^π=0^+) $T_{1/2}$=56.3(8.3) s in 94Sh07 is produced by gating on Zr X-rays, which would be											**
$*^{86}$Nb^m	I : consistent with 2 β-decaying isomers, one with $T_{1/2}$=88 s and the second with ∼20 s, similar to $T_{1/2}$(^{86}Mo)=19 s											**
$*^{86}$Nb^n	I : half-life deduced in 94Sh07 by gating on Zr X-rays, which would be consistent with decay of two isomers, one with $T_{1/2}$=88 s and the second											**
$*^{86}$Nb^n	I : with a half-life similar to that of ^{86}Mo, $T_{1/2}$=19.1 s; not confirmed in 05Ka39, 97Ta10 (sensitive to high-spin structures)											**
$*^{86}$Tc	T : average 01Ga24=44(12) 01Ki13=59(+8-7)											**
$*^{86}$Tc^m	T : average 09Ga40=1.10(0.14), supersedes 08Ga04=1.59(0.20), 00Ch07=1.11(0.21)											**
$*^{86}$Tc^m	E : from E_γ=81(1), 850(1) and 593(1) keV in a cascade from 09Ga40; E_γ uncertainties estimated by NUBASE											**
^{87}Zn	−12600#	400#				10# ms	$5/2^+$#		24Sh17	I	β^- ?;β^-n ?	
^{87}Ga	−28870#	200#				31.3 ms 3.1	$5/2^-$#	15	25To04	TD	β^-=100;β^-n=81 11;β^-2n=15.3 50	*
^{87}Ge	−43590#	210#				103 ms 4	$5/2^+$#	15	14XuZZ	T	β^-=100;β^-n=33.5 15;β^-2n=0.26 6	*
^{87}As	−55617.9	2.0				492 ms 25	$(5/2^-,3/2^-)$	15	15Ko19	TJ	β^-=100;β^-n=77.9 39;β^-2n ?	*
^{87}Se	−66425.0	1.8				5.50 s 0.06	$(3/2^+)$	15	15Ko19	J	β^-=100;β^-n=0.60 12	*
^{87}Br	−73892	3				55.58 s 0.11	$5/2^-$	15	19Wi11	J	β^-=100;β^-n=2.52 8	*
^{87}Kr	−80709.53	0.25				76.3 m 0.5	$5/2^+$*	15	21Te06	T	β^-=100	*
^{87}Rb	−84597.802	0.006				49.61 Gy 0.08	$3/2^-$*	15	22Vi.1	T	IS=27.83 2;β^-=100	*
^{87}Sr	−84880.078	0.005				STABLE	$9/2^+$*	15			IS=7.00 20	*
^{87}Sr^m	−84491.549	0.006	388.5287	0.0023		2.805 h 0.009	$1/2^-$*	15	21Kr05	T	IT=99.70 8;ε=0.30 8	*
^{87}Y	−83018.4	1.1				79.92 h 0.16	$1/2^-$*	15	19Ja03	T	β^+=100	*
^{87}Y^m	−82637.6	1.1	380.82	0.07		13.37 h 0.03	$9/2^+$*	15	19Ja03	T	IT=98.43 11;β^+=1.57 11	*
^{87}Zr	−79347	4				1.68 h 0.01	$9/2^+$	15			β^+=100	
^{87}Zr^m	−79011	4	335.84	0.19		14.0 s 0.2	$1/2^-$	15			IT=100	
^{87}Nb	−73875	7				3.7 m 0.1	$(1/2)^-$	15			β^+=100	
^{87}Nb^m	−73871	7	3.9	0.1		2.6 m 0.1	$(9/2)^+$	15			β^+=100	
^{87}Mo	−66884.0	2.1				14.1 s 0.3	$7/2^+$#	15			β^+=100;β^+p=15 5	
^{87}Mo^m	−66573	30	311	30	MD	100# ms	$1/2^-$#		23Xi01	E	IT ?;β^+ ?	
^{87}Tc	−57690	4			*	2.14 s 0.17	$9/2^+$#	15	19Pa16	TD	β^+=100;β^+p=0.35 20	*
^{87}Tc^m	−57683	4	7	1	*	2# s	$1/2^-$#		09Ga40	E	β^+ ?;IT ?	*
^{87}Tc^n	−57619	4	71	1		647 ns 24	$7/2^+$#	15			IT=100	
^{87}Ru	−45950#	400#				50# ms >1.5us	$1/2^-$#	15	95Ry03	I	β^+ ?;β^+p ?	
$*^{87}$Ga	T : from 25To04=31.3(3.1), supersedes 23Yo04=27(6) and 19Yo03=29(4)											**
$*^{87}$Ga	D : %β^-n from 25To04=81(11), supersedes 23Yo04=72(9,stat)(2,syst) and 19Yo03=81(9,stat)(8,syst); %β^-2n from 25To04, supersedes											**
$*^{87}$Ga	D : 23Yo04=8.7(2.8,stat)(0.05,syst) and 19Yo03=10.2(2.8,stat)(0.05,syst)											**
$*^{87}$Ge	D : %β^-n from 25To04=33.5(1.5); %β^-2n from 25To04=0.26(0.06)											**
$*^{87}$As	T : average 15Ko19=560(80) 13Ma22=484(35) 93Ru01=485(40); others: 12Qu01=1450(550)(+3900-1100) 78Cr03=730(60)											**
$*^{87}$As	D : %β^-n from 25To04=77.9(3.9); other: 93Ru01=15.4(2.2)											**
$*^{87}$Se	T : average 93Ru01=5.29(0.11) 70Kr05=5.85(0.15) 70De08=5.90(0.20) 71To13=5.41(0.10)											**
$*^{87}$Se	D : %β^-n from 93Ru01											**
$*^{87}$Br	T : average 25St.A,24St10=55.3(0.3) 93Ru01=55.6(0.3) 74Kr21=55.9(1.6) 71De35=55.60(0.15) 66Wi18=55.4(0.4) 66Si09=55.80(0.25); others:											**
$*^{87}$Br	T : 80Lu04=55.5(0.3) 77Ki14=53(8) 76Ru01=55.5(0.1) 75Hu02=56(4) 74Ru08=56.7(1.0) 74Gr29=56.3(0.5) 71ShZD=55.65(0.20) 70DeZQ=55.6(0.3)											**
$*^{87}$Br	T : 70OsZZ=56.0(0.3) 63Wi02=55.4(0.7) 57Ke67=54.5(0.9) 49Su14=56.1(0.7) 47Sn07=54(1) 40St03=50(10)											**
$*^{87}$Br	D : %β^-n average 24St10,25St.A=2.36(0.24) 93Ru01=2.56(0.10) 81Ho07=2.6(0.3) 80ReZQ=2.1(0.4) 78Kr15=2.6(0.4) 71De35=2.3(0.3) 64Ar24=3.1(0.6);											**
$*^{87}$Br	D : others: 80Lu04=2.57(0.15) 77Re06,77Re05=2.5(0.3) 76NiZZ=2.55(0.49) 76ShZL=2.56(0.38) 76ReZN=2.16(0.33) 74Kr21=2.3(0.5) 72Sc48=2.4(0.4)											**
$*^{87}$Br	D : 70MaZT=2.1(0.3) 67Ga19=3(1)											**
$*^{87}$Kr	T : average 21Te06=75.8(0.5) 72Eh02=76.3(0.6) 64Cl01=76.4(1.0); others: 49Ko13=78(2) 37Sn02=74(2)											**
$*^{87}$Kr	J : 95Ke04=5/2											**
$*^{87}$Rb	J : 14Ya28=1.53(0.06); 36Mi01,36Ko05,33Ko01=3/2											**
$*^{87}$Rb	T : from 22Vi.1,15Vi02=49.61(0.16), reported uncertainty is 2σ; others: 26Be02=50.8(1.3) 03Ko66=49.67(0.32) 82Mi14=49.44(0.28) 77Da22=48.9(0.4),											**
$*^{87}$Rb	T : supersedes 66Mc12=47.2(0.4), 74Ne14=48.8(0.8)											**
$*^{87}$Sr	J : 90Li28,87An02,87Bu11,65Cu05,38He05=9/2											**
$*^{87}$Sr^m	J : 90Li28,87An02,87Bu11=1/2											**
$*^{87}$Sr^m	T : average 21Kr05=2.808(0.003) 97We13=2.811(0.027) 82Gr07=2.795(0.013) 70Le07=2.793(0.009) 68Go30=3.805(0.001); other: 92An19=2.827(0.001),											**
$*^{87}$Sr^m	T : discrepant (not used)											**
$*^{87}$Y	J : 07Ch07,78Ru04,75Ru06,74EkZW=1/2											**
$*^{87}$Y	T : average 19Ja03=80.63(0.44) 84Pr01=79.6(0.2) 69Zo04=80.3(0.3)											**
$*^{87}$Y^m	J : 07Ch07,78Ru04,75Ru06,74EkZW=9/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{87}Y^m$	T : average 19Ja03=13.55(0.29) 84Pr01=13.37(0.03) 69Zo04=13.2(0.2); other: 67Mi13=12.5(0.2)											**
$*^{87}Tc$	T : average 19Pa16=2.0(0.3) 01Ki13=2.2(0.2)											**
$*^{87}Tc$	D : $\%\beta^+$p from 19Pa16<0.7											**
$*^{87}Tc^m$	E : 64 keV γ ray observed in parallel to the 71 keV one, depopulating $^{87}Tc^n$											**
^{88}Ga	−22390#	300#				20# ms	>300ns		24Sh17	I	β^- ?;β^-n ?	
^{88}Ge	−39520#	300#				61 ms	6	0^+	13 14XuZZ	T	β^-=100;β^-n=37.8 27; β^-2n=0.22 16	*
^{88}As	−50682	3				189.1 ms	2.5		13 25To04	T	β^-=100;β^-n=53.1 21; β^-2n=0.48 17	*
^{88}Se	−63883.1	2.4				1.53 s	0.06	0^+	13		β^-=100;β^-n=0.99 10	
^{88}Br	−70717.0	2.3				16.50 s	0.10	(1^-)	13 15Cz01	J	β^-=100;β^-n=6.70 20	*
$^{88}Br^m$	−70446.8	2.3	270.17	0.11		5.51 μs	0.04	(4^-)	13 15Cz01	JE	IT=100	*
^{88}Kr	−79691.3	2.6				2.815 h	0.008	0^+	13 21Ch46	T	β^-=100	*
^{88}Rb	−82609.02	0.16				17.78 m	0.03	2^-*	13 20Ch42	T	β^-=100	*
$^{88}Rb^m$	−81235.2	0.3	1373.8	0.3		123 ns	13	(7^+)	13		IT=100	
^{88}Sr	−87921.630	0.006				STABLE		0^+	13		IS=82.58 35	
^{88}Y	−84299.0	1.5				106.632 d	0.026	4^-*	13 FGK259	T	β^+=100	*
$^{88}Y^m$	−83906.1	1.5	392.86	0.09		301 μs	3	1^+	13		IT=100	
$^{88}Y^n$	−83624.5	1.5	674.55	0.04		13.98 ms	0.17	8^+*	13		IT=100	*
^{88}Zr	−83629	5				83.4 d	0.3	0^+	13		ε=100	
$^{88}Zr^m$	−80741	5	2887.79	0.06		1.337 μs	0.022	8^+	13 19Ha26	T	IT=100	*
^{88}Nb	−76170	60			*	14.50 m	0.11	(8^+)	13		β^+=100	
$^{88}Nb^m$	−76040	100	130	120	BD*	7.7 m	0.1	(4^-)	13		β^+=100	
^{88}Mo	−72687	4				8.0 m	0.2	0^+	13		β^+=100	
^{88}Tc	−61670	4				6.4 s	0.8	(2^+)	13 09Ga40	J	β^+=100;β^+p ?	
$^{88}Tc^m$	−61600	5	70	3	MD	5.8 s	0.2	(6^+)	13 19Vi05	J	β^+=100;β^+p ?	
$^{88}Tc^n$	−61575	4	95	1		146 ns	12	(4^+)	13 09Ga40	TJ	IT=100	
^{88}Ru	−54250	19				1.5 s	0.3	0^+	13 19Pa16	TD	β^+=100;β^+p=1.8 10	*
^{88}Rh	−37930#	400#				1# ms					β^+ ?	
$*^{88}Ge$	D : $\%\beta^-$n from 25To04=37.8(2.7); $\%\beta^-$2n from 25To04=0.22(0.16)											**
$*^{88}As$	T : other: 12Qu01=200(5)(+200-90)											**
$*^{88}As$	D : $\%\beta^-$n from 25To04=53.1(2.1); $\%\beta^-$2n from 25To04=0.48(0.17)											**
$*^{88}Br$	T : average 25St.A,24St10=16.64(0.05) 93Ru01=16.34(0.08) 87PfZX=16.20(0.10) 74NoZR=16.5(0.3), Birge ratio=2.64; others: 76Ru01=16.7(0.2)											**
$*^{88}Br$	T : 77Pf01=16(2) 75Kr17=16.2(0.4) 74Gr29=16.10(0.12) 74Kr21=16.4(0.6) 72Sc48=16.3(0.5) 71Ch38=16.2(1.5) 71BrYH=16.3(0.8) 71ShZD=15.85(0.10)											**
$*^{88}Br$	T : 70OsZZ=16.6(0.4) 66Si09=15.9(0.2) 59Pe28=16.3(0.8) 57Pe19=15.5(0.4) 49Su14=15.5(0.3)											**
$*^{88}Br$	D : average 25St.A,24St10=6.4(0.6) 93Ru01=6.72(0.27) 87PfZX=7.3(0.6) 81Ho03=6.7(0.6) 80ReZQ=6.1(0.7); others: 80Ho03=6.8(0.3) 80Lu04=6.6(0.4)											**
$*^{88}Br$	D : 78Kr15=6.5(0.7) 77Re05,77Re06=6.1(0.4) 76ReZN=6.3(0.9) 74Kr21=4.2(0.6) 72Sc48=6.4(0.7) 71De35=6.2(0.9) 66Si09=4.6(0.6) 64Ar24=6.0(1.6)											**
$*^{88}Br$	D : 59Pe28=4.0(0.8)											**
$*^{88}Br^m$	T : from 11Ru.A; others: 25Pi01=4.5(0.4) 18Rz01=5.5(0.1) 09Fo05=4(1) 99Ge01=5.1(0.4) 76SeZN=4.9(0.4) 70Gr38,72GrYM=6.3(0.5)											**
$*^{88}Kr$	T : average 21Ch46=2.802(0.012) 12Wa21=2.804(0.015) 72Eh02=2.860(0.017) 64Cl01=2.805(0.022); others: 49Ko13=2.78(0.06) 40Gl05=2.92(0.17)											**
$*^{88}Rb$	J : 68Va03=2											**
$*^{88}Rb$	T : average 20Ch42=17.78(0.05) 89Ab22=17.773(0.033), uncertainty increased to 3σ by evaluator, 69Ra05=17.78(0.11); others: 22Sh20=17.9(0.2)											**
$*^{88}Rb$	T : 69He16=17.7(0.1)											**
$*^{88}Y$	J : 07Ch07=4											**
$*^{88}Y^n$	J : 07Ch07=8											**
$*^{88}Zr^m$	T : average 19Ha26=1.41(0.08) 17Pa35=1.40(0.07) 04Ch35=1.41(+0.12-0.09) 78Ha52=1.320(0.025) 78Ki06=1.28(0.10); other: 71Is04=1.75(0.20)											**
$*^{88}Ru$	T : average 19Pa16=1.9(0.5) 01Ki13=1.2(+0.3-0.2)											**
$*^{88}Ru$	D : $\%\beta^+$p from 19Pa16<3.6											**
^{89}Ga	−16880#	300#				15# ms	>300ns	$5/2^-$#	24Sh17	I	β^- ?;β^-n ?	
^{89}Ge	−33040#	400#				43.1 ms	2.4	$3/2^+$#	21 25To04	TD	β^-=100;β^-n=43.9 62;β^-2n=2.1 13	
^{89}As	−46688	4				81.1 ms	0.7	$5/2^-$#	21 25To04	TD	β^-=100;β^-n=83.8 27;β^-2n=0.25 5	*
^{89}Se	−58990.8	2.9				407 ms	22	$(3/2^+)$	21 22Rz01	TJD	β^-=100;β^-n=6.7 16	*
^{89}Br	−68275.3	2.7				4.330 s	0.018	$(5/2)^-$	21 22Rz01	J	β^-=100;β^-n=13.6 4	*
^{89}Kr	−76535.8	2.1				3.15 m	0.04	$3/2^+*$	21 95Ke04	J	β^-=100	
^{89}Rb	−81712.9	2.9				15.42 m	0.06	$3/2^-*$	12 20Wa08	T	β^-=100	*
^{89}Sr	−86209.03	0.09				50.562 d	0.022	$5/2^+*$	12 25Ko04	T	β^-=100	*
^{89}Y	−87711.2	0.3				STABLE		$1/2^-*$	12		IS=100	*
$^{89}Y^m$	−86802.2	0.3	908.97	0.03		15.663 s	0.005	$9/2^+*$	12 94It.A	T	IT=100	*
^{89}Zr	−84877.7	2.8				78.369 h	0.016	$9/2^+$	12 22Ko02	T	β^+=100	*
$^{89}Zr^m$	−84289.9	2.8	587.82	0.10		4.160 m	0.007	$1/2^-$	12 25Ke01	T	IT=93.77 12;β^+=6.23 12	*
^{89}Nb	−80601	7			*	2.03 h	0.07	$(9/2^+)$	12		β^+=100	
$^{89}Nb^m$	−80600#	30#	0#	30#	*	1.10 h	0.03	$(1/2)^-$	12		β^+=100	
^{89}Mo	−75017	3				2.11 m	0.10	$(9/2^+)$	21		β^+=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{89}Mo^m	−74630	3	387.5	0.2		190 ms 15	$(1/2^-)$	21	80Ga16	T	IT=100	
^{89}Tc	−67393	3				12.8 s 0.9	$(9/2^+)$	21	91He04	T	β^+=100	
^{89}Tc^m	−67330	3	62.6	0.5		12.9 s 0.8	$(1/2^-)$	21	91He04	T	$\beta^+\approx$100;IT ?	
^{89}Ru	−58369	24				1.32 s 0.03	$(9/2^+)$	21	19Pa16	TD	β^+=100;β^+p=3.1 2	*
^{89}Rh	−46360#	200#				<120ns	$9/2^+$#	21	16Ce02	TI	β^+ ?;p ?;β^+p ?	
*^{89}As	T : from 25To04=81.05(0.71)											**
*^{89}Se	T : average 22Rz01=390(30) 12Qu01=345(20,stat)(+95-75,syst) 82Re08=560(80) 71To13=410(40)											**
*^{89}Se	D : %β^-n average 22Rz01=6(2) 93Ru01=7.8(2.5)											**
*^{89}Br	T : average 25St.A=4.30(0.04) 93Ru01=4.348(0.022) 87PfZX=4.2(0.1) 84Ew01=4.30(0.14) 74NoZR=4.32(0.05); others: 76Ru01=4.37(0.03) 75Kr17=4.5(0.4)											**
*^{89}Br	T : 74Gr29=4.55(0.10) 74Kr21=4.44(0.20) 71Ch38=3.2(0.7) 66Si09=4.5(0.8)											**
*^{89}Br	D : average 25St.A=15.1(1.9) 93Ru01=13.4(0.6) 87PfZX=13.6(0.8) 81Ho07=13.9(1.4) 80ReZQ=13.9(1.4); others: 80Al15=14.2(0.9) 80Lu04=13.9(0.8)											**
*^{89}Br	D : 78Kr15=12.5(2.0) 77Re06,77Re05=16.9(1.7) 76ReZN=16.6(2.5) 74Kr21=13.2(2.1) 72Sc48=13.5(2.5) 64Ar24=7(2)											**
*^{89}Rb	T : average 20Wa08=15.47(0.13) 72Eh02=15.60(0.09) 69Ca03=15.15(0.12) 56Ok06=14.9(0.3) 40Gl05=15.4(0.2)											**
*^{89}Rb	J : 79Ek02,78Ek05=3/2											**
*^{89}Sr	T : average 25Ko04=50.43(0.33) 05Am01=50.65(0.05) 02Al02=50.61(0.05) 72La14=50.75(0.25) 71Ba28=50.55(0.09) 65An07=50.52(0.03) 59Os37=50.36(0.18)											**
*^{89}Sr	T : 55He81=50.5(0.2); others: 65Fl02=53 49Go20=55 46Gr06=54.5 39St01,37St01=55(5) 39Li10=54											**
*^{89}Sr	J : 90Li28,87Bu11=5/2											**
*^{89}Y	J : 07Ch07,50Ku69,49Cr17,40Wi08=1/2											**
*^{89}Y^m	J : 07Ch07=9/2											**
*^{89}Zr	T : average 22Ko02=78.373(0.023) 20Fe10=78.368(0.032) 18Ga04=78.333(0.038) 84Sk01=78.62(0.17) 64Va03=78.43(0.08)											**
*^{89}Zr^m	T : average 25Ke01=4.117(0.083) 92KaZM=4.145(0.009) 69Ro02=4.16(0.06) 64Va03=4.18(0.01); others: 53Sh48=4.40(0.04) 53Ka11=4.25 51Sh89=4.4(0.1)											**
*^{89}Zr^m	T : 40Du05=4.5											**
*^{89}Ru	D : %β^+p other: 12Lo08=3.0(+1.9-1.7)											**
*^{89}Ru	T : others: 12Lo08=2.2(1.2) 01Ki13=1.5(0.2) 00We.A=1.45(0.13) 99Li33=1.2(0.2) 95Ry03>1.5 μs 92Ye04>150 ns											**
^{90}Ga	−9850#	400#				8# ms >300ns			26Sh.1	I	β^- ?;β^-n ?	
^{90}Ge	−28470#	500#				30# ms >400ns	0^+	20	10Oh02	I	β^- ?;β^-n ?;β^-2n ?	
^{90}As	−40990#	210#				54.4 ms 1.2		20	25To04	TD	β^-=100;β^-n=76.0 37; β^-2n=5.46 55	
^{90}As^m	−40870#	210#	124.5	0.5		220 ns 100		20	12Ka36	ET	IT=100	*
^{90}Se	−55882	4				210 ms 80	0^+	20	12Qu01	T	β^-=100;β^-n ?	*
^{90}Br	−63999.9	2.7				1.911 s 0.009		20	25St.A	TD	β^-=100;β^-n=25.4 10	*
^{90}Kr	−74960.1	1.7				32.32 s 0.09	0^+	20			β^-=100	
^{90}Rb	−79357	4				158 s 5	0^-*	20			β^-=100	*
^{90}Rb^m	−79250	4	106.90	0.03		258 s 4	3^-*	20			β^-=97.5 4;IT=2.5 4	*
^{90}Rb^x	−79286	13	71	12		$R = 2 \sim 1$	*fsmix*					
^{90}Sr	−85950.8	1.4				28.91 y 0.03	0^+	20			β^-=100	
^{90}Y	−86496.9	0.4				64.05 h 0.05	2^-*	20			β^-=100	*
^{90}Y^m	−85814.9	0.4	682.01	0.05		3.221 h 0.010	7^+*	20	20Kr06	T	IT=99.9982 2;β^-=0.0018 2	*
^{90}Zr	−88772.39	0.10				STABLE	0^+	20			IS=51.47 6	*
^{90}Zr^m	−86453.39	0.10	2319.000	0.009		807.6 ms 1.4	5^-	20	22Fi.1	T	IT=100	*
^{90}Zr^n	−85182.97	0.10	3589.418	0.015		131 ns 4	8^+	20			IT=100	
^{90}Nb	−82662	3				14.60 h 0.05	8^+*	20			β^+=100	*
^{90}Nb^m	−82540	3	122.370	0.022		63 μs 2	6^+	20			IT=100	
^{90}Nb^n	−82537	3	124.67	0.25		18.81 s 0.06	4^-*	20			IT=100	*
^{90}Nb^p	−82491	3	171.10	0.10		< 1 μs	7^+				IT=100	
^{90}Nb^q	−82280	3	382.01	0.25		6.19 ms 0.08	1^+	20			IT=100[gs=0,m=100]	
^{90}Nb^r	−80782	3	1880.21	0.20		471 ns 6	(11^-)	20	05Ch65	TJ	IT=100	*
^{90}Mo	−80172.7	2.9				5.56 h 0.09	0^+	20			β^+=100	
^{90}Mo^m	−77297.9	2.9	2874.81	0.15		1.14 μs 0.03	8^+	20	19Ha26	T	IT=100	*
^{90}Tc	−70724.5	1.0				49.2 s 0.4	(8^+)	20			β^+=100	
^{90}Tc^m	−70580.7	1.3	143.8	1.6	MD	8.7 s 0.2	1^+	20			β^+=100	
^{90}Ru	−64886.2	1.9				11.7 s 0.9	0^+	20			β^+=100	
^{90}Rh	−51350#	200#			*	29 ms 3	(0^+)	20	19Pa16	JTD	β^+=100;β^+p=0.35 20	*
^{90}Rh^m	−51350#	540#	0#	500#	*	0.56 s 0.02	(7^+)	20	19Pa16	JTD	β^+=100;β^+p=9.6 10	
^{90}Pd	−40650#	400#				10# ms >400ns	0^+	20	16Ce02	I	β^+ ?;β^+p ?;2p ?	
*^{90}As^m	T : symmetrized from 12Ka36=200(+120-90)											**
*^{90}Se	T : symmetrized from 12Qu01=195(7,stat)(+95-65,syst)											**
*^{90}Br	T : average 25St.A=1.91(0.03) 12Qu01=2.09(0.03,stat)(0.23,syst) 93Ru01=1.91(0.01) 87PfZX=1.92(0.03) 84Ew01=1.92(0.06) 75As04=1.80(0.15); others:											**
*^{90}Br	T : 80Al15=1.92(0.02) 76Ru01=1.96(0.05) 75Kr17,74Kr21=1.71(0.14) 74RiYE=1.86(0.10) 72Sc48=1.3(0.2) 71Ch38=1.4(0.8) 71ShZD=1.6(0.6)											**
*^{90}Br	T : 70HeZX=1.63(0.14)											**
*^{90}Br	D : average 25St.A=24.2(3.0) 93Ru01=29.0(2.1) 87PfZX=24.3(3.0) 84Ew01=24.8(1.5) 75As04=22.6(3.1); others: 80Al15=24.6(1.7) 78Kr15=18.9(3.9)											**
*^{90}Br	D : 75Kr17,74Kr21=7.8(1.8) 74RiYE=22.6(0.8) 72Sc48=30(7)											**
*^{90}Rb	J : 79Ek02,78Ek05=0											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{90}$Rb^m	J : 79Ek02,78Ek05=3											**
$*^{90}$Y	J : 07Ch07,78Fu06,62Pe01=2											**
$*^{90}$Y^m	J : 07Ch07=7											**
$*^{90}$Y^m	T : average 20Kr06=3.178(0.012) 14Li50=3.204(0.008) 92An19=3.244(0.005) 67Gr02=3.19(0.01) 62Ab03=3.15(0.05) 61Ca12=3.2(0.1) 61He09=3.14(0.10)											**
$*^{90}$Y^m	T : 61Ha17=3.19(0.06). Birge ratio=2.70											**
$*^{90}$Zr	D : from IS=51.47(0.06) in 24Ci.A											**
$*^{90}$Zr^m	T : average 22Fi.1=799.7(8.0) 72Br53=809.2(2.0) 63Wa08=801(5)											**
$*^{90}$Nb	J : 09Ch25,78Ru04,75Ru06,74EkZW=8											**
$*^{90}$Nb^n	J : 09Ch25=4											**
$*^{90}$Nb^r	T : average 05Ch65=470(10) 81Fi02=440(20) 78Ha52=477(8); others: 17Pa35=415(67) 19Ha26=420(60)											**
$*^{90}$Mo^m	T : average 19Ha26=1.14(0.05) 17Pa35=1.15(0.05) 04Ch35=1.17(+0.11-0.07) 78Ha52=1.14(0.05) 71Is04=1.05(0.10)											**
$*^{90}$Rh	D : %β^+p from 19Pa16<0.7											**
^{91}Ge	−21500#	500#			20#	ms	$1/2^+$#		24Sh17	I	β^- ?;β^-n ?	
^{91}As	−36500#	300#			38.3	ms 1.6	$5/2^-$#		13 25To04	TD	β^-=100;β^-n=84.1 49; β^-2n=2.13 61	
^{91}Se	−50267.3	2.3			155.6	ms 3.7	$1/2^+$#		13 25To04	TD	β^-=100;β^-n=17.8 14;β^-2n ?	*
^{91}Br	−61107.0	1.9			543	ms 8	$5/2^-$#		13 25St.A	D	β^-=100;β^-n=29.8 5	*
^{91}Kr	−70973.6	2.1			8.57	s 0.04	$5/2^+$*		13		β^-=100;β^-n ?	*
^{91}Rb	−77760.8	2.1			58.2	s 0.3	$3/2^-$*		13		β^-=100;β^-n ?	*
^{91}Sr	−83645.4	1.0			9.65	h 0.06	$5/2^+$*		13 19Kr10	T	β^-=100	*
^{91}Y	−86351.6	1.9			58.51	d 0.06	$1/2^-$*		13		β^-=100	*
^{91}Y^m	−85796.0	1.9	555.58	0.05	49.71	m 0.04	$9/2^+$		13		IT≈100;β^- ?	
^{91}Zr	−87895.70	0.08			STABLE		$5/2^+$*		13		IS=11.23 6	*
^{91}Zr^m	−84728.4	0.4	3167.3	0.4	4.35	μs 0.14	(21/2$^+$)		13		IT=100	
^{91}Nb	−86638.3	2.9			680	y 130	$9/2^+$*		13 82Na17	T	ε=99.9862 25;e$^+$=0.0138 25	*
^{91}Nb^m	−86533.7	2.9	104.60	0.05	60.86	d 0.22	$1/2^-$*		13 91Hi.A	D	IT=96.6 5;ε=3.4 5;e$^+$=0.0028 2	*
^{91}Nb^n	−84603.9	2.9	2034.42	0.20	3.76	μs 0.12	(17/2$^-$)		13		IT=100	
^{91}Mo	−82217	5			15.49	m 0.01	$9/2^+$		13		β^+=100	
^{91}Mo^m	−81564	5	653.01	0.09	64.6	s 0.6	$1/2^-$		13		IT=50.0 16;β^+=50.0 16	
^{91}Tc	−75987.4	2.0			3.14	m 0.02	(9/2)$^+$		13		β^+=100	
^{91}Tc^m	−75848.1	2.0	139.3	0.3	3.3	m 0.1	(1/2)$^-$		13		β^+≈100;IT ?	
^{91}Ru	−68238.6	1.8			8.0	s 0.4	(9/2$^+$)		13 25Ap05	D	β^+=100;β^+p=0.08 8	*
^{91}Ru^m	−67809	30	430	30	7.6	s 0.8	(1/2$^-$)		13 25Ap05	D	β^+=100;β^+p=0.08 8	*
^{91}Rh	−58456	7			1.47	s 0.22	(9/2$^+$)		13 04De40	TJ	β^+=100;β^+p=1.3 5	*
^{91}Rh^m	−58283	7	172.9	0.4	1.8#	s	$1/2^-$#		13		β^+ ?;IT ?;β^+p ?	*
^{91}Pd	−46220#	300#			32	ms 3	$7/2^+$#		13 18Pa20	TD	β^+=100;β^+p=3.1 10	*
$*^{91}$Se	T : other: 75As04=270(50)											**
$*^{91}$Se	D : %β^-n from 25To04=17.8(1.4); other: 75As04=21(10)											**
$*^{91}$Br	T : average 12Qu01=495(30,stat)(40,syst) 93Ru01=549(9) 88Kr10=510(20) 84Ew01=530(30) 76Ah01=630(70) 75As04=600(50); others: 76Ru01=541(5)											**
$*^{91}$Br	T : 75Kr17,74Kr21=630(70) 74RiYE=600(30) 70HeZX=640(80)											**
$*^{91}$Br	D : average 25St.A=30.6(4.0) 14Ag12=29.5(0.5) 01Lh01=36(2) 93Ru01=22(10) 88Kr10=25.5(3.5) 84Ew01=30.1(2.1); others: 80Al15=19.2(1.3)											**
$*^{91}$Br	D : 78Kr15=14.1(3.6) 75As04=9.9(2.0) 75Kr17,74Kr21=8.3(2.5) 74RiYE=21(10)											**
$*^{91}$Kr	J : 95Ke04=5/2											**
$*^{91}$Rb	J : 78Bo38=3/2											**
$*^{91}$Sr	J : 90Li28,87Bu11=5/2											**
$*^{91}$Sr	T : other: 19Kr10=9.66(0.09)											**
$*^{91}$Y	J : 62Pe21=1/2											**
$*^{91}$Zr	D : from IS=11.23(0.06) in 24Ci.A											**
$*^{91}$Zr	J : 02Ca37,57Br26,49Ar06=5/2											**
$*^{91}$Nb	J : 09Ch25=9/2											**
$*^{91}$Nb	D : from 91Hi.A											**
$*^{91}$Nb^m	J : 09Ch25=1/2											**
$*^{91}$Ru	D : value for gs+m; others: 19Pa16<0.2 12Lo08=1.3(0.5)											**
$*^{91}$Ru^m	D : value for gs+m; others: 19Pa16<0.2 12Lo08=1.3(0.5)											**
$*^{91}$Rh	T : from 04De40=1.47(0.22) using time spectra gated by γ rays feeding the ^{91}Ru gs (9/2$^+$); others: 19Pa16=1.60(0.02) 01Ki13=1.7(0.2)											**
$*^{91}$Rh	T : 00We.A=1.74(0.14) (same group as 01Ki13) probably include both gs and isomer											**
$*^{91}$Rh^m	T : others: ENSDF2013 assign $T_{1/2}$=1.47(0.22) from 04De40, but this value is unambiguously associated in 04De40 with the decay of the 9/2$^+$ gs,											**
$*^{91}$Rh^m	T : 19Pa16=1.60(0.02) 01Ki13=1.7(0.2) 00We.A=1.74(0.14) probably include both gs and isomer											**
$*^{91}$Pd	D : %β^+p symmetrized from 18Pa20=3.0(+1.1-0.9)											**
^{92}Ge	−16390#	500#			10#	ms	0^+		24Sh17	I	β^- ?;β^-n ?	
^{92}As	−30380#	400#			18.3	ms 2.7			12 25To04	TD	β^-=100;β^-n=63 16;β^-2n=23.0 89	
^{92}Se	−46620#	200#			67.5	ms 0.7	0^+		12 25To04	TD	β^-=100;β^-n=15.14 76;β^-2n ?	*
^{92}Se^m	−44780#	400#	3072	2	15.7	μs 0.7	(9$^-$)		20Li15	ETJ	IT=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{92}Br	−56237	5				342 ms 5	(2^-)	12	25To04	D	β^-=100;β^-n=49.9 18;β^-2n ?	*
^{92}Br^m	−55575	5	662	1		88 ns 8			12Ka36	ET	IT=100	*
^{92}Br^n	−55099	5	1138	1		85 ns 10			12Ka36	ET	IT=100	*
^{92}Kr	−68769.6	2.6				1.840 s 0.008	0^+	12			β^-=100;β^-n=0.0332 25	
^{92}Rb	−74771	5				4.48 s 0.03	0^-*	12			β^-=100;β^-n=0.0107 5	*
^{92}Sr	−82867	3				2.611 h 0.017	0^+	12			β^-=100	*
^{92}Y	−84817	9				3.54 h 0.01	2^-*	12			β^-=100	*
^{92}Y^m	−84010#	50#	807#	50#		3.7 μs 0.5	7^+#	12	11Ru.A	ET	IT=100	*
^{92}Zr	−88459.12	0.08				STABLE	0^+	12			IS=17.16 4	*
^{92}Nb	−86453.4	1.8				34.7 My 2.4	7^+*	12			β^+=100	*
^{92}Nb^m	−86317.9	1.8	135.5	0.4		10.116 d 0.013	$(2)^+$	12	19Kr13	T	β^+=100	*
^{92}Nb^n	−86227.6	1.8	225.8	0.4		5.9 μs 0.2	$(2)^-$	12			IT=100	
^{92}Nb^p	−84250.1	1.8	2203.3	0.4		103.6 ns 2.2	11^-	12	24Go14	TJ	IT=100	*
^{92}Mo	−86808.59	0.16				STABLE >190Ey	0^+	12	97Ba35	T	IS=14.649 106;2β^+ ?	
^{92}Mo^m	−84048.07	0.21	2760.52	0.14		208.2 ns 1.7	8^+	12	23Le18	T	IT=100	*
^{92}Tc	−78927.4	2.6				4.25 m 0.15	$(8)^+$	12			β^+=100	
^{92}Tc^m	−78657.3	2.6	270.09	0.08		0.99 μs 0.05	(4^+)	12	19Ha26	T	IT=100	*
^{92}Tc^n	−78398.0	2.6	529.42	0.13		< 0.1 μs	(3^+)				IT=100	
^{92}Tc^p	−78216.1	2.6	711.33	0.15		< 0.1 μs	1^+				IT=100	
^{92}Ru	−74301.6	2.1				3.65 m 0.05	0^+	12			β^+=100	
^{92}Ru^m	−71467.7	2.8	2833.9	1.8		100 ns 8	(8^+)	12	19Ha26	T	IT=100	*
^{92}Rh	−62993.8	2.6			*	5.63 s 0.05	(6^+)	12	19Pa16	TD	β^+=100;β^+p=2.05 7	*
^{92}Rh^m	−62940#	100#	50#	100#	*	3.25 s 0.19	(2^+)	12	19Pa16	TD	β^+=100;β^+p=1.7 3	*
^{92}Rh^n	−62890#	100#	105#	100#		232 ns 15	(4^+)		17Pa35	ETJ	IT=100	*
^{92}Pd	−54645	25				1.06 s 0.03	0^+	12	19Pa16	TD	β^+=100;β^+p=1.6 2	
^{92}Ag	−38230#	400#				1# ms >400ns		16	16Ce02	I	β^+ ?;p ?	
*^{92}Se	T : from 25To04=67.54(0.72)											**
*^{92}Se^m	T : other: 12Ka36=10.3(+5.5-2.8)											**
*^{92}Se^m	E : uncertainty estimated by NUBASE											**
*^{92}Br	T : average 12Qu01=290(+70-55) 88Kr10=310(10) 76Ru01=365(7) 84Ew01=310(20) 78Cr03=350(40) 74Kr21=260(40)											**
*^{92}Br	D : %β^-n from 25To04=49.9(1.8); others: 88Kr10=32.0(4.5) 84Ew01=34.6(2.5) 78Cr03=21(8)											**
*^{92}Br^m	T : symmetrized from 12Ka36=89(+7-8)											**
*^{92}Br^m	E : uncertainty estimated by NUBASE											**
*^{92}Br^n	T : symmetrized from 12Ka36=84(+10-9)											**
*^{92}Br^n	E : uncertainty estimated by NUBASE											**
*^{92}Rb	J : 79Ek02=0											**
*^{92}Sr	T : other (recent): 19Kr10=2.66(0.06)											**
*^{92}Y	J : 07Ch07=2											**
*^{92}Y^m	T : average 11Ru.A=3.3(0.6) 09Fo05=4.2(+0.8-0.6)											**
*^{92}Y^m	E : observed 315-keV and 419-keV γ rays in a cascade with a non-observed, low-energy transition directly depopulating the isomer											**
*^{92}Zr	D : from IS=17.16(0.04) in 24Ci.A											**
*^{92}Nb	J : 09Ch25=7											**
*^{92}Nb	T : average 78Ne04=36(3) 77Ma45=32(6),33(5)											**
*^{92}Nb^m	T : average 19Kr13=10.07(0.02) 68Re04=10.14(0.03) 62Bu16=10.16(0.03) 59We30=10.15(0.03)											**
*^{92}Nb^p	T : from 24Go14=103.6(2.2) using $\gamma\gamma(\Delta t)$; other: 77Br12=167(4) using γ(t)											**
*^{92}Mo^m	T : average 23Le18=214.9(2.1) 22Hu22=195(24) 19Ha26=180(40) 17Pa35=200(37) 79Ha60=195(13) 77Ha49=214(5) 72Ad01=184(5) 71Co08=191(7)											**
*^{92}Mo^m	T : 71Le19=219(22),240(50) 64Lo02=192(7)											**
*^{92}Tc^m	T : average 19Ha26=0.9(0.1) 17Pa35=1.02(0.17) 71Ho27=1.03(0.07)											**
*^{92}Ru^m	T : average 19Ha26=100(10) 80No06=100(14)											**
*^{92}Rh	T : average 25Ap05=5.6(0.5),5.6(0.1) 19Pa16=5.61(0.08) 12Lo08=5.7(0.1) 01Ki13=5.6(0.5); others: 04De40=4.66(0.25) 01Xu05=3.0(0.8), gs+m											**
*^{92}Rh	D : %β^+p average 19Pa16=2.2(0.1) 12Lo08=1.9(0.1)											**
*^{92}Rh	J : from 97Ka07; 01Xu05>4											**
*^{92}Rh^m	T : average 25Ap05=3.5(0.4) 19Pa16=3.18(0.22); other: 04De40=0.53(0.37)											**
*^{92}Rh^n	E : 55.3(0.3) keV above ^{92}Rh^m											**
*^{92}Rh^n	T : from 19Ha26=232(15); other: 17Pa35=230(60)											**
^{93}As	−25500#	400#				12# ms	5/2$^-$#		24Sh17	I	β^- ?;β^-n ?	
^{93}Se	−40700#	300#				47.4 ms 2.0	1/2$^+$#	10	25To04	TD	β^-=100;β^-n=24.7 37; β^-2n=0.79 57	
^{93}Se^m	−40020#	300#	678.2	0.7		420 ns 100			12Ka36	ET	IT=100	*
^{93}Br	−52890	430				152 ms 8	5/2$^-$#	10	13Mi13	TD	β^-=100;β^-n=64 6;β^-2n ?	*
^{93}Kr	−64136.0	2.5				1.287 s 0.010	1/2$^+$*	10	13Mi13	TD	β^-=100;β^-n=1.95 11	*
^{93}Rb	−72619	8				5.84 s 0.02	5/2$^-$*	10			β^-=100;β^-n=1.39 7	*
^{93}Rb^m	−68196	8	4423.1	1.5		106 ns 9	(27/2$^-$)	10	25Pi01	T	IT=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{93}Sr	−80086	8				7.43 m 0.03	$5/2^+$*	10			β^-=100	*
^{93}Y	−84227	10				10.18 h 0.08	$1/2^-$*	10			β^-=100	*
^{93}Y^m	−83468	10	758.719	0.021		820 ms 40	$9/2^+$*	10			IT=100	*
^{93}Zr	−87122.1	0.5				1.61 My 0.05	$5/2^+$	10			β^-=100	*
^{93}Nb	−87212.9	1.5				STABLE	$9/2^+$*	10			IS=100	*
^{93}Nb^m	−87182.1	1.5	30.760	0.005		16.12 y 0.12	$1/2^-$	10	20Ho10	E	IT=100	
^{93}Nb^n	−79753	17	7460	17		1.5 μs 0.5	$33/2^-$#	10			IT=100	*
^{93}Mo	−86807.08	0.18				4.839 ky 0.063	$5/2^+$	10	21Ka50	T	ε=100	
^{93}Mo^m	−84382.13	0.18	2424.95	0.04		6.85 h 0.07	$21/2^+$	10			IT=99.88 1;β^+=0.12 1	
^{93}Mo^n	−77112	17	9695	17		1.8 μs 1.0	$(39/2^-)$	10	05Fu01	T	IT=100	*
^{93}Tc	−83606.1	1.0				2.75 h 0.05	$9/2^+$	10			β^+=100	
^{93}Tc^m	−83214.3	1.0	391.84	0.08		43.5 m 1.0	$1/2^-$	10			IT=77.4 6;β^+=22.6 6	
^{93}Tc^n	−81420.9	1.0	2185.16	0.15		10.15 μs 0.27	$(17/2)^-$	10	19Ha26	T	IT=100	*
^{93}Ru	−77215.6	2.0				59.7 s 0.6	$(9/2)^+$	10			β^+=100	
^{93}Ru^m	−76481.2	2.0	734.40	0.10		10.8 s 0.3	$(1/2)^-$	10			β^+=78.0 23;IT=22.0 23; β^+p=0.027 5	
^{93}Ru^n	−75133.1	2.2	2082.5	0.9		2.46 μs 0.03	$(21/2)^+$	10	19Ha26	T	IT=100	*
^{93}Rh	−69013.6	2.5				13.9 s 1.6	$9/2^+$#	10			β^+=100	
^{93}Rh^m	−68740	40	270	40	MD	500# ms	$1/2^-$#		23Xi01	E	β^+ ?;IT ?	
^{93}Pd	−59085	7				1.174 s 0.007	$(9/2^+)$	10	25Ap05	TD	β^+=100;β^+p=5.98 6	*
^{93}Ag	−46400#	400#				228 ns 16	$9/2^+$#	16	16Ce02	T	p=?;β^+ ?;β^+p ?	*
*^{93}Se^m	E : from 12Ka36=208.3(0.5) and 469.9(0.5) γ rays in a cascade to gs											**
*^{93}Se^m	T : symmetrized from 12Ka36=390(+120-80)											**
*^{93}Br	D : %β^-n average 13Mi13=53(+11-8) 01Lh01=68(7)											**
*^{93}Kr	T : average 13Mi13=1.298(0.054) 12Qu01=1.245(0.070,stat)(0.030,syst) 76Ru01=1.33(0.05) 75As04=1.27(0.02) 69Ca03=1.289(0.012)											**
*^{93}Kr	J : 95Ke04=1/2											**
*^{93}Kr	D : %β^-n other (downweighted): 13Mi13=1.9(+0.6-0.2)											**
*^{93}Rb	J : 78Bo38=5/2											**
*^{93}Rb^m	T : average 25Pi01=97(15) 10Si17=111(11)											**
*^{93}Sr	J : 90Li28=5/2											**
*^{93}Y	J : 07Ch07=1/2											**
*^{93}Y^m	J : 07Ch07=9/2											**
*^{93}Zr	T : average 10Ca01=1.64(0.06) 72FlZM=1.53(0.10); other: 10Ya01=1.13(0.11)											**
*^{93}Nb	J : 09Ch25,47Me27,34Ba01=9/2											**
*^{93}Nb^n	E : from 7435.3(2.1) + x keV in ENSDF2011; x<50 keV estimated by NUBASE											**
*^{93}Nb^n	J : week population in 07Wa45, feeding the 7435.3 keV 37/2$^-$ level; given the Weisskopf $T_{1/2}$ estimates and the measured $T_{1/2}$, the depopulating <50											**
*^{93}Nb^n	J : keV γ-ray transition is most likely E2											**
*^{93}Mo^n	E : from 9670.0(2.3) + x keV in ENSDF2011; x<50 keV assumed in NUBASE											**
*^{93}Mo^n	T : symmetrized from 05Fu01=1.1(+1.5-0.4)											**
*^{93}Tc^n	T : average 19Ha26=10(1) 77Ha49=10.1(0.3) 76Br08=10.5(0.7)											**
*^{93}Ru^n	T : average 19Ha26=2.52(0.04) 17Pa35=2.36(0.12) 09Ga40=2.7(0.2) 83Gr33=2.6(0.3) 83Ko07=2.6(0.2) 78Br25=2.05(0.10)											**
*^{93}Pd	T : average 25Ap05=1.17(0.01),1.18(0.01) 19Pa16=1.17(0.02) 12Lo08=1.15(0.05) 01Ki13=1.0(0.2) 01Xu05=1.3(0.2) 00Sc31=0.9(0.2)											**
*^{93}Pd	D : %β^+p others: 19Pa16=7.4(0.2) 12Lo08=7.5(0.5)											**
*^{93}Ag	T : estimated from the time of flight and the assumption that the ratio between the number of identified nuclei with the same Tz is identical											**
^{94}As	−19000#	400#				8# ms			24Sh17	I	β^- ?;β^-n ?	
^{94}Se	−36600#	400#				50# ms >300ns	0^+	06			β^- ?;β^-n ?;β^-2n ?	*
^{94}Se^m	−34170#	400#	2430.0	0.6		680 ns 50	(7^-)		20Li05	EJT	IT=100	*
^{94}Br	−47650#	200#				70 ms 20	2^-#	06			β^-=100;β^-n=68 16;β^-2n ?	
^{94}Br^m	−47360#	200#	294.6	0.5		530 ns 15			12Ka36	ET	IT=100	
^{94}Kr	−61348	12				212 ms 4	0^+	11	16Mi18	T	β^-=100;β^-n=1.11 7	*
^{94}Rb	−68562.8	2.0				2.702 s 0.005	3^-*	11	11Go37	D	β^-=100;β^-n=10.3 3	*
^{94}Rb^m	−68458.6	2.0	104.2	0.2		130 ns 15	(0^-)		16Mi18	ETJ	IT=100	
^{94}Rb^n	−66487.9	2.4	2074.9	1.4		68.4 ns 0.6	(10^-)		74Su04	TI	IT=100	*
^{94}Sr	−78845.7	1.7				75.3 s 0.2	0^+	11			β^-=100	
^{94}Y	−82351	6				18.7 m 0.1	2^-*	06			β^-=100	*
^{94}Y^m	−81149	6	1202.3	1.0		1.304 μs 0.012	(5^+)	06	17Ki09	T	IT=100	*
^{94}Zr	−87269.33	0.16				STABLE >0.19Ey	0^+	06	23Be10	T	IS=17.36 7;2β^- ?	*
^{94}Nb	−86369.1	1.5				20.4 ky 0.4	6^+	06	12He11	T	β^-=100	*
^{94}Nb^m	−86328.2	1.5	40.892	0.012		6.263 m 0.004	3^+	06			IT=99.50 6;β^-=0.50 6	
^{94}Mo	−88414.11	0.13				STABLE	0^+	06			IS=9.187 33	
^{94}Tc	−84158	4				293.4 m 1.0	7^+*	06	20Li47	T	β^+=100	*
^{94}Tc^m	−84083	5	74.9	2.4		51.0 m 0.7	$(2)^+$	06	68Ar06	D	$\beta^+\approx$100;IT ?	*
^{94}Ru	−82584	3				51.8 m 0.6	0^+	06			β^+=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{94}Ru^m	−79940	3	2644.1	0.4		64.4 μs 0.9	8^+	06	22Ja.1	T	IT=100	*
^{94}Rh	−72910	3				25.8 s 0.2	(8^+)	06			β^+=100	
^{94}Rh^m	−72592	21	318	21	MD	70.6 s 0.6	(4^+)	06	23Mo07	E	β^+=100;β^+p=1.8 5	
^{94}Rh^n	−72537	21	373	21		480 ns 30	(2^+)	06	06Ba55	ETJ	IT=100	*
^{94}Pd	−66099	4				9.02 s 0.17	0^+	06	25Ap05	TD	β^+=100;β^+p=0.3 1	*
^{94}Pd^m	−61216	4	4883.1	0.4		514 ns 1	(14^+)	06	22Ja.1	T	IT=100	*
^{94}Pd^n	−58889	4	7209.8	0.8		217 ns 13	(19^-)		19Ha26	T	IT=100	*
^{94}Ag	−52400#	400#				26.2 ms 0.9	0^+#	06	25Ap05	TD	β^+=100;β^+p=0.12 7	*
^{94}Ag^m	−51050#	570#	1350#	400#		484 ms 5	(7^+)	06	25Ap05	TD	β^+=100;β^+p=16.5 5	*
^{94}Ag^n	−46005	18	6390#	400#		400 ms 40	(21^+)	06			β^+=95.4 7;p=4.1 6;2p=0.5 3; β^+p≈27	*
^{94}Cd	−40700#	500#				80# ms >760ns	0^+	16	16Ce02	I	β^+ ?;β^+p ?	
*^{94}Se	I : 97Be70>300 ns 95Cz.A>300 ns; 17Ch18 observed excited states											**
*^{94}Se^m	E : uncertainty of 0.3 keV is assumed for all γ rays in the cascade											**
*^{94}Kr	T : average 16Mi18,13Mi13=227(14) 03Be05=212(5) 72Am01=200(10) 75As04=220(20); other (not used): 96Me09=330(100)											**
*^{94}Rb	J : 78Bo38=3											**
*^{94}Rb^n	T : from 74Su04 [589γ(t), ^{235}U data]; others: 25Pi01=65(8) 08Ts03=107(16) [589γ(t), ^{252}Cf data] 74Su04=100(50) [589γ(t), ^{239}Pu data]											**
*^{94}Y	J : 07Ch07=2											**
*^{94}Y^m	T : average 17Ki09=1.33(0.01) 11Ru.A=1.295(0.005) 99Ge02=1.35(0.02); Birge ratio=2.77											**
*^{94}Zr	T : from 23Be10; value for 2ν-$\beta\beta$ to 871-keV level; other: >2.4 Ey to gs; 0ν-$\beta\beta$: >3.8 Ey to 871-keV level, >26 Ey to gs											**
*^{94}Zr	D : from IS=17.36(0.07) in 24Ci.A											**
*^{94}Nb	T : others: 59Sc35=20.3(1.6) 55Ro21=18(4) 53Do18=22(5)											**
*^{94}Tc	T : average 20Li47=299(4) 63Ma21=293(1); others: 65Ba48=295(10) 62Mo06=270(12)											**
*^{94}Tc	J : 74EkZW=7											**
*^{94}Tc^m	T : average 20Li47=50(1) 50Me21=52.5(1.5) 62Mo06=53(2) 48Mo19=50(2)											**
*^{94}Tc^m	E : average 77Ha05=76(3) 73Mc04=73(4); other: 79Ra16=72											**
*^{94}Ru	T : other for q=44$^+$ (bare ion): 25Ze03=187(6) μs [from τ=270(9) μs]											**
*^{94}Ru^m	T : average 22Ja.1=64(1), supersedes 22Mi.1=67(3), 19Ha26=64(4) 71Le19=71(4) 77Ha49=68(10); others for q=44$^+$ (bare ion): 25Ze03=118(7)											**
*^{94}Ru^m	T : 24Ze04=98(15), supersedes 17Ze02,17Ch37=102(17)											**
*^{94}Rh^n	ETJ : 54.60(0.20) keV above ^{94}Rh^m											**
*^{94}Pd	T : average 25Ap05=9(3),9.0(0.2) 19Pa16=9.1(0.4) 82Ku15=9.0(0.5)											**
*^{94}Pd	D : %β^+p other: 19Pa16<0.13											**
*^{94}Pd^m	T : average 22Ja.1=499(9) 19Ha26=515(1) 17Pa35=495(7) 11Br01=499(13) 09Ga40=468(19) 02La18=530(10), same as 98Gr.B=530(10) and supersedes											**
*^{94}Pd^m	T : 97Gr02=600(100); other: 95Go30=800(200)											**
*^{94}Pd^n	E : from a least-squares fit to E_γ											**
*^{94}Pd^n	T : average 19Ha26=230(20) 17Pa35=225(32) 11Br01=197(22)											**
*^{94}Ag	T : average 25Ap05=26(1) 19Pa16=27(2)											**
*^{94}Ag	D : %β^+p from 25Ap05<0.23; other: 19Pa16<0.2											**
*^{94}Ag^m	T : average 25Ap05=499(9),510(20) 19Pa16=470(10) 01Ki13=450(20) 94Sc35=420(50); others: 04Mu30=610(20) 04Pl01=590(20)											**
*^{94}Ag^m	D : %β^+p average 25Ap05=15(1) 19Pa16=17.0(0.6)											**
*^{94}Ag^n	D : %p=1.9(0.5) + 2.2(0.4) from 05Mu15, %2p from 06Mu03											**
^{95}As	−13650#	400#				5# ms	$5/2^-$#		24Sh17	I	β^- ?;β^-n ?	
^{95}Se	−30130#	500#				70# ms >400ns	$3/2^+$#	12	10Oh02	I	β^- ?;β^-n ?;β^-2n ?	
^{95}Br	−43850#	300#				80# ms >300ns	$5/2^-$#	09	97Be70	I	β^- ?;β^-n ?;β^-2n ?	
^{95}Br^m	−43310#	300#	537.9	0.5		6.8 μs 1.0			12Ka36	ET	IT=100	*
^{95}Kr	−56159	19				114 ms 3	$1/2^+$*	09	95Ke04	J	β^-=100;β^-n=2.87 18;β^-2n ?	
^{95}Kr^m	−55964	19	195.5	0.3		1.582 μs 0.022	$(7/2^+)$	09	12Ka36	T	IT=100	*
^{95}Rb	−65893	20				378.1 ms 0.8	$5/2^-$*	09	12Qu01	T	β^-=100;β^-n=8.75 22	*
^{95}Rb^m	−65082	20	810.57	0.25		98.7 ns 2.9	$9/2^+$#		10Si17	TE	IT=100	*
^{95}Sr	−75123	5				23.90 s 0.14	$1/2^+$*	09			β^-=100	*
^{95}Y	−81226.2	1.0				10.3 m 0.1	$1/2^-$*	09			β^-=100	*
^{95}Y^m	−80138.6	1.2	1087.6	0.6		48.6 μs 0.5	$9/2^+$	09	11Ru.A	T	IT=100	
^{95}Zr	−85660.0	0.9				64.06 d 0.05	$5/2^+$	09	FGK259	T	β^-=100	
^{95}Nb	−86786.3	0.5				34.995 d 0.010	$9/2^+$*	09	FGK259	T	β^-=100	*
^{95}Nb^m	−86550.6	0.5	235.69	0.02		3.61 d 0.03	$1/2^-$	09			IT=94.4 6;β^-=5.6 6	
^{95}Mo	−87711.88	0.12				STABLE	$5/2^+$*	09			IS=15.873 30	*
^{95}Tc	−86015.95	0.18				19.258 h 0.027	$9/2^+$*	09	20Sz02	T	β^+=100	*
^{95}Tc^m	−85977.04	0.18	38.91	0.04		61.94 d 0.07	$1/2^-$	09	22We05	T	β^+=96.12 32;IT=3.88 32	*
^{95}Ru	−83457	9				1.607 h 0.004	$5/2^+$	09	20Sz02	T	β^+=100	*
^{95}Rh	−78341	4				5.02 m 0.10	$(9/2)^+$	09			β^+=100	
^{95}Rh^m	−77798	4	543.3	0.3		1.96 m 0.04	$(1/2)^-$	09			IT=88 5;β^+=12 5	
^{95}Pd	−69966	3				7.4 s 0.4	$9/2^+$#	09	19Pa16	TD	β^+=100;β^+p=0.23 5	*
^{95}Pd^m	−69160	30	800	30	MD	500# ms	$1/2^-$#		23Xi01	E	IT ?;β^+ ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{95}Pd^{n}	−68091	3	1875.13	0.14		13.3 s 0.2	$(21/2^+)$	09	19Pa16	TD	β^+=89 3;IT=11 3;β^+p=0.71 7	*
^{95}Ag	−59743.2	1.4				1.851 s 0.017	$(9/2^+)$	09	25Ap05	TD	β^+=100;β^+p=1.88 4	*
^{95}Ag^{m}	−59399.0	1.4	344.2	0.3		< 500 ms	$(1/2^-)$				IT=100	
^{95}Ag^{n}	−57211.9	2.1	2531.3	1.5		< 16 ms	$(23/2^+)$				IT=100	
^{95}Ag^{p}	−54883.2	2.1	4860.0	1.5		< 40 ms	$(37/2^+)$				IT=100	
^{95}Cd	−46890#	400#				32.9 ms 2.2	$9/2^+$#	21	25Ap05	TD	β^+=100;β^+p=3.8 6	*
*^{95}Br^{m}	T : symmetrized from 12Ka36=6.7(+1.1-0.9)											**
*^{95}Kr^{m}	T : others: 22Ge01=1.57(0.07) 11Ru.A=1.28(0.05) 06Ge05=1.4(0.2)											**
*^{95}Rb	J : 79Ek02,79Ke02=5/2											**
*^{95}Rb	T : average 12Qu01=412(13,stat)(1,syst) 03Be05=384(4) 93Ru01=379(2), supersedes 76Ru01=400(4), 87GaZF=378(2) 86ReZU=377(1), supersedes											**
*^{95}Rb	T : 77Re05,75Re10=377(4), 81En05=400(10), supersedes 79En02,76AmZW=402(8), 79Ri09=377(6), supersedes 75As04=370(40) 75Ba36=410(20),											**
*^{95}Rb	T : 74Ro15=383.2(6.0) 67Am01,68GaZY=360(20)											**
*^{95}Rb	D : %β^-n average 93Ru01=9.7(0.4), supersedes 80Lu04=8.9(0.6) 86ReZU=9.0(1.1), supersedes 80ReZQ=8.7(0.9) 77Re05=11.0(0.8) 76ReZN=10.9(0.8),											**
*^{95}Rb	D : 86Ok07=8.60(0.57) 81Ho07=7.7(0.7) 81En05=8.2(0.8) 79Ri09=8.6(0.5), supersedes 75As04=8.4(0.5), 74Ro15=8.54(0.91) 69Am01=7.10(0.93)											**
*^{95}Rb^{m}	T : average 25Pi01=101(24) 10Si17=94(7) 74Su04=96(5) [619.6γ(t)], 102(4) [810.6γ(t)]; others: 09Fo05<500											**
*^{95}Rb^{m}	E : other: 09Fo05,ENSDF2010=835.0(0.7)											**
*^{95}Sr	J : 90Li28,87Bu11=1/2											**
*^{95}Y	J : 07Ch07=1/2											**
*^{95}Nb	J : 86Ed01=9/2											**
*^{95}Mo	J : 56Ow04,54Wo07,51Ar29=5/2											**
*^{95}Tc	T : from 20Sz02=19.258(0.005,stat)(0.026,syst)											**
*^{95}Tc	J : 78Ru04,75Ru06,74EkZW=9/2											**
*^{95}Tc^{m}	T : average 22We05=61.88(0.22) 20Sz02=61.96(0.22) 06Ca25=61.95(0.08); other: 59Un01=61(2)											**
*^{95}Ru	T : average 20Sz02=1.6033(0.0017,stat)(0.0041,syst) 70Bo22=1.632(0.021) 68Pi03=1.650(0.017)											**
*^{95}Pd	T : average 19Pa16=7.4(0.5) 12Lo08=7.5(0.5)											**
*^{95}Pd^{n}	T : average 19Pa16=13.2(0.4) 82Ku15=13.3(0.3)											**
*^{95}Pd^{n}	D : %IT from 82Ku15=11(3)											**
*^{95}Ag	T : average 25Ap05=1.79(0.04),1.88(0.02) 19Pa16=1.80(0.07) 12Lo08=1.76(0.09) 05Ha45=1.76(0.13) 03Do09=1.85(0.34) 97Sc30=1.74(0.13)											**
*^{95}Ag	D : %β^+p average 25Ap05=1.87(0.04) 19Pa16=2.1(0.3) 12Lo08=2.5(0.3)											**
*^{95}Cd	T : average 25Ap05=34(4),36(6) 18Pa20=32(3) 17Da07=29(8); other: 10St.A,11StZV=73(+53-28)											**
*^{95}Cd	D : %β^+p average 25Ap05=3.3(0.8) 18Pa20=4.5(+1.2-1.0)											**
^{96}Se	−25800#	500#				6# ms	0^+		24Sh17	I	β^- ?;β^-n ?	
^{96}Br	−38210#	300#				20# ms >300ns		08	97Be70	I	β^- ?;β^-n ?;β^-2n ?	
^{96}Br^{m}	−37900#	300#	311.5	0.5		3.0 μs 0.9			12Ka36	ET	IT=100	*
^{96}Kr	−53101	9				80 ms 8	0^+	12			β^-=100;β^-n=3.7 4	
^{96}Rb	−61354	3				201.7 ms 0.8	2^-*	08	93Ru01	TD	β^-=100;β^-n=14.1 4;β^-2n ?	*
^{96}Rb^{m}	−60219	3	1134.6	1.1		1.80 μs 0.04	(10^-)	08			IT=100	*
^{96}Sr	−72918	8				1.059 s 0.008	0^+	08	12Qu01	T	β^-=100;β^-n ?	*
^{96}Y	−78330	4				5.34 s 0.05	0^-*	08			β^-=100	*
^{96}Y^{m}	−76790	4	1540.6	0.4		9.6 s 0.2	8^+*	08	20Is08	E	β^-=100	*
^{96}Y^{n}	−76675	4	1655.24	0.24		181 ns 9	(6^+)		20Is08	EJT	IT=100	
^{96}Zr	−85438.86	0.11				23.0 Ey 1.8	0^+	08	18Ma51	T	IS=2.78 4;2β^-=100	*
^{96}Nb	−85602.83	0.15				23.35 h 0.05	6^+*	08	86Ed01	J	β^-=100	
^{96}Mo	−88794.89	0.12				STABLE	0^+	08	51Ar29	J	IS=16.673 8	
^{96}Tc	−85822	5				4.28 d 0.07	7^+*	08			β^+=100	*
^{96}Tc^{m}	−85788	5	34.23	0.04		51.5 m 1.0	4^+	08	21He16	D	IT=?;β^+=4.1 4	*
^{96}Ru	−86080.32	0.13				STABLE >80Ey	0^+	08	13Be09	T	IS=5.54 14;2β^+ ?	*
^{96}Rh	−79689.0	2.8				9.90 m 0.10	6^+	08			β^+=100	
^{96}Rh^{m}	−79637.0	2.8	51.98	0.09		1.51 m 0.02	3^+	08			IT=60 5;β^+=40 5	
^{96}Pd	−76192.4	2.5				122 s 2	0^+	08			β^+=100	
^{96}Pd^{m}	−73661.5	2.5	2530.91	0.20		1.811 μs 0.005	(8^+)	08	22Ja.1	T	IT=100	*
^{96}Ag	−64656.4	0.8				4.449 s 0.022	$(8)^+$	08	19Pa16	TD	β^+=100;β^+p=4.2 4	*
^{96}Ag^{m}	−64541.8	1.5	114.6	1.7	MD	6.9 s 0.5	(2^+)	08	12Lo08	TD	β^+=100;β^+p=14.9 18	*
^{96}Ag^{n}	−62195.0	0.9	2461.4	0.3		103.2 μs 4.5	(13^-)		11Bo23	TJD	IT=100	*
^{96}Ag^{p}	−61969.7	0.9	2686.7	0.4		1.557 μs 0.013	(15^+)	08	17Pa35	ETJ	IT=100	*
^{96}Ag^{q}	−57704.7	2.2	6951.7	2.0		132 ns 17	(19^+)	08	17Pa35	ETJ	IT=100	*
^{96}Cd	−55681	30				1003 ms 47	0^+	10	19Pa16	TD	β^+=100;β^+p=1.6 3	*
^{96}Cd^{m}	−49650	1390	6030	1390		541 ms 19	16^+		19Pa16	ETD	β^+=100;β^+p=18.2 10	*
^{96}Cd^{n}	−50080	30	5605	5		198 ns 18	$(12^-,13^-)$		19Da02	EJ	IT=100	*
^{96}In	−38450#	500#				1# ms >350ns		16	25Su07	T	β^+ ?;p ?	
*^{96}Br^{m}	T : symmetrized from 12Ka36=2.7(+1.1-0.7)											**
*^{96}Rb	J : 81Th04=2											**
*^{96}Rb	D : %β^-n average 93Ru01=14.7(1.0) 81Ho07=14.7(1.2) 81En05=14.2(1.2) 80ReZQ=14.2(0.8) 79Ri09=12.5(0.9) 74Ro15=19(2) 69Am01=12.7(1.5)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{96}$Rb	T : average 12Qu01=212(17) 03Be05=197(6) 93Ru01=201(1) 81En05=220(10) 79Ri09=197(5) 78Wo09=203(4) 77Re05=205(4) 74Ro15=199(3.5) 71Tr02=207(3)								**
$*^{96}$Rb	T : 67Am01=230(20)								**
$*^{96}$Rb^m	T : average 12Ka36=1.72(+0.16-0.14) 11Ru.A=1.77(0.05) 05Pi13=2.0(0.1) 99Ge01=1.65(0.15)								**
$*^{96}$Sr	T : average 12Qu01=0.950(0.035) 90Ma03=1.07(0.01) 79En02=1.10(0.02) 78Wo09=1.015(0.019) 75Ba36=1.06(0.04)								**
$*^{96}$Y	J : 07Ch07=0								**
$*^{96}$Y^m	J : 07Ch07=8								**
$*^{96}$Zr	T : 2ν-$\beta\beta$ average 18Ma51=20.3(+4.6-3.1) 10Ar07=23.5(1.4,stat)(1.6,syst) 99Ar25=21(+8-4,stat)(2,syst); others (experiment): 93Ka12=39(9)								**
$*^{96}$Zr	T : 01Wi17=9.4(3.2) (geochemical); others (evaluation): 25Pr02=23.4(2.1) 20Ba63,15Ba11=23(2)								**
$*^{96}$Zr	D : from IS=2.78(0.04) in 24Ci.A								**
$*^{96}$Tc	J : 75Sa18,74EkZW,71FoZA=7								**
$*^{96}$Tc^m	T : from 50Me21=51.5(1.0); other: 78Ke10=52(2)								**
$*^{96}$Tc^m	D : %β^+ symmetrized from 21He16=4.1(+0.39-0.34); other: 67Ce01=2.0(0.5)								**
$*^{96}$Ru	T : 2ν-$\beta^+\varepsilon$>80 Ey (theor. most probable); 2ν-$\beta^+\beta^+$>140 Ey 0ν-^{2}K>1 Zy								**
$*^{96}$Pd^m	T : average 22Ja.1=1.81(0.01), supersedes 22Mi.1=1.85(0.01), 19Ha26=1.840(0.015) 17Pa35=1.80(0.01) 98Gr.B=1.81(0.01), supersedes 97Gr02=1.7(0.1),								**
$*^{96}$Pd^m	T : 09Ga40=1.75(0.06); others: 07My02=2.10(0.21) 83Gr01=2.2(0.3)								**
$*^{96}$Pd^m	E : from a least-squares fit to E_γ in 19Pa16								**
$*^{96}$Ag	T : average 25Ap05=4.34(0.12),4.46(0.04) 19Pa16=4.46(0.04) 12Lo08=4.40(0.09) 03Ba39=4.40(0.06) 97Sc30=4.50(0.06)								**
$*^{96}$Ag	D : %β^+p average 19Pa16=4.4(0.5) 96He25=3.7(0.9)								**
$*^{96}$Ag^m	T : average 12Lo08=6.8(1.0) 03Ba39=6.9(0.6)								**
$*^{96}$Ag^m	D : %β^+p average 19Pa16=14.7(2.4) 12Lo08=14(3) 03Ba39=18(5)								**
$*^{96}$Ag^n	E : from a least-squares fit to E_γ using the level scheme in 11Bo23								**
$*^{96}$Ag^n	T : average 19Ha26=104(5) 11Bo23=100(10)								**
$*^{96}$Ag^p	E : 43.7(0.2) keV above the 2643.0(0.3) keV, 13$^+$ level								**
$*^{96}$Ag^p	T : average 19Ha26=1.55(0.02) 17Pa35=1.57(0.02) 11Bo23=1.56(0.03) 11Be34=1.45(0.07); other: 97Gr02=0.7(0.2) μs								**
$*^{96}$Ag^q	E : 4265(2) keV above ^{96}Ag^p								**
$*^{96}$Ag^q	T : average 19Ha26=120(20), supersedes 17Pa35=160(41), 11Bo23=160(30)								**
$*^{96}$Cd	T : average 19Pa16=1020(60) 17Da07=970(90) 10St.A,11StZV=990(130)								**
$*^{96}$Cd	D : %β^+p average 19Pa16=1.7(0.4) 17Da07=1.5(0.5)								**
$*^{96}$Cd^m	E : symmetried from 19Pa16=5810(+1560-1220) keV								**
$*^{96}$Cd^m	T : average 25Ap05=590(30) 19Pa16=530(30) 17Da07=450(+50-40); other: 11Na34=290(+110-100)								**
$*^{96}$Cd^m	D : %β^+p average 25Ap05=18(1) 19Pa16=19.5(2.9);other: 17Da07=11(3)								**
$*^{96}$Cd^n	T : symmetrized from 19Da02=197(+19-17)								**
$*^{96}$Cd^n	E : uncertainty of 1 keV is assumed by Niubase for all γ rays in the cascade								**
^{97}Se	−19100# 500#		7# ms	3/2$^+$#		24Sh17	I	β^- ?;β^-n ?	
^{97}Br	−34000# 400#		40# ms >300ns	5/2$^-$#	19			β^- ?;β^-n ?;β^-2n ?	
^{97}Kr	−47490 30		62.2 ms 3.2	3/2$^+$#	09	11Ni01	T	β^-=100;β^-n=6.7 6;β^-2n ?	*
^{97}Rb	−58519.1 1.9		169.1 ms 0.6	3/2$^+$*	15			β^-=100;β^-n=25.5 9;β^-2n ?	*
^{97}Rb^m	−58442.5 1.9	76.6 0.2	5.7 μs 0.6	(1/2,3/2)$^-$	15			IT=100	
^{97}Sr	−68581 3		432 ms 4	1/2$^+$*	09	02Pf04	D	β^-=100;β^-n=0.02 1	*
^{97}Sr^m	−68273 3	308.13 0.11	175.2 ns 2.1	7/2$^+$	09	19Es04	T	IT=100	*
^{97}Sr^n	−67750 3	830.83 0.23	514 ns 5	(9/2$^+$)	09	25Pi01	T	IT=100	*
^{97}Y	−76115 7		3.75 s 0.03	1/2$^-$*	09			β^-=100;β^-n=0.055 4	*
^{97}Y^m	−75447 7	667.52 0.23	1.17 s 0.03	9/2$^+$*	09	83Re10	D	β^->99.3;IT<0.7;β^-n=0.11 3	*
^{97}Y^n	−72592 7	3522.6 0.4	142 ms 8	(27/2$^-$)*	09			IT=94.8 9;β^-=5.2 9	*
^{97}Zr	−82936.70 0.12		16.749 h 0.008	1/2$^+$*	09			β^-=100	*
^{97}Zr^m	−81672.35 0.20	1264.35 0.16	104.8 ns 1.7	7/2$^+$	09	11Ru.A	T	IT=100	*
^{97}Nb	−85603 4		72.1 m 0.7	9/2$^+$	09			β^-=100	
^{97}Nb^m	−84860 4	743.35 0.03	58.7 s 1.8	1/2$^-$	09			IT=100	
^{97}Mo	−87544.74 0.16		STABLE	5/2$^+$*	09			IS=9.582 15	*
^{97}Tc	−87219.93 0.26		4.21 My 0.16	9/2$^+$*	09	98Ko27	T	ε=100	*
^{97}Tc^m	−87123.36 0.27	96.57 0.06	91.1 d 0.6	1/2$^-$	09	98Ko27	DT	IT=96.06 18;ε=3.94 18	*
^{97}Ru	−86120.5 2.8		2.8380 d 0.0009	5/2$^+$	09	20Sz02	T	β^+=100	*
^{97}Rh	−82562 3		30.7 m 0.6	9/2$^+$	09			β^+=100	
^{97}Rh^m	−82303 3	258.76 0.18	46.2 m 1.6	1/2$^-$	09			β^+=94.4 6;IT=5.6 6	
^{97}Pd	−77806.9 1.6		3.10 m 0.09	5/2$^+$#	09			β^+=100	
^{97}Ag	−70935.2 1.4		25.5 s 0.3	(9/2)$^+$*	09			β^+=100	*
^{97}Ag^m	−70290 40	650 40 MD	100# ms	1/2$^-$#		20Ho03	E	IT ?	
^{97}Cd	−60512 12		1.19 s 0.03	(9/2$^+$)	09	19Pa16	TD	β^+=100;β^+p=7.4 2	*
^{97}Cd^m	−59267 12	1245.1 0.2	730 μs 70	(1/2$^-$)		19Pa16	ETD	IT=100	
^{97}Cd^n	−58266 26	2246 23 MD	3.69 s 0.03	(25/2$^+$)		19Pa16	ETD	β^+=100;β^+p=25.1 5	*
^{97}In	−47690# 400#		36 ms 6	9/2$^+$#	19	18Pa20	TD	$\beta^+\approx$100;p ?;β^+p=1.0 5	*
^{97}In^m	−47290# 410#	400# 100#	116 μs 66	1/2$^-$#	19	18Pa20	TD	p ?	*
$*^{97}$Kr	T : average 11Ni01=60(+6-5) 03Be05=63(4)								**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{97}$Rb	J : 81Th04=3/2										**
$*^{97}$Sr	J : 90Li28,90Bu12,87Bu11=1/2										**
$*^{97}$Sr	T : average 12Qu01=456(5,stat)(13,syst) 86Wa17=429(5) 87PfZX=420(20) 82Ga24=420(40) 78Wo09=441(15); others (not used): 81En05=390(30)										**
$*^{97}$Sr	T : 83Re10=403(4), superseded by 86Wa17 79En02=430(30), superseded by 81En05										**
$*^{97}$Sr^m	T : average 19Es04=174.7(6.9) 15Cz01=165(4) 11Ru.A=180.9(2.8) 06Hw01=165(25) 83Kr11=170(10); other: 25Pi01=200(10)										**
$*^{97}$Sr^n	T : average 25Pi01=530(22) 19Es04=526(17) 18Rz01=504(8) 13Ru07=515(10) 05Zl01=526(13); others (not used): 12Ka36=520(+160-120) 80Mo.A=515(15)										**
$*^{97}$Sr^n	T : 06Hw01=255(56) 03Hw03=265(27), non standard technique and conflicting										**
$*^{97}$Y	J : 07Ch07=1/2										**
$*^{97}$Y^m	J : 07Ch07=9/2										**
$*^{97}$Y^m	D : %β^-n from 83Re10=0.11(0.03); other: 86Wa17<0.08										**
$*^{97}$Y^n	J : 07Ch07=(27/2)										**
$*^{97}$Zr	J : 02Ca37=1/2										**
$*^{97}$Zr^m	T : average 11Ru.A=106.1(2.1) 85Be20=102(3); others (downweighted): 25Pi01=106(11) 06Hw01=97(16) 96Lh03=106(7)										**
$*^{97}$Mo	J : 56Ow04,54Wo07,51Ar29=5/2										**
$*^{97}$Tc	J : 20Kr09=9/2										**
$*^{97}$Tc^m	T : average 98Ko27=91.4(0.8), supersedes 93Ko64=92.2(1.8), 54Bo24=90.5(1.0)										**
$*^{97}$Ru	T : average 20Sz02=2.8387(0.0028,stat)(0.0040,syst), 2.8422(0.0012,stat)(0.0040,syst), 2.8411(0.0004,stat)(0.0040,syst), 14Li50=2.836(0.007),										**
$*^{97}$Ru	T : original unc=0.014 (2σ), 09Go29=2.8370(0.0014),2.8382(0.0014) 79Si.A=2.839(0.006); others: 98Ko27=2.79(0.03) 93Ko64=2.791(0.004)										**
$*^{97}$Ru	T : 66Cr09=2.9(0.1) 58Ka95=2.88(0.04)										**
$*^{97}$Ag	J : 14Fe01=(9/2)										**
$*^{97}$Cd	T : average 25Ap05=1.20(0.04),1.22(0.05) 19Pa16=1.20(0.07) 11Lo09=1.10(0.08)										**
$*^{97}$Cd	D : %β^+p other: 11Lo09=11.8(2.0)										**
$*^{97}$Cd^n	T : average 25Ap05=3.61(0.04),3.72(0.09) 19Pa16=3.86(0.06) 11Lo09=3.8(0.2)										**
$*^{97}$Cd^n	D : %β^+p other: 11Lo09=25(4)										**
$*^{97}$Cd^n	J : 11Lo09=(25/2$^+$)										**
$*^{97}$In	T : other: 10St.A,11StZV=26(+47-10)										**
$*^{97}$In	D : %β^+p average 25Ap05=0.8(0.5) 18Pa20=1.7(+1.7-0.8)										**
$*^{97}$In^m	T : from 1.3 μs<$T_{1/2}$<230 μs in 18Pa20										**
^{98}Br	−28050#	400#			15# ms	>400ns		20	10Oh02	I	β^- ?;β^-n ?;β^-2n ?	
^{98}Kr	−44250	50			42.8 ms	3.6	0^+	20	11Ni01	T	β^-=100;β^-n=7.0 10;β^-2n ?	*
^{98}Rb	−54369	16			115 ms	6	$(0^-)*$	20			β^-=100;β^-n=14.3 9;β^-2n=0.054 8	*
^{98}Rb^m	−54296	20	73	26	96 ms	3	$(3^+)*$	20			β^-=100;β^-n ?;β^-2n ?	
^{98}Rb^n	−54191	16	178.5	0.4	358 ns	7	(2^-)	20	FGK205	J	IT=100	*
^{98}Sr	−66422	3			652.4 ms	1.6	0^+	20	17Ur03	T	β^-=100;β^-n=0.23 3	*
^{98}Y	−72293.5	1.9			548 ms	2	0^-*	20			β^-=100;β^-n=0.33 3	*
^{98}Y^m	−72122.7	1.9	170.78	0.05	620 ns	8	2^-	20	25Pi01	T	IT=100	*
^{98}Y^n	−71827.8	1.8	465.7	0.7	2.32 s	0.06	7^+*	20	17Ur03	JED	β^-≈100;IT ?;β^-n=3.44 95	*
^{98}Y^p	−71797.4	1.9	496.10	0.11	6.89 μs	0.04	$(4)^-$	20	25Pi01	T	IT=100	*
^{98}Y^q	−71700	10	594	10	180 ns	7	$(3^-,4^-)$	20	17Ur03	T	IT=100	*
^{98}Y^r	−71321.3	1.9	972.17	0.20	450 ns	150	(8^+)	20			IT=100	
^{98}Y^x	−71112.0	1.9	1181.50	0.18	758 ns	13	(10^-)	20	25Pi01	T	IT=100	*
^{98}Zr	−81282	8			30.7 s	0.4	0^+	20			β^-=100	
^{98}Zr^m	−74680	8	6601.9	1.1	1.9 μs	0.2	(17^-)	20			IT=100	
^{98}Nb	−83525	5			2.86 s	0.06	1^+	20			β^-=100	
^{98}Nb^m	−83441	6	84	4	51.1 m	0.4	$(5)^+$	20			β^-≈100;IT ?	
^{98}Mo	−88116.02	0.17			STABLE	>100Ty	0^+	20	52Fr23	T	IS=24.292 80;2β^- ?	*
^{98}Tc	−86433	3			4.2 My	0.3	6^+*	20	25El05	D	β^-=99.71 3;β^+=0.29 3	*
^{98}Tc^m	−86342	3	90.77	0.16	14.7 μs	0.5	$(2,3)^-$	20			IT=100	
^{98}Ru	−88229.69	0.18			STABLE		0^+	20			IS=1.87 3	
^{98}Rh	−83180	10			8.72 m	0.12	$(2)^+$	20			β^+=100	
^{98}Rh^m	−83124	10	56.3	1.0	3.6 m	0.2	(5^+)	20			IT ?;β^+=11 5	
^{98}Pd	−81321	5			17.7 m	0.4	0^+	20			β^+=100	
^{98}Ag	−73076	26			47.54 s	0.26	$(6)^+*$	20			β^+=100;β^+p=0.0012 5	*
^{98}Ag^m	−72969	26	107.28	0.10	161 ns	7	(4^+)	20	17Pa35	T	IT=100	*
^{98}Cd	−67661	11			9.30 s	0.09	0^+	20	25Ap05	TD	β^+=100;β^+p=0.14 2	*
^{98}Cd^m	−65233	11	2428.3	0.4	154 ns	16	(8^+)	20	17Pa35	T	IT=100	
^{98}Cd^n	−61026	11	6635	2	224 ns	5	(12^+)	20			IT=100	
^{98}In	−53930#	300#			30.2 ms	0.9	(0^+)	20	25Ap05	TD	β^+=100;β^+p=0.20 12	*
^{98}In^m	−53110#	790#	820	730	0.853 s	0.018	(9^+)	20	19Pa16	TDE	β^+=100;β^+p=42.2 19	*
^{98}Sn	−41000#	500#			30# ms				25Su07	I	β^+ ?;p ?	
$*^{98}$Kr	T : average 11Ni01=42(4) 03Be05=46(8)											**
$*^{98}$Rb	J : 81Th04=(0)											**
$*^{98}$Rb^n	J : 178.5 keV γ to (0^-) and Weisskopf estimates for E1,M1 and E2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{98}$Sr	T : average 17Ur03=650(5),652(3) 86ReZU=653(2); others (downweighted): 12Qu01=640(35,stat)(20,syst), 577(30,stat)(1,syst) 87PfZX=650(40)							**
$*^{98}$Sr	T : 82Ga24=645(50) 81En05=700(100) 79En02=600(100) 78Wo09=660(70) 76AmZW=1040(110) 71Tr02=845(43)							**
$*^{98}$Sr	D : %β^-n average 93Ru01=0.23(0.03) and 86ReZU=0.23(0.05), supersedes 86Wa17=0.23(0.02) 83Re10=0.18(0.02); other: 81En05=0.36(0.11)							**
$*^{98}$Y	J : 07Ch07=0							**
$*^{98}$Y^m	T : average 25Pi01=680(30) 17Ur03=640(20) 11Ru.A=610(9); other: 70Gr38=620(80)							**
$*^{98}$Y^n	J : from 21De.A=7 (hfs); others: 17Ur03=(6,7) 07Ch07=(4,5) (hfs)							**
$*^{98}$Y^n	D : %β^-n from 81En05							**
$*^{98}$Y^n	T : average 17Ur03=2.36(0.06) 81En05=2.1(0.3) 77Si05=2.0(0.2)							**
$*^{98}$Y^p	T : average 25Pi01=6.74(0.14) 17Ur03=6.95(0.06) 11Ru.A=6.87(0.05)							**
$*^{98}$Y^q	E : 564.0 + x keV is proposed in 17Ur03; x=30(10) is estimated by NUBASE							**
$*^{98}$Y^x	T : average 25Pi01=740(30) 11Ru.A=806(21) 17Ur03=720(20) 70Gr38=830(100)							**
$*^{98}$Mo	T : 0ν-$\beta\beta$ 52Fr23>100 Ty (theoretically faster)							**
$*^{98}$Tc	J : 20Kr09=6							**
$*^{98}$Tc	T : 73Ok.A,66GoZZ=4.2(0.3)							**
$*^{98}$Tc	D : %β^+ from 25El05=0.29(0.03)							**
$*^{98}$Ag	D : %β^+p symmetrized from 96He25=0.0011(+5-4)							**
$*^{98}$Ag	J : 14Fe01=(5,6)							**
$*^{98}$Ag	T : average 00Hu17=47.7(0.3) 82Ku15=47.1(0.5);other: 78Hu11=44.5(1.2)							**
$*^{98}$Ag^m	T : other (recent): 19Ha26=140(40)							**
$*^{98}$Ag^m	E : from the observed 107.28(0.10) keV + 60.55(0.10) keV cascade in 92Pl01, but the ordering is from 17Pa35							**
$*^{98}$Cd	T : average 25Ap05=9.5(0.5) 92Pl01=9.2(0.3) 19Pa16=9.3(0.1)							**
$*^{98}$Cd	D : %β^+p other: 19Pa16<0.029							**
$*^{98}$In	D : %β^+p from 25Ap05<0.4; others: 19Pa16<0.13 12Lo08=5.5(+0.3-0.2), doubted in 19Pa16							**
$*^{98}$In	T : average 25Ap05=31(2) 19Pa16=30(1); others: 12Lo08=47(13) 10St.A,11StZV=32(6) 08Ba53=44(+13-12) 01Ki13=32(+32-11) 95Ry03>1.5 μs 94Sc22>300 ns							**
$*^{98}$In^m	D : %β^+p average 25Ap05=31(5) 19Pa16=44(2);other: 12Lo08=19(2)							**
$*^{98}$In^m	T : average 25Ap05=0.83(0.02),0.98(0.07) 19Pa16=0.99(0.07),0.88(0.20) 08Ba53=0.92(+0.27-0.17) 10St.A,11StZV=0.86(0.21); others: 12Lo08=1.27(0.30)							**
$*^{98}$In^m	T : 01Ki13=1.2(+1.2-0.4)							**
^{99}Br	−23300# 400#				20# ms >300ns	5/2$^-$#	21 24Sh17 I	β^- ?;β^-n ?;β^-2n ?	
^{99}Kr	−38550# 200#				40 ms 11	5/2$^-$#	17 03Be05 TD	β^-=100;β^-n=11 7;β^-2n ?	*
^{99}Rb	−51121 4				54 ms 4	(3/2$^+$)	17 02Pf04 D	β^-=100;β^-n=17.3 25;β^-2n ?	
^{99}Sr	−62519 5				269.2 ms 1.0	3/2$^+$*	17 93Ru01 D	β^-=100;β^-n=0.100 19	*
^{99}Y	−70644 7				1.484 s 0.007	5/2$^+$*	17	β^-=100;β^-n=1.77 19	
^{99}Y^m	−68502 7	2141.65	0.19		8.2 μs 0.4	(17/2$^+$)	17	IT=100	*
^{99}Zr	−77617 10				2.1 s 0.1	1/2$^+$*	17	β^-=100	*
^{99}Zr^m	−77365 10	251.96	0.09		336 ns 5	7/2$^+$	17 20Bo04 T	IT=100	*
^{99}Nb	−82335 12				15.0 s 0.2	9/2$^+$*	17	β^-=100	*
^{99}Nb^m	−81970 12	365.27	0.08		2.5 m 0.2	1/2$^-$	17	β^-≈100;IT=?	
^{99}Mo	−85970.18 0.22				65.937 h 0.011	1/2$^+$*	17 FGK259 T	β^-=100	*
^{99}Mo^m	−85872.39 0.22	97.785	0.003		15.5 μs 0.2	5/2$^+$	17	IT=100	
^{99}Mo^n	−85286.08 0.29	684.10	0.19		744 ns 12	11/2$^-$	17 21Da15 T	IT=100	*
^{99}Tc	−87329.3 0.4				211.5 ky 1.1	9/2$^+$*	17 84Co30 T	β^-=100	*
^{99}Tc^m	−87186.6 0.4	142.6836	0.0011		6.0066 h 0.0002	1/2$^-$*	17 FGK259 T	IT=99.9963 6;β^-=0.0037 6	*
^{99}Ru	−87625.2 0.3				STABLE	5/2$^+$*	17	IS=12.76 14	*
^{99}Rh	−85555 15				16.1 d 0.2	1/2$^-$	17	β^+=100	
^{99}Rh^m	−85491 15	64.4	0.5		4.7 h 0.1	9/2$^+$*	17	β^+≈100;IT ?	*
^{99}Pd	−82181 5				21.4 m 0.2	(5/2)$^+$	17	β^+=100	
^{99}Ag	−76709 3				2.07 m 0.05	(9/2)$^+$*	17	β^+=100	*
^{99}Ag^m	−76203 3	506.2	0.4		10.5 s 0.5	(1/2)$^-$*	17	IT=100	*
^{99}Cd	−69931.6 1.5				16.9 s 0.9	5/2$^+$#	17 25Ap05 TD	β^+=100;β^+p=0.18 4;$\beta^+\alpha$<1e-4	*
^{99}In	−61421 7				3.11 s 0.05	9/2$^+$#	17 25Ap05 TD	β^+=100;β^+p=0.28 3	*
^{99}In^m	−60750 40	670	40	MD	1# s	1/2$^-$#		β^+ ?;IT ?;β^+p ?	*
^{99}Sn	−48020# 500#				23.9 ms 2.5	9/2$^+$#	17 25Ap05 TD	β^+=100;β^+p=4.5 18	*
$*^{99}$Kr	T : other: 11Ni01=13(+34-6)								**
$*^{99}$Sr	J : 91Li05,90Li28=3/2								**
$*^{99}$Sr	T : average 86ReZU=269(1) 83Re10=274(4) 83Wo10=266(6)								**
$*^{99}$Y	J : 21De.A,07Ch07=5/2								**
$*^{99}$Y	T : other (recent): 19Do02=1.27(0.25)								**
$*^{99}$Y^m	T : average 13RuZX=8.0(0.5) 85Me09=8.6(0.8); other: 99Ge01=11(2)								**
$*^{99}$Zr	J : 02Ca37=1/2								**
$*^{99}$Zr^m	J : 130.2-keV E2 transition to 3/2$^+$								**
$*^{99}$Zr^m	T : others: 25Pi01=345(12) 04Hw02=316(48) 99Ge01=400(20) 79Se01=292(20) 70Gr38=400(80)								**
$*^{99}$Nb	J : 09Ch25=9/2								**
$*^{99}$Mo	J : 78Ru04,74Ru05,74EkZW=1/2								**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)				Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{99}$Mo^n	T : average 21Da15=742(13) 78Ba18=760(60) 75Di15=750(30)													**
$*^{99}$Tc	J : 20Kr09,58Lo62,53Ke49=9/2													**
$*^{99}$Tc	T : average 84Co30=211.1(1.2) 66Go10=214(5) 60Bo08=215(5) 51Fr05=212(4)													**
$*^{99}$Tc^m	J : 78Ru04,74EkZW,74Ru05=1/2													**
$*^{99}$Ru	J : 13Ma15,65Ma27,55Mu78,52Gr19=5/2													**
$*^{99}$Ru^m	J : 66Ki02,65Ma27,64Bo28=3/2													**
$*^{99}$Rh^m	J : 74EkZW=9/2													**
$*^{99}$Ag	J : 14Fe01=(9/2)													**
$*^{99}$Ag^m	J : 14Fe01=(1/2)													**
$*^{99}$Cd	T : average 25Ap05=17(4) 19Pa16=17(1) 78El09=16(3)													**
$*^{99}$Cd	D : %β^+p average 25Ap05=0.06(0.04) 19Pa16=0.21(0.02) 78El09=0.17(+0.11-0.05);Birge ratio=2.4													**
$*^{99}$In	T : average 25Ap05=3.14(0.15) 19Pa16=3.11(0.06) 12Lo08=3.1(0.2),3.05(0.60) 01Ki13=3.0(+0.8-0.7)													**
$*^{99}$In	D : %β^+p average 25Ap05=0.25(0.07) 19Pa16=0.29(0.03);other: 12Lo08=0.9(0.4)													**
$*^{99}$Sn	D : %β^+p average 25Ap05=4.1(2.4) 18Pa20=3.9(+3.4-1.7)													**
$*^{99}$Sn	T : average 25Ap05=22(5),25(4) 18Pa20=24(4)													**
^{100}Br	−17100#	400#					2#	ms		21			β^- ?;β^-n ?;β^-2n ?	
^{100}Kr	−34710#	300#					12	ms 8	0^+	21	11Ni01	TD	β^-=100;β^-n ?;β^-2n ?	*
^{100}Rb	−46262	12					51.3	ms 1.6	4^-#	21	20MuZY	T	β^-=100;β^-n=5.6 12;β^-2n=0.15 5	*
^{100}Sr	−59818	7					200.6	ms 1.0	0^+	21	02Pf04	D	β^-=100;β^-n=1.11 34	*
^{100}Sr^m	−58199	7	1618.71	0.22			122	ns 9	(4^-)	21	12Ka36	T	IT=100	*
^{100}Y	−67323	8				&	940	ms 30	4^+*	21	10Ba31	J	β^-=100;β^-n ?	*
^{100}Y^m	−67175	8	147.7	1.3	MD	&	727	ms 6	1^+#	21	93Ru01	D	β^-=100;β^-n=1.08 6	*
^{100}Zr	−76373	8					6.89	s 0.13	0^+	21			β^-=100	*
^{100}Nb	−79791	8					1.40	s 0.14	1^+*	21			β^-=100	*
^{100}Nb^m	−79478.5	2.0	313	8	MD		2.99	s 0.11	5^+*	21	87Me06	T	β^-=100	*
^{100}Nb^n	−79444	11	347	8			408	ns 43	$(4^-,5^-)$	21			IT=100	*
^{100}Nb^p	−79057	11	734	8			12.43	μs 0.26	(8^-)	21	11Ru.A	T	IT=100	*
^{100}Mo	−86192.90	0.29					7.05	Ey 0.11	0^+	21	23Au05	T	IS=9.744 65;2β^-=100	*
^{100}Tc	−86022.4	1.1					15.27	s 0.05	1^+	21	01Fu21	T	β^-=?;ε=0.0026 4	*
^{100}Tc^m	−85821.7	1.1	200.67	0.04			8.35	μs 0.04	4^+	21			IT=100	*
^{100}Tc^n	−85778.5	1.1	243.95	0.04			3.2	μs 0.2	6^+	21	80Bi01	T	IT=100	*
^{100}Ru	−89227.2	0.3					STABLE		0^+	21			IS=12.60 7	
^{100}Rh	−85591	18					20.5	h 0.3	1^-*	21			β^+=100	*
^{100}Rh^m	−85516	18	74.782	0.014			214.3	ns 1.4	2^+	21			IT=100	*
^{100}Rh^n	−85483	18	107.6	0.2			4.6	m 0.2	(5^+)	21			IT≈98.3;β^+≈1.7	*
^{100}Rh^p	−85371	18	219.61	0.22			130	ns 4	(7^+)	21			IT=100	*
^{100}Pd	−85216	13					3.63	d 0.09	0^+	21	68Pa24	T	ε=100	
^{100}Ag	−78138	5					2.01	m 0.09	$(5)^+$*	21			β^+=100	*
^{100}Ag^m	−78122	5	15.52	0.16			2.30	m 0.15	$(2)^+$	21			β^+≈100;IT ?	*
^{100}Cd	−74194.7	1.6					49.1	s 0.5	0^+	21	89Ry02	T	β^+=100	
^{100}In	−64177.9	2.2					5.65	s 0.06	6^+#	21	19Pa16	TD	β^+=100;β^+p=1.66 3	*
^{100}Sn	−57150	240					1.17	s 0.07	0^+	21	19Lu08	T	β^+=100;β^+p=0.5 3	*
^{100}Sn^m	−52650#	310#	4500#	200#			100#	ns	6^+#		11Hi.A	ETJ	p ?	
^{100}Sb	−37250#	400#											p ?	
$*^{100}$Kr	T : symmetrized from 11Ni01=7(+11-3)													**
$*^{100}$Rb	T : average 20MuZY=50(5) 11Ni01=48(3) 87PfZX=53(2); others: 86ReZU=59(10) 86Wa17=55(18) 79Pe01=51(17) 78Ko29=50(10)													**
$*^{100}$Rb	D : %β^-n from 93Ru01; %β^-2n from P_{2n}/P_n=0.027(0.007) in 81JoZV and %β^-n													**
$*^{100}$Sr	T : average 11Ni01=181(+16-13) 93Ru01=165(24) 87PfZX=207(10) 86ReZU=201(1), supersedes 86Wa17=204(2), 87Wo07,86Wo01=193(4) 83Mu19=214(8)													**
$*^{100}$Sr	T : 78Ko29=170(80) 85IaZZ=200(20)													**
$*^{100}$Sr^m	T : other: 95Pf04=85(7)													**
$*^{100}$Y	J : 10Ba31=4 and π5/2[422]⊗ν3/2[411], $K^\pi = 4^+$ configuration by the measured magnetic moment; other: 07Ch07=(3); assignment to gs confirmed in													**
$*^{100}$Y	J : 25Ca26; ENSDF2021=(1)-													**
$*^{100}$Y	T : from 77Kh03 using $\beta-\gamma$(t), where low- and high-spin β^- decaying isomers were resolved													**
$*^{100}$Y^m	T : average 96Me09=710(30) 86Wo01=735(7) 83Mu14=682(18) 77Kh03=550(150) from data dominated by the ^{100}Sr (J^π=0^+) isobar and hence a preferable													**
$*^{100}$Y^m	T : feeding to the low-spin isomer; others: 86ReZU=735(4) 87PfZX=740(20) 93Ru01=638(17) 09Pe06=660(+150-120) 12Qu01=845(45,stat)(60,syst)													**
$*^{100}$Y^m	J : direct β^- feeding to 0^+ states in ^{100}Zr in 86Wo01; assignment to ^{100}Y^m confirmed in 25Ca26; ENSDF2021=4+ conf=π5/2[422]⊗ν3/2[411], $K^\pi = 1^+$													**
$*^{100}$Y^m	D : %β^-n others: 96Me09=1.8(0.6) 87PfZX=0.9(0.3) 86ReZU=0.85(0.09) 86Wa17=0.81(0.04) 86Wo01=0.9(0.2)													**
$*^{100}$Zr	T : average 76Ah06=7.1(0.4) 72Tr08=7.1(0.2) 77Pf01=7.0(0.5) 70Ei02=6.6(0.2) 69WiZX=7.1(0.7)													**
$*^{100}$Nb	T : average 76Ah06=1.5(0.2) 72Tr08=1.3(0.2)													**
$*^{100}$Nb	J : 21De.A=1													**
$*^{100}$Nb^m	T : others: 76Ah06=3.1(0.3) 72He37=2.4(0.3) 67Hu09=2.4													**
$*^{100}$Nb^m	J : 21De.A=5													**
$*^{100}$Nb^n	E : 34.3 keV above ^{100}Nb^m													**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{100}$Nb^n	J : a cascade of two M1 γ rays from 6^- and absence of γ from 8^-											**
$*^{100}$Nb^n	T : average 13RuZX=400(100) 86LhZX=460(60) 70Gr38=320(80)											**
$*^{100}$Nb^p	E : 420.7 keV above ^{100}Nb^m											**
$*^{100}$Nb^p	J : 28 keV (E2) to (6^-)											**
$*^{100}$Nb^p	T : other: 99Ge01=13(1) 80MoZJ=12											**
$*^{100}$Mo	T : 2ν-$\beta\beta$ average 23Au05=7.07(0.02,stat)(0.11,syst) [CUPID], supersedes 23Ar01=7.5(+0.8,stat)(+4-3,syst) 20Ar09=7.12(+0.18-0.14,stat)											**
$*^{100}$Mo	T : (0.10,syst) 17Ar18=6.90(0.15,stat)(0.37,syst), 19Ar04=6.81(0.01,stat)(+0.38-0.40,syst) [NEMO-3], supersedes 11Fl06=7.17(0.01,stat)(0.54,syst)											**
$*^{100}$Mo	T : 05Ar27=7.11(0.02,stat)(0.54,syst), others: 14Ca46=7.15(0.37,stat)(0.66,syst) [NIC, Russia] 01As06=7.2(0.9,stat)(1.8,syst) [Gran Sasso,											**
$*^{100}$Mo	T : Italy]; 97Al02=7.2(+2.2-1.4) [Osburn, USA] 97De40=6.82(+0.38-0.53,stat)(0.68,syst) [Hoover Dam, USA]; others (evaluation): 25Pr02=7.08(0.14)											**
$*^{100}$Mo	T : 20Ba63=7.06(+0.15,-0.13) 15Ba11=7.1(0.4); 0ν-$\beta\beta$: 25Ag04>2.9 Yy 23Ki01>0.34 Yy 22Au.1>1.8 Yy 21Ar.1>1.5 Yy 19Kw01>95 Zy 11Fl06>1 Yy											**
$*^{100}$Mo	T : 01As06>4.9 Zy 23Au01>0.12 Yy to 1130 keV and >0.21 Yy to 540 keV in ^{100}Ru											**
$*^{100}$Tc	T : others: 02Ab03=15.9(0.4) 95Ha46=15.5(0.1) 69Be69=15.8(0.1) 52Bo30=15.8(0.2)											**
$*^{100}$Tc	D : %ε from 08Sj01; other: 93Ga09=0.0018(0.0009)											**
$*^{100}$Tc^m	T : 80Bi01=8.18(0.07) 78Ma36=8.46(0.05) 61Sc11=8.15(0.20) 78Ba18=8.2(0.3); others: 79Pi08=10.2(0.1) 64Br27=11.5(0.2)											**
$*^{100}$Tc^n	T : others: 79Pi08=4.6(0.5) 67Iv04=16(3) 61Sc11=15.5(0.8)											**
$*^{100}$Rh	T : unweighted average 95KeZZ=20.2(0.1) 53Ma64=20.8(0.1); Birge ratio=4.2; others: 64An13=18(1) 50Su29=21 48Li03=19.4(0.1)											**
$*^{100}$Rh	J : 78Ru04,75Ru06=1											**
$*^{100}$Rh^m	T : average 83Bi04=217(5) 79En03=213.6(2.0) 71Re06=214.5(2.0); others: 65Ma34=235(3) 65Ev05=180(20)											**
$*^{100}$Rh^n	T : average 82MaZP=4.5(0.3) 78Ki07=4.8(0.5) 74Si18=4.7(0.3)											**
$*^{100}$Rh^n	D : from 80Ba59											**
$*^{100}$Rh^p	T : average 86Du04=140(5) 84Ma30=120(5),135(20)											**
$*^{100}$Ag	J : 14Fe01=(5)											**
$*^{100}$Ag	T : average 80Ha20=2.00(0.10) 83Ra10=2.06(0.25); others: 95Ba25=2.00(0.03) 70Hn03=2.3(0.1) 71In03=1.9(0.3)											**
$*^{100}$Ag^m	T : from 80Ha20=2.30(0.15)											**
$*^{100}$In	T : average 25Ap05=5.3(0.6),5.5(0.4) 19Pa16=5.62(0.06) 12Lo08=5.7(0.3),6.0(0.5) 02Pl03=5.9(0.2) 95Sz01=6.1(0.9) others: 95Fa.A=6.3(+1.0-0.9)											**
$*^{100}$In	T : 95Sc33=7.8(0.8)											**
$*^{100}$In	D : %β^+p average 25Ap05=1.51(0.16) 19Pa16=1.66(0.03) 12Lo08=1.7(0.4) 02Pl03=1.6(0.3); others: 95Sz01>0.39											**
$*^{100}$Sn	T : average 19Lu08=1.18(0.08) 12Hi07=1.16(0.20) 02Fa13,94Sc22=1.00(+0.54-0.26) 97Su06=0.94(+0.54-0.27) 96Ki23=0.94(+0.54-0.26); other:											**
$*^{100}$Sn	T : 08Ba53=0.55(+0.70-0.31)											**
$*^{100}$Sn	D : %β^+p from 25Ap05<1; others: 12Lo08<35 97Su06<20											**
^{101}Br	−11900#	400#				10# ms	>400ns		21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{101}Kr	−28580#	500#				9# ms	>400ns	$5/2^+$#	10	10Oh02	I	β^- ?;β^-n ?;β^-2n ?	
^{101}Rb	−42538	17				31.8 ms	3.3	$3/2^+$#	06	11Ni01	T	β^-=100;β^-n=28 4;β^-2n ?	*
^{101}Sr	−55324	8				113.7 ms	1.7	$(5/2^-)$	06	02Pf04	D	β^-=100;β^-n=2.75 35	*
^{101}Y	−65055	7				426 ms	20	$5/2^+$*	06	02Pf04	D	β^-=100;β^-n=2.3 8	*
^{101}Y^m	−63850	7	1205.0	1.0		870 ns	90	$13/2^-$#		09Fo05	ETD	IT=100	*
^{101}Zr	−73161	8				2.29 s	0.08	$3/2^+$*	06			β^-=100	*
^{101}Nb	−78891	4				7.1 s	0.3	$5/2^+$*	06			β^-=100	*
^{101}Mo	−83519.82	0.30				14.61 m	0.03	$1/2^+$	06			β^-=100	
^{101}Mo^m	−83506.3	0.3	13.497	0.009		226 ns	7	$3/2^+$	06			IT=100	
^{101}Mo^n	−83462.8	0.3	57.015	0.011		133 ns	70	$5/2^+$	06			IT=100	
^{101}Tc	−86344	24				14.22 m	0.01	$9/2^+$	06			β^-=100	
^{101}Tc^m	−86136	24	207.526	0.020		636 μs	8	$1/2^-$	06			IT=100	
^{101}Ru	−87957.9	0.4				STABLE		$5/2^+$*	06			IS=17.06 2	
^{101}Ru^m	−87430.3	0.4	527.56	0.10		17.5 μs	0.4	$11/2^-$	06			IT=100	
^{101}Rh	−87412	6				4.07 y	0.05	$1/2^-$	06	18Sh09	T	ε=100	
^{101}Rh^m	−87255	6	157.32	0.03		4.343 d	0.010	$9/2^+$*	06			ε=92.80 25;IT=7.20 25	*
^{101}Pd	−85432	5				8.47 h	0.06	$5/2^+$	06			β^+=100	
^{101}Ag	−81334	5				11.1 m	0.3	$9/2^+$*	06			β^+=100	*
^{101}Ag^m	−81060	5	274.1	0.3		3.10 s	0.10	$(1/2)^-$*	06			IT=100	*
^{101}Cd	−75836.5	1.5				1.36 m	0.05	$5/2^+$*	06	18Yo07	J	β^+=100	
^{101}In	−68547	3				15.1 s	1.1	$9/2^+$*	06	19Pa16	D	β^+=100;β^+p=0.9 5	*
^{101}In^m	−67879	7	667	7	MD	10# s		$1/2^-$*				β^+ ?;IT ?	*
^{101}Sn	−59889.9	0.9				2.22 s	0.04	$(7/2^+)$	07	19Pa16	TD	β^+=100;β^+p=21.7 5	*
^{101}Sb	−46800#	500#				1# μs						p ?	
$*^{101}$Rb	T : average 11Ni01=31(+5-4) 95Lh04=32(5)												**
$*^{101}$Sr	T : average 11Ni01=113(2) 86Wa17=114(4) 83Wo10=121(6) 87PfZX=104(15)												**
$*^{101}$Y	T : average 96Me09=400(20) 86Wa17=440(20) 83Wo10=500(50); others: 09Pe06=510(+76-67) 12Qu01=480(+143-114) 93Ru01=279(9), outlier												**
$*^{101}$Y	J : 07Ch07=5/2												**
$*^{101}$Y^m	T : symmetrized from 09Fo05=860(+90-80); other: 12Ka36=187(+49-38)												**
$*^{101}$Y^m	E : 09Fo05=480(1) keV above E($13/2^+$)=724.98(0.10) keV												**
$*^{101}$Y^m	I : 09Fo05=129,164,204,230 and 480 γ rays in a cascade to gs, the first four in agreement with SF data of 05Lu21; other: 12Ka36=128.0(0.5)												**
$*^{101}$Y^m	I : and 203.5(0.5) γ rays in a cascade to gs, but limited statistics												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{101}$Zr	T : average 19Do02=2.27(0.12) 72Th08=2.3(0.1)											**
$*^{101}$Zr	J : 02Ca37=3/2											**
$*^{101}$Nb	J : 09Ch25=5/2											**
$*^{101}$Rh^m	T : average 68Li08=4.39(0.08) 66Ar05=4.34(0.01) 65E_r04=4.43(0.06); Birge ratio=3.22											**
$*^{101}$Rh^m	J : 78Ru04,75Ru06=9/2											**
$*^{101}$Ag	J : 14Fe01,70Wa35=9/2											**
$*^{101}$Ag^m	J : 14Fe01=(1/2)											**
$*^{101}$In	T : average 97Sz04=14.9(1.2) 88Hu07=16(3)											**
$*^{101}$In	J : 24Ka49=9/2											**
$*^{101}$In	D : %β^+p from 19Pa16<1.7											**
$*^{101}$In^m	J : 24Ka49=1/2											**
$*^{101}$Sn	D : %β^+p average 25Ap05=20(1) 19Pa16=23.6(0.8) 12Lo08=22(1) 10St.A=20(1)											**
$*^{101}$Sn	J : from 10Da17											**
$*^{101}$Sn	T : average: 25Ap05=2.24(0.08),2.3(0.3) 19Pa16=2.22(0.05) 12Lo08=2.1(0.2); others: 07Se04=1.3(0.5) 07Ka15=1.9(0.3)											**
^{102}Kr	−24150#	500#				5# ms	>400ns	0^+	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{102}Rb	−37242	27				37 ms	4	(4^-)	08	16Wa16	JD	β^-=100;β^-n=65 22;β^-2n ?	*
^{102}Sr	−52172	27				69 ms	6	0^+	08			β^-=100;β^-n=5.5 15	*
^{102}Y	−61173	4				360 ms	40	(5^-)	08	17Br12	ID	β^-=100;β^-n=2.5 6	*
^{102}Y^m	−61160	4	12.3	1.6	MD	300 ms	100	$(0^-,1^-)$	08			β^-=100;β^-n=2.5 6	*
^{102}Zr	−71581	9				2.01 s	0.08	0^+	08	19Do02	T	β^-=100	
^{102}Nb	−76298.3	2.5				4.3 s	0.4	4^+*	08			β^-=100	*
^{102}Nb^m	−76204	8	94	7	MD	1.31 s	0.16	1^+*	08	19Do02	T	$\beta^-\approx$100;IT ?	*
^{102}Mo	−83561	8				11.3 m	0.2	0^+	08			β^-=100	
^{102}Tc	−84573	9			*	5.28 s	0.15	1^+	08			β^-=100	
^{102}Tc^m	−84520#	50#	50#	50#	*	4.35 m	0.07	(4^+)	08			$\beta^-\approx$100;IT ?	*
^{102}Ru	−89106.3	0.4				STABLE		0^+	08			IS=31.55 14	
^{102}Rh	−86783	6				207.0 d	1.5	2^-*	08	98Sh21	T	β^+=78 5;β^-=22 5	*
^{102}Rh^m	−86642	6	140.73	0.09		3.742 y	0.010	6^+*	08	99Gi14	J	β^+=99.767 24;IT=0.233 24	*
^{102}Pd	−87902.8	0.4				STABLE	>7.6Ey	0^+	08	16Le16	T	IS=1.02 1;2β^+ ?	
^{102}Ag	−82247	8				12.9 m	0.3	5^+*	08			β^+=100	*
^{102}Ag^m	−82238	8	9.40	0.07		7.7 m	0.5	2^+*	08			β^+=51 5;IT=49 5	*
^{102}Cd	−79659.7	1.7				5.5 m	0.5	0^+	08			β^+=100	
^{102}In	−70695	5				23.3 s	0.1	(6^+)	08	95Sz01	J	β^+=100;β^+p=0.0093 13	
^{102}Sn	−64820	16				3.8 s	0.2	0^+	08			β^+=100	
^{102}Sn^m	−62764	16	2056.2	0.5		367 ns	11	(6^+)	08	21Gr06	ET	IT=100	*
^{102}Sb	−51100#	400#										p ?	
^{102}Te	−37750#	300#						0^+				α ?	
$*^{102}$Rb	T : average 15Lo04=37(10) 11Ni01=35(+15-8) 87PfZX=37(5)											**	
$*^{102}$Rb	D : other: %β^-n=18(8) in 87PfZX											**	
$*^{102}$Sr	T : other: 11Ni01=85(15)											**	
$*^{102}$Y	J : direct β^- feeding of 4^- and 5^- levels in ^{102}Zr in 17Br12; π5/2[422]$\otimes\nu$5/2[532], $K^\pi=5^-$ configuration from systematics											**	
$*^{102}$Y	T : from 91Hi02 for the high-spin β^- decaying state											**	
$*^{102}$Y	D : from %β^-n=4.9 12, average 86ReZS=6.0(1.7) 96Me09=4.0(1.5), and by splitting equally between gs and isomer											**	
$*^{102}$Y^m	J : direct β^- feeding of ^{102}Sr (0^+) - see discussion in 91Hi02; π5/2[422]$\otimes\nu$5/2[532], $K^\pi=0^-$ configuration from systematics; other: 07Ch07=(2,3)											**	
$*^{102}$Y^m	T : from 91Hi02 for the low-spin β^- decaying state											**	
$*^{102}$Y^m	D : from %β^-n=4.9 12, average 86ReZS=6.0(1.7) 96Me09=4.0(1.5), and by splitting equally between gs and isomer											**	
$*^{102}$Nb	J : 21De.A=4											**	
$*^{102}$Nb^m	T : average 19Do02=1.33(0.27) 76Ah06=1.3(0.2)											**	
$*^{102}$Nb^m	J : 21De.A=1											**	
$*^{102}$Tc^m	J : direct β^- feeding of J=4 and 5 levels and the lack of direct β^- feeding to the 6^+ levels in ^{102}Ru in 70Hu02 and 69Bl16											**	
$*^{102}$Rh	T : average 98Sh21=207.3(1.7) 61Hi06=206(3)											**	
$*^{102}$Rh	J : 75Sc09=2											**	
$*^{102}$Rh^m	J : 89Hi12,75Sc09=6											**	
$*^{102}$Pd	T : 16Le16 (supersedes 13Le10) >8.8 Ey, >7.6 Ey for the first excited 0^+ and 2^+ states, and >14 Ey for the second excited 2^+											**	
$*^{102}$Ag	J : 70Wa35=5											**	
$*^{102}$Ag^m	J : 68Gr01=2											**	
$*^{102}$Sn^m	T : from 21Gr06=367(11), supersedes 11Hi.A=367(8); others: 98Li50=620(+430-190) 97Gr02=300(+500-200) 96Li50=1000(500)											**	
$*^{102}$Sn^m	E : from 21Gr06, E_γ=87.6(0.3),496.9(0.3),1471.7(0.3) in a cascade; other: 98Li50=2017(2)											**	
^{103}Kr	−17700#	500#				5# ms	>300ns	$5/2^+$#		24Sh17	I	β^- ?;β^-n ?;β^-2n ?	
^{103}Rb	−33050	30				26 ms	11	$3/2^+$#	15	15Lo04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{103}Sr	−47220	29				53 ms	10	$5/2^+$#	15			β^-=100;β^-n ?;β^-2n ?	
^{103}Y	−58457	11				239 ms	12	$5/2^+$#	09	11Ni01	T	β^-=100;β^-n=8.0 17	*
^{103}Zr	−67809	9				1.38 s	0.07	$(5/2^-)$	09	09Pe06	TD	β^-=100;β^-n=0.5 3	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
^{103}Nb	−75028	4				1.34 s	0.07	$5/2^+$*	09	19Do02	T	β^-=100;β^-n ?	*
^{103}Mo	−80954	9				67.5 s	1.5	$3/2^+$	09	09Ch09	J	β^-=100	
^{103}Tc	−84605	10				54.2 s	0.8	$5/2^+$	09			β^-=100	
^{103}Ru	−87267.0	0.4				39.244 d	0.013	$3/2^+$	09	FGK259	T	β^-=100	
^{103}Ru^m	−87028.8	0.8	238.2	0.7		1.69 ms	0.07	$11/2^-$	09			IT=100	
^{103}Rh	−88031.5	2.3				STABLE		$1/2^-$*	09	51Ku41	J	IS=100	
^{103}Rh^m	−87991.7	2.3	39.753	0.006		56.114 m	0.006	$7/2^+$	09			IT=100	*
^{103}Pd	−87456.8	0.9				17.001 d	0.027	$5/2^+$	09	21Ri01	T	ε=100	*
^{103}Ag	−84803	4				65.7 m	0.7	$7/2^+$*	09	58Ew85	J	β^+=100	
^{103}Ag^m	−84669	4	134.45	0.04		5.7 s	0.3	$1/2^-$	09			IT=100	
^{103}Cd	−80651.8	1.8				7.3 m	0.1	$5/2^+$*	09	18Yo07	J	β^+=100	
^{103}In	−74632	9				60 s	1	$9/2^+$*	09	97Sz04	T	β^+=100	*
^{103}In^m	−74000	9	631.7	0.1		34 s	2	$1/2^-$*	09	24Ka49	J	$\beta^+\approx$67;IT≈33	*
^{103}Sn	−67125.7	2.7				7.0 s	0.2	$5/2^+$#	09			β^+=100;β^+p=1.2 1	
^{103}Sb	−56670#	300#					<49ns	$5/2^+$#	15	13Su23	T	p ?	
^{103}Te	−42600#	200#						$7/2^+$#				α ?	
*^{103}Rb	T : symmetrized from 15Lo04=23(+13-9)												**
*^{103}Y	T : average 11Ni01=234(+18-15) 09Pe06=260(+40-20) 96Me09=230(20) 96Lh04=190(50)												**
*^{103}Y	D : %β^-n average 09Pe06=8(2) 96Me09=8(3)												**
*^{103}Zr	D : %β^-n from 09Pe06<1												**
*^{103}Nb	J : 09Ch25=5/2												**
*^{103}Nb	T : others: 76Ah06,84Sh03=1.5(0.2) 88PaZV=1.3(0.1)												**
*^{103}Rh^m	T : average 81Va11=56.114(0.020) 78La21=56.112(0.009, unc of 0.028 at 99.7% C.L. reported by the authors) 73Gu06=56.116(0.009)												**
*^{103}Pd	T : average 21Ri01=17.049(0.016) 81Va11=16.991(0.019) 75Cz03=16.961(0.016); Birge Ratio=2.79												**
*^{103}In	J : 24Ka49=9/2												**
*^{103}In^m	E : other: 20Ho03=689(77)												**
^{104}Rb	−27450#	200#				20# ms	>550ns	1^+#	21	18Sh11	IT	β^- ?;β^-n ?;β^-2n ?	
^{104}Sr	−43410	30				50.6 ms	4.2	0^+	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{104}Y	−53996	16				197 ms	4	$(0^+,1^+)$#	15	09Pe06	D	β^-=100;β^-n=34 10;β^-2n ?	*
^{104}Zr	−65718	9				920 ms	28	0^+	07	09Pe06	TD	β^-=100;β^-n=0.5 3	*
^{104}Nb	−71811.9	1.1			&	0.89 s	0.01	5^-	07	25Na12	TJD	β^-=100;β^-n=0.05 3	*
^{104}Nb^m	−71801.4	1.8	10.5	2.1	MD &	6.1 s	0.1	(1^+)	07	25Na12	TJD	β^-=100;β^-n=0.06 3	*
^{104}Mo	−80344	9				60 s	2	0^+	07			β^-=100	
^{104}Tc	−82578.4	2.2				18.3 m	0.3	(3^-)	07			β^-=100	*
^{104}Tc^m	−82508.7	2.2	69.7	0.2		3.5 μs	0.3	(5^-)	07	81TiZZ	ET	IT=100	*
^{104}Tc^n	−82472.3	2.2	106.1	0.3		400 ns	20	4#	07			IT=100	
^{104}Ru	−88096.5	1.2				STABLE		0^+	07			IS=18.62 27;2β^- ?	*
^{104}Rh	−86959.2	2.3				42.3 s	0.4	1^+	07			β^-=99.55 10;β^+=0.45 10	
^{104}Rh^m	−86830.2	2.3	128.9679	0.0005		4.34 m	0.03	5^+	07			IT=99.87 1;β^-=0.13 1	
^{104}Pd	−89394.2	1.2				STABLE		0^+	07			IS=11.14 8	
^{104}Ag	−85116	4				69.2 m	1.0	5^+*	07			β^+=100	*
^{104}Ag^m	−85109	4	6.90	0.22		33.5 m	2.0	2^+*	07			$\beta^+\approx$100;IT<0.07	*
^{104}Cd	−83968.4	1.7				57.7 m	1.0	0^+	07			β^+=100	
^{104}In	−76183	6				1.80 m	0.03	(5^+)*	07			β^+=100	*
^{104}In^m	−76090	6	93.48	0.10		15.7 s	0.5	(3^+)	07	89Va05	D	IT=80 5;β^+=20 5	
^{104}Sn	−71626	4				20.8 s	0.5	0^+	07			β^+=100	
^{104}Sb	−59338	12				470 ms	130		07	96FaZZ	TD	$\beta^+\approx$100;p<7;α ?;β^+p=3.5 20	*
^{104}Te	−49520	250				7.7 ns	1.9	0^+	21	26Co.1	T	α=100	*
^{104}I	−31720#	500#										α ?	
*^{104}Sr	T : average 15Lo04=53(5) 11Ni01=43(+9-7)												**
*^{104}Y	T : average 15Lo04=198(20) 11Ni01=197(4) 99Wa09=180(60); other: 09Pe06=260(+60-50) 99Wa09=180(60)												**
*^{104}Zr	D : %β^-n from 09Pe06<1												**
*^{104}Nb	T : average 25Na12=0.89(0.01) 19Do02=0.97(0.10) 96Me09=1.0(0.1) 82Ke05=0.99(0.07) 76Ah06=0.8(0.2); other: 80BaZL=0.91												**
*^{104}Nb^m	T : others (discrepant): 86Me09=5.0(0.4) 76Ah06=4.8(0.4)												**
*^{104}Nb^m	D : %β^-n other: 83En03=0.71%, discrepant (not used)												**
*^{104}Tc	J : strong direct β^- feedings to 2^+, 2^- and 4^+ levels in ^{104}Ru; expected π3/2[301]$\otimes\nu$3/2[411], $K^\pi=3^-$ configuration												**
*^{104}Tc^m	J : 81TiZZ=69.7(0.2), E2 γ to gs [J^π=(3^-)]												**
*^{104}Ru	T : 0ν-$\beta\beta$ to 1st exc. state : 13Be09>650 Ey 12An08>190 Ey												**
*^{104}Ag	J : 61Am02,59Ew89=5												**
*^{104}Ag^m	J : 61Am02,59Ew89,58Re10=2												**
*^{104}In	J : 87Eb02=(5)												**
*^{104}Sb	T : symmetrized from 96FaZZ=440(+150-110), supersedes 95Sc28, 95Sc33=520(+180,-130)												**
*^{104}Sb	D : %p from 96FaZZ, supersedes 95Sc28<1; %β^+p from 96FaZZ<7												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{104}$Te	T : symmetrized from 26Co.1=7.2(+2.3-1.5); others: 19Xi06<4 18Au04<18											**
^{105}Rb	−22800#	300#				15# ms >400ns	$3/2^+$#	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{105}Sr	−37890	40				39 ms 5	$5/2^+$#	19			β^-=100;β^-n ?;β^-2n ?	
^{105}Y	−50570#	200#				95 ms 9	$5/2^+$#	19	09Pe06	D	β^-=100;β^-n=41 24;β^-2n ?	*
^{105}Zr	−61458	12				670 ms 28	$1/2^+$#	19	09Pe06	TD	β^-=100;β^-n=1.0 6	*
^{105}Nb	−69915	4				2.91 s 0.05	$(5/2^+)$	19			β^-=100;β^-n=1.7 9	
^{105}Nb^m	−69857	4	58.1	0.1		94 ns 12	$(3/2^-)$		26Ab04	ETJ	IT=100	
^{105}Mo	−77332.7	1.8				36.3 s 0.8	$(5/2^-)$	19			β^-=100	
^{105}Tc	−82196	9				7.64 m 0.06	$(3/2^-)$	19			β^-=100	
^{105}Ru	−85935.3	1.2				4.439 h 0.011	$3/2^+$	19			β^-=100	
^{105}Ru^m	−85914.7	1.2	20.606	0.014		340 ns 15	$5/2^+$	19			IT=100	
^{105}Rh	−87851.0	2.5				35.341 h 0.019	$7/2^+$	19			β^-=100	
^{105}Rh^m	−87721.3	2.5	129.742	0.004		42.8 s 0.3	$1/2^-$	19			IT=100	
^{105}Pd	−88417.2	1.1				STABLE	$5/2^+*$	19			IS=22.33 8	*
^{105}Pd^m	−87928.1	1.1	489.1	0.3		35.5 μs 0.5	$11/2^-$	19			IT=100	
^{105}Ag	−87071	5				41.29 d 0.07	$1/2^-*$	19			β^+=100	*
^{105}Ag^m	−87046	5	25.468	0.016		7.23 m 0.16	$7/2^+$	19			IT ?;β^+=0.34 7	
^{105}Cd	−84333.9	1.4				55.5 m 0.4	$5/2^+*$	19			β^+=100	*
^{105}Cd^m	−81816.3	1.5	2517.6	0.5		4.5 μs 0.5	$(21/2^+)$	19			IT=100	
^{105}In	−79641	10				5.07 m 0.07	$9/2^+*$	19			β^+=100	*
^{105}In^m	−78967	10	674.09	0.25		48 s 6	$1/2^-*$	19			IT≈100;β^+ ?	*
^{105}Sn	−73339	4				32.7 s 0.5	$5/2^+*$	19	25Gu23	J	β^+=100;β^+p=0.011 4	
^{105}Sb	−64015	22				1.12 s 0.16	$(5/2^+)$	19	96FaZZ	T	β^+=100;p<0.1;β^+p ?	*
^{105}Te	−52396	3				493 ns 33	$(7/2^+)$	19	26Co.1	T	α=100	*
^{105}I	−39200#	400#									α ?	
$*^{105}$Y	T : symmetrized from 15Lo04=107(+6-9); others: 11Ni01=83(+5-4) 09Pe06=160(+85-60)											**
$*^{105}$Y	D : %β^-n from 09Pe06<82											**
$*^{105}$Zr	J : 20Ur02=1/2$^+$, 1/2$^+$[411]											**
$*^{105}$Zr	D : %β^-n from 09Pe06<2											**
$*^{105}$Pd	J : 53Bl28,52St56=5/2											**
$*^{105}$Ag	J : 58Ew84=1/2											**
$*^{105}$Cd	J : 18Yo07,69La06=5/2											**
$*^{105}$In	J : 24Ka49,87Eb02=9/2											**
$*^{105}$In^m	E : other: 20Ho03=702(27)											**
$*^{105}$In^m	J : 24Ka49=1/2											**
$*^{105}$Sb	T : from 96FaZZ, supersedes 95Sc28=1.30(0.15) (preliminary, the same group)											**
$*^{105}$Sb	D : %p from 05Li47<0.1% above 430 keV; other: 96FaZZ,94Ti03∼1%											**
$*^{105}$Te	T : others: 06Li41=620(70) 06Se08=700(+250-170)											**
$*^{105}$Te	J : favored α decay to the 171.7-keV state [J^π=(7/2$^+$)] in ^{101}Sn											**
^{106}Rb	−16800#	400#				10# ms >400ns	4^+#	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{106}Sr	−34000#	200#				21 ms 8	0^+	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{106}Y	−45790#	300#				75 ms 6	2^+#	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{106}Zr	−58582	5				179 ms 6	0^+	15	15Lo04	T	β^-=100;β^-n=3.5 20	*
^{106}Nb	−66202.1	1.2				0.90 s 0.20	1^-#	15	96Me09	T	β^-=100;β^-n=4.5 3	*
^{106}Nb^m	−66100#	50#	100#	50#		1.16 s 0.05	(4^-)		21Mi07	T	β^-≈100;IT ?	*
^{106}Nb^n	−65997.3	1.3	204.8	0.5		820 ns 38	(3^+)	15	14Lu07	EJ	IT=100	*
^{106}Mo	−76128	9				8.73 s 0.12	0^+	07			β^-=100	
^{106}Tc	−79736.2	1.9				35.6 s 0.6	$(1,2)(^+$#)	07			β^-=100	
^{106}Ru	−86323	5				370.52 d 0.20	0^+	07	FGK259	T	β^-=100	
^{106}Rh	−86362	5				30.07 s 0.35	1^+	07			β^-=100	
^{106}Rh^m	−86230	10	133	11	BD	131 m 2	$(6)^+$	07			β^-=100	
^{106}Pd	−89906.8	1.1				STABLE	0^+	07			IS=27.33 3	
^{106}Ag	−86942	3				23.96 m 0.04	1^+*	07			β^+≈100;β^- ?	*
^{106}Ag^m	−86852	3	89.66	0.07		8.28 d 0.02	6^+*	07			β^+=100;IT ?	*
^{106}Cd	−87131.4	1.0				STABLE >0.89Zy	0^+	07	23Be16	T	IS=1.245 22;2β^+ ?	*
^{106}In	−80607	12				6.2 m 0.1	7^+*	07			β^+=100	*
^{106}In^m	−80578	12	28.6	0.3		5.2 m 0.1	$(2)^+$	07			β^+=100	
^{106}Sn	−77352	5				1.92 m 0.08	0^+	07			β^+=100	
^{106}Sb	−66473	7				600 ms 200	(2^+)	07			β^+=100	
^{106}Sb^m	−66370	7	103.5	0.3		226 ns 14	(4^+)	07	99So08	T	IT=100	*
^{106}Te	−58105	19				67.9 μs 1.0	0^+	07	26Co.1	T	α=100	*
^{106}I	−43860#	400#				300# ns					α ?	
^{106}Xe	−30160#	300#				100# ns	0^+				α ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{106}$Sr	T : symmetrized from 15Lo04=20(+8-7)										**
$*^{106}$Y	T : average 15Lo04=82(+10-5) 15NiZZ=62(9); other: 11Ni01=62(+25-14)										**
$*^{106}$Zr	T : average 15Lo04=175(7) 11Ni01=186(+11-10)										**
$*^{106}$Zr	D : %β^-n from 09Pe06<7										**
$*^{106}$Nb	T : from 96Me09 using n(t), dominant population from the low-spin										**
$*^{106}$Nb^m	T : average 21Mi07=1.097(0.021) 20Ha14=1.10(0.05) 09Pe06=1.24(0.02) 83Sh06=1.02(0.05); Birge ratio=3.4; values may contain contributions from the										**
$*^{106}$Nb^m	T : shorter-lived gs										**
$*^{106}$Nb^m	J : from 20Ha14										**
$*^{106}$Nb^n	T : average 12Ka36=660(+110-100) 99Ge01=840(40)										**
$*^{106}$Ag	J : 59Ew89,58Re10=1										**
$*^{106}$Ag^m	J : 59Ew89=6										**
$*^{106}$Cd	T : for 0ν-$\varepsilon\varepsilon$; >8.4 Zy, 1.5 Zy and 110 Zy for 0ν-$\beta\beta$, 2ν-$\varepsilon\beta$ and 0ν-$\varepsilon\beta$ respectively. 23Be16 supersedes 16Be11>1.1 Zy 12Be14>0.21 Zy for 2ν-$\varepsilon\beta$										**
$*^{106}$In	J : 86Va27=7										**
$*^{106}$Sb^m	T : average 99So08=232(21) 98Li50=220(20)										**
$*^{106}$Te	T : others: 16Ca33=70(+20-15) 05Ja03=85(+25-15) 94Pa11=60(+40-20) 81Sc17=60(+30-10)										**
^{107}Sr	−28000#	300#			25# ms	>400ns	1/2$^+$#	10	10Oh02	I	β^- ?;β^-n ?;β^-2n ?	
^{107}Y	−41970#	300#			33.5 ms	0.3	5/2$^+$#	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{107}Zr	−53800#	200#			145.7 ms	2.4	5/2$^+$#	15	15Lo04	T	β^-=100;β^-n=12 7	*
^{107}Nb	−63724	8			286 ms	8	(5/2$^+$)	08	19Ku16	TJ	β^-=100;β^-n=7.4 8	*
^{107}Mo	−72545	9			3.5 s	0.5	(1/2$^+$)	08	19Ku16	J	β^-=100	*
^{107}Mo^m	−72480	9	65.4	0.2	445 ns	21	(5/2$^+$)	08	19Ku16	J	IT=100	*
^{107}Tc	−78751	8			21.2 s	0.2	(3/2$^-$)	08	09Gu11	J	β^-=100	
^{107}Tc^m	−78721	8	30.1	0.1	3.85 μs	0.05	(1/2$^+$)	08			IT=100	
^{107}Tc^n	−78685	8	65.72	0.14	184 ns	3	(5/2$^+$)	08			IT=100	
^{107}Ru	−83863	8			3.75 m	0.05	5/2$^+$*	08	25Ma56	J	β^-=100	
^{107}Rh	−86864	12			21.7 m	0.4	7/2$^+$	08			β^-=100	
^{107}Rh^m	−86596	12	268.36	0.04	> 10 μs		1/2$^-$	08			IT=100	
^{107}Pd	−88371.9	1.1			5.94 My	0.07	5/2$^+$	08	26Fa.1	T	β^-=100	*
^{107}Pd^m	−88256.2	1.1	115.74	0.12	850 ns	100	1/2$^+$	08			IT=100	
^{107}Pd^n	−88157.3	1.1	214.6	0.3	21.3 s	0.5	11/2$^-$	08			IT=100	
^{107}Ag	−88409.4	1.2			STABLE		1/2$^-$*	08			IS=51.839 8	*
^{107}Ag^m	−88316.3	1.2	93.125	0.019	44.3 s	0.2	7/2$^+$	08			IT=100	
^{107}Cd	−86990.8	1.6			6.50 h	0.02	5/2$^+$*	08			β^+=100	*
^{107}In	−83567	10			32.4 m	0.3	9/2$^+$*	08			β^+=100	*
^{107}In^m	−82889	10	678.5	0.3	50.4 s	0.6	1/2$^-$*	08			IT=100	*
^{107}Sn	−78512	5			2.90 m	0.05	5/2$^+$*	08	25Gu23	J	β^+=100	
^{107}Sb	−70653	4			4.0 s	0.2	5/2$^+$#	08			β^+=100	
^{107}Te	−60694	5			3.532 ms	0.003	5/2$^+$#	08	26Co.1	T	α=70 30;β^+ ?;β^+p ?	*
^{107}I	−49430#	300#			150# ns		5/2$^+$#				α ?	
^{107}Xe	−35000#	200#			1# μs		7/2$^+$#				α ?	
$*^{107}$Y	T : other: 11Ni01=41(+15-9)										**	
$*^{107}$Zr	T : average 15Lo04=150(3) 11Ni01=138(4); other: 09Pe06=150(+40-30)										**	
$*^{107}$Zr	D : %β^-n from 09Pe06<23										**	
$*^{107}$Nb	T : average 19Ku16=270(20) 15Lo04=280(20) 09Pe06=290(11) 96Me09=300(30)										**	
$*^{107}$Nb	D : %β^-n average 09Pe06=8(1) 96Me09=6.0(1.5)										**	
$*^{107}$Mo	J : 20Ur02,19Ku16=1/2$^+$, 1/2$^+$[411]										**	
$*^{107}$Mo^m	T : average 06Pi14=420(30) 99Ge01=470(30); others: 20Ur02=600(150) 76ChZD=238(7)										**	
$*^{107}$Mo^m	J : 20Ur02,19Ku16=5/2$^+$, 5/2$^+$[413]										**	
$*^{107}$Pd	T : other: 69Fl04=6.5(0.3) 49Pa17∼7										**	
$*^{107}$Ag	J : 24De01,14Fe01,50Cr26,37Ja01=1/2										**	
$*^{107}$Cd	J : 18Yo07,13Yo02,63By02=5/2										**	
$*^{107}$In	J : 24Ka49,87Eb02=9/2										**	
$*^{107}$In^m	E : other: 20Ho03=663(22)										**	
$*^{107}$In^m	J : 24Ka49=1/2										**	
$*^{107}$Te	T : others: 19Au02=3.6(0.2) 14Pa11=3.1(0.1) 79Sc22=3.6(+0.6-0.4)										**	
^{108}Sr	−23700#	400#			10# ms	>400ns	0$^+$	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{108}Y	−36780#	400#			30 ms	5	6$^-$#	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{108}Zr	−50750#	300#			78.5 ms	2.0	0$^+$	15			β^-=100;β^-n ?	
^{108}Zr^m	−48680#	300#	2074.5	0.8	540 ns	30	(6$^+$)	15	12Ka36	T	IT=100	*
^{108}Nb	−59545	8			201 ms	4	(2$^+$)	15	20Ha14	T	β^-=100;β^-n=6.3 5;β^-2n ?	*
^{108}Nb^m	−59381	8	163.8	0.5	108.5 ns	2.0	6$^-$#	15	23Br09	TED	IT=100	*
^{108}Mo	−70749	9			1.105 s	0.010	0$^+$	08	09Pe06	TD	β^-=100;β^-n=0.25 14	*
^{108}Tc	−75924	8			5.17 s	0.07	(2)$^+$	08			β^-=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{108}Tc^m	−75493	8	431	2		116 ns 3	6$^-$#	08	25Pi01	T	IT=100	*
^{108}Ru	−83659.7	1.1				4.55 m 0.05	0$^+$	08			β^-=100	
^{108}Rh	−84972.8	1.5				16.8 s 0.5	1$^+$	08			β^-=100	
^{108}Rh^m	−84907.1	1.7	65.7	1.7	MD	6.0 m 0.3	(5$^+$)	08			β^-=100	
^{108}Pd	−89524.0	1.1				STABLE	0$^+$	08			IS=26.46 9	
^{108}Ag	−87609.5	1.2				2.382 m 0.011	1$^+$*	08	64Ro04	J	β^-=97.15 20;β^+=2.85 20	
^{108}Ag^m	−87500.0	1.2	109.466	0.007		439 y 9	6$^+$*	08	18Sh09	T	β^+=91.3 9;IT=8.7 9	*
^{108}Cd	−89252.3	1.1				STABLE >410Py	0$^+$	08	95Ge14	T	IS=0.888 11;2β^+ ?	
^{108}In	−84120	9				58.0 m 1.2	7$^+$*	08			β^+=100	*
^{108}In^m	−84090	9	29.75	0.05		39.6 m 0.7	2$^+$*	08			β^+=100	*
^{108}Sn	−82070	5				10.30 m 0.08	0$^+$	08			β^+=100	
^{108}Sb	−72445	5				7.4 s 0.3	(4$^+$)	08			β^+=100	
^{108}Te	−65782	5				2.1 s 0.1	0$^+$	08	85Ti02	D	β^+=51 4;α=49 4;β^+p=2.4 10; $\beta^+\alpha$<0.065	
^{108}I	−52814	12				26.4 ms 0.8	1$^+$#	08	19Au02	TD	α≈99.50 21;p=0.50 21;β^+ ?; β^+p ?	
^{108}Xe	−42320	270				78 μs 16	0$^+$	21	26Co.1	T	α=100	*
^{108}Cs	−23870#	400#				1# ns					p ?	
*^{108}Y	T : other: 11Ni01=25(+66-10)											**
*^{108}Zr^m	T : symmetrized from 12Ka36=536(+26-25); other: 11Su11=620(150)											**
*^{108}Nb	T : average 20Ha14=186(8) 15Lo04=195(6) 09Pe06=210(5)											**
*^{108}Nb	D : %β^-n other: 20Ha14=18(11)											**
*^{108}Nb^m	T : average 23Br09=105(7) 12Ka36=108.8(2.1)											**
*^{108}Mo	T : average 09Pe06=1.110(0.011) 95Jo02=1.090(0.020)											**
*^{108}Mo	D : %β^-n from 09Pe06<0.5											**
*^{108}Tc^m	T : other: 04Hw02=94(10)											**
*^{108}Tc^m	E : 04Hw02=154.0 and 176.6-keV γs in a cascade											**
*^{108}Ag^m	T : average 18Sh09=448(27) 04Sc04=437.7(8.8), supersedes 92Sc25=418(15); others: 69Vo11=310(130) 70Ha32=127(21)											**
*^{108}Ag^m	J : 75Fi07=6											**
*^{108}In	J : 86Eb01,86Va27=7											**
*^{108}In^m	J : 86Eb01=2											**
*^{108}Xe	T : average 26Co.1=75(+22-14) 19Xi06=30(+57-12) 18Au04=58(+106-23)											**
^{109}Y	−32480#	400#				25 ms 5	5/2$^+$#	16	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	
^{109}Zr	−45530#	300#				56 ms 3	5/2$^+$#	16			β^-=100;β^-n ?;β^-2n ?	
^{109}Nb	−56780	200				109.5 ms 1.7	3/2$^-$#	16	25Ba16	TD	β^-=100;β^-n=31 5	*
^{109}Nb^m	−56470	200	312.2	0.3		118 ns 6	7/2$^+$#	16	23Br09	TE	IT=100	*
^{109}Mo	−66659	11				700 ms 14	(1/2$^+$)	16	09Pe06	TD	β^-=100;β^-n=1.3 6	*
^{109}Mo^m	−66590	11	69.2	0.2		160 ns 6	(5/2$^+$)	16	25Ba16	ETJ	IT=100	*
^{109}Tc	−74284	9				905 ms 21	(5/2$^+$)	16	19Do02	T	β^-=100;β^-n=0.08 2	*
^{109}Ru	−80739	9				34.4 s 0.2	5/2$^+$*	16	25Ma56	J	β^-=100	
^{109}Ru^m	−80643	9	96.14	0.15		680 ns 30	(5/2$^-$)	16			IT=100	
^{109}Rh	−84999	4				80.8 s 0.7	7/2$^+$	16			β^-=100	
^{109}Rh^m	−84773	4	225.873	0.019		1.66 μs 0.04	3/2$^+$	16			IT=100	
^{109}Pd	−87606.3	1.1				13.438 h 0.013	5/2$^+$	16	19Kr05	T	β^-=100	*
^{109}Pd^m	−87492.9	1.1	113.4000	0.0014		380 ns 50	1/2$^+$	16			IT=100	
^{109}Pd^n	−87417.3	1.1	188.9903	0.0010		4.694 m 0.002	11/2$^-$	16	19Kr05	T	IT=100	*
^{109}Ag	−88718.9	0.4				STABLE	1/2$^-$*	16			IS=48.161 8	*
^{109}Ag^m	−88630.9	0.4	88.0337	0.0010		39.79 s 0.21	7/2$^+$*	16			IT=100	*
^{109}Cd	−88504.3	1.5				461.3 d 0.5	5/2$^+$*	16	FGK209	T	ε=100	*
^{109}Cd^m	−88444.7	1.5	59.60	0.07		11.8 μs 1.6	1/2$^+$	16			IT=100	
^{109}Cd^n	−88041.2	1.5	463.10	0.11		10.6 μs 0.4	11/2$^-$	16			IT=100	
^{109}In	−86491.6	2.6				4.159 h 0.010	9/2$^+$*	16			β^+=100	*
^{109}In^m	−85841.8	2.6	649.79	0.10		1.34 m 0.06	1/2$^-$*	16			IT=100	*
^{109}In^n	−84389.7	2.6	2101.86	0.11		210.0 ms 0.9	19/2$^+$	16			IT=100[gs=100,m=0]	*
^{109}Sn	−82630	8				18.1 m 0.2	5/2$^+$*	16			β^+=100	*
^{109}Sb	−76251	5				17.2 s 0.5	5/2$^+$#	16			β^+=100	
^{109}Te	−67715	4				4.4 s 0.2	(5/2$^+$)	16			β^+=96.1 13;α=3.9 13;β^+p=9.4 31; $\beta^+\alpha$<0.0049	*
^{109}I	−57672	7				92.8 μs 0.8	(1/2$^+$,3/2$^+$)	16			p=99.986 4;α=0.014 4	*
^{109}Xe	−45754	8				16.0 ms 0.6	(7/2$^+$)	16	26Co.1	T	α≈100;β^+ ?;β^+p ?	*
^{109}Cs	−31730#	300#				10# ns	3/2$^+$#				p ?	
*^{109}Nb	T : others: 15Lo04=110(6) 11Ni01=100(+9-8) 09Pe06=130(20) 96Me09=190(30)											**
*^{109}Nb	D : %β^-n from 96Me09=31(5); others: 25Ba16=27(11) 09Pe06<15											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{109}$Nb^m	T : average 23Br09=122(8) 12Ka36=114(+8-7); other: 11Wa03=150(30)												**
$*^{109}$Nb^m	J : from 11Wa03, based on conf=π7/2[413],$K^\pi = 7/2^+$ and oblate shape												**
$*^{109}$Mo	T : others: 15Lo04=700(+40-60), 92Ay02=530(60)												**
$*^{109}$Mo	J : 25Ba16,20Ur02=1/2$^+$, ν1/2$^+$[411]												**
$*^{109}$Mo^m	T : other: 12Ka36=194(+76-49)												**
$*^{109}$Tc	T : average 19Do02=870(70) 09Pe06=1040(110) 96Me09=820(100) 92PeZX=870(40) 69WiZX=930(30) 90Al43=900(100)												**
$*^{109}$Pd	T : average 19Kr05,15Kr07=13.45(0.01) 88Ba60=13.404(0.008) 77Gi11=13.427(0.014) 62Br15=13.47(0.01) 59St28=13.45(0.01); Birge ratio=2.82; others												**
$*^{109}$Pd	T : (not used): 90Ab06=13.7012(0.0024) 70Bo22=13.67(0.07) 58Gu09=13.99(0.16) 48Mo33=14.1(0.3)												**
$*^{109}$Pd^n	T : from 19Kr05,15Kr07=4.694(0.002); others high precision (not used): 92An19=4.750(0.004) 90Ab06=4.696(0.003) 92KaZM=4.663(0.011)												**
$*^{109}$Ag	J : 50Cr26,37Ja01,24De01=1/2												**
$*^{109}$Ag^m	J : 65St18=7/2												**
$*^{109}$Cd	J : 18Yo07,13Yo02,63Mc11=5/2												**
$*^{109}$In	J : 24Ka49,58Ma43,59Ma19=9/2												**
$*^{109}$In^m	J : 24Ka49=1/2												**
$*^{109}$In^n	E : other: 20Ho03=2098(11)												**
$*^{109}$Sn	J : 25Gu23,20Yo07,87Eb01=5/2, but in conflict with 74Ho17=7/2												**
$*^{109}$I	T : other (not used): 19Xi06=89.3(6.0)												**
$*^{109}$Xe	T : other: 06Li41=13(2)												**
^{110}Y	−26900#	700#				20# ms	>400ns	5$^+$#	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{110}Zr	−42000#	400#				37.6 ms	1.7	0$^+$	15	20Ha14	T	β^-=100;β^-n ?;β^-2n ?	*
^{110}Nb	−52190#	200#			*	75 ms	1	5$^+$#	11	20Ha14	TD	β^-=100;β^-n=40 8;β^-2n ?	
^{110}Nb^m	−52090#	210#	100#	50#	*	94 ms	9	2$^+$#		20Ha14	TD	β^-=100;β^-n=40 8;β^-2n ?	*
^{110}Mo	−64536	24				292 ms	7	0$^+$	11	15Lo04	T	β^-=100;β^-n=2.0 7	
^{110}Tc	−71035	9				900 ms	13	(2$^+$,3$^+$)	11			β^-=100;β^-n=0.04 2	
^{110}Ru	−80072.8	0.6				12.04 s	0.17	0$^+$	11			β^-=100	
^{110}Rh	−82705.2	0.8				3.35 s	0.12	(1$^+$)	11			β^-=100	
^{110}Rh^m	−82665.5	0.7	39.7	0.6	MD	28.5 s	1.3	(6$^+$)	11			β^-=100	
^{110}Pd	−88330.8	0.6				STABLE	>290Ey	0$^+$	11	16Le16	T	IS=11.72 9;2β^- ?	*
^{110}Ag	−87456.8	0.4				24.56 s	0.11	1$^+$*	11			β^-=99.70 6;ε=0.30 6	*
^{110}Ag^m	−87455.7	0.4	1.112	0.016		660 ns	40	2$^-$	11			IT=100	
^{110}Ag^n	−87339.2	0.4	117.59	0.05		249.87 d	0.04	6$^+$*	11	FGK259	T	β^-=98.67 8;IT=1.33 8	*
^{110}Cd	−90348.0	0.4				STABLE		0$^+$	11			IS=12.470 61	
^{110}In	−86470	12				4.92 h	0.08	7$^+$*	11			β^+=100	*
^{110}In^m	−86408	12	62.08	0.04		69.1 m	0.5	2$^+$*	11			β^+=100	*
^{110}Sn	−85842	14				4.154 h	0.004	0$^+$	11			ε=100	
^{110}Sb	−77450	6				23.6 s	0.3	(3$^+$)	11			β^+=100	
^{110}Te	−72230	7				18.6 s	0.8	0$^+$	11			$\beta^+\approx$100;α ?	
^{110}I	−60470	60				664 ms	24	(1$^+$)	11			β^+=?;α=17 4;β^+p=11 3;$\beta^+\alpha$=1.1 3	
^{110}Xe	−51808	21				93.9 ms	1.0	0$^+$	11	26Co.1	T	α=64 35;β^+ ?;β^+p ?	*
^{110}Cs	−36440#	300#				100# ns						p ?	
^{110}Ba	−22850#	400#				10# μs		0$^+$				p ?;α ?	
$*^{110}$Zr	T : average 20Ha14=37.7(3.1) 15Lo04=37.5(2.0) 11Ni01=37(+17-9)												**
$*^{110}$Nb	T : from 20Ha14 using $\beta\gamma$(t) gated on γ's depopulating 5$^+$ and 6$^+$ levels; others: 15Lo04=82(2) 11Ni01=86(6) 11Wa26=81(6), 75(9)												**
$*^{110}$Nb	T : 96Me09=170(20) both for the gs and isomer												**
$*^{110}$Nb	D : %β^-n from 96Me09 includes both gs and isomer												**
$*^{110}$Nb^m	T : from 20Ha14 using $\beta\gamma$(t) gated on 213.8 keV γ, depopulating the 2$^+$ state following ^{110}Zr→^{110}Nb→^{110}Mo decay; only low spin												**
$*^{110}$Nb^m	T : levels are populated												**
$*^{110}$Nb^m	D : %β^-n from 96Me09 includes both gs and isomer												**
$*^{110}$Pd	T : 2$\nu-\beta\beta$ in 16Le16, supersedes 13Le10>198 Ey; others: 12Fi01=150(60) Zy (estimate) 52Wi26>0.6 Ey												**
$*^{110}$Ag	J : 69Ac02,69Cu09,66E_α01=1												**
$*^{110}$Ag^n	J : 65We02,58Ew84=6												**
$*^{110}$In	J : 86Va27,68CaZX,59Ma19,58Ma43=7												**
$*^{110}$In^m	E : 89Kr12=62.08(0.04)												**
$*^{110}$In^m	J : 86Va27,68Ca10,68CaZX,67Pr13=2												**
$*^{110}$Xe	T : average 26Co.1=94(1) 07Sa36=93(3); others: 16Ca33=95(+25-20) 05Ja03=105(+35-25) 02Ma19=160(+290-60)												**
^{111}Y	−22000#	700#				15# ms	>400ns	5/2$^+$#	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{111}Zr	−36480#	600#				24.0 ms	0.5	1/2$^-$#	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{111}Zr^m	−36200#	600#	283.1	0.5		226 ns	44	5/2$^+$#		23Br09	TEJ	IT=100	*
^{111}Nb	−48960#	300#				54 ms	2	3/2$^-$#	08			β^-=100;β^-n ?;β^-2n ?	
^{111}Mo	−59932	5				193.6 ms	4.4	1/2$^+$#	15	15Lo04	T	β^-=100;β^-n=6 4	*
^{111}Mo^m	−59830#	50#	100#	50#		∼200 ms		7/2$^-$#	15	11Ku16	T	β^-=100;β^-n ?	
^{111}Tc	−69016	4				350 ms	11	5/2$^+$#	08	09Pe06	T	β^-=100;β^-n=0.85 20	*
^{111}Ru	−76779	4				2.12 s	0.07	5/2$^+$*	08	25Ma56	J	β^-=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{111}Rh	−82301	4				11 s 1	$(7/2^+)$	08			β^-=100	
^{111}Pd	−85985.8	0.7				23.56 m 0.09	$5/2^+$	08	19Kr05	T	β^-=100	*
^{111}Pd^m	−85813.6	0.7	172.170	0.010		5.565 h 0.012	$11/2^-$	08	15Kr07	TD	IT=76.8 10;β^-=23.2 10	*
^{111}Ag	−88215.5	1.5				7.4236 d 0.0011	$1/2^-$*	08	26Da.1	T	β^-=100	*
^{111}Ag^m	−88155.7	1.5	59.82	0.04		64.8 s 0.8	$7/2^+$	08			IT=99.3 2;β^-=0.7 2	
^{111}Cd	−89252.3	0.3				STABLE	$1/2^+$*	08			IS=12.795 12	*
^{111}Cd^m	−88856.1	0.3	396.214	0.021		48.50 m 0.09	$11/2^-$*	08			IT=100	*
^{111}In	−88394.6	0.4				2.8048 d 0.0002	$9/2^+$*	08	FGK259	T	ε=100	*
^{111}In^m	−87857.6	0.4	536.99	0.07		7.7 m 0.2	$1/2^-$*	08	24Ka49	J	IT=100	*
^{111}Sn	−85939	5				35.20 m 0.26	$7/2^+$*	08	22Ch11	T	β^+=100	*
^{111}Sn^m	−85684	5	254.71	0.04		12.5 μs 1.0	$1/2^+$	08			IT=100	
^{111}Sb	−80837	9				75 s 1	$(5/2^+)$	08			β^+=100	
^{111}Te	−73587	6				26.2 s 0.6	$(5/2)^+$	08	05Sh24	T	β^+=100;β^+p=?	*
^{111}I	−64954	5				2.5 s 0.2	$5/2^+$#	08			$\beta^+\approx$100;α=?;β^+p ?	*
^{111}Xe	−54559	10				740 ms 200	$7/2^+$#	08	12Ca03	D	β^+ ?;α=10.4 19;β^+p ?	
^{111}Cs	−42900#	200#				1# μs	$3/2^+$#				p ?	
^{111}Ba	−28180#	300#				100# μs	$7/2^+$#				p ?;α ?	
*^{111}Zr	J : from 23Br09											**
*^{111}Zr^m	T : from τ=326(64) in 23Br09; other: 22Wu18=100(70)											**
*^{111}Mo	T : average 15Lo04=196(5) 11Ku16=186(9); other: 09Pe06=200(+41-36)											**
*^{111}Mo	D : %β^-n from 09Pe06<12											**
*^{111}Tc	T : other: 96Me09=290(20), supersedes 88Pe13=300(30)											**
*^{111}Pd	T : average 15Kr07,19Kr05=23.6(0.1) 77Kr14=23.4(0.2)											**
*^{111}Pd^m	T : average 15Kr07=5.563(0.013) 14Li17=5.580(0.032); other: 19Kr05=5.563(0.013), same as 15Kr07											**
*^{111}Ag	T : average 26Da.1=7.4236(0.0011) 23Do04=7.419(0.015) 16Co01=7.423(0.013); others: 74Ro18=7.450(0.017) 60Ba49=7.45(0.01) 68RoZZ=7.48(0.01)											**
*^{111}Ag	T : 50Jo53=7.50(0.13)											**
*^{111}Ag	J : 56Wo27,54Le40=1/2											**
*^{111}Cd	J : 13Yo02,50Pr51,33Jo02,31Sc01=1/2											**
*^{111}Cd^m	J : 13Yo02,69La06=11/2											**
*^{111}In	J : 24Ka49,59Ma19,58Ma43=9/2											**
*^{111}In^m	J : 24Ka49=1/2											**
*^{111}Sn	T : average 22Ch11=35.1(0.5),35.2(0.6) 69Sh11=35.8(0.8) 67Da11=35.5(0.8) 51Mc11=35(1) 49Hi10=35.0(0.5)											**
*^{111}Sn	J : 25Gu23,74Ho17=7/2											**
*^{111}Te	T : others (outliers): 67Ka01=19.0(0.7) 67Bo41=19.5(0.5)											**
*^{111}I	D : %α: 78Ro19=0.088, based on systematics											**
^{112}Zr	−32420#	700#				43 ms 21	0^+	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{112}Nb	−43930#	300#				38 ms 2	1^+#	14	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{112}Mo	−57467	8				125 ms 5	0^+	14	15Lo04	T	β^-=100;β^-n ?	
^{112}Tc	−65256	5				323 ms 6	(2^+)	14	15Lo04	T	β^-=100;β^-n=1.5 2	*
^{112}Tc^m	−64904	5	352.3	0.7		150 ns 17		14	10Br15	T	IT=100	*
^{112}Ru	−75622	5				1.75 s 0.07	0^+	14			β^-=100	
^{112}Rh	−79603.0	1.5				2.20 s 0.12	(1^+)	14	23Hu01	T	β^-=100	*
^{112}Rh^m	−79563.0	0.7	40.0	1.6	MD	6.90 s 0.07	(6^+)	14	23Hu01	T	β^-=100	*
^{112}Pd	−86321	7				21.04 h 0.17	0^+	14			β^-=100	
^{112}Ag	−86584.8	0.3				3.130 h 0.008	2^-*	14			β^-=100	*
^{112}Cd	−90574.91	0.23				STABLE	0^+	14			IS=24.109 7	
^{112}In	−87990	4				14.88 m 0.15	1^+*	14			β^+=62 4;β^-=38 4	*
^{112}In^m	−87833	4	156.592	0.025		20.67 m 0.08	4^+*	14			IT=100	*
^{112}In^n	−87639	4	350.80	0.05		690 ns 50	$(7)^+$	14			IT=100	
^{112}In^p	−87376	4	613.82	0.06		2.81 μs 0.03	8^-	14			IT=100	
^{112}Sn	−88655.10	0.26				STABLE	0^+	14			IS=0.97 1;2β^+ ?	
^{112}Sb	−81599	18				53.5 s 0.6	(3^+)	14			β^+=100	
^{112}Sb^m	−80773	18	825.9	0.4		536 ns 22	(8^-)	14			IT=100	
^{112}Te	−77568	8				2.0 m 0.2	0^+	14			β^+=100	
^{112}I	−67063	10				3.34 s 0.08	1^+#	14	78Ro19	D	$\beta^+\approx$100;$\alpha\approx$0.0012;β^+p=0.88 10;$\beta^+\alpha$=0.104 12	*
^{112}Xe	−60026	8				2.7 s 0.8	0^+	14			β^+ ?;α=1.2 8;β^+p ?	*
^{112}Cs	−46454	11				488 μs 35	1^+#	14	19Au02	D	p=99.90 7;α=0.10 7	*
^{112}Ba	−35650#	300#				1# ms	0^+				p ?;α ?	
*^{112}Zr	T : symmetrized from 15Lo04=30(+30-10)											**
*^{112}Nb	T : other: 11Ni01=33(+9-6), same group											**
*^{112}Tc	D : %β^-n from 99Wa09=1.5(0.2), supersedes 96Me09=2.6(0.5); other 09Pe06=4(1)											**
*^{112}Tc	T : others: 09Pe06=290(11) 99Wa09=290(20), supersedes 96Me09=230(20)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{112}$Tc^m	E : 12Ka36=93.1(0.5) keV and 259.2(0.5) keV γ rays in a cascade											**
$*^{112}$Tc^m	T : from 10Br15=150(17); other 12Ka36=218(+60-43)											**
$*^{112}$Rh	T : average 23Hu01=2.22(0.13) 91Jo11=2.1(0.3) 99Lh01=3.45(0.37) 88Ay02=3.8(0.6) same group might have contamination											**
$*^{112}$Rh^m	T : average 23Hu01=6.96(0.08) 99Lh01=6.73(0.15) supersedes 88Ay02=6.8(0.2)											**
$*^{112}$Ag	J : 64Ch06=2											**
$*^{112}$In	J : 68Ca10,68CaZX,71CaYV=1											**
$*^{112}$In^m	J : 68Ca14,71CaYV=4											**
$*^{112}$Xe	D : %α symmetrized from 94Pa11=0.8(+1.1-0.5); other 78Ro19∼0.84											**
$*^{112}$Cs	D : %α symmetrized from 19Au02=0.07(+0.09-0.04)											**
$*^{112}$Cs	T : average 12Ca03=506(55) 12Wa10=470(50) 94Pa12=500(100)											**
^{113}Zr	−26340#	300#				15# ms	>550ns	$7/2^+$#	21	18Sh11	IT	β^- ?;β^-n ?;β^-2n ?	
^{113}Nb	−40210#	400#				32 ms	4	$3/2^-$#	09	15Lo04	TD	β^-=100;β^-n ?;β^-2n ?	
^{113}Nb^m	−40080#	400#	135.4	0.2		0.59 μs	0.06	$5/2^+$#		23Br09	JET	IT=100	*
^{113}Mo	−52550#	200#				80 ms	2	$5/2^+$#	15			β^-=100;β^-n ?	
^{113}Tc	−62811	3				152 ms	8	$5/2^+$#	15			β^-=100;β^-n=2.1 3	
^{113}Tc^m	−62697	3	114.0	0.3		519 ns	15	$5/2^-$#	15	23Br09	TE	IT=100	*
^{113}Ru	−71874.6	1.5				800 ms	50	$(1/2)^+$*	09	25Ma56	J	β^-=100	
^{113}Ru^m	−71774.2	1.7	100.4	0.8	MD	510 ms	30	$(7/2^-)$	09	23Hu25	E	β^-= ?;IT= ?	
^{113}Rh	−78770	7				2.80 s	0.12	$(7/2^+)$	09	93Pe11	J	β^-=100	
^{113}Pd	−83591	7				93 s	5	$(5/2^+)$	09			β^-=100	
^{113}Pd^m	−83510	7	81.1	0.3		300 ms	100	$(9/2^-)$	09			IT=100	
^{113}Ag	−86960.4	2.7				5.37 h	0.05	$1/2^-$*	09	24De01	J	β^-=100	*
^{113}Ag^m	−86916.9	2.7	43.50	0.10		68.7 s	1.6	$7/2^+$*	09			IT=64 7;β^-=36 7	*
^{113}Cd	−89043.36	0.23				8.04 Py	0.05	$1/2^+$*	09			IS=12.227 7;β^-=100	*
^{113}Cd^m	−88780.00	0.23	263.361	0.044		13.85 y	0.10	$11/2^-$*	09	25Be31	TDE	β^-=99.921 21;IT=0.0790 21	*
^{113}In	−89367.16	0.19				STABLE		$9/2^+$*	09			IS=4.281 52	*
^{113}In^m	−88975.46	0.19	391.699	0.003		1.6579 h	0.0004	$1/2^-$*	09			IT=100	*
^{113}Sn	−88327.91	0.19				115.08 d	0.05	$1/2^+$*	09	FGK259	T	β^+=100	*
^{113}Sn^m	−88250.52	0.19	77.389	0.019		21.4 m	0.4	$7/2^+$*	09			IT=91.1 23;β^+=8.9 23	*
^{113}Sb	−84417	17				6.67 m	0.07	$5/2^+$*	09	23Le15	J	β^+=100	
^{113}Te	−78347	28				1.7 m	0.2	$(7/2^+)$	09			β^+=100	
^{113}I	−71120	8				6.6 s	0.2	$5/2^+$#	09			β^+=100;α=3.310e-5#;$\beta^+\alpha$?	*
^{113}Xe	−62204	7				2.74 s	0.08	$5/2^+$#	09	85Ti02	D	β^+≈100;α=0.0020#;β^+p=7 4; $\beta^+\alpha$≈0.007 4	*
^{113}Xe^m	−61800	7	403.6	1.4		6.9 μs	0.3	$(11/2^-)$		13Pr01	ETJ	IT=100	
^{113}Cs	−51764	9				16.94 μs	0.09	$(3/2^+)$	15	16Ho16	T	p=100	*
^{113}Ba	−39710#	200#				30# ms		$5/2^+$#				p ?;α ?	
$*^{113}$Nb^m	T : from τ=0.846(0.080) in 23Br09; other: 22Wu18=0.7(0.4)											**
$*^{113}$Tc^m	T : average 23Br09=370(70) 12Ka36=526(+16-15); other 10Br15=500(100)											**
$*^{113}$Ag	J : 24De01,64Ch06=1/2											**
$*^{113}$Ag^m	E : others (mass measurements): 22Ga27=40(5) 24De01=45.8(3.9)											**
$*^{113}$Ag^m	J : 24De01=7/2											**
$*^{113}$Cd	T : from 07Be61=8.037(0.005,stat)(0.05,syst); others: 24Ba40=7.73(+0.60-0.57) 09Da03=8.00(0.11,stat)(0.24,syst)											**
$*^{113}$Cd	J : 13Yo02,50Pr51,33Jo02,31Sc01=1/2											**
$*^{113}$Cd^m	T : average 25Be31=13.61(+0.22-0.29) 11Ko01=13.97(0.13) 72Wa11=14.6(0.5) 65Fl02=13.6(0.2)											**
$*^{113}$Cd^m	J : 13Yo02,69La06,64By03=11/2											**
$*^{113}$Cd^m	E : from 25Be31=263.361(0.026, stat)(0.035,syst); other: ENSDF2010=263.54(0.03)											**
$*^{113}$Cd^m	D : %IT from 25Be31; other (discrepant): 11Ko01=0.104(0.008)											**
$*^{113}$In	J : 24Ka49,22Ve05,38Mi05,37Ba08=9/2											**
$*^{113}$In^m	T : from ENSDF2010=99.476(0.023) m											**
$*^{113}$In^m	J : 24Ka49,22Ve05,60Ch08=1/2											**
$*^{113}$Sn	J : 25Gu23,69Pr07=1/2											**
$*^{113}$Sn^m	J : 74Ho17=7/2											**
$*^{113}$I	D : %α estimate from 81Sc17, based on α-decay hindrance of unity											**
$*^{113}$Xe	D : %α from 85Ti02=0.0024-0.0204, estimated from the reduced width; %β^+p and %$\beta^+\alpha$ derived from β^+p/α=605(35) and β^+p/$\beta^+\alpha$=500-1500 in 85Ti02											**
$*^{113}$Cs	T : average 16Ho16=16.9(0.1) (>10000 events) 15Wa02=17.1(0.2) (18000 events)											**
^{114}Zr	−22080#	400#				10# ms	>400ns	0^+	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{114}Nb	−34810#	500#				17 ms	5	2^-#	15			β^-=100;β^-n ?;β^-2n ?	
^{114}Mo	−49680#	300#				58 ms	2	0^+	15			β^-=100;β^-n ?	
^{114}Tc	−58600	430			*	121 ms	9	5^+#	12	15Lo04	T	β^-=100;β^-n=1.3 4	*
^{114}Tc^m	−58437	13	160	430	MD*	90 ms	20	1^+#	12	11Ri01	TD	β^-≈100;IT ?;β^-n=1.3 4	*
^{114}Ru	−70221	4				540 ms	30	0^+	12	06Mo07	T	β^-=100;β^-n ?;β^-2n ?	*
^{114}Rh	−75661.1	0.7			&	1.81 s	0.02	6^+#	12	88Ay02	TJ	β^-=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{114}Rh^m	−75568.2	0.6	92.9	0.8	MD &	∼1 s	0^-#	12	25St02	JT	β^- ?;IT ?	*
^{114}Rh^n	−75545.8	0.6	115.3	0.8	MD	1.86 s 0.04	3^+#	12	88Ay02	TJ	β^-=100	*
^{114}Pd	−83490	7				2.42 m 0.06	0^+	12			β^-=100	
^{114}Ag	−84923.4	1.2				4.6 s 0.1	1^+*	12	25Va02	J	β^-=100	
^{114}Ag^m	−84724.5	1.6	198.9	1.0		1.50 ms 0.05	(6^+)	12	90Pe10	TED	IT=100	*
^{114}Cd	−90015.02	0.25				STABLE >1.3Ey	0^+	12	08Be22	T	IS=28.754 81;2β^- ?	*
^{114}In	−88569.8	0.3				71.9 s 0.1	1^+	12			β^-=99.50 15;β^+=0.50 15	
^{114}In^m	−88379.5	0.3	190.2682	0.0008		49.51 d 0.01	5^+*	12			IT=96.75 24;β^+=3.25 24	*
^{114}In^n	−88067.9	0.3	501.948	0.003		43.1 ms 0.6	8^-	12			IT=100[gs=0,m=100]	
^{114}Sn	−90559.737	0.029				STABLE	0^+	12			IS=0.66 1	
^{114}Sn^m	−87472.37	0.08	3087.37	0.07		733 ns 14	7^-	12			IT=100	
^{114}Sb	−84497	20				3.49 m 0.03	3^+	12			β^+=100	
^{114}Sb^m	−84002	20	495.5	0.7		219 μs 12	(8^-)	12			IT=100	
^{114}Te	−81890	24				15.2 m 0.7	0^+	12			β^+=100	
^{114}I	−72639	20				2.01 s 0.15	1^+	12	20Ay05	TD	β^+=100;α≈7.7e-9#;β^+p ?	*
^{114}I^m	−72505	20	134.0	0.5		6.2 s 0.5	(4^+)	12	25Jo01	EJ	IT=100;β^+ ?	*
^{114}Xe	−67086	11				10.0 s 0.4	0^+	12			β^+=100	
^{114}Cs	−54690	90				570 ms 20	(1^+)	12	80Ro04	D	β^+=?;α=0.018 6;β^+p=8.7 13; $\beta^+\alpha$=0.19 3	*
^{114}Ba	−45791	28				460 ms 125	0^+	12	16Ca33	T	β^+=?;α=0.9 3;β^+p=20 10; 12C<0.0034	*
*^{114}Tc	T : average 15Lo04=120(10) 11Ro01=110(20) 99Wa09=150(30) other: 06Mo07=91(+62-35) probably mixture of gs and isomer											**
*^{114}Tc	D : %β^-n from 99Wa09, value is a mixture of gs and isomer											**
*^{114}Tc^m	D : %β^-n from 99Wa09, value is a mixture of gs and isomer											**
*^{114}Ru	T : average 06Mo07=510(+69-65) 92Jo05=530(60) 91Le09=570(50)											**
*^{114}Rh	T : average 70WiZN=1.68(0.07) 88Ay02=1.82(0.02) [332.6γ,2$^+$ to 0$^+$] 03Lh01=1.83(0.04) [362.0γ,2$^+$ to 2$^+$],1.67(0.17) [694.7γ,2$^+$ to 0$^+$]											**
*^{114}Rh	J : strong (∼80%) population in fission in 25St02 and the proposed π7/2[413]⊗ν5/2[402],$K^\pi=6^+$ configuration in 88Ay02											**
*^{114}Rh^m	J : weak (∼5%) population in fission in 25St02 and the proposed π7/2[413]⊗ν7/2[523],$K^\pi=0^-$ configuration in 25Li19											**
*^{114}Rh^n	T : average (for levels with I>4) 03Lh01=1.93(0.11),1.87(0.13),2.29(0.40), 2.08(0.26),1.88(0.16),2.17(0.51),1.75(0.09) 88Ay02=1.85(0.05)											**
*^{114}Rh^n	J : intermediate (∼14%) population in fission in 25St02 and the proposed π7/2[413]⊗ν1/2[411],$K^\pi=3^+$ configuration in 88Ay02											**
*^{114}Ag^m	E : 34.5(0.5), 43.9(0.5), 47.4(0.5), 73.1(0.5) γ rays in a cascade to gs in 90Pe10											**
*^{114}Cd	T : for 2ν-$\beta\beta$; others: 95Ge14>92 Py 03Da24>600 Py. 0ν-$\beta\beta$ 16Eb03>1.6 Zy											**
*^{114}In^m	J : 57Go23=5											**
*^{114}I	T : average 20Ay05=1.89(0.23) 77Ki11=2.1(0.2)											**
*^{114}I	D : %α based on Qα systematics in 20Ay05											**
*^{114}I^m	T : 95ZiZZ=6.2(0.5)											**
*^{114}Cs	D : %α from 80Ro04; %β^+p from 96He25; %$\beta^+\alpha$ from β^+p/$\beta^+\alpha$=45.5(1.2) in 85Ti02											**
*^{114}Ba	T : average 16Ca33=380(+190-110) 97Ja12=430(+300-150)											**
*^{114}Ba	D : %β^+p is from 97Ja12; %α from 02Ma19, other: 97Ja12<0.37%											**
^{115}Nb	−30720#	500#				23 ms 8	$3/2^-$#	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	
^{115}Mo	−44360#	400#				45.5 ms 2.0	$7/2^-$#	15	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	*
^{115}Mo^m	−44160#	400#	198.6	0.3		44.8 μs 2.0	$3/2^+$#		23Br09	ETJ	IT=100	*
^{115}Tc	−55800#	200#				78 ms 2	$5/2^+$#	15	21Ha19	TD	β^-=100;β^-n=19 5	*
^{115}Ru	−66054.7	2.9				318 ms 19	$(1/2^+)$	12			β^-=100;β^-n ?	
^{115}Ru^m	−65926	6	129	5	MD	76 ms 6	$(7/2^-)$	12	10Ku25	ETJ	IT= ?;β^-= ?	*
^{115}Rh	−74219	5				1.03 s 0.03	$(7/2^+)$	12	92PeZX	T	β^-=100;β^-n ?	*
^{115}Pd	−80421.4	1.4				25 s 2	$(1/2)^+$	12			β^-=100	
^{115}Pd^m	−80332.2	1.4	89.20	0.16	IT	50 s 3	$(7/2^-)$	12			β^-=92.0 20;IT=8.0 20	
^{115}Ag	−84949.3	2.5				20.0 m 0.5	$1/2^-$*	12	24De01	J	β^-=100	
^{115}Ag^m	−84908.3	2.5	41.04	0.12	IT	18.0 s 0.7	$7/2^+$*	12	25Ur02	E	β^-=79.0 3;IT=21.0 3	*
^{115}Cd	−88084.91	0.30				53.46 h 0.05	$1/2^+$*	12			β^-=100	*
^{115}Cd^m	−87903.9	0.6	181.0	0.5		44.56 d 0.24	$11/2^-$*	12			β^-≈100;IT ?	*
^{115}In	−89536.358	0.012				523 Ty 5	$9/2^+$*	12	24Pa29	T	IS=95.719 52;β^-=100	*
^{115}In^m	−89200.114	0.021	336.244	0.017		4.486 h 0.004	$1/2^-$*	12			IT=95.0 7;β^-=5.0 7	*
^{115}Sn	−90033.848	0.015				STABLE	$1/2^+$*	12			IS=0.34 1	*
^{115}Sn^m	−89421.04	0.04	612.81	0.04		3.26 μs 0.08	$7/2^+$	12			IT=100	
^{115}Sn^n	−89320.21	0.12	713.64	0.12		159 μs 1	$11/2^-$	12			IT=100	
^{115}Sb	−87003	16				32.04 m 0.13	$5/2^+$*	12	26Ef01	T	β^+=100	*
^{115}Sb^m	−84207	16	2796.26	0.09		159 ns 3	$(19/2)^-$	12			IT=100	
^{115}Te	−82063	28			*	5.8 m 0.2	$7/2^+$	12			β^+=100	
^{115}Te^m	−82053	30	10	6	*	6.7 m 0.4	$(1/2^+)$	12	74Ch51	E	β^+≈100;IT ?	*
^{115}Te^n	−81783	28	280.05	0.20		7.5 μs 0.2	$11/2^-$	12			IT=100	
^{115}I	−76338	29				1.3 m 0.2	$5/2^+$#	12			β^+=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{115}Xe	−68657	12				18 s 3	$(5/2^+)$	12			β^+=100;β^+p=0.34 6	*
^{115}Cs	−59700#	100#				1.4 s 0.8	$9/2^+$#	12	23Da19	JD	β^+=100;β^+p≈0.2 1;$\beta^+\alpha$=0.010 5	
^{115}Ba	−49160#	200#				450 ms 50	$5/2^+$#	12	97Ja12	D	β^+=100;β^+p>15	
*^{115}Mo	T : other: 11Ni01=51(+79-19)											**
*^{115}Mo	J : from 23Br09											**
*^{115}Mo^m	T : average 23Br09=43.7(2.8) [from τ=63(4)] 22Wu18=46(3)											**
*^{115}Tc	T : from 15Lo04=78(2); others: 21Ha19=70(9) 11Ni01=83(+20-13) 06Mo07=73(+32-22)											**
*^{115}Ru^m	E : other: 20 keV above the 61.7-keV level in 10Ku25											**
*^{115}Ru^m	J : other: 23Hu25=$(9/2^-)$											**
*^{115}Rh	T : average 92PeZX=1.04(0.03) 88Ay01=0.99(0.05)											**
*^{115}Ag^m	E : average 90Fo07=41.1(0.2) 25Ur02=41.00(0.16); other (mass measurements): 24De01=36.6(1.4)											**
*^{115}Ag^m	J : 24De01=7/2											**
*^{115}Cd	J : 13Yo02,64Mc06=1/2											**
*^{115}Cd^m	J : 13Yo02,69La06=11/2											**
*^{115}In	T : average 24Pa29=526(6) 22Le14=518(6,stat)(+5-15,syst); others: 78Pf01,79Pf01=441(25) 62Wa15=510(40) 61Be15=690(150) 50Ma76=600(200)											**
*^{115}In	T : 51Co19∼100											**
*^{115}In	J : 24Ka49,22Ve05,42Ha07,39Ha12,38Mi05,34Pa01,33Ja03=9/2											**
*^{115}In^m	J : 24Ka49,22Ve05,61Ki02=1/2											**
*^{115}Sn	J : 25Gu23,20Yo07,49Gu02,50Pr51=1/2, but in conflict with 68Ja05=5/2											**
*^{115}Sb	J : 23Le15,68Ja05=5/2											**
*^{115}Sb	T : average 26Ef01=31.3(0.7) 76Wi10=32.1(0.3) 68Ra27=31.8(0.2) 67Ha27=32.3(0.2)											**
*^{115}Te^m	E : from 74Ch51<20 keV											**
*^{115}Xe	T : average 71Ho07=18(4) 69Ha03=19(5)											**
^{116}Nb	−25230#	500#				12# ms >550ns	1^-#	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{116}Mo	−41210#	500#				32 ms 4	0^+	15			β^-=100;β^-n ?;β^-2n ?	
^{116}Tc	−51210#	300#				57 ms 3	2^+#	15	21Ha19	TD	β^-=100;β^-n=17 7;β^-2n ?	*
^{116}Ru	−64069	4				203 ms 5	0^+	15	21Ha19	TD	β^-=100;β^-n=0.40 23	*
^{116}Rh	−70730.1	1.8				685 ms 39	1^+#	09	06Mo07	TD	β^-=100;β^-n=1.1 6	*
^{116}Rh^m	−70609.8	2.3	120.4	1.8	MD	0.9 s 0.4	7^-#	09	88Ay01	T	β^-=100;β^-n=1.1 6	*
^{116}Pd	−79833.03	0.18				11.8 s 0.4	0^+	09			β^-=100	
^{116}Ag	−82543.6	2.2				3.83 m 0.08	1^-*	09	09Ba52	T	β^-=100	*
^{116}Ag^m	−82495.7	2.2	47.90	0.10	IT	20 s 1	4^+*	09	05Ba94	TD	β^-=93 4;IT=7 4	*
^{116}Ag^n	−82413.8	2.2	129.80	0.22	IT	9.3 s 0.3	7^-*	09	05Ba94	TD	Eβ^-=92 4;IT=8 4	*
^{116}Cd	−88712.48	0.16				27.38 Ey 1.20	0^+	09	25Pr02	T	IS=7.512 54;2β^-=100	*
^{116}In	−88249.76	0.22				14.10 s 0.03	1^+	09	13Wr01	D	β^-=99.9763 43;ε=0.0237 43	*
^{116}In^m	−88122.49	0.22	127.267	0.006		54.29 m 0.17	5^+*	09			β^-=100	*
^{116}In^n	−87960.10	0.22	289.660	0.006		2.18 s 0.04	8^-	09			IT=100[gs=0,m=100]	*
^{116}Sn	−91525.97	0.09				STABLE	0^+	09			IS=14.54 9	
^{116}Sn^m	−89160.00	0.09	2365.975	0.021		348 ns 19	5^-	09			IT=100	
^{116}Sn^n	−87978.81	0.19	3547.16	0.17		833 ns 30	10^+	09			IT=100	
^{116}Sb	−86822	5				15.4 m 0.4	3^+*	09	26Tw01	T	β^+=100	*
^{116}Sb^m	−86728	5	93.99	0.05		194 ns 4	1^+	09			IT=100	
^{116}Sb^n	−86440	40	390	40	BD	60.3 m 0.6	8^-*	09	23Le15	J	β^+=100	*
^{116}Te	−85264	24				2.49 h 0.04	0^+	09			β^+=100	
^{116}I	−77420	80				2.91 s 0.15	1^+	09			β^+=100	
^{116}I^m	−76990	80	430.4	0.5		3.19 μs 0.13	(7^-)	09	22Zh.A	T	IT=100	*
^{116}Xe	−73047	13				59 s 2	0^+	09			β^+=100	
^{116}Cs	−62040#	100#			*	700 ms 40	$(0^+,1^+)$#	09	77Bo28	D	β^+=100;β^+p=0.28 7;$\beta^+\alpha$=0.049 25	*
^{116}Cs^m	−61940#	120#	100#	60#	*	3.85 s 0.13	6^+#	09			β^+=100;β^+p=0.44 7; $\beta^+\alpha$=0.0034 23	*
^{116}Ba	−54640#	200#				1.3 s 0.2	0^+	09			β^+=100;β^+p=3 1	
^{116}La	−41150#	200#				50 ms 22	0^-#	22	22Zh76	TD	p=?;β^+ ?;β^+p ?	
^{116}La^m	−40970#	200#	182	1		3.3 μs 1.9	2^+#		22Zh76	TD	EIT=100	*
*^{116}Tc	T : from 15Lo04=57(3); others: 21Ha19=64(16) 11Ni01=56(+15-10)											**
*^{116}Ru	T : average 21Ha19=200(11) 15Lo04=204(6); other: 06Mo07=204(+32-29)											**
*^{116}Ru	D : %β^-n from 21Ha19<0.8											**
*^{116}Rh	T : average 06Mo07=688(+52-50) 88Ay02,88Ay01=680(60) 01Wa04=570(50) [328.4γ,2$^+$ to 0$^+$]											**
*^{116}Rh	D : %β^-n from 06Mo07<2.1, a mixture of gs+m											**
*^{116}Rh^m	D : %β^-n from 06Mo07<2.1, a mixture of gs+m											**
*^{116}Ag	T : from 09Ba52=230(5) s											**
*^{116}Ag	J : from 25Va02=1; other: 05Ba94=(0^-)											**
*^{116}Ag^m	J : from 25Va02=4 and E3 γ to gs (J$^\pi$=1$^-$)											**
*^{116}Ag^n	J : from 25Va02=7 and E3 γ to ^{116}Ag^m (J$^\pi$=4$^+$)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{116}$Cd	T : 2ν-$\beta\beta$: from 25Pr02 (evaluation); 0ν-$\beta\beta$: 16Eb03>1.1 Ey											**
$*^{116}$In	D : %ε average 13Wr01=0.0246(0.0044,stat)(0.0039,syst) 98Bh04=0.0227(0.0063)											**
$*^{116}$In	T : also 13Wr01=14.9(0.8)											**
$*^{116}$In^m	J : 57Go23,56Nu12=5											**
$*^{116}$In^n	J : 79Fo10=8											**
$*^{116}$Sb	J : 74Ek01,68Ga08=3											**
$*^{116}$Sb	T : average 26Tw01=15.30(0.43) 67Ha27=16.2(1.2) 53St42=15.5(1.0)											**
$*^{116}$Sb^n	J : 23Le15,74Ek01=8											**
$*^{116}$I^m	T : average 22Zh.A=3.02(0.24) 90Wu01=3.27(0.16)											**
$*^{116}$Cs	D : %β^+p from 77Bo28; ENSDF2010=2.8(0.7)% in error											**
$*^{116}$Cs^m	D : %β^+p average 77Bo28=0.66(0.13) 78Da07=0.36(0.08), Birge ratio=1.97; %$\beta^+\alpha$ average 78Da07=0.008(0.002)% and 0.0022(0.0010), from											**
$*^{116}$Cs^m	D : %β^+p=0.44(0.07) and β^+p/$\beta^+\alpha$=200(80) in 85Ti02; Birge ratio=2.6											**
$*^{116}$La^m	T : symmetrized from 2.0(+2.8-0.8)											**
$*^{116}$La^m	EJ : from 182 keV M2 γ in 22Zh76											**
^{117}Nb	−21040#	300#				10# ms	>400ns	$3/2^-$#	21	21Su01	I	β^- ?;β^-n ?;β^-2n ?	
^{117}Mo	−35690#	500#				22 ms	5	$3/2^+$#	15			β^-=100;β^-n ?;β^-2n ?	
^{117}Tc	−48140#	400#				44.5 ms	3.0	$5/2^+$#	15			β^-=100;β^-n ?;β^-2n ?	
^{117}Ru	−59530	60				152 ms	3	$3/2^+$#	15	21Ha19	TD	β^-=100;β^-n=2.4 10	*
^{117}Ru^m	−59350	60	184.1	0.2		2.40 μs	0.04	$7/2^-$#	15	23Br09	TE	IT=100	*
^{117}Rh	−68897	9				421 ms	30	$7/2^+$#	09	06Mo07	TD	β^-=100;β^-n=3.8 22	*
^{117}Rh^m	−68516	9	381.4	0.7		177 ns	8	$1/2^-$#		26Zh11	ETJ	IT=100	*
^{117}Pd	−76423	7				4.3 s	0.3	$(1/2^+)$	09	18Ku13	J	β^-=100	
^{117}Pd^m	−76220	7	203.3	0.3		19.1 ms	0.7	$(7/2^-)$	09	18Ku13	J	IT=100	
^{117}Ag	−82187.5	2.1				72.8 s	0.2	$1/2^-*$	09	24De01	J	β^-=100	*
^{117}Ag^m	−82158.6	2.1	28.95	0.14		5.34 s	0.04	$7/2^+*$	09	24De01	JE	β^-=94.0 15;IT=6.0 15	*
^{117}Cd	−86418.4	1.0				2.503 h	0.005	$1/2^+*$	09	19Gi09	T	β^-=100	*
^{117}Cd^m	−86282.0	1.0	136.4	0.2		3.441 h	0.009	$11/2^-*$	09	19Gi09	T	β^-=100	*
^{117}In	−88944.2	2.2				43.2 m	0.3	$9/2^+*$	09			β^-=100	*
^{117}In^m	−88628.9	2.2	315.303	0.011		116.2 m	0.3	$1/2^-*$	09			β^-=52.9 15;IT=47.1 15	*
^{117}Sn	−90397.46	0.14				STABLE		$1/2^+*$	09			IS=7.68 7	*
^{117}Sn^m	−90082.88	0.14	314.58	0.04		13.933 d	0.013	$11/2^-*$	09	20Yo07	J	IT=100	*
^{117}Sn^n	−87991.1	0.4	2406.4	0.4		1.75 μs	0.07	$(19/2^+)$	09			IT=100	
^{117}Sb	−88640	8				2.84 h	0.05	$5/2^+*$	09	26Ef01	T	β^+=100	*
^{117}Sb^m	−85509	8	3130.76	0.19		355 μs	17	$(25/2)^+$	09			IT=100	
^{117}Sb^n	−85409	8	3230.7	0.2		290 ns	5	$(23/2^-)$	09			IT=100	
^{117}Te	−85095	13				63.9 m	1.0	$1/2^+*$	09	26Ef01	T	β^+=100	*
^{117}Te^m	−84799	13	296.1	0.5		103 ms	3	$(11/2^-)$	09	99Mo30	J	IT=100	
^{117}I	−80439	26				2.22 m	0.04	$(5/2)^+$	09	85Le10	T	β^+=100	
^{117}Xe	−74185	10				61 s	2	$5/2^+*$	09	90NeZY	J	β^+=100;β^+p=0.0029 6	*
^{117}Cs	−66470	40			*	8.4 s	0.6	$9/2^+$#	09			β^+=100	
^{117}Cs^m	−66370#	60#	100#	50#	*	6.5 s	0.4	$3/2^+$#	09			β^+=100	
^{117}Cs^x	−66420	70	50	50		R=?		*spmix*					
^{117}Ba	−57460	250				1.75 s	0.07	$(3/2^+)$	09	97Ja12	D	β^+=100;β^+p=13 3;$\beta^+\alpha$=0.024 8	*
^{117}La	−46530#	200#				21.7 ms	1.6	$(3/2^+)$	09	11Li28	TJ	p≈100;β^+ ?;β^+p ?	*
^{117}La^m	−46340#	200#	192	1		3.1 μs	1.0	$(7/2^-)$		22Zh76	ETD	IT=100	*
$*^{117}$Ru	T : average 21Ha19=162(9) 15Lo04=151(3); other: 06Mo07=142(+18-17)											**
$*^{117}$Ru^m	T : average 23Br09=2.27(0.07) 12Ka36=2.487(+0.058-0.055); other: 12LaZT=2.0(0.3)											**
$*^{117}$Rh	T : average 06Mo07=394(+47-43) 91Pe10=440(40)											**
$*^{117}$Rh	D : %β^-n from 06Mo07<7.6											**
$*^{117}$Rh^m	T : average 26Zh11=184(12),172(10); other 13La25=138(17)											**
$*^{117}$Rh^m	E : 26Zh11=321.8(0.5) keV + 59.6(0.5) keV γs in a cascade											**
$*^{117}$Ag	T : average 74Gr29=73.0(0.2),71.5(0.5) 76Fo10=73(6) 58Al90=66(6)											**
$*^{117}$Ag^m	E : average 90Fo07=28.6(0.2) 25Ur02=29.3(0.2),supersedes 25Ab11=29.6(0.3); other (mass measurement): 24De01=29.8(3.1)											**
$*^{117}$Ag^m	T : average 74Gr29=5.34(0.06),5.33(0.08),5.35(0.05) 76Fo10=5.3(0.6)											**
$*^{117}$Cd	J : 13Yo02=1/2											**
$*^{117}$Cd^m	J : 13Yo02=11/2											**
$*^{117}$In	J : 24Ka49,22Ve05,87Eb02,63Ca05=9/2											**
$*^{117}$In^m	J : 22Ve05,68Mu04=1/2											**
$*^{117}$Sn	J : 25Gu23,20Yo07,50Pr51,34To01,33Sc03=1/2											**
$*^{117}$Sn^m	T : average 24Su18=13.930(0.015) 16Do10=13.91(0.03) 03Po21=13.98(0.07) 02Un02=14.00(0.05); others: 77Ka16=13.60(0.04) 51Co34=14.0(0.5)											**
$*^{117}$Sn^m	T : 50Mi52=14.00(0.25)											**
$*^{117}$Sb	T : unweighted average 26Ef01=2.84(0.04) 21Da02=2.97(0.02) 67Ha27=2.80(0.01) 61Fi05=2.76(0.06), Birge ratio=4.45; other: 72Pa13=3.19(0.04)											**
$*^{117}$Sb	J : 23Le15,68Ja05=5/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{117}$Te	T : average 26Ef01=65.5(1.3) 73Ka45=60(6) 67Be46=62(3) 62Kh05,61Va30=66(6) 61Fi05=61(2)											**
$*^{117}$Te	J : 61Ax04=1/2											**
$*^{117}$Xe	J : 90NeZY=5/2											**
$*^{117}$Ba	D : %β^+p from 97Ja12. %$\beta^+\alpha$=0.011%-0.037% from β^+p/$\beta^+\alpha$=350-1200 in 85Ti02											**
$*^{117}$La	T : average 22Zh76=21.6(3.1) 11Li28=20.1(2.5) 01Ma69=24(3) 01So02=22(5)											**
$*^{117}$La^m	T : symetized from 22Zh76=2.7(+1.3-0.7)											**
$*^{117}$La^m	EJ : from 192 keV M2 γ ray to g.s in 22Zh76											**
^{118}Mo	−32270#	500#				21 ms 6	0^+	22	15Lo04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{118}Tc	−43290#	400#				30 ms 4	2^+#	22	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	
^{118}Ru	−57180#	200#				99 ms 3	0^+	22	21Ha19	TD	β^-=100;β^-n=2.3 13	*
^{118}Rh	−64994	5			*	285 ms 8	1^+#	22	21Ha19	TD	β^-=100;β^-n=2.4 8	*
^{118}Rh^m	−64805	8	189	6	MD*	310 ms 30	6^-#		00Jo18	T	$\beta^-\approx$100;IT ?;β^-n ?	*
^{118}Pd	−75388.4	2.5				1.9 s 0.1	0^+	22	89Ko22	T	β^-=100	
^{118}Ag	−79541.9	3.0				3.76 s 0.15	4^+*	93	25Va02	J	β^-=100	*
^{118}Ag^m	−79496	3	45.79	0.09		$\sim$0.1 μs	$(1,2)^-$	93	93Ja03	TJ	IT=100	
^{118}Ag^n	−79429	7	113	6		5.6 s 0.2	0^-*	93	25Va02	EJ	β^-=?;IT ?	*
^{118}Ag^p	−79414.2	3.0	127.63	0.10		1.92 s 0.09	7^-*	93	25Va02	J	β^-=59 3;IT=41 3	*
^{118}Ag^q	−79263	3	279.37	0.20		$\sim$0.1 μs	(3^+)	93	93Ja03	TJ	IT=100	
^{118}Cd	−86690.4	2.0				50.3 m 0.2	0^+	93			β^-=100	
^{118}In	−87276.8	1.9				5.35 s 0.21	1^+	93			β^-=100	*
^{118}In^m	−87236.4	1.0	40.4	2.1	MD	4.368 m 0.017	5^+*	93			β^-=100	*
^{118}In^n	−87098.2	1.0	178.7	2.1	MD	8.5 s 0.3	8^-*	93	69Ha08	TD	IT=98.6 3[gs=0,m=98.6];β^-=1.4 3	*
^{118}Sn	−91652.53	0.06				STABLE	0^+	93			IS=24.22 9	
^{118}Sn^m	−89077.62	0.07	2574.91	0.04		230 ns 9	7^-	93	21Da02	T	IT=100	*
^{118}Sn^n	−88544.47	0.23	3108.06	0.22		2.52 μs 0.06	10^+	93			IT=100	*
^{118}Sb	−87995.9	3.0				3.6 m 0.1	1^+*	93			β^+=100	*
^{118}Sb^m	−87945	3	50.814	0.021		20.6 μs 0.6	3^+	93			IT=100	*
^{118}Sb^n	−87746	5	250	6	BD	5.01 h 0.03	8^-*	93	21Da02	T	β^+=100	*
^{118}Te	−87691	18				6.00 d 0.02	0^+	93			ε=100	
^{118}I	−80971	20				14.16 m 0.27	(2^-)	93	65An05	DT	β^+=100;e$^+$=54 7;ε=46 7	*
^{118}I^m	−80782	20	188.8	0.7		8.5 m 0.5	(7^-)	93	03Mo36	E	$\beta^+\approx$100;IT ?	*
^{118}Xe	−78079	10				3.8 m 0.9	0^+	93			β^+=100	
^{118}Cs	−68409	13			*	14 s 2	2^+*	22	77Ge03	T	β^+=100;β^+p=0.021 14;$\beta^+\alpha$=0.0012 5	*
^{118}Cs^m	−68330#	40#	80#	40#	*	17 s 3	7^+#	22	77Ge03	T	β^+=100;β^+p=0.021 14;$\beta^+\alpha$=0.0012 5	*
^{118}Cs^n	−68200#	40#	206#	40#		0.55 μs 0.06	7^-#	22	21Zh57	ET	IT=100	*
^{118}Cs^x	−68404	12	5	4		$R<0.1$	*spmix*					
^{118}Ba	−62260#	200#				5.35 s 0.14	0^+	22	95Gu01	T	β^+=100	*
^{118}La	−49980#	300#				200# ms >310ns	1^-#		25Su21	I	β^+ ?;β^+p ?	
$*^{118}$Mo	T : symmetrized from 15Lo04=19(+7-4)											**
$*^{118}$Ru	T : from 15Lo04=99(3); others: 21Ha19=98(10) 06Mo07=123(+48-35)											**
$*^{118}$Ru	D : %β^-n from 21Ha19<4.6											**
$*^{118}$Rh	T : average 21Ha19=294(17) [from n(t)] 15Lo04=285(10) 06Mo07=266(+22-21) [from β(t)]											**
$*^{118}$Rh	J : direct β^- feeding to 0^+ state in ^{118}Pd in 06Wa10											**
$*^{118}$Rh	D : %β^-n average 21Ha19=2.1(0.9) 06Mo07=3.1(1.4)											**
$*^{118}$Rh^m	T : from $\beta\gamma$(t) using 575-keV γ ray, depopulating the 4^+ level in ^{118}Pd; dominated by the high-spin β^- decaying state											**
$*^{118}$Rh^m	J : direct β^- feeding to 6^- level in ^{118}Pd in 06Wa10											**
$*^{118}$Ag	T : from 79HiZR; others: 71Fo22=3.7(0.2) 74Gr29=4.00(0.04)											**
$*^{118}$Ag^n	T : from 69We11=5.6(0.2), supersedes 68We10=5.3(0.9), 67Fr16$\sim$5											**
$*^{118}$Ag^n	E : from 25Va02=103-123 keV											**
$*^{118}$Ag^p	D : from 73FoZF=%I_γ(127 keV,^{118}Ag)/%I_γ(48 keV,^{118}Cd)=0.124(0.015)											**
$*^{118}$Ag^p	T : average 89Ko22=1.9(0.1) 79HiZR=2.0(0.2); other: 71Fo22=2.8(0.2)											**
$*^{118}$Ag^p	J : also E_γ=127.6 keV E3 to ^{118}Ag (J^π=4^+)											**
$*^{118}$In	T : average 68Sc24=5.0(0.5) 65Br34=5.7(0.3) 64Ka10=5.0(0.5) 61Gl02=5.1(0.5)											**
$*^{118}$In^m	T : average 94It.A=4.364(0.007) 69Do11=4.45(0.05) 68Sc24=4.4(0.1) 65Br34=4.9(0.1) 65Me11=4.7(0.3) 64Ka10=4.35(0.05); Birge=2.6											**
$*^{118}$In^m	J : 84Be40=5											**
$*^{118}$In^n	J : 84Be40=8											**
$*^{118}$Sn^m	T : average 21Da02=218(36) 80Va13=245(40) 61Bo13=230(10)											**
$*^{118}$Sn^n	J : E2 γ to J^π=8^+ level											**
$*^{118}$Sb	J : 68Ja05=1											**
$*^{118}$Sb^m	J : E2 γ to gs (J^π=1^+)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{118}$Sb^n	T : average 21Da02=5.18(0.05) 74Ca06=5.00(0.02) 72Pa13=5.11(0.06) 68Ki06=5.15(0.05) 67Ha27=4.96(0.02); Birge ratio=2.68											**
$*^{118}$Sb^n	J : 23Le15,74Ek01,74Ca06=8											**
$*^{118}$I	D : %e$^+$,%ε from 65An05											**
$*^{118}$I	T : average 69Ha03=14.3(0.1) 68La18=13.0(0.3) 65An05=13.9(0.5); others: 65Bu08=17.2(0.7) 60Za07=17(2) 57Aa04≈10											**
$*^{118}$I^m	E : from a least-squares fit to the level scheme of 03Mo36											**
$*^{118}$I^m	T : from 68La18=8.5(0.5)											**
$*^{118}$Cs	D : %β^+p from 73JoZL=0.042(0.006) %$\beta^+\alpha$ from 75Ho09=0.0024(0.0004), values for mixture of gs and isomer											**
$*^{118}$Cs	J : 87Co19,81Th06=2											**
$*^{118}$Cs^m	T : from 77Ge03=17(3)											**
$*^{118}$Cs^m	D : %β^+p from 73JoZL=0.042(0.006) %$\beta^+\alpha$ from 75Ho09=0.0024(0.0004), values for mixture of gs and isomer											**
$*^{118}$Cs^n	E : 126 keV above ^{118}Cs^m in 21Zh57											**
$*^{118}$Ba	T : average 95Gu01=5.5(0.2) 97Ja12=5.2(0.2)											**
^{119}Mo	−26440#	300#				12# ms	>550ns	$3/2^+$#	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{119}Tc	−40030#	500#				22 ms	3	$5/2^+$#	15			β^-=100;β^-n ?;β^-2n ?	
^{119}Ru	−52270#	300#				69.5 ms	2.0	$3/2^+$#	15	21Ha19	TD	β^-=100;β^-n=6 5;β^-2n ?	*
^{119}Ru^m	−52040#	300#	226.0	0.3		377 ns	7	$7/2^-$#	15	23Br09	TE	IT=100	*
^{119}Rh	−62823	9				187 ms	4	$7/2^+$#	08	26Zh11	T	β^-=100;β^-n=4.1 8	*
^{119}Rh^m	−62562	9	260.7	0.9		107 ms	10	$1/2^-$#		26Zh11	TJE	β^-≈100;IT ?;β^-n ?	*
^{119}Pd	−71609	4				875 ms	15	$(3/2^+)$	08	22Ku09	TJD	β^-=100;β^-n ?	*
^{119}Pd^m	−71410.3	2.7	199.1	3.0	MD	849 ms	14	$(11/2^-)$		22Ku09	TJD	β^-≈100;IT ?	*
^{119}Ag	−78650.9	2.1			&	6.0 s	0.5	$1/2^-$*	08	24De01	J	β^-=100	
^{119}Ag^m	−78617.5	2.1	33.40	0.10	&	2.1 s	0.1	$7/2^+$*	08	24De01	EJ	β^-=100	*
^{119}Cd	−84063.8	1.9				2.69 m	0.02	$1/2^+$*	08			β^-=100	*
^{119}Cd^m	−83917.2	1.9	146.54	0.11		2.20 m	0.02	$11/2^-$*	08			β^-=100	*
^{119}In	−87710.6	2.0				2.4 m	0.1	$9/2^+$*	08			β^-=100	*
^{119}In^m	−87399.2	2.0	311.37	0.03		18.0 m	0.3	$1/2^-$*	08	76Sc30	D	β^-=97.4 4;IT=2.6 4	*
^{119}In^n	−87056.3	2.0	654.27	0.07		130 ns	15	$(3/2)^+$	08			IT=100	
^{119}In^p	−85053.7	2.7	2656.9	1.8		265 ns	10	$(25/2^+)$	08	20Bi06	T	IT=100	*
^{119}Sn	−90064.7	0.5				STABLE		$1/2^+$*	08			IS=8.59 4	*
^{119}Sn^m	−89975.2	0.5	89.531	0.013		293.1 d	0.7	$11/2^-$*	08	20Yo07	J	IT=100	
^{119}Sn^n	−87937.7	1.1	2127.0	1.0		9.6 μs	1.2	$(19/2^+)$	08			IT=100	
^{119}Sn^p	−87695.7	0.6	2369.0	0.3		96 ns	9	$23/2^+$		16Is03	ETJ	IT=100	
^{119}Sb	−89475	7				38.19 h	0.22	$5/2^+$*	08	23Le15	J	ε=100	*
^{119}Sb^m	−86921	7	2553.6	0.3		130 ns	3	$19/2^-$	08	91Io02	J	IT=100	
^{119}Sb^n	−86633	7	2841.7	0.4		835 ms	81	$25/2^+$	08	19Mi18	ET	IT=100	*
^{119}Te	−87182	7				16.05 h	0.05	$1/2^+$*	08	73Ka45	T	β^+=100	*
^{119}Te^m	−86921	7	260.96	0.05		4.68 d	0.04	$11/2^-$*	08	24Mu01	T	β^+=100	*
^{119}I	−83778	22				19.02 m	0.16	$5/2^+$	08	65An05	DT	β^+=100;e$^+$=51 4;ε=49 4	*
^{119}Xe	−78794	10				5.8 m	0.3	$5/2^+$*	08	90NeZY	J	β^+=100	*
^{119}Cs	−72305	14				30.4 s	0.1	$3/2^+$*	08	84IcZY	T	β^+=100	*
^{119}Cs^m	−72219	14	86.3	0.7		43.0 s	0.2	$9/2^+$*	08	84IcZY	T	β^+=100;$\beta^+\alpha$<2e-6	*
^{119}Cs^n	−72195	14	110.0	0.7		55 μs	5	$(11/2^-)$		21Zh54	EDT	IT=100	
^{119}Cs^x	−72289	9	16	11		$R = .5 \sim\sim .25$		*spmix*					
^{119}Ba	−64590	200				5.4 s	0.3	$(5/2^+)$	08			β^+=100;β^+p=25 2	
^{119}Ba^m	−64520	200	66.0	0.5		0.36 μs	0.02	$(5/2^-)$		21Zh38	ET	IT=100	
^{119}La	−55020#	300#				1# s	>310ns	$11/2^-$#		25Su21	I	β^+ ?	
^{119}Ce	−44050#	500#				200# ms	>310ns	$5/2^+$#		25Su21	I	β^+ ?;β^+p ?	
$*^{119}$Ru	T : from 15Lo04=69.5(2.0); other: 21Ha19=57(13)											**
$*^{119}$Ru^m	T : average 23Br09=376(7) 12Ka36=383(+22-21)											**
$*^{119}$Ru^m	E : from 23Br09 using 90.3(0.2) and 135.7(0.2) γs in a cascade to gs; other: 12Ka3=227.1(0.7) from 90.8(0.5) and 136.3(0.5) γs											**
$*^{119}$Rh	T : average 26Zh11=180(9) 21Ha19=192(12) 15Lo04=190(6) 06Mo07=171(18) 06ToZW=190(10)											**
$*^{119}$Rh	D : average 21Ha19=3.4(0.9) 06Mo07=6.4(1.6)											**
$*^{119}$Pd	T : average of 7γs in 22Ku09; others: 06Mo07=918(111) 91Pe04=920(130)											**
$*^{119}$Pd	J : 22Ku09=(1/2$^+$,3/2$^+$), but strong β feeding to the (5/2$^-$) level at 526.5-keV would support 3/2$^+$											**
$*^{119}$Pd^m	E : other: 22Ku09 suggests 350 keV above the gs.											**
$*^{119}$Pd^m	T : average 22Ku09=849(14) [129.8γ(t)] 860(90) [507.4γ(t)] 840 (110) [680.5γ(t)]											**
$*^{119}$Ag^m	E : from 22Ku09=33.4(0.1) keV; others: 25Ur02=33.5(0.3) 24De01=32.6(7.6),											**
$*^{119}$Cd	J : 13Yo02=1/2											**
$*^{119}$Cd^m	J : 13Yo02=11/2											**
$*^{119}$In	J : 24Ka49,22Ve05,84Be40=9/2											**
$*^{119}$In^m	D : %IT symmetrized from 76Sc30=2.5(+0.5-0.3); other: 61Gl06∼5											**
$*^{119}$In^m	J : 22Ve05,84Be40=1/2											**
$*^{119}$In^p	T : average 20Bi06=270(11) 02Lu15=240(25)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{119}$Sn	J : 25Gu23,20Yo07,50Pr51,34To01,33Sc03=1/2											**
$*^{119}$Sb	J : 23Le15,68Ja05=5/2											**
$*^{119}$Sb^n	T : average 19Mi18=776(181) 79Sh03=850(90)											**
$*^{119}$Sb^n	E : based on 19Mi18=2799(30) keV and known states in ^{119}Sn see 87Lu06; other: ENSDF2009=x keV above 2841.7(0.4)-keV level, conflicting											**
$*^{119}$Sb^n	J : from 87Lu06											**
$*^{119}$Te	T : other: 61Fi05=15.9(0.3)											**
$*^{119}$Te	J : 61Ax04=1/2											**
$*^{119}$Te^m	T : average 24Mu01=4.6(0.1) 73Ka45=4.79(0.12) 63Ka04=4.68(0.05) 61Fi05=4.5(0.3) 60Ko12=4.7(0.3) 60So02=4.75(0.20)											**
$*^{119}$Te^m	J : 61Ax04=11/2											**
$*^{119}$I	D : %e$^+$,%ε from 65An05											**
$*^{119}$I	T : average 69La33=18.2(0.3) 68Se05=19.3(0.2) 65An05=19.5(0.5); others: 65Bu08=25.8(1.9) 60Za07=21(1) 54Ro03=18(1)											**
$*^{119}$Xe	J : 90NeZY=5/2											**
$*^{119}$Cs	T : others: 01Ge01=29(1) 89Ge.A=29(2)											**
$*^{119}$Cs	J : 78Ek03=3/2											**
$*^{119}$Cs^m	E : from a least-squares fit to the level scheme of 21Zh56											**
$*^{119}$Cs^m	D : %$\beta^+\alpha$: 75Ho09<2×10^{-6}; value quoted in ENSDF2009 is misprint											**
$*^{119}$Cs^m	T : others: 01Ge01=43(1) 89Ge.A=44(2) 72Ra16=37.7(1.0) 69Ch18=38(8)											**
$*^{119}$Cs^m	J : 78Fi01=9/2											**
^{120}Tc	−35000#	500#				21 ms 5	3$^+$#	17			β^-=100;β^-n ?;β^-2n ?	
^{120}Ru	−49720#	400#				45 ms 2	0$^+$	17	21Ha19	TD	β^-=100;β^-n=6 3	*
^{120}Rh	−58610	60				133 ms 5	8$^-$#	17	21Ha19	TD	β^-=100;β^-n=7.2 16;β^-2n ?	*
^{120}Rh^m	−58450	60	157.2	0.7		295 ns 16	6#	17	12Ka36	ETD	IT=100	*
^{120}Pd	−70279.7	2.3				492 ms 33	0$^+$	17	06Mo07	TD	β^-=100;β^-n=0.35 20	*
^{120}Ag	−75674.0	2.7				1.52 s 0.07	4$^+$*	01			β^-=100;β^-n=0.0015 9	*
^{120}Ag^m	−75559	4	115	3	MD	940 ms 100	0$^-$*	01			β^-=?;IT ?;β^-n ?	*
^{120}Ag^n	−75470.8	2.7	203.20	0.20		384 ms 22	7$^-$*	01	12Ba58	ED	IT=68 10;β^-=32 10;β^-n ?	*
^{120}Cd	−83957	4				50.80 s 0.21	0$^+$	01			β^-=100	
^{120}In	−85709	3				3.08 s 0.08	1$^+$	01			β^-=100	
^{120}In^m	−85623	3	86	5	MD*&	46.2 s 0.8	5$^+$*	01			β^-=100	*
^{120}In^n	−85615	6	94	6	*&	47.3 s 0.5	8$^-$	01	23Ne13	E	β^-=100	*
^{120}Sn	−91097.9	0.9				STABLE	0$^+$	01			IS=32.58 9	
^{120}Sn^m	−88616.3	0.9	2481.63	0.06		11.8 μs 0.5	7$^-$	01			IT=100	
^{120}Sn^n	−88195.7	0.9	2902.22	0.22		6.26 μs 0.11	10$^+$	01			IT=100	*
^{120}Sb	−88417	7			*	15.89 m 0.04	1$^+$*	01	68Ja05	J	β^+=100	
^{120}Sb^m	−88420#	100#	0#	100#	*	5.76 d 0.02	8$^-$*	01	23Le15	J	β^+=100	*
^{120}Sb^n	−88339	7	78.16	0.05		246 ns 2	(3$^+$)	01			IT=100	
^{120}Sb^p	−86090#	100#	2328#	100#		400 ns 8	13$^+$	01			IT=100	*
^{120}Te	−89362.5	1.7				STABLE >29Zy	0$^+$	01	22Ad07	T	IS=0.09 1;2β^+ ?	
^{120}I	−83748	15				81.67 m 0.18	2$^-$	01	06Ph01	T	β^+=100;ε=54 3;e$^+$=46 3	*
^{120}I^m	−83675	15	72.61	0.09		242 ns 5	3$^+$	01	11Mo27	TJ	IT=100	*
^{120}I^n	−83615#	21#	133#	14#		53 m 4	(7$^-$)	01			β^+=100	*
^{120}Xe	−82172	12				46.0 m 0.6	0$^+$	01	06Ph01	T	β^+=100	
^{120}Cs	−73889	10			*	60.4 s 0.6	2$^+$*	01	06Ph01	T	β^+=100;$\beta^+\alpha$<2.0e-5 4;β^+p<7e-6 3	*
^{120}Cs^m	−73790#	60#	100#	60#	*	57 s 6	(7$^-$)	01	75Ho09	D	β^+=100;$\beta^+\alpha$<2.0e-5 4;β^+p<7e-6 3	*
^{120}Cs^x	−73884	9	5	4		$R<0.1$	*spmix*					
^{120}Ba	−68890	300				24 s 2	0$^+$	01	92Xu04	T	β^+=100	
^{120}La	−57800#	300#				2.8 s 0.2	4$^+$#	01	24Jo02	J	β^+=100;β^+p=?	
^{120}Ce	−49730#	500#				250# ms >310ns	0$^+$		25Su21	I	β^+ ?;β^+p ?	
$*^{120}$Ru	T : from 15Lo04=45(2); other: 21Ha19=48(7)											**
$*^{120}$Rh	T : average 21Ha19=150(15) 15Lo04=131(5) 06Mo07=136(+14-13); other: 04Wa26=120(10), superseded by 06Mo07											**
$*^{120}$Rh	D : %β^-n others: 20Sh.A<8.9(0.4) 06Mo07<5.4											**
$*^{120}$Rh^m	E : 12Ka36=59.1(0.5) and 98.1(0.5) γ rays in a cascade to gs											**
$*^{120}$Rh^m	T : symmetrized from 12Ka36=294(+16-15); other: 23Br09=305(146)											**
$*^{120}$Pd	D : %β^-n from 06Mo07<0.7											**
$*^{120}$Ag	T : from 12Ba58=1.52(0.07); others: 83Re05=1.25(0.03) 71Fo22=1.17(0.05) outliers (not used)											**
$*^{120}$Ag	D : %β^-n from 83Re05<0.003											**
$*^{120}$Ag	J : 25Va02=4											**
$*^{120}$Ag^m	J : 25Va02=0											**
$*^{120}$Ag^n	T : average 12Ba58=440(50) 03Wa13=400(30) 71Fo22=320(40)											**
$*^{120}$Ag^n	J : 25Va02=7; E_γ=203.2 keV E3 to 4$^+$											**
$*^{120}$In^m	J : 87Eb02=5											**
$*^{120}$In^n	E : 23Ne13<15 keV above ^{120}In^m using PI-ICR mass measurements											**
$*^{120}$In^n	J : 79Fo10=8											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{120}Sn^n$	J : 67.2-keV E2 γ to 8^+											**
$*^{120}Sb^m$	J : 23Le15,74Ek01,74Ca06=8											**
$*^{120}Sb^p$	E : 2328.3(0.6) keV above $^{120}Sb^m$											**
$*^{120}I$	T : average 06Ph01=82.1(0.6) 00Ho19=81.7(0.2) 65An05=81.0(0.6)											**
$*^{120}I$	D : %e^+,%ε from 65An05											**
$*^{120}I^m$	T : average 11Mo27=244(5) 74Mu10=228(15)											**
$*^{120}I^n$	E : from 97Ka03=107.7 + x keV, x=50# keV by NUBASE; other: 68La18=320(150) from end-point β^+ energies											**
$*^{120}Cs$	T : average 06Ph01=60.0(0.7) 93Al03=60(2) 77Ge03=64(3) 69Ch18=61.3(1.4)											**
$*^{120}Cs$	D : %$\beta^+\alpha$ and %β^+p from 75Ho09, values for both the gs and isomer											**
$*^{120}Cs$	J : 78Ek05,77Ek02,76EkZX=2											**
$*^{120}Cs^m$	D : %$\beta^+\alpha$ and %β^+p from 75Ho09, values for both the gs and isomer											**
^{121}Tc	−31540#	500#				22 ms 6	$5/2^+$#	15			β^-=100;β^-n ?;β^-2n ?	
^{121}Ru	−44630#	400#				30.1 ms 1.9	$3/2^+$#	15	21Ha19	TD	β^-=100;β^-n=13 4;β^-2n ?	*
^{121}Rh	−56250	620				74 ms 4	$7/2^+$#	09	21Ha19	TD	β^-=100;β^-n=13.4 8	*
^{121}Pd	−66181.8	2.5				290 ms 1	$3/2^+$#	09	21Ha19	TD	β^-=100;β^-n=0.9 5	*
$^{121}Pd^m$	−66046.3	2.5	135.5	0.5		460 ns 90	$7/2^+$#		12Ka36	ETD	IT=100	*
$^{121}Pd^n$	−66022#	14#	160#	14#		460 ns 90	$11/2^-$#		12Ka36	ETD	IT=100	*
^{121}Ag	−74404	9			*	777 ms 10	$7/2^+$*	09	24De01	J	β^-=100;β^-n=0.080 13	*
$^{121}Ag^m$	−74384#	22#	20#	20#	*	200# ms	$1/2^-$*		24De01	J	β^- ?;IT ?;β^-n ?	
^{121}Cd	−81073.8	1.9				13.5 s 0.3	$3/2^+$*	09	13Yo02	J	β^-=100	
$^{121}Cd^m$	−80858.9	1.9	214.86	0.15		8.3 s 0.8	$11/2^-$*	09	13Yo02	J	β^-=100	
^{121}In	−85845.0	1.2				23.1 s 0.6	$9/2^+$*	09			β^-=100	*
$^{121}In^m$	−85531.3	1.2	313.68	0.07		3.88 m 0.10	$1/2^-$*	09			β^-=98.8 2;IT=1.2 2	*
$^{121}In^n$	−83300#	100#	2550#	100#		7.3 μs 0.2	$(25/2^+)$	09	20Bi06	TDJ	IT=100	*
^{121}Sn	−89196.8	0.9				27.03 h 0.04	$3/2^+$*	09			β^-=100	*
$^{121}Sn^m$	−89190.5	0.9	6.31	0.06		43.9 y 0.5	$11/2^-$*	09	02Re18	T	IT=77.6 20;β^-=22.4 20	*
$^{121}Sn^n$	−87198.1	0.9	1998.68	0.13		5.3 μs 0.5	$19/2^+$	09	16Is03	E	IT=100	*
$^{121}Sn^p$	−86974.8	0.9	2222.0	0.2		520 ns 50	$23/2^+$	09	16Is03	EJT	IT=100	*
$^{121}Sn^q$	−86362.9	0.9	2833.9	0.2		167 ns 25	$27/2^-$	09	16Is03	EJ	IT=100	*
^{121}Sb	−89599.8	2.5				STABLE	$5/2^+$*	09	23Le15	J	IS=57.21 5	*
$^{121}Sb^m$	−86849	17	2751	17		179 μs 6	$(25/2^+)$	09	09Wa02	EJ	IT=100	*
^{121}Te	−88544	26				19.31 d 0.07	$1/2^+$	09	19Jo03	T	β^+=100	*
$^{121}Te^m$	−88250	26	293.974	0.022		164.7 d 0.5	$11/2^-$	09	19Jo03	T	IT=88.6 11;β^+=11.4 11	*
^{121}I	−86246	5				2.12 h 0.01	$5/2^+$*	09	65An05	DT	β^+=100;ε=91 1;e^+=9 1	*
$^{121}I^m$	−83869	5	2376.9	0.4		9.0 μs 1.4	$21/2^+$#	09			IT=100	
^{121}Xe	−82481	10				38.8 m 0.4	$5/2^+$*	09	90NeZY	J	β^+=100	*
^{121}Cs	−77102	14				155 s 4	$3/2^+$*	09	91Ge02	T	β^+=100	*
$^{121}Cs^m$	−77034	14	68.5	0.3		122 s 3	$9/2^+$*	09	91Ge02	TD	$\beta^+\approx$83;IT$\approx$17	*
$^{121}Cs^x$	−77056	16	46	8		$R=2\sim1$	*spmix*					
^{121}Ba	−70740	140				29.7 s 1.5	$5/2^+$*	09	75Bo11	D	β^+=100;β^+p=0.02 1	*
^{121}La	−62380#	300#				5.3 s 0.2	$11/2^-$#	09			β^+=100;β^+p ?	
^{121}Ce	−52690#	400#				1.1 s 0.1	$5/2^+$#	09	97Li19	TD	β^+=100;β^+p$\approx$1	
^{121}Pr	−41550#	500#				12 ms 5	$3/2^+$#	09			p$\approx$100;β^+ ?;α ?	*
$*^{121}Ru$	T : average 21Ha19=37(5) 15Lo04=29(2)											**
$*^{121}Rh$	T : average 21Ha19=73(2) 15Lo04=76(5) 20Sh.A=71(7); other:06Mo07=151(+67-58)											**
$*^{121}Rh$	D : %β^-n other: 20Sh.A>11.5(0.6)											**
$*^{121}Pd$	T : from 15Lo04=290(1); others: 21Ha19=290(20) 06Mo07=285(24)											**
$*^{121}Pd$	D : β^-n: from 21Ha19<1.7; other: 06Mo07<0.8											**
$*^{121}Pd^m$	T : symmetrized from 12Ka36=460(+85-92) assuming two isomers in a cascade; other: 12LaZT=630(50) assuming a single-decaying isomer											**
$*^{121}Pd^n$	T : symmetrized from 12Ka36=463(+83-94) assuming two isomers in a cascade;											**
$*^{121}Pd^n$	E : x keV above $^{121}Pd^m$, with x<50# keV estimated by NUBASE											**
$*^{121}Ag$	T : average 06Mo07=661(+75-72) 83Re05=780(10); others: 82Fo10=720(100) 95Fe12=1043(80)											**
$*^{121}Ag$	D : %β^-n from 83Re05; other: 93Ru01=0.076(0.005) quotes older value from the same group as 83Re05											**
$*^{121}In$	J : 24Ka49,22Ve05,84Be40=9/2											**
$*^{121}In^m$	J : 22Ve05,84Be40=1/2											**
$*^{121}In^m$	E : other: 23Ne13=313.9(1.8) from PI-ICR											**
$*^{121}In^n$	T : others (discrepant, not used): 10Re01=17(2) μs 02Lu15=350(50) ns											**
$*^{121}Sn$	J : 20Yo07,25Gu23,69Pr07=3/2											**
$*^{121}Sn^m$	J : 20Yo07,86An24=11/2											**
$*^{121}Sn^n$	E : from a least-squares fit to the level scheme of 16Is03											**
$*^{121}Sn^p$	E : from a least-squares fit to the level scheme of 16Is03											**
$*^{121}Sn^q$	E : from a least-squares fit to the level scheme of 16Is03; other: 2832.7(0.5) from a least-squares fit to the level scheme of 12As05											**
$*^{121}Sb$	J : 23Le15,21Le11,32Ba01,34Cr03,51Lo24=5/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{121}$Sb^m	E : x keV above the 2721.6(0.4) level, with x<60 keV in 08Jo03											**
$*^{121}$Te	T : average 19Jo03=19.38(0.03) 08E_α01=19.2 (0.1) 95Si30=19.16(0.05); Birge ratio=2.8											**
$*^{121}$Te^m	T : average 19Jo03=165.1(0.7) 08E_α01=164.2 (0.8)											**
$*^{121}$I	J : 74EkZX=5/2											**
$*^{121}$Xe	J : 90NeZY=5/2											**
$*^{121}$Xe	T : average 69Bu07=38.8(0.6) 65An05=38.8(0.5); others: 72Mu03=40.1(2.0) 65Bu03=34.0(2.5) 52Dr18=40(2)											**
$*^{121}$Cs	J : 78Ek05,77Ek02,76EkZX=3/2											**
$*^{121}$Cs^m	J : 78Ek05,77Ek02=9/2											**
$*^{121}$Ba	J : 88We14=5/2											**
$*^{121}$Pr	T : symmetrized from 05Ro19=10(+6-3)											**
^{122}Tc	−26310#	500#				13# ms	>550ns	1^+#	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{122}Ru	−41780#	500#				25 ms	1	0^+	15			β^-=100;β^-n ?;β^-2n ?	
^{122}Rh	−51880#	300#				52.3 ms	1.5	7^-#	13	21Ha19	TD	β^-=100;β^-n=11.3 7;β^-2n ?	*
^{122}Rh^m	−51610#	300#	270.4	0.4		872 ns	64	4^+#	13	23Br09	TD	EDIT=100	*
^{122}Pd	−64616	20				195 ms	4	0^+	14	21Ha19	TD	β^-=100;β^-n=1.1 3	*
^{122}Ag	−71220	5				529 ms	12	(1^-)	06			β^-=100;β^-n=0.186 10	*
^{122}Ag^m	−71129	5	91	1		6.3 μs	1.0	(1^+)		13La11	TJE	IT=100	*
^{122}Ag^n	−70917	7	304	5		200 ms	50	(9^-)	06	00Kr18	T	β^-=100;IT ?;β^-n ?	*
^{122}Cd	−80612.4	2.3				5.88 s	0.06	0^+	06	23Ne13	T	β^-=100	*
^{122}In	−83555	3			*	10.3 s	0.6	5^+*	06			β^-=100	
^{122}In^m	−83547	5	8	4	MD*	10.8 s	0.4	8^-	06	23Ne13	E	β^-=100	*
^{122}In^n	−83473.9	0.9	81	3	MD	1.5 s	0.3	1^+	06			β^-=100	
^{122}Sn	−89940.4	1.3				STABLE		0^+	06			IS=4.63 3;2β^- ?	*
^{122}Sn^m	−87531.4	1.3	2409.03	0.04		7.5 μs	0.9	7^-	06			IT=100	
^{122}Sn^n	−87174.9	1.3	2765.5	0.3		62 μs	3	10^+	06	14Is04	EJ	IT=100	*
^{122}Sn^p	−85219.2	1.3	4721.2	0.3		139 ns	9	15^-		14Is04	EJT	IT=100	*
^{122}Sb	−88334.8	2.5				2.740 d	0.016	2^-*	06	21Da13	T	β^-=97.59 12;β^+=2.41 12	*
^{122}Sb^m	−88273.4	2.5	61.4131	0.0005		1.86 μs	0.08	3^+	06			IT=100	
^{122}Sb^n	−88197.3	2.5	137.4726	0.0008		530 μs	30	5^+	06			IT=100	
^{122}Sb^p	−88171.2	2.5	163.5591	0.0017		4.191 m	0.003	8^-*	06	23Le15	J	IT=100	
^{122}Te	−90313.9	1.3				STABLE		0^+	06			IS=2.55 12	
^{122}I	−86080	5				3.63 m	0.06	1^+	06			β^+=100	*
^{122}I^m	−85765	5	315.0	0.4		193.3 ns	0.9	7^-	06	19Mo28	TJ	IT=100	
^{122}I^n	−85701	5	379.5	0.5		79.1 μs	1.2	7^-	06	19Mo28	TJ	IT=100	
^{122}I^p	−85686	5	393.8	0.5		78.2 μs	0.4	(8^+)	06	19Mo28	TJ	IT=100	
^{122}I^q	−85636	5	444.2	0.5		146.5 ns	1.2	8^-	06	19Mo28	TJ	IT=100	
^{122}Xe	−85355	11				20.1 h	0.1	0^+	06	65An05	T	ε=100	
^{122}Cs	−78140	30				21.18 s	0.19	1^+*	06	75Ho09	D	β^+=100;$\beta^+\alpha$<2e-7	*
^{122}Cs^m	−78090	30	45.87	0.12		> 1 μs		3^+	06			IT=100	
^{122}Cs^n	−78005	9	140	30	MD	3.70 m	0.11	8^-*	06	93Al03	T	β^+=100	*
^{122}Cs^p	−78010	30	127.07	0.16		360 ms	20	5^-	06			IT=100	
^{122}Cs^x	−78130	30	14	7		$R = 0.1 \sim .05$		*spmix*					
^{122}Ba	−74609	28				1.95 m	0.15	0^+	06			β^+=100	
^{122}La	−64540#	300#				8.6 s	0.5	2^+#	06	24Jo02	J	β^+=100;β^+p=?	
^{122}Ce	−57870#	400#				2# s		0^+	06			β^+ ?;β^+p ?	
^{122}Pr	−44780#	500#				500# ms	>310ns			25Su21	I	β^+ ?;β^+p ?	
$*^{122}$Rh	D : %β^-n other: 20Sh.A<3.87(0.06)												**
$*^{122}$Rh	T : average 21Ha19=52.4(1.5) 15Lo04=51(6)												**
$*^{122}$Rh^m	E : 23Br09=64.0(0.3) and 206.4(0.2) γ rays in a cascade to gs; other: 12Ka36=271.0(0.7) using 63.9(0.5) and 207.1(0.5) γs												**
$*^{122}$Rh^m	T : average 23Br09=887(76) 12Ka36=820(+130-110)												**
$*^{122}$Pd	T : average 21Ha19=203(12) 15Lo04=195(5) 06Mo07=175(16)												**
$*^{122}$Pd	D : β^-n from 21Ha19<2.2; other: 06Mo07<2.5												**
$*^{122}$Ag	D : %β^-n from 83Re05, probably includes gs and isomer												**
$*^{122}$Ag	T : average 00Kr18=550(50) 95Fe12=520(14) 83Re05=570(30) 78Sh03=480(80); others: 06Mo07=357(24) for both gs and isomer												**
$*^{122}$Ag^n	J : direct β^- decay feeding of 8^- level in ^{122}Cd in 95Za01;												**
$*^{122}$Cd	T : average 23Ne13=5.98(0.10) 74GrYF=5.91(0.12) 73Sc19=5.78(0.09); others: 81Ru07=5.24(0.03) 74Gr29=3.48(0.09), 3.04(0.05), 3.04(0.11)												**
$*^{122}$In	J : 87Eb02=5												**
$*^{122}$In^m	E : from 23Ne13<15 keV using PI-ICR mass measurements												**
$*^{122}$In^m	J : 79Fo10=8												**
$*^{122}$Sn	T : 0ν-$\beta\beta$: 18No01>13 Ty												**
$*^{122}$Sn^n	E : from a least-squares fit to the level scheme of 14Is04; other: 2765.3(0.4) from a least-squares fit to the level scheme of 12As05												**
$*^{122}$Sn^n	T : other: 17Ki09=60.8(+8.3-7.0)												**
$*^{122}$Sn^p	T : average 14Is04=134(12) 12As05=146(15)												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{122}Sn^{p}$	E : from a least-squares fit to the level scheme of 14Is04; other: 4720.2(0.45) from a least-squares fit to the level scheme of 12As05											**
$*^{122}Sb$	T : unweighted average 21Da13=2.69454(0.00039), 2.69388(0.00030), 90Ab06=2.7238(0.0002) 73Ka45=2.84(0.12) 72Em01=2.714(0.006) 72Pa13=2.68(0.04)											**
$*^{122}Sb$	T : 68Bo21=2.82(0.05) 67Ha27=2.681(0.003) 58Gu09=2.75(0.01) 58Pe17=2.73(0.03) 54Co08=2.75(0.02) 51Bl31=2.80(0.02); Birge ratio=29.03											**
$*^{122}Sb$	J : 71Kr15,60Fe08,58Pi45=2											**
$*^{122}I$	T : others: 12At01=4.15(+0.30-0.25) for $^{122}I^{+53}$ and 3.13(+0.15-0.13) for $^{122}I^{+52}$											**
$*^{122}Cs$	J : 78Ek05,77Ek02,76EkZX=1											**
$*^{122}Cs^{n}$	J : 78Ek05,77Ek02,76EkZX=8											**
^{123}Ru	−36550#	500#				19 ms 2	$3/2^+$#	21	15Lo04	TD	β^-=100;β^-n ?;β^-2n ?	
^{123}Rh	−49190#	400#				42.2 ms 1.6	$7/2^+$#	21	21Ha19	TD	β^-=100;β^-n>24.2 14;β^-2n ?	*
^{123}Pd	−60300	250				109.2 ms 2.4	$3/2^+$#	21	21Ha19	TD	β^-=100;β^-n=1.4 3	*
$^{123}Pd^{m}$	−60200#	260#	100#	50#		100# ms	$11/2^-$#		19Ch24	ID	$\beta^-\approx$100;IT ?	
^{123}Ag	−69603	4				302 ms 5	$(7/2^+)*$	21	21Te02	TD	β^-=100;β^-n=0.85 15	*
$^{123}Ag^{m}$	−69544	4	59.3	0.7		200# ms	$(1/2^-)*$		19Ch24	E	β^-=100;β^-n ?	*
$^{123}Ag^{n}$	−68153#	15#	1450#	14#	EU	202 ns 20		21	13La11	ETD	IT=100	*
$^{123}Ag^{p}$	−68129	4	1473.9	0.4		393 ns 16	$(17/2^-)$	21	13La11	ET	IT=100	*
^{123}Cd	−77414.3	2.7				2.134 s 0.018	$3/2^+*$	21	13Yo02	J	β^-=100	*
$^{123}Cd^{m}$	−77271	3	143	4	MD	1.798 s 0.022	$11/2^-*$	21	13Yo02	J	β^-=?;IT ?	*
^{123}In	−83398.6	1.1				6.02 s 0.14	$9/2^+*$	21			β^-=100	*
$^{123}In^{m}$	−83071.4	1.1	327.21	0.04		47.4 s 0.5	$1/2^-*$	21			β^-=100;IT ?	*
$^{123}In^{n}$	−81320.5	1.3	2078.1	0.6		1.4 μs 0.2	$(17/2^-)$	21	04Sc42	ETJ	IT=100	
$^{123}In^{p}$	−81296#	14#	2103#	14#		> 100 μs	$(21/2^-)$	21	10Re01	EJT	IT=100	*
^{123}Sn	−87815.0	1.7				129.3 d 0.4	$11/2^-*$	21			β^-=100	*
$^{123}Sn^{m}$	−87790.4	1.7	24.6	0.4		40.061 m 0.010	$3/2^+*$	21			β^-=100	*
$^{123}Sn^{n}$	−85870.1	1.7	1944.89	0.12		7.4 μs 2.6	$19/2^+$	21	16Is03	EJ	IT=100	
$^{123}Sn^{p}$	−85662.4	1.7	2152.64	0.19		6 μs	$23/2^+$	21	16Is03	EJ	IT=100	*
$^{123}Sn^{q}$	−85102.7	1.7	2712.3	0.3		34 μs	$27/2^-$	21	16Is03	EJ	IT=100	
^{123}Sb	−89223.5	1.3				STABLE	$7/2^+*$	21	23Le15	J	IS=42.79 5	*
$^{123}Sb^{m}$	−86985.6	1.4	2237.9	0.4		214 ns 3	$19/2^-$	21	09Wa02	TJ	IT=100	*
$^{123}Sb^{n}$	−86609.9	1.4	2613.6	0.5		65.1 μs 0.9	$23/2^+$	21	09Wa02	TJ	IT=100	*
^{123}Te	−89171.6	1.3				STABLE >92Py	$1/2^+*$	21	03Al02	T	IS=0.89 3;ε=100	*
$^{123}Te^{m}$	−88924.2	1.3	247.45	0.04		119.50 d 0.07	$11/2^-$	21			IT≈100;ε ?	*
^{123}I	−87943	4				13.2232 h 0.0015	$5/2^+*$	21	FGK209	T	β^+=100	*
^{123}Xe	−85249	10				2.050 h 0.008	$1/2^+*$	21	90NeZY	J	β^+=100	*
$^{123}Xe^{m}$	−85064	10	185.30	0.16		5.66 μs 0.23	$7/2^-$	21			IT=100	*
^{123}Cs	−81044	12				5.88 m 0.03	$1/2^+*$	21			β^+=100	*
$^{123}Cs^{m}$	−80888	12	156.27	0.05		1.65 s 0.14	$11/2^-$	21			IT=100	*
$^{123}Cs^{n}$	−80716	12	328.08	0.08		114 ns 5	$(9/2^+)$	21	00Gi12	TD	IT=100	
$^{123}Cs^{x}$	−81037	13	7	4		$R<0.1$	*spmix*					
^{123}Ba	−75655	12				2.4 m 0.3	$5/2^+*$	21			β^+=100	*
$^{123}Ba^{m}$	−75534	12	120.98	0.23		830 ns 60	$(1/2)^+$	21	91Ii02	TJ	IT=100	
^{123}La	−68650#	200#				16.3 s 0.3	$5/2^+$#	21	92Ic02	T	β^+=100	
^{123}Ce	−60290#	300#				3.9 s 0.2	$(5/2^+)$	21	84Ni03	TJ	β^+=100;β^+p=?	
^{123}Pr	−50230#	400#				800# ms >310ns	$3/2^+$#		25Su21	I	β^+ ?;β^+p ?	
^{123}Nd	−38900#	700#				300# ms >310ns	$5/2^+$#		25Su21	I	β^+ ?;β^+p ?	
$*^{123}Rh$	T : average 21Ha19=42.2(1.8) 15Lo04=42(4)											**
$*^{123}Rh$	D : β^-n other: 20Sh.A>24											**
$*^{123}Pd$	T : average 21Ha19=114(2) 15Lo04=108(1); others: 06Mo07=174(+38-34) 14SmZZ=170(+49-52)											**
$*^{123}Pd$	D : β^-n other: 14SmZZ=10(6)											**
$*^{123}Ag$	J : 00Kr18=(7/2) ($\pi g_{9/2}$); hfs comparison to ^{107,107m}Ag											**
$*^{123}Ag$	D : %β^-n average 21Te02=1.01(0.24) 06Mo07=1.0(0.5) 93Ru01=0.55(0.05) all values probably include gs and isomer; other: 14TeZY=0.60(0.25),											**
$*^{123}Ag$	D : superseded by 21Te02											**
$*^{123}Ag$	T : average 21Te02=350(20) 06Mo07=272(24) 95Fe12=293(7) 86Ma42=300(20) 83Re05=300(10) 89Hu10=350(40) 76Lu02=390(30); other: 14TeZY=396(15),											**
$*^{123}Ag$	T : superseded by 21Te02											**
$*^{123}Ag^{m}$	J : 00Kr18=(1/2) ($\pi p_{1/2}$); hfs comparison to ^{107,107m}Ag											**
$*^{123}Ag^{m}$	E : from 1009.2(0.3)+27.2(0.4)-594.0(0.3)-383.1(0.3) keV γs in 19Ch24; other (mass measurement): 24De01=57.2(8.8)											**
$*^{123}Ag^{n}$	E : 13La11=1365 + x keV above $^{123}Ag^{m}$; x=50# keV estimated by NUBASE											**
$*^{123}Ag^{p}$	T : average 13La11=393(16) 09St28=396(37); other: 05WaZY=330(20)											**
$*^{123}Cd$	T : average 14TeZY=2.35(0.05) 89Hu03=2.12(0.03) 86Ma42=2.11(0.06) 86Go10=2.19(0.10) 83Re05=2.07(0.03)											**
$*^{123}Cd$	J : 13Yo02,15Fr08=3/2											**
$*^{123}Cd^{m}$	T : average 14TeZY=1.74(0.04) 89Hu03=1.81(0.03) 86Ma42=1.88(0.06)											**
$*^{123}Cd^{m}$	J : 13Yo02,15Fr08=11/2											**
$*^{123}In$	J : 24Ka49,22Ve05,87Eb02=9/2											**
$*^{123}In$	T : average 11Hi05=5.8(0.2) 86Go10=6.68(0.20) 74Gr29=5.98(0.06); Birge ratio=2.5											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{123}In^m$	J : 22Ve05,87Eb02=1/2							**
$*^{123}In^m$	T : average 86Go10=45.9(1.0) 74Gr29=47.8(0.5); other: 60Yu01=36(3)							**
$*^{123}In^p$	E : from 10Re01=2078.1 + x keV; x=50# keV estimated by NUBASE							**
$*^{123}Sn$	J : 25Gu23,20Yo07,86An24=11/2							**
$*^{123}Sn$	T : average 68E_r03=129.6(0.6) 66La13=129.0(0.5); others: 51Co34=125(3) 50Ne52=126(5) 49Le05=130(5)							**
$*^{123}Sn^m$	J : 68Ch38,20Yo07=3/2							**
$*^{123}Sn^m$	T : average 90Ab06=40.06(0.01) 68E_r03=40.08(0.07) 77Ti03=41.8(0.5) 48Mo33=41.5(0.5) 49Le05=40(1); others: 70OsZZ=38.9(0.4) 49Du15=39.5							**
$*^{123}Sn^n$	T : from 92Ma27							**
$*^{123}Sn^p$	T : from 94Ma48,95Da26							**
$*^{123}Sn^q$	T : from 94Ma48,95Da26							**
$*^{123}Sb$	J : 21Le11,32Ba01,34Cr03,51Lo24,23Le15=7/2							**
$*^{123}Sb^m$	T : others: 19Bi04=222(23) 07Ju06=190(30) 05Po03=110(10)							**
$*^{123}Sb^n$	T : average 19Bi04=66(4) 09Wa02=65(1) 07Ju06=66(4); other: 08Jo03=52(3)							**
$*^{123}Te$	J : 50Fo08,49Ma47,32Ba01=1/2							**
$*^{123}Te^m$	T : average 92Co11=119.3(0.1) 70EmZY=119.7(0.1) 87Ja13=118.6(0.9)							**
$*^{123}I$	J : 58Ga18=5/2							**
$*^{123}Xe$	J : 90NeZY=1/2							**
$*^{123}Xe$	T : average 21Ze01=2.040(0.009) 69Bu07=2.10(0.03) 65An05=2.08(0.02); others: 74Jo16=2.23(0.02) 67DaZY=1.83(0.15) 65Bu03=1.85(0.05)							**
$*^{123}Xe$	T : 62Pr09=1.85(0.10) 60Mo09=1.85(0.03)							**
$*^{123}Xe^m$	T : average 82Ze05=5.2(0.5) 81Lu01=5.6(0.3) 70Ke01=6.3(0.5)							**
$*^{123}Cs$	T : average 93Al03=5.87(0.05) 81So06=6.08(0.07) 69Ch18=5.87(0.05) 66Da09=5.6(0.1); others: 62Pr09=8.0(0.5) 54Ma54=6							**
$*^{123}Cs$	J : 78Ek05,77Ek02,76EkZX=1/2							**
$*^{123}Cs^m$	J : 61.70-keV E3 γ to 5/2$^+$ followed by 94.57 E2 γs to 1/2$^+$							**
$*^{123}Cs^m$	T : average 81Ma01=1.7(0.2) 72Dr06=1.6(0.2)							**
$*^{123}Ba$	J : 83Mu12,88We14=5/2							**
$*^{123}Ba$	T : average 75Ar31=2.7(0.4) 62Pr09=2.0(0.5)							**
^{124}Ru	−33590#	600#	15 ms 3	0^+	15		β^-=100;β^-n ?;β^-2n ?	
^{124}Rh	−44710#	400#	31.5 ms 1.7	2^+#	15	21Ha19 TD	β^-=100;β^-n=28 5;β^-2n ?	*
^{124}Pd	−58290#	300#	94 ms 3	0^+	14	21Ha19 TD	β^-=100;β^-n=0.89 20	*
$^{124}Pd^m$	−57290#	850# 1000# 800#	> 20 μs		14	12Ka36 ET	IT≈100	
^{124}Ag	−66200	7	177.9 ms 2.6	(2$^-$)	15	21Ha19 TD	β^-=100;β^-n=1.7 7	*
$^{124}Ag^m$	−66011	7 188.3 2.5 MD	144 ms 20	9$^-$#	15	14Ba18 TDJ	β^-=100;β^-n ?	*
$^{124}Ag^n$	−66044	7 155.6 0.5	140 ns 50	(1$^+$)	15	13La11 TJ	IT=100	
$^{124}Ag^p$	−65969	7 231.1 0.7	1.48 μs 0.15	(1$^-$)	15	13La11 TJ	IT=100	*
^{124}Cd	−76699.4	2.6	1.25 s 0.02	0^+	08		β^-=100	
^{124}In	−80910	3	3.67 s 0.03	8$^-$	08	14Le20 T	β^-≈100	*
$^{124}In^m$	−80886	4 24.1 2.7 MD	3.12 s 0.09	3$^+$*	08		β^-=100;IT ?	
^{124}Sn	−88231.3	1.3	STABLE >100Py	0^+	08	52Ka41 T	IS=5.79 5;2β^- ?	
$^{124}Sn^m$	−86026.7	1.3 2204.620 0.023	270 ns 60	5$^-$	08	FGK127 J	IT=100	*
$^{124}Sn^n$	−85906.3	1.3 2324.96 0.04	3.1 μs 0.5	7$^-$	08	14Is04 EJ	IT=100	*
$^{124}Sn^p$	−85574.7	1.3 2656.6 0.3	51 μs 3	10$^+$	08	14Is04 EJ	IT=100	*
$^{124}Sn^q$	−83678.9	1.3 4552.4 0.3	260 ns 25	15$^-$		14Is04 EJ	IT=100	*
^{124}Sb	−87619.7	1.3	60.20 d 0.03	3$^-$*	08		β^-=100	*
$^{124}Sb^m$	−87608.8	1.3 10.8627 0.0008	93 s 5	5$^+$	08		IT=75 5;β^-=25 5	
$^{124}Sb^n$	−87582.9	1.3 36.8440 0.0014	20.2 m 0.2	8$^-$*	08	23Le15 J	IT=100[gs=0,m=100]	
$^{124}Sb^p$	−87578.9	1.3 40.8038 0.0007	3.2 μs 0.3	(3$^+$)	08		IT=100	*
^{124}Te	−90524.8	1.3	STABLE	0^+	08		IS=4.74 14	
^{124}I	−87365.2	2.2	4.1760 d 0.0003	2$^-$*	08	92Wo03 T	β^+=100	*
^{124}Xe	−87668.1	1.3	10.9 Zy 1.2	0^+	08	25Aa01 T	IS=0.095 5;2β^+ ?	*
^{124}Cs	−81741	9	30.9 s 0.4	1$^+$*	08	93Al03 T	β^+=100	*
$^{124}Cs^m$	−81278	9 462.63 0.14	6.41 s 0.07	(7)$^+$	08	17Ra20 D	IT=99.89 2;β^+=0.11 2	*
$^{124}Cs^x$	−81711	22 30 20	R=?	*spmix*				
^{124}Ba	−79090	12	11.0 m 0.5	0^+	08		β^+=100	
^{124}La	−70260	60 *&	29.21 s 0.17	(7,8$^-$)	08	92Id01 J	β^+=100	
$^{124}La^m$	−70160#	120# 100# 100# *&	21 s 4	2$^-$#	08		β^+=100	
^{124}Ce	−64920#	300#	9.1 s 1.2	0^+	08	97As05 T	β^+=100	*
^{124}Pr	−53150#	400#	1.2 s 0.2		08		β^+=100;β^+p=?	
^{124}Nd	−44830#	500#	500# ms >310ns	0^+		25Su21 I	β^+ ?;β^+p ?	
$*^{124}Rh$	T : average 21Ha19=35(3) 15Lo04=30(2)							**
$*^{124}Rh$	D : β^-n other: 20Sh.A<31							**
$*^{124}Pd$	T : others: 15Lo04=88(15) 06Mo07=38(+38-19) 14SmZZ=144(+25-24)							**
$*^{124}Pd$	D : β^-n other: 14SmZZ=17(5)							**
$*^{124}Ag$	T : average 15Lo04=180(3) 95Fe12=172(5); others: 21Ha19=205(17) 14Ba18=191(28) 14TeZY=256(78) 14SmZZ=230(+28-25) 06Mo07=187(+15-14)							**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{124}$Ag	T : 84Hi03=170(30)											**
$*^{124}$Ag	D : %β^-n average 21Ha19=2.3(1.1) 06Mo07=1.3(0.9)											**
$*^{124}$Ag	J : from 14Ba18											**
$*^{124}$Ag^m	J : direct β^- feeding to 8^+ and 10^+ levels in ^{124}Cd in 14Ba18; other: 14Ba18 assumes $J^\pi=(8^-)$											**
$*^{124}$Ag^p	E : 12Ka36=75.5(0.5) and 155.6(0.5) γ rays in a cascade to gs											**
$*^{124}$Ag^p	T : average 13La11=1.46(0.20) 12Ka36=1.62(+0.29-0.24) 05WaZY=1.3(0.3)											**
$*^{124}$In	T : others: 86Go10=3.7(0.2) 74Fo23=2.4(0.3)											**
$*^{124}$In	J : 79Fo10=8											**
$*^{124}$In^m	J : 87Eb02=3											**
$*^{124}$Sn^m	J : E1 γ to 4^+; L(p,p)=5											**
$*^{124}$Sn^n	T : from 17Ki09=2.83(0.12); other: 79Fo10=3.1(0.5)											**
$*^{124}$Sn^p	T : average 17Ki09=55.0(+4.7-4.1) 92Br06=45(5)											**
$*^{124}$Sn^q	T : average 14Is04=260(30) 12As05=260(25)											**
$*^{124}$Sb	J : 70Si17,68Kn02,60Fe08=3											**
$*^{124}$Sb^p	J : 29.94-keV E2 γ to 5^+											**
$*^{124}$I	T : others: 16Lu16=4.1758(0.0014) 21Pi01=4.179(0.006)											**
$*^{124}$I	J : 58Ga18=2											**
$*^{124}$Xe	T : 2ν-$\varepsilon\varepsilon$: average 25Aa01(LUX)=10.9(1.4,stat)(0.5,syst) 22Ap01(XENON1T)=11(2,stat)(1,sys); other (evaluation): 25Pr02=11.0(2.2)											**
$*^{124}$Cs	T : average 93Al03=30.9(0.5) 78Ek05=30.8(0.5); other: 14Le20=31(3)											**
$*^{124}$Cs	J : 78Ek05,77Ek02,76EkZX=1											**
$*^{124}$Cs^m	T : from 14Le20; other: 83We07=6.3(0.2)											**
$*^{124}$Ce	T : average 97As05=10.8(1.5) 78Bo32=6(2)											**
^{125}Ru	−28370#	500#				12# ms >550ns	$3/2^+$#	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{125}Rh	−41830#	500#				26.5 ms 2.0	$7/2^+$#	15			β^-=100;β^-n ?;β^-2n ?	
^{125}Pd	−53710#	400#				64.4 ms 1.7	$3/2^+$#	15	21Ha19	TD	β^-=100;β^-n=3.7 4	*
^{125}Pd^m	−53610#	400#	100#	50#		50# ms	$11/2^-$#		19Ch24	ID	$\beta^-\approx$100;IT ?;β^-n ?	
^{125}Pd^n	−51910#	400#	1805.23	0.18		144 ns 4	$(23/2^+)$		19Wa14	ETJ	IT=100	
^{125}Ag	−64268	4				170 ms 3	$(9/2^+)*$	15	21Ba34	TD	β^-=100;β^-n=1.2 2	*
^{125}Ag^m	−64171	4	97.1	0.5		159 ms 21	$(1/2^-)*$		21Ba34	TD	$\beta^-\approx$100;IT ?;β^-n=4.6 10	*
^{125}Ag^n	−62767	4	1501.2	0.6		491 ns 20	$(17/2^-)$	15			IT=100	
^{125}Cd	−73348.1	2.9				680 ms 40	$3/2^+*$	10	13Yo02	J	β^-=100	
^{125}Cd^m	−73162	3	186	4	MD	480 ms 30	$11/2^-*$	10	13Yo02	J	β^-=100	
^{125}Cd^n	−71700	5	1648	4		19 μs 3	$(19/2^+)$		11Si32	EJT	IT=100	*
^{125}In	−80412.3	1.8				2.36 s 0.04	$9/2^+*$	10			β^-=100	*
^{125}In^m	−80052.2	1.8	360.12	0.09		12.2 s 0.2	$1/2^-*$	10			β^-=100	*
^{125}In^n	−78402.9	1.9	2009.4	0.7		9.4 μs 0.6	$(19/2^+)$	10			IT=100	
^{125}In^p	−78251.1	2.0	2161.2	0.9		5.0 ms 1.5	$(23/2^-)$	10			IT=100	
^{125}Sn	−85893.4	1.3				9.634 d 0.015	$11/2^-*$	10			β^-=100	*
^{125}Sn^m	−85865.9	1.3	27.50	0.14		9.77 m 0.25	$3/2^+*$	10	20Yo07	J	β^-=100	*
^{125}Sn^n	−84000.6	1.3	1892.8	0.3		6.2 μs 0.2	$19/2^+$	10	08Lo07	J	IT=100	
^{125}Sn^p	−83833.9	1.4	2059.5	0.4		650 ns 60	$23/2^+$	10	16Is03	T	IT=100	*
^{125}Sn^q	−83269.9	1.4	2623.5	0.5		230 ns 17	$27/2^-$	10	08Lo07	T	IT=100	*
^{125}Sb	−88255.7	2.5				2.7574 y 0.0014	$7/2^+*$	10	FGK259	T	β^-=100	*
^{125}Sb^m	−86284.5	2.5	1971.25	0.20		4.1 μs 0.2	$15/2^-$	10			IT=100	
^{125}Sb^n	−86143.6	2.5	2112.1	0.3		28.5 μs 0.5	$19/2^-$	10	FGK128	J	IT=100	*
^{125}Sb^q	−85784.7	2.5	2471.0	0.4		277.0 ns 6.4	$(23/2)^+$	10	19Bi04	T	IT=100	*
^{125}Te	−89022.4	1.3				STABLE	$1/2^+*$	10			IS=7.07 15	*
^{125}Te^m	−88877.6	1.3	144.775	0.008		57.41 d 0.05	$11/2^-$	10	24Su18	T	IT=100	*
^{125}I	−88836.7	1.3				59.395 d 0.015	$5/2^+*$	10	FGK259	T	ε=100	*
^{125}Xe	−87200.0	1.3				16.97 h 0.08	$1/2^+*$	10	26Wa03	T	β^+=100	*
^{125}Xe^m	−86947.4	1.3	252.61	0.14		56.9 s 0.9	$9/2^-*$	10			IT=100	
^{125}Xe^n	−86904.1	1.3	295.89	0.15		140 ns 30	$7/2^+$	10			IT=100	
^{125}Cs	−84090	8				44.35 m 0.29	$1/2^+*$	10	19Sz01	T	β^+=100	*
^{125}Cs^m	−83824	8	266.1	1.1		900 μs 30	$(11/2^-)$	10	98Su16	J	IT=100	
^{125}Ba	−79669	11				3.3 m 0.3	$1/2^+*$	10			β^+=100	*
^{125}Ba^m	−79549#	23#	120#	20#		2.76 μs 0.14	$(7/2^-)$	10	FGK128	J	IT=100	*
^{125}La	−73759	26			&	64.8 s 1.2	$11/2^-$#	10			β^+=100	
^{125}La^m	−73652	26	107.00	0.10	&	390 ms 40	$(3/2^+)$	10	99Ca21	J	IT=100	
^{125}Ce	−66660#	200#				9.7 s 0.3	$(7/2^-)$	10	02Pe15	J	β^+=100;β^+p=?	
^{125}Ce^m	−66570#	200#	93.6	0.4		13 s 10	$(1/2^+)$		07Su07	ETJ	IT=100	*
^{125}Pr	−58070#	300#				3.3 s 0.7	$3/2^+$#	10			β^+=100;β^+p ?	
^{125}Nd	−48070#	400#				650 ms 150	$5/2^+$#	10			β^+=100;β^+p=?	
^{125}Pm	−36150#	500#				500# ms >310ns	$3/2^+$#		25Su21	I	β^+ ?;β^+p ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{125}$Pd	T : others: 15Lo04=57(10) 14SmZZ=61(+8-7)											**
$*^{125}$Pd	D : %β^-n other: 14SmZZ=12(4)											**
$*^{125}$Ag	J : 00Kr18=(9/2) ($\pi g_{9/2}$); hfs comparison to ^{107,107m}Ag											**
$*^{125}$Ag	T : average 21Ba34=176(3) 21Ha19=146(11) 15Lo04=150(8) 14SmZZ=163(+11-9) 95Fe12=166(7); other: 14TeZY=267(10)											**
$*^{125}$Ag	D : %β^-n others: 21Ha19=2.2(1.1) 14SmZZ=11.8(2.0)											**
$*^{125}$Ag^m	J : 00Kr18=(1/2) $p_{1/2}$; hfs comparison to ^{107,107m}Ag											**
$*^{125}$Ag^m	E : from 1118.5(0.3)-606.3(0.3)-415.1(0.3) keV in 19Ch24											**
$*^{125}$Cd^n	E : 11Si32=1461.8(0.7) keV above ^{125}Cd^m											**
$*^{125}$In	J : 24Ka49,22Ve05,87Eb02=9/2											**
$*^{125}$In^m	J : 22Ve05,87Eb02=1/2											**
$*^{125}$Sn	T : average 20Gu04=9.63(0.02) 68E_r03=9.67(0.04) 66La13=9.625(0.025)											**
$*^{125}$Sn	J : 25Gu23,20Yo07=11/2											**
$*^{125}$Sn^m	T : unweighted average 20Gu04=10.01(0.08) 68E_r03=9.52(0.05); Birge ratio=5.19											**
$*^{125}$Sn^p	J : E2 γ to 19/2$^+$											**
$*^{125}$Sn^q	J : E2 γ to 23/2$^-$											**
$*^{125}$Sn^q	T : average 08Lo07=230(20) 00Zh47=230(30)											**
$*^{125}$Sb	T : other (evaluation): ENSDF2011=2.75856(0.00025) based on old data, but the small uncertainty is not justified											**
$*^{125}$Sb	J : 23Le15,68St16,68An05,68BaZX,64He08=8											**
$*^{125}$Sb^n	J : E2 to 15/2$^-$											**
$*^{125}$Sb^n	T : average 19Bi04=28.8(0.6) 07Ju06=28.0(0.7)											**
$*^{125}$Sb^q	T : average 19Bi04=278(7) 07Ju06=272(16)											**
$*^{125}$Te	J : 50Fo08,49Ma47=1/2											**
$*^{125}$Te^m	T : average 24Su18=57.48(0.11) 78La21=57.40(0.05) [unc=0.15 3σ]; others: 88GeZS=57.8(0.4) 65An05=58(1) 49Hi27=58(4)											**
$*^{125}$I	J : 58Fl39=5/2											**
$*^{125}$Xe	T : average 26Wa03=16.56(0.08) 21Ze01=17.048(0.032) 19Sz01=16.87(0.08) 65An05=16.8(0.2) 69Lu09=17.3(0.4)- Birge ratio=2.96; others: 60Mo09=17(1)											**
$*^{125}$Xe	T : 52Be55=18.0(0.4) 50An05=20(1)											**
$*^{125}$Cs	J : 71Da01,66Da11=1/2											**
$*^{125}$Ba	J : 83Mu12=1/2											**
$*^{125}$Ba^m	E : 67.7(0.4) keV above 5/2$^+$ level, estimated at 50#(20#) keV by NUBASE											**
$*^{125}$Ce^m	T : symmetrized from 07Su07=134(+641-61) s for a fully ionized ion and α_T=38.1 for a 93.6(0.4) keV, E3 transition; ENSDF2011=3.4(2.7) s											**
^{126}Rh	−37200#	500#				19 ms 3	1$^-$#	21	15Lo04	T	β^-=100;β^-n ?;β^-2n ?	
^{126}Pd	−51500#	400#				48.7 ms 0.6	0$^+$	21	21Ha19	TD	β^-=100;β^-n=4.9 9	*
^{126}Pd^m	−49480#	400#	2023.5	0.7		330 ns 40	(5$^-$)	21	13Wa24	ETJ	IT=100	
^{126}Pd^n	−49390#	400#	2109.7	0.9		440 ns 30	(7$^-$)	21	13Wa24	ETJ	IT=100	
^{126}Pd^p	−49090#	400#	2406.4	1.0		23.0 ms 0.8	(10$^+$)	21	13Wa24	ETJ	β^-=72 8;IT=28 8	
^{126}Ag	−60720#	200#			*	52 ms 10	3$^+$#	21	14Ba18	TD	β^-=100;β^-n=13.7 11	*
^{126}Ag^m	−60620#	220#	100#	100#	*	104.5 ms 1.2	9$^-$#	21	21Ha19	TD	β^-=100;IT ?;β^-n=3.8 2	*
^{126}Ag^n	−60470#	200#	254.8	0.5		27 μs 6	1$^-$#	21	13La11	JTD	IT=100	*
^{126}Cd	−72255.7	2.3				515 ms 5	0$^+$	21	18Ha30	T	β^-=100	*
^{126}In	−77809	4				1.53 s 0.01	3$^+$*	21	74Gr29	T	β^-=100	*
^{126}In^m	−77719	5	90	7	MD	1.64 s 0.05	8$^-$	21	86Go10	T	β^-=100	*
^{126}In^n	−77566	4	243.3	0.2		22 μs 2	1$^-$	21	04Sc42	ETJ	IT=100	
^{126}Sn	−86010	6				211 ky 8	0$^+$	21			β^-=100	*
^{126}Sn^m	−83791	6	2218.99	0.08		6.1 μs 0.7	7$^-$	21			IT=100	*
^{126}Sn^n	−83446	6	2564.5	0.3		7.57 μs 0.22	10$^+$	21			IT=100	*
^{126}Sn^p	−81663	6	4347.4	0.4		114 ns 2	15$^-$	21	14Is04	EJT	IT=100	*
^{126}Sb	−86390	30				11.94 d 0.12	8$^-$*	21	24Mu01	T	β^-=100	*
^{126}Sb^m	−86370	30	17.7	0.3		19.15 m 0.09	5$^+$	21	24Mu01	T	β^-=81.4 6;IT=18.6 6	*
^{126}Sb^n	−86350	30	40.4	0.3		∼ 11 s	3$^-$	21	76Sm01	JT	IT=100[gs=0,m=100]	
^{126}Sb^p	−86290	30	104.6	0.3		553 ns 5	3$^+$	21	76Sm01	JT	IT=100	
^{126}Sb^q	−84580	30	1810.7	1.7		90 ns 16	(13$^+$)		19Bi04	EJT	IT=100	
^{126}Te	−90064.8	1.3				STABLE	0$^+$	21			IS=18.84 25	
^{126}I	−87911	4				12.93 d 0.05	2$^-$*	21			β^+=52.7 5;β^-=47.3 5	*
^{126}Xe	−89146.389	0.011				STABLE >1.9Zy	0$^+$	21	20Ak04	T	IS=0.089 3;2β^+ ?	*
^{126}Cs	−84351	10				97.0 s 0.9	1$^+$*	21	93Al03	T	β^+=100	*
^{126}Cs^m	−84079	10	272.44	0.25		< 1 μs	(4$^-$)		91TaZX	TD	IT=100	*
^{126}Cs^n	−83756	10	595.0	0.8		171 μs 8	8$^-$#	21	07Wa09	J	IT=100	*
^{126}Ba	−82670	12				98.6 m 1.4	0$^+$	21			β^+=100	*
^{126}La	−74970	90			*	64.0 s 0.3	(5$^+$)	21			β^+=100	*
^{126}La^m	−74760	400	210	410	BD*	10# s	0$^-$,1$^-$#	21	FGK257	TJ	β^+=100	*
^{126}Ce	−70821	28				50.96 s 0.34	0$^+$	21	02Ko02	T	β^+=100	*
^{126}Pr	−60400#	200#				3.12 s 0.18	4$^+$#,5$^-$#	21	95Os03	T	β^+=100;β^+p=?	*
^{126}Nd	−53380#	300#				1# s >310ns	0$^+$	21	25Su21	I	β^+ ?;β^+p ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{126}Pm	−39750#	500#				500# ms >310ns			25Su21	I	β^+ ?;β^+p ?	
*^{126}Pd	T : average 21Ha19=51(3) 15Lo04=48.6(0.8) 14Wa26=48.6(0.8); others: 14SmZZ=56(+11-9)											**
*^{126}Pd	D : %β^-n other: 14SmZZ=22(9)											**
*^{126}Ag	D : %β^-n from 14SmZZ, probably includes gs and isomer											**
*^{126}Ag^m	T : average 21Ha19=103.2(1.4) 14Ba18=92(9) 15Lo04=98(5) 14SmZZ=114(3) 95Fe12=107(12)											**
*^{126}Ag^n	T : other: 12Ka36>20 μs											**
*^{126}Cd	T : average 18Ha30=515(17) 15Lo04=513(6) 78Ga18=506(15) 86Go10=600(30)											**
*^{126}In	J : 87Eb02=3											**
*^{126}In	T : other: 86Go10=1.6(0.1)											**
*^{126}In^m	J : 79Fo10=8											**
*^{126}Sn	T : average 09Bi07=198.5(5.7),197.6(5.6) 05Ca14=233(10) 99Ob04=234.5(7.1) 96Ha45=207(21) 96Zh16=250(20); Birge ratio=2.5											**
*^{126}Sn^m	T : average 79Fo10=6.6(1.4) 10Il01=5.9(0.8)											**
*^{126}Sn^n	T : average 00Zh47=7.7(0.5) 10Il01=7.5(0.3) 98GeZX=7.6(0.4)											**
*^{126}Sn^p	T : other: 12As05=160(20),at variance (not used)											**
*^{126}Sb	J : 23Le15=8											**
*^{126}Sb	T : average 24Mu01=11.88(0.07),11.76(0.05) 71Or04=12.4(0.1) 62Dr01=12.5(0.2) 61Ha39=12.2(0.1); Birge ratio=3.51											**
*^{126}Sb^m	T : average 24Mu01=19.4(0.9) 72Pa13=19.6(1.0) 71Or04=19.0(0.3) 70Mu16=19(1) 67Ha27=19.2(0.1) 63Dr01=19.0(0.2)											**
*^{126}Sb^m	D : from 10Fe02; other: 71Or04=86(4) [%β^-] and 14(4) [%IT]											**
*^{126}I	J : 60Ga12=2											**
*^{126}I	D : from 98Fo05											**
*^{126}Xe	T : for 2ν-$\varepsilon\varepsilon$; other: 16Ab03>4.7 Zy (90% CL); 2ν-ε(K)ε(K) 19Ab04>19 Zy											**
*^{126}Cs	J : 78Ek05,77Ek02,76EkZX=1											**
*^{126}Cs	T : average 93Al03=97.8(1.8) 69Ch18=96.8(1.0); other: 54Ka33=96(12)											**
*^{126}Cs^m	T : 91TaZX≤1 μs; 218-keV and 241-keV γ-ray transition below the (4$^-$) isomer show the same lifetime, 166(15) μs and 176(15) μs,											**
*^{126}Cs^m	T : respectively, associated with ^{126}Cs^n											**
*^{126}Cs^n	D : 112-keV and 223-keV γ rays to 5$^-$ and 6$^-$ members of $K^\pi = 4^-$ band in 93Ko25 and 91TaZX											**
*^{126}Cs^n	T : average 91TaZX=166(15), 176(15), 171(13)											**
*^{126}Ba	T : average 76Pa11=100(2) 54Ka33=96.5(2.0) 62Pr09=103(5)											**
*^{126}La	T : 88GeZR=64(3) 02Ko02,97As05=63.6(0.4) [β-1228γ(t)], 66.7(1.6) [β-606γ(t)], 64.6(0.7) [β-621γ(t)] using γs depopulating J=5 and 6 states in											**
*^{126}La	T : ^{126}Ba; others: 92Ic02=54(2) 63Pr02=60(18)											**
*^{126}La	J : probable π1/2[550]⊗ν7/2[523] configuration with a J$^\pi$=5$^+$ bandhead											**
*^{126}La^m	T : 02Ko02,97As05=50.2(2.0) [β-1774γ(t)], 53.9(0.8) [β-727γ(t)] using γs depopulating exciting J$^\pi$=0$^+$ states in ^{126}Ba, consistent with the											**
*^{126}La^m	T : ^{126}Ce(J$^\pi$=0$^+$) half-life, thus implying that the half-life of the shorter-lived, β-decaying state in ^{126}La is much shorter than 50 s											**
*^{126}La^m	J : probable π1/2[550]⊗ν1/2[411] configuration with J$^\pi$=0$^-$ or 1$^-$ bandhead											**
*^{126}Ce	T : others: 87GeZX=50(4) 78Bo32=50(6)											**
*^{126}Pr	T : average 95Os03=3.14(0.22) 88Ba42=3.0(0.4) 83Ni05=3.2(0.6)											**
*^{126}Pr	J : probable π3/2[411]⊗ν5/2[402], $K^\pi = 4^+$ or π3/2[411]⊗ν7/2[523], $K^\pi = 5^-$											**
^{127}Rh	−33730#	600#				28 ms 14	7/2$^+$#	15	15Lo04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{127}Pd	−46900#	500#				38 ms 2	11/2$^-$#	15	21Ha19	TD	β^-=100;β^-n=9 3;β^-2n ?	*
^{127}Pd^m	−45180#	500#	1717.91	0.23		39 μs 6	(19/2$^+$)		19Wa14	ETJ	IT=100	
^{127}Ag	−58650#	200#			*	89.1 ms 0.9	(9/2$^+$)*	09	21Ha19	TD	β^-=100;β^-n=5.5 2	*
^{127}Ag^m	−58550#	220#	100#	100#	*	20# ms	(1/2$^-$)*				β^- ?;IT ?	
^{127}Ag^n	−56710#	200#	1938	17		67.5 ms 0.9	(27/2$^+$)		21Wa49	DJT	β^-=91.2 8;IT=8.8 8	*
^{127}Cd	−68741	6				480 ms 100	3/2$^+$*	09	13Yo02	J	β^-=100;β^-n ?	*
^{127}Cd^m	−68456	4	285	8	MD	337 ms 15	11/2$^-$*		21Ha19	TD	β^-=100;β^-n=0.6 4	*
^{127}Cd^n	−66896	10	1845	8		17.5 μs 0.3	(19/2$^+$)		10Na17	ETJ	IT=100	*
^{127}In	−76891.3	1.2				1.086 s 0.007	9/2$^+$*	09	93Ru01	TD	β^-=100;β^-n=0.015 9	*
^{127}In^m	−76483.2	1.3	408.1	0.5		3.618 s 0.021	1/2$^-$*	09	93Ru01	TD	β^-=100;β^-n=0.70 4	*
^{127}In^n	−75162.6	1.7	1728.7	1.2	MD	1.04 s 0.10	(23/2$^-$)	09	25Ve05	J	β^-=100;β^-n ?	
^{127}In^p	−74526.6	1.5	2364.7	0.9		9 μs 2	(29/2$^+$)	09	04Sc42	ETJ	IT=100	
^{127}Sn	−83470	9				2.10 h 0.04	11/2$^-$*	09			β^-=100	*
^{127}Sn^m	−83465	9	5.07	0.06		4.13 m 0.03	3/2$^+$*	09	20Yo07	J	β^-=100	
^{127}Sn^n	−81643	9	1826.67	0.16		4.52 μs 0.15	19/2$^+$	09	08Lo07	J	IT=100	
^{127}Sn^p	−81539	9	1930.97	0.17		1.26 μs 0.15	(23/2$^+$)	09			IT=100	
^{127}Sn^q	−80918	9	2552.4	1.0		250 ns 30	(27/2$^-$)	09	08Lo07	J	IT=100	
^{127}Sb	−86699	5				3.865 d 0.019	7/2$^+$*	09	25Li48	T	β^-=100	*
^{127}Sb^m	−84779	5	1920.19	0.21		11.7 μs 0.1	15/2$^-$	09	19Bi04	T	IT=100	*
^{127}Sb^n	−84374	5	2324.7	0.4		269 ns 5	23/2$^+$	09	19Bi04	T	IT=100	*
^{127}Te	−88281.1	1.3				9.35 h 0.07	3/2$^+$	09			β^-=100	
^{127}Te^m	−88192.9	1.3	88.23	0.07		106.1 d 0.7	11/2$^-$	09	17Ni03	D	IT=97.86 3;β^-=2.14 3	
^{127}I	−88984	4				STABLE	5/2$^+$*	09			IS=100	
^{127}Xe	−88321	4				36.342 d 0.003	1/2$^+$*	09	FGK209	T	ε=100	*
^{127}Xe^m	−88024	4	297.10	0.08		69.2 s 0.9	9/2$^-$*	09	90NeZY	J	IT=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{127}Cs	−86240	6				6.25 h 0.10	$1/2^+$*	09		β^+=100	*
^{127}Cs^m	−85788	6	452.23	0.21		55 μs 3	$(11/2)^-$	09		IT=100	
^{127}Ba	−82818	11				12.7 m 0.4	$1/2^+$*	09		β^+=100	*
^{127}Ba^m	−82738	11	80.32	0.11		1.93 s 0.07	$7/2^-$	09		IT=100	
^{127}La	−77896	26				5.1 m 0.1	$(11/2^-)$	09		β^+=100	
^{127}La^m	−77882	26	14.2	0.4		3.7 m 0.4	$(3/2^+)$	09		$\beta^+\approx$100;IT ?	
^{127}Ce	−71979	29				34 s 2	$(1/2^+)$	09		β^+=100	
^{127}Ce^m	−71972	29	7.3	1.1		28.6 s 0.7	$(5/2^+)$	09		β^+=100	
^{127}Ce^n	−71942	29	36.9	1.1		> 10 μs	$(7/2^-)$	09		IT=100	*
^{127}Pr	−64650#	200#				4.2 s 0.3	3/2$^+$#	09		β^+=100	
^{127}Pr^m	−64050#	280#	600#	200#		3# μs	$(11/2^-)$		98Mo30 J	IT ?	
^{127}Nd	−55910#	300#				1.8 s 0.4	5/2$^+$#	09		β^+=100;β^+p=?	
^{127}Pm	−45310#	400#				1# s >310ns	3/2$^+$#		25Su21 I	β^+ ?;p ?	
*^{127}Rh	T : symmetrized from 15Lo04=20(+20-7)										**
*^{127}Pd	T : from 15Lo04; others: 21Ha19=39(5) 14SmZZ=73(+24-23)										**
*^{127}Pd	D : %β^-n other: 14SmZZ<19										**
*^{127}Ag	T : others: 15Lo04=89(2) 96Wo.A=79(3), supersedes 95Fe12=109(25)										**
*^{127}Ag	J : 00Kr18=(9/2) ($\pi g_{9/2}$); hfs comparison to ^{107,107m}Ag										**
*^{127}Ag	D : %β^-n other: 14SmZZ=14.6(1.5)										**
*^{127}Ag^m	J : 00Kr18=(1/2) ($\pi p_{1/2}$); hfs comparison to ^{107,107m}Ag										**
*^{127}Ag^n	E : from 21Wa49=150(+14-20) keV above the 1792.2(0.9) keV										**
*^{127}Cd	T : symmetrized 19Lo04=450(+120$^-$-80)										**
*^{127}Cd^m	T : average 21Ha19=340(30) 19Lo04=360(40) 15Lo04=330(20)										**
*^{127}Cd^m	J : 13Yo02=11/2										**
*^{127}Cd^m	D : %β^-n from 21Ha19<1.2										**
*^{127}Cd^n	E : 1560.1(0.5) keV above ^{127}Cd^m										**
*^{127}Cd^n	T : others: 21Wa49=18(1) 12Ka36=11.0(+9.2-3.5)										**
*^{127}In	T : average 93Ru01=1.083(0.007) 86Go10=1.22(0.05) 83Sh07=0.99(0.10) 81En05=1.10(0.04); others: 80Lu04=1.12(0.02), superseded by 93Ru01,										**
*^{127}In	T : 02Pf04=1.090(0.010), compilation										**
*^{127}In	J : 25Ve05,24Ka49,22Ve05,87Eb02=9/2										**
*^{127}In	D : %β^-n from 93Ru01<0.03										**
*^{127}In^m	T : average 93Ru01=3.580(0.025) 86ReZU=3.70(0.04) 83Sh07=3.76(0.31) 80De35=3.7(0.1); other: 02Pf04=3.67(0.04), compilation										**
*^{127}In^m	D : %β^-n average 93Ru01=0.72(0.04) 86ReZU=0.54(0.11)										**
*^{127}In^m	J : 25Ve05,22Ve05=1/2										**
*^{127}In^m	E : from γ-ray energy difference 1202.3(0.3)-270.7(0.4)-523.5(0.2); others: 18Ba08=390(18) 21Iz01=406(12) 24Ja10=408(5)										**
*^{127}Sn	J : 25Gu23,20Yo07=11/2										**
*^{127}Sb	T : average 25Li48=3.877(0.024) 72Pa13=3.91(0.07) 67Ta05=3.75(0.10) 67Ha27=3.80(0.08) 62Uh01=3.92(0.09) 62Dr01=3.89(0.07) 57Bo96=3.67(0.09)										**
*^{127}Sb	T : 50Sl17=3.9(0.1); others: 46Gr06=4.0 39Ab02=3.3										**
*^{127}Sb	J : 23Le15=7/2										**
*^{127}Sb^m	T : other: 74Ap01=11(1)										**
*^{127}Sb^n	T : others (discrepant): 09Wa24=234(12) 05Po03=165(20)										**
*^{127}Xe	J : 90NeZY=1/2										**
*^{127}Xe^m	J : 90NeZY=9/2										**
*^{127}Cs	J : 58Ni27,56Ni16=1/2										**
*^{127}Ba	J : 83Mu12=1/2										**
*^{127}Ce^n	E : 95Os03=29.56(0.05) keV above ^{127}Ce^m										**
*^{127}Pr^m	T : estimated from BE3(11/2$^-$ to 5/2$^+$)=41.2(2.0) (W.u.) in ^{131}Pr										**
^{128}Rh	−27340#	300#				8# ms >550ns		21	18Sh11 I	β^- ?;β^-n ?;β^-2n ?	
^{128}Pd	−44160#	500#				35 ms 3	0^+	16	21Ha19 TD	β^-=100;β^-n=10 7	*
^{128}Pd^m	−42010#	500#	2151.0	1.0		5.8 μs 0.8	(8^+)	16		IT=100	
^{128}Ag	−54710#	300#				64.6 ms 1.3	9$^-$#	15	25Lu09 TJ	β^-=100;β^-n=9.3 5;β^-2n ?	*
^{128}Ag^m	−52610#	300#	2104	17		1.60 μs 0.07	16$^-$#		25Lu09 ETJ	IT=100	*
^{128}Cd	−67238	6				247.2 ms 1.8	0^+	15	25Ll01 T	β^-=100;β^-n=1.0 6	*
^{128}Cd^m	−65368	6	1870.5	0.3		270 ns 7	(5^-)	15	09Ca02 TJ	IT=100	
^{128}Cd^n	−64523	6	2714.6	0.4		3.56 μs 0.06	(10^+)	15	09Ca02 TJ	IT=100	*
^{128}Cd^p	−62951	6	4286.6	1.5		6.3 ms 0.8	(15^-)		17Ju02 ETJ	IT=100	
^{128}In	−74190.1	1.3				812 ms 7	$(3)^+$	15	25Ll01 T	β^-=100;β^-n=0.038 3	*
^{128}In^m	−73942.2	1.3	247.87	0.10		23 μs 2	$(1)^-$	15	04Sc42 J	IT=100	
^{128}In^n	−73905.0	2.0	285.1	2.2	MD	720 ms 100	(8^-)	15		β^-=100;IT ?;β^-n ?	
^{128}In^p	−72392.5	1.4	1797.6	1.6	MD	> 0.3 s	(16^+)	15	20Ne06 JT	$\beta^-\approx$100;IT ?;β^-n ?	
^{128}Sn	−83319	11				59.07 m 0.14	0^+	15		β^-=100	
^{128}Sn^m	−81228	11	2091.50	0.11		6.5 s 0.5	7^-	15		IT=100	*
^{128}Sn^n	−80827	11	2491.91	0.17		2.91 μs 0.14	10^+	15		IT=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{128}Sn^{p}	−79220	11	4099.5	0.4		220 ns 30	(15$^-$)	15			IT=100	
^{128}Sb	−84607.8	2.1				9.05 h 0.04	8$^-$∗	15	23Le15	J	β^-=100	∗
^{128}Sb^{m}	−84564.7	2.5	43	3	MD	10.41 m 0.18	5$^+$	15			β^-=96.4 10;IT=3.6 10	
^{128}Sb^{n}	−82990.5	2.2	1617.3	0.7		500 ns 20	(11$^+$)		19Bi04	ETJ	IT=100	
^{128}Sb^{p}	−82837.9	2.4	1769.9	1.2		217 ns 7	(13$^+$)		19Bi04	ETJ	IT=100	
^{128}Te	−88993.8	0.7				2.17 Yy 0.20	0$^+$	15	25Pr02	T	IS=31.74 8;2β^-=100	∗
^{128}Te^{m}	−86203.0	0.8	2790.8	0.3		363 ns 27	(10$^+$)	15	04Va03	T	IT=100	∗
^{128}I	−87738	4				24.99 m 0.02	1$^+$∗	15			β^-=93.1 8;β^+=6.9 8	∗
^{128}I^{m}	−87600	4	137.851	0.003		845 ns 20	4$^-$	15			IT=100	
^{128}I^{n}	−87571	4	167.368	0.004		175 ns 15	(6)$^-$	15			IT=100	
^{128}Xe	−89860.536	0.009				STABLE	0$^+$	15			IS=1.910 13	
^{128}Xe^{m}	−87073.3	0.3	2787.2	0.3		83 ns 2	8$^-$				IT=100	
^{128}Cs	−85932	5				3.640 m 0.014	1$^+$∗	15	93Al03	T	β^+=100	∗
^{128}Ba	−85368.6	1.6				2.43 d 0.05	0$^+$	15			ε=100	
^{128}La	−78630	50			*	5.18 m 0.14	(5$^+$)	15	97Ha30	T	β^+=100	∗
^{128}La^{m}	−78530#	110#	100#	100#	*	< 1.4 m	(1$^+$,2$^-$)		97Ha30	T	β^+≈100;IT ?	
^{128}Ce	−75534	28				3.93 m 0.02	0$^+$	15	00Li08	T	β^+=100	∗
^{128}Pr	−66331	30				2.85 s 0.09	(3$^+$)	15	99Xi03	J	β^+=100;β^+p=?	∗
^{128}Nd	−60640#	200#				2# s	0$^+$	15	83Ni05	TD	β^+=100;β^+p ?	∗
^{128}Pm	−48220#	300#				1.0 s 0.3	4$^+$#	15	93Li40	D	β^+=100;p=0;β^+p=?	∗
^{128}Sm	−39150#	500#				500# ms >310ns	0$^+$		25Su21	I	β^+ ?;β^+p ?	
∗^{128}Pd	T : from 15Lo04; others: 21Ha19=52(10) 14SmZZ<26.2											∗∗
∗^{128}Ag	T : average 25Lu09=54(4) 21Ha19=67.4(1.6) 15Lo04=59(5) 14SmZZ=73(+10-9) 96Wo.A=58(5) 95Kr.A=60(10)											∗∗
∗^{128}Ag	D : %β^-n from 21Ha19=9.3(0.5); other: 14SmZZ=20(5)											∗∗
∗^{128}Ag^{m}	E : from 2054 + x keV, x=50(17) keV from 25Lu09=20-80 keV											∗∗
∗^{128}Cd	T : average 25Ll01=256(5) 21Ha19=243(11) 16Du13=246.2(2.1) 15Lo04=245(5)											∗∗
∗^{128}Cd	D : %β^-n from 21Ha19<1.9											∗∗
∗^{128}Cd^{n}	T : others: 19Ph02=3.6(0.4) 12Ka36=3.76(+0.44-0.37)											∗∗
∗^{128}In	T : average 25Ll01=814(9) 15Lo04=810(30) 86Go10=840(60) 93Ru01=776(24) 81En05=830(20) 74Gr29=800(30); others: 76Lu02=940(50) 77FoZR=900(100)											∗∗
∗^{128}In	D : %β^-n from 93Ru01, probably includes gs and isomer											∗∗
∗^{128}Sn^{m}	J : E3 to 4$^+$											∗∗
∗^{128}Sn^{n}	J : E2 to 8$^+$											∗∗
∗^{128}Sb	J : 23Le15,74Ek01=8											∗∗
∗^{128}Te	T : 2ν-$\beta\beta$ from 25Pr02 (evaluation); 0ν-$\beta\beta$ 22Ad13>3.6 Yy											∗∗
∗^{128}Te^{m}	T : average 04Va03=337(59) 98Zh09=370(30)											∗∗
∗^{128}I	J : 59Sh63=1											∗∗
∗^{128}Cs	T : average 93Al03=3.66(0.02) 76He04=3.62(0.02); other: 25Ba18=3.3(0.7)											∗∗
∗^{128}Cs	J : 78Ek05,77Ek02,76EkZX=1											∗∗
∗^{128}La	T : average 97Ha30=5.4(0.2) 77Zo02=5.2(0.4) 66Pa06=4.9(0.4) 66Li04=4.9(0.4)											∗∗
∗^{128}Ce	T : average 00Li08=4.0(0.1) 97Ha30=4.1(0.3) 97As05=3.925(0.021)											∗∗
∗^{128}Pr	T : average 99Xi03=2.8(0.1) 88Ba42=3.1(0.3) 85Wi07=3.2(+0.5-0.4)											∗∗
∗^{128}Pr	D : β^+p observed in 85Wi07, but was not quantified											∗∗
∗^{128}Nd	T : 83Ni05=4(2) s, but 85Wi07 associated this with decay of ^{128}Pr											∗∗
∗^{128}Pm	D : %p 93Li40=0											∗∗
^{129}Pd	−37610#	600#				31 ms 7	7/2$^-$#	15			β^-=100;β^-n ?;β^-2n ?	
^{129}Ag	−51870#	400#			*	53.1 ms 1.2	9/2$^+$#	14	22Ph01	TD	β^-=100;β^-n=19.1 13	∗
^{129}Ag^{m}	−51850#	400#	20#	20#	*	10# ms	1/2$^-$#	14			β^- ?;β^-n ?	∗
^{129}Cd	−63122	5				147 ms 3	11/2$^-$∗	15	16Du13	T	β^-=100;β^-n=?	∗
^{129}Cd^{m}	−62779	6	343	8	MD	155.9 ms 1.3	3/2$^+$∗	15	21Ha19	TD	β^-=100;β^-n=1.84 15	∗
^{129}Cd^{n}	−60839	9	2283	8		3.6 ms 0.2	(21/2$^+$)	15	14Ta29	TJE	IT=100	∗
^{129}In	−72834.9	2.0				603 ms 4	9/2$^+$∗	14	21Ga10	T	β^-=100;β^-n=0.24 6	∗
^{129}In^{m}	−72384.1	2.0	450.74	0.16	IT	1.181 s 0.008	1/2$^-$∗	14	21Ga10	T	β^-≈100;IT ?;β^-n=3.2 7	∗
^{129}In^{n}	−71146.9	2.0	1687.97	0.25		10.88 μs 0.09	(17/2$^-$)	14	20Sa31	T	IT=100	∗
^{129}In^{p}	−71188	4	1647	3	MD	650 ms 20	23/2$^-$∗	14	21Ga10	T	β^-≈100;IT ?	∗
^{129}In^{q}	−70907	4	1928	3	IT	98 ms 11	(29/2$^+$)	14	21Ga10	TD	IT=98.0 5;β^-=2.0 5	∗
^{129}Sn	−80592.9	1.8				2.23 m 0.04	3/2$^+$∗	14			β^-=100	∗
^{129}Sn^{m}	−80557.8	1.8	35.15	0.05		6.9 m 0.1	11/2$^-$∗	14	20Yo07	J	β^-=100	
^{129}Sn^{n}	−78831.3	2.1	1761.6	1.0		3.49 μs 0.11	(19/2$^+$)	14	08Lo07	T	IT=100	∗
^{129}Sn^{p}	−78790.3	2.1	1802.6	1.0		2.22 μs 0.13	23/2$^+$	14	08Lo07	TJ	IT=100	∗
^{129}Sn^{q}	−78040.0	2.1	2552.9	1.1		221 ns 18	(27/2$^-$)	14	08Lo07	J	IT=100	
^{129}Sb	−84593.6	1.4				4.366 h 0.026	7/2$^+$∗	14	23Le15	J	β^-=100	
^{129}Sb^{m}	−82742.3	1.4	1851.31	0.06		17.7 m 0.1	19/2$^-$	14	19Bi04	J	β^-=85;IT=15	
^{129}Sb^{n}	−82732.5	1.4	1861.06	0.05		2.23 μs 0.17	15/2$^-$	14	19Bi04	TJ	IT=100	∗

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{129}Sb^{p}	−82454.2	1.4	2139.4	0.3		0.89 μs 0.03	$23/2^+$	14	19Bi04	TJ	IT=100	
^{129}Te	−87004.9	0.7				69.6 m 0.3	$3/2^+$	14			β^-=100	
^{129}Te^{m}	−86899.4	0.7	105.51	0.03		33.6 d 0.1	$11/2^-$	14			IT=64 7;β^-=36 7	
^{129}I	−88507	3				16.14 My0.12	$7/2^+$*	14	18Ga37	T	β^-=100	*
^{129}Xe	−88696.072	0.005				STABLE	$1/2^+$*	14			IS=26.401 138	*
^{129}Xe^{m}	−88459.93	0.03	236.14	0.03		8.88 d 0.02	$11/2^-$*	14	90NeZY	J	IT=100	*
^{129}Cs	−87499	5				32.06 h 0.06	$1/2^+$*	14			β^+=100	*
^{129}Cs^{m}	−86924	5	575.40	0.14		718 ns 21	$(11/2^-)$	14			IT=100	
^{129}Ba	−85061	11				2.23 h 0.11	$1/2^+$	14			β^+=100	
^{129}Ba^{m}	−85053	11	8.42	0.06		2.135 h 0.010	$7/2^+$	14			$\beta^+\approx$100;IT ?	
^{129}La	−81324	21				11.6 m 0.2	$(3/2^+)$	14			β^+=100	
^{129}La^{m}	−81152	21	172.33	0.20		560 ms 50	$(11/2^-)$	14			IT=100	
^{129}Ce	−76288	28				3.5 m 0.3	$(5/2^+)$	14	93Al03	T	β^+=100	
^{129}Pr	−69774	30				30 s 4	$(3/2^+)$	14	96Gi08	J	β^+=100	
^{129}Pr^{m}	−69390	30	382.57	0.24		137# μs 7#	$(11/2^-)$				IT=100	*
^{129}Nd	−62380#	200#				6.8 s 0.6	$(7/2^-)$	14	85Wi07	D	β^+=100;β^+p=?	*
^{129}Nd^{m}	−62360#	200#	16.7	1.3		2.6 s 0.4	$(1/2^+)$	14	23Pe11	EJ	β^+=100;β^+p=?	*
^{129}Nd^{n}	−60100#	200#	2284.3	0.9		480 ns 40	$(21/2^+)$		23Pe11	ETJ	IT=100	
^{129}Pm	−53180#	300#				2.4 s 0.9	$5/2^+$#	14			β^+=100;β^+p ?	
^{129}Sm	−42330#	500#				550 ms 100	$(1/2^+,3/2^+)$	14			β^+=100;β^+p ?	
*^{129}Ag	T : average 22Ph01=53.6(1.3), supersedes 21Ha19=55(3), 15Lo04=52(4) 00Kr18=46(+5-9); other: 14SmZZ=95(+35-29)											**
*^{129}Ag	D : %β^-n: symmetrized from 22Ph01=18.6(+1.7-0.9); others: 21Ha19=17.9(1.4) 14SmZZ<20; observed also by 00Kr18, but was not quantified											**
*^{129}Ag^{m}	T : 00Kr18=158(60) ms is not convincing; not adopted in 02Pf04 (same group)											**
*^{129}Cd	T : from 16Du13=147(3) gated by γs's in the high-spin decay; others: 15Ta13=155(3) 09Ar04=104(6)											**
*^{129}Cd	D : β^-n was observed by 05Kr20, but it was not quantified											**
*^{129}Cd	J : 13Yo02=11/2											**
*^{129}Cd^{m}	D : %β^-n other: observed by 05Kr20, but was not quantified											**
*^{129}Cd^{m}	T : others: 16Du13=157(8) gated by γs's in the low-spin decay; 15Ta13=146(8) 15Lo04=154.5(2.0), possible a mixture of two states,											**
*^{129}Cd^{m}	T : 09Ar04=242(8)											**
*^{129}Cd^{m}	J : 13Yo02=3/2											**
*^{129}Cd^{n}	E : 14Ta29=1940.0(1.4) keV above ^{129}Cd^{m}											**
*^{129}In	J : 25Ve06,24Ka49,22Ve05=(9/2);other: β^- decay properties in 04Ga24											**
*^{129}In	T : average 21Ga10=600(10) 15Lo04=570(10) 93Ru01=611(5) 86Wa17=610(10) 80Lu04=590(20) 80De35=590(30)											**
*^{129}In	D : unweighted average 93Ru01=0.331(0.032) 86Wa17,86ReZU=0.13(0.01) 80Lu04=0.25(0.05); Birge ratio=4.47											**
*^{129}In^{m}	J : 25Ve05,22Ve05=1/2											**
*^{129}In^{m}	T : average 21Ga10=1.16(0.01) 86Wa17=1.18(0.03) 86Go10=1.30(0.10) 80Lu04=1.26(0.02) 80De35=1.20(0.05)											**
*^{129}In^{m}	D : unweighted average 93Ru01=3.92(0.19) 86Wa17=2.52(0.12); Birge ratio=6.2											**
*^{129}In^{n}	T : average 20Sa31=10.8(0.1) 14Ta.A=11.2(0.2)											**
*^{129}In^{p}	T : other: 04Ga24=670(100)											**
*^{129}In^{p}	J : 25Ve05=23/2; other: β^- decay properties in 04Ga24											**
*^{129}In^{q}	E : 04Sc42=281.0(0.2) keV γ above ^{129}In^{p}											**
*^{129}In^{q}	T : average 21Ga10=85(15) 04Sc42=110(15)											**
*^{129}Sn	J : 25Gu23,20Yo07=3/2											**
*^{129}Sn^{n}	T : average 08Lo07=3.4(0.4) 04Ga24=3.2(0.2) 00Pi03=3.7(0.2) 00Ge07=3.6(0.2)											**
*^{129}Sn^{p}	T : average 08Lo07=2.4(0.4) 04Ga24=2.0(0.2) 00Ge07=2.4(0.2)											**
*^{129}Sb^{n}	T : average 19Bi04=2.3(0.3) 03Ge04=2.2(0.2)											**
*^{129}I	T : others: 51Ka16=17.2(0.9) 57Ru65=15.6(0.6) 72Em01=15.7(0.4) 73Ku17=19.7(1.4)											**
*^{129}I	J : 49Li09=7/2											**
*^{129}Xe	J : 50Ko09,34Ko02,34Jo01=1/2											**
*^{129}Xe^{m}	J : 90NeZY=11/2											**
*^{129}Cs	J : 58Ni27,56Ni16=1/2											**
*^{129}Pr^{m}	T : estimated from BE3(11/2$^-$ to 5/2$^+$)=41.2(2.0) (W.u.) in ^{131}Pr											**
*^{129}Nd	T : average 10Xu12=6.7(0.7) 97Gi07=7(1); other: 85Wi07=4.9(0.2) is for a mixture between the gs and the isomer											**
*^{129}Nd	J : from 23Pe11, based on the observed band properties											**
*^{129}Nd^{m}	E : from E(5/2$^+$)=107.9(0.8) keV and 406(1) keV γ to 9/2$^+$ level in 23Pe11, and 318.4(0.2) keV, 178.8(0.2) keV cascade depopulating the same											**
*^{129}Nd^{m}	E : 9/2$^+$ level in 02Ze01											**
^{130}Pd	−32630#	300#				27# ms >550ns	0^+	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{130}Ag	−45900#	420#				43.0 ms 2.5	1^-#	15	22Ph01	TD	β^-=100;β^-n=66 6;β^-2n=2.5 15	*
^{130}Cd	−61118	22				131.0 ms 1.2	0^+	08	22Ph01	TD	β^-=100;β^-n=2.95 14	*
^{130}Cd^{m}	−58989	22	2128.6	0.7		225 ns 4	(8^+)	08	24Ju03	ET	IT=100	*
^{130}In	−69906.5	1.8				273 ms 5	$1(^-)$	08	15Lo04	T	β^-=100;β^-n=0.93 13	*
^{130}In^{m}	−69840.0	2.0	66.5	2.7	MD	540 ms 10	(10^-)	08			β^-=100;β^-n=1.80 7	*
^{130}In^{n}	−69521.1	2.1	385.4	2.6	MD	540 ms 10	(5^+)	08			β^-=100;β^-n=1.80 7	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{130}In^{p}	−69518.2	1.8	388.3	0.2	4.6 μs 0.2	(3^+)		08 16Ju03	T	IT=100	*
^{130}Sn	−80129.6	1.2			3.72 m 0.07	0^+		01		β^-=100	
^{130}Sn^{m}	−78182.7	1.2	1946.88	0.10	1.7 m 0.1	7^-		01 05Le34	J	β^-=100	
^{130}Sn^{n}	−77694.8	1.2	2434.79	0.12	1.501 μs 0.017	(10^+)		01 11Pi05	T	IT=100	
^{130}Sb	−82283	14			39.5 m 0.8	8^-*		01 23Le15	J	β^-=100	
^{130}Sb^{m}	−82278	14	4.80	0.20	6.3 m 0.2	4^+		01 94WaZU	J	β^-=100	
^{130}Sb^{n}	−82198	14	84.67	0.04	800 ns 100	6^-		02Ge07	TJ	IT=100	
^{130}Sb^{p}	−80775	14	1508	1	600 ns 15	(11^+)		19Bi04	ETJ	IT=100	
^{130}Sb^{q}	−80738	14	1544.7	0.5	1.25 μs 0.01	(13^+)		02Ge07	ETJ	IT=100	*
^{130}Te	−87352.961	0.011			933 Ey 9	0^+		01 25Ad05	T	IS=34.08 62;2β^-=100	*
^{130}Te^{m}	−85206.55	0.04	2146.41	0.04	111 ns 4	7^-		01 22Ku31	T	IT=100	*
^{130}Te^{n}	−84685.8	0.8	2667.2	0.8	1.91 μs 0.06	(10^+)		01 04Br19	E	IT=100	*
^{130}Te^{p}	−82979.1	0.9	4373.9	0.9	53 ns 8	(15^-)		14As01	JTE	IT=100	*
^{130}I	−86936	3			12.36 h 0.01	5^+*		01		β^-=100	*
^{130}I^{m}	−86896	3	39.9525	0.0013	8.84 m 0.06	2^+		01		IT=84 2;β^-=16 2	
^{130}I^{n}	−86866	3	69.5865	0.0007	133 ns 7	6^-		01		IT=100	*
^{130}I^{p}	−86854	3	82.3960	0.0019	315 ns 15	(8^-)		01		IT=100	
^{130}I^{q}	−86851	3	85.1099	0.0010	254 ns 4	6^-		01		IT=100	*
^{130}Xe	−89880.476	0.009			STABLE	0^+		01		IS=4.071 22	
^{130}Cs	−86900	8			29.21 m 0.04	1^+*		01		β^+=98.4;β^-=1.6	*
^{130}Cs^{m}	−86737	8	163.25	0.11	3.46 m 0.06	5^-*		01		IT=99.84 2;β^+=0.16 2	*
^{130}Cs^{x}	−86873	17	27	15	$R=0.2\sim0.1$	*fsmix*					
^{130}Ba	−87256.72	0.29			2.2 Zy 0.5	0^+		01 20Ba63	T	IS=0.11 1;2β^+ ?	*
^{130}Ba^{m}	−84781.6	0.3	2475.12	0.18	9.54 ms 0.14	8^-		01 02Mo31	T	IT=100	*
^{130}La	−81627	26			8.68 m 0.09	(3^+)		01 25Ba18	T	β^+=100	*
^{130}La^{m}	−81413	26	214.0	0.3	742 ns 28	(5^+)		01 14Io01	TJ	IT=100	*
^{130}Ce	−79423	28			22.9 m 0.5	0^+		01		β^+=100	
^{130}Ce^{m}	−76969	28	2453.6	0.3	100 ns 8	7^-		01 99Io02	J	IT=100	
^{130}Pr	−71180	60			40.0 s 0.4	$(6,7)$		01 88Ba42	J	β^+=100	*
^{130}Pr^{m}	−71080#	120#	100#	100#	10# s	2^+#		01 88Ba42	J	β^+ ?; IT ?	*
^{130}Nd	−66596	28			21 s 3	0^+		01 01Gi17	T	β^+=100	*
^{130}Pm	−55470#	200#			2.6 s 0.2	$(5,6)$#		01		β^+=100;β^+p=?	*
^{130}Sm	−47700#	400#			1# s	0^+		01		β^+ ?	
^{130}Eu	−34010#	500#			1.0 ms 0.4	(1^+)		08 04Da04	TD	p≈100;β^+ ?;β^+p ?	*
*^{130}Ag	T : average 22Ph01=44(3) 15Lo04=42(5) 05Kr20=35(10)										**
*^{130}Ag	D : %β^-2n from 22Ph01<5										**
*^{130}Cd	T : average 22Ph01=135(2) 21Ha19=134(3) 16Du13=126(4) 15Lo04=127(2); others: 01Ha39=162(7) 86Kr17=195(35)										**
*^{130}Cd	D : %β^-n average 22Ph01=2.9(0.2) 21Ha19=3.0(0.2); other: 01Ha39=3.5(1.0)										**
*^{130}Cd^{m}	T : average 24Ju03=224(4) 12Ka36=248(+21-19) 07Ju05=220(30)										**
*^{130}In	T : average 15Lo04=284(10) 93Ru01=256(9) 86ReZU=278(7)										**
*^{130}In	D : %β^-n average 93Ru01=1.49(0.22) 86Wa17=0.90(0.05), Birge ratio=2.62; other: 86ReZU=0.91(0.10), same as 86Wa17										**
*^{130}In^{m}	D : %β^-n average 93Ru01=2.03(0.12) 86Wa17=1.67(0.09), includes both ^{130}In^{m} and ^{130}In^{n} isomers										**
*^{130}In^{m}	J : 81Fo02=(10^-); direct β^- decay to 9^- consistent with 8^-,9^- or 10^-										**
*^{130}In^{n}	D : %β^-n average 93Ru01=2.03(0.12) 86Wa17=1.67(0.09), includes both ^{130}In^{m} and ^{130}In^{n} isomers										**
*^{130}In^{p}	T : average 16Ju03=4.4(0.2) 12Ka36=5.25(+0.40-0.35); other: 04Sc42=3.1(0.3)										**
*^{130}Sb^{q}	T : from 19Bi04; other: 02Ge07=1.8(0.2)										**
*^{130}Te	T : 2ν-$\beta\beta$, from 25Ad05=932(+5-4,stat)(7,syst), supersedes 21Ad18=771(+8-6,stat)(+12-15,syst) 20Nu01,19Ca21=790(10,stat)(20,syst)										**
*^{130}Te	T : 17Al46=820(20,stat)(60,syst) 11Ar09=700(90,stat)(110,syst) 03Ar02=610(140,stat)(290,syst); others (geochemical): 08Th07=800(110)										**
*^{130}Te	T : 08Me10=900(140) 93Be04=270(100) 91Ma64∼800; other (evaluation): 25Pr02=869(18) 20Ba63=791(21); 0ν-$\beta\beta$: 22Ad14,23Ad01>22 Yy, supersedes										**
*^{130}Te	T : 20Ad04>32 Yy 18Al13>15 Yy										**
*^{130}Te^{m}	T : average 22Ku31=107(17) 14As01=110(5) 72Ke28=115(11); other: 04Va03=186(11)										**
*^{130}Te^{n}	T : average 22Ku31=1.91(0.08) 01Ge07=1.90(0.08); other: 98Zh09=4.2(0.9)										**
*^{130}Te^{p}	T : others: 04Br19=45 98HoZP=261(33)										**
*^{130}I	J : 59Sh63,58Ga20=5										**
*^{130}I^{n}	J : E1 to 5^+										**
*^{130}I^{q}	J : E1 to 5^+										**
*^{130}Cs	J : 58Ni27,56Ni16=1										**
*^{130}Cs^{m}	J : 78Ek05,77Ek02,76EkZX=5										**
*^{130}Ba	T : 2ν-$\varepsilon\varepsilon$ from 20Ba63 (evaluation); other: 25Pr02=1.4(0.8) (evaluation)										**
*^{130}Ba^{m}	T : others: 66Br14=8.8(0.2) 69Wa.A=13.5(1.0)										**
*^{130}La	T : average 25Ba18=8.6(0.2) 63Ya05=8.7(0.1); other: 61Sh17=9.0(1.0)										**
*^{130}La^{m}	T : average 14Io01=760(90) 12Ta18=740(30)										**
*^{130}La^{m}	E : from a least-squares fit to E_γ in 20Io02										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{130}$Pr	J : direct β feeding to the 7^- level in ^{130}Ce in 88Ba42											**
$*^{130}$Pr^m	J : evidence for a low-spin component in ^{130}Pr activity in 88Ba42											**
$*^{130}$Nd	T : others: 00Xu08=13(3) 77Bo02=28(3), discrepant (not used)											**
$*^{130}$Pm	D : β^+p observed in 85Wi07, but not quantified											**
$*^{130}$Eu	T : symmetrized from 04Da04=0.90(+0.49-0.29)											**
^{131}Pd	−25720#	300#				20# ms	>550ns		7/2−#	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{131}Ag	−40750#	500#				35 ms	4		9/2+#	15	22Ph01	TD	β^-=100;β^-n=96 4;β^-2n=3.0 17	*
^{131}Cd	−55212	19				99.0 ms	1.4		7/2−#	06	22Ph01	TD	β^-=100;β^-n=13.8 9;β^-2n=0.35 20	*
^{131}In	−68024.4	2.2				262.0 ms	0.8		9/2+*	06	24Be19	TD	β^-=100;β^-n=2.46 17	*
^{131}In^m	−67648.4	2.5	376	3	MD	335.7 ms	1.2		1/2−*	06	24Be19	TD	β^-=100;β^-n=1.2 6	*
^{131}In^n	−64280	30	3740	30	MD	343 ms	4		(21/2+)	06	24Be19	TD	β^-=100;IT ?;β^-n=8.9 8	*
^{131}In^p	−64240.8	2.3	3783.6	0.5		669 ns	34		(17/2+)		09Go40	TJ	IT=100	*
^{131}Sn	−77278.3	1.9				56.0 s	0.5		3/2+*	06			β^-=100	*
^{131}Sn^m	−77213.2	1.9	65.10	0.27		58.4 s	0.5		11/2−*	06	04Fo06	E	β^-=100;IT ?	*
^{131}Sn^n	−72608.2	1.9	4670.1	0.4		316.0 ns	1.9		(23/2−)	06	24Be19	TD	IT=100	*
^{131}Sb	−81982.3	2.1				23.03 m	0.04		7/2+*	06	23Le15	J	β^-=100	
^{131}Sb^m	−80306.2	2.1	1676.06	0.06		64.2 μs	2.6		15/2−	06	19Bi04	T	IT=100	*
^{131}Sb^n	−80295.1	2.3	1687.2	0.9		4.3 μs	0.8		19/2−	06	00Ge18	TJ	IT=100	
^{131}Sb^p	−79816.7	2.6	2165.6	1.5		0.97 μs	0.03		23/2+	06	19Bi04	T	IT=100	*
^{131}Te	−85211.02	0.06				25.0 m	0.1		3/2+	06			β^-=100	
^{131}Te^m	−85028.76	0.06	182.258	0.018		32.48 h	0.11		11/2−	06	08Ea01	T	β^-=74.1 5;IT=25.9 5	
^{131}Te^n	−83271.0	0.4	1940.0	0.4		93 ms	12		(23/2+)	06			IT=100	
^{131}I	−87441.32	0.20				8.0241 d	0.0013		7/2+*	06	FGK259	T	β^-=100	*
^{131}I^m	−85523.72	0.28	1917.6	0.2		24 μs	1		19/2−		09Wa11	EJT	IT=100	*
^{131}Xe	−88413.576	0.007				STABLE			3/2+*	06			IS=21.232 51	*
^{131}Xe^m	−88249.646	0.011	163.930	0.008		11.955 d	0.012		11/2−*	06	FGK267	T	IT=100	*
^{131}Cs	−88055.57	0.18				9.689 d	0.016		5/2+*	06			ε=100	*
^{131}Ba	−86678.9	0.4				11.549 d	0.028		1/2+*	06	26Wa03	T	β^+=100	*
^{131}Ba^m	−86490.9	0.4	187.995	0.009		14.47 m	0.10		9/2−*	06	25Ba18	T	IT=100	*
^{131}La	−83769	28				60.17 m	0.01		3/2+*	06	25Ba18	T	β^+=100	*
^{131}La^m	−83464	28	304.60	0.24		170 μs	7		11/2−	06			IT=100	
^{131}Ce	−79710	30				10.3 m	0.3		7/2+	06			β^+=100	
^{131}Ce^m	−79650	30	63.09	0.09		5.4 m	0.4		(1/2+)	06	96Gi08	E	β^+=100	
^{131}Pr	−74300	50				1.50 m	0.03		(3/2+)	06	96Gi08	TJ	β^+=100	*
^{131}Pr^m	−74150	50	152.4	0.3		5.73 s	0.20		(11/2−)	06			IT=96.4 12;β^+=3.6 12	
^{131}Nd	−67768	28				26.0 s	0.9		(5/2+)	22			β^+=100;β^+p=?	*
^{131}Pm	−59770#	200#				6.3 s	0.8		(11/2−)	22	99Ga41	T	β^+=100	
^{131}Sm	−50280#	400#				1.2 s	0.2		5/2+#	22	86Wi15	T	β^+=100;β^+p=?	
^{131}Eu	−39460#	400#				17.8 ms	1.9		3/2+	22	99So17	T	p≈100;β^+ ?;β^+p ?	
$*^{131}$Ag	T : average 22Ph01=35(5) 15Lo04=35(8)											**
$*^{131}$Ag	D : %β^-n symmetrized from 22Ph01=100(+0-6); %β^-2n from 22Ph01<6											**
$*^{131}$Cd	T : average 22Ph01=100(2) 15Lo04=98(2) [15Lo04=98.0(0.2) is a typo]; other: 00Ha55=68(3)											**
$*^{131}$Cd	D : %β^-2n symmetrized from 22Ph01=13.5(+1.1-0.7); other: 00Ha55=3.5(1.0); %β^-2n: from 22Ph01<0.7											**
$*^{131}$In	D : %β^-n average 24Be19=2.4(0.6) 22Ph01=2.9(0.3) 19Du12=2.3(0.3) 93Ru01=2.2(0.3)											**
$*^{131}$In	T : average 24Be19=261.8(0.8) 22Ph01=278(7) 19Du12=265(8) 15Lo04=261(3); other: 04Fo06=280(30)											**
$*^{131}$In	J : 24Ka49,22Ve05=(9/2); others: β^- decay properties in 04Fo06 and 19Du12											**
$*^{131}$In^m	T : average 24Be19=335.7(1.2) 19Du12=328(15); other: 04Fo06=350(50)											**
$*^{131}$In^m	J : 22Ve05=1/2; others: β^- decay properties in 04Fo06 and 19Du12											**
$*^{131}$In^n	T : others: 19Du12=323(55) 84Fo19=320(60)											**
$*^{131}$In^n	D : %β^-n other: 19Du12=12(7)											**
$*^{131}$In^p	T : average 12Ka36=685(+42-39) 09Go40=630(60)											**
$*^{131}$Sn	J : 25Gu23,20Yo07=3/2											**
$*^{131}$Sn^m	J : 20Yo07=11/2											**
$*^{131}$Sn^m	E : from γ-ray energy difference 04Fo06=[2434.12(0.10)-2369.0(0.3)]; confirmed as 65.1(0.6) keV in 19Du12=[2434.1(0.5)-2369.0(0.3)]											**
$*^{131}$Sn^n	E : 4605.02(0.21) keV above ^{131}Sn^m											**
$*^{131}$Sn^n	T : average 24Be19=316(2) 19Du12=316(5); others: 12Ka36=309(+24-23) 84Fo19=300(20)											**
$*^{131}$Sb^m	T : average 19Bi04=64(3) 00Ge18=65(5)											**
$*^{131}$Sb^p	J : from 00Ge18											**
$*^{131}$I	J : 58Fl39,58Ga18,53Li24=7/2											**
$*^{131}$I^m	T : other: 20Ba52=24.6(5.2)											**
$*^{131}$I^m	E : from a least-squares fit to γ-ray energies in 20Ba52											**
$*^{131}$Xe	J : 50Ko09,34Ko02=3/2											**
$*^{131}$Xe^m	J : 90NeZY=11/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{131}$Cs	J : 56Ni14,53Be19=5/2											**
$*^{131}$Ba	T : unweighted average 26Wa03=11.55(0.08) 21Ku11=11.657(0.008) 12Da04=11.52(0.01) 91Bo34=11.50(0.06) 56Be12=11.52(0.08), Birge ratio=5.45;											**
$*^{131}$Ba	T : others: 63Ly02=12.0(0.1) 53Co24=11.8(0.2)											**
$*^{131}$Ba^m	T : average 25Ba18=14.47(0.01) 12Da04=14.26(0.09) 63Ho05=14.6(0.2)											**
$*^{131}$La	T : others: 63Ya05=56(3) 60Cr01=61(2)											**
$*^{131}$La	J : 73In04=3/2											**
$*^{131}$Pr	T : average 96Gi08=1.57(0.07) 93Al03=1.48(0.02) 83Ga.A=1.58(0.05)											**
$*^{131}$Nd	T : average 99Ga41=26.6(1.7) 96Ge12=33(3) 93Al03=25.0(1.2) 86Wi15=25(4) 77Bo02=24(3)											**
^{132}Ag	−34400#	500#				30 ms 14	6^-#	18	15Lo04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{132}Cd	−50470	60				82.5 ms 0.9	0^+	18	25Ll.A	D	β^-=100;β^-n=97.8 10;β^-2n=0.9 5	*
^{132}In	−62400	30				202.16 ms 0.20	(7^-)	18	22Ph01	TD	β^-=100;β^-n=12.3 4;β^-2n=0.8 5	*
^{132}Sn	−76546.5	2.0				39.7 s 0.8	0^+	18			β^-=100	
^{132}Sn^m	−71698.0	2.0	4848.52	0.20		2.080 μs 0.016	8^+	18	17Ch51	T	IT=100	*
^{132}Sb	−79633.7	0.8				2.79 m 0.07	$(4)^+$	18			β^-=100	
^{132}Sb^m	−79490.9	1.0	142.8	1.2	MD	4.10 m 0.05	$(8^-)*$	18	23Le15	J	β^-=100	
^{132}Sb^n	−79379.2	0.9	254.5	0.3		108.9 ns 2.2	(6^-)	18	25Pi01	T	IT=100	*
^{132}Te	−85188	3				3.204 d 0.013	0^+	05			β^-=100	
^{132}Te^m	−83413	3	1774.80	0.09		135 ns 3	6^+	05	25Pi01	T	IT=100	*
^{132}Te^n	−83263	3	1925.47	0.09		28.4 μs 0.6	7^-	05	25Pi01	T	IT=100	*
^{132}Te^p	−82465	3	2723.3	0.8		3.62 μs 0.06	(10^+)	05	22Ku31	T	IT=100	*
^{132}I	−85704	4				2.295 h 0.013	4^+*	05			β^-=100	*
^{132}I^m	−85594	10	110	11	BD	1.387 h 0.015	(8^-)	05			IT=86 2;β^-=14 2	
^{132}I^n	−84010#	50#	1694#	50#		342 ns 12	(11^+)		20Ba52	ET	IT=100	*
^{132}Xe	−89278.975	0.005				STABLE	0^+	05			IS=26.909 55	
^{132}Xe^m	−86526.77	0.17	2752.21	0.17		8.39 ms 0.06	10^+	05	18Ka47	T	IT=100	*
^{132}Cs	−87152.7	1.0				6.480 d 0.006	2^+*	05			β^+=98.13 9;β^-=1.87 9	*
^{132}Ba	−88435.1	1.1				STABLE >300Ey	0^+	05	96Ba24	T	IS=0.10 1;2β^+ ?	
^{132}La	−83720	40				4.59 h 0.04	2^-*	05	18Ab02	T	β^+=100	*
^{132}La^m	−83530	40	188.20	0.11		24.1 m 0.3	6^-*	05	25Ba18	T	IT≈76;β^+≈24	*
^{132}Ce	−82469	20				3.51 h 0.11	0^+	05			β^+=100	
^{132}Ce^m	−80128	20	2341.15	0.21		9.4 ms 0.3	8^-	05	09Pe31	J	IT=100	
^{132}Pr	−75227	29			*	1.49 m 0.11	(2^+)	05	94Bu18	TJ	β^+=100	*
^{132}Pr^m	−75200#	40#	30#	30#	*	1# s	(5^+)		90Ko25	J	β^+ ?;IT ?	
^{132}Pr^n	−74980#	40#	250#	30#		2.46 μs 0.04	(8^+)		12Ta18	TJD	IT=100	*
^{132}Pr^p	−74930#	40#	300#	30#		486 ns 70	(8^-)		12Ta18	TJD	IT=100	*
^{132}Nd	−71426	24				1.56 m 0.10	0^+	05	95Bu11	T	β^+=100	*
^{132}Pm	−61630#	150#				8.8 s 0.8	(3^+)	22	90Ko25	TJ	β^+=100;β^+p≈5e-5	*
^{132}Pm^m	−61590#	150#	43.1	0.5		19.9 μs 0.5	(5^-)		23Su.A	EJT	IT=100	
^{132}Pm^n	−61440#	150#	188.8	0.6		187 ns 4	(7^+)		23Su.A	EJT	IT=100	
^{132}Sm	−55000#	300#				4.0 s 0.3	0^+	22	89McZU	T	β^+=100;β^+p ?	
^{132}Eu	−42200#	400#				100# ms	1^+#	22	26Su06	I	β^+ ?;p=0;β^+p ?	*
$*^{132}$Ag	T : symmetrized from 15Lo04=28(+15-12)											**
$*^{132}$Cd	T : average 22Ph01=82.5(0.9) 15Lo04=82(4); others: 00Ha55,01Ha39=97(10) 25Ll.A=67(10)											**
$*^{132}$Cd	D : %β^-n: from 25Ll.A=97.8(1.0); others: 22Ph01=100(+0-6) 00Ha55=60(15); %β^-2n: from 22Ph01<1.7											**
$*^{132}$In	T : average 22Ph01=214(8) 20Be16=202.2(0.2) 20Wh02=194(4) 15Lo04=198(2) 02Di12=206(6) 93Ru01=221(11) 86Wa17=204(6); others: 85Re.A=204(6)											**
$*^{132}$In	T : (same as 86Wa17) 86Bj01=186(22) 80Lu04=220(30)											**
$*^{132}$In	D : %β^-n average 22Ph01=12.2(1.2) 20Wh02=12.3(0.4) 20Be16=12(2) 93Ru01=10.7(3.3); others: 86ReZU=6.8(1.4) 80Lu04=4.2(0.9); %β^-2n from 22Ph01<1.6											**
$*^{132}$Sn^m	T : average 17Ch51=2.15(0.16) 12Ka36=2.088(0.017) 94Fo14=2.03(0.04); other: 82Ka25=1.7(0.2)											**
$*^{132}$Sb^n	T : average 25Pi01=112.0(2.7) 74CiZX=102(4); other: 89St06=150(70)											**
$*^{132}$Te^m	T : average 25Pi01=137(8) 22Ku31=133.1(3.5) 86Fo02=145(8)											**
$*^{132}$Te^n	T : average 25Pi01=28.1(1.3) 22Ku31=28.5(0.9) 17Ki09=28.6(+1.2-1.1) 79Si08=28.1(1.5)											**
$*^{132}$Te^n	J : E1 to 6^+											**
$*^{132}$Te^p	T : average 25Pi01=3.5(0.3) 22Ku31=3.7(0.8) 17Ki09=3.52(0.09) 01Ge07=3.70(0.09) 79Si08=3.9(0.3)											**
$*^{132}$I	J : 60Ga12,59Sh64=4											**
$*^{132}$I^n	E : 20Ba52=1644 + x keV, where x=50#(50#) keV by NUBASE											**
$*^{132}$Xe^m	T : average 18Ka47=8.39(0.08),8.36(0.16) 76Ha50=8.39(0.11); others: 77Go15=8.9(0.5) 67Br12=8.4(0.8) 65De15=8.2(0.6)											**
$*^{132}$Xe^m	J : E3 to 7^-											**
$*^{132}$Cs	J : 58Ni27=2											**
$*^{132}$La	J : 73In04=2											**
$*^{132}$La^m	T : average 25Ba18=24.0(0.4) 69Ge11=24.3(0.5)											**
$*^{132}$La^m	D : estimate from 72Ha41; other: %IT∼85, %β^+∼15 in 69Ge11											**
$*^{132}$La^m	J : 73In04=6											**
$*^{132}$Pr	T : average 94Bu18=1.47(0.12) 74Ar27=1.6(0.3)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{132}Pr^n$	E : 12Ta18=219.9(0.2) keV above $^{132}Pr^m$											**
$*^{132}Pr^p$	E : 12Ta18=273.0(0.6) keV above $^{132}Pr^m$											**
$*^{132}Nd$	T : average 95Bu11=1.47(0.12) 77Bo02=1.75(0.17)											**
$*^{132}Pm$	T : from 90Ko25=8.8(0.8) [γ(t)]; others: 89McZU=6.3(0.4) 88BeYG=5.0(1.0) 85Wi07=5.0(+0.8-0.6) 77Bo02=4(2) [X-rays(t)] less reliable											**
$*^{132}Eu$	D : %p 93Li40=0											**
^{133}Ag	−29080#	500#				25# ms	$9/2^+$#				β^- ?;β^-n ?	
^{133}Cd	−44140#	200#				61 ms 4	$7/2^-$#	10	22Ph01	TD	β^-=100;β^-n=86 7;β^-2n=6 2	*
^{133}In	−57680	40				163.4 ms 1.5	$(9/2^+)$	10	22Ph01	TD	β^-=100;β^-n=89.7 26;β^-2n=0.6 4	*
$^{133}In^m$	−57040	70	640	80	MD	167 ms 11	$(1/2^-)$	10	20Be16	TD	β^-=100;β^-n=93 3	*
^{133}Sn	−70873.9	1.9				1.37 s 0.07	$7/2^-*$	10	93Ru01	TD	β^-=100;β^-n=0.0294 24	*
^{133}Sb	−78920.9	1.1				2.34 m 0.05	$7/2^+*$	10	23Le15	J	β^-=100	*
$^{133}Sb^m$	−74380	9	4541	9		16.54 μs 0.19	$(21/2^+)$	10	16Bo19	E	IT=100	*
^{133}Te	−82933.1	0.5				12.5 m 0.3	$(3/2^+)$	10	65Pr08	T	β^-=100	
$^{133}Te^m$	−82598.8	0.5	334.28	0.03		55.4 m 0.4	$(11/2^-)$	10	79Bo26	E	β^-=83.5 20;IT=16.5 20	*
$^{133}Te^n$	−81322.7	0.7	1610.4	0.5		104 ns 3	$(19/2^-)$	10	25Pi01	T	IT=100	*
^{133}I	−85868.8	0.9				20.83 h 0.08	$7/2^+*$	10			β^-=100	*
$^{133}I^m$	−84234.6	0.9	1634.148	0.010		9 s 2	$(19/2^-)$	10			IT=100	
$^{133}I^n$	−84139.7	0.9	1729.137	0.010		∼ 170 ns	$(15/2^-)$	10			IT=100	
$^{133}I^p$	−83375.1	1.0	2493.7	0.4		473 ns 11	$(23/2^+)$	10	20Ba52	T	IT=100	*
^{133}Xe	−87643.6	2.4				5.2474 d 0.0005	$3/2^+*$	10	FGK209	T	β^-=100	*
$^{133}Xe^m$	−87410.4	2.4	233.221	0.015		2.198 d 0.013	$11/2^-*$	10	90NeZY	J	IT=100	*
$^{133}Xe^n$	−85536.3	2.6	2107.3	1.0		8.64 ms 0.13	$23/2^+$		18Ka47	EJT	IT=100	*
^{133}Cs	−88070.944	0.008				STABLE	$7/2^+*$	10			IS=100	
^{133}Ba	−87553.7	1.0				10.5382 y 0.0016	$1/2^+*$	10	FGK259	T	ε=100	*
$^{133}Ba^m$	−87265.4	1.0	288.252	0.009		38.90 h 0.06	$11/2^-*$	10	12Da04	T	IT=99.9896 4;ε=0.0104 5	*
^{133}La	−85494	28				3.912 h 0.008	$5/2^+*$	10			β^+=100	*
^{133}Ce	−82418	16				97 m 4	$1/2^+*$	10			β^+=100	*
$^{133}Ce^m$	−82381	16	37.2	0.7		5.1 h 0.3	$9/2^-*$	10			β^+=100	*
^{133}Pr	−77938	12				6.5 m 0.3	$(3/2^+)$	10			β^+=100	*
$^{133}Pr^m$	−77746	12	192.12	0.14		1.1 s 0.2	$(11/2^-)$	10			IT=100	
^{133}Nd	−72330	50				70 s 10	$(7/2^+)$	10			β^+=100	
$^{133}Nd^m$	−72200	50	127.97	0.12		∼ 70 s	$(1/2)^+$	10	95Br24	DT	β^+=?;IT=?	
$^{133}Nd^n$	−72150	50	176.10	0.10		292 ns 4	$(9/2^-)$	10	12Ta18	T	IT=100	*
^{133}Pm	−65410	50				13.5 s 2.1	$(3/2^+)$	10			β^+=100	
$^{133}Pm^m$	−65280	50	129.7	0.7		8# s	$(11/2^-)$	10			IT≈100;β^+ ?	
^{133}Sm	−57000#	300#				2.97 s 0.15	$(5/2^+)$	10	06Xu07	TJD	β^+=100;β^+p=?	*
$^{133}Sm^m$			*non − exist*		EU	3.4 s 0.5	$(1/2^-)$	10	06Xu07	IJT	β^+ ?;IT ?	*
^{133}Eu	−47240#	300#				200# ms	$5/2^+$#		26Su06	I	β^+ ?;β^+p ?	
^{133}Gd	−36060#	500#				10# ms	$5/2^+$#		26Su06	I	β^+ ?;β^+p ?	
$*^{133}Cd$	T : average 22Ph01=61(6) 15Lo04=64(8) 05Kr20=57(10)											**
$*^{133}Cd$	D : β^-n was also observed in 05Kr20, but was not quantified											**
$*^{133}In$	T : average 22Ph01=166(4) 19Pi04,20Be16=162(2) 15Lo04=163(7) 02Di12=165(3); other: 96Ho16=180(15)											**
$*^{133}In$	D : %β^-n average 22Ph01=89(5) 20Be16=90(3), supersedes 19Pi04=74(5) (same experiment); other: 96Ho16=85(10); %β^-2n from 22Ph01<1.2											**
$*^{133}In^m$	T : from 19Pi04,20Be16=167(11)											**
$*^{133}In^m$	D : %β^-n from 20Be16, supersedes 19Pi04=80(5) (same experiment)											**
$*^{133}Sn$	T : average 06KeZZ=1.57(0.14) 93Ru01=1.20(0.05) 78Si05=1.37(0.07) 73Bo42=1.47(0.04), Birge ratio=2.57											**
$*^{133}Sn$	J : 25Gu23,20Ro19=7/2											**
$*^{133}Sb$	J : 23Le15,21Le11=7/2											**
$*^{133}Sb^m$	E : from 4526 + x keV above gs, with x<30 keV in 16Bo19											**
$*^{133}Te^m$	T : 68Be64=55.4(0.4); other: 57Al35=53(4)											**
$*^{133}Te^m$	D : %β^-,%IT from 84Br31											**
$*^{133}Te^n$	T : average 25Pi01=106.5(4.4) 05Hw06=99(6) 01Bh06=104(10)											**
$*^{133}I$	J : 60Ga12=7/2											**
$*^{133}I^p$	T : average 20Ba52=478(17) 09Wa02=469(15)											**
$*^{133}Xe$	J : 78Hu04=3/2											**
$*^{133}Xe^m$	J : 90NeZY=11/2											**
$*^{133}Xe^n$	EJT : from 18Ka47 based on 231γ M2+E3 to 19/2$^-$; other: 17Vo06>1 μs, 231γ to 19/2$^-$											**
$*^{133}Ba$	J : 76Ho13=1/2											**
$*^{133}Ba^m$	T : average 12Da04=38.88(0.08) 11Gr01=38.92(0.09)											**
$*^{133}Ba^m$	J : 78No09=11/2											**
$*^{133}La$	J : 73In04=5/2											**
$*^{133}Ce$	J : 73In04=1/2											**
$*^{133}Ce^m$	J : 73In04=9/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{133}$Pr	J : the 130.4-keV E3 → 61.7-keV M1 cascade following the ^{133}Pr^m [J$^\pi$=(11/2$^-$)] decay; in conflict with 72Ek04=5/2											**
$*^{133}$Nd^n	T : average 12Ta18=291(4) 98Ba81=301(18)											**
$*^{133}$Sm	T : average 06Xu07=3.2(0.7) [$\beta_p 213\gamma$(t)] 01Xu04=3.4(0.5) [369.6$\gamma\beta$(t)], 2.8(0.5) [369.6$\gamma\beta$(t)] 93BrZU=3.7(0.7)											**
$*^{133}$Sm	T : [$\beta_p\gamma$(t)] 85Wi07=2.8(0.2) [β_p(t)] 77Bo02=3.2(0.4) [β_p(t)]											**
$*^{133}$Sm^m	I : 06Xu07: a possible isomer based on configuration-constrained deformed potential energy surface calculations and predicted at 120 keV above gs											**
$*^{133}$Sm^m	I : and the ν1/2[541] configuration with J$^\pi$=1/2$^-$. Assignment is unlikely because: (i) the expected Weisskopf M2 γ-ray half-life of ∼50											**
$*^{133}$Sm^m	I : μs would imply isomer to decay via IT rather than β^+ decay; (ii) the decoupled and strongly Coriolis-mixed ν1/2[541] ($h_{9/2}$) band would											**
$*^{133}$Sm^m	I : imply J$^\pi$=5/2$^-$ for the bandhead and as a consequence much shorter half-life for the isomer; (iii) the proposed half-lives for the gs and											**
$*^{133}$Sm^m	I : isomer in 06Xu07 seem indistinguishable											**
^{134}Cd	−39300#	300#				65 ms 15	0^+	15	22Ph01	TD	β^-=100;β^-n=65 26;β^-2n=20 11	
^{134}In	−51860	40				128.3 ms 1.7	(7^-)	04	22Ph01	TD	β^-=100;β^-n=87.0 21;β^-2n=11.6 9	*
^{134}In^m	−51800	40	56.7	0.1		3.5 μs 0.4	(5^-)		19Ph02	ETJ	IT=100	
^{134}Sn	−66434	3				1.046 s 0.009	0^+	04	22Ph01	TD	β^-=100;β^-n=24.1 15	*
^{134}Sn^m	−65187	3	1247.4	0.5		87 ns 8	6^+		12Ka36	T	IT=100	*
^{134}Sb	−74019	3				674 ms 4	(0^-)	11	18Si28	T	β^-=100;β^-n ?	*
^{134}Sb^m	−73740	3	279	1		10.01 s 0.04	$(7^-)*$	11	18Si28	T	β^-=100;β^-n=0.088 4	*
^{134}Te	−82533.8	2.7				41.8 m 0.8	0^+	04			β^-=100	
^{134}Te^m	−80842.5	2.7	1691.34	0.16		166.5 ns 0.6	6^+	04	25Pi01	T	IT=100	*
^{134}I	−84043	5				52.5 m 0.2	$(4)^+$	04			β^-=100	
^{134}I^m	−83727	5	316.49	0.22		3.52 m 0.04	$(8)^-$	04			IT=97.7 10;β^-=2.3 10	
^{134}Xe	−88125.835	0.009				STABLE >28Zy	0^+	04	24Ya08	T	IS=10.436 35;2β^- ?	*
^{134}Xe^m	−86160.3	0.5	1965.5	0.5		290 ms 17	7^-	04			IT=100	
^{134}Xe^n	−85100.6	1.5	3025.2	1.5		5 μs 1	(10^+)	04			IT=100	
^{134}Cs	−86891.166	0.016				754.20 d 0.08	4^+*	04	FGK259	T	β^-=99.99970 12;ε=0.00030 12	*
^{134}Cs^m	−86752.422	0.016	138.7441	0.0026		2.912 h 0.002	8^-*	04			IT=100	*
^{134}Ba	−88949.95	0.20				STABLE	0^+	04			IS=2.42 15	
^{134}Ba^m	−85992.8	0.5	2957.2	0.5		2.61 μs 0.13	10^+	04	19Ka36	JT	IT=100	*
^{134}La	−85219	20				6.45 m 0.16	1^+	04			β^+=100	
^{134}La^m	−84780#	100#	440#	100#		29 μs 4	(6^-)	04			IT=100	*
^{134}Ce	−84831	20				3.16 d 0.04	0^+	04			ε=100	
^{134}Ce^m	−81622	20	3208.6	0.4		308 ns 5	10^+	04			IT=100	
^{134}Pr	−78528	20				17 m 2	2^-*	04			β^+=100	*
^{134}Pr^m	−78460	20	67.7	0.4		∼11 m	6^-	04	11Ti10	EJ	β^+=100	*
^{134}Nd	−75646	12				8.5 m 1.5	0^+	04			β^+=100	
^{134}Nd^m	−73353	12	2293.0	0.4		389 μs 17	8^-	04	17Pe03	TJ	IT=100	*
^{134}Pm	−66760	40			*	12 s 5	(2^+)	04	89Vi04	T	β^+=100	*
^{134}Pm^m	−66710#	60#	50#	50#	*	22.4 s 0.4	(5^+)	04	89Vi04	TD	β^+=100	*
^{134}Pm^n	−66640#	60#	121#	50#		20 μs 1	5^-#		09Cu02	TE	IT=100	*
^{134}Sm	−61300#	200#				9.5 s 0.8	0^+	22			β^+=100	*
^{134}Eu	−49620#	300#				500 ms 200		22	89Vi04	TD	β^+=100;β^+p=?	
^{134}Gd	−41530#	400#				400# ms	0^+	22	26Su06	I	β^+ ?;β^+p ?	
$*^{134}$Cd	T : from 15Lo04=65(15); other: 22Ph01=38(31)											**
$*^{134}$Cd	D : %β^-2n: from 22Ph01<39											**
$*^{134}$In	T : average 22Ph01=127(2) 21Pi11=118(6) 15Lo04=126(7) 02Di12=141(5) 96Ho16=138(8)											**
$*^{134}$In	D : %β^-n average 22Ph01=86(+2-4) 21Pi11=89(3); other: 96Ho16∼65; %β^-2n average 22Ph01=11.9(+1.2-0.8) 21Pi11=9(2); other: 95Jo.A<4											**
$*^{134}$Sn	T : average 22Ph01=1.019(0.034) 93Ru01=1.050(0.011) 76Lu02=1.04(0.02); others: 20Wu04=1.07(0.27) 15Lo04=0.89(0.02) 75As04=0.7(0.2)											**
$*^{134}$Sn	T : 90Fo03=1.2(0.1) 02Pf04=1.12(0.08), compilation											**
$*^{134}$Sn	D : %β^-n other: 75As04=17(13)											**
$*^{134}$Sn^m	T : symmetrized from 12Ka36=86(+8-7); other 00Ko15=80(15)											**
$*^{134}$Sb	T : from 18Si28=674.4(3.4,stat)(1.9,syst); others: 20Wu04=730(110) 90Fo03=750(70) 72Ke21=850(100)											**
$*^{134}$Sb^m	T : average 18Si28=9.87(0.04,stat)(0.07,syst) 93Ru01=10.07(0.05)											**
$*^{134}$Sb^m	J : 21Le11=(7)											**
$*^{134}$Te^m	T : average 25Pi01=172.5(1.6) 17Ur03=165.1(1.0) 01Mi22=165(6) 95Om01=164(1) 70Jo20=163(7) 74ClZX=163(4) 74Su04=170(3),169(3), 183(5),179(4)											**
$*^{134}$Te^m	T : 76ChZD=161(4); others: 17Ki09=190(10) 74Bl03=196(7) 04Hw02=197(20)											**
$*^{134}$Xe	T : 0ν-$\beta\beta$: 24Ya08>300 Zy 17Al38>110 Zy (all 90% confidence) 2ν-$\beta\beta$: 24Ya08>28 Zy 17Al38>0.87 Zy											**
$*^{134}$Cs	D : %ε from 75Va12											**
$*^{134}$Cs	J : 53Be19,52Ja18=4											**
$*^{134}$Cs^m	J : 55Gi04,55Go31=8											**
$*^{134}$Ba^m	T : average 19Ka36=2.51(0.30) 82BeZY=2.63(0.14)											**
$*^{134}$La^m	E : from 336.44(0.17) + x keV, x=100#(100#) keV estimated by NUBASE											**
$*^{134}$Pr	J : 72Ek04=2											**
$*^{134}$Pr^m	E : from a least-squares fit to the level scheme of 11Ti10											**
$*^{134}$Nd^m	T : average 17Pe03=380(20) 72Pa26=410(30)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{134}$Pm	T : from 89Vi04=3-20 s; other: 88KeZX=∼5 s										**
$*^{134}$Pm	J : from β^+ decay properties and consistent with the expected $\pi 3/2[411]\otimes\nu 7/2[404]$, $K^\pi=2^+$ configuration										**
$*^{134}$Pm^m	T : average 90Ko25=23(2) 88KeZX=22.6(0.5) 88BeYG=21(1) 77Bo02=24(2)										**
$*^{134}$Pm^m	J : from β^+ decay properties and consistent with the expected $\pi 3/2[411]\otimes\nu 7/2[404]$, $K^\pi=5^+$ configuration										**
$*^{134}$Pm^n	E : 70.7(0.2) keV E1 from 09Cu02 above ^{134}Pm^m by NUBASE										**
$*^{134}$Pm^n	J : based on the expected $\pi 3/2[411]\otimes\nu 7/2[523]$, $K^\pi=5^-$ configuration										**
$*^{134}$Sm	T : average 90Ko25=9.3(0.8) 89Vi04=10(3) 77Bo02=12(3)										**
^{135}Cd	−32820#	400#			55# ms	5/2−#				β^- ?;β^-n ?	
^{135}In	−47000#	200#			100.4 ms 2.7	(9/2+)	16	22Ph01	TD	β^-=100;β^-n=86 4;β^-2n=9.3 13	*
^{135}Sn	−60632	3			515 ms 5	7/2−#	16	22Ph01	T	β^-=100;β^-n=20.3 17;β^-2n=1.3 7	*
^{135}Sb	−69690.3	2.6			1.668 s 0.009	(7/2+)	16	20Wa04	D	β^-=100;β^-n=19.1 5	*
^{135}Te	−77728.8	1.7			19.0 s 0.2	(7/2−)	08			β^-=100	
^{135}Te^m	−76173.9	1.7	1554.89	0.16	509 ns 14	(19/2−)	08	25Pi01	T	IT=100	*
^{135}I	−83779.2	2.1			6.58 h 0.03	7/2+*	08			β^-=100	*
^{135}Xe	−86413	4			9.14 h 0.02	3/2+	08			β^-=100	*
^{135}Xe^m	−85886	4	526.551	0.013	15.29 m 0.05	11/2−*	08	90NeZY	J	IT=99.70 17;β^-=0.30 17	*
^{135}Cs	−87581.9	0.3			1.46 My 0.09	7/2+*	08	16Ma05	T	β^-=100	*
^{135}Cs^m	−85949.0	1.5	1632.9	1.5	53 m 2	19/2−*	08			IT=100	*
^{135}Ba	−87850.60	0.19			STABLE	3/2+*	08			IS=6.59 10	*
^{135}Ba^m	−87582.38	0.19	268.218	0.020	28.102 h 0.018	11/2−	08	24Su18	T	IT=100	*
^{135}Ba^n	−85462.6	0.6	2388.0	0.6	1.06 ms 0.04	23/2+		18Ka47	ETJ	IT=100	*
^{135}La	−86643	9			18.91 h 0.02	5/2+*	08	18Ab02	T	β^+=100	*
^{135}Ce	−84616	10			17.7 h 0.3	1/2+*	08			β^+=100	*
^{135}Ce^m	−84170	10	445.81	0.21	20 s 1	(11/2−)	08			IT=100	
^{135}Pr	−80936	12			24 m 1	3/2+*	08			β^+=100	*
^{135}Pr^m	−80578	12	358.06	0.06	105 μs 10	(11/2−)	08			IT=100	
^{135}Nd	−76214	19			12.4 m 0.6	9/2−*	08			β^+=100	*
^{135}Nd^m	−76149	19	64.95	0.24	5.5 m 0.5	(1/2+)	08			β^+=100;IT ?	
^{135}Pm	−70070	90			49 s 3	(3/2+,5/2+)	08			β^+=100	
^{135}Pm^m	−69830#	50#	240#	110#	40 s 3	(11/2−)	08	89Ko07	TJ	β^+=100	
^{135}Sm	−62860	150			10.3 s 0.5	(7/2+)	22	77Bo02	J	β^+=100;β^+p=0.02 1	*
^{135}Eu	−54150#	200#			1.5 s 0.2	5/2+#	16			β^+=100;β^+p ?	
^{135}Gd	−44250#	400#			1.1 s 0.2	(5/2+)	16			β^+=100;β^+p≈2	
^{135}Tb	−33050#	400#			1.01 ms 0.28	(7/2−)	16	04Wo07	T	p≈100;β^+ ?	*
$*^{135}$In	T : average 22Ph01=104(4) 21Pi11=89(10),90(9) 15Lo04=103(5) 02Di12=92(10)										**
$*^{135}$In	D : %β^-n symmetrized from 22Ph01=88(+2-5); other: β^-n was observed in 21Pi11 and 02Di12, but was not quantified; %β^-2n from 22Ph01										**
$*^{135}$Sn	T : average 22Ph01=514(30) 15Lo04=515(5) 02Sh08=525(25); others: 06KeZZ=485(37) 01Ko45=600(100) 01Sh12=450(50), superseded by 02Sh08 other										**
$*^{135}$Sn	T : (downweighted): 20Wu04=510(270)										**
$*^{135}$Sn	D : %β^-n average 22Ph01=20(2) 02Sh08=21(3), supersedes 01Sh12=25(7); %β^-2n from 22Ph01<2.5										**
$*^{135}$Sb	D : %β^-n average 20Wa04=14.6(0.4,stat)(1.2,syst) 17AgZZ=24.5(1.0) 93Ru01=21.0(1.1) 02Sh08=22(3) 78Cr03=14(1) 93Ru01=22(4), supersedes										**
$*^{135}$Sb	D : 77Ru04=19.9(2.1); Birge ratio=3.46										**
$*^{135}$Sb	T : average 93Ru01=1.662(0.010) 68To18=1.696(0.021); other (downweighted): 20Wu04=1.57(0.23)										**
$*^{135}$Te^m	T : 25Pi01=500(35) 01Mi22=512(22) 80Ka30=510(20)										**
$*^{135}$I	J : 60Ga12=7/2										**
$*^{135}$Xe	T : other: 21Go.A=9.15(0.49)										**
$*^{135}$Xe^m	D : %β^- from 0.004% to 0.6% in ENSDF2008										**
$*^{135}$Xe^m	J : 90NeZY=11/2										**
$*^{135}$Cs	T : average 16Ma05=1.6(0.3) [by AMS], 1.3(0.1) [by ICPMS] [the quoted uncertainties of 0.6 My and 0.2 My in 16Ma05 are at 95% C.L. (2σ)]										**
$*^{135}$Cs	T : 55Pa53=2.0(0.2) 49Su03=2.1(0.7); other (outlier): 50Ze55=2.95(0.30)										**
$*^{135}$Cs	J : 49Da01=7/2										**
$*^{135}$Cs^m	J : 87Co19,78Ek05,77Ek02=19/2										**
$*^{135}$Ba	J : 50Ar51,41Ha14,37Be09,32Mu06=3/2										**
$*^{135}$Ba^m	T : average 24Su18=28.056(0.048) 12Da04=28.11(0.02); others: 68Bo28=27.2(1.5) 60Wi10=28.7(0.2) 48Yu01=28.7										**
$*^{135}$Ba^n	EJT : from 18Ka47 based on 254γ M2+E3 to 19/2−										**
$*^{135}$La	J : 73In04=5/2										**
$*^{135}$Ce	J : 73In04=1/2										**
$*^{135}$Pr	J : 19Fr08,72Ek04=3/2										**
$*^{135}$Nd	J : 72Ek04=9/2										**
$*^{135}$Sm	TD : from 89Vi04										**
$*^{135}$Tb	T : symmetrized from 04Wo07=940(+330-220) μs										**
^{136}In	−40970#	300#			88 ms 7	7−#	18	22Ph01	TD	β^-=100;β^-n=84 10;β^-2n=12.8 5	*
^{136}Sn	−56074	29			359 ms 3	0+	18	22Ph01	TD	β^-=100;β^-n=21.6 16; β^-2n=0.19 11	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{136}Sb	−64507	6				923 ms 14	(1^-)	18	20Wa04 D	β^-=100;β^-n=24.7 5;β^-2n=0.14 3	*
^{136}Sb^m	−64238	6	269.3	0.5		570 ns 5	(6^-)	18	12Ka36 T	IT=100	*
^{136}Te	−74424.8	2.3				17.63 s 0.09	0^+	18	18Ca22 D	β^-=100;β^-n=1.37 4	*
^{136}I	−79551	4				83.4 s 0.4	(1^-)	18		β^-=100	
^{136}I^m	−79335.5	0.6	215	4	MD	46.6 s 1.1	(6^-)	18		β^-=100	
^{136}Xe	−86429.172	0.007				2.17 Zy 0.04	0^+	18	26Yu06 T	IS=8.857 72;2β^-=100	*
^{136}Xe^m	−84537.43	0.07	1891.74	0.07		2.93 μs 0.02	6^+	18	25Pi01 T	IT=100	*
^{136}Cs	−86350.2	0.5				13.01 d 0.05	5^+*	18		β^-=100	*
^{136}Cs^m	−86276.5	0.5	73.7	0.1		108.8 ns 2.8	3^+		23Ha27 ETD	IT=100	*
^{136}Cs^n	−85832.3	0.5	517.9	0.1		17.5 s 0.2	8^-*	18	11Wi09 T	IT=?;β^- ?	*
^{136}Ba	−88887.02	0.19				STABLE	0^+	18		IS=7.85 24	
^{136}Ba^m	−86856.49	0.19	2030.535	0.018		305.7 ms 1.3	7^-	18	18Ka47 T	IT=100	*
^{136}Ba^n	−85529.8	0.3	3357.19	0.25		91 ns 2	10^+			IT=100	
^{136}La	−86040	50				9.87 m 0.03	1^+*	18		β^+=100	*
^{136}La^m	−85780	50	259.5	0.3		114 ms 5	(7^-)	18		IT=100	
^{136}La^n	−83520	50	2520.6	0.4		187 ns 27	(14^+)	18		IT=100	
^{136}Ce	−86508.49	0.28				STABLE >5Ey	0^+	18	22Le06 T	IS=0.185 2;2β^+ ?	*
^{136}Ce^m	−83413.5	0.7	3095.0	0.6		1.96 μs 0.09	10^+	18	13Va10 T	IT=100	*
^{136}Pr	−81340	11				13.1 m 0.1	2^+*	18		β^+=100	*
^{136}Nd	−79199	12				50.65 m 0.33	0^+	18		β^+=100	
^{136}Pm	−71170	70			*	107 s 6	7^+#	18	73PaZV T	β^+=100	*
^{136}Pm^m	−71070	90	100	120	MD*	90 s 35	2^+#	18	89Vi04 T	β^+=100	*
^{136}Pm^n	−71130	70	42.7	0.2		1.5 μs 0.1	7^-#	18	08Ri05 ET	IT=100	*
^{136}Sm	−66811	12				47 s 2	0^+	18		β^+=100	
^{136}Sm^m	−64546	12	2264.7	1.1		15 μs 1	(8^-)	18		IT=100	
^{136}Eu	−56100#	200#			*	3.3 s 0.3	6^+#	18		β^+=100;β^+p≈0.09	*
^{136}Eu^m	−56000#	220#	100#	100#	*	3.8 s 0.3	1^+#	18		β^+=100;β^+p≈0.09	*
^{136}Gd	−49200#	300#				1# s >200ns	0^+	18	00So11 I	β^+ ?;β^+p ?	*
^{136}Tb	−35900#	500#				200# ms	5^-#	18	26Su06 I	β^+ ?;β^+p ?	
*^{136}In	T : average 22Ph01=90(10) 15Lo04=85(+10-8)										**
*^{136}Sn	D : %β^-n average 22Ph01=18.5(+2.4-1.3) 11Ar18=27(4) 02Sh08=30(5); %β^-2n from 22Ph01<0.37										**
*^{136}Sn	T : average 22Ph01=366(5) 20Ju02=361(5) 15Lo04=350(5); others: 20Wu04=369(76) 02Sh08t=250(30) 01Sh12<400 11Ar18=300(15)										**
*^{136}Sb	D : %β^-n average 20Wa04=17.6(1.0,stat)(2.7,syst) 18Ca22=32.2(1.5) 15CaZM=19.2(1.8) 93Ru01=16.3(3.2); Birge ratio=3.97; %β^-2n from 18Ca22										**
*^{136}Sb	T : from 93Ru01; others: 20Wu04=957(79) 76Lu02=820(20) 77Ru04=750(200) 78Cr03=900(100)										**
*^{136}Sb^m	T : others: 15Lo08=489(40) 07Si27=480(100) 01Mi22=570(50)										**
*^{136}Te	D : %β^-n average 18Ca22=1.47(0.06) 93Ru01=1.31(0.05) 12Ma63=1.34(0.13)										**
*^{136}Xe	T : 2ν-$\beta\beta$: average 26Yu06(PandaX-4T)=2.14(0.05), supersedes 22SiZZ=2.27(0.03,stat)(0.10,syst), 22No06(NEXT)=2.34(+0.85-0.49)										**
*^{136}Xe	T : 19Ga11(KamLAND-Zen)=2.23(0.08), supersedes 16Ga30=2.21(0.07) and 12Ga17=2.38(0.14), 14Al03(EXO)=2.165(0.061),supersedes										**
*^{136}Xe	T : 11Ac03=2.11(0.04,stat)(0.21,sys); others (evaluation): 25Pr02=2.24(0.06) 20Ba63=2.18(0.05) 0ν-$\beta\beta$: 22Ap01>1.2 Yy 21Al33>4.3 Yy 19Ni10>0.21 Yy										**
*^{136}Xe	T : 18Al05>18 Yy 16As01>2.5 Yy 16Ga30>107 Yy 13Ga07>19 Yy 12Au03>16 Yy 02Be74>10 Zy (all at 90% C.L.); 0ν-^{4}B: 22Ab17>3.7 Yy at 90% C.L; 3p:										**
*^{136}Xe	T : 18Al20>0.33 Yy; n2p: >0.19 Yy										**
*^{136}Xe^m	T : average 25Pi01=2.95(0.05) 17Ki09=2.92(0.03) 70Jo20=2.80(0.37),3.40(0.35) 74ClZX=2.78(0.17), 3.35(0.47) 70Ca25=2.8(0.2),3.0(0.3)										**
*^{136}Xe^m	T : 70Gr38=3.10(0.38) 69Wa29=3.4(0.4)										**
*^{136}Cs	J : 71Da01=5										**
*^{136}Cs^m	E : other: 23Re09=74(2)										**
*^{136}Cs^m	J : from 23Re09										**
*^{136}Cs^n	J : 81Th06=8										**
*^{136}Cs^n	E : others: 23Re09=517(3) 83We07=518(5)										**
*^{136}Cs^n	T : others: 87BaYL=17(2) 81Th06=19(8) 75Ra03=19(2)										**
*^{136}Ba^m	T : average 18Ka47=296(7) 72Br53=308.4(1.9) 68WiZY=307(4) 66ClZZ=303(2) 65Ru05=370(50) 62Fe02=320(20)										**
*^{136}La	J : 73In04=1										**
*^{136}Ce	T : for 2ν-$\beta\beta$; see also 17Be21 for a review										**
*^{136}Ce	D : from IS=0.185(0.002) in 24Ci.A										**
*^{136}Ce^m	T : average 13Va10=1.9(0.1) 75Yo01=2.2(0.2)										**
*^{136}Pr	J : 19Fr08,72Ek04=2										**
*^{136}Pm	J : from expected π5/2[532]⊗ν9/2[514],$K^\pi=7^+$ configuration; supported by the observed direct β^+ feeding to I=6,7 levels in ^{136}Nd										**
*^{136}Pm^m	T : from 30 s < $T_{1/2}$ <150 s in 89Vi04; other: 88Ke03=300(50) s, but according to the authors the value is poorly defined										**
*^{136}Pm^m	J : from expected π5/2[532]⊗ν9/2[514],$K^\pi=2^+$ configuration; supported by the observed direct β^+ feeding to I=2,3 levels in ^{136}Nd										**
*^{136}Pm^n	E : 08Ri05=42.7(0.2) keV above a long lived state that could be either the gs or the isomer										**
*^{136}Pm^n	J : 42.7 keV E1 transition to gs (J^π=7^+) and the expected π5/2[413]⊗ν9/2[514],$K^\pi=7^-$ configuration by NUBASE										**
*^{136}Eu	J : expected π5/2[413]⊗ν7/2[404],$K^\pi=6^+$ configuration (prolate shape)										**
*^{136}Eu^m	J : expected π5/2[413]⊗ν7/2[404],$K^\pi=1^+$ configuration (prolate shape)										**
*^{136}Gd	I : also 26Su06										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{137}In	−35830#	400#				70 ms 40	9/2$^+$#	15	15Lo04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{137}Sn	−50110	10				243 ms 10	5/2$^-$#	06	22Ph01	TD	β^-=100;β^-n=23 2;β^-2n=0.45 24	*
^{137}Sb	−60014	6				500 ms 16	(7/2$^+$)	06	21Mo10	TDJ	β^-=100;β^-n=49 6;β^-2n=3.7 10	*
^{137}Te	−69303.8	2.1				2.48 s 0.04	(7/2$^-$)	06	17AgZZ	D	β^-=100;β^-n=2.94 14	*
^{137}I	−76362.1	0.5				24.13 s 0.12	7/2$^+$#	06	20Cz01	D	β^-=100;β^-n=7.51 11	*
^{137}Xe	−82383.42	0.10				3.818 m 0.013	7/2$^-$*	06	89Bo03	J	β^-=100	*
^{137}Cs	−86545.71	0.26				30.04 y 0.03	7/2$^+$*	06	FGK259	T	β^-=100	*
^{137}Ba	−87721.34	0.20				STABLE	3/2$^+$*	06			IS=11.23 23	*
^{137}Ba^m	−87059.68	0.20	661.659	0.003		2.552 m 0.001	11/2$^-$*	06	20So26	D	IT=100;2G=0.000262 30	
^{137}Ba^n	−85372.2	0.5	2349.1	0.5		589 ns 20	(19/2$^-$)	06	17Vo01	T	IT=100	*
^{137}La	−87140.8	1.6				60 ky 20	7/2$^+$*	06	56Br93	T	ε=100	*
^{137}La^m	−85271.3	1.6	1869.50	0.21		342 ns 25	19/2$^-$	06			IT=100	
^{137}Ce	−85918.7	0.3				9.0 h 0.3	3/2$^+$*	06			β^+=100	*
^{137}Ce^m	−85664.4	0.3	254.29	0.05		34.4 h 0.3	11/2$^-$*	06			IT=99.21 4;β^+=0.79 4	*
^{137}Pr	−83202	8				1.28 h 0.03	5/2$^+$*	06			β^+=100	*
^{137}Pr^m	−82641	8	561.22	0.23		2.66 μs 0.07	11/2$^-$	06			IT=100	
^{137}Nd	−79584	12				38.5 m 1.5	1/2$^+$*	06			β^+=100	*
^{137}Nd^m	−79065	12	519.43	0.20		1.60 s 0.15	11/2$^-$	06			IT=100	
^{137}Pm	−74073	13			&	2# m	5/2$^-$#	06			β^+ ?	
^{137}Pm^m	−73910	40	160	50	BD &	2.4 m 0.1	11/2$^-$	06			β^+=100	
^{137}Sm	−67992	29				45 s 1	(9/2$^-$)	06			β^+=100	
^{137}Sm^m	−67890#	60#	100#	50#		20# s	1/2$^+$#				β^+ ?	
^{137}Eu	−60146	4				8.4 s 0.5	5/2$^+$#	06	88Be.A	T	β^+=100	
^{137}Gd	−51400#	300#				2.2 s 0.2	7/2$^+$#	06			β^+=100;β^+p=?	
^{137}Tb	−41080#	400#				600# ms	3/2$^+$#		26Su06	I	p ?;β^+ ?	
*^{137}In	T : symmetrized from 15Lo04=65(+40-30)											**
*^{137}Sn	T : average 22Ph01=231(7) 11Ar18=273(7) 20Wu04=204(12) 20Ju02=238(8) 15Lo04=230(30), 02Sh08=190(60); Birge ratio=2.6											**
*^{137}Sn	D : %β^-n others: 11Ar18=50(8) 02Sh08=58(15) 20Ju02 d=32(15)											**
*^{137}Sb	T : average 21Mo10=507(27) 20Wu04=566(52) 11Ar18=492(25) 02Sh08=450(50)											**
*^{137}Sb	D : %β^-n average 11Ar18=49(8) 02Sh08=49(10); other: 21Mo10=23(4); β^-2n from 21Mo10											**
*^{137}Te	J : from 22Si16, direct β feeding to ^{137}I gs (J$^\pi$=7/2$^+$)											**
*^{137}Te	D : %β^-n average 17AgZZ=2.6(0.3) 93Ru01=3.04(0.16); other: 22Si16=2.63(0.85) [lower limit]											**
*^{137}Te	T : average 22Si16=2.46(0.05) 85Sa15=2.49(0.05); other (downweighted): 20Wu04=2080(+40-400)											**
*^{137}I	T : from 93Ru01, supersedes 74Ru08=24.5(0.2) (same group)											**
*^{137}I	D : %β^-n average 20Cz01=6.66(0.34) 17Ra10=7.9(0.5) 16Ag03=7.76(0.14) 93Ru01=7.14(0.23)											**
*^{137}Xe	J : 89Bo03,90NeZY=7/2											**
*^{137}Cs	J : 87Co19,49Da01=7/2											**
*^{137}Ba	J : 50Ar51,41Ha14,37Be09,32Mu06=3/2											**
*^{137}Ba^m	J : 83Mu12=11/2											**
*^{137}Ba^n	J : from 19Ka04											**
*^{137}La	J : 72Fi19=7/2											**
*^{137}Ce	J : 73In04,63Ha07=3/2											**
*^{137}Ce^m	J : 73In04,66Bl17=11/2											**
*^{137}Pr	J : 19Fr08,72Ek04=3/2											**
*^{137}Nd	J : 72Ek04=1/2											**
^{138}Sn	−45442	21				149 ms 8	0$^+$	17	22Ph01	TD	β^-=100;β^-n=28 5;β^-2n=1.8 13	*
^{138}Sn^m	−44098	21	1344	2		210 ns 45	(6$^+$)	17			IT=100	
^{138}Sb	−54380	70				318 ms 3	(3$^-$)	17	21Mo10	TDJ	β^-=100;β^-n=72 8;β^-2n=0.7 4	*
^{138}Te	−65696	4				1.412 s 0.018	0$^+$	17	17AgZZ	TD	β^-=100;β^-n=4.80 23	*
^{138}I	−71963.5	0.5				6.26 s 0.03	(1$^-$)	17	20Cz01	D	β^-=100;β^-n=5.34 11	*
^{138}I^m	−71895.5	0.6	68.0	0.3		1.13 μs 0.08	(3$^-$)	17	24Lo13	ET	IT=100	*
^{138}Xe	−79972.2	2.8				14.14 m 0.07	0$^+$	17			β^-=100	
^{138}Cs	−82887	9				33.5 m 0.2	3$^-$*	17			β^-=100	*
^{138}Cs^m	−82807	9	79.9	0.3		2.91 m 0.10	6$^-$*	17			IT=81 3;β^-=19 3	*
^{138}Cs^x	−82847	25	40	23		R=?	*fsmix*					
^{138}Ba	−88261.75	0.20				STABLE	0$^+$	17			IS=71.70 29	
^{138}Ba^m	−86171.21	0.20	2090.536	0.021		850 ns 100	6$^+$	17			IT=100	
^{138}La	−86513.4	0.4				103 Gy 1	5$^+$*	17			IS=0.08881 71;β^+=65.5 4; β^-=34.5 4	*
^{138}La^m	−86440.8	0.4	72.57	0.03		116 ns 5	(3)$^+$	17			IT=100	
^{138}La^n	−85774.6	0.4	738.80	0.20		2.0 μs 0.3	7$^-$	17	14As02	TJ	IT=100	
^{138}Ce	−87565.8	0.5				STABLE >1.3Ey	0$^+$	17	22Le06	T	IS=0.251 2;2β^+ ?	*
^{138}Ce^m	−85436.5	0.5	2129.28	0.12		8.73 ms 0.20	7$^-$	17			IT=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{138}Pr	−83129	10				1.45 m 0.05	1^+	17			β^+=100	
^{138}Pr^m	−82779	16	350	19	BD	2.12 h 0.04	7^-*	17			β^+=100	*
^{138}Nd	−82018	12				5.04 h 0.09	0^+	17			β^+=100	
^{138}Nd^m	−78844	12	3174.5	0.4		370 ns 5	10^+	17			IT=100	
^{138}Pm	−74913	12				3.24 m 0.05	(5^-)	17			β^+=100	*
^{138}Pm^m			*non − exist*		EU	10 s 2	0^-#,1^-#	17	83Al06	IT	β^+=100	*
^{138}Sm	−71498	12				3.1 m 0.2	0^+	17			β^+=100	
^{138}Eu	−61750	28			*&	5# s	2^-#	17	FGK205	EJ	β^+ ?	*
^{138}Eu^m	−61650#	60#	100#	50#	*&	12.1 s 0.6	7^-#	17	FGK205	EJ	β^+=100	*
^{138}Gd	−55800#	200#				4.7 s 0.9	0^+	17			β^+=100	
^{138}Gd^m	−53570#	200#	2232.6	1.1		6.2 μs 0.2	(8^-)	17			IT=100	
^{138}Tb	−43600#	300#				800# ms >200ns	2^+#	17	26Su06	I	β^+ ?;β^+p ?;p=0	*
^{138}Dy	−34930#	500#				200# ms	0^+		26Su06	I	β^+ ?;β^+p ?	
*^{138}Sn	T : average 22Ph01=150(21) 20Wu04=158(15) 20Ju02=142(12) 15Lo04=140(+30-20)											**
*^{138}Sn	D : %β^-n other: 07ArZZ=36(12)											**
*^{138}Sb	T : average 21Mo10=313(4) 20Wu04=326(8) 15Le14=346(19) 11Ar18=350(15)											**
*^{138}Sb	D : %β^-n from 11Ar18; %β^-2n from 21Mo10											**
*^{138}Te	D : %β^-n from 17AgZZ; other: 75As04=6.3(2.1)											**
*^{138}Te	T : others: 20Wu04=1.50(0.32) 75As04=1.4(0.4) 06KeZZ=1.151(0.028)											**
*^{138}I	D : %β^-n average 20Cz01=6.07(0.34) 17AgZZ=4.98(0.18) 11Go37=5.32(0.20) 93Ru01=5.56(0.22) 80Lu04=5.5(0.4)											**
*^{138}I^m	E : average 24Lo13=68.1(0.5) 07Rz01=67.9(0.3)											**
*^{138}I^m	T : average 24Lo13=1.65(0.26) 22Mo11=1.0(0.1) 07Rz01=1.26(0.16)											**
*^{138}Cs	J : 67St22,78Sc27,79Bo01=3											**
*^{138}Cs^m	J : 81Th06=6											**
*^{138}La	J : 55So31,72Fi14=5											**
*^{138}Ce	T : other: 17Be21 (review)											**
*^{138}Pr^m	J : 72Ek04=7											**
*^{138}Pm	J : population of 4^+, 5^- and 6^+ levels in β^+ decay; expected conf=π5/2[532]⊗ν5/2[402],$K^\pi = 5^-$ (deformed shape)											**
*^{138}Pm^m	I : not confirmed in 00Be42											**
*^{138}Eu	J : from the expected conf=π5/2[413]⊗ν9/2[514],$K^\pi = 2^-$, based on systematics (π5/2[413] at Z=63 and ν9/2[514] at N=75); ENSDF2017=(1^-)											**
*^{138}Eu^m	J : from the expected conf=π5/2[413]⊗ν9/2[514],$K^\pi = 7^-$, based on systematics (π5/2[413] at Z=63 and ν9/2[514] at N=75); ENSDF2017 J$^\pi$=(6^-) as a											**
*^{138}Eu^m	J : ground state, but the proposed conf=π5/2[532]⊗ν7/2[404] violates the GM rule											**
*^{138}Tb	D : %p from 93Li40											**
^{139}Sn	−39310#	200#				126 ms 32	5/2$^-$#	16	22Ph01	TD	β^-=100;β^-n=56 34;β^-2n=43 25	*
^{139}Sb	−49880#	200#				182 ms 9	7/2$^+$#	16	20Wu04	T	β^-=100;β^-n=90 10;β^-2n ?	*
^{139}Te	−60205	4				724 ms 81	5/2$^-$#	16	20Wu04	T	β^-=100;β^-n=17.6 48	*
^{139}I	−68469.9	2.0				2.280 s 0.011	7/2$^+$#	16	17AgZZ	D	β^-=100;β^-n=9.74 24	*
^{139}Xe	−75644.6	2.1				39.68 s 0.14	3/2$^-$*	16			β^-=100	*
^{139}Cs	−80701	3				9.27 m 0.05	7/2$^+$*	16			β^-=100	*
^{139}Ba	−84913.86	0.20				82.93 m 0.09	7/2$^-$*	16			β^-=100	*
^{139}La	−87222.4	0.6				STABLE	7/2$^+$*	16			IS=99.91119 71	*
^{139}La^m	−85422.0	0.7	1800.4	0.4		315 ns 35	(17/2$^+$)	16			IT=100	
^{139}Ce	−86957.8	2.1				137.642 d 0.020	3/2$^+$*	16	FGK204	T	ε=100	*
^{139}Ce^m	−86203.6	2.1	754.24	0.08		57.58 s 0.32	11/2$^-$	16			IT=100	
^{139}Pr	−84829	4				4.41 h 0.04	5/2$^+$*	16			β^+=100	*
^{139}Nd	−82017	28				29.7 m 0.5	3/2$^+$*	16			β^+=100	*
^{139}Nd^m	−81786	28	231.16	0.05		5.50 h 0.20	11/2$^-$*	16			β^+=87.0 10;IT=13.0 10	
^{139}Nd^n	−79400	28	2616.9	0.6		276.8 ns 1.8	23/2$^+$	16	13Va10	ETJ	IT=100	*
^{139}Pm	−77501	14				4.15 m 0.05	(5/2)$^+$	16			β^+=100	
^{139}Pm^m	−77312	14	188.7	0.3		180 ms 20	(11/2)$^-$	16			IT=100;β^+ ?	
^{139}Sm	−72380	11				2.57 m 0.10	1/2$^+$*	16			β^+=100	*
^{139}Sm^m	−71923	11	457.38	0.23		10.7 s 0.6	11/2$^-$	16			IT=93.7 5;β^+=6.3 5	
^{139}Eu	−65398	13				17.9 s 0.6	(11/2)$^-$	16			β^+=100	
^{139}Eu^m	−65250	13	148.3	0.3		10 μs 2	(7/2$^+$)	16			IT=100	
^{139}Gd	−57600#	200#			*	5.7 s 0.3	9/2$^-$#	16	99Xi04	T	β^+=100;β^+p=?	*
^{139}Gd^m	−57350#	250#	250#	150#	*	4.8 s 0.9	1/2$^+$#	16			β^+=100;β^+p=?	*
^{139}Tb	−48130#	300#				1.6 s 0.2	5/2$^-$#	16			β^+=100;β^+p ?	
^{139}Dy	−37810#	500#				600 ms 200	(7/2$^+$)	16	99Xu05	TD	β^+=100;β^+p≈11	
*^{139}Sn	T : average 22Ph01=139(61) 20Wu04=114(49) 15Lo04=130(60)											**
*^{139}Sn	D : %β^-2n from 22Ph01<86											**
*^{139}Sb	T : other: 11Ar18=93(+14-3)											**
*^{139}Te	T : others (discrepant): 11Ar18=1600(300) 06KeZZ=598(20)											**
*^{139}Te	D : %β^-n from 24Lo13=17.6(4.8)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{139}$I	D : %β^-n average 17AgZZ=9.27(0.33) 93Ru01=10.3(0.4) 81Ho07=10.0(1.1) 75As04=10.2(0.9)											**
$*^{139}$Xe	J : 90NeZY,89Bo03=3/2											**
$*^{139}$Cs	J : 79Bo01,79Ek02,87Co19=7/2											**
$*^{139}$Ba	J : 83Mu12=7/2											**
$*^{139}$La	J : 71Ch02,34An02=7/2											**
$*^{139}$Ce	J : 73In04,63Ha07,62Gr17,61Kn02=3/2											**
$*^{139}$Pr	J : 72Ek04=5/2											**
$*^{139}$Nd	J : 72Ek04=3/2											**
$*^{139}$Nd^m	J : 72Ek04=11/2											**
$*^{139}$Nd^n	T : average 13Va10=278(2) 08Fe02=272(4)											**
$*^{139}$Sm	J : 92Le09=1/2											**
$*^{139}$Gd	T : average 99Xi04=5.8(0.9) 88Be.A=5.8(0.4); other: 83Ni05=4.9(1.0), not used since it corresponds to a mixture of gs and the isomer											**
$*^{139}$Gd	D : β^+p were observed in 83Ni05 and it is assumed that they are associated with both the ground state and the isomer											**
$*^{139}$Gd^m	D : β^+p were observed in 83Ni05 and it is assumed that they are associated with both the ground state and the isomer											**
^{140}Sn	−34490#	200#				50# ms	>550ns	0^+	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{140}Sb	−44150#	300#				170 ms	6	(3^-)	18	20Wu04	T	β^-=100;β^-n=23 4;β^-2n=7.6 25	*
^{140}Sb^m	−43820#	300#	330#	30#		41 μs	8	$(6^-,7^-)$	18	16Lo01	ETJ	IT=100	*
^{140}Te	−56367	14				351 ms	5	0^+	18	20Wu04	TD	β^-=100;β^-n=?	*
^{140}I	−63630	50			*&	380 ms	20	(2^-)	18	22Ya13	T	β^-=100;β^-n=7.60 28;β^-2n ?	*
^{140}I^m	−63580#	70#	50#	50#	*&	470 ms	40	$(4^-,5)$		22Ya13	TJ	β^-=100	*
^{140}I^n	−63530#	110#	100#	100#	EU	910 ms	50	$(0^-,1^-)$		22Ya13	TJ	β^-=100	
^{140}Xe	−72986.5	2.3				13.60 s	0.10	0^+	18			β^-=100	
^{140}Cs	−77050	8				63.7 s	0.3	1^-*	18			β^-=100	*
^{140}Cs^m	−77036	8	13.931	0.021		471 ns	51	$(2)^-$	18			IT=100	
^{140}Ba	−83268	8				12.7527 d	0.0021	0^+	18	FGK254	T	β^-=100	
^{140}La	−84312.1	0.6				40.289 h	0.005	3^-*	18	FGK259	T	β^-=100	*
^{140}Ce	−88074.8	1.3				STABLE		0^+	18			IS=88.450 51	*
^{140}Ce^m	−85966.9	1.3	2107.854	0.024		7.3 μs	1.5	6^+	18			IT=100	
^{140}Pr	−84687	6				3.39 m	0.01	1^+*	18	72Ev01	D	β^+=100;ε=51.3 22;e$^+$=48.7 22	*
^{140}Pr^m	−84559	6	127.8	0.3		350 ns	20	5^+	18			IT=100	
^{140}Pr^n	−83923	6	763.7	0.5		3.05 μs	0.20	$(7)^-$	18			IT=100	
^{140}Nd	−84257	3				3.37 d	0.02	0^+	18			ε=100	
^{140}Nd^m	−82035	3	2221.65	0.09		600 μs	50	7^-	18			IT=100	
^{140}Nd^n	−76822	3	7435.1	0.4		1.22 μs	0.06	20^+	18	08Fe02	TJ	IT=100	*
^{140}Pm	−78212	24				9.2 s	0.2	1^+	18			β^+=100	
^{140}Pm^m	−77783	13	429	28	BD	5.95 m	0.05	8^-	18			β^+=100	
^{140}Sm	−75456	12				14.82 m	0.12	0^+	18			β^+=100	
^{140}Eu	−66800#	100#				1.51 s	0.02	1^+*	18	91Fi03	TD	β^+=100;e$^+$=95.1 7;ε=4.9 7	*
^{140}Eu^m	−66590#	100#	210	14		125 ms	2	(5^-)	18	91Fi03	TD	EIT$\approx$100;β^+<1	*
^{140}Eu^n	−66130#	100#	669	14		299.8 ns	2.1	(8^+)	18			IT=100	*
^{140}Gd	−61782	28				15.8 s	0.4	0^+	18	91Fi03	TD	β^+=100;e$^+$=67 8;ε=33 8	
^{140}Tb	−50480	800				2.29 s	0.15	(7^+)	18	91Fi03	D	β^+=100;ε<3;β^+p=0.26 13	
^{140}Dy	−42830#	400#				700# ms		0^+	18			β^+ ?;β^+p ?	
^{140}Dy^m	−40660#	400#	2166.1	0.5		7.0 μs	0.5	8^-	18	02Kr04	TJ	IT=100	*
^{140}Ho	−29430#	500#				6 ms	3	8^+#	18			p$\approx$100;β^+ ?;β^+p ?	*
$*^{140}$Sb	T : average 20Wu04=169(7) 17Mo12=173(12)												**
$*^{140}$Sb^m	E : 16Lo01=298.2 + x keV; x=30#(30#) keV estimated by the authors												**
$*^{140}$Te	T : average 20Wu04=360(21) 17Mo19=350(5); other: 06KeZZ=334(14)												**
$*^{140}$I	T : from $\beta\gamma$(t); others: 20Wu04=553(46) [$\beta\gamma$(t)] 76Lu02=590(10) [β^-n(t)] 76Ah01=860(40) 75Kr17=870(40) 74Kr21=880(130)												**
$*^{140}$I	T : 70HeZH=860(140) 70WiZN=880(120) [β^-n(t)]												**
$*^{140}$I	D : %β^-n from 17AgZZ=7.60(0.28); other: 20Wa04=7.6(0.9,stat)(2.7,syst)												**
$*^{140}$I	J : from 17Mo19												**
$*^{140}$I^m	T : from $\beta\gamma$(t)												**
$*^{140}$I^m	J : other: 99Li18=4$^-$												**
$*^{140}$Cs	J : 79Bo01,79Ek02,78Ek05=1												**
$*^{140}$La	J : 66Bl05,60Pe09=3												**
$*^{140}$Ce	D : from IS=88.450(0.051) in 24Ci.A												**
$*^{140}$Pr	T : other: 07Li71=7.3(0.4) for q=59$^+$ (bare ion) 3.04(0.10) for q=58$^+$ (H-like ion) and 3.84(0.15) for q=57$^+$ (He-like ion)												**
$*^{140}$Pr	D : %e$^+$=42.4(2.3); %ε=57.6(2.3) for q=58$^+$ (H-like ion) and %e$^+$=51.2(3.1); %ε=48.8(3.1) for q=57$^+$ (He-like ion); %e$^+$ decay for the ground state												**
$*^{140}$Pr	D : (neutral atom) from 72Ev01												**
$*^{140}$Pr	J : 72Ek04=1												**
$*^{140}$Nd^n	T : average 13Va10=1.2(0.1) 08Fe02=1.23(0.07)												**
$*^{140}$Eu	J : 85Ah02=1												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{140}$Eu^m	E : from 185.3 + x keV and x<50 keV in 91Fi03											**
$*^{140}$Eu^n	E : from 459.5(0.3) keV above ^{140}Eu^m											**
$*^{140}$Dy^m	T : average 02Kr04=7.0(0.5) 02Cu01=7.3(1.5)											**
$*^{140}$Ho	D : %p observed in 99Ry04											**
^{141}Sn	−27900#	200#				1# ms	$7/2^+$#				β^- ?;β^-n ?;β^-2n ?	
^{141}Sb	−39430#	300#				103 ms 29	$7/2^+$#	22	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{141}Te	−50670#	100#				193 ms 16	$5/2^-$#	22	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{141}I	−59912	4				420 ms 7	$7/2^+$#	22	20Wu04	TD	β^-=100;β^-n=21.2 30	*
^{141}Xe	−68197.3	2.9				1.729 s 0.007	$5/2^-*$	22	90NeZY	J	β^-=100;β^-n=0.0426 23	*
^{141}Cs	−74477	9				24.84 s 0.16	$7/2^+*$	12	93Ru01	TD	β^-=100;β^-n=0.0342 14	*
^{141}Ba	−79733	5				18.25 m 0.07	$3/2^-*$	22			β^-=100	*
^{141}La	−82930	4				3.931 h 0.019	$(7/2^+)$	22			β^-=100	*
^{141}Ce	−85431.7	1.3				32.505 d 0.010	$7/2^-*$	22	FGK204	T	β^-=100	*
^{141}Pr	−86015.5	1.4				STABLE	$5/2^+*$	22			IS=100	
^{141}Nd	−84192	3				2.49 h 0.03	$3/2^+*$	22			β^+=100;ε=97.28 16;e$^+$=2.72 16	*
^{141}Nd^m	−83435	3	756.51	0.05		62.0 s 0.8	$11/2^-$	22	70Ab05	D	IT=99.968 8;β^+=0.032 8	
^{141}Pm	−80523	14				20.90 m 0.05	$5/2^+*$	22	67Bl27	T	β^+=100	*
^{141}Pm^m	−79894	14	628.61	0.07		630 ns 20	$11/2^-$	22	85Ar19	T	IT=100	
^{141}Pm^n	−77992	14	2530.75	0.17		> 2 μs	$(23/2^+)$	22	85Ar19	TDJ	IT=100	
^{141}Sm	−75938	7				10.4 m 0.5	$1/2^+*$	22			β^+=100	*
^{141}Sm^m	−75762	7	175.80	0.30		22.58 m 0.15	$11/2^-*$	22	76Ke06	D	β^+=99.69 3;IT=0.31 3	*
^{141}Eu	−69926	13				40.7 s 0.7	$5/2^+*$	22			β^+=100	*
^{141}Eu^m	−69830	13	96.45	0.07		3.0 s 0.2	$11/2^-$	22	89Gi06	TD	IT=86 3;β^+=14 3	*
^{141}Gd	−63224	20				17.0 s 2.8	$(1/2^+)$	22	89Gi06	TD	β^+=100;β^+p=0.03 1	*
^{141}Gd^m	−62846	20	377.76	0.09		24.1 s 1.5	$(11/2^-)$	22	89Gi06	TD	β^+=89 2;IT=11 2	*
^{141}Tb	−54540	110			*	3.5 s 0.2	$(5/2^-)$	22	89Gi06	T	β^+=100	*
^{141}Tb^m	−54540#	230#	0#	200#	EU*	7.9 s 0.6	$11/2^-$#		88Be.A	I	β^+=100	
^{141}Dy	−45410#	300#				933 ms 115	$(9/2^-)$	22			β^+=100;β^+p=?	*
^{141}Ho	−34360#	400#				4.1 ms 0.1	$(7/2^-)$	22			p=100	*
^{141}Ho^m	−34300#	400#	66.0	2.0	p	7.3 μs 0.3	$(1/2^+)$	22	01Se03	E	p=100	*
$*^{141}$I	D : %β^-n from 80Al15											**
$*^{141}$I	T : average 20Wu04=418(8) 80Al15=430(20); others: 74Kr21=410(80) 76Lu02=480(30) 70HeZX=430(80) 76Ah01=420(80)											**
$*^{141}$Xe	J : 89Bo03,90NeZY=5/2											**
$*^{141}$Xe	T : average 76Ot03=1.72(0.03) 71Kr22=1.79(0.03) 69Ta04=1.73(0.01) 69Ca03=1.720(0.013) 65Pa14=1.70(0.05)											**
$*^{141}$Xe	D : %β^-n from 75As03=0.0426(0.0023)											**
$*^{141}$Cs	T : average 93Ru01=24.34(0.12) 86Ok03=24.98(0.13) 76Ot03=24.94(0.06), Birge ratio=3.26											**
$*^{141}$Cs	J : 87Co19,79Bo01,79Ek02,78Ek05=7/2											**
$*^{141}$Ba	T : average 69Ca03=18.27(0.07) 72Eh02=18.03(0.19)											**
$*^{141}$Ba	J : 88We07,83Mu12,81Ne06=3/2											**
$*^{141}$La	T : average 81Ge04=3.92(0.03) 72Eh02=4.03(0.04) 62Fr04=3.90(0.05) 60Al33=3.87(0.04)											**
$*^{141}$Ce	J : 63Ha07,62Gr17,57Ke13,55Ca48=7/2											**
$*^{141}$Nd	D : %e$^+$ average 72Ev01=2.72(0.20) 66Gr05=2.73(0.27)											**
$*^{141}$Nd	J : 62Al04=3/2											**
$*^{141}$Pm	J : 72Ek05=5/2											**
$*^{141}$Sm	J : 72Ek05=1/2											**
$*^{141}$Sm	T : average 77Ke03=10.2(0.2) 72E_p01=11.3(0.3) 70Ar17=9.0(0.5); Birge Ratio=3.0											**
$*^{141}$Sm^m	J : 72Ek05=11/2											**
$*^{141}$Sm^m	T : average 93Al03=21.2(1.2) 72E_p01=22.1(0.3) 72De23=22.8(0.2) 70Ar17=22.5(0.5) 68Bl13=22.9(0.5) 67He23=22.5(1.4)											**
$*^{141}$Eu	J : 85Ah02=5/2											**
$*^{141}$Eu^m	D : symmetrized from 89Gi06 %IT=87(+2-4) and %β^+=13(+4-2)											**
$*^{141}$Eu^m	T : average 89Gi06=2.7(0.3) 77De25=3.3(0.3)											**
$*^{141}$Gd	T : average 89Gi06=14(4) 86Wi05=20(4)											**
$*^{141}$Gd^m	T : average 89Gi06=25.5(0.5) 86Re11=22(3) 88TuZY=20.8(0.8); Birge Ratio=3.6											**
$*^{141}$Tb	T : other: 88TuZY=4.5(0.8)											**
$*^{141}$Dy	T : average 06Xu03=900(200) 86Wi15=900(200) 84Ni03=1000(200)											**
$*^{141}$Ho	T : average 08Ka16=4.1(0.1) 99Ry04=3.9(0.5) 98Da03=4.2(0.4)											**
$*^{141}$Ho^m	T : average: 08Ka16=7.4(0.3) 01Se03=6.5(+0.9-0.7); other: 99Ry04=8(3)											**
^{142}Sb	−33450#	300#				80 ms 50		21	20Wu04	T	β^-=100;β^-n ?;β^-2n ?	*
^{142}Te	−46550#	200#				147 ms 7	0^+	10	23Mo01	TD	β^-=100;β^-n ?;β^-2n ?	*
^{142}I	−54803	5				235 ms 11	2^-#	10	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{142}Xe	−65229.6	2.7				1.225 s 0.014	0^+	10	20Wu04	T	β^-=100;β^-n=0.37 3	*
^{142}Cs	−70519	6				1.681 s 0.006	0^-*	10	23Wo01	T	β^-=100;β^-n=0.089 3	*
^{142}Ba	−77839	6				10.51 m 0.07	0^+	10	23Wo01	T	β^-=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{142}La	−80025	6				91.2 m 0.1	2^-	10	23Wo01	T	β^-=100	*
^{142}La^m	−79879	6	145.82	0.08		870 ns 170	$(4)^-$	10			IT=100	
^{142}Ce	−84534.2	2.4				STABLE >2.9Ey	0^+	10	19Be29	T	IS=11.114 51;α ?;2β^- ?	*
^{142}Pr	−83787.3	1.4				19.12 h 0.04	2^-*	10			β^-=99.9836 8;ε=0.0164 8	*
^{142}Pr^m	−83783.6	1.4	3.694	0.003		14.6 m 0.5	5^-*	10			IT=100	*
^{142}Nd	−85951.6	1.1				STABLE	0^+	10			IS=27.152 40	*
^{142}Nd^m			*non − exist*		EU	16.5 μs	6^+	10	87Pr09	I	IT=100	*
^{142}Pm	−81142	24				40.5 s 0.5	1^+	10	91Fi03	TD	β^+=100;e$^+$=77.1 27;ε=22.9 27	*
^{142}Pm^m	−80259	24	883.17	0.16		2.0 ms 0.2	$(8)^-$	10			IT=100	
^{142}Pm^n	−78313	24	2828.7	0.6		67 μs 5	(13^-)	10			IT=100	
^{142}Sm	−78983.3	1.7				72.49 m 0.05	0^+	10	91Fi03	TD	β^+=100;e$^+$<5	
^{142}Sm^m	−76611.2	1.7	2372.1	0.4		170 ns 2	7^-	10			IT=100	
^{142}Sm^n	−75321.1	1.8	3662.2	0.7		480 ns 60	10^+	10			IT=100	
^{142}Eu	−71310	30				2.36 s 0.10	1^+*	10	91Fi03	TD	β^+=100;e$^+$=89.9 16;ε=10.1 16	*
^{142}Eu^m	−70856	12	450	30	BD	73.4 s 0.5	8^-*	10	93Al03	T	β^+=100	
^{142}Gd	−66960	28				70.2 s 0.6	0^+	10	91Fi03	TD	β^+=100;ε=52 5;e$^+$=48 5	
^{142}Tb	−56560	700				597 ms 17	1^+	10	91Fi03	TD	β^+=100;e$^+$=96.8 4;ε=3.2 4; β^+p=0.0022 11	
^{142}Tb^m	−56280	700	279.7	0.4		303 ms 17	5^-	10			IT=100	
^{142}Tb^n	−55910	700	652.1	0.6		26 μs 1	8^+	10			IT=100	
^{142}Dy	−49980#	730#				2.3 s 0.3	0^+	10	91Fi03	TD	β^+=100;e$^+$=90 4;ε=10 4; β^+p=0.06 3	
^{142}Ho	−37280#	400#				400 ms 100	(8^+)	10			$\beta^+\approx$100;β^+p=?;p$\approx$0	*
^{142}Er	−28200#	500#				10# μs	0^+				p ?	
*^{142}Sb	T : symmetrized from 20Wu04=53(+69-31)											**
*^{142}Te	T : average 23Mo01=148(18) 20Wu04=147(8)											**
*^{142}I	T : other: 06KeZZ=222(12)											**
*^{142}Xe	D : %β^-n average 03Be05=0.21(0.06) 75As04=0.406(0.034) 69Ta04=0.45(0.08)											**
*^{142}Xe	T : average 20Wu04=1.26(0.07) 03Be05=1.25(0.03) 69Ca03=1.24(0.02) 67Co31=1.18(0.04) 65Pa14=1.15(0.04)											**
*^{142}Cs	T : average 23Wo01=1.678(0.008) 03Be05=1.65(0.04) 93Ru01=1.684(0.014) 81En05=1.75(0.06) 77Re05=1.70(0.02) 69Ca03=1.68(0.02)											**
*^{142}Cs	D : %β^-n average 93Ru01=0.0896(0.0036) 81En05=0.082(0.008) 80ReZQ=0.090(0.005); also 23Wo01=0.1(+0.05-0.03)											**
*^{142}Cs	J : 79Ek02,78Ek05=0											**
*^{142}Ba	T : average 23Wo01=10.5(0.4) 74Gr29=10.3(0.1) 72Eh02=10.80(0.12) ~ 69Ca03=10.65(0.12)											**
*^{142}La	T : others: 19Kr10=91.8(1.2) 81Ge04=91.1(0.5) 72Eh02=95.4(1.8) 62Fr04=92.5(0.5)											**
*^{142}Ce	T : lower limit is for α decay; 2ν-$\beta\beta$: 11Be02>300 Py 01Da22>260 Py											**
*^{142}Pr	J : 70HiZW,62Ca10,62Li06,61Ca07,58Da12,58Gr92=2											**
*^{142}Pr^m	J : 69HuZY=5											**
*^{142}Nd	D : from IS=27.152(0.040) in 24Ci.A											**
*^{142}Nd^m	I : originally reported in 64Kr02, but not confirmed in the pulsed-beam experiment of 87Pr09											**
*^{142}Pm	T : other: 09Wi09=56(3) for q=61$^+$ (bare ion) 39.2(0.7) for q=60$^+$ (H-like ion) 39.6(1.4) for q=59$^+$ (He-like ion) 19Oz03=55(3) for q=60$^+$											**
*^{142}Pm	T : (H-like ion)											**
*^{142}Pm	D : %e$^+$=71.0(1.3); %ε=29.0(1.3) for q=60$^+$ (H-like ion) and %e$^+$=79.8(1.0); %ε=20.2(1.0) for q=59$^+$ (He-like ion)											**
*^{142}Eu	T : average 91Fi03=2.34(0.12) 75Ke08=2.4(0.2)											**
*^{142}Eu	J : 85Ah02=1											**
*^{142}Eu^m	J : 85Ah02=8											**
*^{142}Ho	D : %p 93Li40=0											**
*^{142}Ho	J : expected conf=π7/2[523]$\otimes\nu$9/2[514]											**
^{143}Te	−40530#	200#				120 ms 8	$7/2^+$#	11	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{143}I	−50790#	200#				182 ms 8	$7/2^+$#	11	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{143}Xe	−60203	5				511 ms 6	$5/2^-$*	11	03Be05	D	β^-=100;β^-n=1.00 15	*
^{143}Cs	−67675	8				1.802 s 0.008	$3/2^+$*	11	93Ru01	TD	β^-=100;β^-n=1.62 6	*
^{143}Ba	−73930	5				14.5 s 0.3	$5/2^-$*	11			β^-=100	*
^{143}La	−78172	7				14.2 m 0.1	$(7/2)^+$	11			β^-=100	
^{143}Ce	−81607.7	2.4				33.039 h 0.006	$3/2^-$*	11			β^-=100	*
^{143}Pr	−83069.7	1.7				13.57 d 0.02	$7/2^+$*	11			β^-=100	*
^{143}Nd	−84003.9	1.1				STABLE >110Ey	$7/2^-$*	11	24Be07	T	IS=12.173 26;α ?	*
^{143}Pm	−82962.3	2.9				265 d 7	$5/2^+$*	11			ε=100;e$^+$<5.7e-6	*
^{143}Sm	−79518.8	2.6				8.75 m 0.06	$3/2^+$*	11			β^+=100;ε=60 2;e$^+$=40 2	*
^{143}Sm^m	−78764.8	2.6	753.99	0.16		66 s 2	$11/2^-$	11			IT=99.76 5;β^+=0.24 5	
^{143}Sm^n	−76725.0	2.9	2793.8	1.3		30 ms 3	$23/2^-$	11	FGK128	J	IT=100	*
^{143}Eu	−74241	11				2.59 m 0.02	$5/2^+$*	11			β^+=100	*
^{143}Eu^m	−73851	11	389.51	0.04		50.0 μs 0.5	$11/2^-$	11			IT=100	
^{143}Gd	−68230	200				39 s 2	$1/2^+$	11	78Fi02	D	β^+=100;β^+p=?;$\beta^+\alpha$=?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{143}Gd^m	−68080	200	152.6	0.5		110.0 s 1.4	11/2$^-$	11	78Fi02	D	β^+=100;β^+p=?;$\beta^+\alpha$=?	*
^{143}Tb	−60444	30			*	12 s 1	(11/2$^-$)	11			β^+=100	
^{143}Tb^m	−60390#	60#	50#	50#	*	17 s 4	5/2$^+$#	11	86Re11	T	β^+=?;IT ?	
^{143}Dy	−52169	13				4.0 s 0.3	(1/2$^+$)	11	03Xu04	TJ	β^+=100;β^+p=?	*
^{143}Dy^m	−51858	13	310.7	0.6		3.0 s 0.3	(11/2$^-$)	11	03Xu04	EJD	β^+=100;β^+p=?	
^{143}Dy^n	−51763	13	406.3	0.8		1.2 μs 0.3	(7/2$^-$)	11	05Ri17	DEJ	IT=100	*
^{143}Ho	−42050#	300#				300# ms >200ns	11/2$^-$#	11	00So11	I	β^+ ?;β^+p ?	
^{143}Er	−31300#	400#				200# ms	(9/2$^-$)	11	22Si09	J	β^+ ?;β^+p ?	
^{143}I	T : other: 06KeZZ=130(45)											**
^{143}Xe	J : 89Bo03=5/2											**
^{143}Cs	T : average 03Be05=1.77(0.03) 93Ru01=1.809(0.009) 81En05=1.83(0.04) 79Ri09=1.765(0.030) 77Re05=1.79(0.02)											**
^{143}Cs	J : 87Co19,79Ek02=3/2											**
^{143}Ba	J : 88We07,83Mu12,81Ne06=5/2											**
^{143}Ce	J : 72Sh01,65Ma19,63Ha07=3/2											**
^{143}Pr	J : 64Bu09=7/2											**
^{143}Nd	T : for α decay; other: 66Ka23>0.2 Ey											**
^{143}Nd	J : 62Sp03,58Hu17,57Ke13,55Bl51,54Mu91=7/2											**
^{143}Nd	D : from IS=12.174(0.026) in 24Ci.A											**
^{143}Pm	J : 20St03=5/2											**
^{143}Sm	D : %e$^+$ from 72Ev01											**
^{143}Sm	J : 72Ek05=3/2											**
^{143}Sm^n	J : E3 γ to 17/2$^+$											**
^{143}Eu	J : 85Ah02,84Ek01=5/2											**
^{143}Gd	D : %β^+p and %$\beta^+\alpha$ from 78Fi02 for ^{143}Gd,^{143}Gd^m=0.001; 39 particles detected											**
^{143}Gd^m	J : from 05Ba64											**
^{143}Dy	T : average 03Xu04=5.6(1.0) 84Ni03=3.2(0.6) 83Ni05=4.1(0.3)											**
^{143}Dy^n	E : 95.6(0.5) keV above ^{143}Dy^m											**
^{143}Dy^n	J : from 05Ri17, based on depopulating 95.6-keV γ being most likely E2											**
^{144}Te	−36220#	300#				93 ms 60	0$^+$	18	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{144}I	−45330#	200#				94 ms 8	1$^-$#	00	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{144}Xe	−56872	5				388 ms 7	0$^+$	00	03Be05	TD	β^-=100;β^-n=3.0 3	
^{144}Cs	−63273	20				994 ms 6	1$^-$*	10	20Cz01	D	β^-=100;β^-n=2.98 6	*
^{144}Cs^m	−63181	20	92.2	0.5		1.1 μs 0.1	(4$^-$)	10			IT=100	
^{144}Cs^n			*non − exist*		EU	< 1 s	(> 3$^-$)		78MoZQ	IJT	β^-=?;IT ?;β^-n ?	*
^{144}Ba	−71770	6				11.73 s 0.08	0$^+$	00	19KoZX	T	β^-=100	*
^{144}La	−74850	13				44.0 s 0.7	(3$^-$)	00	FGK205	T	β^-=100	*
^{144}Ce	−80433.5	2.8				284.38 d 0.07	0$^+$	00	FGK267	T	β^-=100	
^{144}Pr	−80752.2	2.6				17.28 m 0.05	0$^-$	00			β^-=100	
^{144}Pr^m	−80693.2	2.6	59.03	0.03		7.2 m 0.3	3$^-$	00			IT≈99.93;β^-≈0.07	
^{144}Nd	−83749.6	1.1				2.29 Py 0.16	0$^+$	00			IS=23.798 19;α=100	
^{144}Pm	−81417.8	2.8				363 d 14	5$^-$*	00	94Hi05	D	ε=100;e$^+$<8e-5	*
^{144}Pm^m	−80576.9	2.8	840.90	0.05		780 ns 200	(9)$^+$	00			IT=100	
^{144}Pm^n	−72822	4	8595.8	2.2		∼ 2.7 μs	(27$^+$)	00			IT=100	
^{144}Sm	−81967.3	1.3				STABLE	0$^+$	00			IS=3.08 4;2β^+ ?	*
^{144}Sm^m	−79643.7	1.3	2323.60	0.08		880 ns 25	6$^+$	00			IT=100	
^{144}Eu	−75620	11				10.2 s 0.1	1$^+$*	00			β^+=100	
^{144}Eu^m	−74492	11	1127.6	0.6		1.0 μs 0.1	8$^-$	00	FGK127	J	IT=100	*
^{144}Gd	−71760	28				4.47 m 0.06	0$^+$	00			β^+=100	
^{144}Gd^m	−68327	28	3433.1	0.5		145 ns 30	(10$^+$)	00			IT=100	
^{144}Tb	−62367	28				∼ 1 s	1$^+$	00			β^+=100	
^{144}Tb^m	−61970	28	396.9	0.5		4.25 s 0.15	6$^-$	00	86Re11	D	IT=66;β^+=34	*
^{144}Tb^n	−61891	28	476.2	0.5		2.8 μs 0.3	(8$^-$)	00			IT=100	
^{144}Tb^p	−61850	28	517.1	0.5		670 ns 60	(9$^+$)	00			IT=100	
^{144}Tb^q	−61823	28	544.5	0.6		< 300 ns	(10$^+$)				IT=100	
^{144}Dy	−56570	7				9.1 s 0.4	0$^+$	00			β^+=100;β^+p=?	
^{144}Ho	−44610	8				700 ms 100	(5$^-$)	08			β^+=100;β^+p=?	
^{144}Ho^m	−44345	8	265.3	0.3		519 ns 5	(8$^+$)	08	10Ma08	T	IT=100	
^{144}Er	−36610#	200#				400# ms >200ns	0$^+$	04			β^+ ?	
^{144}Tm	−22300#	400#				2.3 μs 0.9	(9$^+$)	08	22Si09	J	p=?;β^+ ?	*
^{144}Cs	D : %β^-n average 20Cz01=2.95(0.24) 93Ru01=3.17(0.13) 79Ri09=2.95(0.25) 80ReZQ=3.12(0.11), 2.67(0.12)											**
^{144}Cs	T : other (downweighted): 17Wu04=932(76)											**
^{144}Cs	J : 79Ek02=1											**
^{144}Cs^n	I : introduced in 78MoZQ, but no β^- decaying isomer was observed in later studies; most likely this is ^{144}Cs^m											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{144}$Ba	T : average 19KoZX=11.6(0.1) 82Ch22=11.5(0.2) 79En02=12.0(0.4) 76AmZW=11.9(0.6) 78Wo09=12.3(0.4) 74Gr29=11.1(0.5) 69WiZX=12.3(0.2)											**
$*^{144}$Ba	T : 69Ru14=11.9(0.3)											**
$*^{144}$La	T : other: ENSDF2001=40.8(0.4) is likely affected by ^{144}Ba impurities											**
$*^{144}$Pm	J : 20St03=5											**
$*^{144}$Sm	T : 0ν-$\beta\beta$ 18No01>1 Py											**
$*^{144}$Eu	J : 85Ah02=1											**
$*^{144}$Eu^m	J : E2 γ to 6^-											**
$*^{144}$Tb^m	T : other: 03Li42=12(2) s for q=65^+ (bare ion)											**
$*^{144}$Tb^m	J : E3 γ to 3^+											**
$*^{144}$Tm	T : symmetrized from 05Gr32,05Bi24=1.9(+1.2-0.5) μs											**
^{145}Te	−30010#	300#				75# ms	>550ns	$3/2^-$#	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{145}I	−41130#	300#				89.7 ms	9.3	$7/2^+$#	10	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{145}Xe	−51493	11				188 ms	4	$3/2^-$#	08			β^-=100;β^-n=5.0 6;β^-2n ?	*
^{145}Cs	−60054	9				582 ms	4	$3/2^+$*	08	20Cz01	D	β^-=100;β^-n=12.8 3	*
^{145}Cs^m	−59291	9	762.9	0.4		500 ns	100	13/2#		15YaZW	TD	IT=100	*
^{145}Ba	−67516	7				4.31 s	0.16	$5/2^-$*	08			β^-=100	*
^{145}La	−72839	11				24.8 s	2.0	$(5/2^+)$	08			β^-=100	
^{145}Ce	−77065	17				3.01 m	0.06	$5/2^-$#	08			β^-=100	
^{145}Pr	−79628	7				5.984 h	0.010	$7/2^+$	08			β^-=100	
^{145}Nd	−81433.6	1.1				STABLE	>27Ey	$7/2^-$*	08	24Be07	T	IS=8.293 12;α ?	*
^{145}Pm	−81269.1	2.7				17.7 y	0.4	$5/2^+$*	08			ε=100;α=2.8e-7	*
^{145}Sm	−80653.1	1.3				340 d	3	$7/2^-$	08			ε=100	*
^{145}Sm^m	−71838.1	1.6	8815	1		3.52 μs	0.16	$49/2^+$	08	20Ge08	EJT	IT=100	*
^{145}Eu	−77993.3	3.0				5.93 d	0.04	$5/2^+$*	08			β^+=100	*
^{145}Eu^m	−77277	3	716.0	0.3		490 ns	30	$11/2^-$	08			IT=100	
^{145}Gd	−72927	20				23.0 m	0.4	$1/2^+$*	08			β^+=100	*
^{145}Gd^m	−72178	20	749.1	0.2		85 s	3	$11/2^-$	08			IT=94.3 5;β^+=5.7 5	
^{145}Tb	−65881	28			*&	30.9 s	0.6	$(11/2^-)$	08			β^+=100	
^{145}Tb^m	−65540	200	340	200	BD*&			$(3/2^+)$				β^+ ?	
^{145}Dy	−58243	7				9.5 s	1.0	$(1/2^+)$	08	93Al03	T	β^+=100;β^+p=?	*
^{145}Dy^m	−58125	7	118.2	0.2		14.1 s	0.7	$(11/2^-)$	08			β^+=100;β^+p≈50	
^{145}Ho	−49120	7			*	2.4 s	0.1	$(11/2^-)$	08			β^+=100	
^{145}Ho^m	−49020#	100#	100#	100#	*	100# ms		$5/2^+$#				β^+ ?;IT ?	
^{145}Er	−39250#	200#				900 ms	200	$(1/2^+)$	08	10Ma20	T	β^+=100;β^+p=?	*
^{145}Er^m	−39000#	200#	255	4	p	1.0 s	0.3	$(11/2^-)$	08	10Ma20	T	β^+=100;IT ?;β^+p=?	
^{145}Tm	−27580#	200#				3.17 μs	0.20	$(11/2^-)$	08			p=100	
$*^{145}$Xe	T : other (downweighted): 20Wu04=202(26)											**
$*^{145}$Cs	T : average 20Wu04=612(20) 17Wu04=613(+32-24) 03Be05=558(9) 93Ru01=579(6) 82Ra13=594(13) 81En05=610(30) 79Ri09=616(20) 79En02=605(30)											**
$*^{145}$Cs	T : 78Wo09=590(20) 77Re05=580(14) 74Ro15=611(21) 71Tr02=563(27)											**
$*^{145}$Cs	D : %β^-n average 20Cz01=13.53(0.90) 93Ru01=14.4(0.6) 80ReZQ=13.3(1.4) 79Ri09=12.2(0.9) 78Cr03=12.5(3.0) 74Ro15=12.1(0.4)											**
$*^{145}$Cs	J : 79Ek02=3/2											**
$*^{145}$Cs^m	E : 16Ya.A=762.9(0.4) keV											**
$*^{145}$Ba	J : 88We07,83Mu12=5/2											**
$*^{145}$Nd	T : for α decay; others: 66Ka23>100 Py 65Is01>60 Py											**
$*^{145}$Nd	J : 62Sp03,58Hu17,55Bl51,54Mu91=7/2											**
$*^{145}$Pm	J : 20St03=5/2											**
$*^{145}$Sm	T : from 59Br65=340(3); other: 21Ka38=345(16)											**
$*^{145}$Sm^m	T : other: 93Fe14=0.96(+0.19-0.15)											**
$*^{145}$Eu	J : 85Ah02,72Ek05=5/2											**
$*^{145}$Gd	J : 72Ek05=1/2											**
$*^{145}$Dy	T : average 93Al03=10.5(1.5) 93To04=6(2) 84Sc.C=10(1)											**
$*^{145}$Er	T : 10Ma20=900(200) 89Vi02=900(300) for a mixture between gs and the isomer											**
^{146}I	−35540#	300#				94 ms	26		21	20Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{146}Xe	−47955	24				146 ms	6	0^+	16	20Wu04	TD	β^-=100;β^-n=6.9 15	*
^{146}Cs	−55310.4	2.9				321.6 ms	0.9	1^-*	16	93Ru01	TD	β^-=100;β^-n=14.2 4;β^-2n ?	*
^{146}Cs^m	−55263.7	2.9	46.7	0.1		1.25 μs	0.05	4^-#	16	15YaZW	TD	IT=100	*
^{146}Ba	−64866.3	1.8				2.15 s	0.04	0^+	16	19KoZX	T	β^-=100	*
^{146}La	−69221.1	1.7			&	9.9 s	0.1	(5^-)	16	24La01	TJ	β^-=100	*
^{146}La^m	−69079.7	1.7	141.4	2.4	MD &	6.09 s	0.17	(1^-)	16	20Or02	E	β^-=100	*
^{146}Ce	−75638	12				13.49 m	0.16	0^+	16			β^-=100	
^{146}Pr	−76703	29				24.09 m	0.10	(2^-)	16			β^-=100	
^{146}Nd	−80927.5	1.1				STABLE	>1.4Zy	0^+	16	24Be07	T	IS=17.189 32;2β^- ?;α ?	*
^{146}Pm	−79456	4				5.53 y	0.05	3^-*	16			ε=66.0 13;β^-=34.0 13	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{146}Sm	−80997.9	3.0				87.6 My 2.3	0^+	16	24Ch.A	T	α=100	*
^{146}Eu	−77119	6				4.47 d 0.08	4^-*	16	25Gu07	T	β^+=100	*
^{146}Eu^m	−76453	6	666.33	0.11		234.1 μs 2.5	9^+	16	22Ze02	T	IT=100	*
^{146}Gd	−76088	4				48.27 d 0.09	0^+	16			ε=100	
^{146}Tb	−67770	40				8 s 4	1^+	16			β^+=100	
^{146}Tb^m	−67500	70	270	80	MD	24.1 s 0.5	5^-	16	93Al03	T	β^+=100	
^{146}Tb^n	−66840#	110#	930#	100#		1.18 ms 0.02	10^+	16			IT=100	*
^{146}Dy	−62555	7				33.2 s 0.7	0^+	16	93Al03	T	β^+=100	
^{146}Dy^m	−59621	7	2934.5	0.4		150 ms 20	10^+	16			IT=100	
^{146}Ho	−51238	7				3.32 s 0.22	(6^-)	16			β^+=100;β^+p=?	
^{146}Er	−44322	7				1.7 s 0.6	0^+	16			β^+=100;β^+p=?	
^{146}Tm	−31070#	200#				155 ms 20	(1^+)	16	05Ro40	TJD	p≈100;β^+ ?;β^+p ?	*
^{146}Tm^m	−30760#	200#	304	6	p	73 ms 7	(5^-)	16	06Ta08	TJ	p≈100;β^+ ?;β^+p ?	*
^{146}Tm^n	−30580#	200#	487	7	p	200 ms 3	(10^+)	16	06Ta08	TJ	p=?;β^+ ?;β^+p ?	*
^{146}Yb	−21270#	400#				100# ms	0^+				β^+ ?;β^+p ?	
*^{146}Xe	T : average 20Wu04=147(13) 03Be05=146(6)											**
*^{146}Cs	T : average 20Wu04=318(16) 17Wu04=288(13) 03Be05=300(20) 93Ru01=321(2) 83Re10=322(1) 79Ri09=325(10)											**
*^{146}Cs	D : %β^-n average 93Ru01=15.1(0.6) 81En05=13.1(1.3) 79Ri09=13.2(0.8) 74Ro15=14.2(1.7)											**
*^{146}Cs^m	E : from 16Ya.A=46.7(0.1)											**
*^{146}Ba	D : %β^-n 93Ru01<0.02% not relevant, since Q(β^-n) is negative											**
*^{146}Ba	T : average 19KoZX=2.06(0.07) 85Ch16=2.22(0.07) 78Wo09=2.18(0.11) 76AmZW=2.14(0.37) 79En02=2.2(0.3); other: 17Wu04=2.56(0.29)											**
*^{146}La	D : %β^-n 93Ru01<0.007% not relevant, since Q(β^-n) is negative											**
*^{146}La	T : average 24La01=9.9(0.1) 78MoYW=10.0(0.4) 74Ar17=11(1) 79En02=9.0(0.6)											**
*^{146}La^m	T : average 24La01=6.1(0.2) 78MoYW=6.2(0.6) 81GoZN=6.0(0.4)											**
*^{146}Nd	T : partial α half-life 24Be07>1.4 Zy; other: 15St09>1.6 Ey; 0ν-$\beta\beta$: 18No01>45 Ey											**
*^{146}Pm	J : 20St03=3											**
*^{146}Sm	T : average (external uncertainty) 24Ch.A=92.0(2.6) 24Ka.A=85.82(+0.64-1.72),91.5(2.0), Birge ratio=2.3; others: 12Ki16=68(7), retracted March											**
*^{146}Sm	T : 2023, 87Me08=103.1(4.5) 66Fr11=102.6(4.8) 64Nu02=74(15) 26Wu.1=78.1(7.6) (theory)											**
*^{146}Eu	T : unweighted average 25Gu07=4.21(0.05) 87Me08=4.40(0.04) 80Ho33=4.51(0.03) 64Ta11=4.59(0.03) 70Ch09=4.65(0.04); Birge ratio=4.0											**
*^{146}Eu	J : 85Ah02,72Ek05=4											**
*^{146}Eu^m	T : average of 22Ze02=230(6) 80E_r04=235(25) 80LeZN=230(10) 71HaXM=235(3) 62Re04=240(10)											**
*^{146}Tb^n	E : 779.57 keV above ^{146}Tb^m from ENSDF2016											**
*^{146}Tm	T : other: 05Bb02=190(80) ms											**
*^{146}Tm^m	T : average 06Ta08=68(3), supersedes 05Bb02=75(3), 05Ro40=82(4); Birge ratio=2.8											**
*^{146}Tm^n	T : average 07DaZU=213(9) 06Ta08=198(3)											**
^{147}I	−31200#	300#				60# ms >550ns	$3/2^-$#	22	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{147}Xe	−42400#	200#				88 ms 14	$3/2^-$#	22	20Wu04	T	β^-=100;β^-n=4.0 23;β^-2n ?	*
^{147}Cs	−51920	8				230.5 ms 0.9	$(3/2^+)$	22	93Ru01	TD	β^-=100;β^-n=28.5 15	*
^{147}Cs^m	−51219	8	701.4	0.4		190 ns 20	$13/2^+$#		15YaZW	TD	IT=100	*
^{147}Ba	−60302.0	2.0				893 ms 1	$5/2^-$	22	13Rz01	J	β^-=100;β^-n=0.110 16	*
^{147}La	−66668.8	2.6				4.026 s 0.020	$(5/2^+)$	22	96Ur02	J	β^-=100;β^-n=0.041 3	*
^{147}Ce	−72036	3				56.4 s 1.1	$(5/2^-)$	22			β^-=100	*
^{147}Pr	−75479.3	2.9				13.39 m 0.04	$3/2^+$	22	15Ru09	T	β^-=100	*
^{147}Nd	−78148.3	1.1				11.09 d 0.05	$5/2^-$*	22	19Br01	T	β^-=100	*
^{147}Pm	−79042.9	1.1				2.6235 y 0.0002	$7/2^+$*	22	FGK257	T	β^-=100	*
^{147}Sm	−79267.9	1.1				106.25 Gy 0.19	$7/2^-$*	22	22Vi.1	T	IS=15.00 14;α=100	*
^{147}Eu	−77546.4	2.5				24.29 d 0.24	$5/2^+$*	22	25Gu07	T	β^+≈100;α=0.0022 6	*
^{147}Eu^m	−76921.1	2.5	625.27	0.05		765 ns 15	$11/2^-$	22	70Kl07	T	IT=100	
^{147}Gd	−75358.6	1.7				38.06 h 0.12	$7/2^-$*	22	69Ch32	T	β^+=100	*
^{147}Gd^m	−66770.8	1.8	8587.8	0.5		519 ns 16	$49/2^+$	22	20Br06	J	IT=100	*
^{147}Tb	−70743	8				1.64 h 0.03	$1/2^+$*	22	97Wa04	T	β^+=100	*
^{147}Tb^m	−70692	8	50.6	0.9		1.87 m 0.05	$(11/2^-)$	22	93Al03	T	β^+=100	*
^{147}Dy	−64196	9				67 s 7	$(1/2^+)$	22	85Al08	T	β^+=100;β^+p≈0.05	*
^{147}Dy^m	−63446	9	750.5	0.4		55.2 s 0.3	$(11/2^-)$	22	85Br07	T	β^+=68.9 23;IT=31.1 23	*
^{147}Dy^n	−60789	9	3407.2	0.8		400 ns 10	$(27/2^-)$	22			IT=100	
^{147}Ho	−55757	5				5.8 s 0.4	$(11/2^-)$	22	82No08	T	β^+=100	
^{147}Ho^m	−53070	5	2687.1	0.4		315 ns 30	$(27/2^-)$	22	82No08	T	IT=100	
^{147}Er	−46556	20			*	3.2 s 1.2	$(1/2^+)$	22	10Ma27	T	β^+=100;β^+p=?	
^{147}Er^m	−46500#	40#	60#	35#	*	1.6 s 0.2	$(11/2^-)$	22	10Ma27	T	β^+=100;β^+p=?	*
^{147}Tm	−35975	7				575 ms 24	$11/2^-$	22	93To02	TD	β^+=85 5;p=15 5	*
^{147}Tm^m	−35910	7	65	4	p	375 μs 5	$(5/2^+)$	22	23Au03	TJ	p=100	*
^{147}Yb	−24870#	400#				300# ms	$1/2^+$#				β^+ ?;β^+p ?	
*^{147}Xe	T : other: 03Be05=100(+100-50)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{147}$Xe	D : $\%\beta^-$n from 03Be05<8									**
$*^{147}$Cs	T : average 20Wu04=255(5) 17Wu04=234(14) 93Ru01=235(3) 86ReZU=229(1) 79Ri09=214(30) 78Ko29=235(10)									**
$*^{147}$Cs	D : $\%\beta^-$n average 93Ru01=30.7(2.0) 86ReZU=26.4(2.9) 79Ri09=25.4(3.2)									**
$*^{147}$Cs^m	E : from 16Ya.A=701.4(0.4)									**
$*^{147}$Ba	T : average 17Wu04=921(47) 93Ru01=894(10) 86Wa17=893(1), supersedes 86ReZU=892(10) and 83Re10=910(40); other: 81ShZH=930(50)									**
$*^{147}$Ba	D : $\%\beta^-$n from 93Ru01=0.110(0.016); others: 86Wa17=0.019(0.001) 86ReZR=0.021(0.018) 83Re10=0.030(0.016) 83MaYQ=4.7(1.1) 79RuZQ=5.2(0.5)									**
$*^{147}$Ba	D : 81En05=5.21(0.52)									**
$*^{147}$La	T : average 93Ru01=4.100(0.021) 86Wa17=4.015(0.008) 81En05=4.10(0.25); Birge ratio=2.68									**
$*^{147}$La	D : $\%\beta^-$n average 93Ru01=0.043(0.004) 86Wa17=0.035(0.006)									**
$*^{147}$Ce	T : average 82To16=57(5) 76ScZR=55(5) 74Ar25=56.4(1.2) 73SeYW=57(3)									**
$*^{147}$Pr	J : from 15Wa28									**
$*^{147}$Nd	T : unweighted average 19Br01=11.26(0.01) 71Ba28=10.98(0.01) 63Ho15=11.02(0.05) 60Al33=11.14(0.06) 57Wr37=11.06(0.04); Birge Ratio=9.98									**
$*^{147}$Nd	J : 61Ca07,60Ca03,57Ke13=5/2									**
$*^{147}$Pm	J : 66Re04,63Bu14,61Ca07,61St18,60Ca03,60Kl02=7/2									**
$*^{147}$Sm	J : 52Bo21,54Mu15,58Hu17,62Sp03=7/2									**
$*^{147}$Sm	T : from 22Vi.1,20Vi05=106.25(0.38), uncertainty is 2σ									**
$*^{147}$Eu	J : 85Ah02,72Ek05=5/2									**
$*^{147}$Eu	T : average 25Gu07=24.6(0.8),24.3(0.3) 71Av09=24.1(0.6) 62Sc09=23.6(1.0) 58An36=25(1) 51Ho30=24(2); other (outlier): 63Fr02=21.5(0.5)									**
$*^{147}$Gd	J : 72Ek05=7/2									**
$*^{147}$Gd^m	T : average 82Ha22=510(20) 79Ha15=530(30) 78Br15=560(60)									**
$*^{147}$Tb	J : 90Al36=1/2									**
$*^{147}$Tb^m	T : average 93Al03=1.92(0.07) 73Bo13=1.83(0.06)									**
$*^{147}$Dy	D : $\%\beta^+$p from 84To07									**
$*^{147}$Dy^m	D : from 97Co21; other: %IT 85Al08=31(3)									**
$*^{147}$Dy^m	T : average 93Al03,85Al08=55.7(0.7) 84ScZT=54.4(0.5) 83ByZZ=55.7(0.5) 82Kl03=57(4) 76Ra07=59(3)									**
$*^{147}$Er^m	E : from 93To02<118 keV, based on systematics									**
$*^{147}$Tm	T : average 95Ho26=560(40) 93To02=640(60) 93Se04=580(70) 83La27=560(40)									**
$*^{147}$Tm^m	T : other: 93Se04=360(40)									**
^{148}Xe	−38650#	300#			85 ms	15	0^+	26 20Wu04	TD β^-=100;β^-n ?;β^-2n ?	
^{148}Cs	−46911	13			151.8 ms	1.0	(2^-)	26 20Wu04	T β^-=100;β^-n=28.7 21;β^-2n ?	*
^{148}Cs^m	−46866	13	45.2	0.1	4.8 μs	0.2	4^-#	15YaZW	TD IT=100	*
^{148}Ba	−57544.9	1.5			619 ms	4	0^+	26 17Wu04	T β^-=100;β^-n=0.4 3	*
^{148}La	−62698.5	2.7			1.414 s	0.025	(2^-)	26 17Wu04	T β^-=100;β^-n=0.18 7	*
^{148}Ce	−70390	8			56.8 s	0.3	0^+	26 04Ko05	T β^-=100	*
^{148}Pr	−72481	17			2.292 m	0.024	1^-	26	β^-=100	*
^{148}Pr^m	−72404	17	76.80	0.20	2.01 m	0.07	4^-	26 04Ko05	EJD β^-=64 10;IT=36 10	*
^{148}Nd	−77409.4	1.9			STABLE	>4.2Ey	0^+	26 24Be07	T IS=5.756 21;2β^- ?;α ?	*
^{148}Pm	−76868	6			5.368 d	0.007	1^-*	26	β^-=100	*
^{148}Pm^m	−76730	6	137.9	0.3	41.26 d	0.08	(6^-)	26	β^-=95.8 6;IT=4.2 6	*
^{148}Sm	−79337.9	1.1			6.3 Py	1.3	0^+	26 16Ca43	T IS=11.25 9;α=100	*
^{148}Eu	−76298	10			54.5 d	0.5	5^-*	26 69GuZW	T $\beta^+\approx$100;α=9.4e-7 28	*
^{148}Eu^m	−75578	10	720.4	0.3	162 ns	8	9^+	26	IT=100	
^{148}Gd	−76271.1	1.3			81.5 y	2.2	0^+	26 23Ch11	T α=100;2β^+ ?	*
^{148}Tb	−70533	12			60 m	3	2^-*	26 90Al03	T β^+=100	*
^{148}Tb^m	−70443	12	90.1	0.3	2.22 m	0.05	9^+	26 93Al03	T β^+=100	*
^{148}Tb^n	−61914	12	8618.6	1.0	1.310 μs	0.007	(27^+)	26 95Id01	T IT=100	
^{148}Dy	−67857	9			3.3 m	0.2	0^+	26	β^+=100	
^{148}Dy^m	−64938	9	2919.1	1.0	471 ns	20	10^+	26	IT=100	
^{148}Ho	−57990	80			2.2 s	1.1	(1^+)	26 82No08	T β^+=100	
^{148}Ho^m	−57740#	130#	250#	100#	9.49 s	0.12	(5^-)	26 93Al03	T β^+=100;β^+p=0.08 1	*
^{148}Ho^n	−57050#	130#	944#	100#	2.36 ms	0.06	$(10)^+$	26	IT=100[gs=0,m=100]	*
^{148}Er	−51479	10			4.59 s	0.13	0^+	26	β^+=100;β^+p$\approx$0.15	*
^{148}Er^m	−48566	10	2913.2	0.4	13 μs	3	(10^+)	26 82No07	TJD IT=100	
^{148}Tm	−38765	10			700 ms	200	(10^+)	26	β^+=100;β^+p ?	
^{148}Yb	−30400#	300#			250# ms		0^+	26	β^+ ?;β^+p ?	
$*^{148}$Cs	T : average 20Wu04=144(9) 18Li06=158(6) 17Li06=152(1) 17Wu04=144(5) 93Ru01=140(12) 86Hi08=158(7); others: 86Wa17=130(10) 78Ko29=130(40)									**
$*^{148}$Cs	J : direct β^- decay feeding to 1^- and 3^- levels in ^{148}Ba in 18Li06									**
$*^{148}$Cs	D : $\%\beta^-$n average 86ReZR=25.1(2.5) 93Ru01=24(17) 18Li06=38(4)									**
$*^{148}$Cs^m	E : from 16Ya.A=45.2(0.1)									**
$*^{148}$Ba	T : average 17Wu04=621(11) 86Wa17=620(5) 84Ch02=607(25) 82Ga24=630(50) 93Ru01=547(51);others: 20Wu04=602(46) 83Mu19=672(7) 86ReZR=653(2),									**
$*^{148}$Ba	T : superseded by 86Wa17									**
$*^{148}$La	T : average 17Wu04=1.27(+0.10-0.09) 93Ru01=1.428(0.012) 86Wa17=1.40(0.02), supersedes 86ReZR=1.38(0.02) 83Re10=1.42(0.07), 83Mu19=1.34(0.02)									**
$*^{148}$La	T : 82Ga24=1.55(0.03) 69Wi.A=1.29(0.08); Birge ratio=2.85; others: 83Gi04=1.05(0.01) 76AmZW=2.62(0.61) 79En02=2.6(0.6)									**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{148}$La	D : %β^-n unweighted average 93Ru01=0.24(0.02) 86Wa17=0.11(0.01), supersedes 86ReZR=0.145(0.015) 83Re10=0.13(0.01); Birge ratio=5.81										**
$*^{148}$Ce	T : average 04Ko05=56.9(0.3) 83Ar15=56(1); others: 86BuZV=45.1(0.5) 74Ar25=48(1)										**
$*^{148}$Pr	T : average 86Wa06=2.25(0.08) 86BuZV=2.33(0.05) 79Ik06=2.27(0.04) 79Ta17=2.28(0.05) 76Ya06=2.28(0.09) 69WiZX=2.47(0.13)										**
$*^{148}$Pr^m	T : average 86Wa06=2.02(0.09) 79Ik06=2.0(0.1)										**
$*^{148}$Nd	T : partial α half-life 24Be07>4.2 Ey and 2α half-life >210 Ey; other lower limit for 2β^- decay 82Be20>3.0 Ey										**
$*^{148}$Pm	T : average 71Ca23=5.364(0.015),5.365(0.020) 71Mo04=5.37(0.04) 70Ca09=5.370(0.009) 62Re03=5.39(0.06); others: 61El02=5.4(0.1) 59Ei31=5.5(0.1)										**
$*^{148}$Pm	T : 59Bh95=4.2(0.2)										**
$*^{148}$Pm	J : 65Al10,65Al16,63Gr10=1										**
$*^{148}$Pm^m	T : average 99Po32=40.0(0.7) 71Wa05=41.29(0.11) 71BaZW=41.4(0.8) 71Mo04=40.9(0.2) 62Re03=40.6(0.4) 61El02=41.8(0.2); others: 62Sc04=45.5(0.5)										**
$*^{148}$Pm^m	T : 59Ei31=50(1) 59Bh95=45.8(2.9)										**
$*^{148}$Pm^m	J : 61.30 keV E4 γ to (2$^-$) and the expected π7/2[404]$\otimes\nu$5/2[512], $K^\pi = 6^-$ configuration										**
$*^{148}$Sm	T : symmetrized from 16Ca43=6.4(+1.2-1.3); others: 70Gu14=7(3) 68Ko06=8(2)										**
$*^{148}$Eu	J : 85Ah02,72Ek05=5										**
$*^{148}$Gd	T : average 23Ch11=86.9(3.9) 81Pr06=74.6(3.0) 66Fr11=97.5(6.5) 62Si14=84(9); other (not used): 03Fu10=70.9(1.0), only 2 years of activity										**
$*^{148}$Gd	T : measurements,										**
$*^{148}$Tb	J : 90Al36=2										**
$*^{148}$Tb	T : other: 75SpZU=60(1)										**
$*^{148}$Tb^m	T : average 93Al03=2.30(0.10) 73Bo13=2.20(0.05); others: 75SpZU=2.43(0.07) 74Ne01=2.3(0.2)										**
$*^{148}$Ho^m	T : average 93Al03=9.30(0.20) 89Ta11=9.59(0.15); others: 88To03=9.7(0.3) 81GaZS=10(2) 79To01=9(1)										**
$*^{148}$Ho^n	E : 694.42 keV above ^{148}Ho^m from ENSDF2026										**
$*^{148}$Er	T : average 89Ta11=4.8(0.2) 88To03=4.4(0.2) 82No08=4.5(0.4)										**
^{149}Xe	−33000#	300#			50# ms	>550ns	3/2$^-$#	22	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{149}Cs	−43408	21			112.3 ms	2.7	3/2$^+$#	22	17Li06	TD	β^-=100;β^-n=25 4;β^-2n ?	*
^{149}Ba	−52829.9	2.4			348 ms	4	3/2$^-$#	22	20Wu04	T	β^-=100;β^-n=3.9 12	*
^{149}La	−60210.1	1.5			1.067 s	0.022	(3/2$^-$)	22	26Ki04	T	β^-=100;β^-n=1.43 28	*
^{149}Ce	−66674.1	1.2			4.94 s	0.04	3/2$^-$#	22	96Ya.A	T	β^-=100	
^{149}Pr	−71056.8	1.3			2.25 m	0.08	(5/2$^+$)	22	77Pi06	T	β^-=100	
^{149}Nd	−74376.9	1.9			1.70 h	0.05	5/2$^-$*	22			β^-=100	*
^{149}Pm	−76066.3	2.1			53.08 h	0.05	7/2$^+$*	22			β^-=100	*
^{149}Pm^m	−75826.1	2.1	240.214	0.007	35 μs	3	11/2$^-$	22	67Ba27	T	IT=100	
^{149}Sm	−77137.9	0.9			STABLE	>2Py	7/2$^-$*	22			IS=13.82 10;α ?	*
^{149}Eu	−76443	4			93.1 d	0.4	5/2$^+$*	22	70Ch09	T	ε=100	*
^{149}Eu^m	−75947	4	496.389	0.006	2.45 μs	0.05	11/2$^-$	22			IT=100	
^{149}Gd	−75129	3			9.28 d	0.09	7/2$^-$*	22			$\beta^+\approx$100;α=4.3e-4 10	*
^{149}Tb	−71490	4			4.119 h	0.024	1/2$^+$*	22			β^+=?;α=16.7 17	*
^{149}Tb^m	−71454	4	35.75	0.08	4.16 m	0.04	11/2$^-$	22	73Bi06	TD	β^+=?;α=0.022 3	*
^{149}Dy	−67699	9			4.22 m	0.13	7/2$^-$	22			β^+=100	*
^{149}Dy^m	−65038	9	2660.94	0.34	490 ms	15	27/2$^-$	22	80Da18	J	IT=99.3 3;β^+=0.7 3	*
^{149}Ho	−61639	11			21.11 s	0.19	(11/2$^-$)	22			β^+=100	*
^{149}Ho^m	−61590	11	48.80	0.20	55.3 s	2.4	(1/2$^+$)	22			β^+=100	*
^{149}Er	−53604	24			4 s	2	(1/2$^+$)	22	89Fi01	TD	β^+=100;β^+p=7 2	
^{149}Er^m	−52862	24	741.69	0.23	9.09 s	0.19	(11/2$^-$)	22	89Fi01	TD	β^+=96.5 7;IT=3.5 7;β^+p=0.18 7	
^{149}Er^n	−50993	24	2611.0	0.3	610 ns	80	(19/2$^+$)	22	87Br14	T	IT=100	
^{149}Er^p	−50302	29	3302	17	4.8 μs	0.1	(27/2$^-$)	22	87Br14	EJD	IT=100	*
^{149}Tm	−43820	50			900 ms	200	11/2$^-$	22	87To12	TD	β^+=100;β^+p=0.26 15	*
^{149}Tm^m	−43720#	70#	100#	50#	500# ms		1/2$^+$#				β^+ ?;β^+p ?	*
^{149}Yb	−33330#	200#			700 ms	200	(1/2$^+$)	22	05Xu04	JT	β^+=100;β^+p$\approx$100	
^{149}Lu	−21190#	300#			490 ns	140	(11/2$^-$)	22	22Au01	TJD	p=100	*
$*^{149}$Cs	T : average 20Wu04=113(6) 00KoZH=112(3),114(16); others: 17Wu04=113(8), superseded by 20Wu04, 18Li06=80(3) 17Li06=80(4)										**
$*^{149}$Ba	T : average 17Wu04=352(6) 93Ru01=324(18) 86Wa17=346(6), supersedes 86ReZU=356(8); other: 20Wu04=368(19), superseded by 17Wu04										**
$*^{149}$Ba	D : %β^-n from 93Ru01; others: 86ReZU=0.58 (0.06) 86Wa17=0.43(0.12)										**
$*^{149}$La	T : average 26Ki04=0.90(0.13) 17Wu04=1.11(0.04) 93Ru01=1.066(0.034) 86Wa17=1.04(0.04), supersedes 86ReZU=1.10(0.03), 79En02=1.2(0.4)										**
$*^{149}$La	D : %β^-n average 93Ru01=1.74(0.13) 86Wa17=1.17(0.12), Birge ratio=3.22										**
$*^{149}$Nd	J : 64Bu09,62Bu21=5/2										**
$*^{149}$Nd	T : unweighted average 90Ab02=1.728(0.001) 66Ri03=1.72(0.01) 66He04=1.73(0.01) 15Ba10=1.5(0.3) 99Po32=1.5(0.1) 67Me19=1.8(0.1) 60Wi10=1.8(0.1)										**
$*^{149}$Nd	T : 52Ru10=1.8(0.1)										**
$*^{149}$Pm	J : 63Gr10,61Ca07,60Ch15=7/2										**
$*^{149}$Pm	T : average 71Ba28=53.08(0.11) 66Mc11=53.08(0.10) 63Ho15=53.07(0.10) 60Bu06=53.09(0.09)										**
$*^{149}$Sm	J : 62Sp03,58Hu17,54Mu15,52Bo21=7/2										**
$*^{149}$Eu	J : 85Ah02,72Ek05=5/2										**
$*^{149}$Gd	J : 72Ek05=7/2										**
$*^{149}$Gd	T : average 68Ch30=9.25(0.10) 62Pr06=9.5(0.3) 57Sh46=9.3(0.3) 60To10=9(1) 58An35=10(1) 51Ho30=9(1)										**
$*^{149}$Tb	D : %α from 78Ja14										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{149}$Tb	T : average 68St09=4.15(0.05) 67Go32,67Ch28=4.10(0.05) 65Br10=4.15(0.05) 65Gr28=4.06(0.08) 60To10=4.10(0.05) 53Ra02=4.1(0.2)											**
$*^{149}$Tb	J : 90Al36=1/2											**
$*^{149}$Tb^m	D : %α average 73Bi06=0.020(0.004) 64Ma19=0.025(0.005)											**
$*^{149}$Dy	T : average 93Al03=4.2(0.2) 75To03=4.1(0.2) 73Bi06=4.6(0.4),5.1(0.9)											**
$*^{149}$Dy^m	T : other: 03Li42=11(1) s for q=66$^+$ (bare ion)											**
$*^{149}$Dy^m	D : %β^+ from 88Ba02=0.7(0.3)											**
$*^{149}$Ho	T : average 93Al03=21.2(0.2) 94Me13=20.5(0.5) 82Ba75=23(4) 79To01=21(2)											**
$*^{149}$Ho^m	T : average 94Me13=56(3), supersedes 89Me13=58(3), 88ToZW=54(4)											**
$*^{149}$Er^m	T : average 89Fi01=8.9(0.2) 84To07=9(1) 84ScZT=10.8(0.6)											**
$*^{149}$Er^p	E : 661 + x keV above $^{149}E_r{}^n$ and x<60 keV in 87Br14											**
$*^{149}$Tm	D : %β^+p symmetrized from 87To12=0.2(+0.2-0.1)											**
$*^{149}$Tm	J : favored α decay from ^{153}Lu (J$^\pi$=11/2$^-$)											**
$*^{149}$Tm^m	I : probably fed by α-decaying isomer, ^{153}Lu^m											**
$*^{149}$Lu	T : symmetrized from 22Au01=450(+170-100)											**
^{150}Xe	−28990#	300#				40# ms	>550ns	0$^+$	21	18Sh11	I	β^- ?;β^-n ?;β^-2n ?	
^{150}Cs	−38257	23				80.7 ms	2.6	(2$^-$)	17	20Wu04	T	β^-=100;β^-n=20 10;β^-2n ?	*
^{150}Ba	−49890	6				259 ms	5	0$^+$	17	02Pf04	TD	β^-=100;β^-n=1.0 5	*
^{150}La	−56312.4	1.9				504 ms	15	(3$^+$)	13	17Wu04	T	β^-=100;β^-n=2.7 3	*
^{150}Ce	−64866.7	2.1				6.05 s	0.07	0$^+$	13	15Ko23	T	β^-=100	
^{150}Pr	−68308.8	1.2				6.10 s	0.08	(1$^-$)	13	24Lo03	T	β^-=100	*
^{150}Nd	−73682.0	0.9				9.4 Ey	0.7	0$^+$	13	16Ar12	T	IS=5.638 28;2β^-=100	*
^{150}Pm	−73599	20				2.698 h	0.015	(1$^-$)	13			β^-=100	
^{150}Sm	−77053.3	0.9				STABLE		0$^+$	13			IS=7.37 9	
^{150}Eu	−74794	6				36.0 y	0.6	5$^-$*	13			β^+=100	
^{150}Eu^m	−74752	6	41.7	1.0		12.8 h	0.1	0$^-$*	13	63Yo07	T	β^-=89 2;β^+=11 2;IT ?	*
^{150}Gd	−75766	6				1.76 My	0.08	0$^+$	13	66Fr11	T	α=100;2β^+ ?	*
^{150}Tb	−71107	7				3.48 h	0.16	2$^-$*	13			β^+=100;α ?	*
^{150}Tb^m	−70645	26	462	27	MD	5.8 m	0.2	9$^+$	13			β^+=100;IT ?	
^{150}Dy	−69311	4				7.17 m	0.05	0$^+$	13			β^+=?;α=33.6 18	*
^{150}Ho	−61943	13			*	76.8 s	1.8	(2)$^-$	13	93Al03	T	β^+=100	*
^{150}Ho^m	−61950	50	−10	50	BD*	23.3 s	0.3	9$^+$	13			β^+=100	*
^{150}Ho^n	−54040	50	7900	50		787 ns	36	(28$^-$)	13	06Fu06	JTE	IT=100	*
^{150}Er	−57825	12				18.5 s	0.7	0$^+$	13			β^+=100	
^{150}Er^m	−55029	12	2796.5	0.5		2.55 μs	0.10	10$^+$	13			IT=100	
^{150}Tm	−46500	90			*&	3# s		(1$^+$)	13	88Ni02	JI	β^+=100	
^{150}Tm^m	−46360#	170#	140#	140#	*&	2.20 s	0.06	(6$^-$)	13			β^+=100;β^+p=1.1 3	*
^{150}Tm^n	−45690#	170#	811#	140#		5.2 ms	0.3	10$^+$#	13			IT=100[gs=0,m=100]	*
^{150}Yb	−38640	40				700# ms	>200ns	0$^+$	13			β^+ ?	
^{150}Yb^m	−35770	40	2871.9	1.8		620 ns	50	(10$^+$)		26Zh07	EJT	IT=100	
^{150}Lu	−24770#	200#				45 ms	3	(5$^-$)	13	03Gi10	J	p=100;β^+ ?	
^{150}Lu^m	−24750#	200#	22	5	p	40 μs	7	(8$^+$)	13	03Gi10	J	p=100	*
$*^{150}$Cs	T : average 18Li06=80(3) 17Wu04=84.4(8.2) 00KoZH=82(7); other: 20Wu04=90(15), superseded by 17Wu04											**
$*^{150}$Cs	D : %β^-n from 00KoZH=20(10)											**
$*^{150}$Cs	J : direct β^- decay feeding to 1$^-$ and 3$^-$ levels in ^{150}Ba in 18Li06											**
$*^{150}$Ba	T : from 17Wu04=259(5); others: 20Wu04=245(16), superseded by 17Wu04 02Pf04∼300, compilation											**
$*^{150}$La	T : average 17Wu04t=510(+10-22) 95Ok02=510(30)											**
$*^{150}$Pr	T : others: 70Wa37=6.1(0.3) 78Ya08=6(1) 74Ar17=9.1(0.4)											**
$*^{150}$Nd	T : 2ν-$\beta\beta$ from 16Ar12=9.34(0.22,stat)(+0.62-0.60,syst), supersedes 09Ar10=9.11(+0.25-0.22,stat)(0.63,syst); others (experiment):											**
$*^{150}$Nd	T : 97De40=6.75(+0.37-0.42,stat)(0.68,syst) 95Ar08=18.8(+6.9-3.9,stat)(1.9,syst); others (evaluation): 25Pr02=11.6(3.7) 20Ba63=9.34(0.65); 2ν-$\beta\beta$											**
$*^{150}$Nd	T : (to 0$^+$ at 740.5 keV): 25Ba06=103(+35-22,stat)(+16-12,syst) 23Ag06=111(+19-14,stat)(+17-15,syst) 14Ki13=107(+45-25,stat)(7,syst)											**
$*^{150}$Nd	T : 09Ba21=133(+36-23,stat)(+27-13,syst) 04Ba10=140(+4-2,stat)(30,syst); 21Po16=97(+29-19,stat)(15,syst) 19KaZW=69(+40-19,stat)(11,syst)											**
$*^{150}$Nd	T : 13Bl.A=71(16) evaluations: 25Pr02=117(+26-21) 20Ba63=120(+30-20); 2ν-$\beta\beta$ (to 2$^+$ at 334.0 keV): 25Ba06=150(+230-60,stat)(40,syst)											**
$*^{150}$Eu	J : 85Ah02=5											**
$*^{150}$Eu	T : average 93Th04=36.9(0.9) 75Ne05=34.2(1.2),36.1(1.1)											**
$*^{150}$Eu^m	J : 72Ek05=0											**
$*^{150}$Gd	T : others: 62Si14=2.1(0.3) 65Og01=1.4(0.4)											**
$*^{150}$Tb	J : 90Al36=2											**
$*^{150}$Dy	D : %α average 74To07=31(3),36(3) 73Bi06=32(5) 77Ha48=36(5)											**
$*^{150}$Ho	T : average 93Al03=78(2) 82No08=72(4)											**
$*^{150}$Ho^m	J : favored α decay from ^{154m}Tm (J$^\pi$=9$^+$)											**
$*^{150}$Ho^n	E : 7912.1(2.3) keV above ^{150}Ho^m from ENSDF2013											**
$*^{150}$Tm^m	D : %β^+p symmetrized from 88Ni02=1.2(+2-4)											**
$*^{150}$Tm^n	E : 671.3(1.0) keV above ^{150}Tm^m from ENSDF2013											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{150}Lu^m$	T : symmetrized from 03Gi10=39(+8-6)											**
^{151}Cs	−34473	26				69 ms 26	$3/2^+$#	17	17Wu04	T	β^-=100;β^-n ?;β^-2n ?	*
^{151}Ba	−44995	21				167 ms 5	$3/2^-$#	17	17Wu04	T	β^-=100;β^-n ?	*
^{151}La	−53528.3	1.5				465 ms 24	$1/2^+$#	17	17Wu04	T	β^-=100;β^-n ?	*
^{151}Ce	−61219.3	1.1				1.76 s 0.06	$(3/2^-)$	08	10Si03	J	β^-=100	*
^{151}Pr	−66777.2	1.0				18.90 s 0.07	$(3/2^-)$	08			β^-=100	
$^{151}Pr^m$	−66742.1	1.0	35.10	0.10		50 μs 8	$(7/2^+)$	08	12Ma03	T	IT=100	
^{151}Nd	−70945.3	0.9				12.44 m 0.07	$3/2^+$	08			β^-=100	
^{151}Pm	−73398.9	1.3				28.40 h 0.04	$5/2^+*$	08			β^-=100	*
^{151}Sm	−74578.5	0.9				94.6 y 0.6	$5/2^-*$	08	15Be23	T	β^-=100	*
$^{151}Sm^m$	−74317.4	0.9	261.13	0.04		1.4 μs 0.1	$(11/2)^-$	08			IT=100	
^{151}Eu	−74654.9	0.9				4.6 Ey 1.2	$5/2^+*$	08	14Ca13	T	IS=47.81 6;α=100	*
$^{151}Eu^m$	−74458.7	0.9	196.245	0.010		58.9 μs 0.5	$11/2^-$	08			IT=100	
^{151}Gd	−74190.7	2.9				123.9 d 1.0	$7/2^-*$	08			ε=100;α≈1.1e-6 6	*
^{151}Tb	−71625	4				17.609 h 0.001	$1/2^+*$	08	74To07	D	β^+=?;α=0.0095 15	*
$^{151}Tb^m$	−71525	4	99.53	0.05		25 s 3	$11/2^-$	08			IT=93.4 20;β^+=6.6 20	*
^{151}Dy	−68755	3				17.9 m 0.3	$7/2^-*$	08	74To07	D	β^+=?;α=5.6 4	*
^{151}Ho	−63623	8				35.2 s 0.1	$11/2^-*$	08	88NeZZ	J	β^+=?;α=22 3	
$^{151}Ho^m$	−63582	8	41.0	0.2		47.2 s 1.3	$1/2^+*$	08	88NeZZ	J	α=77 18;β^+=?	*
^{151}Er	−58248	11				23.5 s 2.0	$(7/2^-)$	08			β^+=100	
$^{151}Er^m$	−55662	11	2586.0	0.5		580 ms 20	$(27/2^-)$	08			IT=95.3 3;β^+=4.7 3	*
$^{151}Er^n$	−47961	11	10286.6	1.0		420 ns 50	$(65/2^-,61/2^+)$	08	09Fu05	J	IT=100	
^{151}Tm	−50768	15				4.17 s 0.11	$11/2^-$	08			β^+=100	*
$^{151}Tm^m$	−50673	15	95	6	AD	6.6 s 2.0	$1/2^+$	08			β^+=100	*
$^{151}Tm^n$	−48112	15	2655.67	0.22		451 ns 34	$(27/2^-)$	08			IT=100	
^{151}Yb	−41310	110				1.6 s 0.5	$(1/2^+)$	08	86To12	T	β^+=100;β^+p=?	*
$^{151}Yb^m$	−40600	50	710	110	MD	1.6 s 0.5	$(11/2^-)$	08	86To12	T	β^+≈100;IT ?;β^+p=?	
$^{151}Yb^n$	−38680#	180#	2630#	141#		2.6 μs 0.7	$19/2^-$#	08			IT=100	*
$^{151}Yb^p$	−38020#	180#	3287#	141#		20 μs 1	$27/2^-$#	08			IT=100	*
^{151}Lu	−30110	40				78.4 ms 0.9	$11/2^-$	08	15Ta12	TJ	p=?;β^+=?	*
$^{151}Lu^m$	−30050	50	57	4	p	16.0 μs 0.5	$3/2^+$	08	17Wa18	T	p=100	*
$*^{151}Cs$	T : from 17Wu04=69(26), supersedes 20Wu04=48(28)											**
$*^{151}Ba$	T : from 17Wu04=167(5), supersedes 20Wu04=166(11)											**
$*^{151}La$	T : from 17Wu04=457(+30-18), supersedes 20Wu04=510(330)											**
$*^{151}Ce$	T : average 17Wu04=1.71(0.09) 06Ko25=1.76 (0.06)											**
$*^{151}Ce$	I : isomer with $T_{1/2}$=1.02(0.06) s suggested in ENSDF2009, but no sufficient experimental evidence exists, so it is not trusted by NUBASE											**
$*^{151}Pm$	J : 63Bu14,61Ca07=5/2											**
$*^{151}Sm$	T : other (downweighted): 09He22=96.6(2.4)											**
$*^{151}Sm$	J : 71Ro21=5/2											**
$*^{151}Eu$	J : 90Al34,85Ah02,57Ma19,55Bl16,35Sc01=5/2											**
$*^{151}Eu$	T : 14Ca13=4.62(0.95,stat)(0.68,syst);others: 12Da16>3.7 Ey 07Be48=5(+11-3)											**
$*^{151}Gd$	D : %α symmetrized from α/KXrays=0.8(+0.8-0.4)e-8 in 65Si06											**
$*^{151}Gd$	J : 72Ek05=7/2											**
$*^{151}Tb$	J : 90Al36,70Ad09=1/2											**
$*^{151}Tb^m$	J : E3 γ to $5/2^+$ following by E2 γ to $1/2^+$											**
$*^{151}Dy$	J : 70Ro21=7/2											**
$*^{151}Ho^m$	D : %α symmetrized from 91To08=80(+15-20)											**
$*^{151}Er^m$	T : other: 03Li42=19(3) s for q=68^+ (bare ion)											**
$*^{151}Tm$	J : favored α decay from ^{155}Lu (J^π=$11/2^-$)											**
$*^{151}Tm^m$	J : favored α decay from $^{155}Lu^m$ (J^π=$1/2^+$)											**
$*^{151}Yb$	T : derived from 1.6(0.1) s for a mixture of gs and isomer that have almost the same half-life											**
$*^{151}Yb^n$	E : 1790 + x keV above $^{151}Yb^m$ in 93Ni05; x=100#(100#) by NUBASE											**
$*^{151}Yb^p$	E : 657 keV above $^{151}Yb^n$ in 93Ni05											**
$*^{151}Lu$	T : average 15Ta12=78(1) 99Bi14=80(2)											**
$*^{151}Lu^m$	T : average 17Wa18=15.4(0.8) 15Ta12=17(1) 99Bi14=16(1)											**
^{152}Cs	−29130#	300#				17# ms		18	26Su01	D	β^- ?;β^-n ?	*
^{152}Ba	−41720	40				139 ms 8	0^+	17	17Wu04	TD	β^-=100;β^-n ?	*
^{152}La	−49191	5				287 ms 16	2^-#	17	17Wu04	TD	β^-=100;β^-n ?	*
^{152}Ce	−58880.8	2.0				1.42 s 0.02	0^+	13	17Wu04	T	β^-=100	
^{152}Pr	−63773.2	2.7				3.57 s 0.11	4^+	13	99To04	J	β^-=100	*
$^{152}Pr^m$	−63658.1	2.7	115.1	0.3		4.16 μs 0.10	(1^+)	13	18Al14	TJE	IT=100	*
^{152}Nd	−70139	4				11.4 m 0.2	0^+	13			β^-=100	
^{152}Pm	−71249	17			*	4.12 m 0.08	1^+	13			β^-=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{152}Pm^m	−71110	80	130	90	BD*	7.52 m 0.08	4(−)	13			β^-=100	*
^{152}Pm^n			*non − exist*		EU	13.8 m 0.2	(8)	13			β^-=100;IT ?	*
^{152}Sm	−74764.1	0.8				STABLE	0^+	13			IS=26.74 9	
^{152}Eu	−72890.3	0.9				13.517 y 0.006	3^-*	13	FGK209	T	β^+=72.08 13;β^-=27.92 13	*
^{152}Eu^m	−72844.7	0.9	45.5998	0.0004		9.3116 h 0.0013	0^-*	13			β^-=73 3;β^+=27 3	*
^{152}Eu^n	−72825.0	0.9	65.2969	0.0004		940 ns 80	1^-	13			IT=100	
^{152}Eu^p	−72812.1	0.9	78.2331	0.0004		165 ns 10	1^+	13			IT=100	
^{152}Eu^q	−72800.5	0.9	89.8496	0.0004		384 ns 10	4^+	13			IT=100	
^{152}Eu^r	−72742.4	0.9	147.86	0.10		95.8 m 0.4	8^-	13	15Hu02	T	IT=100	
^{152}Gd	−74708.4	0.8				108 Ty 8	0^+	13	61Ma05	T	IS=0.204 2;α=100;2β^+ ?	*
^{152}Tb	−70720	40				17.878 h 0.010	2^-*	13	23Co11	T	β^+=100;α ?	*
^{152}Tb^m	−70380	40	342.15	0.16		960 ns 10	5^-	13			IT=100	
^{152}Tb^n	−70220	40	501.74	0.19		4.2 m 0.1	8^+	13			IT=78.9 6;β^+=21.1 6	
^{152}Dy	−70120	5				2.38 h 0.02	0^+	13			ε=99.900 7;α=0.100 7	
^{152}Ho	−63600	12				161.8 s 0.3	2^-*	13	77Ha48	D	β^+=?;α=12 3	*
^{152}Ho^m	−63440	12	160	3	AD	49.8 s 0.2	9^+*	13			β^+=?;α=10.8 17	*
^{152}Ho^n	−60580	12	3019.59	0.19		8.4 μs 0.3	19^-	13			IT=100	
^{152}Er	−60498	9				10.3 s 0.1	0^+	13	87To02	D	α=90 4;β^+=?	
^{152}Tm	−51720	60				5.2 s 0.6	(9^+)	13			β^+=100	*
^{152}Tm^m	−51570	70	150	50	IT	8.0 s 1.0	(2^-)	13			β^+=100	
^{152}Tm^n	−49160	60	2555.05	0.19		301 ns 7	(17^+)	13	18Na20	T	IT=100	*
^{152}Yb	−46070	40				3.03 s 0.06	0^+	13			β^+=100	
^{152}Yb^m	−43330	40	2744.5	1.0		30 μs 1	(10^+)	13			IT=100	
^{152}Lu	−33300#	200#				650 ms 70	$(4^-,5^-,6^-)$	20	88Ni02	T	β^+=100;β^+p=15 7	*
*^{152}Cs	I : 87Ra12											**
*^{152}Ba	T : other: 20Wu04=148(21), superseded by 17Wu04											**
*^{152}La	T : from 17Wu04=298(+6-23), supersedes 20Wu04=270(100)											**
*^{152}Pr	T : average 90An31=3.7(0.2) 85Br08=3.8(0.2) 83Hi05=3.24(0.19)											**
*^{152}Pr^m	T : average 18Al14=4.7(0.3) 95Ya21=4.1(0.1); other: 90Ta07=1.0(0.3)											**
*^{152}Pm^m	J : parity from 77Ya07 based on log ft values not unambiguous; see 71Da19; alternative $K^\pi = 4^+$ and the same configuration as the gs is possible											**
*^{152}Pm^n	I : introduced in 71Da19, but the suggested 1941-keV and 2172-keV levels in the daughter ^{152}Sm nucleus that are fed by the isomer, do not exist											**
*^{152}Pm^n	I : (1941 keV) or don't have high spin (1,2$^+$ for 2172 keV) in ENSDF2013; not confirmed in 77Ya07											**
*^{152}Eu	J : 85Ah02,57Ab05,57Ma19=3											**
*^{152}Eu^m	J : 59Co52=0											**
*^{152}Gd	T : for 0ν-$\varepsilon\varepsilon$ 23La12>4.2 Ty to ^{152}Sm gs; >340 Py to first 2$^+$ in ^{152}Sm											**
*^{152}Gd	D : from IS=0.204(0.002) in 24Ci.A											**
*^{152}Tb	T : from 23Co11=17.8784(0.0095); others: 60To10=17.37(0.23) 67Gr12=17.5(0.1)											**
*^{152}Tb	J : 90Al36,70Ad09=2											**
*^{152}Ho	J : 89Al27,88NeZZ=2											**
*^{152}Ho^m	E : ENSDF2013=160(1) from α decay, but uncertainty not trusted											**
*^{152}Ho^m	J : 89Al27,88NeZZ=9											**
*^{152}Tm	J : strong β^+ feeding to the 8$^+$ level (νf$_{7/2}$,νh$_{9/2}$) in $^{152}E_r$											**
*^{152}Tm^n	T : average 18Na20=304(8) 86Mc14=294(12)											**
*^{152}Lu	T : average 88Ni02=600(100) 87To02=700(100)											**
^{153}Ba	−36470#	200#				116 ms 52	5/2$^-$#	20	17Wu04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{153}La	−46031	19				245 ms 18	1/2$^+$#	20	17Wu04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{153}Ce	−54711.0	2.2				865 ms 25	3/2$^-$#	20	17Wu04	TD	β^-=100;β^-n ?	
^{153}Pr	−61549.5	1.9				4.28 s 0.11	3/2$^-$#	20	90An31	T	β^-=100;β^-n ?	*
^{153}Nd	−67325.4	1.7				31.6 s 1.0	$(3/2)^-$	20			β^-=100	
^{153}Nd^m	−67133.7	1.7	191.71	0.16		1.10 μs 0.04	$(5/2)^+$	20	10Si03	TJ	IT=100	*
^{153}Pm	−70677	3				5.25 m 0.02	5/2$^-$	20			β^-=100	
^{153}Sm	−72561.2	0.8				46.2846 h 0.0023	3/2$^+$*	20	FGK209	T	β^-=100	*
^{153}Sm^m	−72462.8	0.8	98.39	0.10		10.6 ms 0.3	11/2$^-$	20			IT=100	
^{153}Eu	−73369.3	0.9				STABLE >550Py	5/2$^+$*	20	12Da16	T	IS=52.19 6	*
^{153}Eu^m	−71598.3	1.0	1771.0	0.4		475 ns 10	19/2$^-$	20			IT=100	
^{153}Gd	−72884.0	0.8				239.33 d 0.09	3/2$^-$*	20	24Be01	T	ε=100	*
^{153}Gd^m	−72788.8	0.8	95.1737	0.0008		3.5 μs 0.4	9/2$^+$	20			IT=100	
^{153}Gd^n	−72712.8	0.8	171.188	0.004		76.0 μs 1.4	$(11/2^-)$	20			IT=100	
^{153}Tb	−71315	4				2.34 d 0.01	5/2$^+$*	20			β^+=100	*
^{153}Tb^m	−71152	4	163.175	0.005		186 μs 4	11/2$^-$	20			IT=100	
^{153}Dy	−69145	4				6.4 h 0.1	7/2$^-$*	20	74To07	D	β^+=?;α=0.0094 14	*
^{153}Ho	−65014	5				2.01 m 0.03	11/2$^-$*	20	74Sc19	D	β^+=?;α=0.051 25	*
^{153}Ho^m	−64945	5	68.7	0.3		9.3 m 0.5	1/2$^+$*	20	74Sc19	D	β^+=?;α=0.18 8	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{153}Ho^{n}	−62242	5	2772.3	1.4		229 ns 2	$31/2^+$	20	16Pr06	J	IT=100	
^{153}Er	−60472	9				37.1 s 0.2	$7/2^-$*	20	79Ho10	D	α=53 3;β^+=?	*
^{153}Er^{m}	−57674	9	2798.2	1.0		373 ns 9	$(27/2^-)$	20			IT=100	
^{153}Er^{n}	−55224	9	5248.1	1.0		248 ns 32	$(41/2^-)$	20			IT=100	
^{153}Tm	−53965	11				1.48 s 0.01	$(11/2^-)$	20	89Ko02	D	α=91 3;β^+=9 3	
^{153}Tm^{m}	−53922	11	43.2	0.2		2.5 s 0.2	$(1/2^+)$	20			α=92 3;β^+=8 3	*
^{153}Yb	−47100	50				4.2 s 0.2	$7/2^-$	20	88Wi05	D	$\beta^+\approx$100;α ?;β^+p=0.008 2	
^{153}Yb^{m}	−44470#	70#	2630#	50#		15 μs 1	$27/2^-$	20			IT=100	*
^{153}Lu	−38170	40				900 ms 200	$11/2^-$	20	97Ir01	D	β^+=?;α ?;p=0	*
^{153}Lu^{m}	−38090	50	80	5		1# s	$1/2^+$		97Ir01	EDJ	β^+ ?;α ?;p=0	
^{153}Lu^{n}	−35670	40	2502.5	0.4		> 100 ns	$23/2^-$	20			IT=100	
^{153}Lu^{p}	−35540	40	2632.9	0.5		15 μs 3	$27/2^-$	20			IT=100	
^{153}Hf	−27300#	300#				400# ms >200ns	$1/2^+$#	20			β^+ ?	
^{153}Hf^{m}	−26550#	320#	750#	100#		500# ms	$11/2^-$#				β^+ ?;IT ?	
*^{153}Ba	T : from 17Wu04=116(52), supersedes 20Wu04=109(59)											**
*^{153}La	T : from 17Wu04=245(18), supersedes 20Wu04=210(120)											**
*^{153}Pr	T : others (downweighted): 17Wu04=4.68(0.70) 87Gr12=4.3(0.2)											**
*^{153}Nd^{m}	T : average 10Si03=1.17(0.07) 96Ya12=1.06(0.05)											**
*^{153}Sm	J : 61Ca07,60Ca05=3/2											**
*^{153}Eu	J : 92HuZW,90Al34,85Ah02,55Bl16,35Sc01=5/2											**
*^{153}Gd	T : average 24Be01=238.19(0.97) [Ge], 239.55(0.22) [IC], 239.34(0.25) [NaI] 14Un01=239.29(0.10); others (discrepant):											**
*^{153}Gd	T : 72Em01=241.6(0.2),240.9(0.6) 89Po21=226.7(4.2)											**
*^{153}Gd	J : 65Al16=3/2											**
*^{153}Tb	J : 90Al36,70Ad09=5/2											**
*^{153}Dy	J : 70Ro21=7/2											**
*^{153}Ho	J : 89Al27,88NeZZ=11/2											**
*^{153}Ho^{m}	J : 89Al27,88NeZZ=1/2											**
*^{153}Er	J : 85Ah.A,89Ot.A=7/2											**
*^{153}Tm^{m}	ED : from 89Ko02											**
*^{153}Yb^{m}	E : from 93Mc03=2579 (23/2$^-$) + x keV; x=50#(50#) keV by NUBASE, probably overlaps with 51-keV E1											**
*^{153}Lu	D : %p from 97Ir01=0											**
^{154}Ba	−32920#	300#				53 ms 48	0^+	22	17Wu04	TD	β^-=100;β^-n ?;β^-2n ?	
^{154}La	−41430#	200#				161 ms 15	2^-#	22	17Wu04	TD	β^-=100;β^-n ?;β^-2n ?	*
^{154}Ce	−52069.0	2.6				722 ms 14	0^+	22	17Wu04	TD	β^-=100;β^-n ?	
^{154}Pr	−58001.2	2.5				2.30 s 0.09	(3^+)	22	17Wu04	T	β^-=100;β^-n ?	*
^{154}Nd	−65580.3	1.0				25.9 s 0.2	0^+	22	87Gr12	T	β^-=100	
^{154}Nd^{m}	−64282.3	1.0	1297.97	0.22		2.95 μs 0.21	(4^-)	22	09Si21	TJ	IT=100	*
^{154}Pm	−68303.9	2.3				2.68 m 0.08	(4^+)	22	12So10	J	β^-=100	*
^{154}Pm^{m}	−68289	4	15	3		1.73 m 0.10	(1^-)	22	24Ra.A	E	β^-=100	*
^{154}Sm	−72456.4	1.1				STABLE >2.3Ey	0^+	22			IS=22.74 14;2β^- ?	*
^{154}Eu	−71740.1	0.9				8.592 y 0.003	3^-*	22	FGK209	T	β^-=99.982 12;ε=0.018 12	*
^{154}Eu^{m}	−71671.9	0.9	68.1702	0.0004		2.2 μs 0.1	2^+	22			IT=100	
^{154}Eu^{n}	−71594.8	0.9	145.3	0.3		46.26 m 0.23	(8^-)	22			IT=100	*
^{154}Gd	−73707.4	0.8				STABLE >0.1Zy	0^+	22	25Le11	T	IS=2.187 9;α ?	*
^{154}Tb	−70160	50			*	21.6 h 0.3	0^+*	22	22De08	T	β^+=100	*
^{154}Tb^{m}	−70150	50	13	7	*	9.994 h 0.039	3^-*	22	09Gy01	T	β^+=78.2 7;IT=21.8 7	
^{154}Tb^{n}	−69960#	160#	200#	150#		22.7 h 0.5	7^-	22			β^+=98.2 6;IT=1.8 6	*
^{154}Tb^{p}	−69760#	160#	405#	150#		513 ns 42		22	82Be46	TE	IT=100	*
^{154}Dy	−70395	7				1.40 My 0.08	0^+	22	22Ch58	T	α=100;2β^+ ?	*
^{154}Ho	−64641	8				11.75 m 0.20	2^-*	22	93Al03	T	β^+=99.981 4;α=0.019 4	*
^{154}Ho^{m}	−64397	27	244	28	AD	3.11 m 0.08	8^+*	22			$\beta^+\approx$100;α<0.001;IT≈0	*
^{154}Er	−62607	5				3.73 m 0.09	0^+	22			β^+=?;α=0.47 13	*
^{154}Tm	−54424	13			*	8.1 s 0.3	$(2)^-$	22			α=54 5;β^+=?	*
^{154}Tm^{m}	−54350	50	70	50	BD*	3.30 s 0.04	9^+*	22	97To12	D	α=58 5;β^+=?	*
^{154}Yb	−49925	13				409 ms 2	0^+	22	96Pa01	TD	α=92.6 12;β^+=?	*
^{154}Lu	−39610	50				1# s	(2^-)	22			β^+ ?;α ?	*
^{154}Lu^{m}	−39550	50	62	12	AD	1.12 s 0.05	(9^+)	22	88Vi02	DT	$\beta^+\approx$100;α ?;β^+p=?;$\beta^+\alpha$=?	*
^{154}Lu^{n}	−36940#	70#	2670#	50#		35 μs 3	(17^+)	22	90Mc02	TD	IT=100	*
^{154}Hf	−32640#	300#				2 s 1	0^+	22	81Ho10	TD	$\beta^+\approx$100;$\alpha\approx$0	
^{154}Hf^{m}	−29930#	300#	2713#	16#		9 μs 4	(10^+)	22	89Mc07	TD	IT=100	*
*^{154}La	T : from 17Wu04=161(15), supersedes 20Wu04=221(89)											**
*^{154}Pr	T : average 17Wu04=2.29(0.20) 88Ka16=2.3(0.1)											**
*^{154}Nd^{m}	T : average 09Si21=3.2(0.3) 13YoZZ=2.7(0.3)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{154}$Pm	T : average 74Ya07=2.9(0.2) 73Pr05=2.5(0.2) 72Ta13=2.65(0.10) 71Da28=2.8(0.2) 58Wi42=2.5(0.5)								**
$*^{154}$Pm^m	E : from 24Ra.A=10-20 keV								**
$*^{154}$Pm^m	T : 74Ya07=1.7(0.2) 73Pr05=1.6(0.2) 72Ta13=1.8(0.2) 71Da28=1.8(0.2)								**
$*^{154}$Sm	T : 2ν-$\beta\beta$ to 2^+ from 96De60								**
$*^{154}$Eu	J : 66Bl05,62Ju06,57Ab05=3								**
$*^{154}$Eu^n	T : average 75Ca22=48.2(1.7) 76Ch08=45.8(0.3) 76Zo01=46.8(0.6) 88Ka01=47.0(0.5)								**
$*^{154}$Gd	T : for α decay to the first excited 2^+ level in ^{150}Sm; other: 23La12>9.6 Ey								**
$*^{154}$Gd	D : from IS=2.187(0.009) in 24Ci.A								**
$*^{154}$Tb	J : 70Ad09=0; conf=π3/2[411]$\otimes\nu$3/2[651],$K^\pi = 0^+$; a negative Newby shift of -36.7 keV places $K^\pi=0^+$ below $K^\pi=3^+$								**
$*^{154}$Tb	T : average 22De08=21.55(0.64) 72Vy04=22.0(1.5) 73La20=21.4(0.5) 75So03=21.8(1.0) 76NeZT=22.2(1.1)								**
$*^{154}$Tb^m	J : 90Al36,83Be03,70Ad09=3								**
$*^{154}$Tb^m	E : From 73Ba20<25 keV								**
$*^{154}$Tb^m	D : %IT from 73La20=21.8(0.7); other: 73Ba20=15(5)								**
$*^{154}$Tb^n	D : %IT from 73La20								**
$*^{154}$Tb^n	T : average 72Vy04=23.1(0.9) 73La20=22.6(0.6) 75So03=22.5(1.5)								**
$*^{154}$Tb^p	E : 82Be46=53.9,60.4 and 90.1-keV γs show 500 ns half-life; assumed by NUBASE above ^{154}Tb^n since the level is populated in the (^{11}B,5n) reaction								**
$*^{154}$Tb^p	E : that favors high spin								**
$*^{154}$Dy	T : others: 85HoZN=3.0(1.5), revised from 61Ma18=1.5(0.9) and 71Go08=4, 65Ma51=2.9(1.5) 67Go32=10(4)								**
$*^{154}$Ho	D : %α average 74Sc19=0.017(0.003) and 0.028(0.009)								**
$*^{154}$Ho	J : 89Al27,88NeZZ,69Ek01=2								**
$*^{154}$Ho^m	D : IT decay has not been observed; %α from 74Sc19								**
$*^{154}$Ho^m	I : 89Al27=8								**
$*^{154}$Ho^m	T : average 93Al03=2.80(0.15) 68Wa12=3.25(0.10); other: 71To01=3.0(0.3)								**
$*^{154}$Ho^m	J : 89Al27,88NeZZ=8								**
$*^{154}$Er	D : %α from 74To07=0.47(0.13); other: 68Go13=0.17(0.10)								**
$*^{154}$Er	T : average 82To14=4.0(0.3) 82Ba75=3.6(0.3) 74PeZS=3.75(0.12) 82Bo04=3.6(0.2) 74To07=3.75(0.50) 63Ma18=4.5(1.0)								**
$*^{154}$Tm	T : average 82Bo04=8.3(0.3) 78AfZZ=7.6(0.5)								**
$*^{154}$Tm	D : %α from 97To12=54(5); other: 79Ho10=44(15)								**
$*^{154}$Tm^m	T : average 82Bo04=3.35(0.05) 78AfZZ=3.2(0.1) 64Ma45=2.98(0.20)								**
$*^{154}$Tm^m	J : 00Ba16=9								**
$*^{154}$Yb	D : average 96Pa01=92(2) 88Vi02=92.8(2.0) 79Ho10=93(2) 89Wo02=91(18)								**
$*^{154}$Lu	IJ : favored α decay from ^{158}Ta [J^π=(2$^-$)]								**
$*^{154}$Lu	D : α decay not observed in 97Da07 and 96Pa01								**
$*^{154}$Lu^m	D : β^+p and $\beta^+\alpha$ observed in 88Vi02, but not quantified; β^+p confirmed in 90Sh.A but not quantified								**
$*^{154}$Lu^m	T : average 88Vi02=1.16(0.05) 81Ho10=0.96(0.10)								**
$*^{154}$Lu^n	E : 2431.3 + 130.4 + x keV above ^{154}Lu^m; x=50#(50#) keV								**
$*^{154}$Hf^m	E : 93Mc03,89Mc07=2671 + x keV with x=14-70 keV from systematics								**
^{155}Ba	−27400#	400#			10# ms				
^{155}La	−37830#	300#			101 ms 28	1/2$^+$#	19	17Wu04 TD	β^-=100;β^-n ?;β^-2n ? *
^{155}Ce	−47616	6			313 ms 7	5/2$^-$#	19		β^-=100;β^-n ?
^{155}Pr	−55427.8	1.8			1.47 s 0.03	3/2$^-$#	19		β^-=100;β^-n ?
^{155}Nd	−62270.3	2.8			8.9 s 0.2	(3/2$^-$)	19		β^-=100
^{155}Pm	−66937.4	1.8			41.5 s 0.2	(5/2$^-$)	19		β^-=100
^{155}Sm	−70192.0	1.1			22.18 m 0.06	3/2$^-$*	19		β^-=100
^{155}Sm^m	−70175.5	1.1	16.5467	0.0019	2.8 μs 0.5	5/2$^+$	19		IT=100
^{155}Sm^n	−69654.0	1.1	538.03	0.19	1.00 μs 0.08	11/2$^-$	19	10Si03 TJ	IT=100
^{155}Eu	−71820.1	1.0			4.742 y 0.008	5/2$^+$*	19	14Un01 T	β^-=100 *
^{155}Gd	−72071.3	0.8			STABLE	3/2$^-$*	19		IS=14.828 60 *
^{155}Gd^m	−71950.2	0.8	121.10	0.19	31.97 ms 0.27	11/2$^-$	19		IT=100
^{155}Tb	−71256.4	0.8			5.2346 d 0.0036	3/2$^+$*	19	22Co10 T	ε=100 *
^{155}Dy	−69161.8	2.1			9.9 h 0.2	3/2$^-$*	19		β^+=100
^{155}Dy^m	−68927.5	2.1	234.33	0.03	6 μs 1	11/2$^-$	19		IT=100
^{155}Ho	−66044	16			48 m 2	5/2$^+$*	19		β^+=100
^{155}Ho^m	−65902	16	141.87	0.11	880 μs 80	11/2$^-$	19		IT=100
^{155}Er	−62214	6			5.3 m 0.3	7/2$^-$	19	69To06 T	β^+=?;α=0.022 7 *
^{155}Tm	−56626	9			21.6 s 0.2	11/2$^-$	19		β^+=99.17 17;α=0.83 17
^{155}Tm^m	−56585	11	41	6 AD	45 s 4	1/2$^+$	19	90Po13 E	$\beta^+\approx$99;α=? *
^{155}Yb	−50484	11			1.793 s 0.019	(7/2$^-$)	19	91To08 TD	α=89 5;β^+=? *
^{155}Lu	−42539	14			68.6 ms 0.9	11/2$^-$	19	97Da07 TD	α=90 2;β^+ ? *
^{155}Lu^m	−42517	15	21	4 AD	138 ms 8	1/2$^+$	19	97Da07 TD	α=76 16;β^+ ? *
^{155}Lu^n	−40761	14	1778.3	1.0 IT	2.693 ms 0.028	25/2$^-$#	19	18Pa37 D	α=99.895 4;IT=0.105 4 *
^{155}Hf	−34310#	300#			843 ms 29	(7/2$^-$)	19		$\beta^+\approx$100;α ? *
^{155}Hf^m	−31730#	300#	2581.5	1.0	510 ns 30	27/2$^-$		24Al20 TD	IT=100

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{155}Ta	−23900#	300#				3.2 ms 1.3	11/2$^-$		19 07Pa27	T	p=100	*
*^{155}La	T : from 17Wu04=101(28), supersedes 20Wu04=94(59)											**
*^{155}Eu	T : average 14Un01=1731(3) d 98Si12=1739(8) d, supersedes 83Wa26=1737(23) d, 93Th04=1735(22) d											**
*^{155}Gd	D : from IS=14.828(0.060) in 24Ci.A											**
*^{155}Gd	J : 57Ma55,56Lo29,56Sp21=3/2											**
*^{155}Tb	T : others: 70Ch09=5.32(0.06) 60To10=5.4(0.2) 57Mi67=5.6											**
*^{155}Tb	J : 90Al36,70Ad09=3/2											**
*^{155}Er	D : %α from 74To07											**
*^{155}Er	J : favored α decay to ^{151}Dy (J$^\pi$=7/2$^-$)											**
*^{155}Tm^m	J : favored α decay to ^{151}Ho (J$^\pi$=1/2$^+$)											**
*^{155}Yb	T : average 96Pa01=1.80(0.02) 91To08=1.75(0.05); others: 82Bo04=1.7(0.2) 80Da09=1.8(0.3) 79Ho10=1.59(0.22) 77Ha48=1.9(0.2) 64Ma45=1.65(0.15)											**
*^{155}Yb	D : %α average 91To08=90(5) 79Ho10=84(10)											**
*^{155}Lu	T : average 26Br.B=70(6) 97Da07=63(2) 96Pa01=70(1) 91To09=66(7) 79Ho10=70(6)											**
*^{155}Lu	D : %α from 97Da07=90(2); other: 79Ho10=79(4)											**
*^{155}Lu^m	T : average 97Da07=150(24) 96Pa01=136(9) 91To09=140(20)											**
*^{155}Lu^n	T : average 21Br.A,96Pa01=2.71(0.03) [α(t)] 89Ho12=2.60(0.07); others: 21Br.A=3.06(+0.21-0.18) [ce(t)], 3.24(+0.09-0.59) [γ(t)] 79Ho10=2.7(0.3)											**
*^{155}Lu^n	T : 81Ho.A=2.62(0.07)											**
*^{155}Lu^n	E : 26Br.B=1777.5(1.1), from E_γ=286(1),684.8(0.3), and 806.7(0.3) keV in a cascade											**
*^{155}Hf	J : favored α decay from ^{159}W [J$^\pi$=(7/2$^-$)]											**
*^{155}Hf	T : average 11Sa59=840(30) 81Ho10=890(120)											**
*^{155}Ta	T : symmetrized from 07Pa27=2.9(+1.5-1.1); other: 99Uu01=12(+4-3) μs strongly conflicting result - most likely ^{159}Re^m decay											**
*^{155}Ta	D : E_p: 07Pa27=1444(15) keV and 99Uu01=1776(10) keV, the latter similar to E_p=1805(20) keV for ^{159}Re^m. The energy balance Q_p(^{159}Re^m)+Qα(^{158}W)=Qα(^{159}Re^m)+											**
*^{155}Ta	D : Q_p(^{155}Ta)= 8422 keV supports the 07Pa27 data											**
^{156}La	−32950#	400#				84 ms 78	4$^+$#		17 17Wu04	TD	β^-=100;β^-n ?	
^{156}Ce	−44500#	200#				233 ms 9	0$^+$		17 17Wu04	TD	β^-=100;β^-n ?	
^{156}Pr	−51449.3	1.0				444 ms 6	1$^+$#		17 17Wu04	TD	β^-=100;β^-n ?	
^{156}Nd	−60202.1	1.3				5.06 s 0.13	0$^+$		12 07Sh05	T	β^-=100	*
^{156}Nd^m	−58770.8	1.4	1431.3	0.4		195 ns 55	(5$^-$)		12 26Ur.A	T	IT=100	*
^{156}Pm	−64166.9	1.2				27.4 s 0.5	4$^+$		12 16Ko.A	TJ	β^-=100	*
^{156}Pm^m	−64016.6	1.2	150.30	0.10		2.3 s 2.0	1$^+$#		12 07Sh05	ETD	IT≈98;β^-≈2	*
^{156}Sm	−69359	8				9.4 h 0.2	0$^+$		12		β^-=100	
^{156}Sm^m	−67961	8	1397.55	0.09		185 ns 7	5$^-$		12		IT=100	*
^{156}Eu	−70084	3				15.19 d 0.08	0$^+$*		12		β^-=100	*
^{156}Gd	−72536.4	0.8				STABLE	0$^+$		12		IS=20.493 22	*
^{156}Gd^m	−70398.8	0.8	2137.60	0.05		1.3 μs 0.1	7$^-$		12		IT=100	
^{156}Tb	−70092	4				5.35 d 0.10	3$^-$*		12		β^+≈100;β^- ?	*
^{156}Tb^m	−70004	4	88.4	0.2		5.3 h 0.2	(0$^+$)		12		IT=?;β^+=?	
^{156}Tb^n	−69990#	50#	100#	50#		24.4 h 1.0	(7$^-$)		12		IT=?;β^+ ?	*
^{156}Dy	−70530.4	0.8				STABLE >1Ey	0$^+$		12 58Ri23	T	IS=0.056 3;α ?;2β^+ ?	*
^{156}Ho	−65540	40				56 m 1	4$^-$*		12		β^+=100	*
^{156}Ho^m	−65490	40	52.37	0.30		9.5 s 1.5	1$^-$*		12 20Ka.B	TD	IT≈100;β^+ ?	*
^{156}Ho^n	−65304	28	240	50	MD	7.25 m 0.35	9$^+$		12 20Ka.B	T	β^+≈75;IT ?	*
^{156}Er	−64210	25				19.5 m 1.0	0$^+$		12 96By.A	D	β^+=100;α=1.2e-5 3	
^{156}Tm	−56829	13				84.0 s 1.6	2$^-$		12 20Ka.B	T	β^+=?;α=0.064 10	*
^{156}Tm^m	−56430#	200#	400#	200#	EU	∼ 400 ns	(11$^-$)		12		IT=100	*
^{156}Yb	−53264	9				26.1 s 0.7	0$^+$		12		β^+=?;α=10 2	
^{156}Lu	−43580	60			*	198 ms 2	(9$^+$)		12		α=100;β^+ ?	*
^{156}Lu^m	−43550	70	30	50	AD*	494 ms 12	(2$^-$)		12		α=100;β^+ ?	*
^{156}Lu^n	−40980	60	2601.4	1.4		179 ns 4	(19$^-$)		18Le10	ETJ	IT=100	
^{156}Hf	−37620	40				23 ms 1	0$^+$		12 96Pa01	D	α≈100;β^+ ?	
^{156}Hf^m	−35660	40	1958.8	1.0	AD	480 μs 40	(8$^+$)		12 96Pa01	T	α≈100;IT ?	*
^{156}Ta	−26000#	300#				106 ms 4	(2$^-$)		12		p=71 3;β^+=29 3	
^{156}Ta^m	−25910#	300#	94	8	p	345 ms 28	(9$^+$)		12 21Br.A	T	β^+=?;p=4.2 9	*
^{156}W	−17300#	100#				170 ms 50	0$^+$		23Br10	TD	β^+≈100;α ?;2p=0	*
*^{156}Nd	T : others: 89Ok.A=5.51(0.10) 87Gr12=5.47(0.11), see discussion in 07Sh05, 17Wu04=5.2(1.4)											**
*^{156}Nd^m	T : others: 09Si21=365(145) 98Ga12=135											**
*^{156}Pm	T : unweighed average 16Ko.A=27.78(0.07) 87Gr12=26.70(0.10); Birge ratio=8.85											**
*^{156}Pm^m	E : other: 20Or03=152.2(2.7) (PI-ICR mass measurements)											**
*^{156}Sm^m	T : other (recent,downweighted): 09Si21=186(44)											**
*^{156}Eu	J : 90Al34,81Ek03=0											**
*^{156}Gd	D : from IS=20.493(0.022) in 24Ci.A											**
*^{156}Tb	J : 70Ad09,63Bl25,62Lo01=3											**
*^{156}Tb^n	E : from 49.630 + x keV; x=50#(50#) keV estimated by NUBASE											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{156}$Dy	T : the lower limit is for α decay											**
$*^{156}$Ho	J : 89Al27,88NeZZ=4											**
$*^{156}$Ho^m	T : 20Ka.B,95KaZS=9.5(1.5)											**
$*^{156}$Ho^m	E : uncertainty estimated by NUBASE											**
$*^{156}$Ho^m	J : 88NeZZ,69Ek01=1											**
$*^{156}$Ho^n	T : from 20Ka.B,03KaZP=7.25(0.35), supersedes 02KaZO=7.8(0.3); others: 75Iw.A=7.4 75De.B=7.1											**
$*^{156}$Tm	T : others: 81Ga36=86(4),88(3) 80Zo02=82(5) 71To10=80(3) 80AfZZ=86(4) 82To14=80(3) 71ToZR=77(10) 70ToZS=90(10)											**
$*^{156}$Tm^m	E : 203.6 keV above unknown level											**
$*^{156}$Lu	J : favored α decay to ^{152}Tm [J4π=(9$^+$)]											**
$*^{156}$Lu^m	J : favored α decay to ^{152}Tm^{+m} [J$^\pi$=(2$^-$)]											**
$*^{156}$Hf^m	T : average 96Pa01=520(10) 81Ho.A=444(17)											**
$*^{156}$Ta^m	T : average 21Br.A=333(+38-32) 96Pa01=375(54) 93Li34=320(80)											**
$*^{156}$W	T : symmetrized from 23Br10=157(+57-34); other: 24Ya04=291(+86-61)											**
$*^{156}$W	D : 2p was searched in 23Br10 but was not observed											**
^{157}La	−29020#	300#				30# ms >550ns	$1/2^+$#	21	18Sh11	I	β^- ?;β^-n ?	
^{157}Ce	−39710#	300#				175 ms 41	$7/2^+$#	17	17Wu04	TD	β^-=100;β^-n ?	
^{157}Pr	−48435	3				307 ms 21	$3/2^-$#	17	17Wu04	TD	β^-=100;β^-n ?	*
^{157}Nd	−56494.3	2.1				1.157 s 0.024	$(5/2^-)$	17	23Ha30	TJ	β^-=100	*
^{157}Pm	−62297	7				10.60 s 0.08	$(5/2^-)$	21	24Ha23	T	β^-=100	*
^{157}Sm	−66677	4				8.03 m 0.07	$3/2^-$#	15			β^-=100	
^{157}Eu	−69460	4				15.18 h 0.03	$5/2^+*$	15			β^-=100	
^{157}Gd	−70824.9	0.8				STABLE	$3/2^-*$	15			IS=15.657 17	*
^{157}Gd^m	−70761.0	0.8	63.916	0.005		460 ns 40	$5/2^+$	15			IT=100	
^{157}Gd^n	−70398.4	0.8	426.539	0.023		18.5 μs 2.3	$11/2^-$	15			IT=100	
^{157}Tb	−70764.7	0.8				71 y 7	$3/2^+*$	15			ε=100	*
^{157}Dy	−69425	5				8.14 h 0.04	$3/2^-*$	15			β^+=100	
^{157}Dy^m	−69263	5	161.99	0.03		1.3 μs 0.2	$9/2^+$	15			IT=100	
^{157}Dy^n	−69226	5	199.38	0.07		21.6 ms 1.6	$11/2^-$	15			IT=100	
^{157}Ho	−66833	23				12.6 m 0.2	$7/2^-*$	15			β^+=100	
^{157}Er	−63414	27				18.65 m 0.10	$3/2^-*$	15			β^+=100	
^{157}Er^m	−63259	27	155.4	0.3		76 ms 6	$9/2^+$	15			IT=100	
^{157}Tm	−58715	20				3.63 m 0.09	$1/2^+*$	15	96By.A	D	$\beta^+\approx$100;α=7.5e-4 25	*
^{157}Tm^m	−58680	20	35.23	0.11		$\sim$1.6 s	$7/2^-$#		08VaZV	TJE	IT ?;β^+ ?	
^{157}Yb	−53427	10				38.6 s 1.0	$7/2^-*$	15			$\beta^+\approx$100;α=?	
^{157}Lu	−46432	11				7.7 s 2.0	$(1/2^+)$	15			β^+ ?;α=?	*
^{157}Lu^m	−46411	11	20.7	2.0	AD	4.79 s 0.12	$(11/2^-)$	15			β^+=?;α=7.7 19	*
^{157}Hf	−38800	50				115 ms 1	$7/2^-$	15			α=94 4;β^+ ?	*
^{157}Ta	−29390	50				10.1 ms 0.4	$1/2^+$	15			α=96.6 12;p=3.4 12;β^+ ?	
^{157}Ta^m	−29370	40	22	5	AD	4.3 ms 0.1	$11/2^-$	15			$\alpha\approx$100;β^+ ?;p=0	
^{157}Ta^n	−27800	50	1593	9	AD	1.7 ms 0.1	$25/2^-$#	15			α=100	
^{157}W	−19690#	400#				275 ms 40	$(7/2^-)$	15	10Bi03	D	β^+=100;α=0	
^{157}W^p	−19370#	400#	320	30	AD		$(9/2^-)$				IT ?	
$*^{157}$Pr	T : symmetrized from 17Wu04=295(+29-11)											**
$*^{157}$Nd	T : average 23Ha30=1.17(0.04) 17Wu04=1.15(0.03)											**
$*^{157}$Pm	T : average 24Ha23=10.5(0.2) 87Gr12=10.9(0.2) 92Sh32=10.66(0.16) 90An31=10.50(0.12)											**
$*^{157}$Gd	D : from IS=15.657(0.017) in 24Ci.A											**
$*^{157}$Gd	J : 61Ka23,57Ma55,56Lo29,56Sp21=3/2											**
$*^{157}$Tb	J : 90Al36=3/2											**
$*^{157}$Tm	J : 88Al04,87Mi31,86Al32,84Ek01,78EkZW=1/2											**
$*^{157}$Lu	T : unweighted average 91To09=5.7(0.5) 91Le15,92Po14=9.6(0.8); Birge ratio=4.13											**
$*^{157}$Lu^m	D : %α average 91To09=18(5) 79Ho10=6(2); Birge ratio=2.23											**
$*^{157}$Hf	J : favored α decay to ^{153}Yb gs (J$^\pi$=7/2$^-$)											**
$*^{157}$Hf	D : %α average 96Pa01=95(5) 79Ho10=91(7); other: 89Wo02=72(11)											**
^{158}La	−23890#	400#				10# ms			26Su01	ID	β^-=100;β^-n ?	
^{158}Ce	−36250#	400#				99 ms 93	0^+	17			β^-=100;β^-n ?	
^{158}Pr	−44150#	200#				181 ms 14	5^-#	17			β^-=100;β^-n ?	
^{158}Nd	−53835.1	1.3				810 ms 30	0^+	17	17Wu04	TD	β^-=100	*
^{158}Nd^m	−52187.0	1.9	1648.1	1.4		339 ns 20	(6^-)	17			IT=100	
^{158}Pm	−59106.5	0.9				5.10 s 0.03	$(0^+,1^+)$#	17	26Wa.2	T	β^-=100	*
^{158}Pm^m	−58960#	50#	150#	50#		5 ms 3	5^+#		26Wa.2	TDE	IT$\approx$100;β^- ?	*
^{158}Sm	−65252	5				5.30 m 0.03	0^+	17			β^-=100	
^{158}Eu	−67270.5	2.0				45.9 m 0.2	1^-*	17			β^-=100	*
^{158}Gd	−70691.0	0.8				STABLE	0^+	17			IS=24.82 2	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{158}Tb	−69471.7	1.2				180 y 11	3^-*	17	84Pr07	T	β^+=83.4 7;β^-=16.6 7	*
^{158}Tb^m	−69361.4	1.7	110.3	1.2		10.70 s 0.17	0^-	17			IT≈100;β^- ?;β^+ ?	
^{158}Tb^n	−69083.3	1.2	388.39	0.11		400 μs 40	7^-	17			IT=100	
^{158}Dy	−70407.6	2.3				STABLE	0^+	17			IS=0.095 3;α ?;2β^+ ?	
^{158}Ho	−66188	27				11.3 m 0.4	5^+*	17			β^+≈100;α ?	
^{158}Ho^m	−66121	27	67.20	0.01		28 m 2	2^-*	17			IT=?;β^+≈10 6	*
^{158}Ho^n	−66096	27	91.595	0.012		140 ns 25	(1^-)	17	20Ka.B	TJ	IT=100	*
^{158}Ho^p	−66010#	80#	180#	70#		21.3 m 2.3	(9^+)	17			β^+≈100;IT ?	
^{158}Er	−65304	25				2.29 h 0.06	0^+	17			ε=100	
^{158}Tm	−58703	25			*	3.98 m 0.06	2^-*	17			β^+=100	*
^{158}Tm^m	−58600#	60#	100#	50#	*	∼20 s	5^-#	17	81Dr07	IT	IT ?;ε ?	*
^{158}Yb	−56011	8				1.49 m 0.13	0^+	17	92Ha10	D	β^+=?;α=0.0021 12	
^{158}Lu	−47209	14				10.6 s 0.3	$(2)^-$	17	92Ha10	D	β^+=?;α=0.91 20	
^{158}Hf	−42096	13				2.85 s 0.07	0^+	17			β^+ ?;α=44.3 19	
^{158}Ta	−31060	50				49 ms 4	$(2)^-$	17	97Da07	TD	α≈100;β^+ ?	*
^{158}Ta^m	−30920	50	141	11	AD	36.0 ms 0.8	$(9)^+$	17	97Da07	ETJ	α=95 5;β^+ ?	*
^{158}Ta^n	−28250	50	2808	16		6.1 μs 0.1	(19^-)	17			IT=98.6 2;α=1.4 2	*
^{158}W	−23600#	300#				1.43 ms 0.18	0^+	17	19Hi06	T	α=100	*
^{158}W^m	−21710#	300#	1889	8	AD	143 μs 19	(8^+)	17			α=100;IT ?	
*^{158}Nd	T : symmetrized from 17Wu04=820(+15-36); other: 26Wa.2=1300(200)											**
*^{158}Pm	T : other: 87Gr12=4.8(0.5)											**
*^{158}Pm^m	E : 26Wa.2,15YoZX=121 + x (121-keV γ ray below the isomer); x=30#(50#) by NUBASE											**
*^{158}Pm^m	T : from 0.1 ms<26Wa.2<10 ms; other: 15YoZX>16 μs											**
*^{158}Eu	J : 90Al34=1											**
*^{158}Gd	D : from IS=24.82(0.02) in 24Ci.A											**
*^{158}Tb	J : 68E_α04=3											**
*^{158}Ho^m	D : %β^+ from ENSDF2017<19											**
*^{158}Ho^n	T : 20KaB,05KaZY=140(25)											**
*^{158}Tm	J : 86Al32,84Ek01,78EkZW=2											**
*^{158}Tm^m	I : 20 s activity, following observation of γs in $^{158}E_r$ ε decay in 81Dr07, is adopted. Note, that 20 ns appears in the level scheme in Fig. 2											**
*^{158}Tm^m	I : (81Dr07), which seems to be a misprint. This is a spin-trap isomer and the suggested 20 ns half-life in ENSDF2017 is unrealistic. The											**
*^{158}Tm^m	I : configuration is the same as that for the ground state, π7/2[404]⊗ν3/2[521], but $K^\pi = 5^-$. 75Ag01 also cannot rule out the existence of two											**
*^{158}Tm^m	I : ε-decaying states											**
*^{158}Ta	T : average 97Da07=72(12) 96Pa01=46(4); Birge ratio B=2.06											**
*^{158}Ta^m	T : average 97Da07=37.7(1.5) 96Pa01=35(1) 79Ho10=36.8(1.6)											**
*^{158}Ta^n	E : from ENSDF2017=2664.5(0.4) keV above ^{158}Ta^m											**
*^{158}W	T : average 19Hi06=1.9(+1.2-0.6) 00Ma95=1.5(0.2) 96Pa01=0.9(+0.4-0.3)											**
^{159}Ce	−31100#	400#				60# ms	$1/2^-$#		26Su01	ID	β^-=100;β^-n ?	
^{159}Pr	−40770#	300#				134 ms 43	$3/2^-$#	23	17Wu04	TD	β^-=100;β^-n ?	
^{159}Nd	−49724	30				500 ms 30	$7/2^+$#	23	17Wu04	TD	β^-=100;β^-n ?	*
^{159}Pm	−56554	10				1.64 s 0.04	$(5/2^-)$	23	22Ki23	TD	β^-=100;β^-n=0.30 17	*
^{159}Pm^m	−55059	10	1495.0	0.3		4.97 μs 0.12	$(17/2^+)$	23	21Yo08	ETJ	IT=100	*
^{159}Sm	−62208	6				11.37 s 0.15	$5/2^-$	23	87Gr12	T	β^-=100	
^{159}Sm^m	−60932	6	1276.5	0.8		115 ns 10	$(15/2^+)$	23	17Pa25	EJT	IT=100	*
^{159}Eu	−66044	4				18.1 m 0.1	$5/2^+$*	23			β^-=100	*
^{159}Gd	−68562.9	0.8				18.479 h 0.004	$3/2^-$*	10			β^-=100	*
^{159}Tb	−69533.4	1.0				STABLE	$3/2^+$*	10	12Vi10	J	IS=100	*
^{159}Dy	−69168.6	1.0				144.4 d 0.2	$3/2^-$*	10			ε=100	*
^{159}Dy^m	−68815.8	1.0	352.77	0.14		122 μs 3	$11/2^-$	10			IT=100	
^{159}Ho	−67331.0	2.9				33.05 m 0.11	$7/2^-$*	10			β^+=100	*
^{159}Ho^m	−67125.1	2.9	205.91	0.05		8.30 s 0.08	$1/2^+$	10			IT=100	
^{159}Er	−64563	3				36 m 1	$3/2^-$*	10			β^+=100	*
^{159}Er^m	−64380	3	182.602	0.024		337 ns 14	$9/2^+$	10			IT=100	
^{159}Er^n	−64134	3	429.05	0.03		590 ns 60	$11/2^-$	10			IT=100	
^{159}Tm	−60570	28				9.13 m 0.16	$5/2^+$*	10			β^+=100	*
^{159}Yb	−55835	18				1.67 m 0.09	$5/2^-$*	10			β^+=100	*
^{159}Lu	−49710	40			*	12.1 s 1.0	$1/2^+$	10	92Ha10	D	β^+=?;α=0.15 3	*
^{159}Lu^m	−49610#	90#	100#	80#	*	10# s	$11/2^-$#				β^+ ?;IT ?;α ?	
^{159}Hf	−42834	11				5.20 s 0.10	$7/2^-$	10	96Pa01	T	β^+ ?;α=35 7	
^{159}Ta	−34433	15				1.04 s 0.09	$1/2^+$	10	97Da07	T	β^+ ?;α=34 5	*
^{159}Ta^m	−34369	14	64	5	AD	560 ms 60	$11/2^-$	10	97Da07	D	α=55 1;β^+ ?	
^{159}W	−25430#	300#				8.2 ms 0.7	$(7/2^-)$	10	96Pa01	TD	α≈100;β^+ ?	*
^{159}Re	−14710#	310#				40# μs	$1/2^+$#	10			p ?;α ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{159}Re^m	−14500#	300#	210#	50#		20 μs 4	11/2$^-$	10	07Pa27	TD	p=?;α=7.5 35	*
*^{159}Nd	T : symmetrized from 17Wu04=485(+39-20)											**
*^{159}Pm	T : average 22Ki23=1.648(+0.043-0.042) 17Wu04=1.48(0.18) 05Ic02=1.5(0.2), supersedes 01AsZY=1.47(0.15) 98IcZZ,00IcZZ=2(1)											**
*^{159}Pm	D : %β^-n from 22Ki23<0.6											**
*^{159}Pm^m	T : 21Yo08=4.97(0.12) supersedes 15YoZX=4.42(0.17)											**
*^{159}Pm^m	E : 21Yo08=1495.0(0.3) supersedes 15YoZX=1465.0(0.5)											**
*^{159}Sm^m	E : average 17Pa25=1275.9(1.4) 09Ur04=1276.8(1.0)											**
*^{159}Sm^m	T : from 09Ur04; other: 17Pa25=50(17)											**
*^{159}Eu	J : 90Al34=5/2											**
*^{159}Gd	J : 71Kr19,70Pr13,61Ca07=3/2											**
*^{159}Tb	J : 12Vi10,90Al36=3/2											**
*^{159}Dy	J : 65Al16=3/2											**
*^{159}Ho	J : 88NeZZ,70LiZY,69Ek01=7/2											**
*^{159}Er	J : 69Ek01=3/2											**
*^{159}Tm	J : 71Ek01=5/2											**
*^{159}Yb	J : 91Sc33,83Ne13=5/2											**
*^{159}Lu	J : favored α decay to ^{155}Ho^m (J$^\pi$=1/2$^+$)											**
*^{159}Ta	T : average 97Da07=0.83(0.18) 96Pa01=1.10(0.10)											**
*^{159}W	T : others: 19Hi06=10.3(+2.1-1.5) 81Ho10=7.3(2.7)											**
*^{159}W	J : favored α decay from ^{163}Os [J$^\pi$=(7/2$^-$)]											**
*^{159}Re^m	T : average 07Pa27=16(9) 06Jo10=21(4)											**
^{160}Ce	−27250#	400#				30# ms	0$^+$		26Su01	ID	β$^-$=100;β$^-$n ?	
^{160}Pr	−36200#	400#				170 ms 140	1$^+$#	21	17Wu04	TD	β$^-$=100;β$^-$n ?	
^{160}Nd	−46720	50				439 ms 37	0$^+$	21	17Wu04	TD	β$^-$=100;β$^-$n ?	
^{160}Nd^m	−45610	50	1107.9	0.9		1.63 μs 0.21	(4$^-$)	21	16Id02	ETJ	IT=100	
^{160}Pm	−52894.6	2.0				868 ms 35	6$^-$#	21	22Ki23	TD	β$^-$=100;β$^-$n=0.05 3	*
^{160}Pm^m	−52704	11	191	11	MD	> 400 ms	1$^-$#		20Or03	EJT	β$^-$?;IT ?;β$^-$n ?	
^{160}Sm	−60233.2	2.0				9.60 s 0.28	0$^+$	21			β$^-$=100	*
^{160}Sm^m	−58871.9	2.0	1361.3	0.4		120 ns 46	(5$^-$)	21	09Si21	ETJ	IT=100	
^{160}Sm^n	−57475.9	2.0	2757.3	0.4		1.8 μs 0.4	(11$^+$)	21	16Pa01	ETJ	IT=100	
^{160}Eu	−63493.5	0.9				42.6 s 0.4	(5$^-$)	21	18Ha19	TJ	β$^-$=100	*
^{160}Eu^m	−63400.4	0.8	93.0	1.2	MD	30.8 s 0.5	(1$^-$)	21	18Ha19	ETJ	β$^-$=100	*
^{160}Gd	−67943.0	1.0				STABLE >31Ey	0$^+$	21	01Da22	T	IS=21.811 28;2β$^-$?	*
^{160}Tb	−67837.2	1.0				72.31 d 0.21	3$^-$*	21			β$^-$=100	*
^{160}Dy	−69672.7	0.7				STABLE	0$^+$	21			IS=2.329 18	
^{160}Ho	−66383	15				24.8 m 0.8	5$^+$*	21	65St08	T	β$^+$=100	*
^{160}Ho^m	−66323	15	59.98	0.03		4.98 h 0.04	2$^-$*	21	20Ka.B	D	IT=77.9 16;β$^+$=22.1 16	*
^{160}Ho^n	−66190	21	193	14		3.2 s 0.2	(9$^+$)	21	20Ka.B	TJ	IT=100	*
^{160}Er	−66064	24				28.58 h 0.09	0$^+$	21	70Ka23	T	ε=100	
^{160}Tm	−60300	30				9.30 m 0.23	1$^-$*	21			β$^+$=100	*
^{160}Tm^m	−60230	30	71	12		74.5 s 1.5	(5$^+$)	21	83Si20	TD	IT=?;β$^+$=15 5	*
^{160}Tm^n	−60130	30	169	12		∼ 200 ns	(6$^-$)	21			IT=100	*
^{160}Yb	−58163	5				4.8 m 0.2	0$^+$	21	69NeZW	T	β$^+$=100	
^{160}Lu	−50300	40			*	32.4 s 0.9	1$^-$#	21	93Al03	T	β$^+$=100;α ?	*
^{160}Lu^m	−50250#	60#	50#	50#	*	40 s 1	(4)	21	84Au14	TD	β$^+$≈100;α ?	*
^{160}Hf	−45937	9				13.6 s 0.2	0$^+$	21	95Hi12	TD	β$^+$=?;α=0.7 2	*
^{160}Ta	−35680	70			*&	1.70 s 0.20	(2$^-$)	21	96Pa01	TD	β$^+$?;α=?	*
^{160}Ta^m	−35610	60	60	50	AD*&	1.55 s 0.04	(9$^+$)	21	96Pa01	TD	β$^+$?;α=?	*
^{160}W	−29130	40				90 ms 5	0$^+$	21	96Pa01	TD	α=87 8;β$^+$?	*
^{160}Re	−16880#	300#				611 μs 7	(4$^-$)	21	11Da12	TD	p=89 1;α=11 1	*
^{160}Re^m	−16700#	300#	177	15	IT	2.8 μs 0.1	(9$^+$)	21	11Da01	JT	IT=100	
^{160}Os	−7600#	100#				210 ms 50	0$^+$		24Ya04	TD	α=100;2p=0	*
^{160}Os^m	−5760#	100#	1847	17	AD	45 μs 12	8$^+$#		23Br10	T	α=100;IT ?	*
*^{160}Pm	T : average 22Ki23=874(+16-12) 17Wu04=725(57); values probably include contributions from both the gs and isomer; Birge Ratio=2.58											**
*^{160}Pm	D : %β^-n from 22Ki23<0.1											**
*^{160}Sm	T : average 17Wu04=10.1(1.1) 87Gr12=9.6(0.3) 86Ma12=8.7(1.4)											**
*^{160}Eu	T : average 23Ya17=42.5(0.7) 18Ha19=42.6(0.5); others: 82Ba76=41(4) 73Da05=50(10) 73Mo18=53(10)											**
*^{160}Eu^m	T : others: 23Ya17=26.0(0.8) (discrepant) 86Ma12=31(4)											**
*^{160}Gd	T : 0n-BB value quoted at 68% C.L.; other: 23La12>1.8 Ey, >97 Ey, >82 Ey and >50 Ey for 2β$^-$ decay to the 1st 2$^+$, 2nd 2$^+$, 1st 0$^+$ and 2nd 0$^+$ states											**
*^{160}Gd	T : in ^{160}Dy respectively											**
*^{160}Gd	D : from IS=21.811(0.028) in 24Ci.A											**
*^{160}Tb	J : 63Bl25,61Ca07,60Jo12=3											**
*^{160}Tb	T : average 99Po32=72.5(0.6) 63Ho15=72.1(0.3) 57Th11=73.0(0.6) 54Ke35=72.3(0.5) 50Bu19=71(1) 46Bo25=73.5(1.0); other: 02Ka01=97(+16-12)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{160}$Ho	J : 69Ek01,70LiZL,88NeZZ=5											**
$*^{160}$Ho	T : average 65St08=25.6(0.3) 66La11=25(1) 58To32=28(3) 50Wi13=22.5(0.5); Birge ratio=3.13											**
$*^{160}$Ho^m	J : 69Ek01,88NeZZ=2; 66Av03=E3 to g.s											**
$*^{160}$Ho^m	T : average 65St08=5.02(0.05) 66La11=4.6(0.3) 63Ra15=5.0(0.2) 60Gr15=4.76(0.10) 57Dz60=5.3(0.2)											**
$*^{160}$Ho^m	D : %IT from 20Ka.B=77.9(1.6,stat)(0.3,syst); others (same group): 06KaZX=77.9(2.0) 02Ad34=73.6(5.2) 03KaZR=73.3(3.0); other: 74Al28=65(3)											**
$*^{160}$Ho^n	T : from 20Ka.B,05KaZX=3.2(0.2) [118.4γ(t)]; other: 88Bh05$\sim$3											**
$*^{160}$Ho^n	E : from 169.56(0.07) keV + x with x<47 keV from non-observation of of K x rays											**
$*^{160}$Tm	J : 71Ek01=1											**
$*^{160}$Tm	T : average 93Al03=9.2(0.4) 75St12=9.5(0.4) 70De13=9.2(0.4)											**
$*^{160}$Tm^m	E : from 42.11(0.05) + x keV above gs; 7.1<x<49.8 keV from observation of L x rays and non-observation of K x rays in 83Si20											**
$*^{160}$Tm^n	E : 98.2(0.3) keV above ^{160}Tm^m											**
$*^{160}$Lu	T : average 93Al03=33(1) 84Au14=25(5) [1253γ(t)], 26(6) [1810γ(t)], 31(3) [1496γ(t)] with γs depopulating J=1,2 levels in ^{160}Yb											**
$*^{160}$Lu	J : probable conf=π1/2[411]$\otimes\nu$3/2[521],$K^\pi=1^-$											**
$*^{160}$Lu^m	T : 84Au14=40(1) using 395γ, depopulating 4^+ level in ^{160}Yb; other: 84Au14=40(8), using 929γ, depopulating 4^-,5^- level in ^{160}Yb											**
$*^{160}$Lu^m	J : population of 4^+ and (4^-,5^-) levels and absence of population to 6^+ levels in ^{160}Yb											**
$*^{160}$Hf	D : %α other: 73To02=2.3(0.6)											**
$*^{160}$Ta	J : favored α decay to ^{156}Lu^m [J$^\pi$=(2^-)]											**
$*^{160}$Ta^m	J : favored α decay to ^{156}Lu [J$^\pi$=(9^+)]											**
$*^{160}$W	T : average 96Pa01=91(5) 81Ho10=81(15)											**
$*^{160}$Re	J : from 11Da01; other: 92Pa05=(2^-)											**
$*^{160}$Re	D : other: 96Pa01=91(5) [%p] and 9(5) [%α]											**
$*^{160}$Re	T : average 11Da12=614(8) [p(t)], 597(20) [α(t)]; others: 96Pa01=790(+190-130) 92Pa05=860(+230-150)											**
$*^{160}$Os	T : symmetrized from 24Ya04=201(+58-37) from 20 events; other: 23Br10=97(+97-32) from 4 events											**
$*^{160}$Os	D : 2p was searched in 23Br10 but was not observed											**
$*^{160}$Os^m	T : symmetrized from 23Br10=41(+15-9)											**
^{161}Pr	−32490#	500#				90# ms >550ns	$3/2^-$#	21	18Fu08	I	β^- ?;β^-n ?	
^{161}Nd	−42230#	200#				215 ms 76	$1/2^-$#	17	17Wu04	TD	β^-=100;β^-n ?	
^{161}Pm	−50087	9				733 ms 16	($5/2^-$)	17	22Ki23	TD	β^-=100;β^-n=1.09 11	*
^{161}Pm^m	−49121	9	965.8	0.5		0.79 μs 0.04	($13/2^+$)	17	21Yo08	ET	IT=100	
^{161}Sm	−56672	7				4.6 s 0.3	$7/2^+$#	11	22Ki23	TD	β^-=100;β^-n=1.4 8	*
^{161}Sm^m	−55284	7	1388.1	0.6		2.6 μs 0.4	($17/2^-$)		17Pa25	ETJ	IT=100	
^{161}Eu	−61791	10				26.2 s 2.3	$5/2^+$#	11	17Wu04	T	β^-=100	*
^{161}Gd	−65507.0	1.4				3.646 m 0.003	$5/2^-$	11	94It.A	T	β^-=100	
^{161}Tb	−67462.5	1.1				6.957 d 0.004	$3/2^+*$	11	FGK264	T	β^-=100	*
^{161}Dy	−68055.8	0.7				STABLE	$5/2^+*$	11			IS=18.889 42	*
^{161}Dy^m	−67570.2	0.7	485.56	0.16		760 ns 170	$11/2^-$	11	12Sw01	T	IT=100	
^{161}Ho	−67196.6	2.1				2.48 h 0.05	$7/2^-*$	11			ε=100	*
^{161}Ho^m	−66985.5	2.1	211.15	0.03		6.76 s 0.07	$1/2^+$	11			IT=100	
^{161}Er	−65202	9				3.21 h 0.03	$3/2^-*$	11			β^+=100	*
^{161}Er^m	−64806	9	396.44	0.04		7.5 μs 0.7	$11/2^-$	11			IT=100	
^{161}Tm	−61899	28				30.2 m 0.8	$7/2^+*$	11	93Al03	T	β^+=100	*
^{161}Tm^m	−61891	28	7.51	0.24		5# m	($1/2^+$)				β^+ ?;IT ?	
^{161}Tm^n	−61821	28	78.20	0.03		110 ns 3	$7/2^-$	11			IT=100	
^{161}Yb	−57836	15				4.2 m 0.2	$3/2^-*$	11			β^+=100	*
^{161}Lu	−52562	28				77 s 2	$1/2^+*$	11			β^+=100	*
^{161}Lu^m	−52380#	28#	182#	5#		7.3 ms 0.4	($9/2^-$)	11			IT$\approx$100;β^+ ?	*
^{161}Hf	−46317	23				18.4 s 0.4	($7/2^-$)	14	92Ha10	D	β^+=?;α=0.29 5	
^{161}Hf^m	−45988	23	329.0	0.5		4.8 μs 0.2	($13/2^+$)	14			IT=100	
^{161}Ta	−38801	24				3# s	($1/2^+$)	11			β^+ ?;α ?	
^{161}Ta^m	−38711	12	90	23	AD	3.08 s 0.11	($11/2^-$)	11	12Th13	D	β^+ ?;α=7 3	
^{161}W	−30450	50				409 ms 16	$7/2^-$#	11	96Pa01	T	α=73 3;β^+ ?	*
^{161}Re	−20640	40				440 μs 10	$1/2^+$	11	06La16	T	p$\approx$100;α ?	
^{161}Re^m	−20520	40	123.7	1.3	IT	14.7 ms 0.3	$11/2^-$	11			α=93.0 3;p=7.0 3	
^{161}Os	−10200#	400#				640 μs 60	($7/2^-$)	11			α=100	
$*^{161}$Pm	T : average 22Ki23=724(+20-12) 17Wu04=1050(150)											**
$*^{161}$Pm^m	J : from 727.5-keV γ to ($11/2^-$), 609.2-keV γ to ($13/2^-$); conf=π5/2[532]$\otimes\nu$(1/2[521],7/2[633]), $K^\pi=13/2^+$											**
$*^{161}$Pm^m	T : 21Yo08=0.79(0.04) supersedes 15YoZX=0.89(0.09)											**
$*^{161}$Sm	T : average 22Ki23=4.349(+0.425-0.441) 17Wu04=5.2(1.3) 98Ic02=4.8(0.4)											**
$*^{161}$Sm	D : %β^-n from 22Ki23<2.7											**
$*^{161}$Eu	T : average 17Wu04=30.1(9.0) 90An31=24(4) 86Ma12=27(3)											**
$*^{161}$Tb	J : 64Bu09=3/2											**
$*^{161}$Dy	J : 74Fe05,62Sp03,58Pa11,56Co21=5/2											**
$*^{161}$Ho	J : 88NeZZ,87AlZO,64Bu09=7/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{161}$Er	T : other: 16Ba65=3.20(0.09)											**
$*^{161}$Er	J : 69Ek01=3/2											**
$*^{161}$Tm	J : 71Ek01=7/2											**
$*^{161}$Yb	J : 83Ne13,82Bu21=3/2											**
$*^{161}$Lu	J : 98Ge13=1/2											**
$*^{161}$Lu^m	E : 166.5(0.8) keV above the $3/2^+$ member of the $\pi 1/2[411]$ band at x keV; x=15#(5#) keV estimated by NUBASE											**
$*^{161}$W	T : average 96Pa01=409(18) 79Ho10=410(40)											**
^{162}Nd	−39010#	300#				310 ms 200	0^+	23	17Wu04	TD	β^-=100	
^{162}Pm	−46040#	200#				484 ms 28	2^+#	23	22Ki23	TD	β^-=100;β^-n=1.79 19	*
^{162}Sm	−54379	4				3.05 s 0.23	0^+	23	22Ki23	TD	β^-=100;β^-n=0.5 3	*
^{162}Sm^m	−53368	4	1010.7	0.6		1.78 μs 0.07	(4^-)	23	17Yo01	ETJ	IT=100	*
^{162}Eu	−58723.3	1.4				∼ 10 s	1^+#	23	21Wa04	T	β^-=100	*
^{162}Eu^m	−58565.1	1.3	158.2	1.7	MD	15.0 s 0.5	(6^+)		18Ha19	TJ	β^-=100	*
^{162}Gd	−64282	4				8.4 m 0.2	0^+	23			β^-=100	
^{162}Gd^m	−62833	4	1448.6	0.3		99 μs 3	(6^-)	23	21Wa04	TJ	IT=100	
^{162}Tb	−65595.4	1.9				7.74 m 0.09	1^-	23			β^-=100	
^{162}Tb^m	−65379.4	2.2	216.0	1.0	RQ	< 60# ms	4^-		07Bu29	EJ	IT≈100	*
^{162}Dy	−68181.5	0.7				STABLE	0^+	23			IS=25.475 36	
^{162}Dy^m	−65993.4	0.8	2188.1	0.3		8.3 μs 0.3	8^+	23	11Sw02	ETD	IT=100	
^{162}Ho	−66041	3				14.7 m 0.7	1^+*	23			β^+=100	*
^{162}Ho^m	−65935	3	105.87	0.06		67.0 m 0.7	6^-*	23			IT≈63;β^+≈37	*
^{162}Er	−66334.5	0.7				STABLE >140Ty	0^+	23	56Po16	T	IS=0.139 5;α ?;2β^+ ?	*
^{162}Tm	−61478	26				21.70 m 0.19	1^-*	23			β^+=100	*
^{162}Tm^m	−61350	50	130	40		24.3 s 1.7	5^+	23	74De47	EDJ	IT=82.5 34;β^+=17.5 34	*
^{162}Yb	−59823	15				18.87 m 0.19	0^+	23	72Ch23	T	β^+=100	
^{162}Lu	−52820	50			*	1.37 m 0.02	1^-*	23			β^+=100	*
^{162}Lu^m	−52760#	60#	60#	40#	*	1.5 m	4^-#	23	80BeYG	TI	β^+≈100;IT ?	
^{162}Lu^n	−52670#	70#	150#	50#	EU	1.9 m	7^-#	23	80BeYG	TI	β^+ ?;IT ?	*
^{162}Hf	−49170	9				39.4 s 0.9	0^+	23	95Hi12	D	β^+=?;α=0.008 1	
^{162}Ta	−39780	60			*	3.57 s 0.12	3^-#	23			β^+=?;α=0.074 10	
^{162}Ta^m	−39870	80	−90	50	*	5# s	6^+#				β^+ ?;IT ?;α ?	
^{162}W	−33993	13				1.27 s 0.11	0^+	23	14ThZZ	TD	β^+ ?;α=45.2 16	*
^{162}Re	−22400	50				107 ms 13	$(2)^-$	23	97Da07	TD	α=94 6;β^+ ?	
^{162}Re^m	−22220	50	175	9	AD	77 ms 5	$(9)^+$	23	97Da07	TD	α=91 5;β^+ ?	*
^{162}Os	−14410#	300#				2.05 ms 0.09	0^+	23			α=100	*
$*^{162}$Pm	T : average 22Ki23=467(+38-18) 17Wu04=630(180); other: 23Vi.A=487(+46-43) from the same group as 22Ki23											**
$*^{162}$Sm	T : average 22Ki23=3.369(+0.200-0.303) 17Wu04=3.00(0.46) 05Ic02=2.4(0.5)											**
$*^{162}$Sm	D : %β^-n from 22Ki23<1											**
$*^{162}$Sm^m	T : other: 17Pa25=1.7(0.2)											**
$*^{162}$Eu	T : 21Wa04=10.8(0.5) 17Wu04=11.8(1.4) 87Gr12=10.6(1.0) but values include both gs and isomer											**
$*^{162}$Eu	J : from 18Ha19											**
$*^{162}$Eu^m	T : from 18Ha19=15.0(0.5); others: 21Wa04=12.0(0.2),12.3(0.6)											**
$*^{162}$Tb^m	T : an upper limit estimated for ΔK=3 forbidden, 177-keV E2 transition											**
$*^{162}$Ho	J : 69Ek01,88NeZZ=1											**
$*^{162}$Ho	T : average 73Ba21=15(1) 69Ak01=12(2) 65St08=15(1)											**
$*^{162}$Ho^m	J : 69Ek01=6											**
$*^{162}$Er	T : the lower limit is for α decay											**
$*^{162}$Tm	J : 71Ek01=1											**
$*^{162}$Tm^m	E : from 66.90 + x keV; x<125 keV from 74De47											**
$*^{162}$Lu	J : 98Ge13=1											**
$*^{162}$Lu^n	I : existence is tentative and needs confirmation											**
$*^{162}$W	T : unweighted average 14ThZZ=1.48(0.07) 15Li24=0.99(0.03) 96Pa01=1.2(0.1) 79Ho10=1.39(0.04); Birge ratio=5.35											**
$*^{162}$W	D : average 14ThZZ=49(8) 81Ho10=46(4) 89Wo02=49(4) 96Pa01=44(2)											**
$*^{162}$Re^m	T : average 96Pa01=66(7) 97Da07=85(6)											**
$*^{162}$Re^m	D : average 96Pa01=85(9) 97Da07=94(6)											**
$*^{162}$Os	T : average 19Hi06=2.2(+1.0-0.6) 04Jo12=2.1(0.1) 00Ma95=1.9(0.2) 96Bi07=1.5(+0.7-0.5) 89Ho12=1.9(0.7)											**
^{163}Nd	−34080#	400#				80# ms >550ns	$5/2^-$#	21	18Fu08	I	β^- ?;β^-n ?	
^{163}Pm	−42960#	300#				370 ms 40	$5/2^-$#	17	22Ki23	TD	β^-=100;β^-n=5.0 7	*
^{163}Sm	−50600	7				1.68 s 0.18	$1/2^-$#	17	22Ki23	TD	β^-=100;β^-n=0.05 3	*
^{163}Eu	−56573.8	0.9				7.7 s 0.4	$5/2^+$#	10	08Os02	T	β^-=100	
^{163}Eu^m	−55609.3	1.0	964.5	0.5		911 ns 24	$(13/2^-)$		17Pa25	TJE	IT=100	*
^{163}Gd	−61388.6	0.8				68 s 3	$7/2^+$	10	20Za04	J	β^-=100	
^{163}Gd^m	−61250.4	0.8	138.22	0.20		23.5 s 1.0	$1/2^-$		14Ha38	TD	IT≈100;β^- ?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{163}Tb	−64596	4				19.5 m 0.3	$3/2^+$	10			β^-=100	
^{163}Dy	−66381.2	0.7				STABLE	$5/2^-$*	10			IS=24.896 42	*
^{163}Ho	−66378.3	0.7				4.570 ky 0.019	$7/2^-$*	10			ε=100	*
^{163}Ho^m	−66080.4	0.7	297.88	0.07		1.09 s 0.03	$1/2^+$	10			IT=100	
^{163}Ho^n	−64268.9	0.8	2109.4	0.4		800 ns 150	$(23/2^+)$		12Sw01	ETJ	IT=100	
^{163}Er	−65168	5				75.0 m 0.4	$5/2^-$*	10			β^+=100	*
^{163}Er^m	−64723	5	445.5	0.6		580 ns 100	$(11/2^-)$	10			IT=100	
^{163}Tm	−62729	6				1.810 h 0.005	$1/2^+$*	10			β^+=100	*
^{163}Tm^m	−62642	6	86.92	0.05		380 ns 30	$(7/2)^-$	10			IT=100	
^{163}Yb	−59295	15				11.05 m 0.35	$3/2^-$*	10			β^+=100	*
^{163}Lu	−54791	28				3.97 m 0.13	$1/2^+$*	10	98Ge13	J	β^+=100	
^{163}Hf	−49291	26				40.0 s 0.6	$(5/2^-)$	14			β^+=100;α ?	
^{163}Ta	−42530	40				10.6 s 1.8	$1/2^+$	10	FGK12a	J	$\beta^+\approx$100;α ?	*
^{163}Ta^m	−42360#	50#	174#	25#	AD	10# s	$9/2^-$		FGK12a	J	β^+ ?;α ?;IT ?	*
^{163}W	−34890	60				2.63 s 0.09	$7/2^-$	10			β^+ ?;α=14 2	
^{163}W^m	−34410	60	480.3	0.7		154 ns 3	$13/2^+$	10			IT=100	
^{163}Re	−25996	14				390 ms 70	$1/2^+$	15			β^+ ?;α=32 3	
^{163}Re^m	−25876	14	120	5	AD	214 ms 5	$11/2^-$	15			α=66 4;β^+ ?	
^{163}Os	−16340#	300#				5.7 ms 0.5	$(7/2^-)$	15	13Dr06	J	$\alpha\approx$100;β^+ ?	*
^{163}Ir	−5310#	400#				100# ns	$1/2^+$#				p ?	
*^{163}Pm	T : symmetrized from 22Ki23=362(+42-30); others: 17Wu04=430(350) 19Ki.A=255(25) 17Wu04=430(350)											**
*^{163}Sm	T : average 22Ki23=1.744(+0.180-0.204) 17Wu04=1.23(+0.51-0.47)											**
*^{163}Sm	D : %β^-n from 22Ki23<0.1											**
*^{163}Eu^m	T : average 17Pa25=990(40) 17Yo01=869(29)											**
*^{163}Gd^m	J : 20Za04=1/2$^-$											**
*^{163}Dy	J : 62Sp03,58Pa11,56Co21=5/2											**
*^{163}Ho	T : average 88Ka20=4.569(0.030) 83Ba32=4.570(0.025); other: 92Ju01=47(+5-4) d for q=66$^+$ (bare ion)											**
*^{163}Ho	J : 89Al27,88NeZZ=7/2											**
*^{163}Er	J : 69St05=5/2											**
*^{163}Tm	J : 67Sc33=1/2											**
*^{163}Yb	J : 83Ne13,82Bu21=3/2											**
*^{163}Ta	J : favored α decay to ^{159}Lu (J$^\pi$=1/2$^+$)											**
*^{163}Ta^m	J : favored α decay from ^{167}Re (J$^\pi$=9/2$^-$)											**
*^{163}Os	T : average 19Hi06=6.2(+1.3$^-$0.9) 96Bi07=5.5(0.6)											**
^{164}Pm	−38360#	400#				280 ms 40	5$^-$#	21	22Ki23	TD	β^-=100;β^-n=6.2 18	*
^{164}Sm	−47925	4				1.42 s 0.06	0^+	17	22Ki23	TD	β^-=100;β^-n=0.35 20	*
^{164}Sm^m	−46440	4	1485.5	1.2		600 ns 140	(6^-)	17			IT=100	
^{164}Eu	−53232.1	2.1				4.08 s 0.16	3$^-$#	17	21Wa04	T	β^-=100	*
^{164}Gd	−59693.7	1.0				45 s 3	0^+	17			β^-=100	
^{164}Gd^m	−58597.9	1.1	1095.8	0.4		581 ns 16	(4^-)	17	21Wa04	T	IT=100	*
^{164}Tb	−62105.0	1.9				3.0 m 0.1	(5^+)	17			β^-=100	
^{164}Tb^m	−61960	12	145	12	MD	2# m	2$^+$#		20Or03	EJ	β^- ?;IT ?	
^{164}Dy	−65967.9	0.7				STABLE	0^+	17			IS=28.260 54	
^{164}Ho	−64980.8	1.4				28.8 m 0.5	1$^+$*	17			ε=60 5;β^-=40 5	*
^{164}Ho^m	−64841.0	1.4	139.78	0.07		36.6 m 0.3	6$^-$*	17			IT=100	*
^{164}Er	−65942.9	0.7				STABLE	0^+	17			IS=1.601 3;α ?;2β^+ ?	
^{164}Tm	−61909	25				2.0 m 0.1	1$^+$*	17			β^+=100;ε=61 1;e$^+$=39 1	*
^{164}Tm^m	−61889	28	20	12		5.1 m 0.1	6$^-$*	17			IT$\approx$80;$\beta^+\approx$20	*
^{164}Yb	−61014	15				75.8 m 1.7	0^+	17			ε=100	
^{164}Lu	−54642	28				3.14 m 0.03	1$^-$*	17			β^+=100	*
^{164}Hf	−51819	15				111 s 8	0^+	17			β^+=100	
^{164}Ta	−43283	28				14.2 s 0.3	(3^+)	17			β^+=100	
^{164}W	−38233	10				6.3 s 0.2	0^+	17			β^+=?;α=3.8 12	
^{164}Re	−27420	60				890 ms 130	(9^+)	17	09Ha42	TD	β^+ ?;α=3 1	*
^{164}Re^m	−27320	70	100	50	AD	719 ms 89	(2^-)	17			α=?;β^+ ?	*
^{164}Os	−20220	40				21 ms 1	0^+	17			α=96 4;β^+ ?	
^{164}Ir	−7480#	320#				1# ms	2$^-$#	17			p ?;α ?;β^+ ?	
^{164}Ir^m	−7220#	300#	260#	100#		70 μs 10	(9^+)	17	14Dr02	TD	p=96 2;α=4 2;β^+ ?	*
*^{164}Pm	T : symmetrized from 22Ki23=280(+38-33)											**
*^{164}Sm	T : average 22Ki23=1.422(+0.054-0.059) 17Wu04=1.43(0.24)											**
*^{164}Sm	D : %β^-n from 22Ki23<0.7											**
*^{164}Eu	T : average 21Wa04=3.9(0.3) 17Wu04=3.80(0.56) 08Os02=4.2(0.2)											**
*^{164}Gd^m	T : average 21Wa04=560(30) 18Ga18=605(30) 17Yo01=580(23); other: 17Pa25=530(100)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{164}$Ho	J : 70LiZY,69Ek01=1											**
$*^{164}$Ho^m	J : 70LiZY,69Ek01=6											**
$*^{164}$Tm	J : 71Ek01=1											**
$*^{164}$Tm^m	E : from 87Dr07<40 keV											**
$*^{164}$Tm^m	J : 71Ek01=1											**
$*^{164}$Lu	J : 98Ge13=1											**
$*^{164}$Re	T : symmetrized from 09Ha42=864(+150-110)											**
$*^{164}$Re	J : favored α decay to ^{160}Ta^m [J^π=(9$^+$)]											**
$*^{164}$Re^m	T : average 09Ha42=848(+140-105) 96Pa01=380(160) 81Ho10=880(240)											**
$*^{164}$Re^m	J : favored α decay to ^{160}Ta [J^π=(2$^-$)]											**
$*^{164}$Ir^m	T : from p(t) in 14Dr02; others: 14Dr02=69(+41-29) (α(t)) 02Ma61=58(+46-18) 01Ke05=110(+60-30)											**
^{165}Pm	−34670#	500#				300 ms 110	5/2$^-$#	22	22Ki23	TD	β^-=100;β^-n=13.3 62	*
^{165}Sm	−43510#	200#				590 ms 50	5/2$^-$#	22	22Ki23	TD	β^-=100;β^-n=1.4 4	*
^{165}Eu	−50729	5				2.25 s 0.12	5/2$^+$#	22	22Ki23	TD	β^-=100;β^-n=0.20 12	*
^{165}Gd	−56525.8	1.3				11.6 s 1.0	1/2$^-$#	22	17Wu04	T	β^-=100	*
^{165}Tb	−60588.9	1.5				2.11 m 0.10	(3/2$^+$)	22	83Gr02	TD	β^-=100	
^{165}Tb^m	−60382	5	207	5		0.81 μs 0.08	(7/2$^-$)	22	17Gu08	TD	EIT=100	
^{165}Dy	−63612.6	0.7				2.350 h 0.009	7/2$^+$*	22			β^-=100	*
^{165}Dy^m	−63504.4	0.7	108.1562	0.0013		1.258 m 0.006	1/2$^-$	22			IT=97.73 9;β^-=2.27 9	*
^{165}Ho	−64898.3	0.8				STABLE	7/2$^-$*	22			IS=100	*
^{165}Ho^m	−64536.6	0.8	361.675	0.011		1.512 μs 0.004	3/2$^+$	22	59Cr80	T	IT=100	
^{165}Ho^n	−64183.0	0.8	715.332	0.011		< 100 ns	7/2$^+$		58Ka10	T	IT=100	
^{165}Er	−64521.6	0.9				10.36 h 0.04	5/2$^-$*	22			ε=100	*
^{165}Er^m	−63971.0	0.9	550.6	0.1		250 ns 30	11/2$^-$	22	74An04	TJ	IT=100	
^{165}Er^n	−62698.6	0.9	1823.0	0.1		370 ns 40	(19/2)	22	12Sw01	EJT	IT=100	
^{165}Tm	−62930.2	1.6				30.06 h 0.03	1/2$^+$*	22	70Ka23	T	β^+=100	*
^{165}Tm^m	−62849.8	1.6	80.38	0.06		80 μs 3	7/2$^+$	22	67Co26	T	IT=100	
^{165}Tm^n	−62769.7	1.6	160.49	0.06		9.0 μs 0.5	7/2$^-$	22	68Ta05	T	IT=100	
^{165}Yb	−60295	27				9.8 m 0.3	5/2$^-$*	22			β^+=100	*
^{165}Yb^m	−60168	27	126.83	0.08		300 ns 30	9/2$^+$	22	80AdZO	T	IT=100	
^{165}Lu	−56442	27				10.74 m 0.10	1/2$^+$*	22			β^+=100	*
^{165}Hf	−51636	28				75.4 s 2.4	(5/2$^-$)	22			β^+=100	*
^{165}Ta	−45846	13			*&	31.0 s 1.5	(1/2$^+$,3/2$^+$)	22	FGK12a	J	β^+=100	*
^{165}Ta^m	−45831	16	14	16	AD*&	30# s	(9/2$^-$)	22	FGK12a	J	β^+ ?;α ?	*
^{165}W	−38862	26				5.1 s 0.5	5/2$^-$	22	75To05	T	β^+=100;α ?	*
^{165}Re	−30682	23				1.6 s 0.6	(1/2$^+$)	22	12Th13	TD	β^+=?;α=14 8	*
^{165}Re^m	−30625	12	56	22	AD	1.74 s 0.06	(11/2$^-$)	22	12Th13	TD	β^+=?;α=13 1	*
^{165}Os	−21690	50				71 ms 3	(7/2$^-$)	22	96Pa01	T	α=90 2;β^+=?	*
^{165}Ir	−11470	60				1.3 μs 0.8	1/2$^+$#	22	20Hi.B	ITD	p=100;α ?	*
^{165}Ir^m	−11210	40	260	40	p	327 μs 33	(11/2$^-$)	22	14Dr02	TD	p=88 2;α=12 2	*
^{165}Pt	−320#	400#				370 μs 180	7/2$^-$#	22	19Hi06	TD	α=100	*
$*^{165}$Pm	T : symmetrized from 22Ki23=297(+111-101)											**
$*^{165}$Sm	T : symmetrized 22Ki23=592(+51-55); other: 17Wu04=980(210)											**
$*^{165}$Eu	T : average 22Ki23=2.163(+0.139-0.120) 17Wu04=2.14(0.45) 08Os02=2.7(0.3)											**
$*^{165}$Eu	D : %β^-n from 22Ki23<0.4											**
$*^{165}$Gd	T : average 17Wu04=12.5(1.3) 98Ic02=9.3(2.3), 11.2(2.3)											**
$*^{165}$Dy	J : 61Ca07=7/2											**
$*^{165}$Dy	T : unweighted average 24Bh09=2.333(0.017) 89Ab05=2.334(0.005) 73Ha20=2.334(0.006) 63Pe11=2.317(0.008) 60Ha34=2.373(0.008) 60Wi10=2.33(0.08)											**
$*^{165}$Dy	T : 59Cr80=2.355(0.002) 58Gu09=2.369(0.010) 54Ma62=2.38(0.04) 52Sh42=2.3185(0.0023) 47Sl14=2.42(0.05) 46Bo25=2.333(0.025); Birge ratio=4.08											**
$*^{165}$Dy^m	T : average 64Ha19=1.257(0.006) 60Ho16=1.263(0.016); other: 60Wi10=1.3(0.2)											**
$*^{165}$Ho	J : 35Sc02,57Be39,58Ba35,55Ba04,58Hu17=7/2											**
$*^{165}$Er	J : 64Bu09=5/2											**
$*^{165}$Tm	J : 68Ek01,68Sc26=1/2											**
$*^{165}$Yb	J : 83Ne13,82Bu21=5/2											**
$*^{165}$Yb	T : average 72Ch23=9.8(0.8) 68Ta05=9.0(0.5) 67Ta04=10.5(0.5)											**
$*^{165}$Lu	J : 98Ge13,76Ek02,74Ek03=1/2											**
$*^{165}$Hf	T : average 89Hi04=76(4) 81LiZM=75(3); other: 81Br30=102(6)											**
$*^{165}$Ta	J : favored α decay from ^{169}Re^m [J^π=(1/2$^+$,3/2$^+$)]											**
$*^{165}$Ta^m	J : favored α decay from ^{169}Re [J^π=(9/2$^-$)]											**
$*^{165}$W	J : favored α decay from ^{169}Os (J^π=5/2$^-$)											**
$*^{165}$Re	T : other: 05Sc22=2.614(+0.142-0.128)											**
$*^{165}$Re	J : favored α decay from ^{169}Ir [J^π=(1/2$^+$)]											**
$*^{165}$Re^m	J : favored α decay from ^{169}Ir^m [J^π=(11/2$^-$)]											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{165}$Os	D : %α from 08Bi15=90(2)										**
$*^{165}$Ir	T : symmetrized from 20Hi.B=1.20(+0.82-0.74)										**
$*^{165}$Ir	DI : identification via p decay also reported in 19Uu01; 20Hi.B searched for α-decay events, but none were observed										**
$*^{165}$Ir^m	T : average 14Dr02=340(40) 97Da07=290(60),390(160)										**
$*^{165}$Pt	T : symmetrized from 19Hi06=260(+260$^-$-90)										**
^{166}Pm	−29500#	500#				240 ms 120	1^+#		22Ki23	TDI β^-=100;β^-n=26 15	*
^{166}Sm	−40340#	300#				390 ms 60	0^+	17	22Ki23	TD β^-=100;β^-n=4.3 13	*
^{166}Eu	−46750#	100#				1.25 s 0.09	0^-#	14	22Ki23	TD β^-=100;β^-n=0.63 17	*
^{166}Gd	−54370.9	1.6				5.1 s 0.8	0^+	15	17Wu04 T	β^-=100	*
^{166}Gd^m	−52769.4	1.9	1601.5	1.1		950 ns 60	(6$^-$)	15		IT=100	
^{166}Tb	−57808.8	1.5				27.1 s 1.5	(1$^-$)	08	17Wu04 T	β^-=100	*
^{166}Tb^m	−57649.8	2.1	159.0	1.5		3.5 μs 0.4	4$^-$#		17GuZW EJT	IT=100	
^{166}Dy	−62584.8	0.8				81.6 h 0.1	0^+	08		β^-=100	
^{166}Ho	−63070.6	0.8				26.812 h 0.007	0$^-$*	08	FGK204 T	β^-=100	*
^{166}Ho^m	−63064.6	0.8	5.969	0.012		1.1326 ky 0.0039	7$^-$	08	12Ne05 T	β^-=100	*
^{166}Ho^n	−62879.7	0.8	190.9021	0.0020		185 μs 15	3$^+$	08	65Bj03 T	IT=100	
^{166}Er	−64924.5	0.3				STABLE	0^+	08		IS=33.503 36	
^{166}Tm	−61887	12				7.70 h 0.03	2$^+$*	08		β^+=100	*
^{166}Tm^m	−61761	13	126	5		348 ms 21	(6$^-$)	08	96Dr07 TDJ	IT=100	*
^{166}Tm^n	−61639	13	248	5		2 μs 1	(6$^-$)	08	96Dr07 JDT	IT=100	*
^{166}Yb	−61594	7				56.7 h 0.1	0^+	08	70Ka23 T	ε=100	
^{166}Lu	−56021	30				2.65 m 0.10	6$^-$*	08	74De09 T	β^+=100	*
^{166}Lu^m	−55990	30	34.37	0.22		1.41 m 0.10	3$^-$*	08	74De09 TD	β^+=58 5;IT=42 5	*
^{166}Lu^n	−55980	30	43.0	0.4		2.12 m 0.10	0$^-$*	08	74De09 T	β^+=90 6;IT ?	*
^{166}Hf	−53859	28				6.57 m 0.26	0^+	08		β^+=100	*
^{166}Ta	−46098	28				34.4 s 0.5	(2$^+$)	08	82Li17 T	β^+=100	*
^{166}W	−41889	9				19.2 s 0.4	0^+	08		β^+=?;α=0.035 12	*
^{166}Re	−31780	80				2.28 s 0.18	6$^+$#	08		β^+=?;α=12 7	*
^{166}Re^m	−31500#	100#	280#	50#		3# s	2$^-$#			β^+ ?;α ?;IT ?	
^{166}Os	−25425	13				212 ms 4	0^+	08	14ThZZ TD	α=81 3;β^+=?	*
^{166}Ir	−13250	50				10.5 ms 2.2	(2)$^-$	08	97Da07 TD	α=93 3;p=7 3	*
^{166}Ir^m	−13080	50	171	6	p	15.1 ms 0.9	(9)$^+$	08	97Da07 TD	α=98.2 6;p=1.8 6	*
^{166}Pt	−4690#	300#				291 μs 63	0^+	08	19Hi06 T	α=100	*
$*^{166}$Pm	T : symmetrized from 22Ki23=228(+131-112)										**
$*^{166}$Pm	D : %β^-n from 22Ki23<52										**
$*^{166}$Sm	T : symmetrized 22Ki23=396(+56-63); other: 17Wu04=800(630)										**
$*^{166}$Sm	D : symmetrized 22Ki23=4.38(+1.25-1.38)										**
$*^{166}$Eu	T : average 22Ki23=1.277(+0.100-0.145) 17Wu04=1.27(+0.09-0.14); other: 08Os02=1.7(0.3)										**
$*^{166}$Gd	T : average 17Wu04=5.4(1.2) 05Ic02=00As.A=4.8(1.0)										**
$*^{166}$Tb	T : average 17Wu04=28.3(2.0) 05Ic02=00As.A=25.6(2.2)										**
$*^{166}$Ho	J : 61Ca07,61Ch06=0										**
$*^{166}$Ho^m	T : others: 65Fa01=1.20(0.18) 64Fa05=1.20(0.15)										**
$*^{166}$Tm	J : 72Ad14,61Wa04=2										**
$*^{166}$Tm^m	E : from 02Ca46=109.5 + x with x=16(5) keV (uncertainty estimated by NUBASE); other: 96Dr07=109.3 + x keV with x<25 keV, but the decay scheme is										**
$*^{166}$Tm^m	E : different than that of 02Ca46										**
$*^{166}$Tm^m	T : average 96Dr07=340(25) [34.4(t)], 370(40) [74.9(t)]										**
$*^{166}$Tm^n	E : 96Dr07=121.710 keV above ^{166}Tm^m										**
$*^{166}$Tm^n	T : other: 02Ca46=36(2) ns										**
$*^{166}$Lu	J : 98Ge13=6										**
$*^{166}$Lu^m	J : 98Ge13=3										**
$*^{166}$Lu^n	D : %β^+ from 74De09>80%										**
$*^{166}$Lu^n	J : 98Ge13=0										**
$*^{166}$Hf	T : average 94De06=6.77(0.30) 69Ar23=6.0(0.5)										**
$*^{166}$Ta	T : other: 77Le08=32(3)										**
$*^{166}$W	T : average 92HeZV=22.0(1.0) 89Hi04=18.8(0.4),19.6(1.2) 75To05=16(3)										**
$*^{166}$Re	T : average 92Me10=2.3(0.2) 78Sc26=2.2(0.4); other: 84Sc06=2.8(0.3), different α-decay energy										**
$*^{166}$Re	D : β^+ and α decays were observed; %α from ENSDF2008<24										**
$*^{166}$Os	D : %α average 14ThZZ=75(6) 08Bi15=84(4) 81Ho10=72(13)										**
$*^{166}$Os	T : average 14ThZZ=207(9) 15Li24=210(6) 96Pa01=220(7) 91Se01=194(17); others: 81Ho10=181(38) 78Ca11=300(100)										**
$*^{166}$Ir	T : others: 04Ke06=17(+12-5) 96Pa01=12(1), probably a gs+m mixture										**
$*^{166}$Ir^m	T : other: 04Ke06=14.3(+1.9-1.5)										**
$*^{166}$Pt	T : average 19Hi06=260(+100-60) 96Bi07=300(100)										**
^{167}Sm	−35420#	400#				337 ms 81	7/2$^-$#	23	22Ki23 TD	β^-=100;β^-n=8 5	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{167}Eu	−43770#	200#				866 ms 65	5/2$^+$#	23	22Ki23	TD β^-=100;β^-n=1.95 38	*
^{167}Gd	−50776	5				4.17 s 0.25	5/2$^-$#	23	22Ki23	TD β^-=100;β^-n=6 4	*
^{167}Tb	−55883.4	1.8				18.9 s 1.6	3/2$^+$#	23	17Wu04	T β^-=100	*
^{167}Tb^m	−55684.0	2.1	199.4	1.1		2.18 μs 0.09	7/2$^-$#	23	17Gu08	TEDIT=100	*
^{167}Dy	−59914.6	3.0				6.20 m 0.08	(1/2$^-$)	23	77Tu01	T β^-=100	
^{167}Ho	−62279	5				2.98 h 0.04	7/2$^-$	23	02Ka45	T β^-=100	*
^{167}Ho^m	−62020	5	259.34	0.11		6.0 μs 1.0	3/2$^+$	23	77Tu01	T IT=100	
^{167}Er	−63289.57	0.27				STABLE	7/2$^+$*	23		IS=22.869 9	*
^{167}Er^m	−63081.77	0.27	207.801	0.005		2.269 s 0.006	1/2$^-$	23	86Ne05	T IT=100	
^{167}Tm	−62543.2	1.3				9.248 d 0.010	1/2$^+$*	23	24Do04	T ε=100	*
^{167}Tm^m	−62363.7	1.3	179.501	0.024		1.16 μs 0.06	7/2$^+$	23	64Lo04	T IT=100	
^{167}Tm^n	−62250.4	1.3	292.844	0.024		0.9 μs 0.1	7/2$^-$	23	65Ta01	T IT=100	
^{167}Yb	−60590	4				17.5 m 0.2	5/2$^-$*	23		β^+=100	*
^{167}Yb^m	−60018	4	571.511	0.019		∼ 180 ns	11/2$^-$	23	76Gr06	T IT=100	*
^{167}Lu	−57518	30				51.46 m 0.11	7/2$^+$*	23	22Ma25	T β^+=100	*
^{167}Lu^m	−57480	30	33.7	0.4		> 1 m	1/2$^+$*	23	98Ge13	TJ IT ?;β^+ ?	
^{167}Hf	−53468	28				2.05 m 0.05	(5/2$^-$)	23		β^+=100	
^{167}Ta	−48351	28				1.33 m 0.07	(3/2$^+$)	23	92HeZV	T β^+=100	
^{167}W	−42225	16				19.9 s 0.5	(5/2$^-$)	23	89Me02	TD β^+=99.96 1;α=0.04 1	
^{167}W^m	−42098	16	127.2	1.7	IT	8# s	(13/2$^+$)		92Th06	I IT ?;β^+ ?	*
^{167}Re	−34800#	40#			&	3.4 s 0.4	(9/2$^-$)	23	92Me10	T β^+≈100;α ?	*
^{167}Re^m	−34700	40	94#	21#	AD &	5.9 s 0.3	1/2$^+$	23		α=?;β^+ ?	*
^{167}Os	−26480	80				839 ms 5	7/2$^-$	23	10Sc02	TJD α=51 4;β^+ ?	*
^{167}Os^m	−26050	80	434.7	0.8		700 ns 10	13/2$^+$	23	10Sc02	EJD IT=100	*
^{167}Ir	−17066	14				29.6 ms 0.6	1/2$^+$	23	05Sc22	TD α=43.5 19;p=38.6 12;β^+ ?	*
^{167}Ir^m	−16891	14	175.4	2.1	p	28.5 ms 0.5	11/2$^-$	23	05Sc22	TD α=89 3;β^+ ?;p=0.41 6	*
^{167}Pt	−6750#	310#				915 μs 123	7/2$^-$#	23	19Hi06	T α=100	*
*^{167}Sm	T : symmetrized 22Ki23=334(+83-78)										**
*^{167}Sm	D : %β^-n from 22Ki23<16										**
*^{167}Eu	T : symmetrized 22Ki23=852(+76-54); other: 17Wu04=1330(510)										**
*^{167}Gd	T : symmetrized 17Wu04=4.26(+0.18-0.32); other: 22Ki23=2.269(+1.817-0.988)										**
*^{167}Gd	D : %β^-n from 22Ki23<12										**
*^{167}Tb	T : average 17Wu04=18.6(2.0) 99As03=19.4(2.7)										**
*^{167}Tb^m	T : average 17Gu08=2.1(0.1) 14YoZZ=2.45(0.18)										**
*^{167}Tb^m	E : from 14YoZZ using 52(1) keV and 147.5(0.5) keV γs in a cascade										**
*^{167}Ho	T : 02Ka45=3.003(0.018) is average of 8 discrepant values with Birge ratio=10.3. Using the lowest and highest values [2.917-3.038] and uniform										**
*^{167}Ho	T : probability distribution a value of 2.98(0.04) is recommended by NUBASE; other: 60Wi10=3.1(0.1)										**
*^{167}Er	J : 62Sp03,58Hu17,51Bl09=7/2										**
*^{167}Tm	T : average 24Do04=9.250(0.015) 70Ka23=9.25(0.02) 68Ne02=9.24(0.02) 62Bo12=9.25(0.10) 61Bj02=9.3(0.1); Others: 63Ra15=9.6(0.2) 60Na14=9.58(0.05)										**
*^{167}Tm	T : 60Bu27=9.6 55Ne01=9.6 54Mi01=9.6 54Ha16=9.4 49Wi03=9.6(0.1) 48Wi02=9										**
*^{167}Tm	J : 61Wa04=1/2										**
*^{167}Yb	J : 82Bu21,83Ne13=5/2										**
*^{167}Yb^m	J : M1 γ transition to 9/2$^-$ and E1 γ transition to 13/2$^+$										**
*^{167}Lu	T : average 22Ma25=51.66(0.28),51.18(0.43),51.19(0.24),51.54(0.15). others: 76Me06=51.5(1.0) 72Ek01=53 60Ba32,60Ba30=55(5) 60Bo29=55										**
*^{167}Lu	T : 60Bu27,59Ha09=54 58Ar59=55(3)										**
*^{167}Lu	J : 98Ge13,72Ek01=7/2										**
*^{167}W^m	J : favored α decay from ^{171}Os^m [J$^\pi$=(13/2$^+$)]										**
*^{167}W^m	T : from B(E3)=0.027(0.005) W.u. (for a similar 13/2$^+$→7/2$^-$ decay in ^{171}Os) to 7/2$^-$ at 79.2 keV and by assuming %IT=100										**
*^{167}Re	J : favored α decay from ^{171}Ir^m [J$^\pi$=(11/2$^-$)] to J$^\pi$=(11/2$^-$) level at 92 keV in ^{167}Re, following by 92-keV M1 γ M1 to ^{167}Re^m; deformed										**
*^{167}Re	J : π9/2$^-$[514] orbital										**
*^{167}Re^m	J : favored α decay from ^{171}Ir (J$^\pi$=1/2$^+$)										**
*^{167}Os	D : %α average 10Sc02=51(5) 96Pa01=49(7) 81Ho10=58(12)										**
*^{167}Os	T : others: 96Pa01=840(70) 82En03=800(200) 77Ca23=650(150)										**
*^{167}Os	J : favored α decay to ^{163}W (J$^\pi$=7/2$^-$)										**
*^{167}Os^m	J : M2 to 9/2$^-$ followed by M1 to 7/2$^-$ in 10Sc02										**
*^{167}Ir	T : average 05Sc22=29.3(0.6) [p(t)], 30.9(1.3) [α(t)]; others: 97Da07=34.3(2.2) [p(t)], 39.7(4.9) [α(t)]										**
*^{167}Ir	D : %p average 05Sc22=39.3(1.3) 97Da07=32(4); %α average 05Sc22=43(2) 97Da07=48(6)										**
*^{167}Ir^m	T : average 04Ke06=25.7(0.8) 05Sc22=28.7(3.3) (α(t)) and 28.8(1.3) (p(t)) 97Da07=30.0(0.6)										**
*^{167}Ir^m	D : %p average 05Sc22=0.42(0.08) 97Da07=0.4(0.1); %α average 05Sc22=90(3) 97Da07=80(10)										**
*^{167}Pt	T : average 19Hi06=1100(200) 04Ke06=900(+300-200) 96Bi07=700(200)										**
^{168}Sm	−31810#	400#				380 ms 190	0$^+$	21	22Ki23	TD β^-=100;β^-n=11 6	*
^{168}Eu	−39320#	300#				440 ms 50	6$^-$#	17	22Ki23	TD β^-=100;β^-n=4.0 8	*
^{168}Gd	−48171	6				3.03 s 0.15	0$^+$	17	22Ki23	TD β^-=100;β^-n=0.40 23	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{168}Tb	−52747	5				9.4 s 0.4	(4^-)	10	17Wu04	T	β^-=100	
^{168}Tb^m	−52536	5	211	1		0.71 μs 0.03	(6^+)		17Gu24	ETJ	IT=100	
^{168}Dy	−58485.5	2.9				8.7 m 0.3	0^+	10			β^-=100	
^{168}Dy^m	−57107.3	3.0	1378.2	0.6		0.57 μs 0.07	(4^-)		19Zh49	ETJ	IT=100	
^{168}Ho	−60013.0	2.4				2.99 m 0.07	3^+	10			β^-=100	
^{168}Ho^m	−59954.0	2.4	59.0	1.0		132 s 4	(6^+)	10	90Ch37	ETJ	IT≈100;β^- ?	
^{168}Ho^n	−59869.6	2.4	143.43	0.17		> 4 μs	$(1)^-$	10			IT=100	
^{168}Ho^p	−59820.4	2.4	192.57	0.20		108 ns 11	1^+	10			IT=100	
^{168}Er	−62989.55	0.25				STABLE	0^+	10			IS=26.978 18	
^{168}Er^m	−61895.51	0.25	1094.0383	0.0016		109.1 ns 0.6	4^-	10	23Kn03	T	IT=100	*
^{168}Tm	−61312.5	1.7				93.22 d 0.08	3^+*	10	24Do04	T	β^+=99.990 7;β^-=0.010 7	*
^{168}Yb	−61580.198	0.026				STABLE >130Ty	0^+	10	56Po16	T	IS=0.126 1;α ?;2β^+ ?	*
^{168}Lu	−57050	40				5.5 m 0.1	6^-*	10			β^+=100	*
^{168}Lu^m	−56908	6	140	40		6.7 m 0.4	3^+*	10	99Ba65	E	β^+≈100;IT ?	*
^{168}Hf	−55361	28				25.95 m 0.20	0^+	10			β^+=100;ε≈98;e$^+$≈2	
^{168}Ta	−48394	28				2.0 m 0.1	(3^+)	10	FGK208	J	β^+=100	*
^{168}W	−44894	13				50.9 s 1.9	0^+	10			β^+=99.9968 10;α=0.0032 10	
^{168}Re	−35660#	100#				4.4 s 0.1	6^-#	10			β^+≈99.995;α≈0.005	
^{168}Re^m	−35450#	100#	213	11		6# s	3^-#		92Me10	I	β^+ ?;IT ?	
^{168}Os	−29993	10				2.13 s 0.04	0^+	10	14ThZZ	TD	β^+=?;α=44.8 16	*
^{168}Ir	−18520	70			*	230 ms 50	(2^-)	10			α≈100;β^+ ?;β^+p ?	*
^{168}Ir^m	−18520	60	−0	50	AD*	163 ms 16	(9^+)	10	09Ha42	TD	α=78 9;β^+ ?;β^+p ?	*
^{168}Pt	−10810	40				2.02 ms 0.10	0^+	10			α≈100;β^+ ?	
^{168}Au	2530#	400#				5# μs					p ?	
*^{168}Sm	T : symmetrized 22Ki23=353(+210-164)											**
*^{168}Sm	D : %β^-n from 22Ki23<21											**
*^{168}Eu	T : symmetrized 22Ki23=440(+48-47); other: 17Wu04=200(100)											**
*^{168}Gd	T : average 22Ki23=2.947(+0.467-0.387) 17Wu04=3.03(0.16)											**
*^{168}Gd	D : %β^-n from 22Ki23<0.8											**
*^{168}Gd	I : first observed by 85Si25 in fission of ^{252}Cf											**
*^{168}Tb	T : average 17Wu04=9.49(0.39) 99As03=8.2(1.3)											**
*^{168}Er^m	T : average 23Kn03=109.2(1.8) 81Iw04=108.9(0.7) 73Ki09=107.3(2.2) 67Gu04=115.7(3.3) 66Ju02=107(10) 59Ko64=110(15) 57Mi01=120(20)											**
*^{168}Tm	T : average 24Do04=93.41(0.12) 17So26=90.7(2.0) 68Ne02=93.1(0.1) 62Bo12=93.0(0.5); others: 63Fu12=85(10) 63Ra15=86(3) 61Bj02=95(10) 49Wi03=85(2)											**
*^{168}Tm	J : 71Ek01=3											**
*^{168}Yb	T : the lower limit is for α decay; 2β^+: 19Be27>0.1 Py to 1 Ey; 0ν-$\beta\beta$: 19Be27>1.9 Ey											**
*^{168}Yb	D : from IS=0.126(0.001) in 24Ci.A											**
*^{168}Lu	J : 98Ge13,74Ek03=6											**
*^{168}Lu^m	E : from 19Hu15=160(40); others (tentative): 72Ch44=220(130) 97Ba26=202.81(0.12) 99Ba65=202.5(0.4)											**
*^{168}Ta	T : other: 02At01=5.2(0.7) for q=73$^+$ (bare ion)											**
*^{168}Ta	J : direct β^+ feeding to 4$^+$ states in ^{168}Hf and the expected conf=π1/2[541]⊗ν5/2[523], $K^\pi = 3^+$											**
*^{168}Os	T : average 14ThZZ=2.15(0.05) 04GoZZ=2.6(0.2) 96Pa01=2.1(0.1) 95Hi02=2.1(0.6) 84Sc06=2.0(0.2), supersedes 78Sc26=2.4(0.2), 82En03=2.2(0.1)											**
*^{168}Os	T : 78Ca11=1.9(0.1) 77Ca23=2.0(0.4)											**
*^{168}Os	D : average 14ThZZ=45.1(2.4) 96Pa01=40(3) 82En03=49(3); other: 04GoZZ=36(4)											**
*^{168}Ir	T : symmetrized from 09Ha42=222(+60-40)											**
*^{168}Ir	J : favored α decay to ^{164}Re^m [J$^\pi$=(2$^-$)] and the expected conf=π3/2[402]⊗ν7/2[503],$K^\pi = 2^-$											**
*^{168}Ir^m	T : average 09Ha42=160(+30-20) and 153(+40-30) 96Pa01=161(21)											**
*^{168}Ir^m	J : favored α decay to the J$^\pi$=(9$^+$) level in ^{164}Re and the expected conf=π11/2[505]⊗ν7/2[503]											**
*^{168}Ir^m	D : average 09Ha42=75(11) 096Pa01=82(14)											**
^{169}Eu	−35910#	400#				390 ms 90	$5/2^+$#	25	22Ki23	TD	β^-=100;β^-n=15 5	*
^{169}Gd	−43890#	200#				889 ms 90	$7/2^-$#	25	22Ki23	TD	β^-=100;β^-n=0.35 20	*
^{169}Tb	−50368	9				5.13 s 0.32	$3/2^+$#	25	17Wu04	TD	β^-=100;β^-n ?	
^{169}Dy	−55516.8	1.5				39 s 8	$(5/2)^-$	25	90Ch34	T	β^-=100	*
^{169}Dy^m	−55350.7	1.6	166.1	0.5		1.26 μs 0.17	$(1/2^-)$	25	19Zh49	ETJ	IT=100	
^{169}Ho	−58789	4				4.72 m 0.08	$7/2^-$	25			β^-=100	*
^{169}Ho^m	−57403	4	1386.2	0.4		118 μs 6	$(19/2^+)$	25	10Dr05	ETJ	IT=100	
^{169}Er	−60921.48	0.29				9.392 d 0.018	$1/2^-$*	25			β^-=100	*
^{169}Er^m	−60829.5	0.3	92.01	0.09		285 ns 20	$5/2^-$	25			IT=100	
^{169}Er^n	−60677.8	0.3	243.66	0.16		200 ns 10	$7/2^+$	25			IT=100	
^{169}Tm	−61274.7	0.7				STABLE	$1/2^+$*	25			IS=100	*
^{169}Tm^m	−60958.6	0.7	316.1463	0.0001		659.4 ns 2.3	$7/2^+$	25			IT=100	*
^{169}Yb	−60375.86	0.15				32.013 d 0.009	$7/2^+$*	25	FGK259	T	ε=100	*
^{169}Yb^m	−60351.66	0.15	24.2003	0.0016		46 s 2	$1/2^-$*	25	60Ho10	T	IT=100	*
^{169}Lu	−58083	3				34.06 h 0.05	$7/2^+$*	25	70Ka23	T	β^+=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{169}Lu^m	−58054	3	29.0	0.5		160 s 10	$1/2^-$*	25	65Bj01	T	IT=100	*
^{169}Hf	−54717	28				3.24 m 0.05	$5/2^-$	25			β^+=100	
^{169}Hf^m	−54688	28	28.80	0.04		100 ns 30	$7/2^+$	25	75Re05	T	IT=100	*
^{169}Ta	−50290	28				4.9 m 0.3	$5/2^+$#	25	98Zh03	J	β^+=100	*
^{169}W	−44921	15				75 s 6	$5/2^-$#	25			β^+=100	
^{169}Re	−38417	10				8.3 s 0.3	$(9/2^-)$	25	92Me10	DT	β^+=?;α=0.005 3	*
^{169}Re^m	−38232	13	185	11	AD	16.3 s 0.8	$1/2^+$	25	92Me10	TD	β^+ ?;α=?;IT ?	*
^{169}Os	−30723	26				3.39 s 0.09	$5/2^-$	25	96Pa01	T	β^+ ?;α=13.7 8	*
^{169}Os^m	−30531	26	192.0	1.4		17.3 μs 1.2	$(13/2^+)$	25	14ThZZ	TJE	IT=100	
^{169}Ir	−22094	23				353 ms 4	$(1/2^+)$	25	12Th13	D	α=53 7;β^+ ?	*
^{169}Ir^m	−21933	12	161	22	AD	280 ms 1	$(11/2^-)$	25	12Th13	TD	α=79 5;β^+ ?;p ?	*
^{169}Pt	−12410	50				6.99 ms 0.09	$(7/2^-)$	25	09Go16	T	$\alpha\approx$100;β^+ ?	*
^{169}Au	−1640#	300#				1# μs	$1/2^+$#				p ?;α ?	*
^{169}Au^m	−1320	50	320#	300#		1.2 μs 0.5	$11/2^-$#		20Hi.B	DT	p$\approx$94;$\alpha\approx$6	*
*^{169}Eu	T : symmetrized from 22Ki23=389(+92-88)											**
*^{169}Eu	D : symmetrized from 22Ki23=14.62(+5.82-5.09)											**
*^{169}Gd	T : average 22Ki23=926(+95-102) 17Wu04=750(210)											**
*^{169}Gd	D : %β^-n from 22Ki23<0.7											**
*^{169}Dy	T : other: 17Wu04=78(37)											**
*^{169}Ho	T : average 78Ka16=4.7(0.2) 66Fu09=4.4(0.2) 63Mi17=4.8(0.1)											**
*^{169}Er	T : average 04Sc04=9.36(0.04) 77My02=9.40(0.02)											**
*^{169}Er	J : 61Ca07=1/2											**
*^{169}Tm	J : 63Lo07,61Ha37,57Be39,55Li49,34Sc03=1/2											**
*^{169}Tm^m	T : average 94De01=660(5) 74En09=665(5) 72Mo23=640(14) 50Fu63=658(3)											**
*^{169}Yb	J : 74Ch38=7/2											**
*^{169}Yb^m	J : 83Ne13=1/2											**
*^{169}Lu	J : 98Ge13,68Ek01=7/2											**
*^{169}Lu^m	J : 98Ge13=1/2											**
*^{169}Hf^m	T : symmetrized from 75Re05=82(+40-15)											**
*^{169}Ta	T : average 75Gr44=5.0(0.5) 75Re05=4.7(0.7) 69Ar22=5.0(0.5)											**
*^{169}Re	D : %α from 92Me10=0.001 - 0.01											**
*^{169}Re	J : favored α decay from ^{173}Ir^m [J^π=11/2$^-$] to (11/2$^-$) level at 136.2 keV in ^{169}Re and subsequent 136.2 M1 to gs; $\pi 9/2^-[514]$ configuration											**
*^{169}Re	J : (deformed shape)											**
*^{169}Re^m	J : favored α decay from ^{173}Ir (J^π=1/2$^+$)											**
*^{169}Re^m	T : other: 84Sc06=12.9(1.1)											**
*^{169}Os	T : average 96Pa01=3.6(0.2) 95Hi02=3.2(0.3) 84Sc06=3.5(0.2) 82En03=3.4(0.2) 78Sc26=3.2(0.2) 72To19=3.0(0.5); other: 04GoZZ=4.1(0.4)											**
*^{169}Os	J : favored α decay from ^{173}Pt (J^π=7/2$^-$) to the 35-keV level in ^{169}Os, followed by 35.0(0.2) keV M1 to gs											**
*^{169}Ir	T : from 05Sc22=353(4); others: 12Th13=570(30) 99Po09=638(+462-237)											**
*^{169}Ir	D : %α average of 12Th13=57(9) 05Sc22=42(15) 99Po09=50(18)											**
*^{169}Ir^m	D : %α average 12Th13=78(6) 99Po09=84(8) 96Pa01=72(13); other: 05Sc22=59(4), discrepant (not used)											**
*^{169}Ir^m	T : average 12Th13=280(1) 05Sc22,07Sa33=280(3);others: 99Po09=323(+90-66) 96Pa01=308(22) 78Ca11=400(100) 78Sc26=400(200)											**
*^{169}Pt	T : average 09Go16=6.99(0.10) 04Ke06=7.0(0.2); others: 96Pa01=5(3) 81Ho10=2.5(+2.5-1.0)											**
*^{169}Au^m	T : symmetrized from 20Hi.B=1.16(+0.50-0.47)											**
*^{169}Au^m	D : %p and %α from the observed 15 proton and 1 α events in 20Hi.B											**
*^{169}Au^m	I : identification also reported in 19Uu01											**
^{170}Eu	−31020#	400#				200 ms 70	2^+#		22Ki23	TDI	β^-=100;β^-n=12 7	*
^{170}Gd	−40850#	300#				616 ms 68	0^+	18	22Ki23	TD	β^-=100;β^-n=1.5 9	*
^{170}Tb	−46710#	200#				956 ms 70	2^-#	22	17Wu04	TD	β^-=100;β^-n ?	*
^{170}Dy	−53715	7				54.9 s 8.0	0^+	18	17Wu04	TD	β^-=100	
^{170}Dy^m	−52071	7	1643.8	0.3		0.99 μs 0.04	(6^+)	18			IT=100	
^{170}Ho	−56264	8				2.76 m 0.05	(6^+)	18			β^-=100	
^{170}Ho^m	−56113	9	151	5	MD	43 s 2	(1^+)	18			β^-=100	
^{170}Er	−60106.8	1.1				STABLE >410Py	0^+	18	18Be25	T	IS=14.910 36;2β^- ?;α ?	
^{170}Tm	−59795.4	0.7				127.9 d 0.8	1^-*	18	69La34	T	β^-=99.869 10;ε=0.131 10	*
^{170}Tm^m	−59612.2	0.7	183.197	0.004		4.12 μs 0.13	3^+	18	96Ho12	J	IT=100	
^{170}Yb	−60763.932	0.010				STABLE	0^+	18			IS=3.023 2	*
^{170}Yb^m	−59505.47	0.14	1258.46	0.14		370 ns 15	4^-	18			IT=100	
^{170}Lu	−57306	17				2.012 d 0.030	0^+*	18			β^+=100	*
^{170}Lu^m	−57213	17	92.91	0.09		670 ms 100	4^-	18			IT=100	*
^{170}Hf	−56254	28				16.01 h 0.13	0^+	18			ε=100	
^{170}Ta	−50138	28				6.76 m 0.06	(3^+)	18			β^+=100	
^{170}W	−47290	13				2.42 m 0.04	0^+	18			β^+=100	
^{170}Re	−38903	11			&	8.97 s 0.20	6^-#	18	92Me10	TD	β^+=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{170}Re^m	−38828	12	75	16	AD &	< 8# s	2$^+$#		20Cu04	E	β^+=?;IT ?	*
^{170}Re^n	−38693	11	210.1	0.1		130 ns 10	7$^+$#		19Mo.B	ET	IT=100	*
^{170}Os	−33927	10				7.37 s 0.18	0$^+$	18			β^+=?;α=9.5 10	
^{170}Ir	−23080	80			*	820 ms 14	8$^+$#	18	07Ha45	TD	β^+=?;α=38 5	*
^{170}Ir^m	−23120#	100#	−40#	50#	*	910 ms 150	2$^-$#	18	02Ro17	TD	β^+=?;α=5.2 17	*
^{170}Pt	−16293	14				13.96 ms 0.13	0$^+$	18	14ThZZ	T	$\alpha\approx$100;β^+ ?	*
^{170}Au	−3650	50				290 μs 50	(2)$^-$	18	04Ke06	TD	p=89 10;α=11 10	*
^{170}Au^m	−3370	50	280	13	p	620 μs 50	(9)$^+$	18	04Ke06	TD	p=58 5;α=42 5	*
^{170}Hg	5510#	300#				310 μs 250	0$^+$	21	19Hi06	T	α=100	*
*^{170}Eu	T : symmetrized 22Ki23=197(+74-71)											**
*^{170}Eu	D : %β^-n from 22Ki23<24											**
*^{170}Gd	T : average 22Ki23=675(+94-75) 17Wu04=410(+140-120)											**
*^{170}Gd	D : %β^-n from 22Ki23<3											**
*^{170}Tb	T : average 17Wu04=960(78) 16So13=910(+180-130)											**
*^{170}Tm	T : average of 68Re04=128.6(0.3) and 69La34=127.1(0.3), unc=0.9 d reported in 69La34 is 3σ; Birge ratio=3.5											**
*^{170}Yb	D : from IS=3.023(0.002) in 24Ci.A											**
*^{170}Lu	J : 98Ge13,68Ek01=0											**
*^{170}Lu^m	J : M2 γ to 2$^+$											**
*^{170}Re	T : average 92Me10=9.25(0.27),8.97(0.35) 75St02=8.0(0.5)											**
*^{170}Re^m	I : introduced in 20Cu04 from Q-value differences between the low-spin gs and high-spin isomer in α decay of ^{174}Ir using the 19Mo.B decay scheme											**
*^{170}Re^n	J : favored α decay from ^{174}Ir^m (J$^\pi$=7$^+$#)											**
*^{170}Ir	T : average 07Ha45=802(+30-28),826(+30-28),830(+58-53),801(+63-57) 96Pa01=830(30) 04GoZZ=818(31)											**
*^{170}Ir	D : average 04GoZZ=39(6) 96Pa01=36(10)											**
*^{170}Ir^m	T : symmetrized from 02Ro17=870(+180-120)											**
*^{170}Pt	T : average 14ThZZ=14.02(0.24) 04Ke06=14.0(0.2) 98Ki20=13.5(0.3) 96Bi07=14.7(0.5)											**
*^{170}Au	T : symmetrized from 04Ke06=286(+50-40)											**
*^{170}Au	J : favored α decay to ^{166}Re [J$^\pi$=(2)$^-$]											**
*^{170}Au^m	T : symmetrized from 04Ke06=617(+50-40); other: 02Ma61=570(+310-150)											**
*^{170}Au^m	D : %p other: 02Ma61=75(15)											**
*^{170}Au^m	J : favored α decay to ^{166}Re^m [J$^\pi$=(9)$^+$]											**
*^{170}Hg	T : symmetrized from 19Hi06=80(+400$^-$-40)											**
^{171}Gd	−36210#	400#				400 ms 140	9/2$^+$#	21	22Ki23	TD	β^-=100;β^-n=5 3	*
^{171}Tb	−43770#	300#				1.23 s 0.10	3/2$^+$#	18	17Wu04	TD	β^-=100;β^-n ?	*
^{171}Dy	−50174	11				4.07 s 0.40	7/2$^-$#	18	17Wu04	TD	β^-=100	
^{171}Ho	−54609	7				53 s 2	7/2$^-$#	18			β^-=100	
^{171}Er	−57717.1	1.1				7.516 h 0.002	5/2$^-$*	18			β^-=100	
^{171}Er^m	−57518.5	1.1	198.61	0.09		210 ns 10	1/2$^-$	18			IT=100	
^{171}Tm	−59209.4	0.4				700.8 d 4.1	1/2$^+$*	18	22Ka08	T	β^-=100	*
^{171}Tm^m	−58784.4	0.4	424.9557	0.0015		2.60 μs 0.02	7/2$^-$	18			IT=100	
^{171}Tm^n	−57535.0	0.4	1674.43	0.13		1.7 μs 0.2	19/2$^+$	18			IT=100	
^{171}Yb	−59306.821	0.013				STABLE	1/2$^-$*	18			IS=14.216 7	*
^{171}Yb^m	−59211.539	0.013	95.282	0.002		5.25 ms 0.24	7/2$^+$	18			IT=100	
^{171}Yb^n	−59184.405	0.013	122.416	0.002		265 ns 20	5/2$^-$	18			IT=100	
^{171}Lu	−57828.8	1.7				8.247 d 0.023	7/2$^+$*	18			β^+=100	*
^{171}Lu^m	−57757.7	1.7	71.13	0.08		79 s 2	1/2$^-$*	18			IT=100	*
^{171}Hf	−55431	29				12.1 h 0.4	7/2$^+$*	18			β^+=100	*
^{171}Hf^m	−55409	29	21.93	0.09		29.5 s 0.9	1/2$^-$*	18			IT$\approx$100;β^+ ?	
^{171}Ta	−51720	28				23.3 m 0.3	(5/2$^+$)	18			β^+=100	*
^{171}W	−47086	28				2.38 m 0.04	(5/2$^-$)	18			β^+=100	
^{171}Re	−41250	28				15.2 s 0.4	(9/2$^-$)	18			β^+=100	
^{171}Os	−34428	16				8.24 s 0.18	(5/2$^-$)	18	23Zh03	TD	β^+=?;α=1.81 14	*
^{171}Os^m	−34241	16	186.32	0.13		790 ms 16	(13/2$^+$)		23Zh03	TD	β^+ ?;IT=36 6;α=0.21 5	*
^{171}Ir	−26410	40				3.1 s 0.3	1/2$^+$	18	11Ko.B	TJ	α=15 2;β^+ ?	*
^{171}Ir^m	−26210#	40#	199#	21#		1.33 s 0.03	(11/2$^-$)	18	23Zh03	TD	α=54 5;β^+ ?	*
^{171}Pt	−17450	80				45.5 ms 2.5	7/2$^-$	18	10Sc02	JD	α=86 3;β^+ ?	*
^{171}Pt^m	−17040	80	412.6	1.0		901 ns 9	13/2$^+$	18	FGK128	J	IT=100	*
^{171}Au	−7556	17				22.3 μs 2.4	1/2$^+$	18	04Ke06	TJ	p$\approx$100;α ?	*
^{171}Au^m	−7301	14	255	10	p	1.036 ms 0.016	11/2$^-$	18	04Ke06	TDJ	α=?;p=40 3	*
^{171}Hg	3340#	310#				70 μs 30	3/2$^-$#	18	04Ke06	TD	$\alpha\approx$100;β^+ ?	*
*^{171}Gd	T : symmetrized from 22Ki23=392(+145-136)											**
*^{171}Gd	D : %β^-n from 22Ki23<10											**
*^{171}Tb	T : symmetrized from 17Wu04=1.24(+0.09-0.10)											**
*^{171}Tm	T : average 22Ka08=702.4(7.0) 65Fl02=700(5)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{171}$Yb	J : 60Lo01,56Co21,38Sc10=1/2											**
$*^{171}$Yb	D : from IS=14.216(0.007) in 24Ci.A											**
$*^{171}$Lu	J : 98Ge13,68Ek01=7/2											**
$*^{171}$Lu^m	J : 98Ge13=1/2											**
$*^{171}$Hf	J : 00Ye02=7/2											**
$*^{171}$Hf^m	J : 00Ye02=1/2											**
$*^{171}$Ta	T : other: ENSDF2018 assign this lifetime to a $J^\pi=(5/2^-)$ excited state at 31.2 keV above the gs [$J^\pi=(5/2^+)$]											**
$*^{171}$Os	T : average 23Zh03=8.0(0.4), 95Hi02=8.3(0.2)											**
$*^{171}$Os	D : average sum 23Zh03=1.68(0.18),0.096(0.014),0.037(0.011) to gs. and ∼ excited state, 95Hi02=1.9(0.3), 79Ha10=1.7(0.3)											**
$*^{171}$Os^m	D : %IT: probable 109.6 keV E3 γ to the $(7/2^-)$ level at 76.7 keV											**
$*^{171}$Ir	T : other: 02Ro17=3.2(+1.3-0.7)											**
$*^{171}$Ir	D : %α from 13An10=15(2)											**
$*^{171}$Ir	J : favored α decay from ^{175}Au ($J^\pi=1/2^+$)											**
$*^{171}$Ir^m	D : %α average 10An01=53(5) 96Pa01=58(11); other: 23Zh03=9(1) to the gs.											**
$*^{171}$Ir^m	T : average 23Zh03=1.28(0.04) 11Ko.B=1.50(0.07) 02Ro17=1.15(+0.13-0.11) 10An01=1.40(0.10)											**
$*^{171}$Pt	D : %α average 10Sc02=83(3) 04GoZZ=96(5)											**
$*^{171}$Pt^m	J : M2 γ to $9/2^-$ followed by M1 γ to $7/2^-$ gs											**
$*^{171}$Au	T : average 04Ke06=22(+3-2) 99Po09=17(+9-5) other: 03Ba20=37(+7-5), conflicting (not used)											**
$*^{171}$Au^m	T : average 04Ke06=1.09(0.03) 03Ba20=1.014(0.019)											**
$*^{171}$Au^m	D : %p average 04Ke06=34(4) 97Da07=46(4)											**
$*^{171}$Hg	T : symmetrized from 04Ke06=59(+36-16)											**
^{172}Gd	−32890#	400#				170 ms 110	0^+	21	22Ki23	TD	β^-=100;β^-n=25 14	*
^{172}Tb	−39690#	400#				760 ms 190	6^+#	17	17Wu04	TD	β^-=100;β^-n ?	
^{172}Dy	−47760#	300#				3.4 s 0.2	0^+	13	16Wa19	TD	β^-=100	
^{172}Dy^m	−46480#	300#	1278	1		710 ms 50	(8^-)		16Wa19	ETJ	IT=81 3;β^-=19 3	
^{172}Ho	−51620#	200#				25 s 3	0^+#	15			β^-=100	*
^{172}Er	−56482	4				49.3 h 0.5	0^+	15			β^-=100	
^{172}Er^m	−54981	4	1500.9	0.3		579 ns 62	(6^+)	15	10Dr02	ETJ	IT=100	
^{172}Tm	−57373	5				63.6 h 0.3	2^-	15			β^-=100	
^{172}Tm^m	−56897	5	476.2	0.2		132 μs 7	(6^+)	15			IT=100	
^{172}Yb	−59255.453	0.011				STABLE	0^+	95			IS=21.754 10	*
^{172}Yb^m	−57705.02	0.06	1550.43	0.06		3.6 μs 0.1	6^-	95			IT=100	
^{172}Lu	−56736.6	2.0				6.70 d 0.03	4^-*	95			β^+=100	*
^{172}Lu^m	−56694.7	2.0	41.86	0.04		3.7 m 0.5	1^-*	95			IT=100;β^+ ?	*
^{172}Lu^n	−56670.8	2.0	65.79	0.04		332 ns 20	$(1)^+$	95			IT=100	
^{172}Lu^p	−56627.2	2.0	109.41	0.10		440 μs 12	$(1)^+$	95			IT=100	
^{172}Lu^q	−56523.0	2.0	213.57	0.17		150 ns	(6^-)	95			IT=100	
^{172}Hf	−56402	24				1.87 y 0.03	0^+	15			ε=100	
^{172}Hf^m	−54396	24	2005.84	0.11		163 ns 3	(8^-)	15			IT=100	
^{172}Ta	−51330	28				36.8 m 0.3	(3^+)	15			β^+=100	
^{172}W	−49097	28				6.6 m 0.9	0^+	95			β^+=100	
^{172}Re	−41560	40			*	55 s 5	(2^+)	15	FGK208	J	β^+=100	*
^{172}Re^m	−41450#	70#	110#	60#	*	15 s 3	(7^+)	15	FGK208	J	β^+=100	*
^{172}Os	−37243	13				18.9 s 0.8	0^+	95	95Hi02	TD	β^+=?;α=1.19 15	*
^{172}Ir	−27240#	100#				4.19 s 0.17	3^-#	15	23Zh03	TJ	β^+=?;$\alpha\approx$2	*
^{172}Ir^m	−27110#	100#	136	10	AD	1.96 s 0.04	8^+#	15	23Zh03	TJ	β^+=?;α=9.5 11	*
^{172}Pt	−21104	10				97.6 ms 1.3	0^+	10	10An01	D	α=96 3;β^+ ?	*
^{172}Au	−9170	70				28 ms 4	(2^-)	10			$\alpha\approx$100;β^+ ?;p ?	*
^{172}Au^m	−9060	60	110	50	AD	8.1 ms 1.0	(9^+)	10	09Ha42	T	$\alpha\approx$100;p ?	*
^{172}Hg	−860	50				231 μs 9	0^+	10			$\alpha\approx$100;β^+ ?	
$*^{172}$Gd	T : symmetrized from 22Ki23=163(+113-99)											**
$*^{172}$Gd	D : %β^-n from 22Ki23<50											**
$*^{172}$Ho	T : other: 17Wu04=27(11)											**
$*^{172}$Yb	D : from IS=21.754(0.010) in 24Ci.A											**
$*^{172}$Lu	J : 98Ge13,74Ek03=4											**
$*^{172}$Lu^m	J : 98Ge13=1											**
$*^{172}$Re	J : direct β^+ feeding to 2^+; conf=π9/2[514]⊗ν5/2[523], $K^\pi=2^+$											**
$*^{172}$Re^m	J : direct β^+ feeding to 6^+ and 8^+; conf=π9/2[514]⊗ν5/2[523], $K^\pi=7^+$											**
$*^{172}$Os	T : average 23Zh03=17.1(2.2) 95Hi02=19.2(0.9) 71Bo06=19(2)											**
$*^{172}$Os	D : %α average 23Zh03=1.2(0.3) 04GoZZ=1.4(0.3) 95Hi02=1.1(0.2)											**
$*^{172}$Ir	T : average 23Zh03=4.1(0.2) 92Sc16=4.4(0.3)											**
$*^{172}$Ir	J : other: 23Zh03=$(3^-,4^-)$#											**
$*^{172}$Ir	D : %α from 92Sc16∼2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{172}Ir^m$	T : average 23Zh03=1.89(0.05) 92Sc16=2.1(0.1) 78Sc26=2.1(0.1)											**
$*^{172}Ir^m$	J : other: 23Zh03=(7^+)#											**
$*^{172}Ir^m$	D : %α from 14An10=9.5(1.1); other: 92Sc16=23(3)											**
$*^{172}Pt$	D : %α average 10An01=97(3) 04GoZZ=94(6)											**
$*^{172}Au$	T : symmetrized from 09Ha42=22(+6-4)											**
$*^{172}Au$	J : favored α decay to ^{168}Ir [J^π=(2^-)]; conf=π3/2[402]$\otimes\nu$7/2[503]											**
$*^{172}Au^m$	T : average 09Ha42=9(+2-1),8(+5-2) 96Pa01=6.3(1.5); other: 93Se09=4(1)											**
$*^{172}Au^m$	J : favored α decay to $^{168}Ir^m$ [J^π=(9^+)]; conf=π11/2[505]$\otimes\nu$7/2[503]											**
^{173}Gd	−27940#	400#				100# ms	$1/2^-$#		26Su01	ID	β^-=100;β^-n ?	
^{173}Tb	−36440#	400#				400# ms >550ns	$3/2^+$#	21	18Fu08	I	β^- ?;β^-n ?	
^{173}Dy	−43740#	400#				1.43 s 0.20	$9/2^+$#	17	17Wu04	TD	β^-=100;β^-n ?	
^{173}Ho	−49350#	300#				7.1 s 0.4	$7/2^-$#	17	20Li28	TD	β^-=100	*
$^{173}Ho^m$	−48950#	300#	405	1		3.7 μs 1.2	$1/2^+$#		20Li28	TD	IT=100	
^{173}Er	−53650#	200#				1.434 m 0.017	$(7/2^-)$	93	94It.A	T	β^-=100	
$^{173}Er^m$	−52160#	200#	1489.9	0.8		1.1 μs 0.5	$(21/2^+)$		26Ha.A	EJT	IT=100	
^{173}Tm	−56256	4				8.24 h 0.08	$(1/2^+)$	93			β^-=100	
$^{173}Tm^m$	−55938	4	317.73	0.20		10.7 μs 1.7	$7/2^-$	93	12Hu10	TJ	IT=100	*
$^{173}Tm^n$	−54350	4	1905.7	0.4		250 ns 69	$19/2^-$		12Hu10	ETJ	IT=100	
$^{173}Tm^p$	−52208	4	4047.9	0.5		121 ns 28	$35/2^-$		12Hu10	ETJ	IT=100	
^{173}Yb	−57551.236	0.011				STABLE	$5/2^-*$	93			IS=16.098 9	*
$^{173}Yb^m$	−57152.3	0.5	398.9	0.5		2.9 μs 0.1	$1/2^-$	93			IT=100	
^{173}Lu	−56881.6	1.1				1.37 y 0.01	$7/2^+*$	93			ε=100	*
$^{173}Lu^m$	−56757.9	1.1	123.672	0.013		74.2 μs 1.0	$5/2^-$	93			IT=100	
^{173}Hf	−55391	3				23.6 h 0.1	$1/2^-$	06			β^+=100	
$^{173}Hf^m$	−55284	3	107.16	0.05		180 ns 8	$5/2^-$	06			IT=100	
$^{173}Hf^n$	−55194	3	197.47	0.10		160 ns 40	$7/2^+$	06			IT=100	
^{173}Ta	−52397	28				3.14 h 0.13	$5/2^-$	93			β^+=100	
$^{173}Ta^m$	−52224	28	173.10	0.21		205.2 ns 5.6	$9/2^-$	93	95Ca27	E	IT=100	*
$^{173}Ta^n$	−50680	28	1717.2	0.4		132 ns 3	$21/2^-$	93	06Th07	TJ	IT=100	*
^{173}W	−48727	28				7.6 m 0.2	$5/2^-$	93			β^+=100	
^{173}Re	−43554	28				2.0 m 0.3	$(5/2^-)$	93			β^+=100	
^{173}Os	−37442	15				22.4 s 0.9	$5/2^-$	15	95Hi02	TD	β^+ ?;α=0.4 2	
^{173}Ir	−30266	10				9.0 s 0.8	$1/2^+$	15			β^+=?;α=3.5 20	*
$^{173}Ir^m$	−30049	10	216	4	AD	2.20 s 0.05	$11/2^-$	15	01Ko44	J	β^+=?;α=12 1	*
^{173}Pt	−21915	26				379.9 ms 1.6	$7/2^-$	15	14ThZZ	TJ	α=86 4;β^+ ?	*
$^{173}Pt^m$	−21666	26	248.8	0.3		7.07 μs 0.14	$13/2^+$		14ThZZ	TJE	IT=100	
^{173}Au	−12827	23				25.5 ms 0.8	$(1/2^+)$	15	12Th13	T	α=86 13;β^+ ?	*
$^{173}Au^m$	−12611	12	216	21	AD	12.2 ms 0.1	$(11/2^-)$	15	99Po09	D	α=89 11;β^+ ?	*
^{173}Hg	−2600	50				800 μs 80	$(7/2^-)$	15			α=100	
^{173}Tl	8600#	400#				100# ns	$1/2^+$#				p ?;α ?	
$*^{173}Ho$	T : average 20Li28=7.5(0.7) 17Wu04=6.9(0.5)											**
$*^{173}Tm^m$	T : average 12Hu10=11.1(2.8) 72Pu02=10.4(2.1)											**
$*^{173}Yb$	J : 60Lo01,56Co21,54Kr52,38Sc10=5/2											**
$*^{173}Yb$	D : from IS=16.098(0.009) in 24Ci.A											**
$*^{173}Lu$	J : 98Ge13=7/2											**
$*^{173}Ta^m$	T : average 17Wo02=202(6) 91Ku12=225(15)											**
$*^{173}Ta^n$	T : other: 17Wo02=148(9)											**
$*^{173}Ir$	J : favored α decay from ^{177}Au (J^π=$1/2^+$)											**
$*^{173}Ir$	D : %α from ENSDF2015<7											**
$*^{173}Ir^m$	J : favored α decay from $^{177}Au^m$ (J^π=$11/2^-$)											**
$*^{173}Pt$	T : average 14Pe.A=366(7) 14ThZZ=378(3) 04GoZZ=382(2); others: 09An20=430(40) 02Ro17=370(13) 96Pa01=376(11) 92ToZX=290(60) 82En03=360(20)											**
$*^{173}Pt$	T : 81De22=325(20)											**
$*^{173}Pt$	J : favored α decay from ^{177}Hg (J^π=$7/2^-$)											**
$*^{173}Au$	T : average 12Th13=26.3(1.2) 99Po09=25(1)											**
$*^{173}Au$	D : %α symmetrized from 99Po09=94(+6-19)											**
$*^{173}Au^m$	D : %α symmetrized from 99Po09=92(+8-13)											**
^{174}Tb	−31970#	400#				240# ms >550ns	2^-#	21	18Fu08	I	β^- ?;β^-n ?	
^{174}Dy	−40890#	400#				1# s >300ns	0^+	13	12Ku26	I	β^- ?;β^-n ?	
^{174}Ho	−45870#	300#				3.5 s 0.6	(8^-)	17	20Li28	JTD	β^-=100	*
^{174}Er	−51950#	300#				3.2 m 0.2	0^+	98			β^-=100	
$^{174}Er^m$	−50840#	300#	1111.5	0.7		3.9 s 0.3	8^-		17Wu04	T	IT=100	*
^{174}Tm	−53860	40				5.4 m 0.1	4^-	98			β^-=100	*
$^{174}Tm^m$	−53610	40	252.4	0.7		2.29 s 0.01	0^+		06Ch10	TJD	IT≈100;β^-<1.5	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{174}Tm^{n}	−51770	40	2091.7	0.3		106 μs 7	14$^-$		13Hu08	EJT	IT=100	
^{174}Yb	−56944.522	0.011				STABLE	0$^+$	98			IS=31.896 26	*
^{174}Yb^{m}	−55426.374	0.017	1518.148	0.013		830 μs 40	6$^+$	98			IT=100	
^{174}Yb^{n}	−55179.3	0.5	1765.2	0.5		256 ns 11	7$^-$		05Dr05	EJT	IT=100	
^{174}Lu	−55570.8	1.1				3.31 y 0.05	1$^-$*	98	98Ge13	J	β^+=100	
^{174}Lu^{m}	−55400.0	1.1	170.83	0.05		142 d 2	6$^-$*	98	98Ge13	J	IT=99.38 2;ε=0.62 2	
^{174}Lu^{n}	−55330.0	1.1	240.818	0.004		395 ns 15	3$^+$	98			IT=100	*
^{174}Lu^{p}	−55205.6	1.1	365.183	0.006		145 ns 3	4$^-$	98			IT=100	*
^{174}Lu^{q}	−53715.1	1.2	1855.7	0.5		194 ns 24	13$^+$		09Ko19	ETJ	IT=100	
^{174}Lu^{r}	−51502.4	1.4	4068.4	0.9		97 ns 10	(21$^+$)		09Ko19	ETJ	IT=100	
^{174}Lu^{x}	−49721.2	1.4	5849.6	0.9		242 ns 19	(26$^-$)		09Ko19	ETJ	IT=100	
^{174}Hf	−55844.3	1.8				43 Py 13	0$^+$	05	25Be01	T	IS=0.16 12;α=100;2β^+ ?	*
^{174}Hf^{m}	−54295.0	1.8	1549.26	0.04		137 ns 4	6$^+$	05	15Ko14	EJ	IT=100	*
^{174}Hf^{n}	−54046.7	1.8	1797.59	0.07		2.39 μs 0.04	8$^-$	05	15Ko14	EJ	IT=100	
^{174}Hf^{p}	−52532.2	1.8	3312.07	0.06		3.7 μs 0.2	14$^+$	05	15Ko14	EJ	IT=100	
^{174}Ta	−51741	28				1.14 h 0.08	3$^+$	98			β^+=100	
^{174}W	−50227	28				33.2 m 2.1	0$^+$	98			β^+=100	
^{174}W^{m}			*non − exist*		EU	> 187 ns		98			IT=100	*
^{174}W^{n}			*non − exist*		EU	187 ns 25		98			IT=100	*
^{174}W^{p}	−47959	28	2267.8	0.4		158 ns 3	8$^-$	98	06Ta13	ETJ	IT=100	*
^{174}W^{q}	−46711	28	3515.6	0.4		126 ns 6	12$^+$	98	06Ta13	ETJ	IT=100	*
^{174}Re	−43673	28				2.40 m 0.04	3$^+$#	98			β^+=100	
^{174}Re^{m}	−43570#	60#	100#	50#		> 1 μs	7$^+$#		12Gu14	T	IT ?;β^+ ?	
^{174}Os	−39995	10				44 s 4	0$^+$	98			β^+=?;α=0.024 7	*
^{174}Ir	−30787	11				7.9 s 0.6	2$^-$#	98			β^+=?;α=0.5 3	*
^{174}Ir^{m}	−30661	10	126	15	AD	4.91 s 0.23	7$^+$#	98	23Zh03	T	β^+=?;α=2.5 3	*
^{174}Pt	−25319	10				862 ms 8	0$^+$	98	04GoZZ	TD	α=74.9 24;β^+ ?	*
^{174}Au	−14000#	100#				139 ms 3	3$^-$#	98	02Ro17	TD	α=90 6;β^+ ?	*
^{174}Au^{m}	−13880	80	120#	50#		163.3 ms 1.7	9$^+$#		04GoZZ	DTJ	$\alpha\approx$100;β^+ ?	*
^{174}Hg	−6634	15				2.0 ms 0.4	0$^+$	98	99Se14	T	$\alpha\approx$100;β^+ ?	*
^{174}Tl	6520#	300#				1# μs					p ?;α ?	
*^{174}Ho	T : average 20Li28=3.4(0.7) and 3.9(1.1); other: 17Wu04=3.2(1.1)											**
*^{174}Er^{m}	T : average 17Wu04=3.37(0.73) 09Dr06=4.02(0.35)											**
*^{174}Er^{m}	E : from 15Ko14											**
*^{174}Tm	J : direct β^- feeding to 5$^-$ and the proposed conf=π1/2[411]$\otimes\nu$7/2[514], $K^\pi=4^-$											**
*^{174}Tm^{m}	E : uncertainty estimated by NUBASE											**
*^{174}Yb	D : from IS=31.896(0.026) in 24Ci.A											**
*^{174}Lu^{n}	J : E1 γs to 2$^-$ and 3$^-$, and no γ to 1$^-$											**
*^{174}Lu^{p}	J : E1 γs to 3$^+$ and 4$^+$ and no γ to 1$^-$											**
*^{174}Hf	T : symmetrized from 25Be01=38(+17-9), supersedes 20Ca15=70(12); others: 21Br09>28 Py to 2$^+$ 20Da02>3.3 Py 20Da03>71 Py 61Ma05=2.0(0.4)Py											**
*^{174}Hf	T : 59Ri34=4.3 Py											**
*^{174}Hf^{m}	T : average 26Si.1=132(7) 80Wa23=138(4)											**
*^{174}W^{m}	I : not confirmed in 06Ta13, where the half-life is associated with a different level											**
*^{174}W^{n}	I : not confirmed in 06Ta13, where the half-life is associated with a different level											**
*^{174}W^{p}	E : from a least-squares fit to γ-ray energies in 15Ko14											**
*^{174}W^{q}	E : from a least-squares fit to γ-ray energies in 15Ko14											**
*^{174}W^{q}	T : average 20Ro25=124(8) 06Ta13=128(8)											**
*^{174}Os	D : %α symmetrized from 71Bo06=0.020(+10-4)%											**
*^{174}Ir	T : average 23Zh03=7.1(2.2) 92Sc16=9(2) 92Bo21=7.8(0.6)											**
*^{174}Ir	J : favored α decay from ^{178}Au [J^π=2$^-$#]											**
*^{174}Ir	D : %α from 92Sc16=0.5(0.3)											**
*^{174}Ir^{m}	T : average 23Zh03=4.4(1.1) 92Sc16=4.9(0.3) 92Bo21=5.0(0.4)											**
*^{174}Ir^{m}	D : %α from 92Sc16=2.5(0.3)											**
*^{174}Ir^{m}	J : others: 20Cu04=(6,7,8,9), 23Zh03,92Sc16=(7$^+$)											**
*^{174}Pt	T : average 04GoZZ=857(3) 14Pe02=930(30) 96Pa01=890(20) 82En03=900(10); Birge ratio=2.85											**
*^{174}Pt	D : %α average 04GoZZ=74(3) 96Pa01=67(6) 79Ha10=83(5)											**
*^{174}Au	T : average 02Ro17=139(3) 83Sc24=120(20)											**
*^{174}Au^{m}	T : average 04GoZZ=162(4),171(7),160(5),163(2) 96Pa01=171(29); others: 84Sc.A=123(20),119(26)											**
*^{174}Hg	T : symmetrized from 99Se14=1.9(+0.4-0.3); other: 97Uu01=2.1(+1.8-0.7)											**
^{175}Tb	−28490#	400#				180# ms	3/2$^+$#		26Su01	ID	β^-=100;β^-n ?	
^{175}Dy	−36610#	400#				390# ms >550ns	1/2$^-$#	24	18Fu08	I	β^- ?;β^-n ?	
^{175}Ho	−43300#	400#				1.88 s 0.55	7/2$^-$#	24	17Wu04	TD	β^-=100;β^-n ?	
^{175}Er	−48650#	400#				1.2 m 0.3	9/2$^+$#	24	96Zh03	TD	β^-=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{175}Tm	−52310	50				15.2 m 0.5	$(1/2)^+$	24	66Wi04	T	β^-=100	*
^{175}Tm^m	−51870	50	440.0	1.0		319 ns 35	$7/2^-$	24	12Hu10	ETJ	IT=100	
^{175}Tm^n	−50790	50	1517.7	1.2		21 μs 14	$23/2^+$	24	12Hu10	ETJ	IT=100	
^{175}Yb	−54695.55	0.07				4.1615 d 0.0030	$7/2^-$*	24	21Du15	T	β^-=100	*
^{175}Yb^m	−54180.68	0.07	514.867	0.004		69.1 ms 1.5	$1/2^-$	24	72Br53	T	IT=100	*
^{175}Lu	−55166.2	0.4				STABLE	$7/2^+$*	24			IS=97.414 5	*
^{175}Lu^m	−54812.6	0.4	353.59	0.05		1.49 μs 0.07	$5/2^-$	24	69Jo16	T	IT=100	
^{175}Lu^n	−53773.8	0.8	1392.4	0.7		984 μs 33	$19/2^+$	24	15Ko14	EJ	IT=100	*
^{175}Hf	−54481.5	1.8				69.94 d 0.05	$5/2^-$	24	25Km01	T	ε=100	*
^{175}Hf^m	−54355.6	1.8	125.90	0.12		53.7 μs 1.5	$1/2^-$	24	67Co20	T	IT=100	
^{175}Hf^n	−53048.1	1.8	1433.41	0.12		1.02 μs 0.03	$19/2^+$	24	26Si.1	T	IT=100	*
^{175}Hf^p	−51465.9	1.8	3015.6	0.4		1.21 μs 0.15	$35/2^-$	24	80Dr06	T	IT=100	
^{175}Hf^q	−49845.3	2.2	4636.2	1.2		1.9 μs 0.1	$45/2^+$	24	04Ko.A	JT	IT=100	*
^{175}Ta	−52409	28				10.50 h 0.19	$7/2^+$*	24			β^+=100	*
^{175}Ta^m	−52277	28	131.60	0.20		222 ns 8	$9/2^-$	24	96Ko17	JT	IT=100	
^{175}Ta^n	−52070	28	339.2	1.3		170 ns 20	$(1/2^+)$	24	69AdZY	T	IT=100	
^{175}Ta^p	−50841	28	1567.88	0.34		1.95 μs 0.15	$21/2^-$	24	96Ko17	JT	IT=100	
^{175}W	−49633	28				35.2 m 0.6	$(1/2^-)$	24	84Sz07	T	β^+=100	
^{175}W^m	−49398	28	234.95	0.15		216 ns 6	$(7/2^+)$	24	78Wa16	TJ	IT=100	
^{175}Re	−45288	28				5.89 m 0.05	$5/2^-$#	24	84Sz07	T	β^+=100	
^{175}Os	−40101	10				1.4 m 0.1	$(5/2^-)$	24	72Be89	T	β^+=100	
^{175}Ir	−33392	11				8.9 s 0.5	$(1/2^+)$	24	86Ke03	D	β^+ ?;α=0.85 28	*
^{175}Ir^m	−33340#	40#	50#	40#		33 s 4	$9/2^-$#	24	10Wa02	TI	β^+=?;IT ?	*
^{175}Ir^n	−33321	11	71.3	0.5		6.58 μs 0.15	$(5/2^-)$	24	19Gi11	ETJ	IT=100	
^{175}Pt	−25825	16				2.379 s 0.024	$7/2^-$	24	14Pe02	TJ	α=65 5;β^+ ?	*
^{175}Pt^m	−25719#	22#	106#	15#		20# μs	$13/2^+$#				IT ?;α ?;β^+ ?	*
^{175}Au	−17400	40				200 ms 3	$1/2^+$	24	17Ba46	T	α=88 4;β^+ ?	*
^{175}Au^m	−17200#	40#	199#	20#	AD	136 ms 1	$(11/2^-)$	24	17Ba46	T	α=75 4;β^+ ?	*
^{175}Hg	−7950	80				10.2 ms 0.3	$(7/2^-)$	24	17Ba46	T	α≈100;β^+ ?	*
^{175}Hg^m	−7460	80	494.0	1.4		340 ns 30	$(13/2^+)$	24	09Od01	TDE	IT=100	
^{175}Tl	2240#	200#				100# ns	$1/2^+$#				p ?;α ?	
^{175}Pb	14340#	300#				1# μs	$7/2^-$#				α ?;β^+ ?	
*^{175}Tm	J : from l=0 in (t,α), but cannot distinguish between J=1/2 or 3/2											**
*^{175}Yb	T : from 21Du15=4.1615(0.0030); others: 89Ab05=4.185(0.001) 66Wi04=4.19(0.01)											**
*^{175}Yb	J : 12Fl05=7/2											**
*^{175}Yb^m	T : unweighted average 72Br53=68.17(0.27) 62Fe02=67.0(0.2) 60Ho10=72.0(0.5), Birge ratio=6.65; other: 61Kr01=60.0(0.5). ENSDF2024=47.3(0.2), based											**
*^{175}Yb^m	T : on 72Br53, is in error											**
*^{175}Lu	J : 98Ge13,69Fu11,35Sc04=7/2											**
*^{175}Lu	D : from IS=97.414(0.005) in 24Ci.A											**
*^{175}Lu^n	T : from 04Ga04=984(13,stat)(30,syst); other: 98Wh02=930(80)											**
*^{175}Hf	T : average 25Km01=69.90(0.07),69.79(0.11),70.04(0.16) 17Zh52=69.83(0.25), corrected in 25Km01 from 17Zh52=70.73(0.25), 12Fa07=70.65(0.19);											**
*^{175}Hf	T : others: 01Po.1=71.9(1.3) 63Ra14,49Wi11=70(2)											**
*^{175}Hf^n	T : average 26Si.1=1.01(0.03) 80Dr06=1.10(0.08)											**
*^{175}Hf^q	T : ENSDF2025=2.8 is in error											**
*^{175}Ta	T : average 63Sa14=10.5(0.2) 63Ma48=10.5(0.8); other: 62Ma41=10(1)											**
*^{175}Ta	J : 78Ru04,75Ru06=7/2											**
*^{175}Ir	T : average 10Wa02=8.8(0.5) 92Sc16=7.2(1.3),11(3) 92Bo21=13(2); other: 67Si02=4.5(1.0)											**
*^{175}Ir^m	J : from 19Gi11; prolate-deformed π9/2[514] state											**
*^{175}Pt	T : average 25Ko.B=2.30(0.05) 24Hu14=2.35(0.05) 14Pe02=2.38(0.04) [average 2.39(0.06),2.39(0.05),2.34(0.08) for 6.02,5.95 and 5.81α(t),											**
*^{175}Pt	T : respectively] 96Pa03=2.4(0.3) 79Ha10=2.55(0.08) [average 2.56(0.10),2.54(0.15) for 5.95 and 6.03α(t), respectively] 73Ga08=2.52(0.08)											**
*^{175}Pt	T : 66Si08=2.1(0.2)											**
*^{175}Pt	D : %α from 79Ha10=65(5)											**
*^{175}Pt	J : favored α decay from ^{179}Hg (J^π=7/2$^-$)											**
*^{175}Pt^m	E : from 80 keV < E < 131 keV, below the 9/2$^-$ level at 130.91 keV, since no 130.9-keV, 9/2$^-$ to 7/2$^-$ γ ray was observed in 14Pe.A											**
*^{175}Au	T : average 17Ba46=200(3) 13An10=207(7) 11Ko.B=188(12)											**
*^{175}Au	J : favored α decay from ^{179}Tl (J^π=1/2$^+$)											**
*^{175}Au	D : %α average 13An10=90(7) 11Ko.B=87(4)											**
*^{175}Au^m	T : others: 11Ko.B=124(8), supersedes 01Ko44=143(8), 10An01=138(5) 02Ro17=158(3) 96Pa01=185(30) 83Sc24=200(22) for mixture gs and isomer											**
*^{175}Au^m	J : favored α decay to ^{171}Ir^m [J^π=(11/2$^-$)]											**
*^{175}Au^m	D : %α from 11Ko.B=75(4), corrected for %α=65(5) for the ^{175}Pt daughter; others: 10An01=90(3) 83Sc24=94(+6-25)											**
*^{175}Hg	T : average 17Ba46=9.6(0.4) 02Ro17=10.8(0.4); others: 04Ke06=7(+4-2) 09Od01=10(1) 97Uu01=13(+6-4) 96Pa01=8(8) 83Sc24=20(+40-13)											**
^{176}Dy	−33280#	400#				440# ms >550ns	0^+	21	18Fu08	I	β^- ?;β^-n ?	
^{176}Ho	−39390#	500#				1# s >300ns	4^+#	13	12Ku26	I	β^- ?;β^-n ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{176}Er	−46630#	400#				12# s >300ns	0^+		13 12Ku26	I	β^- ?	
^{176}Tm	−49370	100				1.85 m 0.03	(4^+)		22 94It.A	T	β^-=100	
^{176}Yb	−53491.325	0.013				STABLE >160Py	0^+		05 96De60	T	IS=12.887 30;2β^- ?;α ?	*
^{176}Yb^m	−52441.5	0.6	1049.8	0.6		11.4 s 0.3	8^-*		05		IT=100	*
^{176}Lu	−53382.9	0.4				37.19 Gy 0.16	7^-*		05 FGK249	T	IS=2.586 5;β^-=100;ε<6.3E-4	*
^{176}Lu^m	−53260.1	0.4	122.845	0.004		3.664 h 0.019	1^-*		05		β^-=?;ε=0.095 16	*
^{176}Lu^n	−51868.4	0.6	1514.5	0.5		312 ns 69	12^+		05		IT=100	
^{176}Lu^p	−51795.1	0.7	1587.8	0.6		40 μs 3	14^+		05 15Ko14	EJ	IT=100	
^{176}Hf	−54576.0	0.4				STABLE	0^+		05 21Br09	T	IS=5.24 14;α ?	*
^{176}Hf^m	−53242.9	0.4	1333.07	0.07		9.6 μs 0.3	6^+		05		IT=100	
^{176}Hf^n	−53016.7	0.4	1559.31	0.09		9.9 μs 0.2	8^-		05		IT=100	
^{176}Hf^p	−51710.2	0.8	2865.8	0.7		401 μs 6	14^-		05		IT=100	
^{176}Hf^q	−49712.4	1.0	4863.6	0.9		43 μs 4	22^-		05 10Mu13	JT	IT=100	
^{176}Ta	−51370	30				8.09 h 0.05	$(1)^-$		05		β^+=100	
^{176}Ta^m	−51270	30	103.0	1.0		1.08 ms 0.07	7^+		05 78Du06	ET	IT=100	*
^{176}Ta^n	−49900	30	1474.0	1.4		3.8 μs 0.4	14^-		05		IT=100	*
^{176}Ta^p	−48500	30	2874.0	1.4		970 μs 70	20^-		05		IT=100	*
^{176}W	−50642	28				2.5 h 0.1	0^+		05		ε=100	
^{176}Re	−45063	28				5.3 m 0.3	(3^+)		05		β^+=100	
^{176}Os	−42132	11				3.6 m 0.5	0^+		05		β^+=100	
^{176}Ir	−33864	8			*	8.7 s 0.5	2^+#		05		β^+=96.9 6;α=3.1 6	*
^{176}Ir^m	−33810#	50#	50#	50#	*	10# s	(7^+)				$\beta^+\approx$100;IT ?	*
^{176}Pt	−28934	13				6.49 s 0.08	0^+		05 24Hu14	T	β^+ ?;α=39.2 21	*
^{176}Au	−18390#	100#				1.05 s 0.01	2^-#		05 14An10	D	α=58 5;β^+ ?	*
^{176}Au^m	−18250#	100#	137	11	AD	1.36 s 0.02	8^+#		05 21Ha32	D	α=29 5;β^+ ?	*
^{176}Hg	−11781	11				20.3 ms 1.4	0^+		05		α=90 9;β^+ ?	*
^{176}Tl	600	80				6.2 ms 2.3	$(3^-,4^-)$		09 04Ke06	TD	p$\approx$100;α ?;β^+ ?	*
^{176}Pb	9670#	200#				1# μs	0^+				α ?;β^+ ?	
*^{176}Yb	D : from IS=12.887(0.030) in 24Ci.A											**
*^{176}Yb^m	J : 12Fl05=8											**
*^{176}Lu	T : evaluated by FGK249 using the world counting data; others: 06Al03=37.13(0.26), using the world data on age comparison of terrestrial											**
*^{176}Lu	T : minerals, 06Al03=35.40(0.80), using the world data on age comparison of meteorites											**
*^{176}Lu	D : from 23Qu02=ε(to 2^+)/β^-<6.3e-6; others: 23Gh02=ε<0.024%-0.26% 05Am04<0.9% 04No09<0.45% to 2^+, <0.36% to 0^+ (ground state)											**
*^{176}Lu	J : 98Ge13,62Sp03,61Bl07,59Ka97,58St34,39Sc14=7											**
*^{176}Lu	D : from IS=2.586(0.005) in 24Ci.A											**
*^{176}Lu^m	J : 98Ge13,65Wh03=1											**
*^{176}Hf	T : 21Br09>270 Py to 2^+; 20Da04>300 Py to 2^+; 20Ca15>18 Py to 2^+, 20Ca15>93 Ey to 0^+											**
*^{176}Hf	D : from IS=5.24(0.14) in 24Ci.A											**
*^{176}Ta^m	T : average 78Du06=1.05(0.10) 71Go21=1.1(0.1)											**
*^{176}Ta^n	E : 1371(1) keV above ^{176}Ta^m											**
*^{176}Ta^p	E : 2771(1) keV above ^{176}Ta^m											**
*^{176}Ir	J : from the expected conf=π1/2[541]$\otimes\nu$5/2[512],$K^\pi=2^+$											**
*^{176}Ir^m	J : direct β^+ feeding to J=6 and 7 states in ^{176}Os in 94Ki01 implies existence of a high-spin β^+ decaying isomer; expected											**
*^{176}Ir^m	J : conf=π9/2[514]$\otimes\nu$5/2[512],$K^\pi=7^+$											**
*^{176}Pt	T : average 24Hu14=6.55(0.09) 73Ga08=6.33(0.15); others: 96Pa01=6.7(0.7) 82HeZM=6.9(3.6) 82Bo04=11.0(0.2) 66Si08=6.0(0.5) 70Ha18~6											**
*^{176}Pt	D : average 96Pa01=42(4) 82HeZM=38(5) 79Ha10=38(3),supersedes 70Ha18=42(4)											**
*^{176}Au	D : from 21Ha32=58(5); other: 14An10=75(8)											**
*^{176}Au	J : other: 21Ha32=(2^-,3^-)#											**
*^{176}Au^m	T : from 04GoZZ; other: 02Ro17=840(+170-140)											**
*^{176}Au^m	J : other: 21Ha32=(7^+,8^+,9^+)#											**
*^{176}Hg	D : %α symmetrized from 99Po09=94(+6-12)=94(12)											**
*^{176}Tl	T : symmetrized from 04Ke06=5.2(+3.0-1.4)											**
*^{176}Tl	J : l_p=0 to ^{175}Hg (J^π=7/2$^-$) in 04Ke06											**
^{177}Ho	−36280#	500#				1# s >550ns	$7/2^-$#		19 18Fu08	I	β^-=100;β^-n ?	
^{177}Er	−42860#	500#				8# s >300ns	$1/2^-$#		19 12Ku26	I	β^- ?	
^{177}Tm	−47570#	200#			*	95 s 7	$1/2^+$#		19		β^-=100	
^{177}Tm^m	−47470#	220#	100#	100#	*	77 s 11	$7/2^-$#		19		β^-=100	
^{177}Yb	−50986.41	0.22				1.911 h 0.003	$9/2^+$*		19		β^-=100	*
^{177}Yb^m	−50654.9	0.4	331.5	0.3		6.41 s 0.02	$1/2^-$*		19		IT=100	*
^{177}Lu	−52384.4	0.4				6.6443 d 0.0009	$7/2^+$*		19 23Ma26	T	β^-=100	*
^{177}Lu^m	−52234.0	0.4	150.3984	0.0010		130.1 ns 2.4	$9/2^-$		19		IT=100	
^{177}Lu^n	−51814.7	0.4	569.6721	0.0015		155 μs 7	$1/2^+$		19		IT=100	
^{177}Lu^p	−51414.2	0.4	970.1757	0.0024		160.4 d 0.3	$23/2^-$*		19		β^-=77.30 8;IT=22.70 8	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{177}Lu^q	−49612.7	0.6	2771.7	0.5		625 ns 62	33/2$^+$	19			IT=100	
^{177}Lu^r	−48854.0	0.7	3530.4	0.6		6 μs 2	39/2$^-$	19			IT=100	*
^{177}Hf	−52881.1	0.8				STABLE >1.1Ey	7/2$^-$*	19	21Br09	T	IS=18.58 9;α ?	*
^{177}Hf^m	−51565.6	0.8	1315.4502	0.0008		1.09 s 0.05	23/2$^+$	19			IT=100	
^{177}Hf^n	−51538.7	1.3	1342.4	1.0		55.9 μs 1.2	(19/2$^-$)	19			IT=100	
^{177}Hf^p	−50141.1	0.8	2740.02	0.15		51.4 m 0.5	37/2$^-$	19			IT=100	*
^{177}Ta	−51715	3				56.36 h 0.13	7/2$^+$*	19			β$^+$=100	*
^{177}Ta^m	−51642	3	73.16	0.07		410 ns 7	9/2$^-$	19			IT=100	
^{177}Ta^n	−51529	3	186.16	0.06		3.62 μs 0.10	5/2$^-$	19			IT=100	
^{177}Ta^p	−50360	3	1354.8	0.3		5.30 μs 0.11	21/2$^-$	19			IT=100	
^{177}Ta^q	−47059	3	4656.3	0.8		133 μs 4	49/2$^-$	19			IT=100	
^{177}W	−49702	28				132.4 m 2.0	1/2$^-$	19			β$^+$=100	
^{177}Re	−46269	28				14 m 1	5/2$^-$	19			β$^+$=100	
^{177}Re^m	−46170#	60#	100#	50#		> 100 ns	9/2$^-$	19			IT=100	
^{177}Re^n	−46184	28	84.70	0.10		50 μs 10	5/2$^+$	19			IT=100	
^{177}Os	−41957	15				3.0 m 0.2	1/2$^-$	19			β$^+$=100	
^{177}Ir	−36047	20				29.8 s 1.7	5/2$^-$	19			β$^+$=99.94 1;α=0.06 1	
^{177}Ir^m	−35950#	50#	100#	50#		> 100 ns	(9/2$^-$)	19			IT=100	
^{177}Ir^n	−35866	20	180.9	0.4		> 100 ns	5/2$^+$	19			IT=100	
^{177}Pt	−29367	15				10.0 s 0.4	5/2$^-$	19			β$^+$=?;α=5.7 5	
^{177}Pt^m	−29220	15	147.5	0.4		2.34 μs 0.04	1/2$^-$	19	20Ba.A	T	IT=100	*
^{177}Au	−21543	10				1.505 s 0.012	1/2$^+$*	19	23Cu04	J	α=64 5;β$^+$?	*
^{177}Au^m	−21361	10	181.9	0.4		1.193 s 0.013	11/2$^-$*	19	20Ba17	J	α=56 8;β$^+$?	*
^{177}Hg	−12750	60				117 ms 7	7/2$^-$*	19			α≈100;β$^+$?	*
^{177}Hg^m	−12430	60	323.2	1.2		1.50 μs 0.15	13/2$^+$	19			IT=100	
^{177}Tl	−3335	21				18 ms 5	(1/2$^+$)	19			α=73 13;p ?	
^{177}Tl^m	−2528	12	807	18	p	230 μs 40	(11/2$^-$)	19			p=51 8;α=49 8	
^{177}Pb	7850#	200#				20# μs	7/2$^-$#				α ?;β$^+$?	
*^{177}Yb	J : 12Fl05=9/2											**
*^{177}Yb^m	J : 12Fl05=1/2											**
*^{177}Lu	T : average 23Ma26=6.6489(0.0052) 21Du15=6.640(0.009) 17FeZZ=6.6430(0.0011) 12Ko24=6.639(0.009) 11Po07=6.6465(0.0050) 04Sc04=6.6475(0.0020)											**
*^{177}Lu	T : 01Sc23=6.646(0.005) 01Zi01=6.65(0.01) 82La25=6.645(0.030); others: 16Dr15=6.645(0.003) 16Lu16=6.660(0.017) 12Re25=6.681(0.006)											**
*^{177}Lu	T : 08Ca13=6.680(0.006),6.709(0.001) 90Ab02=6.7479 0.0007) 72Em01=6.71(0.01) 60Sc19=6.74(0.04) 58Be41=6.75(0.05)											**
*^{177}Lu	J : 98Ge13,62Pe07=7/2											**
*^{177}Lu^p	J : 98Ge13=23/2											**
*^{177}Lu^r	T : other: 04Al04=6(+3-2) m, not trusted											**
*^{177}Hf	J : 95Ji15,56Sp22=7/2											**
*^{177}Hf	T : 21Br09>1.1 Ey; others: 20Da04>1.3 Ey 20Ca15>75 Py to 7/2$^-$ and >320 Ey to 5/2$^-$											**
*^{177}Hf	D : from IS=18.58(0.09) in 24Ci.A											**
*^{177}Hf^p	T : other: 04Al04=76(+16-9) from decay growth											**
*^{177}Ta	J : 78Ru04,75Ru06=7/2											**
*^{177}Pt^m	T : average 20Ba.A=2.29(0.09) 19Gi11=2.35(0.04); other: 79Ha10=2.2(0.3)											**
*^{177}Au	D : %α from 21Ha32=64(5); other: 09An14=40(6)											**
*^{177}Au	J : also 18Cu04=1/2											**
*^{177}Au	T : average 09An14=1.53(0.07) 01Ko44=1.462(0.032) 14AlZX=1.511(0.013); others: 25Sp01=1.62(0.36),1.17(0.48) 21Ha32=1.37(0.07)											**
*^{177}Au^m	D : %α from 21Ha32=56(8); other: 09An14=60(10)											**
*^{177}Au^m	E : from 20Ve03=(290.2+452.6)-(319.7+241.2) γ-ray energy differences; 0.2 keV uncertainty for the energies of individual γ rays; other:											**
*^{177}Au^m	E : ENSDF2019=182.7(0.5) using γ-ray energies in 01Ko44											**
*^{177}Au^m	T : unweighted average 14AlZX=1.205(0.003) 01Ko44=1.180(0.012); others: 25Sp01=1.38(0.64) 21Ha32=1.27(0.11) 09An14=1.0(0.2) 96Pa01=1.3(0.2)											**
*^{177}Au^m	T : 91Se01=1.18(0.07) 75Ca06=1.3(0.1) 68Si01=1.3(0.4)											**
*^{177}Hg	J : 19Se04,18Ma.1=7/2											**
^{178}Ho	−32000#	500#				750# ms >550ns	2$^+$#	21	18Fu08	I	β$^-$?;β$^-$n ?	
^{178}Er	−40260#	600#				4# s >300ns	0$^+$	13	12Ku26	I	β$^-$?	
^{178}Tm	−44240#	300#				10# s >300ns	1$^-$#	13	09St16	I	β$^-$?;β$^-$n ?	
^{178}Yb	−49677	7				74 m 3	0$^+$	08			β$^-$=100	
^{178}Yb^m	−48448	7	1229.4	1.0		203 ns 16	(4$^-$)		26Ha.1	EJT	IT=100	
^{178}Lu	−50338.4	1.9				28.4 m 0.2	1$^+$*	08			β$^-$=100	*
^{178}Lu^m	−50214.6	3.0	123.8	2.6	RQ	23.1 m 0.3	9$^-$*	08			β$^-$=100	*
^{178}Hf	−52435.7	0.9				STABLE	0$^+$	08			IS=27.28 6;α ?	*
^{178}Hf^m	−51288.3	0.9	1147.416	0.006		4.0 s 0.2	8$^-$	08			IT=100	
^{178}Hf^n	−49989.6	0.9	2446.09	0.08		31 y 1	16$^+$	08	73He19	T	IT=100	
^{178}Hf^p	−49863.3	0.9	2572.4	0.3		68 μs 2	14$^-$	08			IT=100	
^{178}Ta	−50550#	50#			*	2.36 h 0.08	7$^-$	08			β$^+$=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{178}Ta^m	−50499	15	50#	50#	*	9.31 m 0.03	(1^+)	08	96Ko13	E	β^+=100	*
^{178}Ta^n	−49080#	50#	1467.82	0.16		59 ms 3	15^-	08	96Ko13	ETJ	IT=100	*
^{178}Ta^p	−47650#	50#	2901.9	0.7		290 ms 12	21^-	08	96Ko13	ETJ	IT=100	*
^{178}W	−50407	15				21.6 d 0.3	0^+	08			ε=100	
^{178}W^m	−43834	15	6572.7	0.3		220 ns 10	25^+	08			IT=100	
^{178}Re	−45645	20				13.2 m 0.2	(3^+)	08			β^+=100	
^{178}Os	−43545	14				5.0 m 0.4	0^+	08			β^+=100	
^{178}Ir	−36255	19				12 s 2	3^+#	08	FGK256	J	β^+=100	
^{178}Ir^m	−36160#	50#	100#	50#		15# s	(7^+)		FGK256	IJ	$\beta^+\approx$100;IT ?	*
^{178}Pt	−31997	10				20.5 s 0.6	0^+	08	24Hu14	T	β^+=?;α=7.8 3	*
^{178}Au	−22303	10				3.81 s 0.12	2^-#	08	26An02	TD	β^+=?;α=13.5 5;β^+SF<1.13e-6	*
^{178}Au^m	−22130	10	173.4	0.5		294 ns 7	5^-#		21Gi08	ETDIT	=100	*
^{178}Au^n	−22117	10	186	14	MD	2.82 s 0.04	8^+#		26An02	TD	β^+=?;α=14.6 5;β^+SF<9.9e-7	*
^{178}Au^p	−22060	17	243	14		373 ns 9	(8,9)		21Gi08	ETDIT	=100	*
^{178}Au^q	−21890#	60#	410#	50#	AD		7^+#					
^{178}Hg	−16317	11				266.5 ms 2.4	0^+	08	24Hu14	T	α=89 4;β^+ ?	*
^{178}Tl	−4560#	100#				255 ms 9	$(4^-,5^-)$	08	13Li49	TJD	α=62 2;β^+=38 2;β^+SF=0.057 23	*
^{178}Pb	3580	20				250 μs 80	0^+	08	16Ba60	T	$\alpha\approx$100;β^+ ?	*
*^{178}Lu	J : 98Ge13=1											**
*^{178}Lu^m	J : 98Ge13=9											**
*^{178}Hf	T : 21Br09>1.3 Ey, 20Da04>200 Py to 2^+, 20Ca15>69 Py to 2^+ and >58 Ey to 0^+											**
*^{178}Hf	D : from IS=27.28(0.06) in 24Ci.A											**
*^{178}Ta^m	E : K$^\pi$=1^+ state, conf=π9/2[514]$\otimes\nu$7/2$^-$[514], is expected 120 keV above the 7^- gs, based on E=220 keV for the K$^\pi$=8^+,											**
*^{178}Ta^m	E : conf=π9/2[514]$\otimes\nu$7/2$^-$[514] state and Gallagher-Moszkowski splitting energy of 100 keV											**
*^{178}Ta^m	J : log ft=4.7 from ^{178}W β^- decay consistent with a ν7/2[514] $\rightarrow$ π9/2[514] spin-flip transition											**
*^{178}Ta^n	E : from a least-squares fit to γ rays in 96Ko13											**
*^{178}Ta^n	T : average 96Ko13=58(4) 79Du02=60(5)											**
*^{178}Ta^p	E : from a least-squares fit to γ rays in 96Ko13											**
*^{178}Ir	J : favored α decay from ^{182}Au [J$^\pi$=(2^+)] to (2^+) followed by 54.4-keV γ to gs; expected conf=π1/2[541]$\otimes\nu$1/2[521]											**
*^{178}Ir^m	I : direct β^+ feeding to J=7 and 8 states in ^{178}Os in 94Ki01 implies existence of a high-spin β^+ decaying isomer;											**
*^{178}Ir^m	J : expected conf=π9/2[514]$\otimes\nu$5/2[512]											**
*^{178}Pt	T : average 24Hu14=20(2) 00Ko16=20(1) 93Me13=22(2) 82Bo04=21(1) 70Ha18=19(2) 66Si08=21.3(1.5)											**
*^{178}Pt	D : from %$I_\alpha(0^+)$=7.5(0.3), average 80Sc09=7.5(0.3) 70Ha18=7.2(0.8) and %$I_\alpha(2^+)$=0.27(0.03) using %$I_\alpha(2^+)$/%$I_\alpha(0^+)$=3.6(0.4)% from 00Ko16; other:											**
*^{178}Pt	D : 82HeZM=6.0(1.6)											**
*^{178}Au	T : others: 20Cu04=3.4(0.5) 68Si01=2.6(0.5)											**
*^{178}Au	D : %α others: 20Cu04=16(1) 86Ke03>40 96Bu03,84ScZQ<5											**
*^{178}Au	J : 20Cu04=2,3											**
*^{178}Au^m	E : from 60.0(0.2) keV and 113.4(0.4) keV γs in a cascade											**
*^{178}Au^m	J : 60.0-keV (M1/E2) and 113.4-keV (E2) in a cascade above gs (J$^\pi$=2^-#)											**
*^{178}Au^n	T : others: 20Cu04=2.7(0.5)											**
*^{178}Au^n	D : %α others: 20Cu04=18(1)											**
*^{178}Au^n	J : 20Cu04=7,8											**
*^{178}Au^p	E : 56.7(0.2)-keV E1 or M1 above ^{178}Au^n											**
*^{178}Hg	T : average 24Hu14=248(24) 04GoZZ=283(23) 02Ro17=269(3) 00Ko48=262(4) 96Pa01=287(23) 91Se01=250(25) 79Ha10,76HoZD=260(30)											**
*^{178}Hg	D : %α from 12Ve04=89(4); others: 79Ha10∼50 71Ha03∼84											**
*^{178}Tl	T : average 13Li49=252(20) 02Ro17=254(+11-9)											**
*^{178}Tl	D : %β^+SF from %β^+SF/%β^+=0.15(0.06) in 13Li49 and %β^+=38(2)											**
*^{178}Pb	T : from τ=266(+184-77), average of four events in 16Ba60 at 365, 127, 588 and 166 μs and two events in 01Ro.B at 202 and 147 μs											**
^{179}Er	−36080#	500#				3# s >550ns	$3/2^-$#	21	18Fu08	I	β^- ?;β^-n ?	
^{179}Tm	−41900#	400#				18# s >300ns	$1/2^+$#	13	12Ku26	I	β^- ?;β^-n ?	
^{179}Yb	−46790	27				8.0 m 0.4	$(1/2^-)$	08			β^-=100	
^{179}Lu	−49060	5				4.59 h 0.06	$7/2^+$*	08			β^-=100	*
^{179}Lu^m	−48468	5	592.4	0.4		3.1 ms 0.9	$1/2^+$	08			IT=100	
^{179}Lu^n	−47760	5	1299.7	1.0		1.0 μs 0.4	$(17/2^+)$		26Ha.1	EJT	IT=100	
^{179}Lu^p	−46522	5	2537.9	1.0		> 100 ns	$(29/2^-)$		26Ha.1	EJT	IT=100	
^{179}Hf	−50463.3	0.9				STABLE	$9/2^+$*	08			IS=13.63 3;α ?	*
^{179}Hf^m	−50088.3	0.9	375.0352	0.0025		18.67 s 0.04	$1/2^-$	08			IT=100	
^{179}Hf^n	−49356.9	0.9	1106.412	0.033		25.00 d 0.17	$25/2^-$	08	19Kr06	ET	IT=100	*
^{179}Hf^p	−46688.1	2.3	3775.2	2.1		15 μs 5	$(43/2^+)$	08			IT=100	
^{179}Ta	−50357.8	0.9				1.75 y 0.07	$7/2^+$	08	20Ve.A	T	ε=100	*
^{179}Ta^m	−50327.1	0.9	30.7	0.1		1.42 μs 0.08	$9/2^-$	08			IT=100	
^{179}Ta^n	−49837.6	0.9	520.23	0.18		280 ns 80	$1/2^+$	08	FGK128	J	IT=100	
^{179}Ta^p	−49105.2	0.9	1252.60	0.23		322 ns 16	$21/2^-$	08	97Ko13	J	IT=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{179}Ta^q	−49040.6	1.0	1317.2	0.4	9.0 ms 0.2	$25/2^+$	08	97Ko13	J	IT=100	
^{179}Ta^r	−49029.8	1.0	1328.0	0.4	1.6 μs 0.4	$23/2^-$	08	97Ko13	J	IT=100	
^{179}Ta^x	−47718.5	1.0	2639.3	0.5	54.1 ms 1.7	$37/2^+$	08	97Ko13	J	IT=100	
^{179}W	−49296	15			37.05 m 0.16	$7/2^-$	08			β^+=100	
^{179}W^m	−49074	15	221.91	0.03	6.40 m 0.07	$1/2^-$	08			IT=99.71 4;β^+=0.29 4	
^{179}W^n	−47664	15	1631.90	0.08	390 ns 30	$21/2^+$	08	94Wa05	J	IT=100	
^{179}W^p	−45948	15	3348.41	0.14	750 ns 80	$35/2^-$	08	94Wa05	J	IT=100	
^{179}Re	−46584	25			19.5 m 0.1	$5/2^+$	08			β^+=100	
^{179}Re^m	−46519	25	65.35	0.09	95 μs 25	$(5/2^-)$	08			IT=100	
^{179}Re^n	−44760#	60#	1822#	50#	408 ns 12	$(23/2^+)$	08			IT=100	*
^{179}Re^p	−41176	25	5408.0	0.5	466 μs 15	$(47/2,49/2^+)$	08	15Ko14	J	IT=100	
^{179}Os	−43020	16			6.5 m 0.3	$1/2^-$	08			β^+=100	
^{179}Os^m	−42875	16	145.41	0.12	500 ns	$(7/2)^-$	08			IT=100	
^{179}Os^n	−42777	16	243.0	0.8	783 ns 14	$(9/2)^+$	08			IT=100	
^{179}Ir	−38081	10			79 s 1	$(5/2)^-$	08			β^+=100	
^{179}Ir^m	−37880#	100#	200#	100#	> 100 ns	$9/2^-$#				IT ?;β^+ ?	
^{179}Pt	−32268	8			21.2 s 0.4	$1/2^-$	08			β^+=?;α=0.24 3	
^{179}Au	−24986	10			7.19 s 0.19	$1/2^+$*	08	23Cu04	J	β^+ ?;α=22.0 9	*
^{179}Au^m	−24897	10	89.5	0.3	328 ns 2	$(3/2^-)$		21Gi08	ETD	IT=100	*
^{179}Au^p	−24865	14	121	10		$(9/2^-)$		22Ve01	JD	IT=100	*
^{179}Au^q	−23249	14	1737	10	2.16 μs 0.08	$(19/2^+)$		22Ba42	ETJ	IT=100	*
^{179}Hg	−16971	17			1.082 s 0.016	$7/2^-$*	08	12Ve04	D	α=75 4;β^+=?;β^+p=0.21 3	*
^{179}Hg^m	−16800	17	171.4	0.4	6.4 μs 0.9	$13/2^+$	08	02Je09	JTE	IT=100	*
^{179}Tl	−8270	40			437 ms 9	$1/2^+$*	08			α=60 2;β^+ ?	*
^{179}Tl^m	−7410#	40#	860#	20#	1.41 ms 0.02	$(11/2^-)$	08	26Zh42	D	α=75 10;IT=25 10	*
^{179}Tl^n	−7370	40	904.5	0.9	119 ns 14	$(9/2^-)$		17Ba46	TJD	IT=100	*
^{179}Pb	2070	80			2.7 ms 0.2	$(9/2^-)$	10	17Ba46	TJD	α=100	*
*^{179}Lu	J : 98Ge13=7/2										**
*^{179}Hf	T : 21Br09>2.7 Ey 20Ca15>550 Py to 9/2$^-$; 20Ca15>250 Ey to 7/2$^-$; 20Da04>2.2 Ey										**
*^{179}Hf	J : 56Sp22=9/2										**
*^{179}Hf	D : from IS=13.63(0.03) in 24Ci.A										**
*^{179}Hf^n	T : average 19Kr06=24.91(0.27) 70KaZV=25.3(0.3) 73Ch18=24.8(0.3). other: 70Hu04=29(1)										**
*^{179}Ta	T : from 639(26) d, unweighted average 20Ve.A=664.9(3.5) d 74Ch53=588(10) d 74NaYW=664.9(1.4) d; Birge ratio=5.39										**
*^{179}Re^n	E : from 1772.20(0.22) + x keV; x=50#(50#) estimated by NUBASE										**
*^{179}Au	T : average 21Ha32=7.3(0.3) 80Da09=6.9(0.3) 68De01=8.1(0.7) 68Si01=7.2(0.5); others: 21Ha32=7.1(1.2) [γ(t)] 96Pa01=3.3(1.3)										**
*^{179}Au	J : 23Cu04,18Cu04=1/2										**
*^{179}Au^m	T : average 21Gi08=322(9) 11Ve01=328(2)										**
*^{179}Au^p	E : from E_α(1/2$^+$)=6454.3(8.7) and E_α(9/2$^-$)=6335.7(5.0) of ^{183}Tl^m decay, average of 80Sc09=6449(15),6343(10) 04Ra28=6456(15),6333(10) 11Ve01=6334(11)										**
*^{179}Au^p	E : 22Ve01=6458(15),6333(9)										**
*^{179}Au^q	E : from 1615.9(0.4) keV above 179Aup in 22Ba42, based on 243.0-keV, 350.6-keV and 1022.1-keV γs in a cascade										**
*^{179}Hg	J : 19Se04,18Ma.1=7/2										**
*^{179}Hg	T : average 25Sp01=1.01(0.13) 24Hu14=1.10(0.02) 02Ko09=1.00(0.05) 02Ro17=1.08(0.09) 96Pa01=0.929(0.114) 71Ha03=1.09(0.04); other:										**
*^{179}Hg	T : 82HeZM=1.3(+0.5-0.8)										**
*^{179}Hg	D : %α others: 82HeZM=55(25) 79Ha10,71Ha03∼53; %β^+p from I(p)/I(a)=0.0028(0.0004) in 71Ho07 and I(a)=75 4 (12Ve04)										**
*^{179}Hg^m	E : 02Je09=60.6(0.2), 110.8(0.3) γs in a cascade to gs										**
*^{179}Hg^m	J : favored α decay from ^{183}Pbm (J$^\pi$=13/2$^+$); other: M2 γ to 9/2$^-$ followed by M1 γ to 7/2$^-$ in 02Je09										**
*^{179}Tl	T : average 17Ba46=426(10) 11Ko.B=489(21) 02Ro17=415(55); others: 13An10t=265(10) 98To14=230(40) 83Sc24=160(+90-40)										**
*^{179}Tl	J : 17Ba04=1/2; favored α decay to ^{175}Au (J$^\pi$=1/2$^+$)										**
*^{179}Tl	D : %α from 13An10										**
*^{179}Tl^m	J : from favored α decay to ^{175}Au^m [J$^\pi$=(11/2$^-$)]										**
*^{179}Tl^m	T : average 17Ba46=1.40(0.03) 11Ko.B=1.36(0.04) 10An01=1.46(0.04); others: 02Ro17=1.7(0.2) 98To14=1.8(0.4) 96Pa01=0.7(+6-4) 83Sc24=1.4(0.5)										**
*^{179}Tl^m	E : from systematics of know J$^\pi$=11/2$^-$, $\pi h_{11/2}$ states in ^{177}Tl [807(18) keV], ^{181}Tl [896.9(1.1) keV] and ^{183}Tl [905.69(0.23) keV]										**
*^{179}Tl^n	T : symmetrized from 17Ba46=114(+18-10)										**
*^{179}Pb	T : other: 10An01=3.5(+1.4-0.8)										**
^{180}Er	−33180#	500#			2# s >550ns	0^+	21	18Fu08	I	β^- ?;β^-n ?	
^{180}Tm	−38170#	400#			3# s >300ns		15			β^- ?;β^-n ?	
^{180}Yb	−44812	25			2.4 m 0.5	0^+	15			β^-=100	
^{180}Lu	−46680	70			5.7 m 0.1	5^+	15			β^-=100	
^{180}Lu^m	−46670	70	13.9	0.3	∼1 s	3^-		95Me03	JT	IT ?;β^- ?	
^{180}Lu^n	−46060	70	624.0	0.5	> 1 ms	(9^-)	15	01Wh02	EJT	IT=100	
^{180}Hf	−49779.8	0.9			STABLE	0^+	15			IS=35.12 16;α ?	*
^{180}Hf^m	−48638.2	0.9	1141.552	0.015	5.530 h 0.011	8^-	15	FGK259	T	IT=99.69 8;β^-=0.31 8	*
^{180}Hf^n	−48405.4	0.9	1374.36	0.04	570 ns 20	4^-	15	15Ko14	J	IT=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{180}Hf^{p}	−47294.3	1.0	2485.5	0.5		940 ns 110	12^+	15	16Ta23	T	IT=100	
^{180}Hf^{q}	−46180.8	1.3	3599.0	1.0		90 μs 10	(18^-)	15			IT=100	
^{180}Ta	−48936.0	1.6				8.154 h 0.006	1^+	15			ε=85 3;β^-=15 3	
^{180}Ta^{m}	−48858.7	1.5	77.3	0.4	IT	STABLE >290Py	9^-		23Ar11	T	IS=0.01176 23;IT ?;β^- ?;ε ?	*
^{180}Ta^{n}	−47483.6	1.6	1452.39	0.22		31.2 μs 1.4	15^-	15			IT=100	
^{180}Ta^{p}	−45257.1	1.9	3678.9	1.0		2.0 μs 0.5	(22^-)	15			IT=100	
^{180}Ta^{q}	−44763.8	2.3	4172.2	1.6		17 μs 5	(24^+)	15	00Wh04	EJ	IT=100	
^{180}W	−49636.5	0.9				1.59 Ey 0.05	0^+	15	14Mu15	TD	IS=0.12 1;α≈100;2β^+ ?	*
^{180}W^{m}	−48107.5	0.9	1529.05	0.04		5.47 ms 0.09	8^-	15			IT=100	
^{180}W^{n}	−46371.8	0.9	3264.7	0.3		2.33 μs 0.19	14^-	15	15Ko14	TEJ	IT=100	
^{180}Re	−45838	20				2.46 m 0.03	$(1)^-$	15			β^+=100	
^{180}Re^{m}	−45750#	40#	90#	30#		> 1# μs	$(4^+,5^+)$	15	05El10	J	IT≈100;β^+ ?	
^{180}Re^{n}	−42280#	40#	3561#	30#		9.0 μs 0.7	21^-	15	05El10	TJD	IT=100	*
^{180}Os	−44356	16				21.5 m 0.4	0^+	15			β^+=100	
^{180}Ir	−37978	22				1.5 m 0.1	(5^+)	15			β^+=100	
^{180}Pt	−34431	10				56 s 3	0^+	15	20Cu02	D	β^+=?;α=0.52 5	
^{180}Au	−25626	5				7.9 s 0.3	(1^+)*	15	20Ha24	JTD	β^+=?;α=0.58 10	*
^{180}Hg	−20251	12				2.589 s 0.008	0^+	15	24Hu14	T	β^+ ?;α=48.0 17	*
^{180}Tl	−9260#	110#				1.09 s 0.01	(4^-)*	15	17Ba04	J	β^+=?;α=7 3;β^+SF=0.0030 3	*
^{180}Tl^{p}	−8560#	150#	700#	100#			10^-#					
^{180}Pb	−1937	12				4.1 ms 0.3	0^+	15			α=100	
^{180}Bi	11900#	300#				1# ns					α ?;p?	
*^{180}Hf	T : 21Br09>460 Py to 2^+, 20Da04>1 Ey to 2^+											**
*^{180}Hf	D : from IS=35.12(0.16) in 24Ci.A											**
*^{180}Hf^{m}	D : %β^- from 85Ke02=0.29(0.05,stat)(0.06,syst)											**
*^{180}Hf^{n}	T : other: 16Ta23=520(80)											**
*^{180}Hf^{n}	I : 99Da09 (same group as 16Ta23) reported a 15(5) μs, J^π=(10^+) isomer at 2425.8(1.0) keV, but it was retracted by 16Ta23											**
*^{180}Ta^{m}	T : from 23Ar11 with 15.4(2.7)Ey (β^-), 13.3(2.2)Ey (ε), 0.63(0.08)Ey (γ), 0.29(0.04)Ey (IC), 11.3(2.2) (α); others: 23Ce02>1.1 Ey (β^-), 1.6 Ey											**
*^{180}Ta^{m}	T : (ε), 4.1 Py (IC) 17Le01>45 Py with 58 Py (β^-), 200 Py (ε); β^-: 06Hu15>17 Py 85Cu03>1.9 Py; ε: 06Hu15>12 Py 85Cu03>3.0 Py											**
*^{180}Ta^{m}	D : from IS=0.01176(0.00023) in 24Ci.A											**
*^{180}W	T : others (α): 04Co26=1.8(0.2) Ey 03Da05=1.1(+0.8-0.4,stat)(0.3,syst); 2ν-εε(K):16An14>31 Ey 09Be27>0.66 Py; 0ν-εε: 16An14>9.4 Ey;											**
*^{180}Re^{n}	E : 3471.8(0.6) keV above ^{180}Re^{m} in 05El10											**
*^{180}Au	T : average 20Ha24=7.2(0.5) 77Hu05=8.1(0.3); other: 93BoZK=9.7(0.6)											**
*^{180}Hg	T : average 24Hu14=2.53(0.04) 13KoZR=2.60(0.01) 00Ko48=2.59(0.02) 93Wa03=2.56(0.02); others: 96Pa01=2.6(0.8) 86Si19=2.6(0.3) 77Hu05=3.0(0.3)											**
*^{180}Hg	T : 70Hu18=2.9(0.3) 68De01=5.9(0.8)											**
*^{180}Hg	D : %α: average 99To11=48(2) 86Si19=47(5) 82HeZM=49(5)											**
*^{180}Tl	D : %α from 03An27=(2-12)%; %β^+SF from %β^+SF/%β^+=0.0032(0.0002) in 13El08, supersedes 10An13=0.0036(0.0007) and %β^+=93(7); other:											**
*^{180}Tl	D : 98To14∼1.0e-4											**
*^{180}Tl	T : from 10An13=1.09(0.01); others: 13KoZR=1.1(0.2) 87La23=0.7(+1.2-0.9) 98To14=1.5(0.2)											**
^{181}Tm	−35440#	500#				7# s >300ns	$1/2^+$#	13	12Ku26	I	β^- ?;β^-n ?	
^{181}Yb	−41500	25				1# m >300ns	$3/2^-$#	13	09St16	I	β^- ?	
^{181}Lu	−44800	130				3.5 m 0.3	$7/2^+$#	05			β^-=100	
^{181}Hf	−47403.3	0.9				42.39 d 0.06	$1/2^-$	05			β^-=100	
^{181}Hf^{m}	−46808.0	0.9	595.27	0.04		80 μs 5	$9/2^+$	05	01Sh36	T	IT=100	
^{181}Hf^{n}	−46359.8	1.2	1043.5	0.8		∼ 100 μs	$(17/2^+)$	05			IT=100	
^{181}Hf^{p}	−45661.4	1.6	1741.9	1.3		1.5 ms 0.5	$(25/2^-)$	05			IT=100	
^{181}Ta	−48439.5	1.5				STABLE	$7/2^+$*	05			IS=99.98824 23	*
^{181}Ta^{m}	−48433.3	1.5	6.237	0.020		6.05 μs 0.12	$9/2^-$*	05			IT=100	*
^{181}Ta^{n}	−47824.3	1.5	615.19	0.03		18 μs 1	$1/2^+$	05			IT=100	
^{181}Ta^{p}	−47012	14	1428	14		140 ns 36	$19/2^+$#	05	98Sa60	ITD	IT=100	*
^{181}Ta^{q}	−46956.1	1.5	1483.43	0.21		25.2 μs 1.8	$21/2^-$	05	98Wh02	T	IT=100	*
^{181}Ta^{r}	−46211.6	1.7	2227.9	0.9		210 μs 20	$29/2^-$	05	98Wh02	J	IT=100	
^{181}W	−48234.2	0.9				120.956 d 0.019	$9/2^+$	05	14Un01	T	ε=100	*
^{181}W^{m}	−47868.6	0.9	365.55	0.13		14.59 μs 0.15	$5/2^-$	05			IT=100	
^{181}W^{n}	−46581.2	0.9	1653.0	0.3		200 ns 13	$21/2^+$	05	93YeZX	ET	IT=100	
^{181}Re	−46517	13				19.4 h 0.5	$5/2^+$*	05	20Al21	T	β^+=100	*
^{181}Re^{m}	−46254	13	262.91	0.11		156.7 ns 1.9	$9/2^-$	05			IT=100	
^{181}Re^{n}	−44861	13	1656.37	0.14		250 ns 10	$21/2^-$	05			IT=100	
^{181}Re^{p}	−44636	13	1880.57	0.16		11.5 μs 0.9	$25/2^+$	05			IT=100	
^{181}Re^{q}	−42648	13	3869.40	0.18		1.2 μs 0.2	$(35/2^-)$	05			IT=100	
^{181}Os	−43550	25				105 m 3	$1/2^-$	05			β^+=100	
^{181}Os^{m}	−43501	25	49.20	0.14		2.7 m 0.1	$7/2^-$	05			β^+=100	
^{181}Os^{n}	−43393	25	156.91	0.15		262 ns 6	$9/2^+$	05			IT=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{181}Ir	−39475	9				4.90 m 0.15	$5/2^-$	05			β^+=100	
^{181}Ir^m	−39186	9	289.33	0.13		298 ns	$5/2^+$	05			IT=100	
^{181}Ir^n	−39109	9	366.30	0.22		126 ns 6	$9/2^-$	05			IT=100	
^{181}Pt	−34382	14				52.0 s 2.2	$1/2^-$*	05	95Bi01	D	β^+=?;α=0.074 10	*
^{181}Pt^m	−34265	14	116.65	0.08		> 300 ns	$7/2^-$	05	90De03	J	IT=100	
^{181}Pt^n	−34106	14	275.99	0.10		99 ns 9	$9/2^+$		90De03	TD	IT=100	*
^{181}Au	−27871	20				13.7 s 0.3	$(3/2^-)$	05	20Se13	J	β^+=?;α=2.7 5	*
^{181}Au^p	−27869	20	1.80	0.10			$(5/2^-)$		20Se13	E	IT ?	*
^{181}Hg	−20657	15				3.44 s 0.18	$1/2^-$*	05			β^+=?;α=24.3 21;β^+p=0.014 3; $\beta^+\alpha$=9e-6 3	*
^{181}Hg^m	−20450	50	210	50	IT	474 μs 16	$13/2^+$		09An17	T	IT=100	*
^{181}Tl	−12799	9				2.9 s 0.1	$1/2^+$*	09	18Cu04	TD	β^+ ?;α=8.6 6	*
^{181}Tl^m	−11963	9	835.9	0.4		1.40 ms 0.03	$(9/2^-)$	09	09An14	EDT	IT=99.60 4;α=0.40 6;β^+ ?	*
^{181}Pb	−3080	60				39.0 ms 0.8	$(9/2^-)$	05	09An20	TJ	α=100;β^+ ?	*
^{181}Pb^m			*non − exist*		RN		$13/2^+$#		96To01	I		
^{181}Bi	7740#	200#				30# ns	$1/2^+$#				α ?;p?	
*^{181}Ta	J : 33Gi02,33Mc01=7/2											**
*^{181}Ta	D : from IS=99.98824(0.00023) in 24Ci.A											**
*^{181}Ta^m	J : 06Bi14=9/2											**
*^{181}Ta^p	E : 1403.2(0.6) + x keV with x<50 keV in 98Sa60											**
*^{181}Ta^p	J : most likely E1 for γ to the 1403.2-keV (J^π=17/2$^-$) level, as proposed in 98Dr09, and hence J^π=19/2$^+$; 98Sa60 suggests J^π=15/2$^-$											**
*^{181}Ta^p	J : for the 1403.2-keV level, but then J^π=19/2$^+$ seems unlikely, since the depopulating γ would be M2 and much longer half-life would be											**
*^{181}Ta^p	J : expected											**
*^{181}Ta^q	T : average 98Wh02=25(2) 98Dr09=23(+6-2)											**
*^{181}W	T : average 14Un01=121.03(0.07) 73My02=120.95(0.02); other: 72Em01=121.53(0.09), outlier											**
*^{181}Re	T : average 20Al21=19.0(1.2), average of 19.4(2.3),18.5(2.1),18.5(2.4) and 20.2(3.0), 68Sc27=19.9(0.7) 63Gr22=18(1) 69Hu03=20.9(1.9) 57Ga10=20(2)											**
*^{181}Re	J : 78Ru04,75Ru06=5/2											**
*^{181}Pt	J : 99Le52=1/2											**
*^{181}Pt^n	T : average 90De03=110(20),96(10)											**
*^{181}Au	J : other: favored α decay to ^{177}Ir (J^π=3/2$^-$)											**
*^{181}Au	D : %α from 95Bi01=2.7(0.5);other: 79Ha10=1.04(0.15)											**
*^{181}Au	T : average 95Bi01=10.8(3.3),14.2(1.1),12.7(2.4),15.1(0.5),13.3(1.7), 14.1(2.0),14.3(0.5) 79Ha10=13(3) 68De01=12.0(1.2),11.0(0.8)											**
*^{181}Au	T : 68Si01=11.5(1.0); other: 70Ha18∼10											**
*^{181}Au^p	E : from a least-squares fit to E_γ in 20Se13											**
*^{181}Hg	J : 19Se04,18Ma.1,76Bo09=1/2											**
*^{181}Hg	D : %α average 04An07=24(3) 79Ha10=23(4) 75Ho07=26(4); %β^+p from I(p)/I(α)=5.0(0.8)e-4 in 71Ho07; %$\beta^+\alpha$ from I(α)/I(β^+)=1.2e-7 in 75Ho02											**
*^{181}Hg	T : average 82HeZM=3.2(0.7) 79Ha10=3.3(0.4),3.4(0.3) 70Ha18,69Ha03=3.6(0.3)											**
*^{181}Hg^m	T : average 09An17=460(30),480(20); other: 26Zh42=500(90)											**
*^{181}Tl	J : 17Ba04=1/2											**
*^{181}Tl	T : others: 98To14=3.2(0.3) 92Bo.D=3.4(0.6)											**
*^{181}Tl^m	T : others: 98To14=1.4(0.5) 84Sc.A=2.7(1.0)											**
*^{181}Pb	T : average 09An20=36(2) 05Ca.A=39.6(0.9); other: 96To01=45(20) 89To01=50(+40-30) from same group											**
^{182}Tm	−31330#	500#				400# ms			24Ta07	I	β^- ?;β^-n ?	
^{182}Yb	−39054	26				30# s >300ns	0^+	15	12Ku26	I	β^- ?	
^{182}Lu	−41930#	200#				2.0 m 0.2	1^-#	15			β^-=100	
^{182}Hf	−46050	6				8.90 My0.09	0^+	15	04Vo16	T	β^-=100	
^{182}Hf^m	−44877	6	1172.87	0.18		61.5 m 1.5	8^-	15	15Ko14	J	β^-=54 2;IT=46 2	*
^{182}Hf^n	−43479	6	2571.3	1.2		40 μs 10	(13^+)	15			IT=100	
^{182}Ta	−46431.1	1.5				114.74 d 0.12	3^-	15			β^-=100	
^{182}Ta^m	−46414.8	1.5	16.273	0.004		283 ms 3	5^+	15			IT=100	
^{182}Ta^n	−45911.5	1.5	519.577	0.016		15.84 m 0.10	10^-	15			IT=100	
^{182}Ta^p	−44480.5	1.5	1950.58	0.17		247 ns 11	14^+		16Pa.A	EJT	IT=100	
^{182}Ta^q	−44348.4	1.5	2082.7	0.3		< 208 ns	(14^-)		16Pa.A	EJT	IT=100	
^{182}W	−48246.2	0.7				STABLE >7.7Zy	0^+	15	04Co26	T	IS=26.50 16;α ?	*
^{182}W^m	−46015.5	0.7	2230.65	0.14		1.3 μs 0.1	10^+	15	15Ko14	J	IT=100	
^{182}Re	−45450	100			*	64.2 h 0.5	7^+*	15			β^+=100	
^{182}Re^m	−45386	20	60	100	BD*	14.14 h 0.45	2^+*	15			β^+=100	
^{182}Re^n	−45150	140	296	100		585 ns 30	$(2)^-$	15			IT=100	*
^{182}Re^p	−44930	140	521	100		780 ns 90	(4^-)	15			IT=100	*
^{182}Os	−44609	22				21.84 h 0.20	0^+	22			ε=100	*
^{182}Os^m	−42778	22	1831.4	0.3		780 μs 70	8^-	22	15Ko14	J	IT=100	*
^{182}Os^n	−37560	22	7049.5	0.4		146 ns 9	25^+	22	15Ko14	J	IT=100	*
^{182}Ir	−39052	21				15.0 m 1.0	3^+	15			β^+=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{182}Ir^m	−38981	21	71.02	0.17		170 ns 40	$(5)^+$	15			IT=100	
^{182}Ir^n	−38876	21	176.4	0.3		130 ns 50	(6^-)	15			IT=100	
^{182}Pt	−36169	13				2.67 m 0.12	0^+	15			β^+=?;α=0.038 2	*
^{182}Au	−28306	19				16.43 s 0.12	(2^+)*	15	25Mi06	TD	β^+=?;α=0.129 11	*
^{182}Au^m	−28170	19	137	26	AD	20# s	5^-#		FGK209	IJ	$\beta^+\approx$100;IT ?	*
^{182}Hg	−23578	10				10.78 s 0.16	0^+	15	24Hu14	T	β^+=?;α=13.8 4;β^+p=5e-6 3	*
^{182}Tl	−13331	11			*&	1.9 s 0.1	(4^-)*	15	16Va01	TD	$\beta^+\approx$99.5;α>0.49;β^+SF<3.4e-6	*
^{182}Tl^m	−13280#	50#	50#	50#	*&	3.1 s 1.0	(7^+)*		91Bo22	TD	β^+=?;α=2.5 14	*
^{182}Tl^p	−12830#	100#	500#	100#			10^-#					
^{182}Pb	−6829	12				57 ms 4	0^+	15	24Hu14	T	$\alpha\approx$100;β^+ ?	*
^{182}Bi	6200#	300#				300# ns			24Hu14	I	α ?;p ?	*
*^{182}Hf^m	J : E1 γ to 8^+											**
*^{182}W	T : 04Co26>7.7 Zy; others: 03Da05>170 Ey 03Ce01>25 Ey 97Ge15>8.3 Ey											**
*^{182}Re^n	E : 235.732(0.022) keV above ^{182}Re^m											**
*^{182}Re^p	E : 461.3(0.1) keV above ^{182}Re^m											**
*^{182}Os	T : average 76Ka22=22.0(0.2) 73Sv01=22.10(0.25) 69Hu03=22.6(2.4) 60Ne03=21.1(0.3) 58Fo47=21.9(0.1); others: 63Gr22=20.0(0.2) 50St89=24(1)											**
*^{182}Os	T : (outliers)											**
*^{182}Os^m	TD : 66Bu08=780(70)											**
*^{182}Os^n	T : average 89Al19=150(10) 88Ch27=130(20)											**
*^{182}Pt	D : %α from 95Bi01=0.038(0.002)											**
*^{182}Au	T : others: 95Bi01=14.5(1.3)(for β^+), 15.3(1.0)(for A), 92Ro21=15.6(0.4) 79Ha10=20(2) 72Fi12=22.1(1.3) 70Ha18=19(2)											**
*^{182}Au	D : %α average 25Mi06=0.129(0.011) 95Bi01=0.13(0.05); other: 79Ha10=0.038(0.008)											**
*^{182}Au	J : from 20Ha24=(2)											**
*^{182}Au^m	IJ : direct β^+ feeding to 4^+ and 5^+ levels in ^{182}Pt in 99Da18 indicates the existence of a high-spin isomer;											**
*^{182}Au^m	IJ : probable conf=π3/2[532]$\otimes\nu$7/2[633]											**
*^{182}Hg	D : %α average 97Ba21=13.3(0.5) 92HeZM=15.5(2.8) 80Sc09=15.2(0.8); %β^+p from 71Ho07<1e-5											**
*^{182}Hg	T : average 24Hu14=10(1) 93Wa03=10.83(0.06) 92Ro21=11.3(0.2) 72Fi12=11.2(1.0) 70Ha18,69Ha03=11.3(0.5) 68De01=9.6(0.2); Birge ratio=2.97											**
*^{182}Tl	J : 17Ba04=(4)											**
*^{182}Tl^m	J : 17Ba04=(7)											**
*^{182}Tl^m	D : %α from 91Bo01<5%											**
*^{182}Tl^m	T : other: 92Bo.D=2.8(0.6)[α], 2.0(0.3) [β^+]											**
*^{182}Pb	T : average 24Hu14=62(8) 99To11=55(5);other: 87To09=55(+40-35)											**
*^{182}Bi	I : searched for, but not observed in 24Hu14											**
^{183}Tm	−28340#	400#				2# s			24Ta07	I	β^- ?;β^-n ?	
^{183}Yb	−35115	25				30# s >300ns	$3/2^-$#	15	12Ku26	I	β^- ?	
^{183}Lu	−39720	80				58 s 4	$7/2^+$#	15			β^-=100	
^{183}Hf	−43280	30				1.019 h 0.002	$(3/2^-)$	15	26Do01	T	β^-=100	*
^{183}Hf^m	−41820	70	1464	64		40 s 30	$27/2^-$#		10Re07	ETJ	IT$\approx$100;β^- ?	*
^{183}Ta	−45294.0	1.5				5.1 d 0.1	$7/2^+$*	15			β^-=100	*
^{183}Ta^m	−45220.8	1.5	73.164	0.014		109 ns 3	$9/2^-$	15	26Do01	T	IT=100	*
^{183}Ta^n	−44794	23	500	23		42 μs 5	$(1/2^+)$		26Do01	ETJ	IT=100	*
^{183}Ta^p	−43962.0	1.6	1332.0	0.4		838 ns 92	$19/2^+$	15	16Pa.A	ETJ	IT=100	*
^{183}W	−46365.7	0.7				STABLE >670Ey	$1/2^-$*	15			IS=14.31 4;α ?	*
^{183}W^m	−46056.2	0.7	309.492	0.004		5.30 s 0.08	$11/2^+$	15			IT=100	
^{183}Re	−45810	8				70.0 d 1.4	$5/2^+$*	15			ε=100	
^{183}Re^m	−43903	8	1907.21	0.15		1.04 ms 0.04	$25/2^+$	15	15Ko14	J	IT=100	
^{183}Os	−43670	50				13.0 h 0.5	$9/2^+$*	15			β^+=100	*
^{183}Os^m	−43500	50	170.73	0.07		9.9 h 0.3	$1/2^-$*	15			β^+=85 2;IT=15 2	
^{183}Ir	−40211	21				58 m 5	$5/2^-$	15	61Di04	T	$\beta^+\approx$100;α ?	*
^{183}Pt	−35774	14				6.5 m 1.0	$1/2^-$*	15			β^+=?;α=0.0096 5	*
^{183}Pt^m	−35739	14	34.74	0.07		43 s 5	$7/2^-$*	15			β^+=96.9 8;IT=3.1 8	*
^{183}Pt^n	−35578	14	195.90	0.10		> 150 ns	$9/2^+$	15			IT=100	
^{183}Au	−30191	9				42.8 s 1.0	$5/2^-$*	15			β^+=?;α=0.8 2	*
^{183}Au^m	−30118	9	73.10	0.01		> 1 μs	$(1/2)^+$	15	17Ve04	E	IT=100	
^{183}Au^n	−29960	9	230.6	0.6		< 1 μs	$(11/2)^-$				IT=100	
^{183}Hg	−23805	7				8.98 s 0.18	$1/2^-$*	15	22Hu09	TD	β^+=?;α=23.7 7;β^+p=2.6e-4 6	*
^{183}Hg^m	−23605	12	201	12	AD	290 μs 30	$13/2^+$#		22Hu09	TD	IT=100	
^{183}Tl	−16588	9				6.9 s 0.7	$1/2^+$*	15			$\beta^+\approx$100;α ?	*
^{183}Tl^m	−15959	9	628.70	0.30		53.3 ms 0.3	$9/2^-$	15	22Ve01	EDT	IT=98.55 21;α=1.45 21	*
^{183}Tl^n	−15613	9	975.5	0.4		1.48 μs 0.10	$(13/2^+)$	15	01Mu26	TDE	IT=100	
^{183}Pb	−7615	17				535 ms 29	$3/2^-$*	15	24Hu14	T	$\alpha\approx$100;β^+ ?	*
^{183}Pb^m	−7526	17	89	6	AD	422 ms 19	$13/2^+$*	15	24Hu14	T	$\alpha\approx$100;β^+ ?;IT ?	
^{183}Bi	2470#	110#				200# ns	$1/2^+$#		24Hu14	I	α ?;p ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{183}Po	13600#	300#				70# μs	$9/2^-$#				α ?	
*^{183}Hf	T : average 26Do01=1.02(0.14) 06Vo12=1.018(0.002) 67Mo13=1.05(0.05) 66Ba06=1.067(0.017) 60Po01=1.10(0.07) 56Ga46=1.07(0.05)											**
*^{183}Hf^m	T : symmetrized from 10Re07=10(+48-5), value for q=71$^+$ (H+ like ion); the actual half-life could be shorter											**
*^{183}Ta	J : 63Do13=7/2											**
*^{183}Ta^m	J : E1 γ to 7/2$^+$; conf=π9/2[514]											**
*^{183}Ta^m	T : average 26Do01=106(27) 2016Pa.A=109(3) 09Sh17=101(20) 67Mo13=107(11)											**
*^{183}Ta^n	E : from 459.06 + x keV with x<80 keV in 26Do01											**
*^{183}Ta^n	T : symmetrized from 26Do01=41(+6-4)											**
*^{183}Ta^p	T : average 16Pa.A=832(97) 09Sh17=900(300)											**
*^{183}W	J : 48Ko30,50Fo08=1/2											**
*^{183}Os	J : 75Ru06,78Ru04=9/2											**
*^{183}Os^m	J : 75Ru06,78Ru04=1/2											**
*^{183}Ir	T : average 61Di04=55(7) 61La05=60(6)											**
*^{183}Pt	J : 92Hi07,99Le52=1/2											**
*^{183}Pt	D : %α from 95Bi01=0.0096(0.0005)											**
*^{183}Pt^m	J : 99Le52=7/2											**
*^{183}Au	J : 89Wa11,94Pa37=5/2											**
*^{183}Au	D : %α from 95Bi01=0.8(0.2);other: 70Ha18=0.30(0.05)											**
*^{183}Au	T : average 95Bi01=44.6(2.0),51(7),36(10),39(10) 70Ha18=42(4) 70Ma24=42.0(1.2) 68Si01=45(4); others: 68De01=50(2)											**
*^{183}Hg	J : 19Se04,18Ma.1,76Bo09,72Bo09,72OtZX=1/2											**
*^{183}Hg	D : %β^+p from 71Ho07=I(p)/I(a)=2.2(0.3)e-5; %α from 22Hu09											**
*^{183}Hg	T : average 22Hu09=8.9(0.2) 92BoZO=10.7(0.8) 70Ha18=8.8(0.5); other: 84Ma41=12(2)											**
*^{183}Tl	J : 17Ba04,13Ba41=1/2											**
*^{183}Tl	T : 92BoZO,92BlZW=6.9(0.7); other: 92BoZO=6.9(1.4)											**
*^{183}Tl^m	D : %α average 22Ve01=1.4(0.3) 06An11=1.5(0.3)											**
*^{183}Tl^m	EJ : from 22Ve01: E_γ=356.5(0.2) keV,E3 272.2(0.2) keV,M1+E2 in a cascade											**
*^{183}Tl^m	T : from 04Ra28=53.3(0.3); others: 22Ve01=55(3) 80Sc09=60(15)											**
*^{183}Pb	J : 09Se13,07De09=3/2											**
*^{183}Pb	T : average 24Hu14=537(94) 02Je09=535(30)											**
*^{183}Pb^m	J : 09Se13,07De09=13/2											**
*^{183}Pb^m	T : average 24Hu14=489(63) 02Je09=415(20); other: 87To09=300(80)											**
*^{183}Bi	I : searched for, but not observed in 24Hu14											**
^{184}Tm	−23950#	300#				210# ms			26Pi.2	I	β^- ?	
^{184}Yb	−32320	40				7# s	>300ns	0^+	13 12Ku26	I	β^- ?	
^{184}Lu	−36400#	200#				20 s	3	(3^+)	09 95Kr04	TJ	β^-=100	
^{184}Hf	−41440	30				4.12 h	0.05	0^+	09		β^-=100	
^{184}Hf^m	−40170	30	1272.2	0.4		48 s	10	8^-	09 12Re.A	D	IT≈100;β^- ?	*
^{184}Hf^n	−38960	30	2477	10		16 m	7	15$^+$#	10Re07	ET	β^- ?;IT ?	*
^{184}Ta	−42777	7				8.7 h	0.1	(5^-)	09		β^-=100	
^{184}W	−45705.5	0.7				STABLE	>8.9Zy	0^+	09 04Co26	T	IS=30.64 2;α ?	
^{184}W^m	−44420.5	0.7	1284.997	0.008		8.33 μs	0.18	5^-	09		IT=100	
^{184}W^n	−41577.8	0.9	4127.7	0.5		188 ns	38	(14^+)	09 15Ko14	JE	IT=100	
^{184}Re	−44220	4				35.42 d	0.14	3^-	09 22La12	T	β^+=100	*
^{184}Re^m	−44032	4	188.0463	0.0017		177.25 d	0.07	8^+	09 22Ja13	T	IT=74.5 8;ε=25.5 8	*
^{184}Os	−44252.6	0.8				11.2 Ty	2.3	0^+	09 14Pe22	T	IS=0.02 2;α ?;2β^+ ?	*
^{184}Ir	−39634	11				3.090 h	0.008	(5^-)*	09 22Ma25	T	β^+=100	*
^{184}Ir^m	−39408	11	225.65	0.11		470 μs	30	3^+	09		IT=100	
^{184}Ir^n	−39306	11	328.40	0.24		350 ns	90	7^+	09		IT=100	*
^{184}Pt	−37333	15				17.3 m	0.2	0^+	09 95Bi01	D	β^+=?;α=0.0017 7	
^{184}Pt^m	−35493	15	1840.3	0.8		1.01 ms	0.05	8^-	09		IT=100	*
^{184}Au	−30319	22				20.6 s	0.9	5$^+$*	09		β^+≈100;α ?	*
^{184}Au^m	−30250	22	68.46	0.04		47.6 s	0.6	2$^+$*	09		β^+=?;IT=30 10;α=0.013 3	*
^{184}Hg	−26345	10				30.87 s	0.26	0^+	09 80Sc09	D	β^+=?;α=1.11 6	*
^{184}Tl	−16881	10			*	9.41 s	0.17	2$^-$*	09 16Va01	TD	β^+=?;α=1.22 30	*
^{184}Tl^m	−16930	30	−50	30	AD*	10.6 s	0.5	(7^+)	16Va01	JTD	β^+=?;α=0.47 6	*
^{184}Tl^n	−16430	30	450	30	AD	47.1 ms	0.7	(10^-)	15Va10	TD	IT=?;α=0.089 19	*
^{184}Pb	−11052	13				490 ms	25	0^+	09 04An07	D	α=80 11;β^+ ?	*
^{184}Bi	1210#	150#			*&	6.6 ms	1.5	3$^+$#	09		α=100	
^{184}Bi^m	1220#	150#	10#	140#	*&	13 ms	2	10$^-$#	09		α=100	
^{184}Po	9390#	200#				3# μs		0^+			α ?	
*^{184}Hf^m	E : other: 10Re07=1264(10)											**
*^{184}Hf^m	T : others: 12Re19=113(+60-47) 10Re07=113(+74-40) for q=72$^+$ (bare ion)											**
*^{184}Hf^m	J : from 15Ko14											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{184}Hf^n$	T : symmetrized from 12Re19=12(+8-6) for q=72^+; supersedes 10Re07=12(+10-4)							**
$*^{184}Re$	T : average 22La12=35.43(0.16) 06Ha51,08HaZP=35.4(0.3), average of 35.1(0.5), 36.0(0.9) and 35.6(0.5); others: 65Bl06=34(5) 63Jo03=33(3)							**
$*^{184}Re$	T : 62Dz04=38.0(0.5) 60Bo07=38(1)							**
$*^{184}Re^m$	J : E5 γ to 3^-							**
$*^{184}Re^m$	T : others: 63Jo03=169(8) 65Bl06=166(12) 64Ha06=160							**
$*^{184}Os$	T : α decay half-life from 14Pe22; others: 2ν-$\varepsilon\varepsilon$(KK): 21Be20,19Be27>30 Py; 2ν-$\varepsilon\varepsilon$(KL): 21Be20,19Be27>20 Py							**
$*^{184}Ir$	T : average 22Ma25=3.09(0.01),3.08(0.03) 82Al34=3.14(0.02) 81Ha33=3.08(0.03),3.01(0.03) 72Fi12=3.02(0.06); others: 60Ba43=3.1(0.3)							**
$*^{184}Ir$	T : 60Ma28=2.6(0.6) 61Di04=3.2(0.2)							**
$*^{184}Ir$	J : 06Ve10=5							**
$*^{184}Ir^n$	J : M2 γ to 5^-							**
$*^{184}Pt^m$	T : other: 17Pr03=0.86(0.10)							**
$*^{184}Au$	T : average 97Za03=21(1) 92St16=19(2); other: 90Ed01=12(2) conflicting							**
$*^{184}Au$	J : 97Le22=5							**
$*^{184}Au^m$	D : %α from 95Bi01=0.013(0.003);other: 70Ha18=0.022(0.004)							**
$*^{184}Au^m$	T : average 97Za03=48(1) 95Bi01=37(7),49(7),47(2),41(5) 92St16=45(1) 73Fi12=53.0(1.4) 70Ha18=47(3); other: 69Ha03=60(6)							**
$*^{184}Au^m$	J : 97Le22=2							**
$*^{184}Hg$	D : %α other: 70Ha18=1.25(0.20)							**
$*^{184}Tl$	J : 13Ba41=2							**
$*^{184}Tl$	T : average 17Ra11=8.9(0.4) 16Va01=9.5(0.2) 93BoZK=9.7(0.6); others: 76To06=10(2)[α(t)] and 11(2) [$\beta-\gamma$(t)] 76Co24=11(1)							**
$*^{184}Tl$	D : %α other: 76To06=2.1(0.7)							**
$*^{184}Tl^m$	T : average 76Co24=11(1), based on ce-γ-time events below 8^+ state in ^{180}Hg, 16Va01,17Ra11=10.1(0.5), using laser-ionization data							**
$*^{184}Tl^n$	E : 15Va10,16Va01=506.1(0.1) keV above $^{184}Tl^m$							**
$*^{184}Tl^n$	T : other: 16Va01=47(5) [α(t)]							**
$*^{184}Pb$	D : %α average 04An07=80(15) 03Va16=80(15)							**
^{185}Yb	−28130# 200#		5# s >300ns	$9/2^-$#	13	12Ku26	I β^- ?	
^{185}Lu	−33860# 300#		20# s >300ns	$7/2^+$#	13	09St16	I β^- ?	
^{185}Hf	−38320 60		3.5 m 0.6	$3/2^-$#	05	93Yu01	T β^-=100	
^{185}Ta	−41394 14		49.4 m 1.5	$(7/2^+)$	05		β^-=100	
$^{185}Ta^m$	−40988 14	406 1	900 ns 300	$(3/2^+)$	05	07Sh42	ETJ IT=100	
$^{185}Ta^n$	−40121 14	1273.4 0.4	11.8 ms 1.4	$21/2^-$	05	09La17	EJT IT=100	
^{185}W	−43387.9 0.7		75.1 d 0.3	$3/2^-*$	05		β^-=100	*
$^{185}W^m$	−43190.5 0.7	197.383 0.023	1.597 m 0.004	$11/2^+$	05	94It.A	T IT=100	
^{185}Re	−43819.1 0.8		STABLE	$5/2^+*$	05		IS=37.40 5	*
$^{185}Re^m$	−41695.0 0.9	2124.1 0.4	200 ns 4	$25/2^+$	05	06Le.A	EJT IT=100	*
^{185}Os	−42805.9 0.8		92.95 d 0.09	$1/2^-$	05	12Kr05	T ε=100	
$^{185}Os^m$	−42703.5 0.8	102.37 0.11	3.0 μs 0.4	$7/2^-$	05	FGK128	J IT=100	*
$^{185}Os^n$	−42530.4 0.8	275.53 0.12	780 ns 50	$11/2^+$	05		IT=100	
^{185}Ir	−40336 28		14.4 h 0.1	$5/2^-*$	05		β^+=100	*
$^{185}Ir^m$	−38140 40	2197 23	120 ns 20	$(23/2,25/2)$#	05		IT=100	*
^{185}Pt	−36688 26		70.9 m 2.4	$9/2^+*$	05	91Bi04	D β^+=?;α=0.0050 20	*
$^{185}Pt^m$	−36585 26	103.41 0.05	33.0 m 0.8	$1/2^-*$	05		$\beta^+\approx$100;IT ?	*
$^{185}Pt^n$	−36487 26	200.89 0.04	728 ns 20	$5/2^-$	05		IT=100	
^{185}Au	−31870 7		4.24 m 0.06	$5/2^-*$	05	80Ek04	J β^+=?;α=0.26 6	*
$^{185}Au^m$	−31846 7	23.6 0.1	6.8 m 0.3	$1/2^+$	05	82Bo27	JED β^+=?;IT=?	*
$^{185}Au^n$	−30366 7	1504.2 0.4	630 ns 80	$19/2^+$#		25Fu07	JET IT=100	
^{185}Hg	−26184 14		49.1 s 1.0	$1/2^-*$	05		β^+=?;α=6 1	*
$^{185}Hg^m$	−26080 14	103.7 0.4	21.6 s 1.5	$13/2^+*$	05	13Sa43	E IT=54 10;β^+=?;$\alpha\approx$0.03	*
^{185}Tl	−19756 21		19.5 s 0.5	$1/2^+*$	05	13Ba41	J $\beta^+\approx$100;α ?	
$^{185}Tl^m$	−19301 21	454.70 0.22	1.93 s 0.08	$9/2^-*$	05	13Ba41	J IT=?;α=?;β^+ ?	*
^{185}Pb	−11538 16	*	6.3 s 0.4	$3/2^-*$	05		β^+=?;α=34 25	*
$^{185}Pb^m$	−11470 50	70 50	AD* 4.07 s 0.15	$13/2^+*$	05	02An15	T α=50 25;β^+ ?	*
^{185}Bi	−2156 13		3.6 μs 1.7	$1/2^+$	05	96Da06	J p=91.0 14;α=9.0 14	*
$^{185}Bi^m$	−2067# 16#	89# 9#	58.0 μs 1.8	$(7/2^-,9/2^-)$		21Do08	TJE IT=100	*
$^{185}Bi^n$	*non − exist*		RN 50 μs 10	$13/2^+$#		04An07	ITD p ?;α ?	*
^{185}Po	7850# 200#		700# μs	$3/2^-$#			α ?	
^{185}At	19690# 300#		100# μs	$1/2^+$#			α ?;p ?	
$*^{185}W$	J : 63Do13=3/2							**
$*^{185}Re$	J : 54Ja16,31Me01,31Ze01=5/2							**
$*^{185}Re^m$	T : others: 97Sh37=123(23) 02Pf01=120(15)							**
$*^{185}Re^m$	E : from 15Ko14							**
$*^{185}Os^m$	J : E1 γ from $9/2^+$							**
$*^{185}Ir$	J : 78Ru04,75Ru06=5/2							**
$*^{185}Ir^m$	E : 2157.3(0.5) + x keV; x<80 keV							**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{185}$Pt	J : 92Hi07,99Le52=9/2												**
$*^{185}$Pt	D : %α from E_α=4444(10) keV in 91Bi04												**
$*^{185}$Pt^m	J : 92Hi07,99Le52=1/2												**
$*^{185}$Au	D : %α from 95Bi01=0.26(0.06);other: 70Ha18=0.093(0.020)												**
$*^{185}$Au	T : average 95Bi01=3.8(0.3),4.2(0.1) 70Ha18=4.2(0.3) 70FiZZ=4.2(0.2) 68Si01=4.3(0.1) 68De01=4.3(0.2) 53Ra02=4.3(0.2)												**
$*^{185}$Au	J : also 78Ek05,78EkZW,76EkZX=5/2												**
$*^{185}$Au^m	T : from 70FiZZ, based on 145γ(t)												**
$*^{185}$Au^m	D : IT from 82Bo27												**
$*^{185}$Hg	J : 19Se04,18Ma.1,76Bo09,72Bo09,72OtZX=1/2												**
$*^{185}$Hg^m	J : 19Se04,18Ma.1,79Kr11=13/2												**
$*^{185}$Hg^m	D : %IT from 82Bo27; %α from 76Gr.A=I(5365α)/IT=0.00043 and 80ToZZ=I(5372α)/I(α)=0.8												**
$*^{185}$Tl^m	E : from 169.2(0.1) keV + 285.5(0.2) keV γs in a cascade in 13Sa43												**
$*^{185}$Pb	J : 09Se13=3/2												**
$*^{185}$Pb^m	T : average 02An15=4.3(0.2) 80Sc09=3.73(0.24) (excluding the 6.1 s activity)												**
$*^{185}$Pb^m	J : 09Se13=13/2												**
$*^{185}$Bi	T : symmetrized from 21Do08=2.8(+2.3-1.0)												**
$*^{185}$Bi	D : %p average 21Do08=92(2) 04An07=90(2); %α average 21Do08=8(2) 04An07=10(2)												**
$*^{185}$Bi^m	T : average 21Do08=58(2) 04An07=60(4) 01Po05=50(8); other: 96Da06=44(16)												**
$*^{185}$Bi^m	E : 74(1) + x keV above ^{185}Bi; x<30# keV estimated by NUBASE												**
$*^{185}$Bi^n	I : not confirmed in 21Do08												**
^{186}Yb	−25090#	300#				580#	ms	0^+		24Ta07	I	β^- ?;β^-n ?	
^{186}Lu	−30310#	300#				6#	s >300ns		22	12Ku26	I	β^- ?;β^-n ?	
^{186}Hf	−36420	50				2.6	m 1.2	0^+	22	98Yu02	T	β^-=100	
^{186}Hf^m	−33450	70	2968	43		> 20	s	17^+#	22	10Re07	ET	β^- ?;IT ?	*
^{186}Ta	−38610	60				10.53	m 0.22	5^-#	22	21Wa39	TJ	β^-=100	*
^{186}Ta^m	−38510#	70#	100#	40#		1.54	m 0.05	2^-#	22	04Xu08	TD	β^-=?;IT ?	*
^{186}Ta^n	−38260	60	347.9	0.2		17	s 2	9^+#	22	21Wa39	ETD	IT=100;β^- ?	*
^{186}W	−42508.6	1.2				STABLE	>4.1Ey	0^+	22	03Da09	T	IS=28.43 19;2β^- ?;α ?	*
^{186}W^m	−40991.4	1.3	1517.2	0.6		18	μs 1	7^-	22	12La.A	J	IT=100	
^{186}W^n	−38965.8	2.4	3542.8	2.1		2.0	s 0.2	16^+	22	12La.A	TJ	IT=100	*
^{186}Re	−41927.3	0.8				3.7185	d 0.0005	1^-*	22	FGK204	T	β^-=92.50 10;ε=7.50 10	*
^{186}Re^m	−41779.1	0.9	148.2	0.5		~ 200	ky	(8^+)	22	15Ma60	E	IT≈100;β^- ?	
^{186}Re^n	−41747.1	1.1	180.2	0.7		~ 3#	ms	(6^-)				IT=100	*
^{186}Os	−43000.0	0.8				2.0	Py 1.1	0^+	22	75Vi01	T	IS=1.59 64;α=100	
^{186}Ir	−39172	17				16.64	h 0.03	5^+*	22	82Al34	T	β^+=100	*
^{186}Ir^m	−39171	17	0.8	0.4		1.90	h 0.05	2^-	22	91Be25	ETD	β^+=?;IT=25 3	*
^{186}Pt	−37864	22				2.10	h 0.05	0^+	22	91Be25	T	β^+=100;α≈1.4e-4	
^{186}Au	−31715	21				10.7	m 0.4	3^-*	22	76Ek01	J	β^+=?;α=0.0008 2	*
^{186}Au^m	−31670#	40#	50#	30#		> 1#	μs	6^-#		92Ja01	I	IT ?;β^+ ?	*
^{186}Au^n	−31487	21	227.77	0.07		110	ns 10	2^+	22	85Ab03	T	IT=100	
^{186}Hg	−28540	12				1.38	m 0.06	0^+	22	70Ha18	TD	β^+=?;α=0.016 5	*
^{186}Hg^m	−26323	12	2217.3	0.4		86	μs 5	(8^-)	22			IT=100	*
^{186}Tl	−19898	15			&	3.5	s 0.5	(2^-)	22	20St11	TDJ	β^+ ?;α=?	*
^{186}Tl^m	−19853	19	45	15	AD &	27.7	s 0.9	7^+*	22			β^+≈100;α≈0.006	*
^{186}Tl^n	−19478	19	419	15	IT	3.40	s 0.09	10^-*	22	20St11	TD	IT<94.4;β^+ ?	*
^{186}Pb	−14682	11				4.81	s 0.03	0^+	22			β^+ ?;α=38 9	*
^{186}Bi	−3150	17			*	14.8	ms 0.7	3^+#	22	13La02	D	α≈100;β^+ ?;β^+SF≈0.011	*
^{186}Bi^m	−2980#	100#	170#	100#	*	9.8	ms 0.4	10^-#	22	13La02	D	α≈100;β^+ ?;β^+SF≈0.011	*
^{186}Po	4099	19				34	μs 12	0^+	22	13An13	T	α=100	*
^{186}At	17800#	200#				100#	μs					α ?;p ?	
$*^{186}$Hf^m	T : for q=72^+ (bare ion) in 10Re07; the actual half-life could be shorter												**
$*^{186}$Ta	T : average of 55Po43=10.5(0.5) 60Po01=10.6(0.5) 70Pa16=10.5(0.5) 99Ya10=10.0(1.0) (supersedes 98Yu02=10.3(1.0)) 04Xu08=10.4(0.5)												**
$*^{186}$Ta	T : 21Wa39=10.8(0.5); other: 95ItZY=10.390 (0.027)												**
$*^{186}$Ta^m	T : other: 70Pa16=1.6 m, originally attributed to ^{186}W^m; not confirmed in 21Wa39, presumably to the production favoring the high spin state												**
$*^{186}$Ta^n	T : others: 12Re19=3.0(+1.5-0.8) m for q=72^+(H+ like ion); supersedes 10Re07=3.4(+2.4-1.4) m; 04Xu08=1.54(0.05) m not confirmed in 21Wa39												**
$*^{186}$Ta^n	E : other: 10Re07=336(20)												**
$*^{186}$W	T : the limit given is for 2β^- decay; α decay: 04Co26>8.2 Zy 03Da05>170 Ey 03Ce01>27 Ey 97Ge15>6.5 Ey												**
$*^{186}$W^n	T : others: 12Re19=7.5(+4.8-3.3) for q=72^+, 3 ms < 98Wh02 < 30 s												**
$*^{186}$Re	J : 63Do13=1												**
$*^{186}$Re^n	T : using 32 keV M2 γ to ^{186}Re^m and B(M2)=0.00377 W.u. for a similar ν11/2[615]→ν7/2[503] decay in ^{187}Os by NUBASE												**
$*^{186}$Ir	J : 75Ru06,78Ru04=5												**
$*^{186}$Ir^m	J : from 90Ed01=2												**
$*^{186}$Ir^m	D : %IT from 91Be25=20-30%												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{186}$Au	D : %α from 95Bi01=0.0008(0.0002)												**
$*^{186}$Au	T : average 95Bi01=10(2) 70Jo02=10.7(0.5) 72Fi12=11.0(1.0); other: 60Al20$\sim$12												**
$*^{186}$Au	J : 78Ek05,76Ek01=3												**
$*^{186}$Au^m	I : floated, strongly-coupled band in 92Ja01; conf=π3/2[532]$\otimes\nu$9/2[624],$K^\pi=6^-$, same as gs where $K^\pi=3^-$												**
$*^{186}$Hg	T : average 70Ha18=1.42(0.10) 70FiZZ=1.33(0.10) 69Ha03=1.38(0.13)												**
$*^{186}$Hg^m	T : average 92Po01=100(10) 84JaZS=82(5)												**
$*^{186}$Tl	T : symmetrized from 20St11=3.4(+0.5-0.4)												**
$*^{186}$Tl^m	D : %α from 77Ij01, supersedes 76Ij01=0.06(0.02); α-decay branch also discussed in 20St11												**
$*^{186}$Tl^m	T : average 77Co21=27.5(1.0) 77Be23=28(2) 76To06=30(5); others: 74Ha10=48(3)												**
$*^{186}$Tl^m	J : 13Ba41=7												**
$*^{186}$Tl^n	E : 20St11=374.2(0.1) keV above ^{186}Tl^m												**
$*^{186}$Tl^n	J : 13Ba41=10												**
$*^{186}$Pb	T : average 94Wa23=4.83(0.03) 80Sc09=4.79(0.05) 84To09=4.7(0.1)												**
$*^{186}$Pb	D : %α from 99An22=38(9); others: 97An09=50(25) 97Ba25=45(20)												**
$*^{186}$Bi	T : average 03An27=14.8(0.8) 97Ba21=15.0(1.7)												**
$*^{186}$Bi	D : %β^+SF 13La02=0.022 13 for both isomers												**
$*^{186}$Bi^m	T : average 03An27=9.8(0.4) 97Ba21=9.8(1.3)												**
$*^{186}$Bi^m	D : %β^+SF 13La02=0.022 13 for both isomers												**
$*^{186}$Po	T : symmetrized from 13An13=28(+16-6)												**
^{187}Yb	−20640#	300#				3#	s	$3/2^-$#		24Ta07	I	β^- ?;β^-n ?	
^{187}Lu	−27470#	300#				7#	s >300ns	$7/2^+$#	22	12Ku26	I	β^- ?	
^{187}Hf	−33000#	200#				14#	s >300ns	$9/2^-$#	22	99Be63	I	β^- ?	
^{187}Hf^m	−32500#	280#	500#	200#		270	ns 80	$3/2^-$#	22	09Al30	TD	IT=100	*
^{187}Ta	−36900	60				283	s 10	$(7/2^+)$	22	22Mu10	TJ	β^-=100	*
^{187}Ta^m	−35110	60	1778	1		7.3	s 0.9	$(25/2^-)$	22	20Wa29	ETJ	IT≈100;β^- ?	*
^{187}Ta^n	−33970	60	2935	14		136	s 24	$41/2^+$#	22	25Ch10	TD	β^-=?;IT ?	*
^{187}W	−39904.0	1.2				23.809	h 0.025	$3/2^-*$	22	19Kr02	T	β^-=100	*
^{187}W^m	−39493.9	1.2	410.06	0.04		1.41	μs 0.06	$11/2^+$	22	25Ch10	T	IT=100	*
^{187}Re	−41216.5	0.7				41.6	Gy 0.4	$5/2^+*$	08	01Be81	T	IS=62.60 5;β^-=100;α=0	*
^{187}Re^m	−41010.3	0.7	206.2473	0.0010		555.3	ns 1.7	$9/2^-$	08			IT=100	
^{187}Re^n	−39534.5	0.9	1682.0	0.6		354	ns 62	$21/2^+$	08	16Re02	ETJ	IT=100	
^{187}Os	−41219.0	0.7				STABLE	>3.2Py	$1/2^-*$	08	24Be17	T	IS=1.96 17;α ?	*
^{187}Os^m	−41118.6	0.7	100.45	0.04		112	ns 6	$7/2^-$	08			IT=100	
^{187}Os^n	−40961.9	0.7	257.10	0.07		231	μs 2	$11/2^+$	08			IT=100	
^{187}Ir	−39549	28				10.5	h 0.3	$3/2^+*$	08			β^+=100	*
^{187}Ir^m	−39363	28	186.16	0.04		30.3	ms 0.6	$9/2^-$	08			IT=100	
^{187}Ir^n	−39115	28	433.75	0.06		152	ns 12	$11/2^-$	08			IT=100	
^{187}Ir^p	−37061	28	2487.7	0.4		1.8	μs 0.5	$29/2^-$		10Mo09	ETJ	IT=100	
^{187}Pt	−36686	24				2.35	h 0.03	$3/2^-*$	08			β^+=100	*
^{187}Pt^m	−36512	24	174.38	0.22		311	μs 15	$11/2^+$	08			IT=100	*
^{187}Au	−33030	22				8.3	m 0.2	$1/2^+*$	08			β^+≈100;α ?	
^{187}Au^m	−32910	22	120.33	0.14		2.3	s 0.1	$9/2^-*$	08	20Ba29	J	IT=100	
^{187}Au^n	−30360	22	2669.8	1.0		100	ns 5	$31/2^-$	08	89Jo02	TDE	IT=100	*
^{187}Hg	−28119	13				1.9	m 0.3	$3/2^-*$	08	70Ha18	TD	β^+=100;α ?	*
^{187}Hg^m	−28061	15	58	14	MD	2.4	m 0.3	$13/2^+*$	08	70Ha18	D	β^+=100;α ?	*
^{187}Tl	−22447	8				$\sim$51	s	$1/2^+$	08			β^+≈100;α ?	
^{187}Tl^m	−22110	8	337	4	AD	15.60	s 0.12	$9/2^-*$	08	13Ba41	J	IT=?;β^+=?;α=0.15 5	
^{187}Tl^n	−20570#	50#	1875#	50#		1.12	μs 0.06		08	24Gu20	T	IT=100	*
^{187}Tl^p	−19865	8	2582.5	0.3		693	ns 38	$29/2^+$#	08	00By02	T	IT=100	*
^{187}Pb	−14987	5			*	15.2	s 0.3	$3/2^-*$	08	02An19	D	β^+=?;α=9.5 20	*
^{187}Pb^m	−14968	11	19	10	MD*	18.3	s 0.3	$13/2^+*$	08	99An36	D	β^+=?;α=12 2	*
^{187}Pb^n	−14679	5	307.9	0.1		5.15	μs 0.15	$(7/2^-)$		22Zh22	TEJ	IT=100	
^{187}Bi	−6384	10				37.6	ms 1.7	$(9/2^-)*$	08			α=100	*
^{187}Bi^m	−6275	11	108	8	AD	370	μs 20	$1/2^+$	08			α=100	*
^{187}Bi^n	−6132	10	252	3		7	μs 5	$(13/2^+)$	08	02Hu14	ETJ	IT=100	*
^{187}Po	2789	23			*	1.40	ms 0.25	$1/2^-,5/2^-$	08	06An11	TJ	α≈100;β^+ ?	*
^{187}Po^m	2788	27	−1	26	AD*	0.5	ms	$13/2^+$#		06An11	ETD	α≈100;β^+ ?	
^{187}At	13700#	200#				300#	μs	$1/2^+$#				α ?;p ?	
$*^{187}$Hf^m	D : from 232 keV and 264 keV γ's reported in 09Al30 (by NUBASE)												**
$*^{187}$Ta	T : other: 12Re19,10Re07=138(36) for q=73^+ (bare ion)												**
$*^{187}$Ta	J : other: 20Wa29=($7/2^+$), conf=π7/2[404]												**
$*^{187}$Ta^m	T : others: 12Re19,10Re07=22(9) for q=73^+ (bare ion)												**
$*^{187}$Ta^m	E : others: 12Re19=1793(10) 10Re07=1789(13)												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{187}$Ta^n	T : from 25Ch10=137(30),134(41); others: 10Re07,12Re19>5 m for q=73$^+$ (bare ion)											**
$*^{187}$Ta^n	E : from 10Re07=2935(14)											**
$*^{187}$W	T : average 19Kr0=23.80(0.03) 64An02=23.72(0.06) 57Wr37=24.04(0.09) 53Ei02=23.85(0.08)											**
$*^{187}$W	J : 63Do13=3/2											**
$*^{187}$W^m	T : average 25Ch10=1.54(0.13) 08Bo26=1.31(0.08) 05Sh26=1.55(0.13)											**
$*^{187}$W^m	J : E1 γ to 9/2$^-$; l(d,p)=(6)											**
$*^{187}$Re	T : recommended in 01Be81, based on 96Sm.A data, in agreement with 01Ga01=41.2(1.1) (direct measurement); other: 96Bo37=32.9(2.0) y for q=75$^+$											**
$*^{187}$Re	T : (bare ion)											**
$*^{187}$Re	J : 54Ja16,31Me01,31Ze01=5/2											**
$*^{187}$Os	T : from 24Be17,20Be23 for $T_{1/2}(\alpha,1/2^-\rightarrow3/2^-)$											**
$*^{187}$Os	J : 61Gu08,55Mu45=1/2											**
$*^{187}$Ir	J : 78Ru04,75Ru06=3/2											**
$*^{187}$Pt	J : 92Hi07,78Ru04,75Ru06=3/2											**
$*^{187}$Pt^m	J : M2 γ to 7/2$^-$											**
$*^{187}$Au^n	T : average 97Pe26=102(5) 89Jo02=90(10)											**
$*^{187}$Hg	T : from 70Ha18; other: 98Ru04=2.4 m, but no uncertainty given											**
$*^{187}$Hg	J : 76Bo09,72OtZX,71Bo31=3/2											**
$*^{187}$Hg^m	T : from 70Ha18; other: 98Ru04=2.2 m, but no uncertainty given											**
$*^{187}$Hg^m	J : 79Kr11=13/2											**
$*^{187}$Tl^n	E : 1433.23(0.19)+191+201 + x keV; x=50#(50#) keV estimated by NUBASE											**
$*^{187}$Tl^n	T : average 24Gu20=1.13(0.10) 00By02=1.11(0.07)											**
$*^{187}$Pb	J : 09Se13=3/2											**
$*^{187}$Pb^m	J : 09Se13=13/2											**
$*^{187}$Pb^m	T : average 22Hu09=17.9(0.2) 81Mi02=18.3(0.3); others: 72Ga27=17.5(3.6) 74Le02=17(4)											**
$*^{187}$Bi	J : 21Ba45=(9/2$^-$); favored α decay to ^{183}Tl^m [J$^\pi$=(9/2$^-$)]											**
$*^{187}$Bi	T : average 06An11=40(2) 99Ba45=32(3) 03Ke08=35(+14-8)											**
$*^{187}$Bi^m	J : favored α decay to ^{183}Tl (J$^\pi$=1/2$^+$)											**
$*^{187}$Bi^n	T : symmetrized from 02Hu14=3.2(+7.6-2.0)											**
$*^{187}$Bi^n	E : 02Hu14=252 keV γ at the focal plane of RITU separator; uncertainty estimated by NUBASE											**
$*^{187}$Po	J : favored α decay to 286-keV level in ^{183}Pb (J$^\pi$=1/2$^-$,5/2$^-$), followed by 286(1) M1 γ to ^{183}Pb gs (J$^\pi$=3/2$^-$)											**
^{188}Lu	−23700#	400#				1# s	>300ns		18	12Ku26	I	β^- ?;β^-n ?	
^{188}Hf	−30830#	300#				7# s	>300ns	0$^+$	18	99Be63	I	β^- ?	
^{188}Ta	−33910#	200#				19.6 s	2.0	(1$^-$)	18			β^-=100	
^{188}Ta^m	−33810#	200#	99	33		19.6 s	2.0	(7$^-$)	18			IT ?;β^- ?	
^{188}Ta^n	−33520#	200#	391	33		3.1 μs	0.1	10$^+$#	18	22Mi.1	T	IT=100	*
^{188}W	−38668	3				69.77 d	0.05	0$^+$	18	14Un01	T	β^-=100	
^{188}W^m	−36741	3	1926.7	0.8		109.5 ns	3.5	8$^-$	18			IT=100	
^{188}Re	−39016.9	0.7				17.005 h	0.003	1$^-$*	18			β^-=100	
^{188}Re^m	−38844.8	0.7	172.0848	0.0024		18.59 m	0.04	6$^-$	18			IT=100	
^{188}Os	−41137.3	0.7				STABLE	>3.3Ey	0$^+$	18	24Be17	T	IS=13.24 27;α ?	*
^{188}Ir	−38345	9				41.5 h	0.5	1$^-$*	18			β^+=100	
^{188}Ir^m	−37381	25	964	23		4.15 ms	0.15	11$^-$#	18			IT≈100;β^+ ?	*
^{188}Pt	−37821	5				10.16 d	0.18	0$^+$	18			ε=100;α=2.6e-5 3	
^{188}Au	−32371.3	2.7				8.84 m	0.06	1$^-$*	18			β^+=100	*
^{188}Hg	−30199	7				3.25 m	0.15	0$^+$	18			β^+=100;α=3.7e-5 8	
^{188}Hg^m	−27475	7	2724.1	0.4		142 ns	14	12$^+$	18	83Ha15	T	IT=100	*
^{188}Tl	−22336	30			*	71 s	2	2$^-$#	18			β^+=100	
^{188}Tl^m	−22308	9	30	30	MD*	71.5 s	1.5	7$^+$*	18	13Ba41	J	β^+=100	*
^{188}Tl^n	−22040	40	299	30		41 ms	4	9$^-$	18			IT≈100;β^+ ?	*
^{188}Pb	−17812	10				25.5 s	0.1	0$^+$	18			β^+=?;α=8.5 5	
^{188}Pb^m	−15235	10	2577.2	0.4		800 ns	20	8$^-$	18			IT=100	
^{188}Pb^n	−15102	10	2709.8	0.5		94 ns	12	12$^+$				IT=100	
^{188}Pb^p	−13029	10	4783.4	0.7		440 ns	60	(19$^-$)	18			IT=100	
^{188}Bi	−7194	10				60 ms	3	1$^+$*	18	21Ba45	J	α≈100;β^+ ?;β^+SF=0.14 7	*
^{188}Bi^m	−7130	30	66	30	AD	100# ms		7$^+$#	18			α ?;β^+ ?;IT ?	*
^{188}Bi^n	−7040	30	153	30	AD	265 ms	15	(10$^-$)*	18	13La02	TD	α≈100;β^+ ?;β^+SF=0.46 9	*
^{188}Bi^p	−6790#	50#	400#	50#		250 ns	50		18	22Zh46	ET	IT=100	*
^{188}Po	−550	17				270 μs	30	0$^+$	18			α≈100;β^+ ?	
^{188}At	12160#	300#				360 μs	230	1$^+$#		25Ko13	TD	p=?;α=?	*
$*^{188}$Ta^n	T : others: 11St21=3.5(0.4) 05Ca02=5(2) 09Al30=4.4(1.0)												**
$*^{188}$Ta^n	E : from 05Ca02=292.4(0.2) keV above ^{188}Ta^m												**
$*^{188}$Os	T : from 24Be17,20Be23 for $T_{1/2}(\alpha,0^+\rightarrow2^+)$												**
$*^{188}$Ir^m	E : 923.53(0.22) + x; x<80 keV												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{188}$Au	J : 89Wa11,80Ek04,78Ek05,78EkZW,76Ek01=1											**
$*^{188}$Hg^m	T : average 83Ha15=134(15) 04Gl04=187(35)											**
$*^{188}$Tl^m	J : 92Me07,13Ba41=7											**
$*^{188}$Tl^n	E : from 91Va04=268.8(0.2) keV above ^{188}Tl^m											**
$*^{188}$Tl^n	J : M2 γ to ^{188}Tl^m											**
$*^{188}$Bi	D : %β^+SF from 20An12=0.18(0.07)-0.04(0.02); other: 13La02=0.32(0.16) for both β^+SF decaying isomers											**
$*^{188}$Bi	J : 21Ba45=1; Other: 20An12=(3$^+$) (α-decay hindrance)											**
$*^{188}$Bi	T : from 13La02, supersedes 06An04=66(6) 03An26=60(3); others: 97Wa05=46(7) 84Sc.A=44(3)											**
$*^{188}$Bi^m	T : 06An04>5 μs											**
$*^{188}$Bi^n	D : %β^+SF from 20An12; other: 13La02=0.32(0.16) for both β^+SF isomers											**
$*^{188}$Bi^n	J : 21Ba45=(10)											**
$*^{188}$Bi^n	T : from 13La02, supersedes 06An04=280(20) 03An26=265(15); others: 97Wa05=218(50) 84Sc.A=210(87)											**
$*^{188}$Bi^p	E : at least 243 keV above ^{188}Bi^n; no γ-γ coincidences											**
$*^{188}$At	T : symmetrized from 25Ko13=190(+350-80)											**
^{189}Lu	−20590#	300#				1# s	7/2$^+$#		23Ha31	I	β^- ?;β^-n ?	
^{189}Hf	−27150#	300#				400# ms	>300ns	3/2$^-$#	17 09Al30	I	β^-=100	
^{189}Ta	−31960#	200#				20# s	>300ns	(7/2$^+$)	17 99Be63	I	β^-=100	
^{189}Ta^m	−30650#	200#	1309	2		1.20 μs	0.07	(19/2$^+$)	17 25Sh11	TDEI	IT=100	*
^{189}Ta^n	−30520#	200#	1444	2		160 ns	20	(21/2$^-$)	17 25Sh11	TDEI	IT=100	*
^{189}W	−35640	30				11.6 m	0.2	9/2$^-$#	17		β^-=100	
^{189}Re	−37979	8				24.3 h	0.4	5/2$^+$	17		β^-=100	
^{189}Re^m	−37854	9	125	3		∼2# μs		9/2$^-$	76Hi08	EJ	IT ?	*
^{189}Re^n	−36208	8	1770.9	0.6		223 μs	14	29/2$^+$	17 16Re02	JTE	IT=100	
^{189}Os	−38986.8	0.7				STABLE	>3.5Py	3/2$^-$*	17 24Be17	T	IS=16.15 23;α ?	*
^{189}Os^m	−38956.0	0.7	30.82	0.02		5.81 h	0.10	9/2$^-$	17		IT≈100;β^- ?	
^{189}Ir	−38453	11				13.2 d	0.1	3/2$^+$*	17		ε=100	
^{189}Ir^m	−38081	11	372.17	0.04		13.3 ms	0.3	11/2$^-$	17		IT=100	
^{189}Ir^n	−36120	11	2332.8	0.3		3.7 ms	0.2	25/2$^+$	17 75Ke06	J	IT=100	
^{189}Pt	−36471	10				10.95 h	0.08	3/2$^-$*	17 22Ka04	T	β^+=100	*
^{189}Pt^m	−36298	10	172.79	0.06		464 ns	25	9/2$^-$	17		IT=100	
^{189}Pt^n	−36280	10	191.4	0.2		143 μs	5	(13/2$^+$)	17		IT=100	
^{189}Au	−33582	20				28.7 m	0.4	1/2$^+$*	17		β^+=100;α<3e-5	*
^{189}Au^m	−33335	20	247.25	0.16		4.59 m	0.11	11/2$^-$*	17		β^+=100;IT ?	*
^{189}Au^n	−33257	20	325.12	0.16		190 ns	15	9/2$^-$	17		IT=100	
^{189}Au^p	−31027	20	2554.8	0.8		242 ns	10	31/2$^+$	17		IT=100	
^{189}Hg	−29630	30				7.6 m	0.2	3/2$^-$*	17		β^+=100;α ?	
^{189}Hg^m	−29549	18	80	30	MD	8.6 m	0.2	13/2$^+$*	17		β^+=100;α ?	*
^{189}Tl	−24616	8				2.3 m	0.2	1/2$^+$	17		β^+=100	
^{189}Tl^m	−24331	8	285	6	AD	1.4 m	0.1	9/2$^-$*	17		β^+=100;IT ?	*
^{189}Pb	−17844	14				39 s	8	3/2$^-$*	17 09Sa09	T	β^+=?;α=0.42 15	*
^{189}Pb^m	−17804	14	40	4	AD	50.5 s	2.1	13/2$^+$*	17 74Ho26	D	β^+=?;α≈0.4	*
^{189}Pb^n	−15369	15	2475	4		26 μs	5	31/2$^-$	17 09Dr03	JE	IT=100	*
^{189}Bi	−10062	21				688 ms	5	9/2$^-$*	21 07DoZW	TD	α≈100;β^+ ?	*
^{189}Bi^m	−9883	21	179	5	AD	4.99 ms	0.07	1/2$^+$	21 07DoZW	T	α=83 5;IT=17 5	*
^{189}Bi^n	−9704	21	357.6	0.5		871 ns	24	13/2$^+$	21 22Zh46	T	IT=100	*
^{189}Po	−1418	22				3.5 ms	0.5	(5/2$^-$)	21 05Va04	T	α≈100;β^+ ?	*
^{189}At	8600#	200#				700# μs		1/2$^+$#			α ?;p ?	
$*^{189}$Ta^m	T : others: 11St21=0.58(0.22) 09Al30=1.6(0.2)											**
$*^{189}$Re^m	IJ : possible M2 γ to 5/2$^+$; existence of a similar isomer in ^{187}Re											**
$*^{189}$Re^m	T : estimated from B(M2)=0.7 (W.u.) for ^{187}Re^m											**
$*^{189}$Os	T : from 24Be17 for T$_{1/2}$(α,3/2$^-$→3/2$^-$)											**
$*^{189}$Os	J : 58Bl59,54Lo36,52Mu40=3/2											**
$*^{189}$Pt	J : 92Hi07,78Ru04,75Ru06=3/2											**
$*^{189}$Pt	T : average 22Ka04=11.0(0.1) 64Le07=10.87(0.12) 61An02=11.1(0.4)											**
$*^{189}$Au	J : 78Ek05,76Ek01=1/2											**
$*^{189}$Au^m	J : 78Ek05,76Ek01=11/2											**
$*^{189}$Hg^m	J : 79Da06,79Kr11=13/2											**
$*^{189}$Tl^m	J : 85Bo46,13Ba41,12Ba32=9/2											**
$*^{189}$Pb	J : 09Se13=3/2											**
$*^{189}$Pb	D : %α from 74Ho26											**
$*^{189}$Pb^m	T : average 09Sa09=50(3) 72Ga27=51(3)											**
$*^{189}$Pb^m	J : 09Se13=13/2											**
$*^{189}$Pb^n	E : 2434.50(0.18) keV above ^{189}Pb^m											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{189}Pb^n$	T : symmetrized from τ=32(+10-2) in 05Ba51											**
$*^{189}Bi$	J : 21Ba45,17Ba12,12Ba32,95Ba75=(9/2); favored α decay to $^{185}Tl^m$ [J^π=(9/2$^-$)]											**
$*^{189}Bi$	T : others: 03Ke08=580(25) 02Hu14=667(13) 97Wa05=728(40) 85Co06=680(30)											**
$*^{189}Bi^m$	J : favored α decay to ^{185}Tl (J^π=1/2$^+$)											**
$*^{189}Bi^m$	T : average 07DoZW=5.0(0.1) 99An52=5.0(0.1) 03An26=4.9(0.5) 03Ke08=4.6(+0.8-0.6) 97An09=4.8(0.5) 97Wa05=5.2(0.6); others: 95Ba75=7.0(2.0)											**
$*^{189}Bi^m$	T : 93An19=4(2) 84ScZQ~5											**
$*^{189}Bi^m$	D : from 03Ke08											**
$*^{189}Bi^n$	J : M2 γ to 9/2$^-$											**
$*^{189}Bi^n$	T : average 22Zh46=820(50) 07DoZW=888(32) 02Hu14=880(50); other: 01An11>360(120)											**
$*^{189}Po$	T : other: 99An52=5(1)											**
^{190}Lu	−16690#	400#				120# ms			24Ta07	I	β^- ?;β^-n ?	
^{190}Hf	−24800#	400#				600# ms >300ns	0^+	20	12Ku26	I	β^- ?	
^{190}Ta	−28720#	200#				5.3 s 0.7	(3)	20	09Al30	TJD	β^-=100	
^{190}W	−34390	30				30.0 m 1.5	0^+	20			β^-=100	
$^{190}W^m$	−32650	30	1743.6	1.0		111 ns 17	8^+	20	10La16	ETJ	IT=100	
$^{190}W^n$	−32550	30	1840.6	1.4		166 μs 6	10^-	20	10La16	ETJ	IT=100	*
^{190}Re	−35583	5				3.0 m 0.2	$(2)^-$	20			β^-=100	
$^{190}Re^m$	−35379	11	204	10		3.1 h 0.2	(6^-)	20	12Re19	E	β^-=54.4 20;IT=45.6 20	
^{190}Os	−38707.8	0.6				STABLE >12Ey	0^+	20	24Be17	T	IS=26.26 20;α ?	*
$^{190}Os^m$	−37002.1	0.6	1705.7	0.1		9.86 m 0.03	10^-	20	12Kr05	T	IT=100	*
^{190}Ir	−36753.6	1.4				11.7511 d 0.0020	4^-	20	24Ja07	T	β^+=100;e$^+$<0.002	*
$^{190}Ir^m$	−36727.5	1.4	26.1	0.1		1.120 h 0.003	1^-	20	96Ga30	TD	IT=100	*
$^{190}Ir^n$	−36717.4	1.4	36.154	0.025		> 2 μs	4^+	20	96Ga30	TD	IT=100	
$^{190}Ir^p$	−36377.2	1.4	376.4	0.1		3.087 h 0.012	11^-	20	96Ga30	TD	β^+=91.4 2;IT=8.6 2	*
^{190}Pt	−37306.5	0.7				483 Gy 3	0^+	20	FGK209	T	IS=0.012 2;α=100;2β^+ ?	
^{190}Au	−32834	3				42.8 m 1.0	1^-*	20			β^+=100;α<1e-6	*
$^{190}Au^m$	−32480#	100#	358#	100#		125 ms 20	11^-#	20	82Ne05	E	IT≈100;β^+ ?	*
^{190}Hg	−31373	16				20.0 m 0.5	0^+	20			β^+=100;α ?	
^{190}Tl	−24366	7				2.6 m 0.3	2^-*	20	13Ba41	J	β^+=100	*
$^{190}Tl^m$	−24296	5	70	7	MD	3.6 m 0.3	7^+*	20	13Ba41	J	β^+=100	
$^{190}Tl^n$			*non − exist*		EU	750 μs 40	(8^-)	20			IT=100	*
$^{190}Tl^p$	−24052	16	306	10	AD	60# ms	(9^-)	20	91Va04	EJT	IT=100	*
^{190}Pb	−20417	13				71 s 1	0^+	20			β^+=?;α=0.40 4	
$^{190}Pb^m$	−17802	13	2614.8	0.8		150 ns 14	10^+	20	01Dr05	J	IT=100	*
$^{190}Pb^n$	−17750#	50#	2665#	50#		24.3 μs 2.1	(12^+)	20			IT=100	*
$^{190}Pb^p$	−17759	13	2658.2	0.8		7.7 μs 0.3	11^-	20	01Dr05	JT	IT=100	*
^{190}Bi	−10611	15				6.3 s 0.1	$(3^+)*$	20	20An12	D	α=77 21;β^+=?;β^+SF ?	*
$^{190}Bi^m$	−10461	18	150	14	AD	6.2 s 0.1	10^-*	20	20An12	D	α=70 9;β^+=?;β^+SF=4e-6 3	*
$^{190}Bi^n$	−10490	21	121	15		175 ns 8	$(4^-,5^-)$	20	09An11	ET	IT=100	*
$^{190}Bi^p$	−10220	40	394	40		1.3 μs 0.8	(8^-)	20	09An11	EJT	IT=100	*
^{190}Po	−4564	13				2.45 ms 0.05	0^+	20			α=100;β^+ ?	
^{190}At	7190	60			&	2.1 ms 1.7	3^+#	23	23An09	T	α=100;β^+ ?	*
$^{190}At^m$	7350#	120#	170#	130#	&	4.4 ms 2.5	10^-#	23	23An09	T	α=100;β^+ ?	*
$*^{190}W^n$	T : others: 24Sa41=127(12) 11St21=108(9) 09Al30=106(18) 05Ca02=60(+1500-30) 00Po26<3.1 ms											**
$*^{190}W^n$	E : other: 00Po26=2381											**
$*^{190}Os$	T : from 24Be17,20Be23 for $T_{1/2}(\alpha,0^+\rightarrow2^+)$											**
$*^{190}Os^m$	J : M2+E3 γ to the 8$^+$ member of the K$^\pi$=0$^+$ gs band											**
$*^{190}Ir$	T : others: 75Ba35=11.78(0.10) 69Sa18=12.1(0.2) 63Gr22=11(1) 60Ka14=12/3(0.4) 55At32~11 50Ch11=12.6(0.3) 47Go01=10.7(0.3)											**
$*^{190}Ir^m$	J : M3 γ to 4$^-$; *l*(d,t)=1											**
$*^{190}Ir^p$	J : M4 γ to 7$^+$; conf=π11/2[505]$\otimes\nu$11/2[615] and *log* ft=4.94 to $^{190}Os^m$ (J^π=10$^-$, conf=ν9/2[505]$\otimes\nu$11/2[615]), consistent with											**
$*^{190}Ir^p$	J : ν9/2[505]$\rightarrow\pi$11/2$^-$[505] spin-flip transition											**
$*^{190}Au$	J : 66Ch05,64Li06=1											**
$*^{190}Au^m$	E : from 41, 47, 115 and 155 keV γs in a cascade in 82Ne05											**
$*^{190}Tl$	J : 13Ba41,92Me07=2											**
$*^{190}Tl^m$	J : 13Ba41,92Me07=7											**
$*^{190}Tl^n$	I : introduced in 81Kr20, but not confirmed in 91Va04 and 05Xi06											**
$*^{190}Tl^p$	E : 236(7) keV above $^{190}Tl^m$											**
$*^{190}Tl^p$	T : from BM2=5.2(0.6)e-6 (W.u.) for a similar isomer in ^{188}Tl; other: 91Va04>1 μs											**
$*^{190}Pb^m$	T : uncertainty from 12Dr.A											**
$*^{190}Pb^n$	E : x keV above $^{190}Pb^m$; x=50#(50#)											**
$*^{190}Pb^n$	T : uncertainty from 12Dr.A											**
$*^{190}Pb^p$	T : average 01Dr05=7.2(0.6) 85St16=7.9(0.4)											**
$*^{190}Bi$	D : %α symmetrized from 91Va04=90(+10-30)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{190}$Bi	J : 17Ba12=(3)											**
$*^{190}$Bi	T : from 88Hu03=6.3(0.1); others: 13Ny01=7.7(+1.0-0.8) 91Va04=6(+4-2),5.7(0.8)											**
$*^{190}$Bi^m	T : from 88Hu03=6.2(0.1); others: 13Ny01=5.9(+1.0-0.8) 91Va04=5.6(0.6) 72Ga27,74Le02=5.4(0.5)											**
$*^{190}$Bi^m	J : 17Ba12=(10); favored α decay to ^{186}Tl^n (J^π=10^-)											**
$*^{190}$Bi^m	D : %α from 91Va04; %β^+SF from $T_{1/2}(\beta^+SF)$=4.7(+22.6-3.5)e7 in 20An12											**
$*^{190}$Bi^n	J : E1 and M1(+E2) γs in a cascade to (3^+)											**
$*^{190}$Bi^n	E : from 45(15) + 76 keV above ^{190}Bi											**
$*^{190}$Bi^p	E : from 09An11=274(1) keV above ^{190}Bi^m											**
$*^{190}$Bi^p	T : symmetrized from 09An11=1.0(+1.0-0.5)											**
$*^{190}$At	T : symmetrized from 23An09=0.56(+2.69-0.26); other: 23Ko10=1.0(+1.4-0.4) combined for gs and isomer											**
$*^{190}$At^m	T : symmetrized from 23An09=2.67(+3.65-0.98); other: 23Ko10=1.0(+1.4-0.4) combined for gs and isomer											**
^{191}Hf	−21000#	300#				100# ms	>300ns	$1/2^-$#	23	23Ha31	I β^- ?;β^-n ?	
^{191}Ta	−26520#	300#				1.3 s	0.9	$7/2^+$#	23	23Lu.A	TD β^-=100	*
^{191}W	−31180	40				14# s	>300ns	$3/2^-$#	23	99Be63	I β^- ?	
^{191}W^m	−30950#	40#	235#	10#		340 ns	14	$9/2^-$#	23	11St21	ETDIT=100	*
^{191}Re	−34350	10				9.8 m	0.5	$(3/2^+)$	23	97Hi06	J β^-=100	*
^{191}Re^m	−34205	10	145	3		∼ 15# μs		$9/2^-$		FGK209	TIJ IT ?	*
^{191}Re^n	−32749	10	1601.5	0.4		50.6 μs	3.5	$25/2^-$	23	16Re02	EJT IT=100	*
^{191}Os	−36395.2	0.7				14.99 d	0.02	$9/2^-$	23	12Kr05	T β^-=100	
^{191}Os^m	−36320.8	0.7	74.382	0.003		13.10 h	0.05	$3/2^-$	23	75Ca03	T IT=100	*
^{191}Ir	−36708.8	1.3				STABLE		$3/2^+*$	23		IS=37.23 9	*
^{191}Ir^m	−36537.5	1.3	171.268	0.011		4.899 s	0.023	$11/2^-$	23		IT=100	*
^{191}Ir^n	−34607.8	1.6	2101.0	0.9		5.7 s	0.4	$31/2^{(+)}$	23	12Dr02	ETJ IT=100	*
^{191}Pt	−35698	4				2.83 d	0.02	$3/2^-*$	23		ε=100	*
^{191}Pt^m	−35597	4	100.668	0.020		> 1 μs		$9/2^-$	23	76Pi03	IT IT=100	*
^{191}Pt^n	−35549	4	149.040	0.022		103.8 μs	2.6	$13/2^+$	23		IT=100	*
^{191}Au	−33798	5				3.18 h	0.08	$3/2^+*$	23	67Jo06	T β^+=100	*
^{191}Au^m	−33532	5	266.1	0.7		920 ms	110	$11/2^-*$	23	71Be61	T IT=100	*
^{191}Au^n	−31308	5	2490.0	0.8		402 ns	20	$31/2^+$	23	97Pe26	T IT=100	*
^{191}Hg	−30593	22				49 m	10	$3/2^-*$	23	74Va19	T β^+=100;α ?	*
^{191}Hg^m	−30470	30	128	22	MD	50.8 m	1.5	$13/2^+*$	23	71Be61	T β^+=100;α ?	*
^{191}Tl	−26283	7				20# m		$1/2^+*$	23		β^+ ?	*
^{191}Tl^m	−25986	7	297	7	AD	5.22 m	0.16	$9/2^-*$	23	74Va19	T β^+=100	*
^{191}Pb	−20293	7				1.33 m	0.08	$3/2^-$	23	10Co13	JD β^+=?;α=0.51 5	*
^{191}Pb^m	−20234	8	59	10	MD	2.18 m	0.08	$13/2^+*$	23	81Mi11	T β^+=100	*
^{191}Pb^n	−17632	12	2661	10		180 ns	80	$33/2^+$	23	99La06	JTD IT=100	*
^{191}Bi	−13239	7				12.12 s	0.24	$9/2^-*$	23	23Ke04	D α=51 10;β^+=?	*
^{191}Bi^m	−12999	9	240	5	AD	126 ms	5	$1/2^+$	23		α=68 5;β^+ ?;IT ?	*
^{191}Bi^n	−12809	7	429.7	0.5		562 ns	10	$13/2^+$	23	04Ni06	TJ IT=100	*
^{191}Bi^p	−11364#	26#	1875#	25#		400 ns	40	$25/2^-$#	23	04Ni06	TD IT=100	*
^{191}Po	−5069	7				22 ms	1	$3/2^-$	23	02An19	T α=100;β^+ ?	*
^{191}Po^m	−5008	12	61	11	AD	93 ms	3	$13/2^+$	23	02An19	T α=100;β^+ ?	*
^{191}At	3863	16				2.1 ms	0.8	$1/2^+$	23	03Ke08	T α=100;β^+ ?	*
^{191}At^m	3921	18	58	20	AD	2.2 ms	0.4	$(7/2^-)$	23	03Ke08	T α=100;β^+ ?	*
$*^{191}$Ta	T : symmetrized from 23Lu.A=1.1(+1.0-0.7)											**
$*^{191}$W^m	T : average 11St21=360(20) 09Al30=320(20)											**
$*^{191}$Re	J : measured (t,α) cross sections in 77Hi06 favor J=3/2 over 1/2											**
$*^{191}$Re^m	IJ : M2 to $5/2^+$ at 97(3) keV; existence of a similar isomer in ^{187}Re											**
$*^{191}$Re^m	T : estimated from B(M2)=0.7 (W.u.) in ^{187}Re											**
$*^{191}$Re^n	T : other: 11St21=77(33)											**
$*^{191}$Os^m	T : others: 12Kr05=13.6(0.2) 66Pl02=13.03(0.21) 63Pl01=13.0(0.5)											**
$*^{191}$Os^m	J : M3+E4 γ to $9/2^-$											**
$*^{191}$Ir	J : 50Br75,52Mu40,53Si61=3/2											**
$*^{191}$Ir	D : from IS=37.23(0.09) in 24Ci.A											**
$*^{191}$Ir^m	J : E3 γ to $5/2^+$											**
$*^{191}$Ir^n	T : average 12Dr02=5.8(0.6) 79Lu01=5.5(0.7)											**
$*^{191}$Ir^n	E : from a least-squares fit to γ-ray energies using data of 12Dr02											**
$*^{191}$Pt	J : 92Hi07,78Ru04,75Ru06=3/2											**
$*^{191}$Pt^m	J : E2 γ to $5/2^-$											**
$*^{191}$Pt^m	T : other: 2 μs, estimated from B(E2)=0.088(0.005) (W.u.) in ^{189}Pt											**
$*^{191}$Pt^n	J : M2 γ to $9/2^-$											**
$*^{191}$Pt^n	T : average 76Pi03=95(5) 67Co20=107(3)											**
$*^{191}$Au	J : 60Ew06=3/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{191}$Au^m	J : 20Ba17=11/2												**
$*^{191}$Au^n	J : E2 γ to 27/2$^+$; measured magnetic moment												**
$*^{191}$Hg	J : 76Bo09=3/2												**
$*^{191}$Hg^m	J : 79Kr11=13/2												**
$*^{191}$Hg^m	T : others: 55Sm42=55(10) 54Gi04=57(5)												**
$*^{191}$Tl	J : 92Me07=1/2												**
$*^{191}$Tl^m	J : 13Ba41,12Ba32,84Be40=9/2												**
$*^{191}$Pb	J : favored α decay to ^{187}Hg^m (J$^\pi$=3/2$^-$)												**
$*^{191}$Pb	D : %α other: 74Ho26=0.013(0.005)												**
$*^{191}$Pb	T : from 74Ho26; other: 74Le02=1.3(0.3)												**
$*^{191}$Pb^m	J : 91Du07=13/2												**
$*^{191}$Pb^n	E : 2602.31(0.24) keV above ^{191}Pb^m												**
$*^{191}$Pb^n	T : symmetrized from 99La06=150(+100-50)												**
$*^{191}$Bi	J : 17Ba12=(9/2); favored α decay to ^{187}Tl^m (J$^\pi$=9/2$^-$)												**
$*^{191}$Bi	T : average 13Ny01=11.7(0.4) 03Ke04=12.4(0.4) 99Ta20=13.0(+2.1-1.5) 85Co06=12(1) 74Le02=13(1) 72Ga27=12.0(0.7); other: 24Wa14=58(+278-27)												**
$*^{191}$Bi^m	J : favored α decay to ^{187}Tl (J$^\pi$=1/2$^+$)												**
$*^{191}$Bi^m	T : average 03Ke04=121(+8-5) 99Ta20=156(+27-20) 99An36=115(10) 81Le23=150(15)												**
$*^{191}$Bi^n	J : M2 γ to 9/2$^-$												**
$*^{191}$Bi^p	E : 1825.1 + x keV; x=50#(25#) keV												**
$*^{191}$Po	J : favored α decay to ^{187}Pb (J$^\pi$=3/2$^-$)												**
$*^{191}$Po^m	J : favored α decay to ^{187}Pb^m (J$^\pi$=13/2$^+$)												**
$*^{191}$At	T : symmetrized from 03Ke08=1.7(+1.1-0.5)												**
$*^{191}$At	J : favored α decay to ^{187}Bi^m (J$^\pi$=1/2$^+$)												**
$*^{191}$At^m	T : symmetrized from 03Ke08=2.1(+0.4-0.3)												**
^{192}Hf	−18500#	400#				170#	ms	0$^+$		23Ha31	I	β^- ?;β^-n ?	
^{192}Ta	−23100#	400#				2.2	s 0.7	(2)		12 09Al30	T	β^-=100;β^-n ?	
^{192}W	−29620#	200#				40#	s >300ns	0$^+$		12		β^- ?	
^{192}Re	−31680	40				15.4	s 0.5	(0$^-$)		12 21Wa15	TJ	β^-=100	*
^{192}Re^m	−31520	40	159	1		88	μs 8			12 11St21	ETD	IT=100	*
^{192}Re^n	−31410	40	267	10		< 500	ms			21Wa15	T	β^- ?;IT ?	*
^{192}Os	−35882.3	2.3				STABLE	>5.8Ey	0$^+$		12 24Be17	T	IS=40.78 32;2β^- ?;α ?	*
^{192}Os^m	−33866.9	2.3	2015.40	0.11		5.94	s 0.09	10$^-$		12 13Dr05	J	IT≈100;β^- ?	*
^{192}Os^n	−31302.0	2.5	4580.3	1.0		205	ns 7	(20$^+$)		12 13Dr05	ETJ	IT=100	*
^{192}Ir	−34835.6	1.3				73.820	d 0.018	4$^+$*		12 FGK259	T	β^-=95.24 4;ε=4.76 4	*
^{192}Ir^m	−34778.9	1.3	56.720	0.005		1.45	m 0.05	1$^-$		12		IT=99.9825;β^-=0.0175	
^{192}Ir^n	−34667.5	1.3	168.14	0.12		241	y 9	(11$^-$)		12 70Ha32	T	IT=100	
^{192}Pt	−36288.4	2.6				STABLE	>60Py	0$^+$		12 66Ka23	T	IS=0.782 24;α ?;2β^- ?	
^{192}Pt^m	−34116.0	2.6	2172.37	0.13		272	ns 23	10$^-$		12		IT=100	*
^{192}Au	−32765	14				4.94	h 0.09	1$^-$*		12		β^+=100	*
^{192}Au^m	−32630	14	135.41	0.25		29	ms	5$^+$		12		IT=100	*
^{192}Au^n	−32333	14	431.6	0.5		160	ms 20	11$^-$		12		IT=100	*
^{192}Hg	−32013	16				4.85	h 0.20	0$^+$		12		ε=100;α ?	
^{192}Tl	−25870	30				9.6	m 0.4	2$^-$*		12 13Ba41	J	β^+=100	*
^{192}Tl^m	−25670	30	196	7		10.8	m 0.2	7$^+$*		12 13Ba41	J	β^+=100	*
^{192}Tl^n	−25420	30	447	7		296	ns 5	(8$^-$)		12		IT=100	*
^{192}Tl^p	−25687	5	190	30	AD			(3$^+$)		91Va04	E	α=100	
^{192}Pb	−22552	6				3.5	m 0.1	0$^+$		12		β^+=?;α=0.0059 7	
^{192}Pb^m	−19971	6	2581.1	0.4		166	ns 6	10$^+$		12 07Io03	J	IT=100	
^{192}Pb^n	−19927	6	2625.1	1.1		1.09	μs 0.04	12$^+$		12 07Io03	J	IT=100	
^{192}Pb^p	−19809	6	2743.5	0.4		756	ns 14	11$^-$		12 07Io03	J	IT=100	
^{192}Bi	−13530	30				34.6	s 0.9	3$^+$*		12		β^+=?;α=12 5	*
^{192}Bi^m	−13398	9	140	30	MD	39.6	s 0.4	10$^-$*		12		β^+=?;α=10 3	*
^{192}Po	−8067	11				32.2	ms 0.3	0$^+$		12		α≈100;β^+ ?	
^{192}Po^m	−5772	11	2294.6	1.0		580	ns 100	11$^-$		12 03Va16	TD	IT=100	*
^{192}At	2926	28			*&	11.5	ms 0.6	3$^+$#		12 06An04	T	α≈100;β^+ ?;β^+SF<0.51	*
^{192}At^m	2926	28	0	40	AD*&	88	ms 6	(9$^-$,10$^-$)		12 06An04	T	α≈100;β^+ ?;β^+SF<0.51	*
$*^{192}$Re	T : average 21Wa15=15.1(0.6) 12Al05=16(2) 79Ka.B=16(1)												**
$*^{192}$Re^m	T : average 11St21=85(10) 09Al30=93(15); other: 05Ca02=120(+210-50) μs												**
$*^{192}$Re^m	E : 159.3 keV γ and Re K X-rays seen only in 11St21												**
$*^{192}$Re^n	T : not observed in 21Wa15, based on the extraction time of the isotope separation system; other: 12Re19=61(+40-20) s for q=75$^+$ (bare ions)												**
$*^{192}$Re^n	E : from 12Re19												**
$*^{192}$Os	T : 24Be17,20Be23 for T$_{1/2}$(α,0$^+$→2$^+$)												**
$*^{192}$Os^m	T : average 79KaYT=5.9(0.1) 73Pa21=6.1(0.2); other: 15Ak02=10.5(+1.0-0.9) from τ=15.1(+1.5-1.3) for q=75$^+$ (H-like)												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{192}Os^n$	T : from τ=295(10) in 13Dr05											**
$*^{192}Ir$	J : 71Es03,70Hi12,69Re06,64Ca15,63Do13,63Ko21=4											**
$*^{192}Pt^m$	J : E2 to 8^-											**
$*^{192}Au$	J : 60Ew06,59Ew88=1											**
$*^{192}Au^m$	J : E3 γ to 2^-, M2 γ to 3^-											**
$*^{192}Au^n$	J : E3 γ to 8^+											**
$*^{192}Tl$	J : 13Ba41,92Me07=2											**
$*^{192}Tl^m$	J : 13Ba41,92Me07=7											**
$*^{192}Tl^m$	E : from 91Va04=168 + x keV, 15 keV <x< 40 keV											**
$*^{192}Tl^n$	E : 250.6(0.2) keV above $^{192}Tl^m$											**
$*^{192}Bi$	J : 17Ba12=(3); favored α decay to $J^\pi=3^+$ level in ^{188}Tl											**
$*^{192}Bi^m$	J : 17Ba12=(10); favored α decay to $J^\pi=10^-$ level in ^{188}Tl											**
$*^{192}Po^m$	J : E1 γ to 10^+											**
$*^{192}Po^m$	E : uncertainty estimated by the evaluator											**
$*^{192}Po^m$	T : other: 99He32$\sim$1 μs											**
$*^{192}At$	D : %β^+SF 13An03=0.42(0.09) for both isomers											**
$*^{192}At^m$	T : other: 13An03=110(+26-18)											**
$*^{192}At^m$	D : %β^+SF 13An03=0.42(0.09) for both isomers											**
^{193}Ta	−20720#	400#				220# ms	>300ns	$7/2^+$#	17	12Ku26	I	β^- ?;β^-n ?	
^{193}W	−26190#	200#				30# s	>300ns	$1/2^-$#	17	09St16	I	β^- ?	
^{193}Re	−30230	40				3# m	>300ns	$5/2^+$#	17	99Be63	I	β^- ?	
$^{193}Re^m$	−30080	40	146.0	0.2		69 μs	6	$(9/2^-)$	17	11St21	ETJ	IT=100	*
^{193}Os	−33394.4	2.3				29.830 h	0.018	$3/2^-$	17			β^-=100	
$^{193}Os^m$	−33078.8	2.3	315.6	0.3		121 ns	28	$(9/2^-)$	17			IT=100	
^{193}Ir	−34536.3	1.3				STABLE		$3/2^+*$	17			IS=62.77 9	*
$^{193}Ir^m$	−34456.1	1.3	80.238	0.006		10.53 d	0.04	$11/2^-$	17			IT=100	
$^{193}Ir^n$	−32257.4	1.4	2278.9	0.5		124.8 μs	2.1	$31/2^+$	17			IT=100	
^{193}Pt	−34479.7	1.4				49 y	6	$1/2^-*$	17	71Ra18	T	ε=100	*
$^{193}Pt^m$	−34329.9	1.4	149.78	0.04		4.33 d	0.03	$13/2^+*$	17	86Sc04	J	IT=100	
^{193}Au	−33405	9				17.65 h	0.15	$3/2^+*$	17			β^+=100;α ?	
$^{193}Au^m$	−33115	9	290.20	0.04		3.9 s	0.3	$11/2^-*$	17	23Cu04	J	IT$\approx$100;β^+ ?	*
$^{193}Au^n$	−30918	9	2486.7	0.6		150 ns	50	$31/2^+$	17	07Ok05	J	IT=100	
^{193}Hg	−31063	16				3.80 h	0.15	$3/2^-*$	17			β^+=100	
$^{193}Hg^m$	−30922	16	140.76	0.05		11.8 h	0.2	$13/2^+*$	17			β^+=92.8 5;IT=7.2 5	*
^{193}Tl	−27476	7				21.6 m	0.8	$1/2^+*$	17			β^+=100	
$^{193}Tl^m$	−27104	8	372	4		2.11 m	0.15	$9/2^-*$	17			IT$\approx$75;$\beta^+\approx$25	*
^{193}Pb	−22229	10				4# m		$3/2^-$#	17			β^+ ?	*
$^{193}Pb^m$	−22137	7	93	12	AD	5.8 m	0.2	$13/2^+*$	17	17Al34	E	β^+=100	*
$^{193}Pb^n$	−19522	16	2707	13		180 ns	15	$33/2^+$	17	04Io01	J	IT=100	*
^{193}Bi	−15885	8				63.6 s	3.0	$9/2^-*$	17	05De01	D	β^+=?;α=3.5 15	*
$^{193}Bi^m$	−15580	9	305	6	AD	3.20 s	0.14	$1/2^+*$	17	15He27	T	α=84 16;β^+ ?	*
$^{193}Bi^n$	−15279	8	605.53	0.18		153 ns	10	$13/2^+$	17			IT=100	
$^{193}Bi^p$	−13535	8	2349.6	0.6		85 μs	3	$29/2^+$	17			IT=100	
$^{193}Bi^q$	−13480	8	2405.1	0.7		3.02 μs	0.08	$(29/2^-)$	17			IT=100	
^{193}Po	−8326	15				399 ms	34	$3/2^-*$	17			$\alpha\approx$100;β^+ ?	*
$^{193}Po^m$	−8225	15	100	6	AD	245 ms	11	$13/2^+*$	17			$\alpha\approx$100;β^+ ?	*
^{193}At	−69	22			*	29 ms	5	$1/2^+$	17	03Ke08	T	α=100	*
$^{193}At^m$	−57	21	13	8	AD*	21 ms	5	$7/2^-$	17			α=100	*
$^{193}At^n$	−23	21	46	8	AD	28 ms	4	$13/2^+$	17	03Ke08	T	IT=76 10;α=24 10	*
^{193}Rn	9047	25				1.15 ms	0.27	$(3/2^-)$	17			α=100	*
$*^{193}Re^m$	E : average 05Ca02=146.1(0.3) 11St21=145.2(0.5) 09Al30=146.1(0.2) keV												**
$*^{193}Re^m$	T : average 11St21=65(9) 09Al30=72(8); other: 05Ca02=75(+450-40)												**
$*^{193}Ir$	J : 67At03,53Si61,52Mu40,50Br75,35Ve01=3/2												**
$*^{193}Ir$	D : from IS=362.77(0.09) in 24Ci.A												**
$*^{193}Pt$	J : 92Hi07=1/2												**
$*^{193}Au^m$	J : 23Cu04,20Ba17=11/2												**
$*^{193}Hg^m$	J : 66Da07,64To05=13/2												**
$*^{193}Tl^m$	E : 76Ha25<13 keV above 365.2-keV level due to negligible L Xray yield												**
$*^{193}Tl^m$	J : 13Ba41,12Ba32=9/2												**
$*^{193}Pb$	T : 4.0 m reported in the Karlsruhe 1981 and 1995 charts; not traceable												**
$*^{193}Pb^m$	J : 91Du07=13/2												**
$*^{193}Pb^n$	E : 2612.5(0.5) keV above $^{193}Pb^m$												**
$*^{193}Bi$	J : 16Ba42=9/2												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{193}$Bi^m	J : 16Ba42=1/2											**
$*^{193}$Po	J : 13Se03,14Se07=(3/2); favored α decay to ^{189}Pb (J^π=3/2$^-$)											**
$*^{193}$Po^m	J : 13Se03,14Se07=(13/2); favored α decay to ^{189}Pb^m (J^π=13/2$^+$)											**
$*^{193}$At	T : symmetrized from 03Ke08=28(+5-4)											**
$*^{193}$At	J : favored α decay to ^{189}Bi^m (J^π=1/2$^+$)											**
$*^{193}$At^m	J : favored α decay to ^{189}Bi (J^π=7/2$^-$)											**
$*^{193}$At^n	T : symmetrized from 03Ke08=27(+4-3)											**
$*^{193}$At^n	J : favored α decay to ^{189}Bi^n (J^π=13/2$^+$)											**
$*^{193}$Rn	J : favored α decay to excited J^π=(3/2$^-$) level in ^{189}Po											**
^{194}Ta	−17130#	500#				2# s	>300ns		21	12Ku26	I	β^- ?;β^-n ?	
^{194}W	−24410#	300#				20# s	>300ns	0^+	21			β^- ?	
^{194}Re	−27260#	200#				5 s	1	1$^-$#	21	12Al05	T	β^-=100	*
^{194}Re^m	−27110#	210#	150#	50#		45 μs	18	4$^-$#	21	11St21	TD	IT=100	*
^{194}Re^n	−26980#	200#	285	40		25 s	8	11$^-$#	21	12Re19	E	β^-=100	*
^{194}Re^p	−26430#	200#	833	33		100 s	10		21	12Re19	E	β^-=100	
^{194}Os	−32435.2	2.4				6.0 y	0.2	0^+	21	65Jo10	T	β^-=100	
^{194}Ir	−32531.8	1.3				19.35 h	0.07	1$^-$*	21	16Kr06	T	β^-=100	*
^{194}Ir^m	−32384.7	1.3	147.073	0.002		31.85 ms	0.24	4^+	21	72Br53	T	IT=100	
^{194}Ir^n	−32200	70	330	70	BD	171 d	11	(11$^-$)	21	68Su02	T	β^-=100	*
^{194}Pt	−34760.1	0.5				STABLE		0^+	21			IS=32.864 410	
^{194}Au	−32211.9	2.1				38.02 h	0.10	1$^-$*	21	92Si02	T	β^+=100	*
^{194}Au^m	−32104.5	2.2	107.4	0.5		600 ms	8	5^+	21	75Ya14	TD	IT=100	*
^{194}Au^n	−31736.2	2.2	475.7	0.6		417 ms	8	11$^-$	21	75Ya14	TD	IT=100	*
^{194}Hg	−32184.0	2.9				447 y	28	0^+	21	15Do01	T	ε=100	*
^{194}Tl	−26937	14				33.3 m	0.3	2$^-$*	21	13Ba41	J	β^+=100;α ?	*
^{194}Tl^m	−26677	4	260	14	MD	32.8 m	0.2	7$^+$*	21	60Ju01	T	β^+=100	*
^{194}Pb	−24211	16				10.7 m	0.3	0^+	21			β^+=100;α=7.3e-6 29	*
^{194}Pb^m	−21583	16	2628.33	0.25		370 ns	7	12^+	21	FGK128	J	IT=100	*
^{194}Pb^n	−21278	16	2933.21	0.25		133 ns	5	11$^-$	21	FGK128	J	IT=100	*
^{194}Bi	−16023	5				99.5 s	2.0	3$^+$*	21	91Va04	TD	β^+=?;α=0.46 25	*
^{194}Bi^m	−15880	50	150	50	MD	125 s	2	(6$^+$)	21	87Va09	T	$\beta^+\approx$100;α ?	*
^{194}Bi^n	−15860	5	163	4	AD	115.5 s	2.8	10$^-$*	21	91Va04	TD	β^+=?;α=0.20 7	*
^{194}Po	−11005	13				392 ms	4	0^+	21	93Wa04	T	α=93 7;β^+ ?	*
^{194}Po^m	−8691	13	2313.6	0.3		12.9 μs	0.5	(10$^-$)	21	16An10	TJE	IT=100	
^{194}At	−726	18			*	323 ms	7	10$^-$	21	13An03	T	$\alpha\approx$100;β^+ ?;β^+SF=0.032	*
^{194}At^m	−730	19	−4	18	AD*	286 ms	7	(4$^-$,5$^-$)	21	13An03	TD	$\alpha\approx$100;β^+ ?;β^+SF=0.032	*
^{194}Rn	5723	17				780 μs	160	0^+	21	06An36	TD	α=100;β^+ ?	
^{194}Fr	17870#	300#				500# ns						α ?	
$*^{194}$Re	T : other: 09Ku28=1.0(0.5) withdrawn by the authors in 14Ku23											**
$*^{194}$Re^m	E : only 86.3 keV γ is seen in 11St21											**
$*^{194}$Re^m	I : assignment from 11St21; similar experiment, but with less statistics, in 05Ca02 also reports a μs isomer with 464, 148, 128 γs labeled in											**
$*^{194}$Re^m	I : a singles spectrum, among others, on the top of high background; the assignment of these γs to ^{194}Re is ambiguous											**
$*^{194}$Re^n	T : associated with the 194, 349 and 554 keV γs following β^- decay and placed in 12Al05 in the high-spin part of ^{194}Os level scheme											**
$*^{194}$Ir	T : average 16Kr06=19.20(0.02) 72Ge10=19.15(0.03) 72Em01=19.41(0.01); Birge ratio=8.27											**
$*^{194}$Ir	J : 69Re06,63Do13=1											**
$*^{194}$Ir^n	J : direct β^- feeding to J^π=10$^+$ and no feeding to 8$^+$ and 9$^-$											**
$*^{194}$Au	T : others: 19Ja03=39.61(0.39),38.47(+0.79-0.76) 49Wi08=39.5(0.5) 49St17=39(2)											**
$*^{194}$Au	J : 60Ew06,59Ew88=1											**
$*^{194}$Au^m	J : M2 γ to the 3$^-$ member of $K^\pi = 1^-$ gs band											**
$*^{194}$Au^m	T : other: 82Ne05=600(50)											**
$*^{194}$Au^n	J : E3 γ to 8$^+$											**
$*^{194}$Au^n	T : average 75Ya14=420(10) 82Ne05=420(20) 53He57=400(20)											**
$*^{194}$Hg	T : average 81Ho18=477(32) 79Pr15=358(55), values corrected in 15Do01 for the new branching intensity of the 328.5 keV γ ray.											**
$*^{194}$Tl	J : 76Ek03,92Me07,13Ba41=2											**
$*^{194}$Tl	T : average 03Su30=33.0(0.5) 60Ju01=33.0(0.5) 68Pe13=35.1(1.0) 76Ek03=34(2)											**
$*^{194}$Tl^m	J : 13Ba41,92Me07=7											**
$*^{194}$Pb	T : average 03Su30=10.0(0.4) 87El09=12.0(0.5) 82Hi04=9.2(1.1) 60Ju01=11(2)											**
$*^{194}$Pb	D : %α from 87El09											**
$*^{194}$Pb^m	J : E2 γ to 10$^+$; measured magnetic moment											**
$*^{194}$Pb^m	T : average 04Gl04=389(28) 85St16=350(10) 77Ro15=392(10) 72Al49=335(30)											**
$*^{194}$Pb^n	J : E2 γ to 9$^-$; measured magnetic moment											**
$*^{194}$Pb^n	T : average 05Dr11=139(7) 04Vy01=133(15) 86Va03=122(10) 86Pa18=135(25)											**
$*^{194}$Bi	J : 17Ba12=(3); favored α decay to ^{190}Tl (J^π=3$^+$)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{194}$Bi	T : average 91Va04=95(3) 88Hu03=94(5) 87Va09=106(3); other: 74Le02=105(15)												**
$*^{194}$Bi^m	J : from 85HuZY												**
$*^{194}$Bi^n	J : 17Ba12=(10); favored α decay from ^{198}At^m (J$^\pi$=10$^-$)												**
$*^{194}$Bi^n	T : average 91Va04=115(4) 88Hu03=116(4)												**
$*^{194}$Po	T : others: 14Ka23=340(+110-70) 05Uu02=200(+960-90) 99He32,01Ju09=370(40) 96En02=420(+80-60) 81Le23=410(30) 77De32=700(100) 67Si09=600(200)												**
$*^{194}$At	T : 13An03=323(7), supersedes 09An11=310(8); other: 13Ny01=300(+50-40)												**
$*^{194}$At	D : %β^+SF: from 13An03=0.065(0.008) for both isomers												**
$*^{194}$At	J : favored α decay to ^{190}Bi^m (J$^\pi$=10$^-$)												**
$*^{194}$At^m	T : 13An03=286(7), supersedes 09An11=253(10)												**
$*^{194}$At^m	D : %β^+SF:from 13An03=0.065(0.008) for both isomers												**
$*^{194}$At^m	J : favored α decay to ^{190}Bi^n [J$^\pi$=(4$^-$,5$^-$)]												**
^{195}Ta	−14600#	300#				20#	s			26Pi.2	I	β^- ?	
^{195}W	−20740#	300#				1.0	s 0.6	3/2$^-$#	16	23Lu.A	TD	β^-=100	*
^{195}Re	−25560#	300#				6	s 1	5/2$^+$#	14			β^-=100	
^{195}Os	−29510	60				6.5	m 0.4	(3/2$^-$)	14	21Ah02	TDJ	β^-=100	*
^{195}Os^m	−29080	60	427.8	0.3		47	s 3	13/2$^+$#	14	20Wa12	ETJ	IT≈100;β^- ?	*
^{195}Ir	−31692.3	1.3				2.29	h 0.17	3/2$^+$	14	13Bi14	TD	β^-=100	
^{195}Ir^m	−31592	5	100	5		3.74	h 0.07	11/2$^-$	14			β^-≈100;IT ?	*
^{195}Ir^n	−29338	6	2354	6		4.4	μs 0.6	(27/2$^+$)		11St21	ETJ	IT=100	*
^{195}Pt	−32793.9	0.5				STABLE	>6.3Ey	1/2$^-$*	14	11Be08	T	IS=33.775 240;α ?	
^{195}Pt^m	−32534.8	0.5	259.077	0.023		4.004	d 0.004	13/2$^+$*	14	24Su18	T	IT=100	*
^{195}Au	−32567.0	1.1				186.01	d 0.06	3/2$^+$*	14	14Un01	T	ε=100	*
^{195}Au^m	−32248.4	1.1	318.58	0.04		30.5	s 0.2	11/2$^-$*	14	23Cu04	J	IT=100	*
^{195}Au^n	−30066#	20#	2501#	20#		12.89	μs 0.21	31/2(−)	14	13Dr01	ET	IT=100	*
^{195}Hg	−31014	23				10.69	h 0.16	1/2$^-$*	14	15Do01	T	β^+=100	*
^{195}Hg^m	−30838	23	176.07	0.04		41.60	h 0.19	13/2$^+$*	14	15Do01	T	IT=54.2 20;β^+=45.8 20	*
^{195}Tl	−28156	11				1.16	h 0.05	1/2$^+$*	14			β^+=100	*
^{195}Tl^m	−27673	11	482.63	0.17		3.6	s 0.4	9/2$^-$*	14			IT=100	*
^{195}Pb	−23740	5				15.0	m 1.4	3/2$^-$	14			β^+=100	*
^{195}Pb^m	−23537	5	202.9	0.7		15.0	m 1.2	13/2$^+$	14	91Gr12	E	β^+=100;IT ?	
^{195}Pb^n	−21981	5	1759.0	0.7		10.0	μs 0.7	21/2$^-$	14			IT=100	
^{195}Pb^p	−20838	5	2901.7	0.8		95	ns 20	33/2$^+$				IT=100	
^{195}Bi	−18026	5				183	s 4	9/2$^-$*	14			β^+=?;α=0.030 12	*
^{195}Bi^m	−17626	8	399	6	AD	87	s 1	1/2$^+$*	14			β^+=?;α=33 10	*
^{195}Bi^n	−15645	5	2381.0	0.5		614	ns 5	(29/2$^-$)	14	17He12	EJT	IT=100	*
^{195}Bi^p	−15410	5	2615.9	0.5		1.49	μs 0.01	29/2$^+$	14	17He12	ETJ	IT=100	*
^{195}Po	−11118	6				4.64	s 0.09	3/2$^-$*	14			α=94 4;β^+ ?	*
^{195}Po^m	−10968	7	150	9	MD	1.92	s 0.02	13/2$^+$*	14	17Al34	EJ	α≈100;β^+ ?;IT ?	*
^{195}At	−3473	10				290	ms 20	1/2$^+$*	14			α≈100;β^+ ?	*
^{195}At^m	−3441	8	31	7	AD	143	ms 3	7/2$^-$*	14			α=88 4;IT=12 4;β^+ ?	*
^{195}At^p	−3370#	40#	100#	40#				(13/2$^+$)		13Uu01	J	IT ?	*
^{195}Rn	5050	50			*	7	ms 3	3/2$^-$	14			α=100	*
^{195}Rn^m	5130	17	80	50	AD*	6	ms 3	13/2$^+$	14			α=100	*
^{195}Fr	14450#	200#				1#	ms	7/2$^-$#				α ?	
$*^{195}$W	T : average 23Lu.A=0.8(0.7),1.2(+1.7-1.1)												**
$*^{195}$Os	T : other: 13Bi14=6.5(1.1)												**
$*^{195}$Os^m	T : other: 12Re19=32(+154-16) m for q=76$^+$ (bare ion)												**
$*^{195}$Os^m	E : other: 12Re19=454(10)												**
$*^{195}$Ir^m	T : average 68Ja06,73Ja10=3.67(0.08) 68Ho01=4.00(0.15)												**
$*^{195}$Ir^m	E : from 78Ya03,83Ci01=100(5) keV in ^{196}Pt(t,α); other: 73Ja10=120(36) keV from β^- decay end-point energies												**
$*^{195}$Ir^n	E : from 268.4,404.4,476.4,537.8,and 566.7 keV γs in a cascade to ^{195}Ir^m												**
$*^{195}$Pt	J : 92Hi07,51Pr02,37To03,36Ja01=1/2												**
$*^{195}$Pt^m	T : average 24Su18=3.999(0.005) 00Mo05=4.010(0.005); Others: 78LeZA=3.75(0.25) 72PoZU=4.02(0.01) 67Ab07=4.1(0.1) 63Ka34=4.5(0.1) 63Ve13=3.5(0.2)												**
$*^{195}$Pt^m	T : 60Br11=4.08(0.12)												**
$*^{195}$Pt^m	J : 72Ba22=13/2												**
$*^{195}$Au	J : 65Ca12,60Ew06=3/2												**
$*^{195}$Au^m	J : 23Cu04,20Ba17=11/2												**
$*^{195}$Au^n	E : 13Dr01=2460.9 + x; x=40#(20#) estimated by NUBASE												**
$*^{195}$Hg	T : average 15Do01=10.84(0.03) 01Li17=10.53(0.03); Birge ratio B=7.3												**
$*^{195}$Hg	J : 64To05=1/2												**
$*^{195}$Hg^m	T : average 15Do01=41.6(0.2) 73Vi09=41.6(0.8)												**
$*^{195}$Hg^m	J : 65Sm01,64To05=13/2												**
$*^{195}$Tl	J : 62Ax02=1/2												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{195}Tl^m$	J : 13Ba41,12Ba32=9/2											**
$*^{195}Pb$	T : from 82Hi04, determined to be within 1.2 m of the $^{195}Pb^m$ half-life											**
$*^{195}Bi$	J : 16Ba42=9/2											**
$*^{195}Bi$	D : %α from 85Co06=0.01-0.05%											**
$*^{195}Bi^m$	J : 16Ba42=1/2											**
$*^{195}Bi^m$	D : %α from 85Co06=16-49%											**
$*^{195}Bi^n$	E : uncertainty estimated by NUBASE; other: Esndf14=2395.5(0.5)											**
$*^{195}Bi^p$	E : uncertainty estimated by NUBASE											**
$*^{195}Po$	J : 13Se03,14Se07,17Al34=(3/2);favored α decay to ^{191}Pb ($J^\pi=3/2^-$)											**
$*^{195}Po^m$	J : 13Se03,14Se07,17Al34=(13/2); favored α decay to $^{191}Pb^m$ ($J^\pi=13/2^+$)											**
$*^{195}At$	J : 18Cu02=(1/2); favored α decay to $^{191}Bi^m$ ($J^\pi=1/2^+$)											**
$*^{195}At$	T : 13Ny01=290(20) 03Ke04=328(20) 99Ta20=390(+70-50); other: 24Wa14=210(+1008-95)											**
$*^{195}At^m$	E : ENSDF2014=33.0(1.0) is erroneous											**
$*^{195}At^m$	J : 18Cu02=(7/2); favored α decay to ^{191}Bi ($J^\pi=7/2^-$)											**
$*^{195}At^p$	E : estimated 70#(40#) above $^{195}At^m$ by NUBASE; 13Ny01<130 keV											**
$*^{195}Rn$	T : symmetrized from 01Uu01=6(+3-2)											**
$*^{195}Rn^m$	T : symmetrized from 01Uu01=5(+3-2)											**
^{196}W	−18740#	400#				25# s	>300ns	0^+	13	12Ku26	I	β^- ?	
^{196}Re	−22360#	300#				2.6 s	1.0		13	23Lu.A	TD	β^-=100	*
$^{196}Re^m$	−22240#	300#	120#	40#		3.6 μs	0.6		13	11St21	T	IT=100	*
^{196}Os	−28280	40				34.9 m	0.2	0^+	17	77Ha32	T	β^-=100	*
^{196}Ir	−29440	40				52.0 s	1.1	$(1,2^-)$	06	20Mu16	TJ	β^-=100	*
$^{196}Ir^m$	−29227	20	210	40	BD	1.40 h	0.02	11^-#	06			$\beta^-\approx$100;IT ?	
^{196}Pt	−32644.5	0.5				STABLE		0^+	06			IS=25.211 340	
^{196}Au	−31137.4	2.6				6.165 d	0.011	2^-*	06	11Hi19	T	β^+=93.0 3;β^-=7.0 3	*
$^{196}Au^m$	−31052.7	2.6	84.656	0.020		8.2 s	0.2	5^+	06	71Ro16	T	IT=100	
$^{196}Au^n$	−30541.7	2.6	595.66	0.04		9.603 h	0.022	12^-*	06	20Mo24	T	IT=100	*
^{196}Hg	−31825.4	2.9				STABLE	>2.5Ey	0^+	06	90Bu28	T	IS=0.15 1;2β^+ ?	
^{196}Tl	−27497	12				1.84 h	0.03	2^-*	06			β^+=100	*
$^{196}Tl^m$	−27103	12	394.2	0.5		1.41 h	0.02	7^+*	06	92Me07	J	β^+=96.2 4;IT=3.8 4	
^{196}Pb	−25345	8				37 m	3	0^+	06			β^+=100;α<3e-5	
$^{196}Pb^m$			*non − exist*		RN	< 1 μs		4^+				IT=100	*
$^{196}Pb^n$	−23547	8	1797.51	0.14		140 ns	14	5^-	06			IT=100	
$^{196}Pb^p$	−22650	8	2694.6	0.3		270 ns	4	12^+	06			IT=100	
^{196}Bi	−18001.8	0.9				5.13 m	0.20	(3^+)	06	87Va09	T	β^+=?;α=0.00115 34	*
$^{196}Bi^m$	−17836.2	1.2	165.6	1.5	MD	0.6 s	0.5	(7^+)	06	87Va09	TJ	IT≈100;β^+ ?	
$^{196}Bi^n$	−17736.3	0.8	265.4	1.2	MD	4.00 m	0.05	(10^-)	06	87Va09	T	β^+=74.2 25;IT=25.8 25; α=0.00038 10	*
^{196}Po	−13469	5				5.63 s	0.07	0^+	06	16Tr07	T	α=94 5;β^+ ?	*
$^{196}Po^m$	−10975	5	2493.9	0.4		856 ns	17	11^-	06			IT=100	
^{196}At	−3910	30			*	377 ms	4	$(3^+)*$	06	16Tr07	TD	α=97.5 3;β^+=2.5 3; β^+SF=0.00023 4	*
$^{196}At^m$	−3950	18	−40	40	AD*	200# ms		10^-#		96En01	DI	$\alpha\approx$100;β^+ ?;IT ?	*
$^{196}At^n$	−3750	30	157.9	0.1		7.6 μs	1.4	(5^+)	06	00Sm06	TDE	IT=100	
^{196}Rn	1974	14				4.7 ms	1.1	0^+	06	01Ke06	T	$\alpha\approx$100;β^+ ?	*
^{196}Fr	13490#	200#				3# ms						α ?	
$*^{196}Re$	T : average 23Lu.A=2.5(+3.1-2.0),2.2(+1.9-1.4) 14Ku23=3(+1-2)											**	
$*^{196}Re^m$	E : E>72 keV (K-shell binding energy), since K X-rays were observed											**	
$*^{196}Os$	T : other: 18Hi07=35.3(1.4)											**	
$*^{196}Ir$	T : average 20Mu16=49(5) 68Ja06=54.5(2.0) 67Mo10=52(2) 66Vo05=50(2); other: 21Hi05=49(8),54(10), superseded by 20Mu16											**	
$*^{196}Au$	T : unweighted average 11Hi19=6.1451(0.0013) 01Li17=6.1669(0.0006) 63Ik01=6.183(0.010); Birge ratio=10.86											**	
$*^{196}Au$	J : 60Ew06=2											**	
$*^{196}Au^n$	J : 71Ba94,62Ch13=12											**	
$*^{196}Tl$	J : 92Me07,76Ek03=2											**	
$*^{196}Pb^m$	T : 4^+ member of the ground-state band ($K^\pi=0^+$) and the half-life is expected to be in the ps range											**	
$*^{196}Bi$	T : from 87Va09=308(12) s											**	
$*^{196}Bi^n$	T : from 87Va09=240(3) s											**	
$*^{196}Po$	T : average 16Tr07=5.75(0.12) 97Pu01=5.5(0.1) 93Wa04=5.8(0.2); others (downweighted): 10He25=4.1(+5.6-1.5) 05Uu02=5.1(+3.1-1.4)											**	
$*^{196}Po$	D : %α from 93Wa04											**	
$*^{196}At$	D : %β^+SF: from %β^+SF/%β^+=0.009(0.001) in 16Tr07, other: 93An11=0.088, and %β^+=2.5(0.3)											**	
$*^{196}At$	J : 18Cu02=(3)											**	
$*^{196}At$	T : average 16Tr07=371(5) 00Sm06=388(7); others: 22Hu12=314(+94-59) 14Ka23=350(90) 13Ny01=350(+50-40) 05De01=389(54) 95Mo14=320(+220-90)											**	
$*^{196}At$	T : 97Pu01=253(9)											**	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{196}$At^m	I : expected from α decay towards ^{192}Bi^m (J$^\pi$=10$^-$); level not adopted in ENSDF2007											**
$*^{196}$Rn	T : symmetrized from 01Ke06=4.4(+1.3-0.9); other: 97Pu01=3(+7-2), supersedes 95No.A=3.1(+3.1-1.6) (the same group)											**
^{197}W	−14870#	400#				1# s	>300ns	$5/2^-$#	13	12Ku26	I	β^- ?	
^{197}Re	−20350#	300#				1.4 s	1.2	$5/2^+$#	13	23Lu.A	TD	β^-=100	*
^{197}Os	−25050#	100#				93 s	7	$5/2^-$#	09	18Hi07	TD	β^-=100	*
^{197}Os^m	−24650#	140#	400#	100#		45# s	15#	$13/2^+$#		18Hi07	TI	β^- ?;IT ?	*
^{197}Ir	−28224	11				5.8 m	0.5	$3/2^+$	02			β^-=100	
^{197}Ir^m	−28109	12	115	5		8.9 m	0.3	$11/2^-$	02			$\beta^-\approx$100;IT ?	
^{197}Ir^n	−26520#	500#	1700#	500#		30 μs	8			05Ca02	T	IT=100	*
^{197}Ir^p	−25420#	500#	2800#	500#		15 μs	9			05Ca02	T	IT=100	*
^{197}Pt	−30419.8	0.5				19.8915 h	0.0019	$1/2^-*$	02			β^-=100	*
^{197}Pt^m	−30020.3	0.5	399.522	0.021		95.41 m	0.18	$13/2^+$	02	21Kr02	ED	IT=96.27 7;β^-=3.73 7	
^{197}Au	−31139.7	0.5				STABLE		$3/2^+*$	02			IS=100	*
^{197}Au^m	−30730.6	0.5	409.15	0.08		7.73 s	0.04	$11/2^-$	02	22Fi.1	T	IT=100	*
^{197}Au^n	−28607.2	1.1	2532.5	1.0		150 ns	5	$27/2^+$#		06Wh02	ETJ	IT=100	
^{197}Hg	−30540	3				64.93 h	0.07	$1/2^-*$	02	20Le04	T	ε=100	*
^{197}Hg^m	−30241	3	298.93	0.08		23.82 h	0.04	$13/2^+*$	02	20Le04	TD	IT=94.68 9;ε=5.32 9	*
^{197}Tl	−28355	14				2.84 h	0.04	$1/2^+*$	02			β^+=100	*
^{197}Tl^m	−27747	14	608.22	0.08		540 ms	10	$9/2^-*$	02			IT=100	*
^{197}Pb	−24746	5				8.1 m	1.7	$3/2^-$	02			β^+=100	
^{197}Pb^m	−24426	5	319.31	0.11		42.9 m	0.9	$13/2^+*$	02			β^+=81 2;IT=19 2	*
^{197}Pb^n	−22832	5	1914.10	0.25		1.15 μs	0.20	$21/2^-$	02			IT=100	
^{197}Bi	−19683.3	1.9				9.33 m	0.50	$9/2^-*$	02			β^+=100;α ?	*
^{197}Bi^m	−19154	8	530	8	AD	5.04 m	0.16	$1/2^+*$	02			α=55 23;β^+=?	*
^{197}Bi^n			*non − exist*		RN	204 ns	18	$(23/2^-)$	02			IT=100	*
^{197}Bi^p	−17280	12	2403	12		263 ns	13	$(29/2^-)$	02	86Ch01	TJD	IT=100	*
^{197}Bi^q	−16753.8	2.0	2929.5	0.5		209 ns	30	$(31/2^-)$	02	86Ch01	TJD	IT=100	
^{197}Po	−13393	10				53.6 s	0.9	$(3/2^-)*$	02	71Ho01	D	α=90 10;β^+ ?	*
^{197}Po^m	−13197	7	196	12	MD	25.8 s	0.1	$13/2^+*$	02	93Wa04	T	α=84 9;β^+ ?;IT ?	*
^{197}At	−6355	8				388.2 ms	5.6	$9/2^-*$	02	05De01	T	α=96.1 12;β^+ ?	*
^{197}At^m	−6311	9	45	8	AD	2.0 s	0.2	$1/2^+*$	02			$\alpha\approx$100;β^+ ?;IT ?	*
^{197}At^n	−6044	8	310.7	0.2		1.3 μs	0.2	$13/2^+$		08An11	ETJ	IT=100	*
^{197}Rn	1510	16				54 ms	6	$3/2^-$	02	08An05	T	α=100;β^+ ?	*
^{197}Rn^m	1709	16	199	11	AD	25.6 ms	2.5	$13/2^+$	02	08An05	T	α=100;β^+ ?	*
^{197}Fr	10260	60				2.3 ms	1.9	$(7/2^-)$	14	13Ka16	TDJ	α=100	*
$*^{197}$Re	T : symmetrized from 23Lu.A=0.9(+1.5-0.8); other: 09St16>300 ns												**
$*^{197}$Os	T : average 18Hi07=91(8) from β(t) and 18Hi07=101(18) by gating on β^- delayed 478.7 and 495.1 keV γs; others: 22Ga22(review), 03Xu08=2.8(0.6)												**
$*^{197}$Os	T : min, but the identified γs do not match these in 18Hi07												**
$*^{197}$Os^m	T : average of 18Hi07=58(37),68(44),27(21),68(44),70(59) from $\beta\gamma$(t) for the shorter-lived component by NUBASE; 18Hi07 indicates that												**
$*^{197}$Os^m	T : the half-life can be shorter than 0.1 s												**
$*^{197}$Ir^n	E : 279, 379, 495, 567 keV γs in 37-73 μs time window in 05Ca02												**
$*^{197}$Ir^p	E : 279,379,458,495,567,609 keV γs in 0-37 μs time window in 05Ca02												**
$*^{197}$Pt	J : 68ChZZ=1/2												**
$*^{197}$Au	J : 39El03=3/2												**
$*^{197}$Au^m	T : average 22Fi.1=7.73(0.05) 86Ne05=7.73(0.06) 73Fo15=7.5(0.4)												**
$*^{197}$Hg	T : average 20Le04=64.81(0.24) 01Li17=64.94(0.07); ENSDF2005 includes 66El09=64.14(0.05) strongly conflicting, Birge ratio would be 6.7												**
$*^{197}$Hg^m	J : 73Re04,59Me82=13/2												**
$*^{197}$Tl	J : 57Br32=1/2												**
$*^{197}$Tl^m	J : 13Ba41,12Ba32=9/2												**
$*^{197}$Pb^m	J : 91Du07=13/2												**
$*^{197}$Bi	J : 16Ba42=9/2												**
$*^{197}$Bi^m	J : 16Ba42=1/2												**
$*^{197}$Bi^m	D : %α from 85Co06=15-95%												**
$*^{197}$Bi^n	I : ENSDF2005 reported an isomer at 2129 keV, depopulating by 160.7 keV γ; not trusted by NUBASE, since the time spectrum for 160.7 keV γ												**
$*^{197}$Bi^n	I : in 86Ch01 (fig.3) shows a significant prompt component												**
$*^{197}$Bi^p	T : other: 95Zh36=252.6(38.7), downweighted (not used)												**
$*^{197}$Bi^p	E : from 95Zh36=2383.1 + x, with x<40 keV; 86Ch01=2360.4 + x is the same level but the authors mis-assigned the 97 keV γ, see Fig.1 of 95Zh36												**
$*^{197}$Po	T : average 93Wa04=53(1) 71Ho01=60(6) 67Le21=58(3) 67Si09=52(4); other (discrepant): 96Ta18=84(16)												**
$*^{197}$Po	J : 13Se03,14Se07,17Al34=(3/2)												**
$*^{197}$Po^m	T : others (downweighted): 71Ho01=27(3) 67Le21=29(9) 67Si09=26(2) 10He25=14.45(+14.45-4.9) ms for 3 events, strongly conflicting												**
$*^{197}$Po^m	J : 13Se03,14Se07,17Al34=(13/2); favored α decay to ^{193}Pb^m (J$^\pi$=13/2$^+$)												**
$*^{197}$Po^m	E : from 17Al34												**
$*^{197}$At	T : average 05De01=390(16) 99Sm07=388(6); other: 14Ka23=354(+17-15)												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{197}$At	J : 18Cu02=(9/2); favored α decay to ^{193}Bi (J^π=9/2$^-$)											**
$*^{197}$At^m	T : other: 14Ka23=2.8(+3.8-1.0)											**
$*^{197}$At^m	J : 18Cu02=(1/2); favored α decay to ^{193}Bi^m (J^π=1/2$^+$)											**
$*^{197}$At^n	T : other: 99Sm07=5.5(1.4)											**
$*^{197}$At^n	J : M2 γ to 9/2$^-$											**
$*^{197}$Rn	T : symmetrized from 08An05=53(+7-5)											**
$*^{197}$Rn	J : favored α decay to ^{193}Po (J^π=3/2$^-$)											**
$*^{197}$Rn^m	T : symmetrized from 08An05=25(+3-2); others: 05Uu02=30(+150-15) 96En02=19(+8-4) 95Mo14=18(+9-5)											**
$*^{197}$Rn^m	J : favored α decay to ^{193}Po^m (J^π=13/2$^+$)											**
$*^{197}$Fr	T : symmetrized from 13Ka16=0.6(+30-3)											**
^{198}W	−12600#	300#				330# ms	0$^+$		26Pi.2	I	β^- ?	*
^{198}Re	−16990#	400#				1.1 s 0.8		15	23Lu.A	D	β^-=100;β^-n ?	*
^{198}Os	−23674	28				125 s 28	0$^+$	15	18Hi07	TD	β^-=100	
^{198}Ir	−25760	25				8.7 s 0.4	1$^-$	15	20Mu16	TJ	β^-=100	*
^{198}Ir^m	−25260#	100#	500#	100#		> 10# s	11$^-$#				β^- ?;IT ?	
^{198}Pt	−29903.6	2.1				STABLE >470Py	0$^+$	15	11Be08	T	IS=7.356 130;α ?;2β^- ?	*
^{198}Au	−29580.8	0.5				2.6946 d 0.0002	2$^-$*	15	FGK209	T	β^-=100	*
^{198}Au^m	−29268.6	0.5	312.2227	0.0020		124 ns 4	5$^+$	15			IT=100	
^{198}Au^n	−28768.9	1.6	811.9	1.5		2.272 d 0.016	12$^-$	15	FGK128	J	IT=100	*
^{198}Hg	−30954.3	0.5				STABLE	0$^+$	15			IS=10.04 3	
^{198}Tl	−27529	8				5.3 h 0.5	2$^-$*	15			β^+=100	
^{198}Tl^m	−26985	8	543.6	0.4		1.87 h 0.03	7$^+$*	15			β^+=55.9 23;IT=44.1 23	
^{198}Tl^n	−26842	8	686.8	0.5		150 ns 40	(5)$^+$	15	77Kr04	EJT	IT=100	
^{198}Tl^p	−26787	8	742.4	0.4		32.1 ms 1.0	10$^-$	15	FGK128	J	IT=100	*
^{198}Pb	−26069	9				2.4 h 0.1	0$^+$	15			β^+=100	
^{198}Pb^m	−23928	9	2141.4	0.4		4.12 μs 0.07	7$^-$	15	FGK128	J	IT=100	*
^{198}Pb^n	−23838	9	2231.4	0.5		137 ns 10	9$^-$	15	FGK128	J	IT=100	*
^{198}Pb^p	−23247	9	2821.7	0.6		213 ns 3	12$^+$	15	FGK128	J	IT=100	*
^{198}Bi	−19357.3	1.4				11.6 m 0.3	7$^+$	15	16Ly01	J	β^+=100	*
^{198}Bi^m	−19237.6	1.6	119.7	2.1	MD	10.3 m 0.3	3$^+$	15	16Ly01	J	β^+=100	*
^{198}Bi^n	−19108.8	1.5	248.5	0.5		7.7 s 0.5	10$^-$*	15			IT=100	*
^{198}Po	−15476	16				1.760 m 0.024	0$^+$	15	93Wa04	D	α=57 2;β^+ ?	
^{198}Po^m	−12910	16	2565.92	0.20		200 ns 20	11$^-$	15			IT=100	
^{198}Po^n	−12740#	50#	2740#	50#		750 ns 50	12$^+$	15	90Ma14	T	IT=100	*
^{198}At	−6709	5				4.47 s 0.05	3$^+$*	15	19Gh11	T	α=97.0 17;β^+ ?	*
^{198}At^m	−6442	5	266.6	2.7	IT	1.23 s 0.05	10$^-$*	15	19Gh11	E	α=93 4;β^+ ?	*
^{198}Rn	−1231	13				64.4 ms 1.6	0$^+$	15	95Bi17	T	α=93 7;β^+ ?	*
^{198}Fr	9568	27			*	15 ms 3	3$^+$#	15	13Ka16	TD	α=100	
^{198}Fr^m	9585	28	20	30	AD*	1.1 ms 0.7	(10$^-$)	15	13Ka16	TD	α=100	*
^{198}Ra	16500#	400#				100# μs	0$^+$				α ?	
$*^{198}$Re	T : symmetrized from 23Lu.A=1.0(+0.8-0.7); other: 12Ku26>300 ns											**
$*^{198}$Ir	T : average 20Mu16=8.9(0.4) 14Ku23=8(2) 72ScYY=8(1) 73Sz03=8(3); others: 18Hi07,18Mu19=9.1(0.8), superseded by 20Mu16, 14Mo15=8(3), same as											**
$*^{198}$Ir	T : 14Ku23											**
$*^{198}$Pt	T : for α: 11Be08>470 Py; for 2β^-: 22Da02>32 Ey 11Be32>3.5 Ey											**
$*^{198}$Au	J : 56Ch08=2											**
$*^{198}$Au	T : rounded from FGK209=2.69464(0.00014) evaluated using the world data											**
$*^{198}$Au^n	J : M4 γ to 8$^+$; magnetic moment											**
$*^{198}$Tl^p	J : E3 γ to 7$^+$											**
$*^{198}$Pb^m	J : E2 γ to 5$^-$; measured magnetic moment											**
$*^{198}$Pb^m	T : average 87Ca23=4.19(0.10) 18La03=4.05(0.10); others (not used): 72Is01=3.7(0.3) 73Dj01=4 92Wa20∼5.3											**
$*^{198}$Pb^n	J : E2 γ to 7$^-$											**
$*^{198}$Pb^p	J : E2 γ to 10$^+$; measured magnetic moment											**
$*^{198}$Pb^p	T : average 87Ca23=212(4) 83St15=211(10) 18La03=212(10) 73Pa03=221(30) 86Ho03=240(20)											**
$*^{198}$Bi	J : favored α decay from ^{202}At (J^π=7$^+$)											**
$*^{198}$Bi^m	J : favored α decay from ^{202}At^m (J^π=3$^+$)											**
$*^{198}$Bi^m	E : from 22Mo.A=119.7(2.1) keV											**
$*^{198}$Bi^n	E : from 92Hu04=248.5(0.5) keV above ^{198}Bi											**
$*^{198}$Bi^n	J : 17Ba12=(10); E3 to 7$^+$											**
$*^{198}$Po^n	E : 2691.86(0.20) + x keV; x=50#(50#) by NUBASE											**
$*^{198}$At	J : 18Cu02=(3); favored α decay to ^{194}Bi (J^π=3$^+$)											**
$*^{198}$At	D : %α from 95Bi.A>94											**
$*^{198}$At	T : others: 14Ka23=3.0(0.1) 12Fo09=4.2(2.0) 05Uu02=3.8(0.4) 92Hu04=4.2(0.3) 67Tr06=4.9(0.5) 25Zh34=4.0(+1.2-0.8)											**
$*^{198}$At^m	J : 18Cu02=(10); favored α decay from ^{202}Fr^m (J^π=10$^-$)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{198}$At^m	T : average 19Gh11=1.28(0.10) 14Ka23=1.24(0.06) 05Uu02=1.04(0.15); others: 92Hu04=1.0(0.2) 67Tr06=1.5(0.3)											**
$*^{198}$At^m	D : %α from 95Bi.A>86											**
$*^{198}$Rn	T : average 95Bi17=64(2) 99Ta03=66(+3-2) 84Ca32=50(9); others (not used): 14Ka23=34(+11-7) 05Uu02=22(+110-10)											**
$*^{198}$Rn	D : %α value quoted in 93Wa04 from a PhD thesis of M. Leino (1983)											**
$*^{198}$Fr^m	J : favored α decay to ^{194}At^m (J^π=10$^-$)											**
^{199}Re	−14730#	400#				250# ms	>300ns	5/2$^+$#	13	12Ku26	I	β^- ?
^{199}Os	−20200#	100#				2.6 s	1.0	5/2$^-$#	06	23Lu.A	T	β^-=100 *
^{199}Os^m	−19950#	160#	250#	120#		1# s		13/2$^+$#				β^- ?;IT ?
^{199}Ir	−24400	27				7 s	5	3/2$^+$#	06	14Ku23	T	β^-=100 *
^{199}Pt	−27388.3	2.2				30.80 m	0.21	5/2$^-$*	06			β^-=100 *
^{199}Pt^m	−26964.3	3.0	424	2		13.48 s	0.16	13/2$^+$*	06	18Mu19	T	IT=100 *
^{199}Au	−29093.7	0.5				3.139 d	0.007	3/2$^+$*	06	56Ch08	J	β^-=100
^{199}Au^m	−28544.8	0.5	548.9405	0.0021		440 μs	30	11/2$^-$	06			IT=100 *
^{199}Hg	−29546.1	0.5				STABLE		1/2$^-$*	06			IS=16.94 12 *
^{199}Hg^m	−29013.6	0.5	532.48	0.10		42.67 m	0.09	13/2$^+$*	06			IT=100
^{199}Tl	−28059	28				7.42 h	0.08	1/2$^+$*	06			β^+=100 *
^{199}Tl^m	−27310	28	748.87	0.06		28.4 ms	0.2	9/2$^-$*	06			IT=100
^{199}Pb	−25231	7				90 m	10	3/2$^-$	06			β^+=100
^{199}Pb^m	−24802	8	429.5	2.7		12.2 m	0.3	(13/2$^+$)	06			IT≈93;β^+≈7 *
^{199}Pb^n	−22667	8	2563.8	2.7		10.1 μs	0.2	(29/2$^-$)	06			IT=100 *
^{199}Bi	−20798	11				27 m	1	9/2$^-$*	06			β^+=100 *
^{199}Bi^m	−20131	11	667	3		24.70 m	0.15	(1/2$^+$)	06			β^+≈100;IT ? *
^{199}Bi^n	−18836	25	1962	23		100 ns	30	25/2$^+$#	06			IT=100 *
^{199}Bi^p	−18250	25	2548	23		168 ns	13	29/2$^-$#	06			IT=100 *
^{199}Po	−15241	6				5.47 m	0.15	3/2$^-$*	15	13Se03	J	β^+=?;α=7.5 3 *
^{199}Po^m	−14929	5	311.8	2.7	AD	4.17 m	0.05	13/2$^+$*	15			β^+=73.5 10;α=24 1;IT=2.5 10 *
^{199}At	−8823	5				7.02 s	0.12	9/2$^-$*	06	05De01	T	α=89 6;β^+ ? *
^{199}At^m	−8579	5	244.0	1.0	IT	273 ms	9	1/2$^+$*		14Au03	TJD	IT≈99;α≈1 *
^{199}At^n	−8250	5	572.9	0.1		70 ns	20	13/2$^+$		10Ja05	ETJ	IT=100 *
^{199}At^p	−6530	5	2293.4	0.5		800 ns	50	(29/2$^+$)		10Ja05	ETJ	IT=100
^{199}Rn	−1561	7				590 ms	30	3/2$^-$	06			α=100;β^+ ? *
^{199}Rn^m	−1340	8	221	11	AD	310 ms	20	13/2$^+$	06			α=100;β^+ ?;IT ? *
^{199}Fr	6769	14				6.6 ms	2.2	1/2$^+$	06	13Ka16	T	α=100;β^+ ? *
^{199}Fr^m	6816	10	47	13	AD	6.5 ms	0.9	7/2$^-$		13Ka16	T	α=100;β^+ ? *
^{199}Fr^n	7020#	50#	250#	50#		2.2 ms	1.2	13/2$^+$#		13Uu01	TDJ	α=100;β^+ ? *
^{199}Ra	15620#	300#				1# ms		3/2$^-$#				α ?
$*^{199}$Os	T : average 23Lu.A=2.4(+2.9-1.8),1.7(+1.4-1.1) 14Ku23,14Mo15=5(+4-2)											**
$*^{199}$Ir	T : symmetrized from 14Ku23,14Mo15=6(+5-4)											**
$*^{199}$Pt	J : 17Hi05=5/2											**
$*^{199}$Pt	T : other: 17Hi05=31.3(1.5)											**
$*^{199}$Pt^m	J : 17Hi05=(13/2); E3 γ to 7/2$^-$											**
$*^{199}$Pt^m	T : average 18Mu19=12.4(0.7) 17Hi05=14.3(1.4) 73Ur01=13.3(0.2) 59Wa15=14.1(0.3)											**
$*^{199}$Au^m	J : M2 γ to 7/2$^+$; $l(^3He,d)$=5											**
$*^{199}$Hg	J : 51Pr02,31Sc03=1/2											**
$*^{199}$Tl	J : 57Br32=1/2											**
$*^{199}$Pb^m	E : 424.8(0.2) + x; x < 9.3 keV											**
$*^{199}$Pb^m	D : from 78Le.A											**
$*^{199}$Pb^n	E : 2559.1(0.4) + x; x < 9.3 keV											**
$*^{199}$Bi	J : 59Ax98=9/2											**
$*^{199}$Bi^m	D : %IT 80Br23<2% 85St02<3.2%											**
$*^{199}$Bi^m	E : average 80Br23=667(5) 85St02=667(5)											**
$*^{199}$Bi^n	E : 1922.3 + x keV; x<80 keV in 85Pi05											**
$*^{199}$Bi^p	E : 2523.2 + x keV; x<80 keV in 85Pi05											**
$*^{199}$Po	J : 13Se03,14Se07=(3/2); favored α decay to ^{195}Pb (J^π=3/2$^-$)											**
$*^{199}$Po^m	J : 13Se03,14Se07,17Al34=(13/2); favored α decay to ^{195}Pb^m (J^π=13/2$^+$)											**
$*^{199}$At	T : average 12Fo09=6.7(0.5) 05De01=6.92(0.13) 05Uu02=7.8(0.4) 67Tr06=7.2(0.5)											**
$*^{199}$At	J : 18Cu02=(9/2); favored α decay to ^{195}Bi (J^π=9/2$^-$)											**
$*^{199}$At	D : %α symmetrized from 80Ew03=92(+3-8)%											**
$*^{199}$At^m	T : other: 13Ja06=310(80)											**
$*^{199}$At^m	J : 18Cu02=(1/2); favored α decay to ^{195}Bi^m (J^π=1/2$^+$)											**
$*^{199}$At^m	D : %α from 13Ja06∼1											**
$*^{199}$At^n	T : from $\gamma\gamma$(t) by gating on γs above and below the isomer; other: 00La36=580(130) ns from recoil-time, probably includes decay of											**
$*^{199}$At^n	T : ^{199}At^p											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{199}$Rn	T : other: 14Ka23=340(+280-110)											**
$*^{199}$Rn	J : favored α decay to ^{195}Po (J^π=3/2$^-$)											**
$*^{199}$Rn^m	J : favored α decay to ^{195}Po^m (J^π=13/2$^+$)											**
$*^{199}$Fr	T : average 13Ka16=4.5(+3.1-1.3) 99Ta20=12(+10-4); other (downweighted): 24Wa14=5.5(+26.4-2.5)											**
$*^{199}$Fr	J : favored α decay to ^{195}At (J^π=1/2$^+$)											**
$*^{199}$Fr^m	T : average 13Ka16=6.2(+1.1-0.8) 13Uu01=7(+3-2)											**
$*^{199}$Fr^m	J : favored α decay to ^{195}At^m (J^π=7/2$^-$)											**
$*^{199}$Fr^n	T : symmetrized from 13Uu01=1.6(+1.6$^-$.6)											**
^{200}Re	−11000#	300#				70# ms			26Pi.2	I	β^- ?	
^{200}Os	−18520#	300#				5.6 s 2.5	0$^+$	23	23Lu.A	T	β^-=100	*
^{200}Ir	−21577	17				43 s 6	(2$^-$,3$^-$)	23	14Mo15	T	β^-=100;β^-n ?	*
^{200}Pt	−26599	20				12.6 h 0.3	0$^+$	23	76Hi06	T	β^-=100	
^{200}Au	−27203	5				48.4 m 0.3	(1$^-$)	23	59Ro53	T	β^-=100	
^{200}Au^m	−26233	26	969	27	BD	18.7 h 0.5	12$^-$*	23	68Sa08	T	β^-=84 1;IT=16 1	*
^{200}Hg	−29503.3	0.5				STABLE	0$^+$	23			IS=23.14 9	
^{200}Tl	−27047	6				26.1 h 0.1	2$^-$*	23	62Ja10	T	β^+=100	*
^{200}Tl^m	−26293	6	753.62	0.24		34.0 ms 0.9	7$^+$	23			IT=100	*
^{200}Tl^n	−26285	6	762.00	0.24		397 ns 17	5$^+$	23	19Ro12	T	IT=100	
^{200}Pb	−26252	10				21.5 h 0.4	0$^+$	23	55Be12	T	ε=100	
^{200}Pb^m	−24069	10	2183.3	1.1		456 ns 6	(9$^-$)	23	18La03	T	IT=100	
^{200}Pb^n	−23246	10	3005.8	1.2		198 ns 3	(12$^+$)	23	18La03	T	IT=100	*
^{200}Bi	−20358	11			*	36.4 m 0.5	7$^+$*	23	70DaZM	T	β^+=100	*
^{200}Bi^m	−20260#	70#	100#	70#	*	31 m 2	(2$^+$)	23	78LiZM	T	β^+=100	
^{200}Bi^n	−19930	11	428.20	0.10		400 ms 50	(10$^-$)	23	72Ha73	TED	IT=100	
^{200}Po	−16938	8				11.54 m 0.09	0$^+$	23			β^+=?;α=11.3 4	
^{200}Po^m	−14342	8	2596.09	0.25		100 ns 10	11$^-$	23			IT=100	
^{200}Po^n	−14121	11	2817	7		268 ns 3	12$^+$	23			IT=100	*
^{200}At	−8981.6	1.4				43.1 s 0.8	(3$^+$)*	23	96Ta18	T	α=52 4;β^+=?	*
^{200}At^m	−8868.6	1.1	113.0	1.7	AD	47 s 1	(7$^+$)*	23	92Hu04	T	β^+=?;α=43 7;IT ?	*
^{200}At^n	−8637.7	1.1	343.9	1.7	IT	6.3 s 0.5	(10$^-$)*	23	96Ta18	T	IT=?;α=10.5 3;β^+ ?	*
^{200}Rn	−4001	6				1.03 s 0.03	0$^+$	23			α=92 8;β^+ ?	*
^{200}Rn^m	−1600#	100#	2400#	100#		28 μs 9		23	02Do19	T	IT=100	*
^{200}Fr	6130	30			*	49.6 ms 2.1	(3$^+$)	23	19Gh11	T	α≈98.8 7;β^+ ?;β^+SF=0.037 30	*
^{200}Fr^m	6180	60	40	60	AD*	190 ms 120	10$^-$#	23	96En01	TD	α≈100;IT ?	*
^{200}Fr^n	6280#	60#	150#	50#		790 ns 360		23	14Ka23	T	IT=100	*
^{200}Ra	12630#	200#				10# ms	0$^+$				α ?	
^{200}Ac	24530#	400#				1# μs					α ?;p ?	
$*^{200}$Os	T : average 23Lu.A=2.3(+5.0-1.6) 14Ku23,14Mo15=6(+4-3), supersedes 05Ku.A=4.6(1.3)											**
$*^{200}$Ir	J : from 13Mo20=(2$^-$,3$^-$)											**
$*^{200}$Ir	T : supersedes 11Be.A=43(+6-5)											**
$*^{200}$Au^m	D : %IT,%β^- from 72Cu07											**
$*^{200}$Au^m	J : 73Ba11=12											**
$*^{200}$Tl	J : 58Ma21=2											**
$*^{200}$Tl^m	T : average 63De38=34.1(1.0) 67Co20=33(2) 63Di10=37(4)											**
$*^{200}$Pb^m	T : average 73Pa04=480(30) 74Lu03=480(20) 78Mc03=480(60) 87Fa15=424(10) 88Pa12=480(20) 89Su12=480(30) 18La03=476(12); others (not used):											**
$*^{200}$Pb^m	T : 72Is01=540(30) 73Dj01≈500											**
$*^{200}$Pb^n	T : average 79Ma37=194(6) 87Fa15=202(5) 89Su12=199(5) 18La03=195(8); others (not used): 78Mc03=180(30) 88Pa12=152(30) 75Yo04=158(30)											**
$*^{200}$Bi	J : 59Ax98=7											**
$*^{200}$Po^n	E : 2804.4(0.3) + x; x<25 keV											**
$*^{200}$At	T : average 96Ta18=44(2) 92Hu04=43(1) 75BaYJ=44(3) 67Tr06=42(2); other: 63Ho18=54(12)											**
$*^{200}$At	J : 18Cu02=(3)											**
$*^{200}$At^m	J : 18Cu02=(7)											**
$*^{200}$At^n	E : 92Hu04=230.9(0.2) keV above ^{200}At^m											**
$*^{200}$At^n	T : other: 05Uu02=7.3(+2.6-1.5)											**
$*^{200}$At^n	J : 18Cu02=(10)											**
$*^{200}$Rn	T : average 96Ta18=0.96(0.03) 84Ca32=1.06(0.02),1.06(0.07) 71Ho01=1.0(0.2); others: 10He25=1.4(+1.4-0.5) 05Uu02=1.1(+0.6-0.3)											**
$*^{200}$Rn	T : 96Le09=0.65(+0.28-0.15) 65Nu04=3(1)											**
$*^{200}$Rn	D : %α symmetrized from 93Wa04=86(+14-4)											**
$*^{200}$Rn^m	E : 2300.5(0.5) + x keV; x=100#(100#) keV, based on 161-keV and 183-keV delayed γs observed in 02Do19											**
$*^{200}$Rn^m	T : symmetrized from 02Do19=25(+11-6)											**
$*^{200}$Fr	T : average 19Gh11=52(3) 14Ka23=46(4) 05De01=49(4); others: 22Hu12=75(+23-15) 96En01=19(+13-6)											**
$*^{200}$Fr	D : %α from 14Ka23>97.5%; %β^+SF from %β^+SF/%β^+=3.1(1.7)% in 14Gh09 and %β^+=1.2(0.7)											**
$*^{200}$Fr^m	I : two events with 100 ms and E_α=7550 keV correlated with E_α=6880 keV assigned by NUBASE to ^{196}At^m											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{200}Fr^m$	T : symmetrized from 84Sc13=100(+180-40) (2 events with $T_{1/2}$=100 ms)											**
$*^{200}Fr^n$	E : 14Ka23=101.13 + x keV; x=50#(50#) keV by NUBASE											**
$*^{200}Fr^n$	T : symmetrized from 14Ka23=600(+500-200)											**
^{201}Re	−8100#	300#				10# ms	$5/2^+$#		26Pi.2	I	β^- ?	
^{201}Os	−14650#	300#				3# s >300ns	$1/2^-$#	22			β^- ?	
^{201}Ir	−20073	21				21 s 5	$(3/2^+)$	22	14Mo15	T	β^-=100	*
^{201}Pt	−23819	6				2.46 m 0.09	$(5/2^-)*$	22	22Hi07	J	β^-=100	
$^{201}Pt^m$	−23120#	100#	700#	100#		10# s	$13/2^+$#				IT ?;β^- ?	*
^{201}Au	−26401	3				26.0 m 0.8	$3/2^+$	22			β^-=100	
$^{201}Au^m$	−25807	6	594	5		730 μs 630	$11/2^-$	22	11St21	T	IT=100	*
$^{201}Au^n$	−24791	6	1610	5		5.6 μs 2.4	$19/2^+$#	22	11St21	ETD	IT=100	*
^{201}Hg	−27662.8	0.6				STABLE	$3/2^-*$	22			IS=13.17 9	*
$^{201}Hg^m$	−26896.6	0.6	766.22	0.15		94.0 μs 2.0	$13/2^+$	22			IT=100	
^{201}Tl	−27182	14				3.0421 d 0.0008	$1/2^+*$	22	FGK209	T	ε=100	*
$^{201}Tl^m$	−26263	14	919.47	0.11		2.11 ms 0.11	$9/2^-$	22			IT=100	*
$^{201}Tl^n$	−23100#	50#	4080#	50#		110 ns 30	$(33/2)$	22	13Bo18	TJD	IT=100	*
^{201}Pb	−25273	12				9.33 h 0.05	$5/2^-*$	22	81An11	T	β^+=100	*
$^{201}Pb^m$	−24644	12	629.1	0.3		60.8 s 1.8	$13/2^+$	22			IT=100	
$^{201}Pb^n$	−22320	23	2953	20		508 ns 3	$(29/2^-)$	22			IT=100	*
^{201}Bi	−21430	12				103 m 3	$9/2^-*$	22			β^+=100	*
$^{201}Bi^m$	−20584	12	846.35	0.18		58.5 m 1.1	$1/2^+$	22			β^+=?;IT≈11;α=0.3#	
$^{201}Bi^n$	−19458	26	1972	23		118 ns 28	$25/2^+$#	22	85Pi05	ET	IT=100	*
$^{201}Bi^p$	−19419	26	2011	23		105 ns 75	$27/2^+$#	22	85Pi05	ET	IT=100	*
$^{201}Bi^q$	−18650	26	2780	23		124 ns 4	$29/2^-$#	22	85Pi05	ET	IT=100	*
^{201}Po	−16521	5				15.50 m 0.22	$3/2^-*$	22			β^+=?;α=1.13 3	*
$^{201}Po^m$	−16098	5	423.41	0.22		8.96 m 0.12	$13/2^+*$	22			β^+≈55;IT≈42.6;α=2.4 5	*
^{201}At	−10785.6	1.0				86.8 s 0.6	$9/2^-*$	22			α=71 7;β^+=?	*
$^{201}At^m$	−10326.4	1.0	459.20	0.14		45 ms 3	$1/2^+$	22	14Au03	ETJ	IT=100	
$^{201}At^n$	−8465.8	1.0	2319.8	0.3		3.39 μs 0.09	$29/2^+$	22	15Au01	ETJ	IT=100	
^{201}Rn	−4107	10				7.0 s 0.4	$3/2^-$	22	71Ho01	D	α=80#;β^+ ?	*
$^{201}Rn^m$	−3863	7	245	12	AD	3.8 s 0.1	$13/2^+$	22	71Ho01	D	α=90#;β^+ ?	*
^{201}Fr	3589	9				62.8 ms 1.9	$9/2^-$	22	14Ka23	TD	α≈100;β^+ ?	*
$^{201}Fr^m$	3718	10	129	10	AD	24 ms 6	$1/2^+$	22	20Au01	T	α=100	*
$^{201}Fr^n$	3879	9	289.5	0.4		720 ns 40	$13/2^+$	22	20Au01	ETJ	IT=100	*
^{201}Ra	11937	20				30 ms 30	$3/2^-$	22	14Ka23	TJ	α=100	*
$^{201}Ra^m$	12200	26	263	26	AD	6 ms 5	$13/2^+$	22	05Uu02	T	α=100	*
^{201}Ac	21400#	300#				10# μs	$1/2^+$#				α ?;p ?	
$*^{201}Ir$	J : 13Mo20=(1/2$^+$,3/2$^+$,5/2$^+$), but 3/2$^+$ agrees with systematics at Z=77											**
$*^{201}Pt^m$	I : floating high-spin level populated in decay of high-spin isomer in 11St21; systematics of similar isomers in neighboring odd-N Pt nuclei											**
$*^{201}Au^m$	T : symmetrized from 11St21=340(+900-290)											**
$*^{201}Au^m$	J : $l(t,\alpha)$ in 81Fl05											**
$*^{201}Au^n$	E : 378.2(0.5)+638.0(0.5) keV γs in a cascade above $^{201}Au^m$											**
$*^{201}Hg$	J : 35Sc04,31Sc03=3/2											**
$*^{201}Tl$	J : 58Li45,58Ma21=1/2											**
$*^{201}Tl^m$	J : E3 γ to 3/2$^+$											**
$*^{201}Tl^n$	T : symmetrized from 13Bo18=95(+39-21)											**
$*^{201}Pb$	J : 77Gu18=5/2											**
$*^{201}Pb$	T : average 81An11=9.300(0.075),9.40(0.15),9.350(0.078)											**
$*^{201}Pb^n$	E : 2917.6(0.9) + x keV; x<70 keV in 81He07											**
$*^{201}Bi$	J : 60Li03,59Ax98=9/2											**
$*^{201}Bi^n$	E : 1932.3(0.4) + x keV; x<80 keV in 85Pi05											**
$*^{201}Bi^p$	E : 1971.3(0.4) + x keV; x<80 keV in 85Pi05											**
$*^{201}Bi^q$	E : 2740.0(0.3) + x keV; x<80 keV in 85Pi05											**
$*^{201}Po$	J : 14Se07,13Se03,62Ax02,61Ax02=3/2											**
$*^{201}Po^m$	J : 13Se03,14Se07=13/2											**
$*^{201}At$	J : 18Cu02=(9/2); favored α decay to ^{197}Bi (J$^\pi$=9/2$^-$)											**
$*^{201}At$	T : average 96Ta18=83(2) 74Ho27=88(5) 70DaZM=87.0(0.6) 67Tr06=90(4) 63Ho18=90(6)											**
$*^{201}Rn$	T : average 96Ta18=7.1(0.8) 71Ho01=7.0(0.4); other: 10He25=6.7(+5.1-2.0)											**
$*^{201}Rn$	J : favored α decay to ^{197}Pb (J$^\pi$=3/2$^-$)											**
$*^{201}Rn^m$	T : average 96Ta18=3.8(0.1) 71Ho01=3.8(0.4); others: 67Va17=3.0(1.5) 10He25=3.24(+3.24-1.08)											**
$*^{201}Rn^m$	J : favored α decay to $^{197}Pb^m$ (J$^\pi$=13/2$^+$)											**
$*^{201}Fr$	T : average 14Ka23=64(3) 05Uu02=53(4) 05De01=67(3); others (not used): 96En01=69(+16-11) 80Ew03=48(15)											**
$*^{201}Fr$	J : favored α decay to ^{197}At (J$^\pi$=9/2$^-$)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{201}$Fr^m	T : average 20Au01=37(+14-8) 14Ka23=8(+12-3) 05Uu02=19(+19-6)											**
$*^{201}$Fr^m	J : favored α decay to ^{197}At^m (J^π=1/2$^+$)											**
$*^{201}$Fr^n	T : other: 14Ka23=700(+500-200)											**
$*^{201}$Ra	T : symmetrized from 14Ka23=8(+40-4)											**
$*^{201}$Ra^m	T : symmetrized from 05Uu02=1.6(+7.7-0.7)											**
^{202}Os	−12650#	400#				2# s	>300ns	0^+	23		β^- ?	
^{202}Ir	−16950#	300#				11 s	3	(2$^-$)	23	14Ku23	T β^-=100	*
^{202}Ir^m	−14350#	320#	2600#	100#		3.4 μs	0.6		23	11St21	TD IT=100	*
^{202}Pt	−22692	25				44 h	15	0^+	23	92Sh15	T β^-=100	
^{202}Pt^m	−20905	25	1787.4	0.9		141 μs	7	(7$^-$)	23	11St21	T IT=100	
^{202}Au	−24358	5				28.4 s	1.2	(1$^-$)	23		β^-=100	
^{202}Hg	−27345.4	0.6				STABLE		0^+	23		IS=29.74 13	
^{202}Tl	−25981.5	1.7				12.4706 d	0.0055	2$^-$*	23	11Hi19	T ε=100	*
^{202}Tl^m	−25031.3	1.7	950.19	0.10		591 μs	3	7^+	23		IT=100	
^{202}Tl^n	−21832.7	2.0	4148.8	1.1		215 μs	10	(20$^+$)	23	20Wa24	ET IT=100	
^{202}Pb	−25941	4				52.5 ky	2.8	0^+	23	81Na15	T ε=100	
^{202}Pb^m	−23771	4	2169.83	0.08		3.54 h	0.02	9^-	23		IT=90.3 4;β^+=9.7 4	
^{202}Pb^n	−21800#	50#	4140#	50#		106.4 ns	1.5	16^+	23	19Ro12	T IT=100	*
^{202}Pb^p	−20640#	50#	5300#	50#		108 ns	3	19^-	23	19Ro12	T IT=100	*
^{202}Bi	−20751	14				1.71 h	0.04	5$^+$*	23		β^+=100	*
^{202}Bi^m	−20126	19	625	13		3.04 μs	0.06	10$^-$#	23	81Th03	TD IT=100	*
^{202}Bi^n	−18134	18	2617	12		310 ns	50	(17$^+$)	23	81Th03	TD IT=100	*
^{202}Po	−17943	9				44.5 m	0.4	0^+	23		β^+=?;α=1.92 7	
^{202}Po^m	−16231	15	1712	12		114 ns	5	8^+	23	24Si.A	T IT=100	*
^{202}At	−10673.4	1.8				182 s	2	7^+	23	16Ly01	D β^+=?;α=8.6 11	*
^{202}At^m	−10458.8	2.1	214.6	2.8	AD	184 s	1	3^+	23	16Ly01	D β^+=?;α=12 7;IT ?	*
^{202}At^n	−10281.7	1.8	391.70	0.20		460 ms	50	10^-	23	16Ly01	J IT=?;α=0.096 11;β^+ ?	*
^{202}Rn	−6278	17				9.74 s	0.13	0^+	23	87He10	D α=78 8;β^+ ?	*
^{202}Rn^m	−3970#	50#	2310#	50#		2.22 μs	0.07	11$^-$#	23	02Do19	T IT=100	*
^{202}Fr	3101	6				372 ms	12	3$^+$*	23	14Ka23	T $\alpha\approx$100;β^+ ?	*
^{202}Fr^m	3359	6	258	5	AD	286 ms	13	10$^-$*	23	14Ka23	T $\alpha\approx$100;β^+ ?;IT ?	*
^{202}Ra	9074	15				4.1 ms	1.1	0^+	23	14Ka23	T α=100	*
^{202}Ac	20360#	200#				50# μs					α ?;p ?	
$*^{202}$Ir	T : 14Ku23=11(3), supersedes 14Mo15=15(3)											**
$*^{202}$Ir^m	E : using 311.5, 655.9, 737.2, 889.2, and 967.6 keV γ rays seen in 11St21 and by assuming that 655.9 and 967.6 keV γs depopulate the same											**
$*^{202}$Ir^m	E : level											**
$*^{202}$Tl	J : 58Ma35=2											**
$*^{202}$Pb^n	E : From 4091.0(0.8) + x keV; x=50#(50#) keV by NUBASE											**
$*^{202}$Pb^n	T : average 19Ro12=93(4) 18La03=103(10) 86Ja13=120(6),108.5(2.0), 105.5(3.0),112(9)											**
$*^{202}$Pb^p	E : 5251.0(0.5) + x keV; x=50#(50#) keV by NUBASE											**
$*^{202}$Pb^p	T : average 19Ro12=113(6) 87Fa15=107(3) 18La03=105(38)											**
$*^{202}$Bi	J : 59Ax98=5											**
$*^{202}$Bi^m	E : 605(5) + x keV; x<40 keV in 81Th03											**
$*^{202}$Bi^n	E : 2597.07(0.25) + x keV; x<40 keV in 81Th03											**
$*^{202}$Po^m	E : From 1691.54(0.31) + x keV; x<40 keV in 76Be12											**
$*^{202}$Po^m	T : average 24Si.A=114(5) 76Ha56=110(15); others: 72Na02=185(30) 71Ha01=165(20) 76Be12,90Fa03=85(15) 98Bi06∼100											**
$*^{202}$At	J : 18Cu02=(7); favored α decay from ^{206}Fr^m (J^π=7$^+$)											**
$*^{202}$At	DT : %α: average 16Ly01=8.5(1.5) 92Hu04=8.7(1.5)											**
$*^{202}$At^m	J : 18Cu02=(3); favored α decay from ^{206}Fr (J^π=3$^+$)											**
$*^{202}$At^m	T : from 92Hu04											**
$*^{202}$At^n	ED : from 92Hu04=391.7(0.2) keV above the 7$^+$ state											**
$*^{202}$At^n	J : other: E3 γ to 7$^+$											**
$*^{202}$Rn	T : average 96Ta18=10.3(0.4) 92Wa29=9.5(0.2) 71Ho01=9.85(0.20)											**
$*^{202}$Rn^m	E : from 2260.4(0.5) + x keV; x=50#(50#) keV by NUBASE											**
$*^{202}$Fr	J : 13Fl09=3, 14Ly01=(3)											**
$*^{202}$Fr^m	J : 13Fl09=10, 14Ly01=(10)											**
$*^{202}$Ra	T : symmetrized from 14Ka23=3.8(+1.3-0.8); others: 05Uu02=16(+30-7) 96Le09=0.7(+3.3-0.3)											**
^{203}Os	−6980#	400#				300# ms	>300ns	9/2$^+$#	21	12Ku26	I β^- ?;β^-n ?	
^{203}Ir	−14950#	400#				7# s	>300ns	3/2$^+$#	21	09St16	I β^- ?	
^{203}Ir^m	−14450#	410#	500#	100#		> 100# ns		11/2$^-$#	21	11St21	IJ IT ?;β^- ?	*
^{203}Ir^n	−12710#	410#	2236#	100#		370 ns	30	19/2$^+$#	21	26Ba28	TDJ IT=100	*
^{203}Pt	−19852	19				22 s	4	(1/2$^-$)	21	14Mo15	T β^-=100	*
^{203}Pt^m	−18485#	19#	1367#	3#		12 s	5	13/2$^+$#	21	13Mo20	TE IT≈100;β^- ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{203}Pt^n	−18430#	50#	1420#	50#		> 100# ns	27/2−#	21	11St21	IJ	IT=100	
^{203}Pt^p	−17320#	50#	2530#	50#		641 ns 55	33/2+#	21	11St21	TJD	IT=100	
^{203}Au	−23143	3				60 s 6	3/2+	21	94We02	T	β−=100	
^{203}Au^m	−22502	4	641	3		140 μs 44	11/2−#	21	11St21	TJ	IT=100	*
^{203}Hg	−25271.1	1.3				46.599 d 0.010	5/2−*	21	FGK259	T	β−=100	*
^{203}Hg^m	−24338.0	1.3	933.14	0.23		22.1 μs 1.0	(13/2+)	21	11St21	T	IT=100	*
^{203}Hg^n	−16989.8	1.4	8281.3	0.5		146 ns 30	(53/2+)	21	11Sz01	EJT	IT=100	
^{203}Tl	−25762.8	0.4				STABLE	1/2+*	21	24Yu02	J	IS=29.515 43	*
^{203}Tl^m	−24279.0	0.6	1483.8	0.4		< 1 μs	(9/2−)		20Fo05	ETJ	IT=100	*
^{203}Tl^n	−22497.2	0.6	3265.6	0.4		7.05 μs 0.24	(29/2+)	21	22Bo04	ETJ	IT=100	*
^{203}Pb	−24788	6				51.954 h 0.019	5/2−	21	14Un01	T	ε=100	*
^{203}Pb^m	−23963	6	825.11	0.10		6.21 s 0.08	13/2+	21			IT=100	
^{203}Pb^n	−21839	6	2949.12	0.24		480 ms 7	29/2−	21	77Li04	T	IT=100	
^{203}Pb^p	−21820#	50#	2970#	50#		122 ns 4	25/2−#	21	88Ro08	T	IT=100	*
^{203}Bi	−21525	13				11.76 h 0.05	9/2−*	21	60St21	T	β+=100	*
^{203}Bi^m	−20427	13	1098.21	0.09		305 ms 5	1/2+	21	84Lo16	T	IT=100	
^{203}Bi^n	−19484	13	2041.5	0.6		194 ns 30	25/2+	21	78Hu02	T	IT=100	
^{203}Po	−17310	5				36.7 m 0.5	5/2−*	21	70DaZM	T	β+=?;α=0.11 2	*
^{203}Po^m	−16668	5	641.64	0.14		45 s 2	13/2+*	21	86Fa04	T	IT≈100;α ?	*
^{203}Po^n	−15152	5	2158.3	0.6		> 200 ns		21	86Fa04	T	IT=100	
^{203}At	−12163	11				7.4 m 0.2	9/2−*	21	74Ho27	D	β+=?;α=31 3	*
^{203}At^m	−11480	11	683.4	0.3		3.5 ms 0.6	1/2+	21	17Au05	ETJ	IT=100	
^{203}At^n	−9833	11	2330.0	0.3		9.77 μs 0.21	29/2+	21	18Au01	ETJ	IT=100	
^{203}Rn	−6186	6				44.2 s 1.6	3/2−	21	78HoZZ	D	α=66 9;β+ ?	*
^{203}Rn^m	−5824	5	362	4	AD	26.9 s 0.5	13/2+*	21	87Bo29	J	α=75 10;β+ ?	*
^{203}Fr	876	6				550 ms 10	9/2−*	21			α≈100;β+ ?	*
^{203}Fr^m	1237	7	361	6		43 ms 4	1/2+	21	13Ja06	TJD	IT ?;α=20 4	*
^{203}Fr^n	1302	6	426.0	1.0		370 ns 50	13/2+	21	13Ja06	TJD	IT=100	
^{203}Ra	8600	10				36 ms 13	3/2−	21	96Le09	J	α=100;β+ ?	*
^{203}Ra^m	8848	10	248	14	AD	25 ms 5	13/2+	21	96Le09	J	α=100;β+ ?	*
^{203}Ac	17577	21				210 μs 170	(1/2+)		24Wa14	TDJ	α=100;p ?	*
*^{203}Ir^m	I : floating high-spin level populated in decay of ^{203}Ir^n in 11St21; systematics of similar isomers in neighboring odd-Z Ir nuclei											**
*^{203}Ir^n	E : 841.3+894.7 keV γs in a cascade to ^{203}Ir^m											**
*^{203}Ir^n	T : other: 11St21=798(350)											**
*^{203}Pt	J : from 13Mo20=(1/2−)											**
*^{203}Au^m	E : from 94Gr07											**
*^{203}Hg	J : 64Re03,21Da16,21Da01=5/2											**
*^{203}Hg^m	T : average 11St21=21.9(1.0) 86Ze03=27(5) 64Br27=21(5)											**
*^{203}Tl	J : 24Yu02,24Yu11,17Ba04,13Ba41,50Pr51,32Ja02,31Sc02=1/2											**
*^{203}Tl	D : from IS=[29.44,29.59] in 24Ci.A											**
*^{203}Tl^m	T : not directly measured; half-life expected ∼2-20 ns											**
*^{203}Tl^n	T : average 22Bo04=6.6(0.3) 20Za.A=7.9(0.6) 98Pf02=7.7(0.5)											**
*^{203}Pb	T : average 14Un01=51.92(0.04) 01Li17=51.99(0.03) 24Po10,80Ho17=51.88(0.04) [unc 80Ho17=0.02] 71Ch54=52.02(0.05)											**
*^{203}Pb^p	E : 2923.3 + x keV; x=50#(50#) keV by NUBASE											**
*^{203}Bi	J : 59Li50=9/2											**
*^{203}Po	J : 13Se03,14Se07,17Al34,61Ax02=5/2											**
*^{203}Po^m	J : 13Se03,14Se07=13/2											**
*^{203}At	J : 18Cu02=9/2											**
*^{203}Rn	T : average 96Ta18=42(3) 71Ho01=45(2) 67Va17=45(5)											**
*^{203}Rn	J : favored a-decay to ^{199}Po (J$^\pi$=3/2−)											**
*^{203}Rn^m	D : from 87He10											**
*^{203}Fr	J : 17Wi11,13Fl09=9/2,14Ly01=(9/2)											**
*^{203}Fr	T : average 05Uu02=530(20) 05De01=560(15) 80Ew03=550(20)											**
*^{203}Fr^m	J : favored α decay to ^{199}At^m (J$^\pi$=1/2+)											**
*^{203}Ra	T : symmetrized from 05Uu02=31(+17-9); others 14Ka23=50(+40-15) 96Le09=1.1(+5.0-0.5)											**
*^{203}Ra	J : favored α decay to ^{199}Rn^m (J$^\pi$=3/2−)											**
*^{203}Ra^m	T : symmetrized from 05Uu02=24(+6-4); others: 14Ka23=37(+37-12) 96Le09=33(+22-10)											**
*^{203}Ra^m	J : favored α decay to ^{199}Rn^m (J$^\pi$=13/2+)											**
*^{203}Ac	T : symmetrized from 24Wa14=56(+269-26)											**
^{204}Ir	−9850#	400#				2# s >300ns	(5+,6+)#	13	11Mo18	I	β− ?;β−n ?	
^{204}Pt	−18140	10				10.3 s 1.4	0+	09	09Mo17	T	β−=100	*
^{204}Pt^m	−16144	10	1995.1	0.7		5.5 μs 0.7	5−#	09	11St21	E	IT=100	*
^{204}Pt^n	−16100	22	2039	20		55 μs 3	7−#	09	08St20	T	IT=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{204}Pt^{p}	−14943	22	3197	20		146 ns 14	10^+#	09	08St20	T	IT=100	*
^{204}Au	−20638.8	2.6				38.4 s 0.6	(2^-)	09	14Mo15	T	β^-=100	*
^{204}Au^{m}	−18640#	100#	2000#	100#		< 1# s	12^-#		11St21	JI	IT ?	
^{204}Au^{n}	−16820#	100#	3820#	100#		2.1 μs 0.3	16^+#	09	11St21	JDE	IT=100	
^{204}Hg	−24690.1	0.5				STABLE	0^+	09			IS=6.82 4;2β^- ?	
^{204}Hg^{n}	−17464.0	0.5	7226.08	0.17		∼ 485 ns	22^+		15Wr02	ETJ	IT=100	
^{204}Tl	−24347.50	0.24				3.783 y 0.012	2^-*	09			β^-=?;β^+=2.87 7	*
^{204}Tl^{m}	−23243.4	0.3	1104.1	0.2		61.7 μs 1.0	7^+	09	11Br12	EJ	IT=100	*
^{204}Tl^{n}	−22028.5	0.4	2319.0	0.3		2.84 μs 0.09	12^-	09	11Br12	EJ	IT=100	*
^{204}Tl^{p}	−19955.9	0.6	4391.6	0.5		420 ns 30	18^+	09	11Br12	ETJ	IT=100	
^{204}Tl^{q}	−18108.1	0.6	6239.4	0.5		90 ns 3	22^-		11Br12	ETJ	IT=100	
^{204}Pb	−25111.23	0.17				STABLE >140Py	0^+	09			IS=1.4 6;α ?	*
^{204}Pb^{m}	−23837.10	0.18	1274.13	0.05		265 ns 6	4^+	09			IT=100	
^{204}Pb^{n}	−22925.35	0.19	2185.88	0.08		66.93 m 0.10	9^-	09			IT=100	
^{204}Pb^{p}	−22846.81	0.18	2264.42	0.06		473 ns 49	7^-	09	20Za.A	T	IT=100	*
^{204}Pb^{q}	−16762.2	1.0	8349	1		0.22 ms 0.02	(22^+)		22Wa20	TE	IT=100	*
^{204}Bi	−20646	9				11.22 h 0.10	6^+*	09	60St21	T	β^+=100	*
^{204}Bi^{m}	−19841	9	805.5	0.3		13.0 ms 0.1	10^-	09	74Ra25	T	IT=100	
^{204}Bi^{n}	−17813	9	2833.4	1.1		1.07 ms 0.03	17^+	09	74Ra25	T	IT=100	
^{204}Po	−18342	10				3.528 h 0.008	0^+	09	65AnZZ	TD	β^+=?;α=0.67 3	*
^{204}Po^{m}	−16703	10	1639.03	0.06		158.6 ns 1.8	8^+	09	10Ka29	T	IT=100	*
^{204}At	−11862	11				9.23 m 0.10	7^+*	09			β^+=?;α=3.91 16	*
^{204}At^{m}	−11275	11	587.30	0.20		108 ms 10	10^-	09			IT=100	
^{204}Rn	−7967	8				74.5 s 1.4	0^+	09	71Ho01	T	α=72.4 9;β^+ ?	*
^{204}Fr	610.5	1.1				2.02 s 0.09	3^+*	09	95Bi.A	D	α=96 2;β^+ ?	*
^{204}Fr^{m}	656.4	1.3	45.9	1.7	MD	2.70 s 0.13	7^+*	09	95Bi.A	D	α=90 2;β^+ ?	*
^{204}Fr^{n}	931.7	1.6	321.2	1.9	IT	1.71 s 0.14	10^-*	09	22Ya27	TD	α=77 5;IT=?	*
^{204}Ra	6061	9				61 ms 9	0^+	09	05Uu02	T	α=100;β^+ ?	*
^{204}Ac	16670	30				7.9 ms 1.8	(3^+)		22Hu12	TD	α=100;p ?	*
^{204}Th	23920#	400#				1# ms	0^+				α ?	
*^{204}Pt	T : average 09Mo17=10.4(1.8),10.1(2.2); other: 14Mo15=16(+6-5)											**
*^{204}Pt^{m}	E : 872.4(0.5)+1122.7(0.5) keV γs in a cascade to gs											**
*^{204}Pt^{n}	E : no K X-rays observed in 11St21, so 10 keV<ΔE<78.4 keV above ^{204}Pt^{m}											**
*^{204}Pt^{p}	E : 1157.5(0.5) γ to ^{204}Pt^{n} in 11St21											**
*^{204}Pt^{p}	T : other: 25Ba40=160(30)											**
*^{204}Au	T : average 14Mo15=37.2(0.8) 84Cr01=39.8(0.9); others: 17Ca12=33.7(14.9) 72Pa06=40(3)											**
*^{204}Tl	J : 57Br32,56Be24=2											**
*^{204}Tl	D : using I(K x ray)=1.64(0.04)% from 1990Sc08, K fluorescence yield=0.962(0.004) from 1996Sc06, and K-shell ε probability=0.5932(0.0026) from											**
*^{204}Tl	D : 2019Mo35, based on Qε=344.1(1.2) keV (2021Wa16)											**
*^{204}Tl^{m}	T : average 08Fo03=60.7(1.2) 75Uy01=65(3) 66MoZZ=63(2) 58Du80=62(5); other: 20Za.A=42(6), for both m+n											**
*^{204}Tl^{n}	T : average 20Za.A=2.9(0.1) 98Pf02=2.6(0.2)											**
*^{204}Pb	T : also 13Be16>140 Ey											**
*^{204}Pb	D : other: IS=[0.00,1.58] in 24Ci.A											**
*^{204}Pb^{p}	T : average 20Za.A=450(70) 78So02=450(+100-30)											**
*^{204}Bi	J : 59Li50=6											**
*^{204}Po	T : average 70Ra14=3.57(0.02) 70Jo26=3.5(0.1) 70DaZM=3.55(0.15) [α(t)], 3.69(0.11) [γ(t)] 67Ti04=3.6(0.1) 65AnZZ=3.50(0.01) [α(t)], 3.59(0.02)											**
*^{204}Po	T : [γ(t), average of 11 γs] 61Fo05=3.6(0.2) 61La02=3.53(0.03)											**
*^{204}Po^{m}	T : average 10Ka29=161(4) 87Ra04=158(2); others: 90Fa03=150(10) 83He08=150(10) 71Ha01=140(5) 70Ya03=190(20) 70Br.A=143(5)											**
*^{204}At	T : average 61La02=9.3(0.3) 63Ho18=9.3(0.2) 64Th07=8.9(0.2) 70DaZM=9.1(0.2) 10Ka29=9.6(0.2)											**
*^{204}At	J : 18Cu02=(7)											**
*^{204}Rn	T : average 71Ho01=74(2) 67Va17=75(2); Others: 22Zh45=80(+22-14) 96Ta18=70(11)											**
*^{204}Fr	T : average 22Ya27=1.99(0.12) 05Uu02=1.9(0.5) 92Hu04=1.7(0.3) 74Ho27=2.1(0.2) 64Gr04=2.0(0.5) 67Va20=2.2(0.2)											**
*^{204}Fr	J : 15Vo05,14Ly01,13Vo10=3											**
*^{204}Fr	D : %α other: 74Ho27=70(15)											**
*^{204}Fr^{m}	T : average 13Ja06=2.6(0.3) 05Uu02=1.6(+0.5-0.3) 92Hu04=2.6(0.3) 74Ho27=2.1(0.3) 67Va20=3.3(0.2)											**
*^{204}Fr^{m}	J : 15Vo05,14Ly01=7											**
*^{204}Fr^{m}	D : other: %α 74Ho27=30(6)											**
*^{204}Fr^{n}	E : 12Ja01=275 keV above ^{204}Fr^{m}											**
*^{204}Fr^{n}	T : average 22Ya27=2.19(0.41) 13Ja06=1.65(0.15); others: 05Uu02=0.8(0.2) 92Hu04∼1											**
*^{204}Fr^{n}	J : 15Vo05,14Ly01=10											**
*^{204}Fr^{n}	D : %α average 22Ya27=80(7) 95Bi.A=74(8); others: 14Ly01=50(10) 94Le05=1.4(+0.8-0.4)											**
*^{204}Ra	T : average 05Uu02=54(+19-11) 96Le09=59(+12-9) 95Le04=45(+55-21); other: 10He25=44(+44-15)											**
*^{204}Ac	T : symmetrized from 22Hu12t=7.4(+2.2-1.4); other: 24Wa14=11.6(+10.6-7.8)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{204}$Ac	J : favored α decay to ^{200}Fr ($J^\pi=3^+$)										**
^{205}Ir	−6020#	500#				1# s >300ns	$3/2^+$#	20	12Ku26 I	β^- ?;β^-n ?	
^{205}Pt	−13220#	300#				2# s >300ns	$9/2^+$#	20		β^- ?	
^{205}Au	−19070	14				32.0 s 1.4	$3/2^+$#	20		β^-=100	
^{205}Au^m	−18148	17	922	10	MD	6 s 2	$11/2^-$#	20		IT=?;β^-=?	
^{205}Au^n	−16220	14	2849.7	0.4		163 ns 5	$19/2^+$#	20		IT=100	
^{205}Hg	−22289	4				5.14 m 0.09	$1/2^-*$	20		β^-=100	*
^{205}Hg^m	−20733	4	1556.4	0.3		1.09 ms 0.04	$13/2^+$	20		IT=100	
^{205}Hg^n	−18972	4	3316.6	0.8		5.89 μs 0.18	$(23/2^-)$	20		IT=100	
^{205}Tl	−23822.3	0.5				STABLE	$1/2^+*$	20		IS=70.485 43	*
^{205}Tl^m	−20531.7	0.5	3290.61	0.17		2.6 μs 0.2	$25/2^+$	20		IT=100	
^{205}Tl^n	−18986.7	1.6	4835.6	1.5		235 ns 10	$(35/2^-)$	20		IT=100	
^{205}Pb	−23771.56	0.12				16.8 My 0.8	$5/2^-$	20	FGK219 T	ε=100	
^{205}Pb^m	−23769.23	0.12	2.329	0.007		24.2 μs 0.4	$1/2^-$	20		IT=100	
^{205}Pb^n	−22757.71	0.12	1013.85	0.03		5.55 ms 0.02	$13/2^+$	20		IT=100	
^{205}Pb^p	−20575.8	0.6	3195.8	0.6		218 ns 4	$25/2^-$	20	20Za.A T	IT=100	*
^{205}Bi	−21066	5				14.91 d 0.07	$9/2^-*$	20		β^+=100	*
^{205}Bi^m	−19569	5	1497.17	0.09		7.9 μs 0.7	$1/2^+$	20		IT=100	
^{205}Bi^n	−19001	5	2064.7	0.4		100 ns 6	$21/2^+$	20		IT=100	
^{205}Bi^p	−18927	5	2139.0	0.7		220 ns 25	$25/2^+$	20		IT=100	
^{205}Bi^q	−13080	40	7988	44		8 ms 2	$(51/2^-)$		22Wa20 T	IT=100	*
^{205}Po	−17521	10				1.74 h 0.08	$5/2^-*$	20		β^+=?;α=0.040 12	*
^{205}Po^m	−17378	10	143.166	0.015		310 ns 60	$1/2^-$	20		IT=100	
^{205}Po^n	−16641	10	880.31	0.04		645 μs 20	$13/2^+$	20		IT=100	
^{205}Po^p	−16060	10	1461.21	0.21		57.4 ms 0.9	$19/2^-$	20		IT=100	
^{205}Po^q	−14434	10	3087.2	0.4		115 ns 10	$29/2^-$	20		IT=100	
^{205}At	−12985	12				26.9 m 0.8	$9/2^-*$	20		β^+=?;α=10 2	*
^{205}At^m	−10645	12	2339.64	0.23		7.76 μs 0.14	$29/2^+$	20		IT=100	
^{205}Rn	−7710	5				170 s 4	$5/2^-*$	20		β^+=?;α=24.6 9	*
^{205}Rn^m	−7053	5	657.1	0.5		> 10 s	$13/2^+$#	20		IT≈100;α ?;β^+ ?	
^{205}Fr	−1307.3	1.2				3.90 s 0.07	$9/2^-*$	20		α=98.5 4;β^+=?	*
^{205}Fr^m	−763.3	1.6	544.0	1.0		80 ns 20	$13/2^+$			IT=100	
^{205}Fr^n	−698	6	609	6		1.15 ms 0.04	$(1/2^+)$	20		IT=100	
^{205}Ra	5804	23				220 ms 50	$3/2^-$	20	96Le09 T	α=100;β^+ ?	*
^{205}Ra^m	6067	11	263	25	AD	180 ms 50	$13/2^+$	20	17Al34 E	α=100;IT ?;β^+ ?	*
^{205}Ac	14054	18				8.4 ms 2.2	$9/2^-$	20	22Hu12 T	α=100;β^+ ?;p ?	*
^{205}Th	22930#	300#				1# ms	$3/2^-$#			α ?	
$*^{205}$Hg	T : other: 10Ku02=5.61(0.38) for q=80^+ (bare ion)										**
$*^{205}$Hg	J : 75Ro10,72OtZX=1/2										**
$*^{205}$Tl	J : 24Yu02,24Yu11,13Ba41,12Ba32,50Pr51,32Ja02,31Sc02=1/2										**
$*^{205}$Tl	T : other: 24Si18=291(+33-27) d for q=81^+ (bare ion)										**
$*^{205}$Tl	D : from IS=[70.41,70.56] in 24Ci.A										**
$*^{205}$Pb^p	T : average 20Za.A=220(10) 76Li09=217(5) 73Be32=226(17)										**
$*^{205}$Bi	J : 59Li50=9/2										**
$*^{205}$Bi^q	E : unobserved <150 keV γ to the 7913 keV level										**
$*^{205}$Po	J : 61Ax02=5/2										**
$*^{205}$At	J : 18Cu02=9/2										**
$*^{205}$Rn	J : 87Bo29=5/2										**
$*^{205}$Fr	J : 14Ly01,13Vo10,15Vo05,13Fl09=9/2										**
$*^{205}$Ra	T : symmetrized from 96Le09=210(+60-40)										**
$*^{205}$Ra	J : favored α decay to ^{201}Rn ($J^\pi=3/2^-$)										**
$*^{205}$Ra^m	T : symmetrized from 96Le09=170(+60-40); other: 10He25=68(+68-23)										**
$*^{205}$Ra^m	J : favored α decay to ^{201}Rn^m ($J^\pi=13/2^+$)										**
$*^{205}$Ac	T : symmetrized from 22Hu12=7.7(+2.7-1.6); supersedes 14Zh03=20(+97-9)										**
$*^{205}$Ac	J : favored α decay to ^{201}Fr ($J^\pi=9/2^-$)										**
^{206}Pt	−9700#	300#				500# ms >300ns	0^+	25	12Ku26 I	β^- ?;β^-n ?	
^{206}Au	−14453	8				40 s 15	$(5^+,6^+)$	25	15Mo20 T	β^-=100	*
^{206}Hg	−20934	8				8.32 m 0.07	0^+	25		β^-=100	*
^{206}Hg^m	−18832	8	2102.4	0.3		2.095 μs 0.017	5^-	25	18La03 T	IT=100	*
^{206}Hg^n	−17211	8	3723.0	0.7		106 ns 3	(10^+)	25	18La03 T	IT=100	*
^{206}Tl	−22253.9	0.5				4.202 m 0.014	0^-*	25		β^-=100	*
^{206}Tl^m	−19610.8	0.5	2643.10	0.18		3.74 m 0.03	$(12)^-$	25		IT=100	
^{206}Pb	−23786.91	0.11				STABLE >2.5Zy	0^+	25	13Be16 T	IS=24.1 30;α ?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{206}Pb^{m}	−21586.78	0.12	2200.13	0.05		126.0 μs 0.6	7$^-$	25	26Su04	T	IT=100	
^{206}Pb^{n}	−19759.6	0.4	4027.3	0.4		205 ns 3	12$^+$	25	20Za.A	T	IT=100	*
^{206}Bi	−20030	8				6.243 d 0.003	6$^+$*	25			β^+=100	*
^{206}Bi^{m}	−19970	8	59.897	0.017		7.7 μs 0.2	4$^+$	25			IT=100	
^{206}Bi^{n}	−18985	8	1044.8	0.7		890 μs 10	10$^-$	25	74Ra25	T	IT=100	
^{206}Bi^{p}	−10797	8	9233.3	0.8		155 ns 15	(28$^-$)	25	12Ci05	EJD	IT=100	
^{206}Bi^{q}	−9860	8	10170.5	0.8		27 μs 2	(31$^+$)	25	12Ci05	EJD	IT=100	*
^{206}Po	−18189	4				8.8 d 0.1	0$^+$	25	56Jo34	T	β^+=?;α=5.45 5	
^{206}Po^{m}	−16603	4	1585.96	0.09		232 ns 4	8$^+$	25			IT=100	
^{206}Po^{n}	−15927	4	2262.17	0.10		1.05 μs 0.06	9$^-$	25	90Ba31	T	IT=100	
^{206}At	−12440	14				30.5 m 0.6	(6)$^+$*	25			β^+=?;α=0.90 8	*
^{206}At^{m}	−11630#	14#	810#	3#		813 ns 21	(10)$^-$	25	09Dr08	T	IT=100	*
^{206}Rn	−9134	9				5.67 m 0.17	0$^+$	25	69Ha03	T	α=62 3;β^+=?	
^{206}Fr	−1325	4				∼16 s	7$^+$*	25	16Ly01	DJ	α=84.7 15;β^+ ?	*
^{206}Fr^{m}	−1111	4	215	6	AD	∼16 s	3$^+$*	25	16Ly01	DJ	α=88.4 33;β^+=?	*
^{206}Fr^{n}	−794	4	531.0	1.0		0.7 s 0.1	10$^-$*	25	16Ly01	DJ	IT=?;α=13 2	*
^{206}Fr^{x}	−1230	100	100	100	MD	R=?	*spmix*					
^{206}Ra	3562	17				242 ms 17	0$^+$	25	21Ni08	T	α=100;β^+ ?	*
^{206}Ac	13468	15				25 ms 4	3$^+$	25	25Zh34	T	α=100;β^+ ?	*
^{206}Ac^{m}	13690	30	220	30	AD	41 ms 16	10$^-$	25			α=100;β^+ ?	*
^{206}Th	20000#	200#				1# ms	0$^+$				α ?	
*^{206}Au	T : from $\beta\gamma$(t) in 15Mo20=40(15); other: 17Ca12=56(17)											**
*^{206}Hg	T : average 62Ka27=8.5(0.1) 64Wo05=8.1(0.4) 68Wo08=8.15(0.10); others: 98Zh22=8.36(+0.80-0.60),8.34(+1.06-0.85) 61Nu01=7.5(1.0)											**
*^{206}Hg^{m}	T : average 18La03=2.08(0.04) 15Al09=2.19(0.07) 11St21=2.09(0.02) 82Be38=2.15(0.21)											**
*^{206}Hg^{n}	T : average 18La03=106(15) 11St21=112(4) 09Al29=96(15) 01Fo08=92(8) 01La09=90(10)											**
*^{206}Tl	J : 69Cu09,69Fu09,68Ro12=0											**
*^{206}Pb	D : other: IS=[1.90,86.73] in 24Ci.A											**
*^{206}Pb^{m}	T : average 26Su04=127.2(1.1) 95An36=125(19) 73Sa22=125(2) 68Ta13=123.3(1.1) 66MoZZ=126(6) 62Th12=130.5(1.5) 60Be36=123(3) 57To22=128(5)											**
*^{206}Pb^{m}	T : 57As65=123(4); others: 94Po20=124 73DaZL=119(3) 67Co20=141(7) 53Al47=145(15) 20Za.A=93(2)											**
*^{206}Pb^{n}	T : average 20Za.A=240(10) 18La03=203(28) 93Bl02=205(4) 83St15=185(15) 79Ma37=198(6) 71Be37=200(14); others: 71Be37=424(35),379(31)											**
*^{206}Bi	J : 69Fu11,59Li50,57Ma24=6											**
*^{206}Bi^{q}	T : from 22Wa20=27(2); other: 12Ci05>2											**
*^{206}At	J : 18Cu02=(6)											**
*^{206}At^{m}	T : others: 10Ka29=377(44) 99Fe10=410(80)											**
*^{206}At^{m}	E : 806.7(1.4) + x keV; x<6 keV estimated by NUBASE											**
*^{206}Fr	J : 15Vo05=7,14Ly01,16Ly01=7											**
*^{206}Fr^{m}	J : 14Ly01,16Ly01,13Vo10,15Vo05=3											**
*^{206}Fr^{n}	E : 531(1) keV above ^{206}Fr in 81Ri04; uncertainty from ENSDF2025											**
*^{206}Fr^{n}	J : 15Vo05,16Ly01=10											**
*^{206}Fr^{n}	D : IT observed in 81Ri04											**
*^{206}Ra	T : average of 21Ni08=283(48) 87He10=240(20) 96Le09=210(50); others: 95Le15=250(50) 95Uu01=400(+700-160) 95Le41=990 67Va20=400(20) 68Lo15=500											**
*^{206}Ac	T : average 25Zh34=24(+6-4) 98Es02=22(+9-5); others: 14Zh03=41(+56-15) 98LuZV=11(+9-3)											**
*^{206}Ac	J : favored α decay to ^{202}At (J$^\pi$=3$^+$)											**
*^{206}Ac^{m}	T : symmetrized from 98Es02=33(+22-9)											**
*^{206}Ac^{m}	J : favored α decay to ^{202}At^{m} (J$^\pi$=10$^-$)											**
^{207}Pt	−4510#	400#				600# ms >300ns	9/2$^+$#	22	12Ku26	I	β^- ?;β^-n ?	
^{207}Au	−11100#	300#				3# s >300ns	3/2$^+$#	22	06Ca30	I	β^- ?;β^-n ?	
^{207}Hg	−16446	6				2.9 m 0.2	9/2$^+$*	10	21Da01	J	β^-=100	*
^{207}Tl	−21031.5	0.7				4.77 m 0.02	1/2$^+$*	10	13Ba41	J	β^-=100	*
^{207}Tl^{m}	−19683.3	0.7	1348.18	0.16		1.33 s 0.11	11/2$^-$*	10	24Yu02	J	IT≈100;β^- ?	
^{207}Pb	−22453.37	0.05				STABLE >1.9Zy	1/2$^-$*	10	13Be16	T	IS=22.1 50;α ?	*
^{207}Pb^{m}	−20820.01	0.05	1633.356	0.004		806 ms 5	13/2$^+$	10			IT=100	
^{207}Pb^{n}	−13618.8	0.7	8834.6	0.7		1.46 μs 0.10	(39/2$^-$)		25Ta17	ETJ	IT=100	
^{207}Bi	−20055.4	2.1				31.22 y 0.17	9/2$^-$	10	14Un01	T	β^+=100	
^{207}Bi^{m}	−17953.8	2.1	2101.61	0.16		182 μs 6	21/2$^+$	10			IT=100	
^{207}Po	−17147	7				5.80 h 0.02	5/2$^-$*	10			β^+=?;α=0.021 2	*
^{207}Po^{m}	−17078	7	68.557	0.014		205 ns 10	1/2$^-$	10			IT=100	
^{207}Po^{n}	−16032	7	1115.076	0.017		49 μs 4	13/2$^+$	10			IT=100	
^{207}Po^{p}	−15764	7	1383.16	0.07		2.79 s 0.08	19/2$^-$	10			IT=100	
^{207}At	−13228	12				1.81 h 0.03	9/2$^-$*	10			β^+=?;α≈10	*
^{207}At^{m}	−11111	12	2117.3	0.6		107.6 ns 0.8	25/2$^+$	10	23Ya12	T	IT=100	*
^{207}At^{n}	−10843	12	2384.6	0.1		4.30 μs 0.26	(29/2$^+$)		23Ya12	EJ	IT=100	*
^{207}Rn	−8634	5				9.25 m 0.17	5/2$^-$*	10			β^+=?;α=21 3	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{207}Rn^m	−7735	5	899.1	1.0		184.5 μs 0.9	13/2$^+$	10			IT=100	
^{207}Fr	−2849	18				14.8 s 0.1	9/2$^-$∗	10			α=95 2;β$^+$?	∗
^{207}Ra	3536	15				1.38 s 0.18	5/2$^-$#	10			α≈86;β$^+$?	∗
^{207}Ra^m	4072	10	535	17	AD	56 ms 6	13/2$^+$	10	21Ni08	TD	α=0.26 20;IT= ?	∗
^{207}Ac	11150	60				36.5 ms 2.7	9/2$^-$	10	22Ya27	T	α=100	∗
^{207}Th	19353	24				37 ms 29	3/2$^-$#	22	22Ya15	T	α=100	∗
^{207}Pa	28730#	400#				1# ms	9/2$^-$#				α ?	
∗^{207}Hg	J : 21Da01=(9/2); l(d,p)=4 in 20Ta03											∗∗
∗^{207}Tl	T : others: 05Oh08=4.25(0.14) 10Ku02=4.70(0.19) for q=81$^+$ (bare ion)											∗∗
∗^{207}Tl	J : other: 24Yu02,24Yu11=1/2											∗∗
∗^{207}Pb	J : 50Pr51,32Ko01,31Mu02=1/2											∗∗
∗^{207}Pb	D : other: IS=[0.35,23.51] in 24Ci.A											∗∗
∗^{207}Po	J : 15Fi07,61Ax02=5/2											∗∗
∗^{207}At	J : 18Cu02=9/2											∗∗
∗^{207}At^m	T : average 23Ya12=107.5(0.9) 81Sj01=108(2)											∗∗
∗^{207}At^n	T : from 26Ta.A; other: 23Ya12=2 μs-4.5 μs											∗∗
∗^{207}Rn	J : 87Bo29=5/2											∗∗
∗^{207}Fr	J : 17Wi11,14Ly01,86Ek02=9/2											∗∗
∗^{207}Ra	T : average 95Uu01=1.1(+0.9-0.3) 68Lo15=1.8(0.5) 67Va22=1.3(0.2)											∗∗
∗^{207}Ra^m	T : average 21Ni08=55(9) 96Le09=63(16) 87He10=55(10)											∗∗
∗^{207}Ra^m	J : favored α decay to ^{203}Rn^m (J$^\pi$=13/2$^+$)											∗∗
∗^{207}Ac	T : others: 98Es02=27(+11-6) 94Le05=22(+40-9)											∗∗
∗^{207}Ac	J : favored α decay to ^{203}Fr (J$^\pi$=9/2$^-$)											∗∗
∗^{207}Th	T : symmetrized from 22Ya15=9.7(+46.6-4.4), one event observed											∗∗
^{208}Pt	−790#	400#				220# ms >300ns	0$^+$	22	12Ku26	I	β$^-$?;β$^-$n ?	
^{208}Au	−6220#	300#				20# s >300ns	5$^+$#	22	06Ca30	I	β$^-$?;β$^-$n ?	
^{208}Hg	−13275	17				135 s 10	0$^+$	10	20Ca25	T	β$^-$=100	∗
^{208}Hg^m	−11937	29	1338	24		99 ns 14	(8$^+$)				IT=100	∗
^{208}Tl	−16755.5	0.5				3.053 m 0.004	5$^+$	07			β$^-$=100	
^{208}Tl^m	−14948.5	1.1	1807	1		1.3 μs 0.1	(0$^-$)		20Ca25	TEJ	IT=100	
^{208}Pb	−21749.925	0.013				STABLE >2.6Zy	0$^+$	07	13Be16	T	IS=52.4 70;α ?	∗
^{208}Pb^m	−16854.70	0.05	4895.23	0.05		514 ns 17	10$^+$	07	25Ta17	T	IT=100	∗
^{208}Bi	−18871.0	2.0				368 ky 4	5$^+$∗	07	18Sc05	J	β$^+$=100	
^{208}Bi^m	−17299.9	2.0	1571.1	0.4		2.58 ms 0.04	10$^-$	07			IT=100	
^{208}Po	−17470.9	1.3				2.898 y 0.002	0$^+$	07	93Sa14	D	α=?;β$^+$=0.0042 4	
^{208}Po^m	−15942.7	1.3	1528.22	0.04		373 ns 8	8$^+$	07	21Br06	T	IT=100	∗
^{208}At	−12470	9				1.63 h 0.03	6$^+$∗	07			β$^+$=?;α=0.55 6	∗
^{208}At^m	−10194	9	2276.4	1.8		1.5 μs 0.2	16$^-$	07			IT=100	
^{208}Rn	−9657	10				24.29 m 0.14	0$^+$	07	71Ho01	T	α=62 7;β$^+$=?	∗
^{208}Rn^m	−7829	10	1828.3	0.4		487 ns 12	8$^+$	07			IT=100	∗
^{208}Fr	−2668	11				58.56 s 0.21	7$^+$∗	07			α=89 3;β$^+$=?	∗
^{208}Fr^m	−1842	11	826.3	0.5		432 ns 11	10$^-$	07	09Dr08	TJE	IT=100	∗
^{208}Ra	1731	9				1.110 s 0.045	0$^+$	07	10He25	TD	α=87 3;β$^+$?	∗
^{208}Ra^m	3878	9	2147.4	0.4		263 ns 17	(8$^+$)	07	05Re02	T	IT=100	∗
^{208}Ac	10754	10				171 ms 13	3$^+$	07	22Ya27	T	α=100;β$^+$?	∗
^{208}Ac^m	11256	10	502	14	AD	35.1 ms 3.3	10$^-$	07	22Ya27	T	α=100;β$^+$?;IT ?	∗
^{208}Th	16695	18				2.4 ms 1.2	0$^+$	11	10He25	T	α=100	∗
^{208}Pa	27650#	300#				2# ms					α ?	
∗^{208}Hg	T : average 20Ca25=135(10) 17Ca12=132(50); others (conflicting): 22Ga22=2460(+300-240) 98Zh22=2460(+300-200) 94Zh02=2520(+1380-720)											∗∗
∗^{208}Hg^m	E : 1296.9(0.9) + x keV; x<83 keV											∗∗
∗^{208}Pb	D : other: IS=[3.38,97.75] in 24Ci.A											∗∗
∗^{208}Pb^m	T : average 25Ta17=508(19) 17Br08=570(50) 89Ro04=500(50)											∗∗
∗^{208}Po^m	T : average 21Br06=377(9) 76Ha56=350(20)											∗∗
∗^{208}At	J : 18Cu02=6											∗∗
∗^{208}Rn	T : average 71Ho01=24.35(0.14) 71Go35=23.5(0.5)											∗∗
∗^{208}Rn^m	T : other: 10Ka29=590(144)											∗∗
∗^{208}Fr	J : 13Vo10,15Vo05,78Ek02,78Ek05=7											∗∗
∗^{208}Fr	T : average 81Ri04=59.1(0.3) 74Ho27=58.0(0.3) 67Va20=59.0(2.0); others: 19Zh23=42(+34-13) 26Zh40=31(+21-9)											∗∗
∗^{208}Fr^m	T : from τ=623(16) in 09Dr08; others: 10Ka29=233(18), not trusted 06Me03=446(14), originally assigned to ^{209}Fr, see 09Dr04											∗∗
∗^{208}Ra	T : others: 22Zh45=0.9(+0.2-0.1) 68Lo15=1.8(0.5) 67Va22=1.2(0.2)											∗∗
∗^{208}Ra^m	T : average 05Re02=250(30) 99Co13=270(21)											∗∗
∗^{208}Ac	T : 22Ya27=171(13) supersedes 14Ya19=93(+40-22); others: 96Ik01=83(+34-19) 94Le05=95(+24-16)											∗∗
∗^{208}Ac	J : favored α decay to ^{204}Fr (J$^\pi$=3$^+$)											∗∗

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{208}$Ac^m	T : average 22Ya27=37.1(3.7) 94Le05=25(+9-5); other: 96Ik01=21(+28-8)											**
$*^{208}$Ac^m	J : favored α decay to ^{204}Fr^n (J^π=10$^-$)											**
$*^{208}$Th	T : symmetrized from 10He25=1.7(+1.7-0.6); other: 22Ya15=4.4(+6.0-1.6)											**
^{209}Au	−2680#	400#				1# s	>300ns	$3/2^+$#	13	10Al24	I	β^- ?;β^-n ?	
^{209}Hg	−8600#	100#				6.3 s	1.1	$9/2^+$#	13	17Ca12	T	β^-=100;β^-n ?	*
^{209}Tl	−13647	3				2.162 m	0.007	$1/2^+$*	13	24Yu02	J	β^-=100;β^-n ?	
^{209}Tl^m	−12419	4	1228.1	2.0		146 ns	10	$17/2^+$	13	17Am01	ETJ	IT=100	*
^{209}Pb	−17608.1	0.3				3.235 h	0.005	$9/2^+$	15	21Ta01	T	β^-=100	*
^{209}Bi	−18259.4	0.8				20.1 Ey	0.8	$9/2^-$*	13			IS=100;α=100	*
^{209}Po	−16367.4	1.4				124 y	3	$1/2^-$*	13			α=99.546 7;β^+=0.454 7	*
^{209}Po^m	−12102.0	1.4	4265.4	0.3		119 ns	4	$31/2^-$	13			IT=100	
^{209}At	−12884	5				5.42 h	0.05	$9/2^-$*	13	17Lo13	D	β^+=?;α=3.9 4	*
^{209}At^m	−10455	5	2429.32	0.22		916 ns	10	$29/2^+$	13			IT=100	
^{209}Rn	−8941	10				28.8 m	1.0	$5/2^-$*	13	87Bo29	J	β^+=?;α=17 2	*
^{209}Rn^m	−7767	10	1174.01	0.13		13.4 μs	1.3	$13/2^+$	13			IT=100	
^{209}Rn^n	−5304	10	3636.81	0.23		3.0 μs	0.3	$35/2^+$	13			IT=100	
^{209}Fr	−3783	11				50.5 s	0.7	$9/2^-$*	13			α=89 3;β^+=?	*
^{209}Fr^m	877	11	4659.8	0.7		420 ns	18	$45/2^-$	13	09Dr04	ETJ	IT=100	*
^{209}Ra	1858	6				4.71 s	0.08	$5/2^-$*	13	08Ha12	T	$\alpha\approx$100;β^+ ?	*
^{209}Ra^m	2740	6	882.4	0.7		117 μs	5	$13/2^+$	13			IT=100	
^{209}Ac	8850	60				98 ms	7	$9/2^-$	13	22Ya27	T	α=100;β^+ ?	*
^{209}Th	16270#	100#				60# ms		$5/2^-$#	13			α ?;β^+ ?	
^{209}Th^m	16765	25	500#	100#		3.1 ms	1.2	$13/2^+$	13	10He25	T	α=100;IT ?	*
^{209}Pa	25080#	200#				5# ms		$9/2^-$#				α ?	
$*^{209}$Hg	T : others (discrepant): 22Ga22,98Zh19=35(+9-6) 98Zh22=35(+13-8), 42(+24-11) and 36(+16-8)											**
$*^{209}$Tl^m	T : other: 09Al29=95(11)											**
$*^{209}$Pb	T : average 21Ta01=3.252(0.043) 13Su13=3.232(0.005) 72Be44=3.253(0.014); others: 40Kr08=2.75(0.05) 42Ma03=3.3(1.9) 41Fa04=3.32(0.03)											**
$*^{209}$Pb	T : 59Po64=3.31(0.03) 71Pe03=3.31(0.03)											**
$*^{209}$Bi	J : 18Sc05,17Ba12,38Sc10,35Sc04,28Ba01=9/2											**
$*^{209}$Po	J : 13Se03,14Se07,55Va16=1/2											**
$*^{209}$At	D : %α average 17Lo13=3.6(0.7) 68Gu.A=4.1(0.5)											**
$*^{209}$At	J : 18Cu02=9/2											**
$*^{209}$Rn	D : other: %β^+=91(2) %α=9(2) in 17Lo13 likely due to Rn diffusion											**
$*^{209}$Fr	J : 86Ek02,78Ek02,78Ek05=9/2											**
$*^{209}$Fr^m	T : from τ=606(26) in 09Dr04											**
$*^{209}$Ra	J : 88Ah02=5/2											**
$*^{209}$Ac	T : average 22Ya27=103(9) supersedes 14Ya19=98(22), 96Ik01=82(+18-13) 94Le05=91(+21-14); others: 00He17=98(+59-27) 68Va04=100(50)											**
$*^{209}$Ac	J : favored α decay to ^{205}Fm (J^π=9/2$^-$)											**
$*^{209}$Th^m	T : symmetrized from 10He25=2.5(+1.7-0.7), based on 4 events from 10He25 combined with 2 events from 96Ik01											**
$*^{209}$Th^m	J : favored α decay to ^{205}Ra^m (J^π=13/2$^+$)											**
^{210}Au	2390#	400#				10# s	>300ns	6^+#	14	10Al24	I	β^- ?;β^-n ?	
^{210}Hg	−5300#	200#				64 s	12	0^+	14	17Ca12	TD	β^-=100;β^-n=2.2 22	
^{210}Hg^m	−4640#	200#	663	2		2.1 μs	0.7	(3^-)	14			IT=100	
^{210}Hg^n	−3890#	200#	1406	23		2 μs	1	8^+#	14	13Go10	E	IT=100	*
^{210}Tl	−9248	12				1.30 m	0.03	5^+#	14			β^-=100;β^-n=0.009 6	*
^{210}Tl^m	−8050#	200#	1200#	200#		> 3 μs		$9^+,10^+,11^+$		18Br15	ID	β^- ?;IT ?	*
^{210}Pb	−14729.4	0.8				22.20 y	0.22	0^+	14			β^-=100;α=1.9e-6 4	
^{210}Pb^m	−13534.8	0.8	1194.61	0.18		92 ns	10	6^+		18Br15	ETJ	IT=100	
^{210}Pb^n	−13454.6	0.9	1274.8	0.3		201 ns	17	8^+	14			IT=100	
^{210}Bi	−14792.7	0.8				5.012 d	0.005	1^-*	14			β^-=100;α=13.2e-5 10	*
^{210}Bi^m	−14521.4	0.8	271.31	0.11		3.04 My	0.06	9^-	14			α=100	
^{210}Po	−15954.46	0.13				138.376 d	0.002	0^+	14			α=100	
^{210}Po^m	−14397.49	0.13	1556.97	0.03		98.9 ns	2.5	8^+				IT=100	
^{210}Po^n	−10896.81	0.14	5057.65	0.05		263 ns	5	16^+	14	20Za.A	T	IT=100	*
^{210}At	−11973	8				8.1 h	0.4	$(5)^+$*	14			β^+=?;α=0.175 20	*
^{210}At^m	−9423	8	2549.6	0.2		482 ns	6	$(15)^-$	14			IT=100	
^{210}At^n	−7945	8	4027.7	0.2		5.58 μs	0.06	$(19)^+$	14	26Ta.A	T	IT=100	*
^{210}Rn	−9605	5				2.4 h	0.1	0^+	14			α=96 1;β^+ ?	
^{210}Rn^m	−7900	30	1710	30	AD	644 ns	40	8^+	14	05Po10	JT	IT=100	
^{210}Rn^n	−5750	30	3857	30		1.06 μs	0.05	17^-	14	05Po10	JT	IT=100	*
^{210}Rn^p	−3090	30	6514	30		1.04 μs	0.07	23^+	14	05Po10	JT	IT=100	*
^{210}Fr	−3344	13				3.18 m	0.06	6^+*	14	05Ku06	D	α=71 4;β^+ ?	*
^{210}Fr^m	1073	13	4417.2	1.0		475 ns	6	$(23)^+$	14	16Ma41	ETJ	IT=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{210}Ra	441	9				4.0 s 0.1	0^+	14	08Ha12	T	$\alpha\approx100;\beta^+$?	*
^{210}Ra^m	2492	9	2050.9	0.7		2.29 μs 0.03	8^+	14	04Re04	TJ	IT=100	*
^{210}Ac	8700	60				350 ms 40	7^+#	14	00He17	T	α=100;β^+ ?	*
^{210}Th	14057	18				15.1 ms 2.7	0^+	14	23Ch24	T	α=100;β^+ ?	*
^{210}Pa	24338	21				6.3 ms 1.3	3^+#		25Zh34	TD	α=100	*
*^{210}Hg^n	E : 1366 + x keV; x<80 from 13Go10											**
*^{210}Tl	D : %β^-n symmetrized from 61St20=0.007(+7-4)%											**
*^{210}Tl^m	J : direct β^- to 10^+ in ^{210}Pb in 18Br15											**
*^{210}Bi	J : 54Sm96=1											**
*^{210}Po^n	T : average 20Za.A=260(20) 85Be22=265(10) 85Ka07=262(6)											**
*^{210}At	J : 18Cu02=(5)											**
*^{210}At^n	T : average 26Ta.A=5.16(0.16) 01Ba79=5.61(0.07) 87Dr01=5.90(0.17); others: 78Ra03=4.0(1.7) 76WeZD=3.6(0.6)											**
*^{210}Rn^n	E : 2147.4(0.2) keV above the 8^+ level at 1664.6(0.1) keV											**
*^{210}Rn^p	E : 4803.7(0.4) keV above the 8^+ level at 1664.6(0.1) keV											**
*^{210}Fr	J : 87Co19,78Ek05,78Ek02=6											**
*^{210}Fr^m	E : uncertainty estimated by NUBASE											**
*^{210}Ra	T : others: 22Zh45=3.0(+1.2-0.7) 07Le14=2.5(+1.4-0.7) and 3.5(+4.8-1.3) 68Lo15=3.6(0.2) 67Va22=3.8(0.2)											**
*^{210}Ra^m	T : average 13Ba29=2.1(0.1) 06Ha17=2.28(0.08) 04Re04=2.1(0.1) 04He25=2.36(0.04); other: 99Co13=2.24											**
*^{210}Ac	T : average 00He17=335(+64-46) 68Va04=350(50)											**
*^{210}Th	T : average 23Ch24=14(4) 10He25=16.0(3.6); others: 95Uu01=9(+17-4) 95Le41=10(+50-5)											**
*^{210}Pa	T : symmetrized from 25Zh34=6.0(+1.5-1.1)											**
^{211}Hg	−500#	200#				26.4 s 8.1	$9/2^+$#	13	17Ca12	TD	β^-=100;β^-n=6.3 63	
^{211}Tl	−6080	40				81 s 16	$1/2^+$	13	14Mo02	TJ	β^-=100;β^-n=2.2 22	*
^{211}Tl^m	−4840#	110#	1244#	100#		580 ns 80	$17/2^+$#		19Go10	ETJ	IT=100	*
^{211}Pb	−10492.71	0.19				36.1628 m 0.0025	$9/2^+$*	13	18Lo02	T	β^-=100	*
^{211}Pb^m	−8774#	23#	1719#	23#		159 ns 28	$(27/2^+)$	13	05La01	JT	IT=100	*
^{211}Bi	−11856.1	0.8				2.14 m 0.02	$9/2^-$*	13	18Ba03	J	α=99.724 4;β^-=0.276 4	
^{211}Bi^m	−10599	10	1257	10		1.4 μs 0.3	$(25/2^-)$	13			IT=100	
^{211}Po	−12433.9	0.5				516 ms 3	$9/2^+$*	13	74Ba29	T	α=100	*
^{211}Po^m	−10971	5	1462	5	AD	25.2 s 0.6	$(25/2^+)$	13			α=99.984 4;IT=0.016 4	
^{211}Po^n	−10299	5	2135	5		252 ns 14	$(31/2^-)$	13	20Za.A	T	IT$\approx$100;α ?	*
^{211}Po^p	−7562	6	4872	6		2.59 μs 0.19	$(43/2^+)$	13	20Za.A	T	IT$\approx$100;α ?	*
^{211}At	−11648.0	2.5				7.214 h 0.007	$9/2^-$*	13			ε=58.20 8;α=41.80 8	*
^{211}At^m	−6833.5	2.5	4814.5	0.5		4.22 μs 0.06	$(39/2^-)$	13	26Ta.A	T	IT=100	*
^{211}Rn	−8757	7				14.6 h 0.2	$1/2^-$*	13			β^+=72.6 17;α=27.4 17	*
^{211}Rn^m	−7154#	16#	1603#	14#		596 ns 28	$17/2^-$	13	81Po08	EJT	IT=100	*
^{211}Rn^n	148#	21#	8905#	20#		201 ns 4	$63/2^-$	13	85Po06	EJT	IT=100	*
^{211}Fr	−4141	12				3.10 m 0.02	$9/2^-$*	13	05Ku06	D	α=87 3;β^+=?	*
^{211}Fr^m	−1718	12	2423.16	0.24		146 ns 14	$29/2^+$	13	86By01	ETJ	IT=100	
^{211}Fr^n	516	12	4657.3	0.4		124.5 ns 1.2	$45/2^-$	13	16Ma41	T	IT=100	*
^{211}Ra	832	5				13.7 s 0.2	$5/2^-$*	13	24Lo12	T	$\alpha\approx100;\beta^+$?	*
^{211}Ra^m	2030	5	1198.1	0.8		9.57 μs 0.17	$13/2^+$	13	24Lo12	T	IT=100	*
^{211}Ac	7140	50				228 ms 4	$9/2^-$	13	24Lo12	T	α=100;β^+ ?	*
^{211}Th	13920	50				48 ms 20	$5/2^-$#	13			α=100;β^+ ?	*
^{211}Th^m	14690	50	778	7		83 μs 8	$(13/2^+)$		21Au03	TJD	IT=96 3;α=4 3	*
^{211}Pa	22060	80				6 ms 3	$9/2^-$	13	20Au04	TD	α=100;β^+ ?;p ?	*
^{211}U	30530#	400#				1# ms	$5/2^-$#				α ?	
*^{211}Tl	T : average 17Ca12=77(18) 14Mo02,12Be28=88(+46-29)											**
*^{211}Tl^m	E : 144 keV + x keV; x=1100#(100#) keV by NUBASE from interpretation in 19Go10 and similarity with ^{209}Tl^m											**
*^{211}Pb	T : others: 16Ai01=36.164(0.013) 15Ko09=36.165(0.037) 22Fr01=36.6(2.4), 38.4(1.2)											**
*^{211}Pb	J : 86An06=9/2											**
*^{211}Pb^m	E : 1679.1 + x keV; x<80# keV estimated by NUBASE											**
*^{211}Po	J : 13Se03,14Se07,15Fi07=9/2											**
*^{211}Po	T : others: 25Gu12=480(50) 58To25=560(40) 54Sp32=520 54Wi26=500(100)											**
*^{211}Po^n	T : average 20Za.A=260(20) 98Mc03=243(21)											**
*^{211}Po^p	T : average 20Za.A=2.6(0.2) 98Mc03=2.8(0.7) 98Fo04=2(1)											**
*^{211}At	J : 18Cu02,58Ga16=9/2											**
*^{211}At^m	T : average 26Ta.A=4.19(0.14) 01Ba79=4.23(0.07); other: 71Ma36=4.2(0.4)											**
*^{211}Rn	J : 87Bo29,83Ah03=5/2											**
*^{211}Rn^m	E : 1577.8 + x keV; x<50 keV from 81Po08											**
*^{211}Rn^n	E : from 8880#(14#) + y keV; y<50 keV from 85Po06											**
*^{211}Fr	J : 14Ly01,78Ek02,78Ek05=9/2											**
*^{211}Fr^n	J : from 86By01											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{211}$Ra	T : others: 19Zh54=10(3) 07Le14=9(5) 68Lo15=12(2) 67Va22=15(2)											**
$*^{211}$Ra	J : 83Ah03=5/2											**
$*^{211}$Ra^m	T : average 24Lo12=9.6(0.2) 13Ba29=9.4(0.4) 06Ha17=9.7(0.6); other: 04He25=4.0(0.5)											**
$*^{211}$Ac	T : average 24Lo12=228(4) 00He17=200(29) 68Va04=250(50); other: 26Zh40=270(+170-70)											**
$*^{211}$Th	T : symmetrized from 95Uu01=37(+28-11); other: 15Ya13=20.8(+37.9-8.2) (2 events)											**
$*^{211}$Th^m	E : from 182(5) keV, 393(2) keV and 203(5) keV γs in a cascade in 21Au03											**
$*^{211}$Pa	T : symmetrized from 20Au04=3.8(+4.6-1.4)											**
$*^{211}$Pa	J : favored α decay to ^{207}Ac (J^π=9/2$^-$)											**
^{212}Hg	2950#	300#				30# s	>300ns	0^+	20	10Al24	I	β^- ?;β^-n ?	
^{212}Tl	−1550#	200#				31 s	8	(5^+)	20	17Ca12	TD	β^-=100;β^-n=1.8 18	*
^{212}Pb	−7554.0	0.3				10.6323 h	0.0024	0^+	20	25Bo.1	T	β^-=100	*
^{212}Pb^m	−6219.0	2.0	1335	2		6.0 μs	0.8	8^+#	20	12Re.B	E	IT=100	*
^{212}Bi	−8123.4	0.5				60.55 m	0.06	1^-*	20	89Ha.A	D	β^-=64.06 6;α=35.94 6;$\beta^-\alpha$≈0.014	*
^{212}Bi^m	−7870	30	250	30	MD	25.0 m	0.2	$(8^-,9^-)$	20	84Es01	TD	α=67 1;β^-=33 1;$\beta^-\alpha$=30 1	
^{212}Bi^n	−6639	30	1485	30	MD	7.0 m	0.3	(18^-)	20	13Ch12	D	β^-≈100;IT ?	
^{212}Po	−10370.81	0.11				295.0 ns	0.2	0^+	20	22Be20	T	α=100	*
^{212}Po^m	−7448	4	2923	4	AD	45.1 s	0.6	(18^+)	20			α=99.93 2;IT ?	
^{212}Po^n	−6915	4	3456	4		1.9 μs	0.3	21^-#		22Za05	ETD	IT=100	
^{212}Po^p	−6518	4	3853	4		0.20 μs	0.08	23^+#		22Za05	ETD	IT=100	
^{212}At	−8629.0	2.1				314.0 ms	1.7	(1^-)	20			α=100;β^+ ?;β^- ?	*
^{212}At^m	−8406.1	2.1	222.90	0.30	AD	119.7 ms	0.8	(9^-)	20			α≈100;IT ?	*
^{212}At^n	−3857.6	2.6	4771.4	1.5		152 μs	5	(25^-)	20			IT=100	
^{212}Rn	−8660.9	2.9				23.9 m	1.2	0^+	20			α=100	
^{212}Rn^m	−7021.2	2.9	1639.68	0.15		118 ns	14	6^+	20			IT=100	
^{212}Rn^n	−6966.8	2.9	1694.1	0.3		910 ns	30	8^+	20			IT=100	
^{212}Rn^p	−2486.7	2.9	6174.2	0.3		102 ns	4	22^+	20	09Dr12	J	IT=100	
^{212}Rn^q	−81.7	2.9	8579.2	0.4		154 ns	14	30^+	20	09Dr12	J	IT=100	
^{212}Fr	−3516	9				20.0 m	0.6	5^+*	20			β^+=?;α=43 2	*
^{212}Fr^m	−1965	9	1551.4	0.3		31.9 μs	0.7	11^+	20	86By01	J	IT=100	
^{212}Fr^n	−1024	9	2492.2	0.4		604 ns	28	15^-	20	86By01	J	IT=100	
^{212}Fr^p	2339	9	5854.7	0.6		312 ns	21	27^-	20	86By01	J	IT=100	
^{212}Fr^q	5017	9	8533.4	1.1		23.6 μs	2.1	34^+#	20			IT=100	
^{212}Ra	−200	10				13.0 s	0.2	0^+	20			α=100;β^+ ?	
^{212}Ra^m	1758	10	1958.4	2.0		9.3 μs	0.9	8^+	20			IT=100	
^{212}Ra^n	2413	10	2613.3	2.0		850 ns	130	11^-	20	13Ba29	T	IT=100	
^{212}Ac	7299	22				884 ms	13	7^+*	20	24Lo12	T	α=100;β^+ ?	*
^{212}Th	12114	10				31.7 ms	1.3	0^+	20	10He25	T	α=100;β^+ ?	*
^{212}Pa	21590	60				5.8 ms	1.9	3^+#	20	20Au04	T	α=100	*
^{212}U	27890#	300#				1# ms		0^+				α ?	
$*^{212}$Tl	T : other: 14Mo02,12Be28=96(+42-38)											**
$*^{212}$Pb	T : average 25Bo.1=10.6314(0.0074) 24Pi01=10.627(0.007),10.623(0.008), 10.636(0.004),10.645(0.007),10.628(0.010)											**
$*^{212}$Pb	T : 22Be20=10.620(0.011,stat)(0.014,syst) 17Ko16=10.622(0.007) 55To11=10.643 (0.012); others: 22Fr01=10.66(0.16),10.91(0.07) 95Ma90=11.0(0.6)											**
$*^{212}$Pb	T : 55To11=10.643(0.012) 53Ma26=10.64(0.03) 52Bu72=10.67(0.05)											**
$*^{212}$Pb^m	T : 12Go19=6.0(0.8) supersedes 12Re.B=5.0(0.3); other: 98Pf02=5(1)											**
$*^{212}$Bi	J : 17Ba12=1											**
$*^{212}$Po	T : average 22Be20=295.02(0.18,stat)(0.17,sys) 21Be18=295.1(0.4) 17Ap03=293.9(1.0,stat)(0.6,syst) 13Be31=294.7(0.8,stat)(0.6,syst) others:											**
$*^{212}$Po	T : 14Be39=298.8(0.8,stat)(1.4,sys) 18Sa45=350(60) 18So16=302(27) 12Be14=260(30) 03Da24=290(+40-30) 81Bo29=309(11) 75Sa06=296(2) 72Mc29=300(8)											**
$*^{212}$Po	T : 63As02=305(5) 62Fl03=305(25) 53Ha09==290(10) 49Bu09=304(4) 49Va01=220(10) 48Hi21=300(15) 39Du01=300(100)											**
$*^{212}$At	T : average 70Re02=315(3) 74Ba29=313(3) 76FrZO=314(3); others: 25Gu12=430(100) 99Ho28=306(15) 07Ku30=310(30) 63Jo09=305											**
$*^{212}$At^m	T : average 70Re02=122(1) 74Ba29=115(2) 76FrZO=115(2) 25Gu12=120(20) 99Ho28=125(17) 07Ku30=125(25); other: 63Jo09=120											**
$*^{212}$At^m	E : from relative E_α=7887.7(0.2) and 7669.0(0.2) in 76FrZO											**
$*^{212}$Fr	J : 87Co19,78Ek02,78Ek05=5											**
$*^{212}$Ac	T : average 24Lo12=881(15) 14Ya19=880(35) 00He17=880(110) 68Va04=930(50); others: 19Zh23=1.6(+0.9-0.4) s 26Zh40=740(+300-160)											**
$*^{212}$Ac	J : 17Gr18,16Fe11=(7); favored α decay to ^{208}Fr (J^π=7$^+$)											**
$*^{212}$Th	T : others: 22Zh45=29(+7-5) 15De22=173(+398-143) 15Ma37=27.8(+5.06-1.10), 21.5(+21.5-7.2) 80Ve01=30(+20-10)											**
$*^{212}$Pa	T : average 20Au04=4.5(+2.7-1.3) 14Ya19=5.1(+5.1-1.7), combining 14Ya19 and 97Mi03											**
^{213}Hg	8030#	300#				15# s	>300ns	$9/2^+$#	22	10Al24	I	β^- ?;β^-n ?	
^{213}Tl	1784	27				23.8 s	4.4	$1/2^+$#	22	17Ca12	TD	β^-=100;β^-n=7.6 34	*
^{213}Tl^m	2769	27	985.3	1.9		1.34 ms	0.05	$11/2^-$#		24Ye04	TDE	IT=100	*
^{213}Tl^n	3190	40	1407	25		4.2 μs	0.3	$17/2^+$#	22	24Ye04	TEJ	IT=100	*
^{213}Tl^p	3890#	40#	2105#	25#		0.6 μs	0.3	$25/2^-$#	22	19Go10	TD	IT=100	*
^{213}Pb	−3203	7				10.2 m	0.3	$(9/2^+)$	22	64Bu05	T	β^-=100	
^{213}Pb^m	−1872	7	1331.0	1.8		260 ns	20	$(21/2^+)$	22	21Va03	JTD	IT=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{213}Bi	−5233.48	0.29				45.60 m 0.04	$9/2^-$*	22	18Ba03	J	β^-=97.860 10;α=2.140 10	*
^{213}Bi^m	−3880	21	1353	21		> 168 s	$25/2^-$#		08ChZI	T	β^- ?;IT ?	*
^{213}Po	−6646.5	2.6				3.6976 μs 0.0004	$9/2^+$	22	25Ga07	T	α=100	*
^{213}At	−6580	5				125 ns 6	$9/2^-$	22	81Bo29	T	α=100	*
^{213}At^m	−5222	24	1358	23		112 ns 9	$25/2^-$#	22	80Sj01	ET	IT=100	*
^{213}At^n	−3582	27	2998	27		45 μs 4	$49/2^+$#	22	03LaZZ	TEJ	IT=100	*
^{213}Rn	−5697	3				19.41 ms 0.10	$9/2^+$#	22			α=100	*
^{213}Rn^m	−4015	10	1682	10		1.01 μs 0.21	$(25/2^+)$	22	88St10	ET	IT=100	*
^{213}Rn^n	−3492	10	2205	10		1.36 μs 0.07	$(31/2^-)$	22	88St10	ET	IT=100	*
^{213}Rn^p	268	14	5965	14		164 ns 10	$(55/2^+)$	22	88St10	ET	IT=100	*
^{213}Fr	−3555	5				34.14 s 0.06	$9/2^-$*	22	13Fi08	T	α=99.44 5;β^+=?	*
^{213}Fr^m	−1965	5	1590.40	0.18		505 ns 15	$21/2^-$	22	86By01	TJ	IT=100	*
^{213}Fr^n	−1017	5	2537.61	0.23		238 ns 6	$29/2^+$	22	86By01	TJ	IT=100	
^{213}Fr^p	4540	5	8094.9	0.7		3.1 μs 0.2	$65/2^-$	22	86By01	TJ	IT=100	
^{213}Ra	346	10				2.73 m 0.05	$1/2^-$*	22	17Lo13	D	α=87 2;β^+=?	*
^{213}Ra^m	2114	11	1768	4	AD	2.20 ms 0.05	$(17/2^-)$	22	06Ku26	TD	IT=?;α=0.6 4	
^{213}Ac	6140	12				757 ms 11	$9/2^-$*	22	24Lo12	T	α=100;β^+ ?	*
^{213}Th	12120	9				148 ms 21	$5/2^-$	22	80Ve01	T	α=100;β^+ ?	*
^{213}Th^m	13300	9	1180.0	1.4		8.3 μs 0.8	$(13/2)^+$	22	21Zh24	TDJ	IT=100	*
^{213}Th^p	12380#	50#	260#	50#								
^{213}Pa	19660	60				7.1 ms 2.4	$9/2^-$	22	20Au04	TD	α=100	*
^{213}U	27440#	200#				1# ms	$5/2^-$#				α ?	
*^{213}Tl	T : others: 16Ca25=24(4), superseded by 17Ca12, 14Mo02,12Be28=46(+55-26) 10Ch19=101(+484-46)											**
*^{213}Tl^n	E : 379.3(0.8) keV + 85 keV (K electron binding energy of Tl) above ^{213}Tl^m; no X rays observed											**
*^{213}Tl^n	T : average 24Ye04=4.3(0.4) 19Go10=4.1(0.5)											**
*^{213}Tl^p	EI : 698 keV above ^{213}Tl^n by NUBASE; not confirmed in 24Ye04; assignment is tentative											**
*^{213}Bi	T : average 21Ta01=45.598(0.091),45.636(0.220) 13Su13,13Ma13=45.62(0.06) 73Po16=45.59(0.06); others: 64Gr11=46(1) 50Ha52=47(1)											**
*^{213}Bi	D : %α from 13Ma13=2.14(0.01); others: 97Ch53=2.20(0.03) 98Ar03=2.09(0.03) 82He06=2.022(0.026) 64Gr11=2.16(0.11)											**
*^{213}Bi^m	E : from 12Ch19											**
*^{213}Po	T : average 25Ga07=3.6970(0.0005) 23Al22=3.6984(0.0006), supersedes 18Al32=3.705(0.001); others: 23Mo25=3.686(0.023) 20Ko06=3.709(0.012)											**
*^{213}Po	T : 18Sa45=3.5(0.5) 13Su13=3.708(0.008)											**
*^{213}At	T : others: 22Pa09=127(20) 76Da18=110(20) 75LiZH=110 68Ha14<2 s											**
*^{213}At^m	E : 1318.1(0.6) + x keV; 20<x<100 keV from 80Sj01											**
*^{213}At^m	T : average 80Sj01=110(17) [387γ(t)] and 113(10) [405γ(t)]											**
*^{213}At^n	E : 1615(2) + y keV above ^{213}At^m; y∼50 keV in 03LaZZ											**
*^{213}Rn	T : average 25Gu12=17.5(3.0) 00He17=19.5(0.1),18.0(0.4),19.0(0.5) 25G 05Li17=21(4) 70TaZS=20.5(1.0); others: 19Mi08=16(1) 21Hu19=16(+5-3)											**
*^{213}Rn	J : other: 83Ah03=1/2, not trusted											**
*^{213}Rn^m	E : 1664.0(1.0) + x keV; x<35 keV from 88St10											**
*^{213}Rn^n	E : 522.7 keV above ^{213}Rn^m from 88St10											**
*^{213}Rn^p	E : 4265 + y keV above ^{213}Rn^m; y<35 keV from 88St10											**
*^{213}Fr	T : others: 16Pr08=33.2(2.0), 28.4(3.5) 19Mi08=20(+48-8) 82Bo04=35.0(0.2) 74Ho27=34.6(0.3) 67Va20=34.7(0.3) 64Gr04=33.7(1.5)											**
*^{213}Fr	T : 12No08=34.1(0.7),34(6) 15De22=16(+37-13)											**
*^{213}Fr	D : %α average: 64Gr04=99.48(0.03) 67Va20=99.43(0.03) 74Ho27=99.1(0.1); %β^+ other: 17Lo13=0.25(0.15), discrepant likely due to Rn diffusion											**
*^{213}Fr	J : 87Co19,78Ek02,78Ek05=9/2											**
*^{213}Fr^m	T : average 86By01=499(21) 76Ha37=510(20)											**
*^{213}Fr^n	T : average 86By01=243(21) 76Ha37=238(6)											**
*^{213}Ra	J : 83Ah03=1/2											**
*^{213}Ra	T : average 00Ni02=2.54(+0.21-0.18) 68Lo15=2.74(0.06) 67Va22=2.75(0.15); others: 55Mo68=2.7(0.3)											**
*^{213}Ac	J : 17Gr18,16Fe11,17Fe10=(9/2); favored α decay to ^{209}Fr (J^π=9/2$^-$)											**
*^{213}Ac	T : average 24Lo12=771(14) 00He17=731(17) 68Va04=800(50); other: 61Gr42∼1 s											**
*^{213}Th	J : favored α decay to ^{209}Ra (J^π=5/2$^-$)											**
*^{213}Th	T : average 80Ve01=130(+50-30) 68Va18=150(25)											**
*^{213}Th^m	E : from 381(1) keV and 799(1) keV γs in a cascade											**
*^{213}Th^m	T : other: 07Kh22=1.4(0.4)											**
*^{213}Pa	T : average 20Au04=4.9(+5.9-1.8) 95Ni05=5.3(+4.0-1.6)											**
*^{213}Pa	J : favored α decay to ^{209}Ac (J^π=9/2$^-$)											**
^{214}Hg	11770#	400#				8# s >300ns	0^+	21	10Al24	I	β^- ?;β^-n ?	
^{214}Tl	6470#	200#				11.0 s 2.4	5^+#	21	17Ca12	TD	β^-=100;β^-n=34 12	
^{214}Pb	−184.3	1.6				27.06 m 0.07	0^+	21	11Vo01	T	β^-=100	
^{214}Pb^m	1236	20	1420	20		6.2 μs 0.3	8^+#	21	12Go19	ET	IT=100	*
^{214}Bi	−1202	11				19.71 m 0.02	1^-*	21	91Ma68	T	β^-=?;α=0.0210 13;$\beta^-\alpha$≈0.003	*
^{214}Bi^m	−660	30	539	30		9.39 m 0.10	(8^-)*	21	21An14	TJ	β^-=100	*
^{214}Po	−4470.9	0.8				163.67 μs 0.09	0^+	21	26Ta06	T	α=100	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{214}At	−3380	4				558 ns 10	1^-	21	82Ew01	T	α=100	
^{214}At^m	−3321	8	59	9	AD	265 ns 30		21	82Ew01	TI	α=100;IT ?	
^{214}At^n	−3148	4	232	5	AD	760 ns 15	9^-	21	82Ew01	TI	α=100;IT ?	
^{214}Rn	−4321	9				259 ns 3	0^+	21	19Pa45	T	α=100	*
^{214}Rn^m	274	9	4595.4	1.8		244 ns 23	(22^+)	21	87Dr08	TJ	IT=100	*
^{214}Fr	−960	8				5.51 ms 0.13	(1^-)*	21	19Mi08	T	α=100	*
^{214}Fr^m	−838	8	121	5	AD	3.35 ms 0.05	(8^-)	21	68To10	T	α=100	
^{214}Fr^n	−322	9	638	5		103 ns 4	(11^+)	21	94By01	TJ	IT=100	*
^{214}Fr^p	5620#	100#	6577#	100#		108 ns 7	(33^+)	21	94By01	TJ	IT=100	*
^{214}Ra	92	5				2.437 s 0.016	0^+	21	15Kh09	T	α=?;β^+=0.059 4	*
^{214}Ra^m	1912	5	1819.70	0.17		118 ns 7	6^+	21	92St09	TJ	IT=100	
^{214}Ra^n	1957	5	1865.2	1.1		67.2 μs 1.5	8^+	21	06Ku26	TD	IT=?;α=0.09 7	*
^{214}Ra^p	2775	5	2683.2	1.4		295 ns 7	11^-	21	92St09	TJ	IT=100	
^{214}Ra^q	3570	5	3478.4	1.6		279 ns 4	14^+	21	92St09	TJ	IT=100	
^{214}Ra^r	4239	5	4146.8	1.7		225 ns 4	17^-	21	92St09	TJ	IT=100	
^{214}Ra^x	6669	6	6577.0	2.4		128 ns 4	(25^-)	21	92St09	TJ	IT=100	
^{214}Ac	6433	14				8.2 s 0.2	5^+*	21	68Va04	TD	α=?;β^+=7 4	*
^{214}Th	10692	10				100 ms 6	0^+	21			α=100;β^+ ?	*
^{214}Th^m	12873	10	2181.0	2.7		1.21 μs 0.09	(8^+)	21	21Zh24	TJ	IT=100	*
^{214}Pa	19390	80				17 ms 3	7^+#	21	95Ni05	DT	α=100	
^{214}U	25178	26				1.0 ms 0.6	0^+	21	21Zh22	TD	α=100	*
*^{214}Pb^m	E : 1365 + x keV; x=20-90 keV from 12Go19											**
*^{214}Bi	T : others: 21An14=19.9(0.2) 56Da06=19.9(0.4)											**
*^{214}Bi	D : %α from 60Wa14; %$\beta^-\alpha$ from 89Ha.A, quoted value from 65Le08											**
*^{214}Bi	J : 25Ba36=1											**
*^{214}Bi^m	E : from 08ChZI											**
*^{214}Bi^m	J : 25Ba36=(8)											**
*^{214}Po	T : unweighted average 26Ta06=163.83(0.16) 22Be20=163.64(0.10) 20Al.A=163.47(0.03), superseds 16Al28=163.46(0.04), 15Al10=163.45(0.04)											**
*^{214}Po	T : 13Al11=163.5(0.8) 13Be31=163.6(0.3) 12Su11=164.2(0.6) 50Vo02=163.7(0.2); others: 13Be20=163.8(3.0) 93Zh30=160(12) 71E_r02=165(3)											**
*^{214}Po	T : 61Do02=164.3(1.8) 53Ba60=158(2) 43Ja01=155(5) 41Ro01=145(5) 39Ro03=140(15) 39Du01=150(20) 25Ge09=169(5)											**
*^{214}Rn	T : other: 70Va13=270(20)											**
*^{214}Rn^m	T : average 87Dr08=263(35) 83Lo01=230(30)											**
*^{214}Fr	T : average 19Mi08=6.0(0.2) 15Kh09=5.9(0.4) 05Li17=4.6(0.7) 68To10=5.0(0.2) 68Va18=5.5(0.5); other: 21Hu18=5.5(+1.7-1.0)											**
*^{214}Fr	J : 16Fa11=(1)											**
*^{214}Fr^n	E : 516.6(0.2) keV above ^{214}Fr^m											**
*^{214}Fr^p	E : 6477 + y keV; y=100#(100#) keV estimated by NUBASE											**
*^{214}Ra	T : average 15Kh09=2.36(0.06) 12No08=2.435(0.020) 73Be33=2.46(0.03); others: 23Lu04=1.91(+0.89-0.46) 18Br13=2.27(+98-53) 74Ho27=2.4(0.1)											**
*^{214}Ra	T : 68Lo15=2.5(0.1) 67Va22=2.6(0.2) 61Gr42∼2.6											**
*^{214}Ra	D : %β^+ from 68To10=0.059(0.004); other: 67Va22=0.09(0.03)											**
*^{214}Ra^n	D : %α from 06Ku26; %β^+=99.91 7 in ENSDF2021 should be %IT											**
*^{214}Ra^n	T : average 06Ku26=68.6(2.0) 92St09=66.5(3.5) 71MaXN=67(3) 72Co18=57(6)											**
*^{214}Ac	J : 17Gr18,16Fe11=5											**
*^{214}Ac	D : %β^+ from 68Va04<14											**
*^{214}Th	T : average 22Zh45=113(+11-9) 07Le14=92(+32-10),83(+58-25) 84Sc13=96(30) 80Ve01=80(10) 68Va18=125(25)											**
*^{214}Th^m	T : average 21Zh24=1.18(0.13) 07Kh22=1.24(0.12)											**
*^{214}U	T : symmetrized from 0.52(+0.95-0.21)											**
^{215}Hg	17000#	400#				600# ms >300ns	$9/2^+$#	22	06Ca30	I	β^- ?;β^-n ?	
^{215}Tl	10030#	300#				9.7 s 3.8	$1/2^+$#	22	17Ca12	TD	β^-=100;β^-n=4.6 46	
^{215}Tl^m	10900#	300#	874	5		3.0 ms 0.3	$11/2^-$#		24Ye04	TDE	IT=100	
^{215}Tl^n	11550#	300#	1515	26		< 210 ns	$17/2^+$#		24Ye04	TDJ	IT=100	*
^{215}Pb	4340	50				142 s 11	$9/2^+$#	13	17Ca12	T	β^-=100	*
^{215}Bi	1629	5				7.62 m 0.13	$(9/2^-)$*	13	14Mo02	T	β^-=100	*
^{215}Bi^m	2996#	21#	1367#	20#		36.9 s 0.6	$(25/2^-)$	13			IT=76.9 5;β^-=23.1 5	*
^{215}Po	−541.8	0.6				1.7784 ms 0.0010	$9/2^+$	13	26As.1	T	α=100;β^-=2.3e-4 2	*
^{215}At	−1254	4				36.3 μs 0.9	$9/2^-$	13	24Ba08	T	α=100	*
^{215}Rn	−1169	5				2.30 μs 0.10	$9/2^+$	13	70Va13	T	α=100	*
^{215}Fr	317	7				90 ns 4	$9/2^-$	13	19Mi08	T	α=100	*
^{215}Ra	2531	7				1.669 ms 0.009	$9/2^+$#	13	18Di11	T	α=100	*
^{215}Ra^m	4409	7	1877.8	0.3		7.31 μs 0.13	$(25/2^+)$	13	04He25	T	IT=100	*
^{215}Ra^n	4778	7	2246.9	0.4		1.39 μs 0.07	$(29/2^-)$	13			IT=100	
^{215}Ra^p	6340#	50#	3807#	50#		555 ns 10	$(43/2^-)$	13			IT=100	*
^{215}Ac	6030	12				171 ms 10	$9/2^-$*	13	68Va04	TD	α=99.91 2;β^+=0.09 2	*
^{215}Ac^m	7826	12	1796.0	0.9		185 ns 30	$21/2^-$	13	83De08	TD	IT=100	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{215}Ac^{n}	8520#	50#	2488#	50#		335 ns 10	(29/2$^+$)	13	83De08	TD	IT=100	*
^{215}Th	10922	6				1.35 s 0.14	(1/2$^-$)	13	19Zh54	T	α=100	*
^{215}Th^{m}	12390#	50#	1471#	50#		745 ns 48	9/2$^+$#	13	21Zh24	T	IT=100	*
^{215}Pa	17810	80				14 ms 2	9/2$^-$	21	00He17	T	α=100	*
^{215}U	24930	80				1.4 ms 0.9	5/2$^-$#	15	15Ya13	T	α=100;β^+ ?	*
*^{215}Tl^{n}	E : 598.3(1.0) keV + x keV above ^{215}Tl^{m}; x < 85 keV (K electron binding energy of Tl)											**
*^{215}Pb	T : average 17Ca12=98.4(30.8) 13De20=147(12) 14Mo02=160(40); other: 96Ry.B=36(1)											**
*^{215}Bi	T : average 14Mo02=7.6(0.2) 90Ru02=7.7(0.2) 89Bu09=7.5(0.4) 65Nu03=7.4(0.6)											**
*^{215}Bi	J : 25An17,25Ba36=(9/2)											**
*^{215}Bi^{m}	E : 1347.5(0.2) + x keV; x=20#(20#) keV estimated by NUBASE											**
*^{215}Po	T : average 26As.1=1.77805(0.00091,stat)(0.00067,syst) 25To01=1.774(0.055) 23Ta02=1.781(0.005) 17Ri.A=1.7735(0.0554) 14BeZZ=1.78(0.05)											**
*^{215}Po	T : 71E_r02=1.784(0.006) 61Vo06=1.778(0.005); others: 42Wa04=1.83(0.04) 23Be10=1.5(0.6)											**
*^{215}At	T : from 24Ba08=36.3(0.3,stat)(0.9,syst); others: 25Gu12=70(20) 18Sa45=37(3) 51Me10=100(20)											**
*^{215}Rn	T : others: 25Gu12=2.6(0.4) 18Sa45=2.5(0.3)											**
*^{215}Fr	T : average 19Mi08=101(15) 84De16=86(5) 84Sc25=104(16) 74No02-120(20)											**
*^{215}Ra	T : average 18Di11=1.64(0.08) 18Br13=1.66(0.07) 15Kh09=1.70(0.06) 05Li17=1.64(0.04) 00He17=1.67(0.01); others: 20Su02=1.51(+0.40-0.26)											**
*^{215}Ra	T : 24Ya27=1.86(+1.02-0.49)											**
*^{215}Ra^{m}	T : average 04He25=7.6(0.2) 98St24=6.9(0.3) 88Fu10=7.2(0.2)											**
*^{215}Ra^{p}	E : 3756.6(0.4) + x keV; x=50#(50#) keV estimated by NUBASE											**
*^{215}Ac	T : other: 17Su18=193(+97-49)											**
*^{215}Ac	J : 17Gr18,16Fe11=9/2											**
*^{215}Ac^{n}	E : 2438 + x keV; x=50#(50#) from 83De08											**
*^{215}Th	T : average 19Zh54=1.5(0.2) 68Va18=1.2(0.2); other: 07Le14=0.63(+1.26-0.21)											**
*^{215}Th^{m}	E : 1421.3(0.3) + x keV; x=50#(50#) keV estimated by NUBASE											**
*^{215}Th^{m}	T : average 21Zh24=700(80) 05Ku31=770(60)											**
*^{215}Pa	J : favored α decay to ^{211}Ac (J$^\pi$=9/2$^-$)											**
*^{215}Pa	T : others: 26Zh40=11(+7-2) 96An21=15(4) 79Sc09=14(+20-3)											**
*^{215}U	T : symmetrized from 15Ya13=0.73(+1.33-0.29) ms											**
^{216}Hg	20920#	400#				2# s >300ns	0$^+$	25	10Al24	I	β^- ?;β^-n ?	
^{216}Tl	14870#	300#				5.9 s 3.3	5$^+$#	25	17Ca12	TD	β^-=100;β^-n=6 3	*
^{216}Pb	7510#	200#				1.66 m 0.20	0$^+$	25	17Ca12	TD	β^-=100	
^{216}Pb^{m}	9020#	200#	1514	20		400 ns 40	8$^+$#	25	12Go19	EJT	IT=100	*
^{216}Bi	5874	11			*	2.110 m 0.022	(8$^-$)*	25	24An09	TDJ	β^-=100	*
^{216}Bi^{m}	5898	15	24	19	AD*	3.37 m 0.18	(3$^-$)*	25	24An09	TDJ	β^-=100	*
^{216}Po	1777.94	0.27				143.8 ms 0.4	0$^+$	25	26Li08	T	α=100;2β^- ?	*
^{216}At	2251	3				300 μs 30	1$^-$	25	51Me10	T	$\alpha\approx$100;β^- ?;ε ?	
^{216}At^{m}	2412	10	161	11	AD	100# μs	9$^-$#				α=100	
^{216}Rn	250	5				29 μs 4	0$^+$	25	18Sa45	T	α=100	*
^{216}Fr	2970	4				700 ns 20	(1$^-$)	25	70Bo13	T	α=100;β^+ ?	*
^{216}Fr^{m}	3189	6	219	6	AD	850 ns 30	(9$^-$)	25	07Ku30	TJD	α=100;β^+ ?	
^{216}Ra	3290	8				172 ns 7	0$^+$	25	19Pa45	T	α=100	*
^{216}Ac	8150	9				380 μs 11	(1$^-$)	25	21Ma66	T	α=100;β^+ ?	*
^{216}Ac^{m}	8188	10	38	5	AD	441 μs 7	9$^-$#		00He17	T	α=100;β^+ ?	*
^{216}Ac^{n}	8570#	100#	422#	100#		$\sim$ 300 ns		25			IT=100	*
^{216}Th	10297	11				26.28 ms 0.16	0$^+$	25	19Zh54	T	α=100;β^+ ?	*
^{216}Th^{m}	12339	12	2041	8	AD	135.4 μs 2.9	8$^+$	25	19Zh54	T	IT=?;α=2.8 9	*
^{216}Th^{n}	12945	14	2648	8		580 ns 26	(11$^-$)	25	01Ha46	JT	IT=100	*
^{216}Th^{p}	13979	14	3682	8		740 ns 70	(14$^+$)	25	05Ku31	TE	IT=100	*
^{216}Pa	17829	23				108 ms 11	5$^+$#	25	26Zh40	T	α=100;β^+ ?	*
^{216}U	23067	19				2.4 ms 0.5	0$^+$	25	22Zh45	T	α=100	*
^{216}U^{m}	25277	19	2209	23	AD	0.94 ms 0.20	8$^+$#	25	22Zh45	T	α=100	*
^{216}Np	33050#	400#				1# ns					α ?	
*^{216}Tl	D : %β^-n from 17Ca12<11.5											**
*^{216}Pb^{m}	E : 1459 + x keV; x=20-90 keV from 12Go19											**
*^{216}Bi	T : average 24An09=2.147(0.045),1.974(0.037) 14Mo02=2.21(0.25) 00Ku06=2.25(0.05) 96Ry.B=2.17(0.05)											**
*^{216}Bi	J : 25Ba36=(8)											**
*^{216}Bi^{m}	T : average 24An09=3.70(0.33),3.07(0.26) 90Ru02=3.6(0.4); other: 89Bu09=6.6(2.1)											**
*^{216}Bi^{m}	J : 25Ba36=(3)											**
*^{216}Po	T : average 26Li08=143.7(0.5,stat)(0.2,syst) 21Az03=143.3(2.8) 17Na22=144.0(0.6) 18Ba44=136(6) 03Da24=144(8) 63Di05=145(2); others:											**
*^{216}Po	T : 23Be16=161(16) 19Mi18=145(11)											**
*^{216}Rn	T : others: 25Gu12=44.4(5.0) 61Ru06=45(5)											**
*^{216}Fr	T : other: 25Gu12=2.0(0.6) μs											**
*^{216}Ra	T : average 19Pa45=161(11) 17Su18=167(53) 73No09=182(10)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{216}$Ac	T : average 21Ma66=330(50) 17Hu08=360(70) 05Li17=390(60) 00He17=440(16) 70To18=330(20) 51Me10=300(30)											**
$*^{216}$Ac^m	T : average 00He17=443(7) [9316α(t)], 432(17) [8273α(t)]											**
$*^{216}$Ac^n	E : 322 keV + x keV, x=100#(100#) keV by NUBASE											**
$*^{216}$Th	T : average 19Zh54=26.3(0.5) 05Ku31=26.0(0.2) 01Ha46=25.4(0.8) 00He17=27.0(0.3) 68Va18=28(2); others: 14Ya19=29(+13-7) 05Li17=30(9) 00He17=30(3)											**
$*^{216}$Th^m	T : average 19Zh54=126(14) 05Ku31=135(4) 01Ha46=128(8) 00He17=140(5)											**
$*^{216}$Th^m	J : favored α decay to ^{214}Rn^m (J$^\pi$=8$^+$)											**
$*^{216}$Th^n	E : 05Ku31=606.8(0.1) keV above ^{216}Th^m											**
$*^{216}$Th^n	T : average 05Ku31=570(30) 01Ha46=615(55)											**
$*^{216}$Th^p	E : 05Ku31=1641.4(0.7) keV above ^{216}Th^m											**
$*^{216}$Pa	T : average 26Zh40=120(+46-26) 19Zh23=92(+50-24) 96An21=105(12); others: 98Ik01=150(70-40),140(50-30) 79Sc09=170(100-40) 71Su14=200(40)											**
$*^{216}$U	T : symmetrized from 22Zh45=2.25(+0.63-0.40) supersedes 21Zh22=1.28(+0.49-0.28); others: 15Ma37=4.72(+4.72-1.57) 15De22=3.8(+8.8-3.2)											**
$*^{216}$U^m	T : symmetrized from 22Zh45=0.89(+0.24-0.16); other: 15Ma37=0.74(+1.34-0.29)											**
^{217}Tl	18660#	400#				2# s	>300ns	1/2$^+$#	17	10Al24	I	β^- ?;β^-n ?	
^{217}Pb	12260#	300#				19.9 s	5.3	9/2$^+$#	17	17Ca12	TD	β^-=100	
^{217}Bi	8730	18				98.5 s	1.3	(9/2$^-$)*	17			β^-=100	*
^{217}Bi^m	10221	27	1491	20		3.0 μs	0.2	25/2$^-$#	17			IT=100	*
^{217}Po	5884	6				1.53 s	0.05	(9/2$^+$)*	17	04Li28	TJ	α=97.5 14;β^-=2.5 14	*
^{217}At	4392.4	0.9				32.6 ms	0.3	9/2$^-$*	17	19Ba22	J	α=99.992 2;β^-=0.008 2	*
^{217}Rn	3666	4				581 μs	36	9/2$^+$	17	25Gu12	T	α=100	*
^{217}Fr	4314	6				22.9 μs	1.9	9/2$^-$	17	22Pa09	T	α=100	
^{217}Ra	5888	7				1.90 μs	0.11	(9/2$^+$)	17	25Gu12	T	α=100	*
^{217}Ac	8702	10				69 ns	4	9/2$^-$	17			α=100;β^+ ?	*
^{217}Ac^m	10714	10	2012.3	0.4		740 ns	40	29/2$^+$	17	85De14	DJT	IT=95.49 18;α=4.51 18	*
^{217}Th	12206	11				248 μs	4	9/2$^+$#	17	19Zh54	T	α=100	*
^{217}Th^m	12879	11	673.3	0.1		141 ns	50	(15/2$^-$)	17			IT=100	
^{217}Th^n	14510	30	2307	32		71 μs	14	(25/2$^+$)	17	05Ku31	ETJ	IT=100	*
^{217}Pa	17054	12				3.8 ms	0.2	9/2$^-$	17			α=100;β^+ ?	*
^{217}Pa^m	18914	13	1860	7	AD	1.08 ms	0.03	(23/2$^-$)	17			α=73 4;IT ?	
^{217}U	22970#	80#				850 μs	710	1/2$^-$#	17	05Le42	T	α=100;β^+ ?	*
^{217}Np	31080#	300#				5# ns		9/2$^-$#				α ?	
$*^{217}$Bi	J : 25An17,25Ba36=(9/2)											**
$*^{217}$Bi^m	E : 1436 + x keV; x=20-90 keV from 12Go19											**
$*^{217}$Po	T : average 03Ku25=1.53(0.03) 96Ry.B=1.47(0.05); other: 04Li28=1.6(0.2)											**
$*^{217}$Po	J : 15Fi07=(9/2,11/2)											**
$*^{217}$Po	D : %β^- from 77Vy02<5											**
$*^{217}$At	D : %β^- average 97Ch53=0.0067(0.0024) 69Le.A=0.012(0.004)											**
$*^{217}$Rn	T : average 25Gu12=500(100) 18Sa45=670(60) 61Ru06=540(50); other: 51Me10=1000(100)											**
$*^{217}$Ra	T : average 25Gu12=2.3(0.9) 21Hu19=1.52(+0.42-0.27) 19Mi08=2.5(0.2) 19Ya04=1.4(+0.4-0.3) 90An19=1.7(0.3) 70Va13=1.6(0.2); other: 70To07=4(2)											**
$*^{217}$Ac	T : others: 19Mi08=150(+370-60) 82GoZU=75(3) 73No09=111(7)											**
$*^{217}$Ac^m	E : from γ rays in a cascade in 25Sa04											**
$*^{217}$Th	T : average 19Zh54=249(11) 15Kh09=259(12) 05Ku31=257(2) 02He29=237(2) 00He17=248(3) 00Ni02=261(+22-18) 73Ha32=252(7); Birge ratio=2.95; other:											**
$*^{217}$Th	T : 05Li17=310(70)											**
$*^{217}$Th^n	T : symmetrized from 05Ku31=67(+17-11); other: 02Mu.A=20(5)											**
$*^{217}$Th^n	E : 2251.9 + x keV; x<110 keV in 05Ku31, due to the observed weak Kx rays											**
$*^{217}$Pa	J : favored α decay to ^{213}Ac (J$^\pi$=9/2$^-$)											**
$*^{217}$U	T : symmetrized from 05Le42=0.19(+1.13-0.10) ms; other: 00Ma65=15.6(+21.3-5.7)											**
^{218}Tl	23710#	400#				1# s		6$^+$#				β^- ?;β^-n ?	
^{218}Pb	15630#	300#				14.8 s	6.8	0$^+$	19	17Ca12	TD	β^-=100	
^{218}Bi	13216	27				33 s	1	(8$^-$)*	19	04De16	JT	β^-=100	*
^{218}Po	8355.4	1.6				3.097 m	0.012	0$^+$	19			α=99.980 2;β^-=0.020 2	
^{218}At	8099	11				1.28 s	0.06	(2$^-$,3$^-$)*	19	19Ba22	J	α=100;β^- ?	
^{218}Rn	5216.4	2.0				33.75 ms	0.15	0$^+$	19	12Su11	T	α=100	*
^{218}Fr	7059	4				1.4 ms	0.5	1$^-$	19	82Ew01	T	α=100	*
^{218}Fr^m	7146	5	88	4	AD	21.9 ms	0.5	(8$^-$)	19	99Sh03	J	α=100;IT ?	*
^{218}Ra	6644	10				25.91 μs	0.14	0$^+$	19			α=100	
^{218}Ac	10850	60			*	1.02 μs	0.03	(1$^-$)	19	23Lu04	T	α=100	*
^{218}Ac^m	10910	90	60	70	*	> 100# ns		8$^-$#	19			IT ?;α ?;β^+ ?	
^{218}Ac^n	11460#	110#	607#	86#		103 ns	11	(11$^+$)	19			IT=100	*
^{218}Th	12379	9				117 ns	4	0$^+$	21			α=100	*
^{218}Pa	18649	18				108 μs	5	8$^-$#	21	20Zh01	TDJ	α=100	*
^{218}Pa^m	18730	20	81	19	AD	150 μs	50	1$^-$#	21	20Zh01	TDJ	α=100	*
^{218}U	21892	13				660 μs	80	0$^+$	21	22Zh45	T	α=100	*
^{218}U^m	24001	15	2109	13	AD	400 μs	60	8$^+$#	21	22Zh45	T	$\alpha\approx$100;IT=?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{218}Np	30720#	200#				10# ns					α ?	
$*^{218}$Bi	T : others: 17Ca12=38.5(21.6) 14Mo02=33(6)											**
$*^{218}$Bi	J : 25Ba36=(8)											**
$*^{218}$Rn	T : others: 25Gu12=28(6) 71E_r02=39(2) 63Di05=35(1) 61Ru06=30(3) 48St42=19											**
$*^{218}$Fr	T : symmetrized from 82Ew01=1.3(+0.5-0.4)											**
$*^{218}$Fr^m	T : average 14Bu06=21(2) 82Ew01=22.0(0.5); other: 25Gu12=29.5(6.0)											**
$*^{218}$Ac	T : average 23Lu04=1.22(0.12) 21Hu18=0.87(+0.18-0.07) 19Ya04=1.04(0.12) 15Kh09=0.96(0.05) 89Mi17=1.06(0.09) 83Sc23=1.12(0.11) 17Su18=0.98(0.12);											**
$*^{218}$Ac	T : others: 19Mi08=1.5(0.1),1.8(0.1)											**
$*^{218}$Ac	J : favored α decay to ^{214}Fr [J$^\pi$=(1$^-$)]											**
$*^{218}$Ac^n	E : 507.0(0.3) + x keV above ^{218}Ac^m; x=50#(50#) keV by NUBASE											**
$*^{218}$Th	T : average 82Ch29=125(5) 73Ha32=122(8) 73No09,73Hi06=96(7); others: 23Lu04=155(+72-37) 18Br13=169(+73-40) 15Kh09=160(40)											**
$*^{218}$Pa	T : average 20Zh01=107(5) 00He17=113(10), supersedes 96An21=110(20)											**
$*^{218}$Pa^m	T : symmetrized from 20Zh01=135(+62-32)											**
$*^{218}$U	T : symmetrized from 22Zh45,21Zh22=650(+80-70); others: 18Ya01=131(+179-48) 05Le42=510(+170-100) 92An04=1500(+7300-700) (one event)											**
$*^{218}$U^m	T : symmetrized from 22Zh45=390(+60-50); others: 05Le42=560(+260-140) 18Ya01=134(+244-53) 15Ma37=280(+1300-120)											**
^{219}Pb	20620#	400#				5# s	>300ns	$9/2^+$#	21	10Al24	I β^- ?	
^{219}Bi	16320#	200#				8.7 s	2.9	$9/2^-$#	21	17Ca12	T β^-=100;β^-n ?	*
^{219}Po	12681	16				10.3 m	1.0	$9/2^+$#	21	15Fi07	TD β^- ?;α=28.2 20	
^{219}At	10395.8	2.9				56 s	3	$(9/2^-)*$	21	19Ba22	J α=93.6 10;β^-=?	*
^{219}Rn	8829.2	0.6				3.963 s	0.010	$5/2^+*$	21		α=100	*
^{219}Fr	8620	4				23.3 ms	1.5	$9/2^-*$	21	25Gu12	T α=100	*
^{219}Ra	9394	6				8.6 ms	1.1	$(7/2^+)$	21	18Sa45	TJD α=100	*
^{219}Ra^m	9411	6	16.6	0.2		10 ms	3	$(11/2^+)$	21	18Sa45	TJD α=100;IT ?	
^{219}Ac	11570	50				9.4 μs	1.0	$9/2^-$	21	19Mi08	T α=100;β^+ ?	*
^{219}Th	14469	9				1.021 μs	0.016	$9/2^+$#	21	23Lu04	T α=100;β^+ ?	*
^{219}Pa	18580	70				56 ns	9	$9/2^-$	21	17Su18	TD α=100;β^+ ?	*
^{219}U	23296	13				60 μs	7	$9/2^+$#	21	19Zh54	T α=100;β^+ ?	*
^{219}Np	29410	80				171 μs	52	$9/2^-$#	21	26Zh40	T α=100	*
$*^{219}$Bi	T : other: 12Be28=22(7)											**
$*^{219}$At	J : 19Ba22=(9/2)											**
$*^{219}$At	D : %α from 15Fi07											**
$*^{219}$At	T : average 89Bu09=57(4) 53Hy83=54(6)											**
$*^{219}$Rn	T : average 66Hu20=3.96(0.01) 61Ro04=4.00(0.05),4.01(0.06); others: 25Gu12=6.9(1.5) 23Be10=3.9(0.5)											**
$*^{219}$Rn	J : 88NeZZ,87Bo29=5/2											**
$*^{219}$Fr	T : average 25Gu12=28(4) 18Sa45=28(3) 51Me10=20(2); others: 63Su.A,64Hy02=21.5 48Gh01$\sim$0.1											**
$*^{219}$Fr	J : 15De28=9/2											**
$*^{219}$Ra	T : average 25Gu12=8.5(1.5) 18Sa45=8(2),10(3) [for E(α)=7.98 MeV and 7.66 MeV]; other: 70Va13=10(3)											**
$*^{219}$Ac	T : average 19Mi08=7.6(+2.1-1.4) 89Mi17=11.8(1.5) 70Bo13=7(2)											**
$*^{219}$Th	T : average 23Lu04=1.05(0.05) 19Ya04=1.03(0.03) 18Br13=0.94(0.08) 17Su18=1.09(0.08) 15Kh09=0.97(0.04) 73Ha32=1.05(0.03) 20Ma27=0.90(0.08);											**
$*^{219}$Th	T : others: 20Su02=0.94(+0.21-0.15) 19Zh54=1.24(0.68-0.32)											**
$*^{219}$Pa	T : average 17Su18=60(+28-15) 87Fa.A=53(10)											**
$*^{219}$U	T : others: 93An07=42(+34-13) 05Le42=80(+100-30)											**
$*^{219}$Np	T : averaged 26Zh40=140(+70-30) 18Ya01=150(+720-70)											**
^{220}Pb	24130#	400#				1# s	>300ns	0^+	11	10Al24	I β^- ?	
^{220}Bi	20960#	300#				9.5 s	5.7	1^-#	11	17Ca12	TD β^-=100;β^-n ?	
^{220}Po	15263	18				9 s	2	0^+	10	23Po.B	TD β^-=100	
^{220}At	14376	14				3.71 m	0.04	3^-#	10		β^-=?;α=8 2	
^{220}Rn	10607.62	0.25				55.77 s	0.12	0^+	10	23Be16	T α=100;2β^- ?	*
^{220}Fr	11477	4				27.4 s	0.3	1^+*	10	74Ho27	T α=99.65 5;β^-=0.35 5	*
^{220}Ra	10270	6				18.1 ms	1.2	0^+	10	25Gu12	T α=100	*
^{220}Ac	13743	6				26.36 ms	0.19	(3^-)	10	97Sh09	J α=100;β^+ ?	*
^{220}Th	14688	14				10.2 μs	0.3	0^+	14	19Pa45	T α=100;ε ?	*
^{220}Pa	20294	11			*	0.83 μs	0.04	1^-#	10	23Lu04	T α=100;β^+ ?	*
^{220}Pa^m	20305	22	11	21	AD*	270 ns	80	9^-#	10	21Ma66	DT α=100	*
^{220}Pa^n			*non − exist*		RN	260 ns	210		10	18Hu13	DTI α=100	*
^{220}U	22910#	100#				60# ns		0^+			α ?;β^+ ?	
^{220}Np	30520	60				27 μs	6	1^-#	19	26Zh40	TD α=100	*
$*^{220}$Rn	T : average 23Be16=51(8) 18Ba44=58(4) 03Da24=61(+10-8) 66Hu20=55.65(0.17) 63Gi07=55.3(0.3) 61Ro14=56.3(0.2) 55Sc81=51.5(1.0); other:											**
$*^{220}$Rn	T : 25Gu12=56.5(11.0)											**
$*^{220}$Fr	J : other: 14Ly01=1											**
$*^{220}$Fr	T : others: 25Gu12=31.3(5.0) 51Me10=27.5(1.5)											**
$*^{220}$Ra	T : average 25Gu12=18.2(3.9) 18Sa45=19(3) 00He17=18(2) 90An19=17(2) 61Ru06=23(5); other: 78IbZZ=31(8)											**
$*^{220}$Ac	T : average 90An19=26.4(0.2) 70Bo13=26.1(0.5)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{220}$Th	T : average 19Pa45=10.4(0.4) 73Ha32=9.7(0.6)								**
$*^{220}$Pa	T : average 23Lu04=0.83(0.07) 21Ma66=0.75(0.08), supersedes 20Ma27=0.73(0.11), 19Ya04=0.91(0.10) 17Hu08=0.90(0.13) 87FaZS=0.78(0.16); others:								**
$*^{220}$Pa	T : 19Zh54=0.98(+0.40-0.22) 87MiZO=1.1(0.1)								**
$*^{220}$Pa^{m}	T : symmetrized from 21Ma66=233(+108-56); other: 18Hu13=308(+250-95),1 event								**
$*^{220}$Pa^{n}	T : symmetrized from 18Hu13=69(+330-30), 1 event								**
$*^{220}$Pa^{n}	I : not confirmed in 21Ma66 with much higher statistics compared to 18Hu13								**
$*^{220}$Np	T : average 26Zh40=23(+9-5) 19Zh23=25(+14-7)								**
^{221}Bi	24200#	300#	2# s	>300ns	$9/2^-$#	11	10Al24	I	β^- ?;β^-n ?	
^{221}Po	19774	20	37.1 s	1.4	$9/2^+$#	13	25Be.2	TD	β^-=100	*
^{221}At	16783	14	2.3 m	0.2	$3/2^-$#	07			β^-=100	
^{221}Rn	14472	5	25.7 m	0.5	$7/2^+$*	07	97Li23	T	β^-=78 1;α=22 1	*
^{221}Fr	13275.2	0.7	4.801 m	0.005	$5/2^-$*	07	13Su13	T	α=?;β^-=0.0048 15; 14C=8.8e-11 11	*
^{221}Ra	12971	4	26.2 s	0.6	$5/2^+$*	07	24Ba08	T	α=100;14C=1.2e-10 9	*
^{221}Ac	14520	50	49.8 ms	1.5	$(5/2^-)$	07	22Pa09	JT	α=100	*
^{221}Th	16939	8	1.741 ms	0.014	$7/2^+$#	07	25Ku.A	TD	α=100	*
^{221}Pa	20370	60	5.9 μs	1.7	$9/2^-$	07			α=100	*
^{221}U	24520	70	660 ns	140	$9/2^+$#	15			α=100;β^+ ?	
^{221}Np	29910#	200#	30# ns		$9/2^-$#				α ?	
^{221}Pu	35930#	300#	100# μs		$9/2^+$#				α ?;SF ?	
$*^{221}$Po	T : other: 10Ch19=112(+58-28)								**
$*^{221}$Rn	J : 87Bo29,83Ah03=5/2								**
$*^{221}$Fr	D : %β^- from 97Ch53; %^{14}C from 94Bo28								**
$*^{221}$Fr	T : average 13Su13=4.806(0.006) 10Wa42=4.768(0.017) 07Je07=4.79(0.02)								**
$*^{221}$Fr	J : 15De28,14Ly01,78Ek02,78Ek05,87Co19=5/2								**
$*^{221}$Ra	T : from 24Ba08=26.2(0.1,stat)(0.6,syst); others: 25Gu12=23(4) 18Sa45=16(2) 58To25=28(2) 51Me10=30(2)								**
$*^{221}$Ra	D : %^{14}C from 94Bo28								**
$*^{221}$Ra	J : 88Ah02,83Ah03=5/2								**
$*^{221}$Ac	T : average 25To01=49.5(3.0) 22Pa09=45(3) 70Bo13=52(2)								**
$*^{221}$Th	T : average 25Ku.A=1.80(+0.08-0.07) 20Pa44=1.73(0.02) 14Lo10=1.78(0.03) 01Ko07=1.73(0.03) 70To07=1.68(0.06); others: 19Mi08=1.0(0.2)								**
$*^{221}$Th	T : 19Ya04=2.28(+0.70-0.43) 05Li17=2.3(0.4) 00He17=2.0(+0.3-0.2) 21Hu19=1.95(+0.38-0.27)								**
$*^{221}$Pa	T : other: 19Mi08=3.5(+8.5-1.4)								**
^{222}Bi	28950#	300#	3# s	>300ns	1^-#	23	10Al24	I	β^- ?;β^-n ?	
^{222}Po	22490	40	68.7 s	2.1	0^+	23	25Be.2	T	β^-=100	*
^{222}At	20953	16	54 s	10		23	89Bu09	T	β^-=100	
^{222}Rn	16370.7	1.6	3.8215 d	0.0002	0^+	23	15Be07	T	α=100	*
^{222}Fr	16378	7	14.2 m	0.3	2^-*	23	73AfZV	T	β^-=100	*
^{222}Ra	14320	4	33.6 s	0.4	0^+	23	12Po13	T	α=100;14C=3.0e-8 10	*
^{222}Ac	16621	5	4.9 s	0.3	1^-	23			α=?;β^+=1.0 3	*
^{222}Ac^{m}	16700	21	79	21 AD	1.05 m	0.05	5^+#	23	72Es03	DTJ	α=?;β^+=1.4 4	*
^{222}Th	17200	10	1.964 ms	0.002	0^+	23	16Pa28	T	α=100;ε ?	*
^{222}Pa	22070	90	3.57 ms	0.17	1^-#	23	21Hu18	T	α=100	*
^{222}U	24220	12	4.7 μs	0.6	0^+	23	23Lu04	T	α=100;β^+ ?	*
^{222}Np	31270	40	480 ns	190	1^-#	23	20Ma27	TD	α=100	*
^{222}Pu	34850#	300#	10# μs		0^+				α ?;SF ?	
$*^{222}$Po	T : other: 10Ch19=145(+694-66) s								**
$*^{222}$Rn	T : rounded from 15Be07=3.82146(0.00016,stat)(0.00004,syst)=3.82146(0.00016)								**
$*^{222}$Fr	J : 78Ek02,78Ek05=2								**
$*^{222}$Ra	T : others: 25Gu12=31(4) 95Ko54=36.17(0.10) 82Bo04=43(4)								**
$*^{222}$Ac	T : average 72Es03=5(1) 58To25=4.2(0.5) 52Me13=5.5(0.5)								**
$*^{222}$Ac	D : %β^+ from 66Wa23=1-2								**
$*^{222}$Ac^{m}	D : %β^+ from 0.7 < 72Es03 < 2								**
$*^{222}$Th	T : others: 01Ku07=2.237(0.013) and 99Ho28=4.2(0.5), superseded by 16Pa28, 18Mi11=2.3(+0.8-0.5) 05Li17=2.4(0.3) 02CaZU=1.9(0.2) 00He17=2.0(0.1)								**
$*^{222}$Th	T : 99Gr28=2.1(0.1) 91AnZZ=2.2(0.2) 70Va13=2.8(0.3) 70To07=4(1)								**
$*^{222}$Pa	T : average 21Hu18=2.76(+0.43-0.33) 19Mi08=4.5(0.3) 95Ni.A=3.3(0.3) 79Sc09=2.9(+0.6-0.4); other: 70Bo13=5.7(0.5), conflicting (not used)								**
$*^{222}$U	T : average 23Lu04=4.0(+1.9-1.0) 15Kh09=4.7(0.7); other: 83Hi12=1.0(+1.2-0.4)								**
$*^{222}$Np	T : symmetrized from 20Ma27=380(+260-110)								**
^{223}Bi	32240#	400#	1# s	>300ns	$9/2^-$#	11	10Al24	I	β^- ?;β^-n ?	
^{223}Po	27080#	200#	7.8 s	0.7	$11/2^+$#	11	23Po.B	TD	β^-=100	
^{223}At	23428	14	50 s	7	$3/2^-$#	01			$\beta^-\approx$100;α ?	
^{223}Rn	20390	8	24.3 m	0.4	$7/2^+$*	01			β^-=100;α ?	*
^{223}Fr	18382.1	0.9	22.00 m	0.07	$3/2^-$*	01	01Li44	D	β^-=?;α=0.02 1	*
^{223}Ra	17233.1	0.6	11.4352 d	0.0010	$3/2^+$*	01	15Ko06	T	α=100;14C=8.9e-8 4	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{223}Ac	17828	4			2.10 m 0.05	$(5/2^-)$	01			$\alpha\approx100;\varepsilon$?	
^{223}Th	19386	7			603 ms 18	$(5/2)^+$	01	25To01	T	α=100	*
^{223}Pa	22340	80			5.3 ms 0.3	$9/2^-$	01	19Mi08	T	α=100;β^+ ?	*
^{223}U	26056	17			27 μs 4	$7/2^+$#	01	25Ku.A	T	α=100;β^+ ?	*
^{223}Np	30660	80			2.5 μs 0.8	$9/2^-$#	19	17Su18	TD	α=100	*
^{223}Pu	36120#	300#			10# μs	$9/2^+$#				α ?;SF ?	
^{223}Am	42820#	300#			10 ms 9	$9/2^-$#	15	15De22	TI	$\alpha\approx100;\beta^+$?	*
*^{223}Rn	J : 88NeZZ,83Ah03=3/2										**
*^{223}Fr	J : 15De28,85Co24=3/2										**
*^{223}Ra	T : average 15Ko06=11.4362(0.0050) 15Be13=11.447(0.006),11.445(0.013) 15Co02=11.4358(0.0028) 65Ki05=11.4346(0.0011)										**
*^{223}Ra	J : 18Ly01,88Ah02,83Ah03=3/2										**
*^{223}Th	T : average 25To01=618(47) 87El02=600(20); others: 70Va13=660(10) 58To25=900(10)										**
*^{223}Pa	T : average 19Mi08=7(1) 99Ho28=4.9(0.4) 95Ni.A=5.0(1.0) 70Bo13=6.5(1.0)										**
*^{223}Pa	J : favored α decay to ^{219}Ac (J$^\pi$=9/2$^-$)										**
*^{223}U	T : symmetrized from 25Ku.A=26.6(+4.0-3.0); others: 20Su02=62(+14-10) 91An10=18(+10-5)										**
*^{223}Np	T : symmetrized from 17Su18=2.15(+1.00$^-$-0.52)										**
*^{223}Am	T : symmetrized from 15De22=5.2(+12.0-4.4)										**
^{224}Bi	37070#	400#			1# s >300ns	1^-#	22	10Al24	I	β^- ?;β^-n ?	
^{224}Po	29910#	200#			3# s >300ns	0^+	22	10Al24	I	β^- ?	
^{224}At	27711	22			2.5 m 1.5	2^+#	22	10Ch19	T	β^-=100	*
^{224}Rn	22445	10			108.4 m 2.7	0^+	22			β^-=100	*
^{224}Fr	21749	11			3.33 m 0.10	1^-*	22	81Ku02	TD	β^-=100	*
^{224}Fr^x	21850#	100#	100#	100#			22				
^{224}Ra	18821.49	0.29			3.6316 d 0.0014	0^+	22	21Be13	T	α=100;14C=4.1e-9 8	*
^{224}Ac	20229	4			2.78 h 0.16	(0^-)	22			β^+=90.9 17;α=9.1 17	*
^{224}Th	19993	8			1.041 s 0.017	0^+	22			α=100;β^+ ?	*
^{224}Pa	23862	8			844 ms 19	(5^-)	22			α=100;β^+ ?	*
^{224}U	25741	15			396 μs 17	0^+	22	14Lo10	T	α=100;β^+ ?	
^{224}Np	32030	30			48 μs 19	2^-#	22	18Hu13	T	α=100	*
^{224}Pu	35110#	300#			10# μs	0^+				α ?;SF ?	
^{224}Am	43630#	400#			1# ms					α ?;SF ?	
*^{224}At	T : symmetrized from 10Ch19=76(+138-23) s, value for q=84$^+$ ions										**
*^{224}Rn	T : average 73AfZY=107(3) 64Bu02=114(6)										**
*^{224}Fr	J : 85Co24=1										**
*^{224}Ra	T : average 21Be13=3.6321(0.0028) [NIST-IC] 3.6323(0.0027) [NIST-Ge] 3.6262(0.0048) [NPL-Ge] 04Sc04=3.6319(0.0023) [PTβ^-IC]										**
*^{224}Ra	D : %^{14}C average 92Ar02=4.0(1.0)e-9 85Pr01=4.3(1.2)e-9										**
*^{224}Ac	D : from β^+/α=10(2) in 51Me10										**
*^{224}Ac	T : average 87Mi10=2.55(0.28) 51Me10=2.9(0.2)										**
*^{224}Th	T : average 00He17=0.812(0.099) 78IbZZ=1.05(0.02) 70Va13=1.03(0.05) 58To25=1.05(0.05); other: 25Gu12=0.55(0.17)										**
*^{224}Pa	T : average 97Wi15=850(20) 96Li05=790(60); other: 70Bo13=950(150)										**
*^{224}Pa	J : favored α decay to J$^\pi$=(5$^-$) level at 68.71 keV in ^{220}Ac										**
*^{224}Np	T : symmetried from 18Hu13=38(+26-11)										**
^{225}Po	34580#	300#			10# s >300ns	$3/2^+$#	11			β^- ?	
^{225}At	30300#	200#			15.8 s 1.3	$1/2^+$#	11	23Po.B	TD	β^-=100;β^-n ?	
^{225}Rn	26534	11			4.66 m 0.04	$7/2^-$*	08			β^-=100	*
^{225}Fr	23821	12			3.95 m 0.14	$3/2^-$*	08			β^-=100	*
^{225}Ra	21993.6	1.7			14.82 d 0.19	$1/2^+$*	08	87Mi10	T	β^-=100	*
^{225}Ac	21635.4	1.5			9.9179 d 0.0014	$3/2^-$*	19	26Du.1	T	α=100;14C=5.3e-10 13	*
^{225}Th	22317	5			8.75 m 0.04	$3/2^+$	08	89Ac01	J	$\alpha\approx90;\varepsilon$?	*
^{225}Pa	24340	50			1.82 s 0.07	$(5/2^-)$	08	22Pa09	JT	α=100	*
^{225}U	27369	10			62 ms 4	$5/2^+$#	08	19Mi08	T	α=100	*
^{225}Np	31620	90			6.5 ms 3.5	$9/2^-$#	15	15De22	T	α=100;β^+ ?	*
^{225}Pu	36470#	300#			100# μs	$7/2^+$#				α ?;SF ?	
^{225}Am	42480#	400#			100# μs	$9/2^-$#				α ?;SF ?	
*^{225}Rn	J : 88NeZZ,83Ah03=1/2										**
*^{225}Fr	J : 15De28,85Co24=3/2										**
*^{225}Ra	J : also 83Ah03,18Ly01=1/2										**
*^{225}Ra	T : average 87Mi10=15.02(0.56) 50Ha52=14.8(0.2)										**
*^{225}Ac	T : average 26Du.1=9.9195(0.0050), 9.9225(0.0044) 25Pi12=9.9159(0.0031) 24Ga01=9.914(0.004) 23Br08=9.9150(0.0063) 20Ko06=9.9179(0.0030)										**
*^{225}Ac	T : 12Po14=9.920(0.003); others: 50Ha52=10.0(0.1) 47En03=10										**
*^{225}Ac	J : 25Li31=3/2										**
*^{225}Th	J : favored α decay to J$^\pi$=3/2$^+$ level at 321.4 keV in ^{221}Ra										**
*^{225}Th	D : %α: 51Me10∼90										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{225}$Th	T : from 87Mi10; other: 51Me10=8.0(0.5)										**
$*^{225}$Pa	T : average 22Pa09=1.95(0.10) 70Bo13=1.8(0.3) 78IbZZ=1.7(0.1)										**
$*^{225}$U	T : average 19Mi08=63(7) 00He17=59(+5-2); others: 25Ku.A=64.2(+23.4-13.5) 03Ni10=135(+93-39) 01Ku07=84(4) 94An02=68(+45-20) 92To02=95(15)										**
$*^{225}$U	T : 89He13=80(+40-10)										**
$*^{225}$Np	T : average 15De22=3.8(+7.6-2.7)(^{233}Bk decay) 3.3(+7.6-0.7) (^{229}Am decay); other: 19Mi08=0.31(+0.75-0.13)										**
^{226}Po	37550#	400#			1# m	>300ns	0^+	11	10Al24	I β^- ?	
^{226}At	34660#	300#			12.2 s	1.7	2^+#	11	23Po.B	TD β^-=100;β^-n ?	
^{226}Rn	28747	10			7.4 m	0.1	0^+	96		β^-=100	
^{226}Fr	27521	6			48.5 s	0.7	1^-*	96	86Bo35	T β^-=100	*
^{226}Ra	23666.3	1.6			1.600 ky	0.007	0^+	96	90We01	D α=100;14C=2.6e-9 6;2β^- ?	*
^{226}Ac	24308.1	2.9			29.37 h	0.12	$(1^-)*$	96	25Li31	J β^-=83 3;ε=17 3;α=0.006 2	*
^{226}Th	23197	4			30.70 m	0.03	0^+	96	01Bo11	D α=100;18O<3.2e-12	*
^{226}Pa	26033	11			1.8 m	0.2	1^-#	96		α=74 5;β^+=?	
^{226}U	27325	11			269 ms	6	0^+	14	02CaZU	T α=100	*
^{226}Np	32740	110			35 ms	10		96	19Mi08	T α=100;β^+ ?	*
^{226}Pu	35557	27			> 1 ms		0^+		25Ku.A	TD α=?;β^+ ?;SF ?	
^{226}Am	43280#	300#			100# μs					α ?;SF ?	
$*^{226}$Fr	T : average 75Ra03=48(1) 86Bo35=49(1)										**
$*^{226}$Fr	J : 85Co24=1										**
$*^{226}$Ra	D : %^{14}C average 90We01=2.3(0.8)e-9% 86Ba26=2.9(1.0)e-9% 85Ho21=3.2(1.6)e-9%										**
$*^{226}$Ac	J : 25Li31,19Ve07=3/2										**
$*^{226}$Th	T : from 12Po13; others: 87Mi10=30.57(0.10) 95Ko54=30.83(0.01)										**
$*^{226}$U	T : average 02CaZU,01Ca.B=258(13) 00He17=281(9) 99Gr28=260(10); other: 18Mi11=400(100)										**
$*^{226}$Np	T : average 19Mi08=48(5) 90Ni05=35(10); other: 95Le15=58(+70-20)										**
^{227}Po	42280#	400#			2# s	>300ns	$5/2^+$#	16		β^- ?	
^{227}At	37430#	300#			5# s	>300ns	$1/2^+$#	16		β^- ?;β^-n ?	
^{227}Rn	32886	14			19.9 s	0.4	$(3/2^+)*$	16	23Po.1	T β^-=100	*
^{227}Fr	29682	6			2.47 m	0.03	$1/2^+*$	16		β^-=100	*
^{227}Ra	27176.2	1.6			42.2 m	0.5	$3/2^+*$	16		β^-=100	*
^{227}Ac	25849.3	0.9			21.772 y	0.003	$3/2^-*$	16	70Ki12	D β^-=?;α=1.3800 36	*
^{227}Th	25804.6	0.6			18.693 d	0.003	$(1/2^+)$	16	26Pi.1	T α=100	*
^{227}Pa	26833	5			38.3 m	0.3	$(5/2^-)$	16		α=85 2;ε=15 2	
^{227}U	29045	8			1.1 m	0.1	$(3/2^+)$	16		α=100;β^+ ?	
^{227}Np	32580	80			510 ms	60	$5/2^+$#	16		$\alpha\approx$100;β^+ ?	
^{227}Np^p	32730#	90#	150#	50#							
^{227}Pu	36800	26			2.3 s	0.4	$5/2^+$#		25Ku.A	TD α=77 10;β^+ ?	*
^{227}Am	42270#	200#			20# ms		$9/2^-$#			α ?;SF ?	
$*^{227}$Rn	T : average 23Po.1=16.7(1.4) 97Ku20=20.2(0.4), supersedes 89Bo11=22(1) 86Bo35=23(1)										**
$*^{227}$Rn	J : 83Ah03=(3/2)										**
$*^{227}$Fr	J : 85Co24=1/2										**
$*^{227}$Ra	J : 18Ly01,88Ah02,83Ah03,87We03=3/2										**
$*^{227}$Ac	J : 17Gr18,16Fe11,51To19=3/2										**
$*^{227}$Th	T : average 26Pi.1=18.699(0.011,HpGe), 18.701(0.013,Ge-well) 19Ko06=18.679(0.009,LSC),18.695(0.021,IC) 15Co11=18.695(0.004,IC),18.683(0.020,Ge);										**
$*^{227}$Th	T : others: 87Mi10=18.738(0.054) 67JoZX=18.7176(0.0052), supersedes 63Ei10=18.729(0.048) and 54Ha60=18.169(0.084), 49Pe08=18.6(0.1)										**
$*^{227}$Pu	T : symmetrized from 25Ku.A=2.2(+0.5-0.3); other: 24Ya27=0.78(+0.39-0.19)										**
^{228}At	41880#	400#			1# m	>300ns	3^+#	12	10Al24	I β^- ?;β^-n ?	
^{228}Rn	35243	18			65 s	2	0^+	12		β^-=100	
^{228}Fr	33384	7			38 s	1	2^-*	12		β^-=100	*
^{228}Fr^m	34390	30	1004	30	180 s	110			08ChZI	TIE IT ?;β^- ?	*
^{228}Ra	28941.6	1.7			5.75 y	0.03	0^+	12	62Ma58	T β^-=100	*
^{228}Ac	28896.0	1.8			6.15 h	0.02	3^+*	12	25Li31	J β^-=100	*
^{228}Ac^m	28902.3	1.8	6.26	0.03	221.9 ns	2.8	(1^-)		25Le.2	ET IT=100	*
^{228}Ac^p	29250	30	356	30	140 s	50			08ChZI	ET IT ?;β^- ?	*
^{228}Th	26766.6	0.4			1.9125 y	0.0007	0^+	12	93Bo20	D α=100;20O=1.13e-11 22	*
^{228}Pa	28918	4			19.8 h	0.4	3^+	12	21Km01	T β^+=98.15 17;α=1.85 17	*
^{228}U	29217	13			9.1 m	0.2	0^+	12	61Ru05	TD α=?;ε=2.5 14	*
^{228}Np	33820#	100#			61.0 s	1.3	4^+#	12	94Kr13	TD β^+=60 6;α=40 6;β^+SF=0.012 6	*
^{228}Pu	36106	23			2.1 s	1.3	0^+	12	03Ni10	T α=100;β^+ ?	*
^{228}Am	43020#	300#			100# ms					α ?;SF ?	
$*^{228}$Fr	J : 85Co24=2										**
$*^{228}$Fr^m	T : symmetrized from 08ChZI=94(+170-29)										**
$*^{228}$Ra	T : others: 21Ki08=5.2(1.7) 60Du11=5.7(0.2) 31Cu01=6.7										**
$*^{228}$Ac	J : 25Li31,67Bh01=3										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{228}$Ac^m	E : average 21Ki08=6.11(0.09) 95So11=6.28(0.03); other: 25Le.2=5.95(0.07)										**
$*^{228}$Ac^m	T : average 25Le.2=224(3) [5.95γ(t)], 222(17) [6.42γ(t)] 21Ki08=207(8)										**
$*^{228}$Ac^p	T : symmetrized from 08ChZI=119(+61-30)										**
$*^{228}$Th	T : average 14Un01=698.4(0.4) 71Jo14=698.77(0.32) 56Ki16=697.6(0.7)										**
$*^{228}$Pa	T : average 21Km01=19.5(0.4) 51Me10=22(1); other: 64Ge08=29(1)										**
$*^{228}$U	D : %ε from 61Ru05<5										**
$*^{228}$Np	D : %β^+,%α: from β^+/α=1.5(0.4) in 94Kr13; %β^+SF from %β^+SF/%ε=0.020(0.009) in 94Kr13 and %ε=60(6)										**
$*^{228}$Np	T : average 94Kr13=61.4(1.4) 78SoZZ=52(8) 66Ku13=60(5); other: 03Ni10=56(+45-17)										**
$*^{228}$Pu	T : symmetrized from 03Ni10=1.1(+2.0-0.5)										**
^{229}At	44890#	400#			1# s	>300ns	$1/2^+$#	25	10Al24	I	β^- ?;β^-n ?	
^{229}Rn	39362	13			11.9 s	0.8	$5/2^+*$	25	23Po.1	T	β^-=100	*
^{229}Fr	35668	5			50.2 s	0.4	$(1/2^+)*$	25	92Bo05	T	β^-=100	*
^{229}Ra	32562	15			4.0 m	0.2	$5/2^+*$	25			β^-=100	*
^{229}Ac	30690	12			62.7 m	0.5	$3/2^+*$	25	73Ch24	T	β^-=100	*
^{229}Th	29586.1	1.4			7.907 ky	0.016	$5/2^+*$	25	18Es07	T	α=100	*
^{229}Th^m	29586.1	1.4	0.0084	0.0000	7 μs	1	$3/2^+*$	25			IT=100	*
^{229}Pa	29896.1	2.7			1.54 d	0.04	$5/2^+$	25	21Km01	T	ε=?;α=0.49 5	*
^{229}Pa^m	29908.3	2.7	12.211	0.025	420 ns	30	$3/2^-$	25			IT=100	
^{229}U	31218	6			57.8 m	0.5	$3/2^+$	25	15Ah04	T	$\beta^+\approx$80;$\alpha\approx$20	
^{229}Np	33780	80			3.91 m	0.11	$5/2^+$#	25	04Sa05	TD	α=68 11;β^+ ?	*
^{229}Np^p	33830#	90#	50#	50#			$5/2^-$#					
^{229}Pu	37390	60			89 s	10	$3/2^+$#	25	10Kh06	TD	$\alpha\approx$50 20;β^+ ?;SF<7	*
^{229}Am	42180	110			1.8 s	1.5	$5/2^-$#	25			α=100;β^+ ?	*
^{229}Am^p	42560#	230#	380#	200#								
$*^{229}$Rn	T : average 23Po.1=11.8(1.1) 09Ne03=12.0(+1.2-1.3)										**
$*^{229}$Rn	J : 83Ah03=5/2										**
$*^{229}$Fr	J : 14Bu06=1/2										**
$*^{229}$Ra	J : 18Ly01,83Ah03=5/2										**
$*^{229}$Ac	J : 25Li31,19Ve07=3/2										**
$*^{229}$Th	T : average 18Es07=7.825(0.044) (unc=0.087 at 2σ) 14Va04=7.917(0.024) 11Ki16=7.932(0.028) (unc=0.055 at 2σ) 89Go19=7.880(0.060)										**
$*^{229}$Th	T : (unc=0.120 at 2σ); other: 50Ha52=7.340(0.080)										**
$*^{229}$Th	J : 25Zi04,18Th02,64E_γ01,64To02=5/2										**
$*^{229}$Th^m	T : neutral atoms: 17Se01=7(1); others: 25On01=7.9 19Sh38=10(8); ionized atoms: Th-dopped,LiSrAlF6: 24El03=394(9,stat)(14,syst) s;										**
$*^{229}$Th^m	T : 25Te04=397.5(2.0) s [γ(t)], 299(49) [growth(t)] Th-dopped,CaF2: 24Ti04=437(10) s 24Hi06=447(16,stat)(20,syst) s 24Zh44=444.3(2.8) s										**
$*^{229}$Th^m	T : 25Sc06=428(13) s,438(6),164(6) s at ^{100}K,^{150}K,^{297}K Th-implanted,MgF2: 23Kr02=670(102) s; Th(3^+)-trapped,vacuum: 24Ya11=1400(+600-300) s										**
$*^{229}$Th^m	E : rounded from 0.008355734(0.000000011) eV, deduced as an average from 24Ti04=148.3821(0.0005)nm 24El03=148.38219(0.00004,stat)(0.00020,syst)nm;										**
$*^{229}$Th^m	E : others(direct photon detection): 24Zh44,25Hi02=8.3557335540 21(0.000000000008,stat) eV [150 K] 25Hi02=8.355733552329(0.000000000012,stat) [229										**
$*^{229}$Th^m	E : K] 8.355733550811(0.000000000008,stat) eV [293 K] 25Pi03=148.491(0.019)(0.150,syst)nm,148.402(0.086,stat)(0.150,syst)										**
$*^{229}$Th^m	E : 24Hi06=148.18(0.04,stat)(0.20,syst)nm 23Kr02=148.71(0.06,stat)(0.41,syst)nm 25Sc06=8.355735(0.000006) eV 19Se13=8.28(0.03,stat)(0.01,syst) eV										**
$*^{229}$Th^m	E : 25On01=8.6(0.2,stat)(0.1,syst) eV 20Si22=8.10(0.17) eV 19Ya18=8.30(0.92) eV others(direct ce detection): 19Se13=8.28(0.03,stat)(0.01,syst) eV										**
$*^{229}$Th^m	E : 25On01=8.6(0.2,stat)(0.1,syst) eV others(indirect microcallorimetry): 20Si22=8.10(0.17) eV 19Ya18=8.30(0.92) eV										**
$*^{229}$Th^m	J : 18Th02=3/2										**
$*^{229}$Pa	T : average 21Km01=1.5(0.1) 87Ah05=1.50(0.05) 18Gr09=1.67(0.08), determined by NUBASE as unweighted average from 8 individual values										**
$*^{229}$Pa	D : %α average 87Ah05=0.48(0.05) 18Gr09=0.53(0.10)										**
$*^{229}$Np	T : average 04Sa05,00Sa52,02As08=4.0(0.4) 90HaZY=3.85(0.14) 68Ha14=4.0(0.2)										**
$*^{229}$Pu	T : average 10Kh06=67(+41-19) 02CaZU=90(10); other: 01Ca.B=90(+71-27)										**
$*^{229}$Am	T : symmetrized from 15De22=0.9(+2.1-0.7); also 15De22=6.4(+14.9-5.4)										**
^{230}Rn	42170#	200#			24# s	>300ns	0^+		10Al24	I	β^- ?	
^{230}Fr	39487	7			19.1 s	0.4	2^+#	23	25Ba22	TD	β^-=100;β^-SF<3.3e-6	*
^{230}Ra	34516	10			93 m	2	0^+	23	78Gi07	T	β^-=100	
^{230}Ac	33838	16			122 s	3	(1^+)	23	78Gi07	T	β^-=100;β^-SF=1.2e-6 4	*
^{230}Th	30861.3	0.5			75.584 ky	0.055	0^+	23	13Ch53	T	IS=0.02 2;α=100;SF<4e-12; 24Ne=5.8e-11 13	*
^{230}Pa	32172.4	2.9			17.4 d	0.5	2^-	23			β^+=92.3 7;β^-=7.7 7;α=0.0032 1	*
^{230}U	31614	4			20.23 d	0.02	0^+	23	12Po12	T	α=100;22Ne=4.8e-12 20	
^{230}Np	35240	50			4.6 m	0.3	4^+#	23	68Ha14	TD	α=?;β^+ ?	
^{230}Pu	36929	14			105 s	10	0^+	23	18Mi11	T	α=100;β^+ ?	*
^{230}Am	42940#	230#			40 s	9	1^-#	23	17Wi13	TD	β^+=100;β^+SF>30	*
^{230}Cm	46420#	300#			1# s		0^+				β^+ ?;α ?	
$*^{230}$Fr	T : average 25Ba22=19.1(0.5) 79Ca16=19(1)										**
$*^{230}$Ac	D : %β^-SF from 25Ba22<4.2e-8										**
$*^{230}$Th	T : from 13Ch53=75.584(0.055), supersedes 00Ch56=75.7(0.1); others: 80Me10=75.4(0.3) 62At01=76.1(1.4) 49Hy03=80(3) 31So01=73(4) 30Cu02=82.3(2.5)										**
$*^{230}$Pa	T : average 49Os01=17.7(0.5) 48St42=17.0(0.5)										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)		Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{230}$Pa	D : %α average 66Ba14=0.0032(0.0001) 65Br32=0.0031(0.0005) 64Mc21=0.0043(0.0007);										**
$*^{230}$Pu	T : average 18Mi11=200(+77-43) 02CaZU,01Ca.B=102(10)										**
$*^{230}$Pu	D : %β^+ from 02CaZU<27										**
$*^{230}$Am	T : average 17Wi13=36(+15-8) 16Ka13=32(+22-9); other: 03MoZX=17(+119-17)										**
^{231}Rn	46550#	300#			2# s	>300ns	$1/2^+$#	22	10Al24	I	β^- ?	
^{231}Fr	42081	8			17.6 s	0.5	$(1/2^+)$	22	14Bu06	J	β^-=100	*
^{231}Ra	38216	11			103.9 s	1.3	$(5/2^+)*$	22	06Bo33	T	β^-=100	*
^{231}Ra^m	38282	11	66.21	0.09	$\sim$53 μs		$(1/2^+)$	22	01Fr05	T	IT=100	
^{231}Ac	35763	13			7.5 m	0.1	$1/2^+$	22	73Ch24	T	β^-=100	
^{231}Th	33814.6	0.5			25.57 h	0.08	$5/2^+$	22			β^-=100	
^{231}Pa	33424.0	1.0			32.57 ky	0.07	$3/2^-*$	22	20Je01	T	IS=100;α=100;SF<3e-10; 24Ne=13.4e-10 17;23F=9.9e-13	*
^{231}U	33805.8	1.8			4.2 d	0.1	$(5/2^+)$	22	49Os01	T	ε=?;α=0.004 1	*
^{231}Np	35630	50			48.8 m	0.2	$5/2^-$#	22	73We08	T	β^+=?;$\alpha\approx$2	*
^{231}Pu	38309	22			8.6 m	0.5	$(3/2^+)$	22	99La14	DT	β^+ ?;α=13 5	*
^{231}Am	42390#	90#			140 s	90	$5/2^-$#		26Wa.1	TD	β^+ ?;α=50 40	*
^{231}Am^p	42530#	100#	140#	40#			$3/2^-$#					
^{231}Cm	47320#	300#			20# s		$3/2^+$#				β^+ ?;α ?	
^{231}Bk	53370#	200#			10# s		$3/2^-$#				α ?;β^+ ?	
$*^{231}$Fr	T : average 01Fr05=17.7(0.6) 85Hi02=17.5(0.8)										**
$*^{231}$Ra	J : 18Ly01=(5/2)										**
$*^{231}$Ra	T : average 06Bo33=104.1(1.4) 85Hi02=103(3)										**
$*^{231}$Pa	T : average 20Je01=32.57(0.13) 69Ro33=32.765(0.110) 68Br04=32.340(0.115) 61Ki05=32.647(0.260); other: 49Va02=34.3(0.3)										**
$*^{231}$Pa	J : 61Ax01,60 Ky01,61Ri06,34Sc04=3/2										**
$*^{231}$U	J : favored α decay from ^{235}Pu [J^π=(5/2$^+$)] and log ft$\sim$6 in ^{231}Np (J^π=5/2$^-$, π5/2[523]) β^+ decay; J^π=(5/2$^-$) in ENSDF2022 based on										**
$*^{231}$U	J : ν5/2[752] Nilsson assignment is unlikely										**
$*^{231}$U	D : %α from 94Li12										**
$*^{231}$Np	J : favored α decay from ^{235}Am [J^π=5/2$^-$#]										**
$*^{231}$Pu	D : %α symmetrized from 99La14=10(+7-3)										**
$*^{231}$Am	T : symmetrized from 26Wa.1=75(+137-30) s										**
$*^{231}$Am	D : %α symmetrized from 26Wa.1=17(+65-15)										**
^{232}Fr	46073	14			5.5 s	0.6	(5)	04	04Pe17	J	β^-=100;β^-SF<1.3e-5	
^{232}Ra	40497	9			4.0 m	0.3	0^+	04	08ChZI	T	β^-=100	*
^{232}Ac	39154	13			1.98 m	0.08	(1^+)	04	25Ba22	D	β^-=100;β^-SF<2.7e-7	
^{232}Th	35448.1	0.9			14.0 Gy	0.1	0^+	04	95Bo18	D	IS=99.98 2;α=100;SF=1.1e-9 4; 24Ne$^+$26Ne<2.78e-10;2β^- ?	*
^{232}Pa	35942	7			1.32 d	0.02	(2^-)	04			β^-=100;ε ?	
^{232}U	34605.2	0.4			68.9 y	0.4	0^+	04			α=100;24Ne=8.9e-10 7; SF=2.7e-12 6;28Mg<5e-12	*
^{232}Np	37360#	100#			14.7 m	0.3	5^-	04			$\beta^+\approx$100;α ?	*
^{232}Pu	38358	16			33.7 m	0.5	0^+	04			ε=?;α=10 6	*
^{232}Am	43340#	220#			1.31 m	0.04	1^-#	04	90Ha28	DT	$\beta^+\approx$100;α ?;β^+SF=0.069 10	
^{232}Cm	46270#	200#			10# s		0^+				β^+ ?;α ?	
^{232}Bk	53790#	300#			10# s						α ?;β^+ ?	
$*^{232}$Fr	D : %β^-SF from 25Ba22<1.3e-5										**
$*^{232}$Ra	T : average 08ChZI=4.00(0.33) 86Gi08=4.2(0.8)										**
$*^{232}$Th	D : %^{24}Ne^{+26}Ne from 95Bo18; %SF from 00Ho27										**
$*^{232}$Np	J : favored α decay from ^{236}Am (J^π=5$^-$)										**
$*^{232}$Pu	T : average 00La25=33.1(0.8) 73Ja06=34.1(0.7)										**
$*^{232}$Pu	D : %α from 73Ja06<20										**
^{233}Fr	48920	20			900 ms	100	$1/2^+$#	20			β^-=100;β^-n ?	
^{233}Ra	44334	9			30 s	5	$1/2^+$#	20			β^-=100	
^{233}Ac	41308	13			143 s	10	$(1/2^+)$	20			β^-=100	
^{233}Th	38733.0	0.9			21.83 m	0.04	$1/2^+$	20			β^-=100	
^{233}Th^m	38739.1	0.9	6.06	0.02	27# s	1#	$7/2^-$#				IT ?;β^- ?	*
^{233}Pa	37488.6	0.8			26.973 d	0.013	$3/2^-*$	20	26Bo.1	T	β^-=100	*
^{233}U	36920.0	0.9			159.19 ky	0.15	$5/2^+*$	20			α=100;SF<6e-11;24Ne=7.2e-11 9; 28Mg<1.3e-13	*
^{233}Np	37950	50			36.2 m	0.1	$5/2^+$#	20	50Ma14	D	$\beta^+\approx$100;$\alpha\approx$0.0007	*
^{233}Np^p	38000#	60#	50#	30#			$(5/2^-)$					
^{233}Pu	40060	50			20.9 m	0.4	$5/2^+$#	20			β^+=?;α=0.12 5	
^{233}Am	43160#	90#			3.2 m	0.8	$5/2^-$#	20	00Sa52	TD	β^+ ?;α=4.5 9	*
^{233}Cm	47290	60			27 s	10	$3/2^+$#	20	10Kh06	TD	β^+ ?;α=20 10	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{233}Bk	52890#	230#				40 s 30	3/2$^-$#	20	15De22	TD	$\alpha\approx82;\beta^+$?	*
*^{233}Th^m	J : from the expected conf=ν7/2[743]											**
*^{233}Th^m	T : from B(E3:7/2$^-$ → 1/2$^+$)(^{233}Th^m)= B(E3: 1/2$^+$ → 7/2$^-$)(^{235}U^m)/4=0.01363(0.00028) (W.u.), determined using T$_{1/2}$(^{235}U^m)=26.2(0.2) m,											**
*^{233}Th^m	T : E_γ(^{235}U^m)=0.076737(0.000018) keV and α_T(^{235}U^m)=2.79(0.05)e20, and E_γ(^{233}Th^m)=6.06(0.02) keV and α_T(^{233}Th^m)=3.36(0.09)e9											**
*^{233}Pa	J : 61Ma42=3/2											**
*^{233}Pa	T : average 26Bo.1=26.95(0.03) 00Us01=27.02(0.03) 99Po33=26.9(0.1) 86Jo08=26.967(0.020, uncertainty increased from 0.002 d by NUBASE)											**
*^{233}Pa	T : 57Wr37=26.95(0.06) 56Mc60=27.0(0.1); others: 02Ab03=27.46(1.80) 41Gr03=27.4(0.4)											**
*^{233}U	J : 68Ma42,60Ro27,58Da21,57Do40,56Ka53,56Zi05,55Ko36,54Va01=5/2											**
*^{233}Np	D : %α observed in 50Ma14 with β^+/α=1.5e5											**
*^{233}Am	D : %α combining 10Kh06<6 and 00Sa52>3											**
*^{233}Cm	T : symmetrized from 10Kh06=23(+13-6)											**
*^{233}Bk	T : symmetrized from 15De22=21(+48-17)											**
^{234}Fr	53130#	200#				100# ms					β^- ?;β^-n ?	
^{234}Ra	46931	8				30 s 10	0$^+$	23	92Bo44	T	β^-=100;β^-SF ?	
^{234}Ac	44841	14				44.9 s 1.9	1$^+$#	23	08ChZI	T	β^-=100;β^-SF<4.9e-4	*
^{234}Ac^m	44980	30	140	30		> 93 s			08ChZI	TE	β^- ?;IT ?	
^{234}Ac^n	45460	30	620	30		180 s 70			08ChZI	TE	β^- ?;IT ?	*
^{234}Th	40613.6	2.1				24.107 d 0.012	0$^+$	23	18Pa45	T	β^-=100	*
^{234}Pa	40342.1	2.4				6.67 h 0.03	4$^+$	23			β^-=100	*
^{234}Pa^m	40418.6	2.4	76.5	0.5	IT	1.159 m 0.011	(0$^-$)	23			β^-=?;IT=0.160 14	*
^{234}U	38145.1	0.5				245.59 ky 0.12	0$^+$	23	16Va13	T	IS=0.0054 5;α=100; SF=1.64e-9 22;28Mg=1.4e-11 3; 24Ne$^+$26Ne=9e-12 7	*
^{234}U^m	39566.4	0.5	1421.28	0.05		33.5 μs 2.0	6$^-$	23	63Ha30	T	IT=100	
^{234}Np	39955	8				4.4 d 0.1	(0$^+$)	23	55Pr29	T	β^+=100	
^{234}Pu	40349	7				8.8 h 0.1	0$^+$	23	73Ja06	T	$\varepsilon\approx94;\alpha\approx6$	*
^{234}Pu^m	42450#	500#	2100#	500#		1.5 ns 0.9	0$^+$#		90Ha02	T	SF<100;IT ?	*
^{234}Am	44400#	160#				2.32 m 0.08	0$^-$#	23	90Ha02	DT	β^+=?;α=0.039 12;β^+SF=0.0066 18	*
^{234}Cm	46719	17				52 s 9	0$^+$	23	10Kh06	D	$\beta^+\approx74;\alpha\approx22$;SF$\approx4$	*
^{234}Bk	53460#	230#				20 s 5	3$^-$#	23	16Ka13	TD	$\alpha\approx50;\beta^+$?	*
*^{234}Ac	T : average 08ChZI=45(2) 86Gi08=44(7)											**
*^{234}Ac	D : %β^-SF from 25Ba22<4.9e-4											**
*^{234}Ac^n	T : symmetrized from 08ChZI=145(+95-42)											**
*^{234}Th	T : average 18Pa45=24.157(0.037) 48Kn23=24.101(0.013), quoted NUBASE uncertainties are 1σ; ENSDF2023 uses 2σ; others: 39Sa11=24.1(0.2)											**
*^{234}Th	T : 31Cu01=24.5(0.5)											**
*^{234}Pa	T : average 62Bj01=6.75(0.03) 54Zi02=6.658(0.012); Birge ratio=2.8											**
*^{234}Pa^m	D : %IT average 63Bj02=0.13(0.03) 60Fo15=0.18(0.02) 38Fe02=0.150(0.025)											**
*^{234}U	T : average 16Va13=244.90(0.67) 13Ch53=245.62(0.13,1σ), supersedes 00Ch56=245.25(0.25,1σ), 72DeYN=245.0(0.9), as recommended in 89Ho24,											**
*^{234}U	T : 72LoZL=245.8(1.3), as recommended in 89Ho24, 80Ge13=246.0(0.9),245.7(0.9), as recommended in 89Ho24.											**
*^{234}U	D : %SF=1.64(0.22)e-9, derived from T$_{1/2}$(SF)=15(2) Py in 00Ho27											**
*^{234}Pu	T : others: 52Or03=9.0(0.5) 49Pe04=8.5(1.0)											**
*^{234}Pu^m	T : from 10e-8 <T$_{1/2}$<3 in 90Ha02											**
*^{234}Am	T : other: 04Sa05=3.5(1.3)											**
*^{234}Cm	T : average 16Ka13=49(+15-9) 02CaZU,01Ca.B=51(12)											**
*^{234}Bk	T : symmetrized from 16Ka13=19(+6-4)											**
^{235}Fr	56250#	300#				10# ms	1/2$^+$#				β^- ?;β^-n ?	
^{235}Ra	51130#	200#				5# s	5/2$^+$#				β^- ?	
^{235}Ac	47357	14				62 s 4	1/2$^+$#	14	08ChZI	T	β^-=100	
^{235}Th	44018	13				7.2 m 0.1	1/2$^+$#	14			β^-=100	
^{235}Pa	42292	13				24.4 m 0.2	3/2$^-$	14	77Th04	J	β^-=100	
^{235}U	40919.0	0.4				704 My1	7/2$^-$*	14	04Sc03	T	IS=0.7204 6;α=100;SF=7e-9 2; 20Ne=8e-10 4;25Ne$\approx$8e-10; 28Mg=8e-10	*
^{235}U^m	40919.1	0.4	0.0767	0.0000		26.2 m 0.2	1/2$^+$	14	18Po07	E	IT=100	*
^{235}U^n	43320	600	2400	600		11 ms 3	11/2$^+$#	14	21Ob01	TE	SF$\approx$100;IT ?	*
^{235}Np	41043.2	0.9				396.1 d 1.2	5/2$^+$	14	70La08	T	ε=?;α=0.00260 13	*
^{235}Pu	42182	20				25.3 m 0.5	(5/2$^+$)	14			β^+=?;α=0.0028 7	
^{235}Pu^m	45180	200	3000	200		27 ns 4	3/2$^-$#	14	70Bu02	TE	SF$\approx$100;IT ?	*
^{235}Am	44630	50				10.3 m 0.6	5/2$^-$#	14	04Sa05	TD	β^+=99.60 5;α=0.40 5	
^{235}Cm	47865	30				7 m 3	5/2$^+$#	14	20Kh10	TD	β^+ ?;α=4 3	*
^{235}Bk	52720#	110#				1# m	3/2$^-$#		26Wa.1	I	β^+ ?;α ?	
^{235}Cf	58420#	300#				10# ms	3/2$^+$#				α ?;SF ?	
*^{235}U	J : 58Da21,57Bl66,56Ka53,56Hu26,55Va07=7/2											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{235}U^m$	E : rounded from 18Po07=0.076737 (0.000018) keV											**
$*^{235}U^m$	T : average 18Sh23=26.37(0.05) [26.40(0.06),26.39(0.05),26.38(0.05), 26.30(0.05) on Cu sheet], 25.97(0.06) [25.91(0.07),26.01(0.08),											**
$*^{235}U^m$	T : 25.81(0.10),25.87(0.07),26.10(0.07),25.96(0.06),26.10(0.07), 25.92(0.08) in HF/N_2 gas], 26.33(0.07) [26.25(0.09),26.35(0.08),											**
$*^{235}U^m$	T : 26.49(0.09),26.01(0.10),26.42(0.08),26.37(0.07) in O_2 gas] 15Be11=26.6(0.5) [unweighted average of 26.76(0.04) on Al-implant, 27.4(0.7) on											**
$*^{235}U^m$	T : Ti-implant, 25.46(0.04) on Ti-deposit, 26.37(0.05) on Pt-deposit, 25.7(0.2) on Ag-implant, 29.01(0.24) on NaCl-implant, 25.62(0.11) on											**
$*^{235}U^m$	T : steel-deposit] 16Ch11=25.7(0.1) 79Iz02=25.7(0.4)											**
$*^{235}U^n$	T : from 21Ob01=11(3), supersedes (reanalysis of) 07Ob02=3.6(1.8)											**
$*^{235}Np$	D : %α from 86AgZV; others: 56Ho46=0.0035(0.0004) 57Th37=0.0012(0.0001)											**
$*^{235}Pu^m$	T : average 70Bu02=30(5) 78SoZP=18(9);others: 72Ga42=30 69Me11=20											**
$*^{235}Cm$	T : symmetrized from 20Kh10=300(+250-100) s											**
$*^{235}Cm$	D : %α determined from 0<%α<8 in 20Kh10											**
^{236}Ra	53940#	300#				1# s	0^+				β^- ?;β^-n ?	
^{236}Ac	51220	40				4.5 m 3.7	3^+#	22	10Ch19	T	β^-=100	*
^{236}Th	46255	14				37.5 m 0.2	0^+	22	84Mi02	T	β^-=100	*
^{236}Pa	45334	14				9.1 m 0.1	(1^-)	22			β^-=100;β^-SF=6e-8 4	*
^{236}U	42444.9	0.4				23.42 My0.04	0^+	22	72Fl03	T	α=100;SF=9.4e-8 4	*
$^{236}U^m$	43497.4	0.7	1052.5	0.6		101 ns 4	4^-	22			IT=100	*
$^{236}U^n$	45195	10	2750	10		120.1 ns 1.7	(0^+)	22	25Re12	TDE	IT=87.0 12;SF=13.0 12	*
^{236}Np	43370	50			*	156 ky 5	(6^-)	22	81Li30	TD	ε=87.79 44;β^-=12.05 43; α=0.16 4	*
$^{236}Np^m$	43434	6	60	50	BD*	22.5 h 0.4	(1^-)	22	69Le05	TD	ε=?;β^-=49.3 10	*
$^{236}Np^p$	43615	14	240	50	AD		(3^-)					
^{236}Pu	42897.2	0.4				2.858 y 0.006	0^+	22			α=100;SF=2.40e-7 22;28Mg=2e-12; $2\beta^+$?	*
$^{236}Pu^m$	44082.6	0.4	1185.45	0.15		1.2 μs 0.3	5^-	22			IT=100	
$^{236}Pu^n$	45700#	500#	2800#	500#		32.5 ps 2.4	0^+#	22	77Me08	TDJ	SF≈100;IT ?	*
$^{236}Pu^p$	46400	400	3500	400		34 ns 8		22	69La14	TD	SF≈100;IT ?	*
^{236}Am	46040#	120#				3.67 m 0.16	5^-	22	04Sa05	D	β^+≈100;α=4.0e-3 1	*
$^{236}Am^m$	46140#	130#	100#	50#		2.9 m 0.2	(1^-)	22	05As01	TD	β^+≈100;α ?	
^{236}Cm	47850	17				6.8 m 0.8	0^+	22	10Kh06	TD	β^+ ?;α=18 2;SF ?	
^{236}Bk	53460#	300#				26 s 10	4^+#	22	17Ko02	TD	β^+≈100;α ?;β^+SF=4 2	*
^{236}Cf	57200#	280#				1# ms	0^+	22			α ?;SF ?	
$*^{236}Ac$	T : symmetrized from 10Ch19=72(+345-33) s											**
$*^{236}Th$	T : others: 73Or06=37.5(1.5) 73Ka10=36(3)											**
$*^{236}Pa$	T : average 84Mi02=9.1(0.1) 68Tr07=9.1(0.3); others: 73Ka10=9(1) 63Wo04=12.5(1.0)											**
$*^{236}Pa$	D : %β^-SF from 78Ga07, but the decay questioned in 90Ha02											**
$*^{236}U$	T : others: 52Fl20=23.91(0.18) 51Ja09=24.5(0.7)											**
$*^{236}U$	D : %SF from $T_{1/2}$(SF)=24.9(1.1)Py, average 83Be66=27(4) 81Vo02=24.3(1.3) 71Co35=27(3) 49JaZZ=20(16)											**
$*^{236}U^m$	T : average 80Bu13=103(6) 79McZP=97(6) 73Br05=125(20)											**
$*^{236}U^n$	D : from IT/SF=6.7(0.7), average 25Re12=6.5(0.8) 89Sc30=8(3) 76An11=7(2)											**
$*^{236}U^n$	T : average 25Re12=131(31),123(30),119(15) 89Ma57,90Ma59=121(2) 89Sc30=125(30) 82Go02=137(18) 78Gu02,80Gu20=115(5) 77Bo09=120(15) 75Ch09=116(7)											**
$*^{236}U^n$	T : 72Pe01=130(40) 71Br38=130(15) 70Wo06=105(20) 69La14=110(50); others (outliers): 71Bo61=80(20) 71Be62=70(30) 70Re05=70(14) 70El03=66.6(8.7)											**
$*^{236}U^n$	T : 20Ba53=66(3),68(6); ENSDF2022=67(3), dominated by 20Ba53, not trusted											**
$*^{236}U^n$	E : from 89Sc30; other: 25Re12=2814(33)											**
$*^{236}Np$	TD : from $T_{1/2}(\beta^-)$=1.295(0.020) My [average 1.34(0.15), 1.29(0.03), 1.32(0.09), 1.69(0.30), 1.29(0.03) and 1.31(0.08) My in 81Li30], $T_{1/2}(\beta^+)$=											**
$*^{236}Np$	TD : 0.177(0.007) My [average 0.175(0.010) and 0.179(0.010) My in 81Li30] and $T_{1/2}(\alpha)$=95(25) My [average 94(35) and 96(35) My in in 81Li30]											**
$*^{236}Np^m$	D : %β^- average 69Le05=50(5),47(8) 59Gi58=49(1) 56Gr11=57(5)											**
$*^{236}Pu$	T : average 84Na30=2.866(0.009) 57Ho66=2.851(0.008); other: 49Ja01=2.7(0.3)											**
$*^{236}Pu$	D : from $T_{1/2}$(SF)=1.19(0.11)Gy, average 95Hu21=1.13(0.13)Gy 90Og01=1.36(0.20)Gy; others: 88SeZY=2.09(0.06)Gy 52Gh27=3.5(1.0 Gy); %^{28}Mg from 90Og01											**
$*^{236}Pu^n$	T : average 77Me08=37(4),30(3); other: 74MeYP=40(15)											**
$*^{236}Pu^p$	E : from 73Br38											**
$*^{236}Am$	T : average 05As01=3.6(0.2) 98Ts02=4.4(0.8) 89HaZO=3.73(0.28)											**
$*^{236}Bk$	T : symmetrized from 17Ko02=22(+13-6); other: 20Po07∼19											**
^{237}Ra	58350#	400#				100# ms	$7/2^+$#				β^- ?	
^{237}Ac	54020#	200#				23# s	$1/2^+$#				β^- ?	
^{237}Th	49955	16				4.8 m 0.5	$5/2^+$#	06			β^-=100	
^{237}Pa	47536	12				8.7 m 0.2	$1/2^+$	06	77Th04	J	β^-=100	
^{237}U	45390.5	0.6				6.752 d 0.002	$1/2^+$	06			β^-=100	
$^{237}U^m$	45664.5	1.2	274.0	1.0		155 ns 6	$7/2^-$	06			IT=100	*
^{237}Np	44870.5	0.4				2.144 My0.007	$5/2^+*$	06	89Pr.A	D	α=100;SF<2e-10;30Mg<4e-12	*
$^{237}Np^m$	45815.7	0.4	945.20	0.10		710 ns 40	$13/2^-$	06	90St29	JED	IT=100	*
$^{237}Np^n$	47620	240	2754	240		44 ns 5		06	77Mi09	TDE	SF≈100;IT ?	*
^{237}Pu	45090.7	1.3				45.64 d 0.04	$7/2^-$	06			ε=99.9958 4;α=0.0042 4	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{237}Pu^m	45236.2 1.3	145.543 0.008	180 ms 20	$1/2^+$	06		IT=100	
^{237}Pu^n	47390 200	2300 200	97 ns 4	$1/2^+$#	06	82Ra04 T	SF≈100;IT ?	*
^{237}Pu^p	47690 250	2600 250	1.07 μs 0.06	$11/2^+$#	06		SF≈100;IT ?	*
^{237}Am	46570# 60#		73.6 m 0.8	$5/2^-$	06		β^+=99.975 3;α=0.025 3	
^{237}Am^m	48670# 210#	2100 200	5 ns 2	$7/2^+$#	06	70Po01 T	SF≈100;IT ?	*
^{237}Cm	49250 70		5# m	$5/2^+$#	06	20Kh10 D	β^+ ?;α=15 1	
^{237}Cm^p	49300 70	50.0 1.0		$7/2^-$#		20Kh10 E		*
^{237}Bk	53080# 220#		2# m	$3/2^-$#			β^+ ?;α ?	
^{237}Cf	57940 80		0.8 s 0.2	$5/2^+$#	06	10Kh06 TD	α=70 10;SF=30 10	*
^{237}Es	64300# 400#		10# ms	$3/2^-$#			α ?;SF ?;β^+ ?	
*^{237}U^m	J : E1 γ to $5/2^+$							**
*^{237}Np	D : also cluster (Z=10-14) emission 92Mo03<1.8e-12%							**
*^{237}Np	J : 24Ka23,55Bo56,54Bl73,48To08=5/2							**
*^{237}Np^m	J : multiple decay branches in 90St29 agree with J=11/2,13/2$^-$, but the absence of γ rays to J^π=7/2$^-$ and 9/2$^+$ argues against J=11/2							**
*^{237}Np^n	T : average 77Mi09=45(5) 73Wo03=40(12)							**
*^{237}Np^n	E : average 77Mi09=2850(400) 73Wo03=2700(300)							**
*^{237}Pu^n	T : average 82Ra04=85(7) 79Gu03=77(16) 74Ba82=110(9) 72Vi10=130(20) 71Te07=114(12) 71Br39=100(50),120(50) 71Ru03=88(35) 70Bu02=120(50)							**
*^{237}Pu^n	T : 69Me11,71Re11=60(20) 69VaZX=120(30); others: 70Po01=60 72Ga42=70							**
*^{237}Pu^n	E : from 73Br38							**
*^{237}Pu^p	T : average 79Gu03=1.05(0.40) 74Ba82=1.31(0.26) 72Vi10=1.0(0.2) 71Te07=0.95(0.30) 71Ru03=1.12(0.08) 70Po01=0.90(0.15)							**
*^{237}Pu^p	E : 73Va16=300(150) keV above ^{237}Pu^n							**
*^{237}Am^m	E : from 73Br38=2100(200) based on 70Po01 data							**
*^{237}Cm^p	E : 50(1) keV E1 γ above the ^{237}Cm gs in 20Kh10							**
*^{237}Cf	T : other (discrepant): 95La09=2.1(0.3)							**
^{238}Ac	58100# 200#		50# ms				β^- ?	
^{238}Th	52440# 220#		9.4 m 2.0	0^+	14		β^-=100	
^{238}Pa	50894 16		2.28 m 0.09	3^-#	14	85Ba57 D	β^-=100;β^-SF<2.6e-6	
^{238}U	47308.370 0.015		4.469 Gy 0.005	0^+	14	18Pa45 T	IS=99.2742 10;α=100; SF=5.45e-5 7;2β^-=2.2e-10 7	*
^{238}U^m	49866.0 0.5	2557.6 0.5	280 ns 6	0^+	14	92St05 T	IT=97.4 4;SF=2.6 4	*
^{238}Np	47453.5 0.5		2.099 d 0.002	2^+*	14	24Ta18 T	β^-=100	*
^{238}Np^m	49750# 200#	2300# 200# EU	112 ns 39		14	70Vi05 T	SF≈100;IT ?	*
^{238}Pu	46163.3 0.5		87.7 y 0.1	0^+	14	21Cr02 D	α=100;SF=1.85e-7 3; 32Si≈1.4e-14;28Mg+30Mg≈6e-15	*
^{238}Pu^m	48560 200	2400 200	0.60 ns 0.14	0^+#	14	73Li01 TE	SF≈100;IT ?	*
^{238}Pu^n	49800 180	3640 180	6.0 ns 1.2		14	73Li01 TE	SF≈100;IT ?	*
^{238}Am	48420 60		98 m 3	1^+	14	72Ah04 TD	β^+=100;α=1.0e-4 4	
^{238}Am^m	50920# 210#	2500# 200#	35 μs 4		14	70Po01 T	SF≈100;IT ?	*
^{238}Cm	49445 12		2.2 h 0.4	0^+	14		ε ?;α=3.84 18;SF=0.048 2	
^{238}Bk	54160# 260#		2.40 m 0.08	1#	14	94Kr03 TD	β^+≈100;α ?;β^+SF=0.048 2	*
^{238}Cf	57160# 300#		21.2 ms 1.3	0^+	14	10Kh06 DT	SF=?;α=2.5 14	*
^{238}Es	64500# 400#		50# ms				α ?;SF ?;β^+ ?	
*^{238}U	T : average 18Pa45=4.456(0.021) 04Sc03=4.468(0.005), adjusted from 71Ja07=4.4683(0.0024), 4.495(0.018), adjusted from 49Ki26=4.490(0.005); others							**
*^{238}U	T : (non-enriched samples): 4.457(0.004), adjusted in 04Sc03 from 59St45=4.460(0.005), 4.51(0.02), adjusted in 04Sc03 from 55Ko13=4.507(0.009),							**
*^{238}U	T : 4.46(0.03), adjusted in 04Sc03 from 35Sc.A=4.42(0.03), 57Le21=4.56(0.03) 41Cu.A=4.514(0.009) 32Ko02=4.52; other: (evaluation):							**
*^{238}U	T : 22Vi.1,16Vi01=4.4683(0.0096), unc. is 2σ; 2β^-: 91Tu02=2.0(+0.6-0.5) Zy							**
*^{238}U	D : %2β^-=2.2(0.7)e-10, derived from $T_{1/2}$(2ν-$\beta\beta$)=2.0(0.6) Zy in 91Tu02; %SF=5.45(0.07)e-5, derived from $T_{1/2}$(SF)=8.2(0.1) Py in 00Ho27							**
*^{238}U^m	T : average 92St05=298(18) 91Ku23=274(10) 89Ma54=267(13) 83Dm04=290(30) 77VoZU=300(32) 74WoZW=270(40),295(15) 69La14=300(100); others:							**
*^{238}U^m	T : 85Dr01=155(33) 83Dr14=146(22) 82Go02=211(60) 77ArZZ=125(35) 75Ru03=191(44) 71Ta17=200(50) 70Po01=200(70) 70Wo06=195(30) 70Re05=110(30)							**
*^{238}U^m	E : 84Ka10=1512.7(0.5) keV γ to the 2$^+$ lvl at 44.916(0.013) keV							**
*^{238}U^m	D : %IT,%SF from 15Br06, using σ(SF)/σ(γ+ce)=0.0262(0.0041)							**
*^{238}Np	T : unweighted average 24Ta18=2.0963(0.0021) 06Re09=2.1024(0.0005) 90Ch35=2.0980(0.0003); others: 66Qa01=2.117(0.002) 50Fr53=2.10(0.01); Birge							**
*^{238}Np	T : ratio=5.42							**
*^{238}Np	J : 58Al92=2							**
*^{238}Np^m	I : not observed in 74Bo02, 70Po01, 69La14							**
*^{238}Pu	D : from %SF from $T_{1/2}$(SF)=47.45(0.83) Gy in 21Cr02							**
*^{238}Pu^m	T : average 73Li01=0.5(0.2) 74MeYP=0.7(0.2)							**
*^{238}Pu^m	E : other: 73Br38-2400(200)							**
*^{238}Pu^n	T : average 70Bu02,71Br39=6.5(1.5) 73Li01=5.0(2.0)							**
*^{238}Pu^n	E : other: 73Br38=3400(400)							**
*^{238}Am^m	T : from 70Po01, but uncertainty as quoted in 73Br38; other: 67Bo23=60(15)							**
*^{238}Bk	D : %β^+SF other: 24Kh02<0.16							**
*^{238}Cf	D : %α from 10Kh06<5							**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{238}$Cf	T : average 0Kh06=22(5) 01Og08=21.1(+1.9-1.7) 95La09=21(2)											**
^{239}Ac	61170#	200#				10# ms	$1/2^+$#				β^- ?	
^{239}Th	56500#	300#				1# m	$7/2^+$#				β^- ?	
^{239}Pa	53340#	200#				1.8 h 0.5	$1/2^+$#	13			β^-=100	
^{239}U	50573.31	0.17				23.45 m 0.02	$5/2^+$	13			β^-=100	
^{239}U^m	50707.11	0.17	133.7991	0.0010		780 ns 40	$1/2^+$	13	75Ya03	T	IT=100	
^{239}U^n	52273.3	2.3	1700.0	2.3		> 250 ns	$5/2^+$#		94Ob01	T	SF≈100;IT ?	*
^{239}Np	49312.0	0.8				2.356 d 0.003	$5/2^+$*	13			β^-=100	*
^{239}Pu	48588.5	0.4				24.11 ky 0.03	$1/2^+$*	13			α=100;SF=3.1e-10 6	*
^{239}Pu^m	48980.1	0.4	391.584	0.003		190.2 ns 0.2	$7/2^-$	13	22Ba06	T	IT=100	*
^{239}Pu^n	50790	200	2200	200		7.3 μs 0.3	$5/2^+$#	13	80Gu20	T	SF≈100;IT ?	*
^{239}Am	49389.9	1.8				11.9 h 0.1	$5/2^-$	13	72Po04	TD	ε=99.990 1;α=0.010 1	*
^{239}Am^m	51890	200	2500	200		163 ns 9	$(7/2^+)$	13	85Ra28	TJ	SF≈100;IT ?	*
^{239}Cm	51150	150				2.5 h 0.4	$7/2^-$#	13	02Sh.C	TD	β^+≈100;α=6.2e-3 14	
^{239}Cm^p	51388	21	240	150		> 100# ns	$1/2^+$				IT ?;β^+ ?	
^{239}Bk	54250#	210#				100# s	$(7/2^+)$	13	10An08	TD	β^+≈100;α ?;SF ?	*
^{239}Bk^m	54290#	210#	41	11	AD	~ 30# μs	$(3/2^-)$		89Ha27	J	IT ?;β^+ ?	*
^{239}Cf	58050	70				28 s 2	$5/2^+$#	13	20Kh10	TD	α=65 3;β^+ ?	*
^{239}Es	63650#	230#				1# s	$3/2^-$#				α ?;β^+ ?;SF ?	
$*^{239}$U^n	E : from 02Th.1											**
$*^{239}$U^n	J : from 98Th01											**
$*^{239}$Np	J : 24Ka23,58Hu11=5/2											**
$*^{239}$Pu	J : 58Ab18,58Hu70,55Bo56,55Ka40,55Ko36,54Bl72,54Va06=1/2											**
$*^{239}$Pu^m	T : other: 55En07=193(4)											**
$*^{239}$Pu^n	T : average 80Gu20=6.5(0.4) 79Ba02=11(2) 77GoZH=7.5(1.0) 73Na35=9(1) 72Wo07=8.1(0.8) 70Po01=8(1)											**
$*^{239}$Pu^n	E : from 73Br38											**
$*^{239}$Am	J : favored α decay to $J^\pi=5/2^-$ level at 49.10 keV in ^{235}Np											**
$*^{239}$Am^m	T : average 85Ra28=163(16) 72Br35=163(12) 69La14=160(40); others: 70Vi05=280(90)											**
$*^{239}$Am^m	E : from 73Br38; other: 69La14=2900(100)											**
$*^{239}$Bk	J : from 89Ha27											**
$*^{239}$Bk^m	T : estimated from B(M2)[$7/2^+\rightarrow3/2^-$]=0.019(0.05) W.u in ^{251}Bk^m											**
$*^{239}$Cf	T : other: 81Mu12=39(+37-12)											**
^{240}Th	59230#	400#				10# s	0^+				β^- ?	
^{240}Pa	57010#	200#				20# s	3^+#				β^- ?	
^{240}U	52703.9	1.1				14.10 h 0.09	0^+	24	81Hs02	T	β^-=100	*
^{240}Np	52313	17			*	61.9 m 0.2	(5^+)	24	82Pa23	T	β^-=100	*
^{240}Np^m	52329	13	17	14	IT*	7.36 m 0.14	(1^+)	24	81Hs02	D	β^-=99.88 1;IT=0.12 1	*
^{240}Pu	50125.7	0.4				6.563 ky 0.004	0^+	24	FGK243	T	α=100;SF=5.70e-6 5; 34Si<1.3e-11	*
^{240}Pu^m	51434.4	0.4	1308.74	0.05		165 ns 10	5^-	24	67Wa27	T	IT=100	*
^{240}Pu^n	52380	200	2250	200		3.66 ns 0.10	0^+#	24	01Th16	E	SF≈100;IT ?	*
^{240}Am	51509	14				50.85 h 0.23	(3^-)	24	70Go42	D	β^+≈100;α≈1.9e-4	*
^{240}Am^m	54110	200	2600	200		931 μs 32		24	79Be06	T	SF≈100;IT ?	*
^{240}Cm	51720.0	0.7				30.4 d 3.7	0^+	24	08Qi03	T	α≈100;ε ?;SF=3.9e-6 8	*
^{240}Cm^m	53920#	400#	2200#	400#		10 ps 3	0^+#	24	76Sl01	TD	SF≈100;IT ?	
^{240}Cm^n	55020#	400#	3300#	400#		55 ns 12		24	76Sl01	TD	SF≈100;IT ?	
^{240}Bk	55560#	230#				4.2 m 0.8	7^-#	24	83Ga05	TD	β^+ ?;α ?;β^+SF=0.0020 13	*
^{240}Bk^p	55860#	250#	300#	100#			*am*					
^{240}Cf	57986	17				1.00 m 0.12	0^+	24	70Si19	T	α=98.5 2;SF=1.5 2;β^+ ?	*
^{240}Es	64200#	310#				6.0 s 1.7	1#	24	17Ko02	TD	α=70 10;β^+=30 10;β^+SF=4.8 24	*
^{240}Es^p	64350#	310#	150#	50#			3^+#					
$*^{240}$U	T : average 81Hs02=14.1(0.1) 53Kn23=14.1(0.2)											**
$*^{240}$Np	T : others: 66Qa01=67(1) 60Le03=63(2)											**
$*^{240}$Np^m	T : unweighted average 81Hs02=7.22(0.02) 66Qa01=7.50(0.06); Birge ratio=4.4; other: 53Kn23=7.3(0.3)											**
$*^{240}$Pu	D : %SF from $T_{1/2}$(SF)=116.08(0.91) Gy in 21Cr02											**
$*^{240}$Pu^m	J : M1 γs to 4^- and 6^-											**
$*^{240}$Pu^n	T : average 00Pa40=3.76(0.15) 86De04=3.8(+0.6-0.4) 78Go10=3.5(0.2) 73Li01=3.0(0.5) 73Na03=2.4(0.5) 71Br39,70Bu02=3.8(0.3) 70El03,69El06=4.6(0.6)											**
$*^{240}$Pu^n	T : 69VaZX=4.4(0.8) 69Me11=7(2) 69La14=9(4)											**
$*^{240}$Pu^n	E : from 01Th16=2250(200); others: 73Br38=2400(200) 71Br39=2600(200) 70Bu02=3000(200) 73Na03=3000(+300-500)											**
$*^{240}$Am	T : average 72Ah07=50.8(0.3) 72PoZS=50.7(0.8) 66Bi03=50.9(0.7) 60Gl01=51.0(0.5); other: 14Le02=50.8 52Hi63=53 50St61=50											**
$*^{240}$Am^m	T : average 79Be06=942(38) 67Bj03=910(70) 72Wo07=900(100); other: 71Br39>50 ns											**
$*^{240}$Am^m	E : from 73Br38=2600(200); other: 74Ga41=3000(300)											**
$*^{240}$Bk	D : %β^+SF symmetrized from 83Ga05=0.0013(+18-7)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{240}$Cf	T : average 70Si19=1.06(0.15) 95La09=0.9(0.2); others: 10As.A=0.672(0.015) 95La09=0.8(+0.3-0.2)											**
$*^{240}$Cf	D : α, %SF from 10Kh06; other: $\alpha\sim9$, %SF~2 in 95La09											**
$*^{240}$Es	T : average 20Po07=4.7(+3.8-1.4) 17Ko02=6(2); other: 20Kh08=8(+6-2)											**
$*^{240}$Es	D : from $\%\beta^+$SF/$\%\beta^+$=0.16(0.06) in 17Ko02 and $\%\beta^+$=30(10)											**
^{241}Th	63730#	400#				1# s	$9/2^-$#				β^- ?	
^{241}Pa	59740#	300#				28# m	$1/2^+$#				β^- ?	
^{241}U	56240	40				4# m	>250ms	$7/2^+$#	23		β^- ?	
^{241}Np	54399	29				13.9 m	0.2	$(5/2^+)$	15		$\beta^-\approx100;\alpha$?	
^{241}Pu	52955.5	0.4				14.329 y	0.029	$5/2^+*$	15		β^-=?;α=0.00245 8;SF<2.4e-14	*
^{241}Pu^m	53117.2	0.4	161.6853	0.0009		880 ns	50	$1/2^+$	15	75Ya03 T	IT=100	
^{241}Pu^n	54960	200	2000	200		23.0 μs	0.9	$9/2^-$#	15	81Gu04 T	SF$\approx$100;IT ?	*
^{241}Pu^p	55260#	200#	2300#	200#		31 ns	4		15	81Gu04 T	SF$\approx$100;IT ?	*
^{241}Am	52933.2	0.4				432.6 y	0.6	$5/2^-*$	15		α=100;SF=3.6e-10 9	*
^{241}Am^m	55130	200	2200	200		1.0 μs	0.3	$7/2^+$#	15	73Br38 E	SF$\approx$100;IT ?	*
^{241}Cm	53700.7	1.2				32.8 d	0.2	$1/2^+$	15	74Po08 D	ε=?;α=0.98 7	*
^{241}Cm^m	55700	200	2000	200		15.3 ns	1.0	$5/2^+$#	15	71Br39 TE	SF$\approx$100;IT ?	*
^{241}Bk	55970#	180#				4.6 m	0.4	$(7/2^+)$	15		β^+=?;α ?	
^{241}Bk^m	56020#	180#	51	3	AD	27# μs	10#	$(3/2^-)$			IT ?	*
^{241}Cf	59180	70				2.35 m	0.18	$7/2^-$#	15	20Kh10 D	β^+ ?;α=15 1	*
^{241}Cf^m	59370#	110#	190#	80#		>400 ms		$1/2^+$#		24Gi.A ET	IT ?;α ?	
^{241}Es	63770#	220#				5.1 s	1.8	$3/2^-$#	15	20Kh08 TD	$\alpha\approx100;\beta^+$?	*
^{241}Es^p	63960#	240#	190#	80#				*am*				
^{241}Fm	69200#	300#				730 μs	60	$5/2^+$#	15	08Kh10 TD	SF$\approx$100;α ?;β^+ ?	*
$*^{241}$Pu	D : $\%\alpha$ from β^-/α=2.45(0.08)e-5 in 68Ah01											**
$*^{241}$Pu	J : 55Bo56,54Bl72=5/2											**
$*^{241}$Pu^n	T : average 81Gu04=20.5(2.2) 70Ga10=23(1) 70Po01=27(3)											**
$*^{241}$Pu^n	E : from 73Br38											**
$*^{241}$Pu^p	T : average 81Gu04=34(7) 69La14=30(5)											**
$*^{241}$Am	J : 68Ed01,67EaZZ,60Ma30,56Th18,53Fr01=5/2											**
$*^{241}$Am^m	T : average of 69La14=1.5(0.6) 93Ku16=0.9(0.3)											**
$*^{241}$Cm	D : $\%\alpha$ average 74Po08=1.0(0.1) 60Gl01=0.96(0.09)											**
$*^{241}$Cm^m	T : others: 74SpZS=10(1) 71Re11=25(15) 70Po01=19(8) 72Ga42=20 69Me11=20											**
$*^{241}$Cm^m	E : from 73Br38; others: 71Br39=2300(200) 72Vy07=2600(200)											**
$*^{241}$Bk^m	T : estimated from B(M2)[$7/2^+\rightarrow3/2^-$]=0.019(0.05) W.u in ^{251}Bk^m											**
$*^{241}$Cf	T : from 10As.A=141(11) s; others: 22Te01=3.8(+1.1-0.7) 70Si19=3.78(0.70)											**
$*^{241}$Es	T : symmetrized from 20Kh08=4.3(+2.4-1.2); others: 96Ni09=8(+6-4) 26Ku.1=0.25(+0.92-0.22)											**
$*^{241}$Fm	D : only SF observed; $\%\alpha$<14 and $\%\beta^+$<12 are estimated in 08Kh10											**
^{242}Pa	63760#	300#				25# m					β^- ?	
^{242}U	58700	90				16.8 m	0.5	0^+	21	79Ha26 T	β^-=100	
^{242}Np	57540	80			*	2.2 m	0.2	(1^+)	21	79Ha26 T	β^-=100	
^{242}Np^m	57590#	90#	50#	50#	*	5.5 m	0.1	(6^+)	21	81Fr07 T	β^-=100	
^{242}Pu	54717.3	0.6				373 ky	2	0^+	21	21Cr02 D	α=100;SF=5.51e-4 4	*
^{242}Pu^m	55809.5	0.6	1092.15	0.13		25# ms		(6^+)		FGK256 IT	IT=100	*
^{242}Pu^n	56550	160	1830	160		3.5 ns	0.6	0^+#	21	74MeYP T	SF$\approx$100;IT ?	*
^{242}Pu^p	57520#	500#	2800#	500#		28 ns			21	70Po01 T	SF$\approx$100;IT ?	*
^{242}Am	55466.9	0.4				16.021 h	0.009	1^-*	21		β^-=83.02 17;ε=16.98 17;α ?	*
^{242}Am^m	55515.5	0.4	48.603	0.009		140.7 y	1.2	5^-	21		IT=?;α=0.45 1;SF<4.7e-9	*
^{242}Am^n	57670	80	2200	80		13.9 ms	0.2	$(2^+,3^-)$#	21		SF$\approx$100;IT=?	
^{242}Cm	54803.9	0.5				162.88 d	0.08	0^+	21		α=100;SF=6.2e-6 3; 34Si=1.1e-14 4;2β^+ ?	*
^{242}Cm^m	56600#	400#	1800#	400#		40 ps	15	0^+#	21	76Sl01 T	SF$\approx$100;IT ?	
^{242}Cm^n	57600	400	2800	400		180 ns	70		21	71Re11 T	SF$\approx$100;IT ?	*
^{242}Bk	57740#	100#				7.0 m	1.3	3^+#	21	79Wi03 T	$\beta^+\approx100;\alpha$?;β^+SF<3e-5	*
^{242}Bk^m	59740#	410#	2000#	400#		9.5 ns	2.0		21	72Wo07 T	SF$\approx$100;IT ?	
^{242}Bk^n	59840#	410#	2100#	400#		600 ns	100		21	72Wo07 T	SF$\approx$100;IT ?	
^{242}Bk^p	57993	21	250#	100#				6^+#				
^{242}Cf	59386	13				3.49 m	0.15	0^+	21	70Si19 T	α=61 3;β^+ ?;SF<0.014	*
^{242}Es	64740#	260#				17.1 s	0.7	2^+#	21	24Kh02 TD	β^+=?;α=41 3;β^+SF=0.89 24	*
^{242}Es^p	65410#	270#	670#	60#	AD							
^{242}Fm	68400#	360#				800 μs	200	0^+	21	75Te01 T	SF$\approx$100;α ?	*
$*^{242}$Pu	D : %SF from $T_{1/2}$(SF)=67.66(0.37) Gy in 21Cr02											**
$*^{242}$Pu^m	ITD : direct β^- feeding from ^{242}Np^m [$K^\pi=(6^+)$] in 81Fr07 and similarity with ^{244}Cm^m											**
$*^{242}$Pu^n	E : symmetrized from 71Au06=1860(+130-180)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{242}Pu^p$	T : 70Po01=28, reevaluated from 69La14=50(30)												**
$*^{242}Am$	J : 61Ma27=1												**
$*^{242}Am$	T : average 05Ma90=16.02(0.02) 82Wi05=16.1(0.1) 69Al20=16.07(0.14) 53Ke38=16.02(0.01)												**
$*^{242}Am$	D : from β^-/ε=4.89(0.06), average 59Ho02=5.1(0.1) 69Ga17=4.8(0.1) 69Al20=4.6(0.4) 72Ga35=4.8(0.1); %α from 69Al20												**
$*^{242}Am^m$	T : average 79Ze05=141.9(1.7),139.7(1.8) 59Ba22=139.5(1.8) [by the evaluator from $T_{1/2}(\alpha)$=2.96(0.15)e4 y, corrected for the current												**
$*^{242}Am^m$	T : $T_{1/2}(^{243}Am)$=7352 y, compared to 7951 y used in 59Ba22, and %α=0.45(0.01)%]												**
$*^{242}Am^m$	D : %α from $T_{1/2}(\alpha)$=3.10(0.05)e4 y, average 79Ze05=3.12(0.05)e4 y 59Ba22=2.96(0.15)e4 y [corrected for the current $T_{1/2}(^{243}Am)$=7352 y, compared to												**
$*^{242}Am^m$	D : 7951 y used in 59Ba22]; %SF from $T_{1/2}$(SF) 00Ho27>3e12 y												**
$*^{242}Cm$	D : %^{34}Si symmetrized from 1.0(+4-3)e-14												**
$*^{242}Cm^n$	E : from 73Br38												**
$*^{242}Bk$	D : %β^+SF from 80Ga07												**
$*^{242}Cf$	T : average 70Si19=3.68(0.44) 67Si07=3.4(0.2) 67Fi04=3.2(0.5) 67Il01=3.7(0.3)												**
$*^{242}Cf$	D : %α from 11Ve03; other: 81Mu12=80(20)												**
$*^{242}Es$	T : average 24Kh02=16.9(0.8), using α(t), 10An08=17.8(1.6); others: 24Kh02=18.2(+4.5-3.0), using SF(t), 00Sh10=11(3) 96Ni09=16(+6-4)												**
$*^{242}Es$	D : %β^+SF from %β^+SF/%β^+=1.5(0.4)% in 24Kh02, others: 10An08=1.3(+1.2-0.7) 00Sh10=0.6(0.2), and %β^+=59(3); %α from 24Kh02, supersedes												**
$*^{242}Es$	D : 10An08=43(3)												**
$*^{242}Fm$	T : 08Kh10 excludes 4 μs-1 s (conflicting)												**
^{243}Pa	66870#	400#				20#	m	$1/2^+$#				β^- ?	
^{243}U	62480#	200#				16#	m	$9/2^-$#	15			β^- ?	
^{243}Np	59914	10				1.85	m 0.15	$5/2(^-$#)	13	22So18	J	β^-=100	
^{243}Pu	57752.0	2.3				4.9553	h 0.0025	$7/2^+$	13	19Le09	T	β^-=100	*
$^{243}Pu^m$	58135.6	2.3	383.64	0.25		330	ns 30	$(1/2^+)$	13	75Ya03	T	IT=100	
$^{243}Pu^n$	59550	200	1800	200		59	ns 9	$5/2^+$#	13	70Vi05	T	SF≈100;IT ?	*
^{243}Am	57176.5	0.6				7.352	ky 0.009	$5/2^-$*	13	20Ma63	T	α=100;SF=3.7e-9 9	*
$^{243}Am^m$	59180	200	2000	200		5.5	μs 0.4		13	73Br38	E	SF≈100;IT ?	*
^{243}Cm	57182.2	1.1				29.1	y 0.1	$5/2^+$*	13			α=?;ε=0.29 3;SF=5.3e-9 9	*
$^{243}Cm^m$	57269.6	1.1	87.4	0.1		1.08	μs 0.03	$1/2^+$	13	75Ya03	T	IT=100	
$^{243}Cm^n$	58680	200	1500	200		41	ns 5	$9/2^-$#	13	72Wo07	T	SF≈100;IT ?	*
$^{243}Cm^p$	57285	15	103	15	AD			$(7/2^+)$				IT ?	
^{243}Bk	58689	4			*	4.52	h 0.09	$3/2^-$	13	18Ah01	J	β^+=?;α≈0.15	*
$^{243}Bk^m$	58689	6	0	7	AD*	>460#	μs	$(7/2^+)$				IT≈100;β^+ ?	
$^{243}Bk^n$	60890#	400#	2200#	400#		5	ns		13	72Ga42	T	SF≈100;IT ?	
^{243}Cf	60991	19				10.8	m 0.3	$(1/2^+)$	13	18Ko05	T	β^+ ?;α≈14 3	*
^{243}Es	64750#	210#				22.1	s 1.4	$(3/2^-)$	13			α=61 6;β^+ ?	
$^{243}Es^m$	64760#	210#	9.40	0.14		210#	μs 60#	$(7/2^+)$		22He04	EJ	IT ?	*
^{243}Fm	69170	90				231	ms 9	$7/2^-$#	13	20Kh10	D	α=91 3;SF=9 3;β^+ ?	*
$*^{243}Pu$	T : average 19Le09=4.948(0.010) 69Ho10=4.958(0.005) 68Di09=4.955(0.003)												**
$*^{243}Pu^n$	T : average 70Vi05=58(11) 69La14=60(15)												**
$*^{243}Pu^n$	E : from 73Br38; other: 80Bj02=1700(300)												**
$*^{243}Am$	T : average 20Ma63=7342(14),7349(15) y 07Ag02=7364(23) y, deduced from $T_{1/2}(^{243}Am)$=7357(23) y and $T_{1/2}(^{241}Am)$=432.6(0.6) y, 74Po17=7380(34) y												**
$*^{243}Am$	T : 68Br22=7336.9(57.2),7390(50) y												**
$*^{243}Am^m$	T : average 73Na35=6(3) 72Wo07=5.2(0.5) 70Po01=6.5(1.0)												**
$*^{243}Am^m$	E : from 73Br38; other: 80Bj02=2300(200)												**
$*^{243}Cm$	J : 73Ab03=5/2												**
$*^{243}Cm^n$	T : average 72Wo07=42(6) 71Re11=45(20) 70Po01=38(10); others: 72Ga42,74GaZD=40 69Me11=45												**
$*^{243}Cm^n$	E : from 73Br38; other: 80Bj02=1900(300)												**
$*^{243}Bk$	T : average 56Ch77=4.5(0.3) 53Hu60=4.5(0.1) 50Th52=4.6(0.2)												**
$*^{243}Cf$	T : average 18Ko05=10.9(0.5) 67Fi04=12.5(1.0) 67Si08=10.3(0.5)												**
$*^{243}Cf$	D : %α from I(7060α)/I(7171α)≈2.5 in 67Fi04 and (β^++α)/I(7060α)=10(2) in 67Si08												**
$*^{243}Es$	T : average 19Br06=24(3) 10An08=23(3) 89Ha27=21(5) 73Es02=21(2)												**
$*^{243}Es$	D : %α from 10An08=61(6); β^+ and SF were not observed												**
$*^{243}Es^m$	T : estimated from B(M2)[7/2$^+$→3/2$^-$]=0.019(0.05) W.u in $^{251}Bk^m$; other: 25Xu07=5.0(0.5), value not trusted												**
$*^{243}Es^m$	J : from 10An08												**
$*^{243}Es^m$	E : from E_γ=219.0(0.1) keV -209.6(0.1) keV in 22He04; other: 25Xu07=83.9(0.9) keV, from E_γ=167.4(0.5)+138.4(0.5)-219.2(0.5) keV												**
$*^{243}Fm$	D : %β^+ other: 20Kh10,08Kh10<10												**
^{244}U	65220#	300#				1#	m	0^+	17	60Di03	I	β^- ?	
^{244}Np	63400#	100#				2.29	m 0.16	(7^-)	17			β^-=100	
^{244}Pu	59794.4	0.5				81.3	My 0.3	0^+	17			α=?;SF=0.123 6	
$^{244}Pu^m$	61010.4	0.7	1216.0	0.5		1.75	s 0.12	8^-	17	15Ko14	E	IT=100	
$^{244}Pu^n$	62250	280	2460	280		380	ps 80	0^+#	17	74MeYP	T	SF≈100;IT ?	*
^{244}Am	59879.5	1.1				10.01	h 0.03	(6^-)	17	19Tr05	T	β^-=100	
$^{244}Am^m$	59969.9	0.6	90.4	1.2	RQ	26.13	m 0.43	1^+	17	19Tr05	T	β^-=99.9636 13;ε=0.0364 13	
$^{244}Am^n$	61480	200	1600	200		1.07	ms 0.11		17	73Br38	E	SF≈100;IT ?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{244}Am^{p}	61680#	400#	1800#	400#	EU	∼6.5 μs		17	69SlZZ	TI	SF≈100;IT ?	
^{244}Cm	58452.2	0.4				18.11 y 0.03	0^+	17			α≈100;SF=1.37e-4 2	
^{244}Cm^{m}	59492.4	0.4	1040.181	0.011		34 ms 2	6^+	17			IT=100	
^{244}Cm^{n}	60650#	400#	2200#	400#		< 5 ps	0^+#		76Sl01	T	SF≈100;IT ?	
^{244}Cm^{p}	61450	400	3000	400		> 100 ns		17	71Br39	T	SF≈100;IT ?	*
^{244}Bk	60713	14				5.02 h 0.03	4^-	17	18Ah01	J	β^+ ?;α=0.006 3	
^{244}Bk^{m}	62210#	500#	1500#	500#		820 ns 60		17	72Wo07	T	SF≈100;IT ?	*
^{244}Bk^{p}	60850#	50#	140#	50#			*am*					
^{244}Cf	61475.8	1.5				19.5 m 0.5	0^+	17	18Ko05	TD	α=75 6;ε= ?	*
^{244}Es	65990#	250#				37 s 4	6^+#	17	02Sh02	D	β^+=?;α=5 3;β^+SF=0.011 4	*
^{244}Es^{p}	66090#	260#	100#	50#								
^{244}Fm	69000#	200#				3.12 ms 0.08	0^+	17	08Kh10	TD	SF≈100;β^+ ?;α ?	
^{244}Md	75720#	320#				0.36 s 0.14	3^+#	21	20Kh08	IDT	α≈100;β^+ ?;β^+SF<14	*
^{244}Md^{m}	75920#	350#	200#	150#		∼9 μs	7^+#		20Kh08	ITD	IT≈100;β^+ ?	*
*^{244}Pu^{n}	E : symmetrized from 71Au06=2430(+300-260)											**
*^{244}Am^{n}	T : average 72Wo07=1.1(0.2) 68Bj04=1.10(0.15) 67Fl08=0.9(0.3); other: 69Bo25=0.60(0.15)											**
*^{244}Cm^{p}	E : from 73Br38=3000(400)											**
*^{244}Bk^{m}	T : other: 72Ga42>30 ns											**
*^{244}Cf	T : average 18Ko05=19.3(1.2) 67Si08=19.4(0.6) 67Fi04=20.4(1.6)											**
*^{244}Es	D : %α symmetrized from 73Es02=4(+3-2); %β^+SF from %β^+SF/%β^+=0.012(0.004)% in 02Sh02 and %β^+=95(3)											**
*^{244}Md	T : symmetrized from 20Kh08=0.30(+0.19-0.09); other: 20Po07=0.4(+0.4-0.1), suggested in 21He15 to be associated with ^{245}Md decay											**
*^{244}Md	I : reported in both 20Po07 and 20Kh08, but 21He15 conclude that 20Po07 results are associated with ^{245}Md. Also, 20Po07 assigned this level as an											**
*^{244}Md	I : isomer. The proposed ground state in 20Po07, associated with E(α)=8.3 MeV and $T_{1/2}$∼6 s, is tentative and not trusted by NUBASE. It was											**
*^{244}Md	I : not confirmed in 20Kh08											**
*^{244}Md^{m}	D : possible %β^+∼44 in 20Kh08 is speculative											**
^{245}U	69500#	400#				10# s	$1/2^+$#	23	60Di03	I	β^- ?	
^{245}Np	66060#	200#				6# m	$5/2^+$#	23			β^- ?	
^{245}Pu	63167	13				10.57 h 0.02	$(9/2^-)$	23			β^-=100	*
^{245}Pu^{m}	63478#	13#	311#	3#		330 ns 20	$(1/2^+)$	23	07Ma82	TD	IT=100	*
^{245}Pu^{n}	65170#	200#	2000#	200#	EU	90 ns 30		23	80Bj02	T	SF≈100;IT ?	*
^{245}Am	61900.7	1.5				122.4 m 0.4	$5/2^+$	23			β^-=100	*
^{245}Am^{m}	64100#	400#	2200#	400#		640 ns 60	$7/2^+$#	23	72Wo06	T	SF≈100;IT ?	*
^{245}Cm	61004.8	0.5				8.25 ky 0.07	$7/2^+$*	23	09Ko.A	T	α=100;SF=6.0e-7 8	*
^{245}Cm^{m}	61360.8	0.5	355.96	0.09		290 ns 20	$1/2^+$	23	75Ya03	TD	IT=100	
^{245}Cm^{n}	62700	200	1700	200		13.2 ns 1.8	$5/2^+$#	23	72Wo07	T	SF≈100;IT ?	*
^{245}Bk	61812.6	1.5			*	4.96 d 0.02	$3/2^-$	23	76Ah03	TD	ε=99.88 10;α=0.12 1	*
^{245}Bk^{m}	61900#	30#	90#	30#	*	∼40# μs	$(7/2^+)$				IT ?;ε ?;α ?	*
^{245}Bk^{n}	64010#	400#	2200#	400#		2 ns 1		23	71Re11	T	SF≈100;IT ?	
^{245}Cf	63384.1	2.2				45.0 m 1.4	$1/2^+$	23			β^+=65 4;α=35 4	
^{245}Cf^{m}	63441	5	57	4		> 100# ns	$(7/2^+)$		11Lo06	E	IT=100	
^{245}Es	66310#	180#			*	1.12 m 0.06	$(3/2^-)$	23	19Br06	TD	β^+ ?;α=49 6	*
^{245}Es^{m}	66300	160	−0#	70#	*	> 37# μs	$(7/2^+)$				IT ?;β^+ ?;α ?	*
^{245}Es^{p}	66560	160	250#	70#	IT		$(7/2^-)$				IT=100	*
^{245}Es^{q}	66600#	170#	290	50	AD		$(1/2^-)$				IT=100	*
^{245}Fm	70090#	110#				5.6 s 0.7	$(1/2^+)$	23	22Te01	TD	α=?;β^+=13 6;SF<0.3	*
^{245}Md	75180#	240#			*&	0.38 s 0.10	$7/2^-$#	23	20Kh08	TD	α≈100;β^+ ?	*
^{245}Md^{m}	75280#	260#	100#	100#	*&	0.94 ms 0.22	$1/2^-$#	23	20Kh08	TD	SF≈100;α ?	*
*^{245}Pu	T : average 67Bu09=10.59(0.02) 68Da02=10.48(0.05),10.4(0.2)											**
*^{245}Pu^{m}	E : 47# keV above 264.5(0.3) keV, 5/2$^+$,5/2[522] level in 07Ma82, based on ^{244}Pu(d,p) data of 75ErZT; other: 309 keV in 77Ch27											**
*^{245}Pu^{n}	T : 80Bj02=90(30), but the origin cannot be traced; ENSDF2023 reference another review 90Bh02											**
*^{245}Am	T : average 83Po15=122.5(0.8) 68Da02=123.0(0.6) 56Bu92=124(1) 55Fi37=119(1) 55Br02=125(5)											**
*^{245}Am^{m}	T : other: 72Br35=390(70)											**
*^{245}Cm	T : average 09Ko.A=8.245(0.070) 69Me01=8.270(0.180); others (not trusted): 82Po14=8.445(0.100) 71Ma32=8.532(0.053)											**
*^{245}Cm^{n}	T : other: 71Br39=23(5)											**
*^{245}Cm^{n}	E : from 73Br38											**
*^{245}Bk	T : average 51Hu39=4.95(0.10) 56Ma32=4.98(0.02) 76Ah03=4.90(0.03)											**
*^{245}Bk^{m}	T : estimated from B(M2)[7/2$^+$→3/2$^-$]=0.019(0.05) W.u in ^{251}Bk^{m}											**
*^{245}Es	T : average 22Te01=1.25(+0.97-0.42) 19Br06=1.08(0.10) 08Ga25=0.92(+0.20-0.14) 89Ha27=1.1(0.1) 67Mi06=1.33(0.15)											**
*^{245}Es	D : %α average 19Br06=54(7) 73Es01=40(10); other: 67Mi06=17(4) 23Ni.2=54											**
*^{245}Es	J : favored α decay to ^{241}Bkm [J^π=(3/2$^-$)]											**
*^{245}Es^{m}	T : estimated from B(M2)[7/2$^+$→3/2$^-$]=0.019(0.05) W.u in ^{251}Bk^{m}											**
*^{245}Es^{m}	J : 253.2(0.3) keV,E1 from ^{245}Es^{p} [J^π=(7/2$^-$)]											**
*^{245}Es^{p}	E : 253.2(0.3) keV above ^{245}Es^{m}											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{245}Es^p$	J : favored α decay from ^{249}Md [J^π=(7/2$^-$)]											**
$*^{245}Es^q$	J : favored α decay from $^{249}Md^m$ [J^π=(1/2$^-$)]											**
$*^{245}$Fm	T : average 22Te01=5.5(0.7) 22Lo03=7.7(+5.3-2.3) 67Nu01=4.2(1.3); other: 21Sv02=5.4(0.8) superseded by same group 22Te01											**
$*^{245}$Fm	D : %β^+: symmetrized from 22Te01=11.5(+6.8-5.0); other: 20Kh10<7; %SF: 20Kh10<0.3											**
$*^{245}$Md	T : average 20Kh08=0.33(+0.15-0.08) 96Ni09=0.35(+0.23-0.16); other: 26Ku.1=0.17(+0.62-0.15)											**
$*^{245}Md^m$	T : average 20Kh08=0.9(+0.6-0.3) 96Ni09=0.90(0.25)											**
^{246}U	72570#	300#				1# s	0$^+$	22	60Di03	I	β^- ?	
^{246}Np	69980#	300#				50# s	3$^+$#				β^- ?	
^{246}Pu	65389	15				10.843 d 0.019	0$^+$	22			β^-=100	*
^{246}Am	64979#	25#				39 m 3	7$^-$	22	68Fi03	T	β^-=100	*
$^{246}Am^m$	65019	15	40#	20#		25.0 m 0.2	2$^-$	22			$\beta^-\approx$100;IT ?	*
$^{246}Am^n$	67180#	400#	2200#	400#		73 μs 10		22	72Wo07	TD	SF$\approx$100;IT ?	
^{246}Cm	62617.7	1.0				4.700 ky 0.017	0$^+$	22	07Ko01	T	α=99.97385 7;SF=0.02615 7	*
$^{246}Cm^m$	63797.4	1.0	1179.66	0.13		1.12 s 0.24	8$^-$	22	19Sh34	ETJ	IT=100	
^{246}Bk	63970	60				1.80 d 0.02	2$^-$	22	76Ah03	TJD	$\beta^+\approx$100;α ?	*
^{246}Cf	64090.6	1.1				35.7 h 0.5	0$^+$	22	51Hu39	T	$\alpha\approx$100;SF=2.44e-4 18	*
$^{246}Cf^m$	66590#	200#	2500#	200#		45 ns 10	0$^+$#	22	68Ga04	T	SF$\approx$100;IT ?	
^{246}Es	67910	20				7.5 m 0.5	6$^+$#	22	67Mi06	TD	β^+=90.1 16;α=9.9 16; β^+SF=0.006 5	*
$^{246}Es^m$	68010#	70#	100#	70#	AD	2# m	1$^+$#	22			β^+ ?;α ?	
$^{246}Es^p$	68062	20	151.9	2.0			7$^-$#					*
$^{246}Es^q$	68390#	70#	480#	70#			0$^-$,1$^-$#					*
^{246}Fm	70191	14				1.55 s 0.03	0$^+$	22	22Is05	TD	α=93.6 4;SF=6.4 4;β^+<1.3; β^+SF ?	*
^{246}Md	76050#	260#			*	0.92 s 0.16	1$^-$#	22	10An08	TD	$\alpha\approx$100;ε ?;β^+SF ?	*
$^{246}Md^m$	76150#	260#	100#	60#	AD*	4.4 s 0.8	4$^-$#	22	10An08	TD	β^+ ?;α=12 7;β^+SF>8.1	*
$*^{246}$Pu	T : average 83Po14,83Po16=10.78(0.05) 56Ho23=10.85(0.02) 55En16=11.2(0.2)											**
$*^{246}$Am	J : direct β^- feeding to $^{246}Cm^m$ (K^π=8$^-$)											**
$*^{246}$Am	T : other: 67Or02=40(7)											**
$*^{246}Am^m$	T : average 83Po14=24.7(0.7) 55En16=25.0(0.2)											**
$*^{246}$Cm	D : %SF from α/SF=3823(10), average of 69Me01=3822(10) 71Ma32=3833(32)											**
$*^{246}$Cm	T : average 07Ko01=4.706(0.040) 71Mc19=4.654(0.040) 69Me11=4.711(0.022); others (outliers): 77Po20=4.852(0.076) 61Ca01=5.48(0.17)											**
$*^{246}$Bk	T : other: 66Or01=1.83(0.15)											**
$*^{246}$Cf	D : %SF from $T_{1/2}$(SF)=1.67(0.12)ky , average of 68Sk01=2.0(0.2)ky 63Fr04=1.34(0.16)ky 53Hu85=2.1(0.3)ky											**
$*^{246}$Es	T : average 01Sh09=6.0(1.2) 89Ha27=8.2(3.6) 67Mi06=7.7(0.5)											**
$*^{246}$Es	D : %α,%β^+ from α/β^+=0.11(0.02) in 67Mi06; %β^+SF from %β^+SF/%β^+=0.0037(+0.0085-0.0030)% in 01Sh09 and %β^+=90.1(1.6); other: 80Ga07$\sim$0.003											**
$*^{246}Es^p$	E : 19Vo03=151.9(2.0) keV above ^{246}Es by NUBASE											**
$*^{246}Es^q$	E : 19Vo03=379.5(2.0) keV above $^{246}Es^m$ by NUBASE											**
$*^{246}$Fm	T : average 22Is05=1.50(+0.08-0.07) 12Pi05=1.6(0.2) 11Ve03=1.54(0.04), 1.60(0.06); others: 75Og02=0.9(0.3) 67Nu01=1.2(0.2)											**
$*^{246}$Fm	D : %SF average 22Is05=6.1(0.5) 11Ve03=6.8(0.6); others: 96Ni09=4.5(1.3) 67Nu01=8(3) 10Sv01=5(3); %β^+ from 11Ve03											**
$*^{246}$Md	T : average 10An08=1.3(0.4),0.8(0.2) 96Ni09=1.0(0.4); other: 06An13=0.75(0.18),1.3(0.4), superseded by 10An08											**
$*^{246}Md^m$	D : %α from 10An08<23; %β^+SF from %β^+SF/%β^+>10% in 10An08 and %β^+=88(7)											**
^{247}U	77140#	300#				1# s	7/2$^+$#	15	60Di03	I	β^- ?	
^{247}Np	72950#	400#				10# s	5/2$^+$#				β^- ?	
^{247}Pu	69240#	200#				2.27 d 0.23	1/2$^+$#	14			β^-=100	
^{247}Am	67150#	100#				23.0 m 1.3	5/2#	14			β^-=100	
^{247}Cm	65530	4				15.6 My 0.5	9/2$^-*$	14			α=100	*
$^{247}Cm^m$	65757	4	227.38	0.19		26.3 μs 0.3	5/2$^+$	14			IT=100	
$^{247}Cm^n$	65935	4	404.90	0.03		100.6 ns 0.6	1/2$^+$	14			IT=100	
^{247}Bk	65491	5				1.38 ky 0.25	3/2$^-$	14			$\alpha\approx$100;SF ?	
^{247}Cf	66109	14				3.11 h 0.03	(7/2$^+$)	14	84Ah02	D	ε=99.965 5;α=0.035 5	
^{247}Es	68558	6			*&	4.73 m 0.16	(7/2$^+$)	14	89Ha27	JT	β^+=?;$\alpha\approx$7;SF ?	*
$^{247}Es^m$	68600#	40#	40#	40#	*&	> 20# μs	(3/2$^-$)				IT ?;β^+ ?;α ?	
$^{247}Es^p$	68852	6	293.70	0.10			(7/2$^-$)		05He27	E	IT=100	
^{247}Fm	71671	10				31 s 1	(7/2$^+$)	14	06He27	TJD	$\alpha\approx$64;β^+ ?	
$^{247}Fm^m$	71722	9	51	14	AD	5.1 s 0.2	(1/2$^+$)	14	06He27	TJD	α=?;IT=12 2;β^+ ?	*
^{247}Md	75950#	210#				1.23 s 0.06	(7/2$^-$)	14	22He04	TJD	α=?;SF=0.86 10	*
$^{247}Md^m$	76110#	210#	154	15	AD	247 ms 21	(1/2$^-$)	14	22He04	TJD	α=?;SF=20.6 18	*
$*^{247}$Cm	J : 73Ab03=9/2											**
$*^{247}$Es	D : %α from 67Mi06$\sim$7											**
$*^{247}$Es	T : average 89Ha27=4.55(0.26) 73Es01=4.7(0.3) 67Mi06=5.0(0.3)											**
$*^{247}Fm^m$	D : %IT from 06He27=12(2), but no direct γ-ray decay was observed											**
$*^{247}$Md	T : average 25Xu07=1.3(0.1) 22He04=1.20(0.12) 10An08=1.2(0.1) 93Ho.A=1.12(0.22)											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{247}$Md^m	T : 25Xu07=260(+80-50) [α(t)], 270(50) [SF(t)] 22He04=230(30) [α(t)] 10An08=250(40); others: 22He04=320(10) [SF(t), includes gs decay]											**
$*^{247}$Md^m	T : 93Ho.A=230(+190-120)											**
$*^{247}$Md^m	D : %SF average 25Xu07=27(7) 22He04=20(2) 10An08=21(5)											**
^{248}U	80350#	300#				100# ms	0^+	24	60Di03	I	β^- ?	
^{248}Np	77100#	300#				1# s	6^+#	24			β^- ?	
^{248}Pu	71800#	200#				1# d	0^+	24			β^- ?	
^{248}Am	70550#	200#				3# m	3^+#	24			β^- ?	
^{248}Cm	67381.1	0.5				348 ky 6	0^+	24			α=?;SF=8.39 16;2β^- ?	
^{248}Cm^m	68841.6	1.3	1460.5	1.2		146 μs 18	8^-#	24	19Sh34	TJ	IT=100	
^{248}Bk	68079	29			*	> 9 y	6^+#	24	65Mi08	T	β^- ?;ε ?;α ?	*
^{248}Bk^m	68115	19	36	26	*	23.7 h 0.2	1^-	24	78Gr10	TD	β^-=70 5;ε=30 5;α ?	
^{248}Cf	67239	5				333.5 d 2.8	0^+	24	73Hu01	TD	α=?;SF=0.0029 3	
^{248}Cf^m	68140#	300#	900#	300#		> 139 ns	5^-#	24	22Or04	EJT	IT=100	
^{248}Es	70300#	50#				24.5 m 2.3	2^-#	24	01Sh09	TD	β^+ ?;α≈0.25;β^+SF=3.5e-4 18	*
^{248}Fm	71897	8				34.8 s 0.7	0^+	24			α=?;SF=0.10 5;β^+ ?	*
^{248}Fm^m	73000#	100#	1100#	100#		10.1 ms 0.6	6^+#	24	10KeZY	TD	IT≈100;α ?;β^+ ?	
^{248}Md	77010#	260#				10.9 s 1.9		24	24Po18	TD	α=61 15;β^+ ?;β^+SF<0.05	*
^{248}No	81010#	280#				<2us	0^+	24	03Be18	IT	SF ?	
$*^{248}$Bk	J : from expected conf=π3/2[521]⊗ν9/2[734],K$^\pi$=6$^+$											**
$*^{248}$Es	D : %β^+SF from 01Sh09; other: 80Ga07=3e-5; %β^+,%α from β^+/A∼400 in 56Ch67											**
$*^{248}$Es	T : average 01Sh09=23(3) 70Ah01=28(5) 56Ch67=25(5); other: 89Ha27=19(1)											**
$*^{248}$Fm	T : average 11Ga19=35.1(0.8) 10KeZY=32.3(1.5) 04He28=36(2) 67Nu01=38(4) 66Ak01=36(4)											**
$*^{248}$Md	T : average 24Po18=13(+3-2) 73Es01=7(3); other: 08Ne01=13(+15-4)											**
$*^{248}$Md	D : %α average 24Po18=65(22), from 24Po18=61(16)% - 68(22)%, 08Ne01=58(20); other: 73Es01=20(10)%											**
^{249}U	85180#	300#				100# ms	$9/2^+$#	23	60Di03	I	β^- ?	
^{249}Np	80450#	300#				1# s	$5/2^+$#	23	60Di03	I	β^- ?	
^{249}Pu	76000#	300#				1# s	$3/2^+$#	23	60Di03	I	β^- ?	
^{249}Am	73100#	300#				3# m	5/2#	23	60Di03	I	β^- ?	
^{249}Cm	70739.0	0.6				64.15 m 0.03	$1/2^+$	23	73DrZM	T	β^-=100	
^{249}Cm^m	70787.8	0.6	48.76	0.04		23 μs	$7/2^+$	23	66As12	T	IT=100	
^{249}Bk	69846.6	0.6				327.2 d 0.3	$7/2^+$*	23	14Ch47	T	β^-=?;α=0.00137 10;SF=47e-9 2	*
^{249}Bk^m	69855.4	0.6	8.777	0.014		300 μs	$3/2^-$	23	60As06	T	IT=100	
^{249}Cf	69723.0	0.4				351 y 2	$9/2^-$	23			α=100;SF=5.0e-7 4	
^{249}Cf^m	69868.0	0.4	144.98	0.05		45 μs 5	$5/2^+$	23	67Ah02	TD	IT=100	
^{249}Es	71210#	30#			*	102.2 m 0.6	$7/2^+$	23	70Ah01	TD	β^+=99.43 8;α=0.57 8	*
^{249}Es^m	71250#	50#	40#	40#	*	> 20# μs	$(3/2^-)$				IT ?;β^+ ?;α ?	
^{249}Es^p	71560#	30#	353.2	0.4			$(7/2^-)$		12He09	E	IT=100	
^{249}Fm	73518	6				1.65 m 0.09	$7/2^+$	23	11Lo06	J	β^+ ?;α=33 9	*
^{249}Md	77140	160				23.5 s 0.5	$(7/2^-)$	23	25Br09	TD	α=72 4;β^+ ?	*
^{249}Md^m	77240#	170#	100#	50#		1.2 s 0.5	$(1/2^-)$	23	25Br09	TJD	IT=98 1;α=2 1	*
^{249}Md^n	78240#	260#	1100#	200#		2.38 ms 0.16	$19/2^-$#	23	21Go26	TJE	IT=100	*
^{249}No	81830#	110#				38.1 ms 2.8	$(5/2^+)$	23	22Te01	TD	α=?; SF=0.4 4	*
$*^{249}$Bk	J : 72Bo67,67Wo01=7/2											**
$*^{249}$Bk	D : %α from 13Ah03; %SF from $T_{1/2}$(SF)=1.87(0.09)e9 y in 69Mi08											**
$*^{249}$Es	T : average 89Ha27=102(24) 76Ah07=102.2(0.6) 70Ah01=102(6)											**
$*^{249}$Fm	T : average 06Ni09=1.95(0.25) 04He28=1.6(0.1); others: 66Ak01=2.6(0.7) 59Pe27=2.5(1.0)											**
$*^{249}$Md	T : average 25Br09=22.3(1.0) 25Ap07=23.0(0.6) 19Br06=26(1) 09He20=23(3) 08Ga25=23.8(+3.8-2.9) 73Es01=24(4); others: 01He35=19(+3-2)											**
$*^{249}$Md	T : 85He22=25(+14-7), superseded by 09He20											**
$*^{249}$Md	D : %α average 25Br09=67(6) 19Br06=75(5); other: 23Ni.2=75											**
$*^{249}$Md^m	T : symmetrized from 25Br09=1.1(+0.6-0.4); other: 01He35=1.5(+1.2-0.5)											**
$*^{249}$Md^n	E : 910(15) + x keV using sum energy of coincident γ rays and e-; x=200#(200#) by NUBASE											**
$*^{249}$Md^n	T : average 25Ap07=2.3(0.2) 21Go26=2.8(0.5) [recoil-e-α(t)], 2.4(0.3) [recoil-e(t)]											**
$*^{249}$No	T : 22Te01=38.1(2.8), supersedes 21Sv02=38.1(2.5) 21Te08=43.8(3.7); others: 22Lo03=28.7(+14.3-7.2) 21Kh07=15(+74-7) 03Be18=54.0(+13.9-9.2) μs											**
$*^{249}$No	T : reassigned to ^{250}No by 06Pe17											**
$*^{249}$No	D : %SF symmetrized from 22Te01=0.23(+0.46-0.23)											**
$*^{249}$No^p	EJ : other: supported by Geant4 simulation by same group											**
^{250}Am	76860#	400#				50# s					β^- ?	
^{250}Cm	72978	10				8300# y	0^+	01			SF≈74;α ?;β^- ?	
^{250}Bk	72952.8	2.7				3.212 h 0.005	2^-	01			β^-=100	
^{250}Bk^m	72988.4	2.7	35.59	0.10		29 μs 1	4^+	01	08Ah02	EJ	IT=100	
^{250}Bk^n	73036.7	2.7	83.90	0.18	IT	213 μs 8	7^+	01	08Ah02	J	IT=100	*
^{250}Bk^p	73164.6	2.7	211.80	0.20			2^+		08Ah02	EJ	IT=100	
^{250}Cf	71171.1	1.0				13.08 y 0.09	0^+	01			α=99.923 3;SF=0.077 3	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{250}Es	73230#	100#			*	8.6 h 0.1	$6(^+)$	01		$\beta^+\approx100;\alpha$?	
^{250}Es^m	73430#	180#	200#	150#	*	2.22 h 0.05	$1(^-)$	01		$\beta^+\approx100;\alpha$?	
^{250}Fm	74079	5				31.0 m 1.1	0^+	01	18Mi11 T	α=?;SF=0.0069 10;ε ?	*
^{250}Fm^m	75278	5	1199.2	1.0		1.92 s 0.05	(8^-)	01	08Gr17 ETJ	IT$\approx$100;α ?;β^+ ?;SF ?	*
^{250}Md	78485	10				54 s 4	7^-#	01	08An16 TD	β^+=93.0 8;α=7.0 8; β^+SF=0.026 15	*
^{250}Md^m	78710#	80#	230#	80#	AD	42.4 s 4.5	$0^-,1^-$#		19Vo03 TI	α=?;β^+ ?;IT ?	
^{250}Md^p	78790	40	310	40						IT=100	
^{250}Md^q	78792	10	306.7	1.5					19Vo03 E	IT=100	
^{250}No	81620#	200#				4.54 μs 0.13	0^+	06	26Kh03 T	SF$\approx$100;α ?;β^+ ?	*
^{250}No^m	82870#	200#	1254	2		37.2 μs 0.9	(6^+)	06	22Te01 T	IT=100	*
^{250}No^n	83070#	280#	1450#	200#		1.4 μs 0.9			22Kh08 TD	IT=100	*
^{250}Lr	88180#	300#				10# ms				α ?;SF ?	
*^{250}Bk^n	E : 83.88(0.18) keV from a least-squares fit to γ-ray data in 08Ah02										**
*^{250}Fm	T : average 18Mi11=32.5(1.8) 08Ga25=28.4(+3.9-3.0) 06Ba09=30.4(1.5); others: 06Fo02=18(+13-6) 66Ak01=30(3)										**
*^{250}Fm^m	T : others: 07Gr17=1.93(0.15), superseded by 08Gr17, 73Gh03=1.8(0.1)										**
*^{250}Md	T : average 19Vo03=59.5(9.1) 08An16=50(+10-7) 73Es01=52(6); other: 08Ga25=25(+10-5) in conflict										**
*^{250}Md	D : %β^+SF symmetrized from 80Ga07=0.02(+0.02-0.01); %α other: 06Fo02=9(+19-7)										**
*^{250}No	T : average 24Mu08=4.7(0.2) 26Kh03,22Kh08=4.0(0.4) 20Ka02=3.8(0.3) 17Sv02,18Sv02=5.1(0.3) 06Pe17=3.7(+1.1-0.8) 03Be18=5.6(+0.9-0.7); others:										**
*^{250}No	T : 24Sa.A=3.89(0.17) 22Te01=4.7(0.1) same group as 24Mu08, 03Po08=6(1), 22Te01 supersedes 21Te08=5.84(1.72)										**
*^{250}No^m	T : from 22Te01, supersedes 21Te08=40.50(0.73); others: 24Mu08=46(4) 24Sa.A=39.14(3.34) from same group as 22Te01, 26Kh03,22Kh08=23(4)										**
*^{250}No^m	T : 20Ka02=34.4(+3.9-3.2) 18Sv02,17Sv02=36(3) 06Pe17=43(+22-15) 03Be18=46(+22-14) 01Og08=36(+11-6)										**
*^{250}No^m	D : no fission events observed in 22Kh08										**
*^{250}No^m	E : from 21Te08=1090 keV, 115 keV and 49 keV, extrapolated for 2^+ to 0^+, in a cascade; ΔE_γ=1 keV by NUBASE										**
*^{250}No^n	T : symmetrized from 26Kh03,22Kh08=0.7(+1.4-0.3)										**
^{251}Cm	76644	23				16.8 m 0.2	$(3/2^+)$	22	78Lo13 T	β^-=100	*
^{251}Bk	75224	11				56.0 m 0.9	$(3/2^-)$	22		β^-=100	*
^{251}Bk^m	75260	11	35.5	1.3		58 μs 4	$(7/2^+)$	22	70HoZN T	IT=100	
^{251}Cf	74131	4				898 y 44	$1/2^+$	22		$\alpha\approx$100;SF ?	*
^{251}Cf^m	74501	4	370.47	0.03		1.3 μs 0.1	$11/2^-$	22	71Ah01 TD	IT=100	
^{251}Es	74513	5				33 h 1	$3/2^-$	22	70Ah01 TD	ε=99.49 13;α=0.51 13	*
^{251}Es^m	74521	5	8.34	0.23		$\sim$83# ms	$(7/2^+)$			IT ?	*
^{251}Es^p	74974	5	461.40	0.22			$7/2^-$			IT=100	
^{251}Fm	75959	14				5.30 h 0.08	$9/2^-$	22	73Ah02 TD	β^+=?;α=1.80 13	*
^{251}Fm^m	76159	14	200.09	0.11		22.9 μs 0.9	$5/2^+$	22	18Re07 TJ	IT=100	*
^{251}Md	78947	4				4.25 m 0.10	$(7/2^-)$	22	25Mo10 T	β^+ ?;α=10 1	*
^{251}Md^m	79005	4	58	5	AD	20# s	$(1/2^-)$	22		α ?;IT ?	
^{251}Md^n	80121	4	1173.9	0.8		1.30 s 0.03	$(23/2^+)$	22	25Mo10 ETJ	IT=100	*
^{251}No	82850.2	2.0				800 ms 10	$(7/2^+)$	22	06He27 J	α=83 16;β^+ ?;SF<0.3	*
^{251}No^m	82956.6	2.0	106.4	2.4	AD	1.02 s 0.03	$(1/2^+)$	22		α=100	*
^{251}No^n	83978.2	2.2	1128	1		7 μs 4	$17/2^-$#	22	26Kh03 TD	IT ?	*
^{251}Lr	87770#	210#				26 ms 6	$7/2^-$#	22	22Hu21 TD	α=?;SF ?	*
^{251}Lr^m	87880#	210#	114	30	AD	60 ms 30	$1/2^-$#	22	22Hu21 TD	α=?;SF ?	*
*^{251}Cm	J : direct β^- feeding to ^{251}Bk gs (J^π=3/2$^-$) and 269.1-keV level (J^π=5/2$^+$); expected conf=ν3/2[622]										**
*^{251}Bk	T : average 84Li05=55.6(1.1) 67Di02=57.0(1.7)										**
*^{251}Cf	T : average 69Me01=900(50) 68Ch03=892(88)										**
*^{251}Es	J : favored α decay to ^{247}Bk (J^π=3/2$^-$)										**
*^{251}Es	D : from I(α)/I(X-rays)=0.008(0.002) in 70Ah01 and I(X-rays)/I(ε)=0.64(0.05) in 05Ah09										**
*^{251}Es^m	T : estimated from B(M2)[7/2$^+\rightarrow$3/2$^-$]=0.019(0.05) W.u in ^{251}Bk^m										**
*^{251}Fm	D : %α from 78Ah02, supersedes 73Ah02=1.9(0.2)										**
*^{251}Fm^m	T : average 18Re07=23.7(1.1) 11As03=21.1(1.9) 06He20=21(3); other: 71Di03=15.2(2.3)										**
*^{251}Fm^m	E : from 11As03=200.09(0.11); other: 06He20=199.9(0.3)										**
*^{251}Md	T : average 25Mo10=4.0(0.4) 21Go26=4.28(0.12) 06Ch52=4.27(0.26) 73Es01=4.0(0.5)										**
*^{251}Md	D : %α from 06Ch51=10(1)										**
*^{251}Md^n	T : from 25Mo10=1.30(0.03); other: 21Go26=1.4(0.3)										**
*^{251}No	D : %α symmetrized from 01He35=91(+9-22)										**
*^{251}No	T : from 06He27=800(10), supersedes 04He28=780(20) 01He35=760(30) 97He29=1000(300); others: 26Kh03=680(200) 09Fo02=780(+380-220) 67Gi01=800(300)										**
*^{251}No^m	T : from 06He27=1.02(0.03), supersedes 04He28=0.93(0.06) 97He29=0.9(+1.6-0.3)										**
*^{251}No^n	T : symmetrized from 26Kh03=4(+6-2); other: 06He27>1.7										**
*^{251}No^n	E : from 06He27=142.4(0.5) + 203.1(0.5) + 782.5(0.6) keV γs in a cascade to gs										**
*^{251}No^n	J : from expected conf=ν^3(1/2[631],7/2[624],9/2[734]),$K^\pi = 17/2^-$										**
*^{251}Lr	T : symmetrized from 22Hu21=24.4(+7.0-4.5)										**
*^{251}Lr^m	T : symmetrized from 22Hu21=42(+42-14)										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{252}Cm	79060#	300#				1# m	0^+	21			β^- ?;α ?	
^{252}Bk	78520#	200#				1.8 m 0.5		21	92Kr.A	TD	β^-=?;α ?	
^{252}Cf	76022.9	0.5				2.6476 y 0.0014	0^+	21	22Th06	T	α=?;SF=3.1028 27	*
^{252}Es	77243	29				471.7 d 1.9	(4^+)	21	77Ah03	T	α=?;ε=22 2	*
^{252}Es^p	77720	29	477.0	1.0			(1^-)					*
^{252}Fm	76817	5				25.39 h 0.04	0^+	21	84Ah02	TD	α=?;SF=0.0023 2	
^{252}Md	80470	90				3.8 m 1.3	1^+#	21			$\beta^+\approx$100;α ?	*
^{252}Md^p	80542	10	70	90								
^{252}No	82870	9				2.457 s 0.015	0^+	21	21Is09	T	α=65.6 4;SF=33.4 3;β^+=1.0 3	*
^{252}No^m	84125	9	1254.6	1.5		109.1 ms 2.5	(8^-)	21	11Lo06	T	IT=100	*
^{252}No^n	85270#	200#	2400#	200#		15 μs 9	16^+#		26Kh03	T	IT=100	*
^{252}Lr	88600#	260#				402 ms 47	7^-#	21	24Po18	TD	$\alpha\approx$80 6;β^+ ?;SF$\approx$2	*
^{252}Lr^p	88770#	260#	170	30	AD							
^{252}Rf	93140#	300#				100 ns 60	0^+		25Kh01	TJD	SF=100	*
^{252}Rf^m	94140#	360#	1000#	200#		14 μs 4	(6^+)		25Kh01	TJD	SF<90;IT=?	*
*^{252}Cf	D : %SF from 18Be29											**
*^{252}Cf	T : average of 65Me02=2.646(0.004) 73Mi05=2.659(0.010) 74Sp02=2.638(0.007) 76Mo30=2.637(0.005) 82La25=2.639(0.007) 83Al24=2.648(0.002)											**
*^{252}Cf	T : 84SmZV=2.651(0.003) 85Ax02=2.6503(0.0031) 91Ch.A=2.638(0.009) 92Sh33=2.645(0.003) 22Th06=2.6485(0.0014). unc=0.0009 y increased to 0.0014 y											**
*^{252}Cf	T : (the smallest experimental unc); others (experiment): 54Ma98=2.2(0.2) and 57E_α01=2.55(0.15), superseded by 65Me02, 69De23=2.621(0.006)											**
*^{252}Cf	T : (excluded because of shorter-lived ^{254}Cf contaminants); others (evaluation): 26Cr01=2.650(0.003) ENSDF2021=2.647(0.003)											**
*^{252}Cf	T : 13KeZZ,06BeZV=2.6470(0.0026)											**
*^{252}Es	J : direct feeding to the 3^+ level at 969.8 keV in ^{252}Cf [conf=ν^2(1/2[620],7/2[613])] and the expected conf=π7/2[633]$\otimes\nu$1/2[620]; log											**
*^{252}Es	J : $ft\sim$8.3, consistent with π7/2[633]$\rightarrow\nu$7/2[613], nz=2 forbidden transition; ENSDF2021=(5^-)											**
*^{252}Es	D : from 73Fi06											**
*^{252}Es^p	E : from 378.5-keV + 99.4-keV γs in coincidence with 7207-keV α in 00Ah02, which match the α energy difference 7678(8)-7207(2) keV											**
*^{252}Es^p	J : favored α decay from ^{256}Md [J^π=(1^-)]; expected conf=π7/2[514]$\otimes\nu$7/2[613], K^π=0^-											**
*^{252}Md	T : average 92Ka08=4.8(+0.8-0.5) 73Es01=2.3(0.8); Birge ratio=2.5; other: 65Do09=8											**
*^{252}Md	J : expected conf=π7/2[514]$\otimes\nu$9/2[734], $K^\pi = 1^+$											**
*^{252}No	T : average 21Is09=2.46(0.05) 12He01=2.43(0.13) 12Su22=2.43(0.13) 12Sv02=2.3(0.1) 11Ga19=2.47(0.02) 07Su19=2.42(0.06) 06Le29=2.46(0.05) [α(t)],											**
*^{252}No	T : 2.54(0.07)[SF(t)] 04He28=2.52(0.22) 01Og08=2.44(0.04) 03Be18=2.38(+0.26-0.22) 94Wi17=2.44(0.12) 89La07=2.25(+0.18-0.16) 77Be09=2.30(0.22);											**
*^{252}No	T : others: 26Kh03=2.6(0.7) 02He01=2.4(0.3) 76Fl13=2.3 01Ju05=2.4(0.3) 70Og05=2.4(0.2) 67Mi03=4.5(1.5) 67Gh01=2.3(0.3)											**
*^{252}No	D : %SF average 12Su22=33.9(0.3) 01Og08=32.2(0.5) 03Be18=32(3); others: 11Ga19=29.3(0.9) 93An10=21.6(4.2) 77Be09=26.9(1.9); %β^+, %α from											**
*^{252}No	D : β^+/α=0.016(0.005) in 02He01; other: α/SF=3.3(0.8) in 06Le29 in conflict											**
*^{252}No^m	T : average 11Lo06=110(8) 08Ro21=109(6) 12Su22=109(3), supersedes 07Su19=110(10); other: 26Kh03=110(40)											**
*^{252}No^n	T : symmetrized from 26Kh03=9(+13-4)											**
*^{252}Lr	T : average 24Po18=410(+70-50) 08Ne01=270(+180-80) 01He35=360(+110-70)											**
*^{252}Lr	D : %α from 24Po18=70-90; %SF 76Og02$\sim$2											**
*^{252}Lr	J : expected conf=π7/2[514]$\otimes\nu$7/2[624],$K^\pi = 7^-$; K=0^- isomer originating from the same configuration should be expected											**
*^{252}Rf	T : symmetrized from 25Kh01=60(+90-30)											**
*^{252}Rf^m	T : symmetrized from 25Kh01=13(+4-3)											**
^{253}Cm	82930#	300#				10# s	$9/2^+$#				β^- ?;α ?	
^{253}Bk	81010#	360#				60# m	$3/2^-$#	12	91Kr.A	I	β^- ?	
^{253}Cf	79290	4				17.81 d 0.08	$7/2^+$*	12	23We04	J	β^-=?;α=0.31 4	
^{253}Es	79010.7	0.6				20.47 d 0.03	$7/2^+$*	12	05Ah03	D	α=100;SF=8.7e-6 3	*
^{253}Es^m	79117	4	106	4		> 10# μs	$3/2^-$#		93Mo18	IJ	IT ?	
^{253}Fm	79345.8	1.1				3.00 d 0.12	$1/2^+$	12	67Ah02	TD	ε=?;α=12 1	*
^{253}Fm^m	79486	6	140	6		> 100# ns	$7/2^+$#	12			IT ?	*
^{253}Fm^n	79697	6	351	6		560 ns 60	$11/2^-$#	12	11An13	ETJ	IT=100	*
^{253}Md	81210#	30#				12 m 8	$(7/2^-)$	12	05He27	D	β^+=?;$\alpha\approx$0.7	*
^{253}No	84358	7				1.567 m 0.019	$9/2^-$*	12	26Kh03	T	α=55 3;β^+ ?	*
^{253}No^m	84525	7	167.1	0.5		30.3 μs 1.6	$5/2^+$	12	09He23	T	α=100	*
^{253}No^n	85550	110	1196	107		706 μs 24	$19/2^+$#	12	11Lo06	TJ	IT=100	*
^{253}No^p	85610	110	1256	113		552 μs 15	$25/2^+$#	12	11Lo06	JD	IT=100	*
^{253}Lr	88490	160			*	563 ms 13	$(7/2^-)$	12	25Br09	TD	α=89 4;β^+=10 4;SF=1.0 5	*
^{253}Lr^m	88520#	170#	30#	50#	AD*	1.7 s 0.3	$(1/2^-)$	12	25Br09	TJD	α=83.2 53;β^+=11 5;SF=5.8 17	*
^{253}Rf	93710#	110#			*	9.9 ms 1.2	$(1/2^+)$	23	22Lo03	TD	SF=?;α=17 6	*
^{253}Rf^m	93820#	130#	110#	60#	*	52.8 μs 4.4	$(7/2^+)$	23	22Lo03	TD	SF$\approx$100;α ?	*
^{253}Rf^n	94910#	230#	1200#	200#		0.8 ms 0.3	$23/2^-$#	23	22Lo03	TD	IT$\approx$100;α ?	*
^{253}Rf^p	93960#	150#	250#	100#			$9/2^-$#		25Mo17	J		
*^{253}Es	D : %SF from α/SF=1.15(0.03)e7 in 65Me02											**
*^{253}Es	J : 22No01,75Go05,71Ed04,70Wo14=7/2											**
*^{253}Fm	J : favored α decay to 416.6-keV level in ^{249}Cf (J^π=$1/2^+$)											**
*^{253}Fm^m	E : from 130-150 keV in 11An13											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life		J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{253}Fm^n$	E : 211 keV above $^{253}Fm^m$												**
$*^{253}Md$	T : symmetrized from 92Ka08=6.4(+11.6-3.6)												**
$*^{253}Md$	J : favored α decay to $7/2^-$ level at 461.4 keV in ^{251}Es												**
$*^{253}No$	T : average 26Kh03=1.48(0.33) 18Ac08=1.67(0.09) 17Mi01=1.7(0.2) 09He23=1.56(0.02) 09Qi04=1.57(+0.18-0.15) 67Mi03=1.58(0.17) 67Gh01=1.75(0.33)												**
$*^{253}No$	D : ε/e^+=0.45(0.03) in 11An13												**
$*^{253}No$	J : 18Ra11=9/2												**
$*^{253}No^m$	T : average 09He23=28(3) 07Lo11=31.1(2.1) 73Be33=31.3(4.1); others: 26Kh03>17 and 11An13=22.7(0.5) 10St14=24(2) (outliers)												**
$*^{253}No^m$	E : 16He08=167.1(0.5), superseded 11An13=167.5(0.5)												**
$*^{253}No^n$	E : greater than 1011 keV and less than 1380 keV												**
$*^{253}No^n$	T : others: 26Kh03=900(300) 07Lo11=970(210), 11An13=627(5) [r-ce-g(t)] 650(15) [r-ce-802,713,209g(t)]												**
$*^{253}No^p$	E : less than 120 keV above $^{253}No^n$ in 11Lo06												**
$*^{253}No^p$	T : from 11An13 using [r-ce-K x rays(t)]												**
$*^{253}Lr$	T : average 25Br09=550(30) 22Hu21=650(50) 09He20=670(60), supersedes 01He35=570(+70-60) 10He11=700(+500-200), 11An03=552(15); others:												**
$*^{253}Lr$	T : 17Br.A=520(+29-32), superseded by 25Br09												**
$*^{253}Lr$	D : %SF average 25Br09=1.0(0.7) 17He08=1.0(0.6); others: 17Br.A=3(1), , superseded by 25Br09, 01He35=1.3(+3.0-1.0); $\%\beta^+$ from 25Br09												**
$*^{253}Lr^m$	T : average 25Br09=2.0(+0.2-0.1) 09He20=1.32(0.14), supersedes 01He35=1.49(+0.30-0.21) and 10He11=1.2(+0.7-0.4), 22Hu21=2.46(0.32); other:												**
$*^{253}Lr^m$	T : 17Br.A=2.00(+0.16-0.19), superseded by 25Br09; Birge ratio=3.0												**
$*^{253}Lr^m$	D : %SF others: 24Zh19=14(+10-8) 17He08=12(3) 01He35=8(5) 17Br.A=6.0(2.5)												**
$*^{253}Rf$	T : others: 21Kh07=12.8(+7.0-3.4) 97He29=11(+6-3)												**
$*^{253}Rf$	D : $\%\alpha$ other: 21Kh07∼12.5												**
$*^{253}Rf^m$	T : others: 21Kh07=44(+17-10) 97He29,99He11=48(+17-10)												**
$*^{253}Rf^n$	T : symmetrized from 22Lo03=0.66(+0.40-0.18); other: 21Kh07∼0.6 μs												**
^{254}Bk	84520#	300#				1#	m					β^- ?	
^{254}Cf	81330	11				60.5	d 0.2	0^+	19	68Be21	D	SF=99.69 2;α=0.31 2	
^{254}Es	81994.8	2.7				275.7	d 0.5	7^+*	19	22No01	J	$\alpha\approx100;\beta^-$=1.74e-4 8;ε ?; SF<3e-6	
$^{254}Es^m$	82075.3	2.5	80.5	1.1	AD	39.3	h 0.2	2^+*	19			β^-=99.59 11;α=0.330 10; ε=0.078 6	*
^{254}Fm	80903.3	1.4				3.240	h 0.002	0^+	19			α=99.9408 3;SF=0.0592 3	
^{254}Md	83450#	100#			*	10	m 3	0^-#	19			$\beta^+\approx100;\alpha$?	
$^{254}Md^m$	83500#	140#	50#	100#	*	28	m 8	3^-#	19			$\beta^+\approx100;\alpha$?	
^{254}No	84733.1	1.5				51.0	s 0.3	0^+	19	23Lo.1	TD	α=?;β^+=10 1;SF=0.145 7	*
$^{254}No^m$	86029.5	1.9	1296.4	1.1		265.1	ms 0.9	(8^-)	19	25Wa17	T	IT≈100;SF<2.26e-3;α<0.01	
$^{254}No^n$	87666.1	1.8	2933	1		184.1	μs 1.6	16^+#	19	25Wa17	ET	IT≈100;SF<0.012	*
^{254}Lr	89734	5				12.0	s 0.9	4^+#	19	19Vo03	T	α=71.7 19;β^+=28.3 19;SF<0.1	*
$^{254}Lr^m$	89845	3	110	4	MD	20.3	s 4.2	1^+#		19Vo03	TE	α=?;β^+ ?;IT ?	
$^{254}Lr^p$	89933	5	199.1	1.5						19Vo03	E	IT=100	
$^{254}Lr^q$	90065	4	331	5	IT					19Vo03	E	IT=100	*
^{254}Rf	93250#	280#				22.9	μs 1.0	0^+	23	20Kh01	T	SF≈100;α ?	*
$^{254}Rf^m$	94550#	340#	1300#	200#		4.3	μs 0.7	8^-#	23	15Da12	JTD	IT≈100;SF ?	*
$^{254}Rf^n$	95250#	570#	2000#	500#		247	μs 73	16^+#	23	15Da12	JTD	IT≈100;SF ?	*
^{254}Db	100230#	300#				0.5#	s					SF ?;α ?	
$*^{254}Es^m$	T : other: 19De11=51.8(16.1), probably a mixture between gs and isomer												**
$*^{254}Es^m$	J : 75Go05=2												**
$*^{254}Es^m$	D : from $\%\beta^-/\%\alpha$=302(9) in 73Ah04 and $\%\varepsilon/\%\beta^-$=7.8(0.6)e-4 in 63Ph01, and by assuming that the %IT and %SF branches are negligible; others												**
$*^{254}Es^m$	D : (non observed): %IT<3% in 73Ah04 and %SF<0.045% in 54Fi14												**
$*^{254}No$	T : average 23Lo.1=50.8(0.5) 06He19=51.2(0.4); others: 26Kh03=53(8) 18Mi11=54(4) 99Le42=48(3) 94Hu18=53(20) 89La07=54(+8-6) 88Tu07=53(+46-24)												**
$*^{254}No$	T : 85He22=68(+36-18) 67Gh01=52(5) 67Mi03=75(17) 66Do04=50(10) 23Ku17=51.2												**
$*^{254}No$	D : $\%\beta^+$ from 10He10; other: 88Tu07=10(4); %SF from 23Lo.1; others: 10He10=0.23(0.10) 94Hu18=0.17(0.02) 88Tu07=0.25(+0.20-0.11) 89La07=0.17(0.05)												**
$*^{254}No^m$	T : average 25Wa17=259(7) 25Mo.A=267(4) 23Lo.1=265.2(1.3) 11Lo06=259(17) 10Cl01=263(2) 10He10=275(7) 06He19=266(2) 06Ta19=266(10); other:												**
$*^{254}No^m$	T : 26Kh03=258(35) 73Gh03=280(40)												**
$*^{254}No^m$	D : $\%\alpha$ from 10He10; %SF from 23Lo.1; other: 10He10=0.020(0.012)												**
$*^{254}No^n$	T : average 25Wa17=186(9) 25Mo.A=214(18) 06He19=184(3) 10He10=198(13) 10Cl01=184(2) 06Ta19=171(9); other: 26Kh03=240(80)												**
$*^{254}No^n$	D : %SF from 10He10												**
$*^{254}Lr$	T : average 19Vo03=11.9(0.9)(GSI) 24Zh19=15(2), supersedes 01Ga20=13.4(4.2)(IMP); others (not used): 08Ga25=17.8(+1.9-1.6)(LBNL)												**
$*^{254}Lr$	T : 08An16=18.4(1.8)(GSI) 89Mu09=10.0(+4.5-2.4)(GSI) 85He22=13(+3-2)(GSI) 06Fo02=22(+9-6)(LBNL), presumably affected by the longer-lived isomer												**
$*^{254}Lr$	D : other (discrepant): $\%\alpha$=60(+11-15) $\%\beta^+$=40(+15-11) in 06Fo02												**
$*^{254}Lr^q$	E : 19Vo03=220.7(1.5) keV above $^{254}Lr^m$ by NUBASE												**
$*^{254}Rf$	T : average 20Kh01=20(3) 15Da12=23.2(1.1) 97He29=23(3); other: 08Dr05=29.6(+0.7-0.6)												**
$*^{254}Rf$	D : $\%\alpha$ 97He29<1.5%, not observed												**
$*^{254}Rf^m$	T : average 15Da12=4.7(1.1) 20Kh01=4(1)												**
$*^{254}Rf^m$	D : %SF 15Da12<10%, not observed												**
$*^{254}Rf^n$	D : %SF 15Da12<40%, not observed												**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{255}Cf	84810#	200#				85 m 18	9/2$^+$#	11		β^-=100;SF ?;α ?	
^{255}Es	84086	11				39.8 d 1.2	7/2$^+$*	11	22No01 J	β^-=92.0 4;α=8.0 4;SF=0.0041 2	
^{255}Fm	83797	4				20.07 h 0.07	7/2$^+$*	11		α=100;SF=2.4e-5 10	*
^{255}Md	84844	5			*	27.2 m 1.6	7/2$^-$	11		β^+=?;α=8.3 8;SF ?	*
^{255}Md^p	84850#	70#	10#	70#	*	2# m	1/2$^-$#			α ?;IT ?	
^{255}No	86812	14				3.52 m 0.18	(1/2$^+$)	11	11As03 TJD	β^+=?;α=30 5	
^{255}No^m	87037	15	225	5		96 μs 6	(11/2$^-$)		24Ke05 ETJ	IT=100	*
^{255}No^n	88166#	15#	1354#	5#		1.5 μs 0.5	21/2$^+$#		24Ke05 ETJ	IT=100	*
^{255}No^p	88296#	17#	1484#	9#		80 μs 5	27/2$^+$#		24Ke05 ETJ	IT=100	*
^{255}No^q	89310#	200#	2500#	200#		5 μs 1			24Ke05 ET	IT=100	
^{255}No^r	86959	14	146.7	0.5			(3/2$^+$)		09As.A E	IT=100	*
^{255}Lr	89932.6	1.7				31.1 s 1.1	(1/2$^-$)	11	08Ha31 TD	α=74 5;β^+ ?	*
^{255}Lr^m	89967.1	1.8	34.4	2.4	AD	2.54 s 0.04	(7/2$^-$)	11	06Ch52 TJD	IT ?;$\alpha\approx$40;β^+ ?	*
^{255}Lr^n	90760	30	824	30		$<$ 1 μs	(15/2$^+$)			IT=100	*
^{255}Lr^p	91430#	30#	1493#	30#		1.78 ms 0.05	(25/2$^+$)	11		IT$\approx$100;α ?	*
^{255}Lr^q	89980#	30#	50#	30#			(9/2$^+$)		FGK256 E		*
^{255}Rf	94326	13				1.67 s 0.03	(9/2$^-$)	11	23Ch05 TD	SF=50.2 10;α=?;β^+=0.06 2	*
^{255}Rf^m	94476	13	150.0	1.0		50 μs 17	(5/2$^+$)		15An05 TJ	IT=100	*
^{255}Rf^n	95429#	16#	1103#	10#		22 μs 4	19/2$^+$#		23Ch05 ETD	IT=100	*
^{255}Rf^p	95629#	16#	1303#	10#		45 μs 8	25/2$^+$#		23Ch05 ETD	IT=100	*
^{255}Db	99580#	210#				2.7 ms 0.4	9/2$^+$#	11	24Po17 TD	SF=92 3;α=8 3	*
^{255}Db^m	99680#	220#	100	70	EU	2.8 ms	1/2$^-$#		17He08 TD	SF$\approx$100;α ?	*
*^{255}Fm	J : 26Ur04=7/2										**
*^{255}Md	D : %α average 71Ho16=10.0(1.4) 70Fi12=7(1) 65Si14=10(2)										**
*^{255}Md	T : average 71Ho16=27(3) 70Fi12=27(2) 65Si14=35(10)										**
*^{255}Md	J : favored α decay to 7/2$^-$ level at 461.4 keV in ^{251}Es										**
*^{255}No^m	T : average 24Ke05=86(8) 22Br08=109(9)										**
*^{255}No^m	E : from γs in 24Ke05; other: 22Br08=240-300 keV										**
*^{255}No^n	E : from γs in 24Ke05; other: 22Br08$\geq$1500 keV										**
*^{255}No^n	T : average 24Ke05=2(1) 22Br08=1.2(+0.6-0.4)										**
*^{255}No^p	E : from γs in 24Ke05; other: 22Br08=1400-1600 keV										**
*^{255}No^p	T : average 24Ke05=92(13) 22Br08=77(6)										**
*^{255}Lr	T : average 08Ha31=31(2) 06Ch52=31.1(1.3); others: 08An16$>$19.1 01Ga20,02Gu33=21(8) 76BeYM=22(5) 71Es01=22(5)										**
*^{255}Lr^m	T : average 08Ha31=2.6(0.1) 08An16=2.53(0.05) 06Ch52=2.53(0.13)										**
*^{255}Lr^n	E : 740.0 keV above 9/2$^+$ level (^{255}Lr^q)										**
*^{255}Lr^p	E : 1408.6 keV above 9/2$^+$ level (^{255}Lr^q)										**
*^{255}Lr^p	T : average 09Je02=1.70(0.03) 08An16=1.81(0.02) (Birge ratio=3.05); other: 08Ha31=1.4(0.1)										**
*^{255}Lr^p	D : %α 08An16$<$0.15% (not observed)										**
*^{255}Lr^q	E : estimated from E(9/2$^+$)=159(68) keV (^{251}Lr) and 98(28) keV (^{253}Lr)										**
*^{255}Rf	T : average 23Ch05=1.69(0.03) 20Mo11=1.60(0.07) 06He27=1.68(0.09) 01He35=1.64(0.11); others: 20Kh01=1.9(0.2) 15An05=1.54(0.19)										**
*^{255}Rf	T : 09Fo02=2.3(+0.8-0.5) 08Dr05=1.6(+0.3-0.2) 97He29=1.4(+0.5-0.3) 86He28=1.4(+0.3-0.2) 85He06=1.4(0.2) 84De07=1.5(+0.3-0.2)										**
*^{255}Rf	T : 84Og02,84Og03=1.7(0.2),1.1(+0.6-0.4) 75Og01$\sim$4										**
*^{255}Rf	D : %SF average 23Ch05=50.9(1.1) 20Mo11=51(7) 20Kh01=53(8) 15An05=45(3) 01He35=52(6) 97He29=45(6) 86He28,85He06=52(7); others: 09Fo02=52(+13-17)										**
*^{255}Rf	D : 84Og03,70Og01$\sim$50; %β^+ from 23Ch05=0.06(0.02); other: 15An05$<$6										**
*^{255}Rf	J : favored α decay to the (9/2$^-$) level at 203.6 keV in ^{251}No										**
*^{255}Rf^m	T : other: 20Kh01$>$30 μs										**
*^{255}Rf^m	E : from 23Ch05=150(1)										**
*^{255}Rf^n	T : average 23Ch05=29(+7-5) 20Mo11=15(+6-4), supersedes 20Mo10=29(7),31(7)										**
*^{255}Rf^n	E : from 23Ch05 assigned as 778(1) keV above 17/2$^-$ at 324#(10#) keV; other: 900-1200 keV above the gs in 20Mo11										**
*^{255}Rf^p	T : average 23Ch05=49(+13-10) 20Mo11=38(+12-7)										**
*^{255}Rf^p	E : 98(1)+102(1) γs above 255Rfn in 23Ch05; other: 1150-1450 keV above the gs in 20Mo11										**
*^{255}Db	T : symmetrized from 24Po17,24Po18=2.7(+0.4-0.3); others: 05Le.A=37(+51-14) 17He08=54 83OgZW=1.6(+0.6-0.4) s 77FlZY=1.5 s										**
*^{255}Db^m	I : proposed in 17He08, but not confirmed in 24Po17										**
^{256}Cf	87040#	310#				12.3 m 1.2	0$^+$	17		SF=100;α ?;2β^- ?	
^{256}Es	87170#	100#			*&	7.6 h	7$^+$#	17		β^-=100;β^-SF=0.002	*
^{256}Es^m	87170#	140#	0#	100#	*&	25.4 m 1.2	0$^+$#,1$^+$#	17	81Lo15 T	β^-=100	*
^{256}Fm	85473.1	2.0				157.1 m 1.3	0$^+$	17		SF=91.9 3;α=8.1 3	
^{256}Md	87467	30				77.5 m 1.6	(1$^-$)	17		β^+=?;α=9.5 4;SF$<$3	*
^{256}Md^m	87630#	100#	160#	100#	EU	100# m	7$^-$#			β^+ ?;α ?	
^{256}Md^p	87710#	140#	240#	140#			*am*				
^{256}No	87823	7				2.90 s 0.05	0$^+$	17	21Ke10 T	α=99.45 5;SF=0.55 5;ε ?	*
^{256}No^m	88910	70	1089	74		11 μs 6	5$^-$#		21Ke10 TDJ	IT=100	*
^{256}Lr	91737	6				27.7 s 0.8	3$^-$#	20	FGK205 J	α=?;β^+=?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{256}Lr^{p}	91970#	40#	230#	40#								
^{256}Rf	94221	18				6.60 ms 0.05	0^+		17 23Is03	T	SF=?;α=0.30 7	*
^{256}Rf^{m}	95340#	100#	1120#	100#		25 μs 2	4^-#		17 15Ko14	J	IT=100;SF ?	*
^{256}Rf^{n}	95620#	100#	1400#	100#		17 μs 2	8^-#		17 21Kh03	T	IT=100;SF ?	*
^{256}Rf^{p}	96620#	200#	2400#	200#		27 μs 5			17		IT=100;SF ?	*
^{256}Db	100360#	260#				1.54 s 0.21	9^-#		17 24Po18	TD	α=?;β^+=15 4;SF ?	*
*^{256}Es	J : from expected conf=π7/2[633]$\otimes\nu$7/2[613],$K^\pi = 7^+$; ENSDF2017 proposed $K^\pi = 8^+$ by invoking ν9/2[615], but it is close to Fermi surface at N=161											**
*^{256}Es^{m}	T : 81Lo15=25.4(2.4), but the uncertainty is 2σ											**
*^{256}Es^{m}	J : from expected conf=π7/2[633]$\otimes\nu$7/2[613],$K^\pi = 0^+$											**
*^{256}Md	T : average 93Mo18=78.1(1.8) 71Ho16=77(5) 70Fi12=75(4); others: 65Si14=90(12) 58Ph40=90											**
*^{256}Md	D : %α average 93Mo18=11(3) 71Ho16=9.9(0.5) 70Fi12=8.5(0.8)											**
*^{256}No	D : %SF symmetrized from 90Ho03=0.53(+6-3)											**
*^{256}No	T : average 21Ke10=2.77(0.24) 90Ho03=2.91(0.05); others: 68Fl05=3.7(0.5) 67Gh01=3.3(0.2) 67Dr02=6(2) 66Ku10=8.2(1.0)											**
*^{256}No^{m}	T : symmetrized 21Ke10=7.8(+8.3-2.6)											**
*^{256}No^{m}	E : lower limit from sum electron energies in 21Ke10											**
*^{256}Lr	T : average 14Sa21=28(1) 76BeYM=25.9(1.7) 71Es01=31(3); others: 70Dr08=35(10) 65Do10=45(10)											**
*^{256}Lr	D : %β^+ observed in 76BeZY; %β^+ 71Es01<20% (estimate)											**
*^{256}Lr	J : probable conf=π7/2[514]$\otimes\nu$1/2[620], $K^\pi = 3^-$											**
*^{256}Rf	T : average 23Is03=6.7(0.2) 21Kh03=6.4(0.5) 21Te08,20Ku23=6.90(0.23) 20Mo11=6.75(0.49) 18Sv02=5.75(0.17) 12Gr12,13Ri07=6.9(0.2) 11Ro20=6.9(0.4)											**
*^{256}Rf	T : 10St14=5.1(1.0-0.7) 09Je01=6.67(0.09) 08Dr05=6.70(0.09) 97He29=6.2(0.2) 84Og02=6.7(0.2); other: 26Is.A=5.3(+2.0-1.3) at 95% CL											**
*^{256}Rf	D : %α: average 21Te08=0.29(+0.08-0.07), supersedes 20Ku23=0.29(+0.13-0.10), 97He29=0.32(0.17); others: 23Is03=0.3(+0.5-0.3); %SF 10St14=97(+2-6)											**
*^{256}Rf^{m}	T : from 09Je01=25(2); others: 21Kh03=14(+6-4) 11Ro20=17(5)											**
*^{256}Rf^{n}	T : from 09Je01=17(2); other: 21Kh03=10(+5-3)											**
*^{256}Rf^{p}	T : from 09Je01=27(5); other: 20Mo10=18(7)											**
*^{256}Db	T : average 24Po18=1.4(+0.3-0.2), supersedes 24Po17=1.6(+0.3-0.2), 01He35=1.6(+0.5-0.3); other: 83Og.A=2.6(+1.4-0.8)											**
*^{256}Db	D : %β^+ average 24Po18=10(4) 01He35=36(12) 08Ne01=30(11)											**
^{257}Es	89480#	410#				7.7 d 0.2	$7/2^+$#		12		$\beta^-\approx$100;α ?	
^{257}Fm	88578	4				100.5 d 0.2	$9/2^+$		12 13As02	J	α=99.790 4;SF=0.210 4	
^{257}Md	88992.7	1.1				5.52 h 0.05	$(7/2^-)$		12 93Mo18	D	ε=84.8 26;α=15.2 26;SF ?	
^{257}No	90247	6				24.5 s 0.5	$(3/2^+)$		12 02Ho11	D	α=85 8;β^+ ?;SF ?	*
^{257}No^{p}	90460#	50#	210#	50#			$7/2^+$#					
^{257}Lr	92640#	30#			*	6.0 s 0.4	$(7/2^-)$		12 16He08	J	$\alpha\approx$100;β^+ ?;SF ?	*
^{257}Lr^{m}	92740#	60#	100#	50#	*	0.27 s 0.12	$1/2^-$#		16He08	TI	α ?;IT ?	*
^{257}Lr^{p}	92790#	110#	150#	100#			*am*					
^{257}Rf	95870	8				5.04 s 0.14	$(1/2^+)$		12 22Ha04	T	α=89.3 14;β^+=9.4 14;SF=1.3 3	*
^{257}Rf^{m}	95939	8	70	5	AD	4.38 s 0.05	$11/2^-$#		12 22Ha04	ETD	α=81.0 25;IT=13.8 26;β^+=4.8 6; SF=0.4 2	*
^{257}Rf^{n}	97021	8	1152	5	IT	106 μs 6	$21/2^+$#		12 13Ri07	TJ	IT=100	*
^{257}Db	100130	160			*	1.90 s 0.09	$9/2^+$#		12 25Br09	TD	α=96.7 8;SF=3.3 8;β^+ ?	*
^{257}Db^{m}	100250#	170#	120#	50#	AD*	663 ms 41	$(1/2^-)$		12 25Br09	TD	$\alpha\approx$100;SF ?;β^+ ?	*
^{257}Db^{n}	101230#	260#	1100#	200#		717 μs 24	$25/2^-$#		25Br09	TDI	IT$\approx$100;α ?	*
^{257}Sg	105830#	170#				13.5 ms 3.0	$9/2^-$#		25Mo17	TD	SF$\approx$90;$\alpha\approx$10	*
^{257}Sg^{m}	105950#	170#	120#	30#		60 μs	$5/2^+$#		25Mo17	TJ	SF ?;α ?;IT ?	*
*^{257}No	T : 05As05=24.5(0.5)											**
*^{257}Lr	T : average 10St14=6.3(+0.9-0.7) and 5.8(0.5); others (not used): 97He29=3.3(+0.5-0.4), 4.3(+1.3-0.8) 76BeYM=0.646(0.025) 71Es01=0.6(0.1)											**
*^{257}Lr	J : favored α decay to ^{253}Md [J^π=(7/2$^-$)]											**
*^{257}Lr^{m}	J : direct β^+ decay feeding from ^{257}Rf (J^π=1/2$^+$)											**
*^{257}Lr^{m}	T : symmetrized from 16He08=0.203(+0.164-0.063)											**
*^{257}Rf	J : favored α decay to the (1/2$^+$) level at 670 keV in ^{253}No F											**
*^{257}Rf	T : average 22Ha04=6.2(+1.2-1.0) 13Ri07=6.1(0.5) 10St14=5.5(0.4) 10Be16=4.8(0.2) 09Qi04=4.7(0.3) 08Dr05=7.2(+1.3-1.1); others: 85So03=3.8(0.8)											**
*^{257}Rf	T : 74Be.A=4.8(0.3) 71Gh03=4.8(0.5)											**
*^{257}Rf	D : %β^+ from 16He08, stated that 10St14=19.4(1.4) is a misprint; other: 09Qi04=2(1)%											**
*^{257}Rf^{m}	T : average 22Ha04=4.37(0.05) 20Mo10=4.7(0.4) 13Ri07=4.7(0.4) 10St14=4.9(0.7) 10Be16=4.6(0.3) 09Qi04=4.1(+2.4-1.3) 08Dr05=4.1(+0.7-0.6)											**
*^{257}Rf^{m}	T : 97He29=3.9(0.4)											**
*^{257}Rf^{m}	D : %IT from 100$^-$%α-%ε-%SF, but 22Ha04=14(1); other: %β^+: 16He08=11.5(1.5)											**
*^{257}Rf^{n}	E : 1082(2) keV above ^{257}Rf^{m} in 10Be16											**
*^{257}Rf^{n}	T : others: 10Be16=134.9 (7.7), reanalyzed in 13Ri07 to 10Be16=110(5) 20Mo10=105(19) 09Je01=109(13) (same group as 13Ri07) 09Qi04=160(+42-31)											**
*^{257}Db	T : average 25Br09=1.8(0.1), supersedes 17Br.A=1.81(+0.10-0.11), 09He20=2.3(0.2), supersedes 01He35=1.50(+0.19-0.15) 10He11=1.5(+0.9-0.4)											**
*^{257}Db	D : %SF symmetrized from 25Br09=3.0(+1.0-0.5); %α other: 23Ni.2=90											**
*^{257}Db	J : expected conf=π9/2[624] at Z=105 by NUBASE; other: 25Br09=9/2$^-$ and conf=π9/2[505]											**
*^{257}Db^{m}	T : average 25Br09=650(+60-50), supersedes 17Br.A=650(+40-50), 09He20=670(60), supersedes 01He35=760(+150-110) 10He11=360(+220-90); others:											**
*^{257}Db^{m}	T : 24Zh19=480(+210-110)											**
*^{257}Db^{m}	J : favored α decay to ^{253}Lr^{m} [J^π=(1/2$^-$)]											**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{257}$Db^n	T : symmetrized from 25Br09=710(+29-18)											**
$*^{257}$Db^n	J : expected conf=π9/2[624]$\otimes\nu^2$(7/2[624],9/2[734])											**
$*^{257}$Sg	T : symmetrized from 25Mo17=12.6(+3.7-2.3)											**
$*^{257}$Sg^m	E : from systematics of 5/2$^+$ states in N=151 isotones											**
^{258}Es	92700#	400#				4# m					β^- ?;α ?	
^{258}Fm	90420#	200#				370 μs 14	0^+	17	86Hu05	T	SF≈100;α ?	
^{258}Md	91691	3				51.50 d 0.29	8^-#	17	93Mo18	DT	α≈100;β^+<0.003;β^-<0.003	
^{258}Md^m	91820#	50#	130#	50#		57.0 m 0.9	1^-#	17	93Mo18	DT	ε=?;SF ?;β^- ?;α ?	*
^{258}No	91480#	100#				1.23 ms 0.12	0^+	17	18Br13	T	SF≈100;α ?	*
^{258}Lr	94780#	100#				3.6 s 0.4	2^-#	17	14Ha04	TD	α=97.4 18;β^+=2.6 18	*
^{258}Lr^p	95020#	140#	240#	100#			*am*					
^{258}Rf	96354	13				12.5 ms 0.5	0^+	17	20Mo11	T	SF=?;α=4.9 16	*
^{258}Rf^m	97550#	300#	1200#	300#		3.4 ms 1.7	5^+#	17	16He15	ITD	IT≈100;α ?;β^+ ?	*
^{258}Rf^n	97850#	500#	1500#	500#		15 μs 10		17	16He15	ITD	IT≈100;SF ?	
^{258}Db	101647	11			&	4.41 s 0.21	5^+#	17	19Vo03	TEJ	α=77 8;β^+=23 8;SF ?	*
^{258}Db^m	101708	11	60	15	AD &	2.17 s 0.36	1^+#	17	19Vo03	TJ	α=64 10;β^+=36 10	*
^{258}Db^p	101930#	150#	280#	150#								
^{258}Db^q	101804	11	156.5	0.5					09He20	E		
^{258}Sg	105350#	410#				2.7 ms 0.4	0^+	17	17He08	TD	SF≈100;α ?	*
$*^{258}$Md^m	D : %SF<15, %α<1.2, %β^-<30 and %SF<30 in 93Mo18											**
$*^{258}$No	T : average 18Br13=1.24(+0.16-0.14) 89Hu09=1.2(0.2)											**
$*^{258}$Lr	T : 14Ha04=3.54(+0.46-0.36); others: 15Mo25=2.6(+1.2-1.1) 20Ha27=3.14(+1.36-0.76)											**
$*^{258}$Rf	T : average 20Mo11=8.79(1.12) 19He17=14.2(+1.2-0.4) 16He15=10.0(1.1) 08Ga08=14.7(+1.2-1.0) 85So03=13(3) 69Gh01=11(2); other: 20Ku23=12(+16-10)											**
$*^{258}$Rf	D : %α from 16He15; other: 08Ga08=31(11)											**
$*^{258}$Rf^m	T : symmetrized from 16He15=2.4(+2.4/-0.8)											**
$*^{258}$Db	T : others: 24Zh19=3.0(+1.8-1.0) 16He15=4.4(1.0) 09He20=4.3(0.5) 06Fo02=4.8(+1.0-0.8) 01Ga20=4.3(1.1) 85He22=4.4(+0.9-0.6) 81Mu06=4.0(+1.0-0.8)											**
$*^{258}$Db	D : from 09He20; others: %β^+ 06Fo02=39(+11-9) 85He22=33(+9-5)											**
$*^{258}$Db^m	T : others: 24Zh19=3.0(+1.8-1.0) 16He15=3.6(0.3),2.8(0.6) 09He20=1.9(0.5)											**
$*^{258}$Db^m	D : from 09He20											**
$*^{258}$Sg	T : average 17He08=2.6(+0.6-0.4), determined by combining data from 09Fo02, 02Pa.A and 97He29, 26Is.A=2.2(+2.4-1.0) at 95% CL											**
^{259}Fm	93700#	280#				1.5 s 0.2	$1/2^-$#	11			SF=100	
^{259}Md	93560#	100#				1.60 h 0.06	$7/2^-$#	11	93Mo18	TD	SF≈100;α ?	*
^{259}No	94076	6				58 m 5	$9/2^+$	11	13As02	J	α=75 4;ε=25 4;SF<10	
^{259}No^p	94310#	150#	230#	150#			$1/2^-$#					
^{259}Lr	95850#	70#				6.2 s 0.3	$1/2^-$#	11			α=78 2;SF=22 2;β^+ ?	
^{259}Lr^p	96200#	170#	350#	150#								
^{259}Rf	98287	18				2.63 s 0.26	$3/2^+$#	11	08Ga08	TD	α=85 4;β^+=15 4;SF ?	*
^{259}Rf^p	98350	70	60	70	AD		($7/2^+$)					
^{259}Rf^q	98490	90	210	90	AD							
^{259}Db	102030#	40#				510 ms 160	$9/2^+$#	11	01Ga20	TD	α=100	*
^{259}Sg	106516	15				402 ms 56	($11/2^-$)	11	15An05	TJD	α≈100;SF ?	
^{259}Sg^m	106601	15	85	11	AD	226 ms 27	($1/2^+$)		15An05	TJD	α=?;SF=3 1	*
^{259}Sg^n	107720#	300#	1200#	300#		40 μs			25Mo17	TD	IT=?	*
^{259}Bh	112300#	300#				10# ms	$5/2^-$#				α ?;β^+ ?;SF ?	
$*^{259}$Md	T : other: 82Wi08=1.72(0.20)											**
$*^{259}$Md	D : %α 93Mo18<1.3%											**
$*^{259}$Rf	T : average 08Ga08=2.5(+0.4-0.3) 94Gr08=1.7(+0.8-0.5); others: 06Gr24=1.9(+1.3-0.5) 04Fo08=2.2(+1.7-0.8) 03Gi05=4.0(+7.3-1.6)											**
$*^{259}$Rf	T : 98Ho13=2.6(+1.4-0.7) 85So03=3.4(1.7) 81Be03=3.0(1.3) 73Dr10=3.2(0.8) 69Gh01=3.2(0.8); 10Ni14(1 event)=107 ms											**
$*^{259}$Rf	I : 08Ga08 suggest existence of an isomer formed only in direct production											**
$*^{259}$Rf	D : %β^+ 08Ga08=15(4)% to ^{259}Lr followed by SF; %SF 17He08<3%											**
$*^{259}$Db	T : 22Ga22(review),01Ga20=510(160); other: 25Mo17=0.5 s											**
$*^{259}$Sg^m	D : %SF: 15An05=3(1), assumed for this state by NUBASE											**
$*^{259}$Sg^m	T : other: 25Mo17=0.23 s											**
$*^{259}$Sg^n	TD : one E(e-)=250 keV event 40 μs after implantation in 25Mo17											**
^{260}Fm	95770#	440#			EU	1# m	0^+				SF ?	*
^{260}Md	96540#	320#				27.8 d 0.8		98	92Lo.B	TD	SF≈100;α ?;ε ?;β^- ?	*
^{260}No	95600#	200#				106 ms 8	0^+	98			SF=100	*
^{260}Lr	98290#	150#				3.0 m 0.5	5^-#	98			α=?;β^+ ?	
^{260}Rf	99150#	200#				20.7 ms 0.9	0^+	98	26Is.1	T	SF≈100;α ?;β^+ ?	*
^{260}Db	103660#	40#				1.52 s 0.13		98	77Be36	TD	α=90.4 6;SF=9.6 6;β^+ ?	*
^{260}Db^p	103760#	160#	100#	150#								
^{260}Sg	106553	18				4.95 ms 0.33	0^+	98	09He20	TD	SF=?;α=29.0 21	*
^{260}Bh	113190#	270#				41 ms 14		16	08Ne01	TD	α≈100;β^+ ?;SF ?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
$*^{260}$Fm	I : $T_{1/2}$∼4 ms and %SF=100 mode were reported in the 92Lo.B, but the results were not confirmed in the subsequent experiment by same group											**
$*^{260}$Fm	I : (97Lo.A)											**
$*^{260}$Md	T : from 92Lo.B supersedes 86Hu01=31.8(0.5), same group											**
$*^{260}$No	T : other: 19De11=155(+212-57)											**
$*^{260}$Rf	T : average 26Is.1=16.8(+2.8-1.9) [uncertainty=+5.5-3.8 is 2σ] 08Ga08=22.2(+3.0-2.4) 85So03=21(1); others: 08Go.A=21(+7.3,-4.3) 13Mu08=12(11)											**
$*^{260}$Db	T : others: 04Mo26=1.5(+0.8-0.4) 04Ga29=0.89(+0.79-0.35) 70Gh02=1.6(0.3) 71Dr01=1.4(+0.6)0.3)											**
$*^{260}$Sg	T : supersedes 85Mu11=3.6(+0.9-0.6); other: 26Is.A=7.0(+2.6-1.7) at 95%CL											**
$*^{260}$Sg	D : average 26Is.A=29(3) 09He20=29(3); other: 85Mu11 %SF=50(+30-20) and %α=50(+20-30)											**
$*^{260}$Bh	T : symmetrized from 08Ne01=35(+19-9)											**
^{261}Md	98660#	510#				40# m	$7/2^-$#				α ?	
^{261}No	98440#	200#				3# h	$1/2^-$#				α ?	
^{261}Lr	99610#	200#				39 m 12	$1/2^-$#		18		SF≈100;α ?	*
^{261}Rf	101290#	50#			*	69.9 s 2.5	$7/2^+$#		18 24Og02	TD	α≈100;β^+ ?;SF ?	*
^{261}Rf^m	101310	30	20#	60#	*	2.12 s 0.15	$3/2^+$#		18 24Og02	TE	SF=82 4;α=?	*
^{261}Rf^p	101440#	70#	150#	50#			$1/2^-$#					
^{261}Db	104280#	110#				4.7 s 1.0	$9/2^+$#		18 13Su04	TD	SF=73 11;α=27 11	*
^{261}Db^p	104560#	230#	280#	200#								
^{261}Sg	108008	17				183 ms 5	(3/2$^+$)		18 10St14	TJD	α=98.1 4;β^+=1.3 3;SF=0.6 2	*
^{261}Sg^m	108110#	50#	100#	50#		9.3 μs 1.8	$7/2^+$#		18 10Be16	T	IT=100	*
^{261}Bh	113060	180				12.8 ms 3.2	$5/2^-$#		18 10He11	TJD	α≈100;SF ?	*
^{261}Hs	119020#	400#				10# μs	$1/2^+$#				α ?;SF ?	
$*^{261}$Lr	TI : from 89HuZU; other: 91HeZT=44(+17-11)											**
$*^{261}$Rf	T : average 24Og02=68(3) 02Ho11=78(+11-6) 00Sy01=74(+7-6) 71Gh01=65(10); others: 13Mu08=19(+5-3) 12Ha05=59(42) 08Dv02=20(+110-10)											**
$*^{261}$Rf	T : 08Ga08=71(+342-33)											**
$*^{261}$Rf^m	T : average 24Og02=2.6(+0.7-0.5), combined with 08Dv02 data, 12Ha05=2.6(+0.7-0.5) 11Ha13=1.9(0.4) (α(t)) and 1.8(0.4) (SF(t))											**
$*^{261}$Rf^m	T : 08Go.A=2.2(+0.9-0.5) 96La11=2.1(0.2); others: 08Dv02=3(1) 02Ho11=4.2(+3.4-1.3), 13Mu08=3.9(3.0) 15Mo25=4.7(+3.6-1.4) 08Mo09=2 events at 2.97											**
$*^{261}$Rf^m	T : and 8.3 s 94La22=1.2(+1.0-0.5) originally attributed to ^{262}Rf, but re-assigned in 08Go.A and 11Ha13 to ^{261}Rf											**
$*^{261}$Rf^m	D : %SF average 11Ha13=73(6) 12Ha05=82(9) 13Mu08=88(5); other: 08Dv02=91											**
$*^{261}$Db	T : average 13Su04=4.7(+3.6-1.4) 10St14=4.1(+1.4-0.8); others: 04Ga29=1.70(+0.79-0.49) 71Fl02=1.8(0.6) 71Gh01=1.8(0.6)											**
$*^{261}$Db	D : from 13Su04 where 11 SF and 4 α events were observed; uncertainty estimated by NUBASE											**
$*^{261}$Sg	T : average 10St14=184(5), supersedes 09He20=195(15), 10Be16=178(14)											**
$*^{261}$Sg^m	T : symmetrized from 10Be16=9.0(+2.0-1.5)											**
$*^{261}$Bh	T : average 24Zh19=8.9(+2.2-1.5) 10He11=11.8(+3.9-2.4) 08Ne08=6.7(+3.8-1.8); others: 06Fo02=10(+14-5) 89Mu09=11.8(+5.3-2.8), superseded by 10He11											**
$*^{261}$Bh	D : no SF decays were observed in 10He11 (%SF<5)											**
^{262}Md	101670#	450#				3# m					SF ?;α ?	
^{262}No	100090#	360#				∼ 5 ms	0^+		01		SF≈100;α ?	*
^{262}Lr	102140#	200#				212 m 18			01 00Ho27	D	SF≈100;α ?	*
^{262}Rf	102390#	220#				250 ms 100	0^+		01 08Go.A	TD	SF=100	*
^{262}Rf^m	103390#	460#	1000#	400#		47 ms 5	(8$^-$,9$^-$)#		85So03	TD	SF=100	*
^{262}Db	106250#	140#				34 s 4			01 14Ha04	TD	SF=52 4;α=48 4;β^+ ?	*
^{262}Db^p	106300#	160#	50#	70#							α ?	
^{262}Sg	108379	20				10.3 ms 1.7	0^+		01 17He08	D	SF=94 6;α=?	*
^{262}Sg^p	109240	110	860	110	AD		9$^-$#					*
^{262}Bh	114330#	150#			*	90 ms 9	6$^-$#		01 24Zh19	T	α≈100;SF ?	*
^{262}Bh^m	114392	19	60#	150#	AD*	9.5 ms 1.6	1$^-$#		01 06Fo02	T	α≈100;SF ?	*
^{262}Bh^n	114610	50	280#	160#	AD	5# ms	10$^+$#		01		α≈100;IT ?	
^{262}Hs	118650#	300#				100# μs	0^+				α ?;SF ?	
$*^{262}$No	TI : from 89LoZW; other: 89HuZU											**
$*^{262}$Lr	TI : from 89HuZU; others: 90HuZV, 89LoZW											**
$*^{262}$Lr	D : %SF<10 from $T_{1/2}$(SF)/$T_{1/2}$=10 in 00Ho27											**
$*^{262}$Rf	T : symmetrized from 08Go.A=210(+128-58), 7 events; others: 85So03=1.3(0.1) 96La11=2.1(0.2) 94La22=1.2(+1.0-0.5) 98Tu01=2.5(+2.4-1.6). 11Ha13 and											**
$*^{262}$Rf	T : 08Go.A suggested that the long-lived activities belong to ^{261}Rf											**
$*^{262}$Rf^m	I : assigned as a K isomer in 96La11											**
$*^{262}$Db	T : symmetrized from 14Ha04=33.8(+4.4-3.5); others: 15Mo25=39(+53-14) 20Ha27=33.7(+9.3-6.0)											**
$*^{262}$Sg	T : average 06Gr24=15(+5-3) 17He08=8.5(+2.3-1.5), determined by merging data from 01Ho06 and 12Ac04											**
$*^{262}$Sg	D : %α two events reported in 12Ac04											**
$*^{262}$Sg^p	J : favored α decay from ^{266}Hs^m (J^π=9$^-$#)											**
$*^{262}$Bh	T : average 24Zh19=96(+18-13) 09He20=83(14), supersedes 89Mu09=102(26) 06Fo02=84(+21-16); others: 08Ne08=120(+55-29) 06St.A=135(+15-12)											**
$*^{262}$Bh	T : 81Mu06(1 event)=115(+231-75)											**
$*^{262}$Bh^m	T : average 06Fo02=9.6(+3.6-2.4) 97Ho14(11 events)=12.2(+5.5-2.8) 89Mu09=8.0(2.1); others: 09He20=22(4) 08Ne08(4 events)=16(+14-5)											**
$*^{262}$Bh^m	T : 24Zh19=21(+8-5) 81Mu06(5 events)=4.7(+2.3-1.6)											**
^{263}No	103130#	490#				20# m	$9/2^+$#				α ?;SF ?	
^{263}Lr	103710#	220#				5# h	$1/2^-$#				α ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{263}Rf	104750#	150#				7 s 3	1/2$^-$#	99	24Og02	TDJ	SF≈100;α=?	*
^{263}Rf^p	104920#	160#	170#	50#			9/2$^+$#					
^{263}Db	107110#	170#				29 s 9	9/2$^+$#	99	92Kr01	DT	SF=56 14;α=?;β^+=6.9 16	*
^{263}Db^p	107370#	260#	260#	200#								
^{263}Sg	110120	60				940 ms 140	3/2$^+$#	99	06Gr24	TD	α=?;SF=13 8	*
^{263}Sg^m	110170	70	51	19	AD	420 ms 100	7/2$^+$#	99	04Fo08	T	α≈100;SF ?;IT ?	*
^{263}Sg^p	110210	70	100	30	AD							
^{263}Bh	114530#	300#				200# ms	5/2$^-$#	99			α ?	
^{263}Hs	119670	80				0.9 ms 0.4	3/2$^+$#	99	09Dr02	TD	α≈100;SF ?	*
^{263}Hs^m	120000	80	330	110	AD	1# ms	11/2$^-$#				α≈100;SF ?	
*^{263}Rf	T : from 24Og02=5.1(+4.6-1.7), combination with 08Dv02 data; others: 03Kr20=24(+19-7) m 93Gr.C=500(+300-200) s 92Cz.A=600(+300-200) s											**
*^{263}Rf	T : 08Dv02=8(+40-4) s using one SF event											**
*^{263}Rf	D : %α observed in 93Gr.C (two events)											**
*^{263}Db	D : %SF symmetrized from 92Kr01=57(+13-15); %β^+ average 03Kr20=3(+4-1) 93Gr.C=8(2)											**
*^{263}Db	T : symmetrized from 92Kr01=27(+10-7); other: 98Ik02=54(+98-21) from SF(t)											**
*^{263}Sg	T : average 06Gr24=820(+370-190) 94Gr08=553(+336-152) 74Gh04=900(200), all produced in direct reaction population											**
*^{263}Sg^m	T : average 04Fo08=290(+170-90) 04Mo40=549(+300-143) 03Gi05=222(+404-87) 98Ho13=310(+160-80), all produced via α decay of ^{267}Hs; other: τ=702 ms											**
*^{263}Sg^m	T : via α decay of ^{267}Hs in 10Ni14											**
*^{263}Hs	T : symmetrized from 09Dr02=0.74(+0.48-0.21) 6 events observed											**
*^{263}Hs	D : no SF observed in 09Dr02 (%SF<8.4)											**
^{264}No	105010#	590#				1# m	0$^+$				α ?;SF ?	
^{264}Lr	106430#	440#				5.4 h 1.8	5$^-$#	23	22Og08	TD	SF≈100;α ?	*
^{264}Rf	106060#	360#				1# h	0$^+$				α ?	
^{264}Db	109270#	250#				3# m					α ?	
^{264}Sg	110780#	280#				78 ms 25	0$^+$	06	17He08	TD	SF≈100;α ?	*
^{264}Bh	115950#	160#				1.07 s 0.21		98	04Mo26	TD	α≈85;SF≈15;β^+ ?	*
^{264}Bh^p	116280#	220#	330#	150#			*am*					
^{264}Hs	119569	27				0.7 s 0.3	0$^+$	98	17He08	TD	α=?;SF=30 30	*
*^{264}Lr	T : symmetrized from 22Og08,23Ko22=4.8(+2.2-1.3), supersedes 22Og07=4.9(+2.1-1.3)											**
*^{264}Sg	T : symmetrized from 17He08=68(+32-16), determined by merging data from 10Ni14, 06Ni10 and 06Gr24											**
*^{264}Sg	D : no α's observed in 17He08 (%α<36)											**
*^{264}Bh	T : average 04Mo26=0.9(+0.3-0.2) 04Ga29=1.17(+0.88-0.44) 02Ho11=1.02(+0.69-0.29)											**
*^{264}Hs	T : symmetrized from 17He08=0.63(+0.34-0.16), determined by merging data from 87Mu15 and 11Sa41											**
*^{264}Hs	D : %SF symmetrized from 17He08=20(+40-20), determined by merging data from 87Mu15 and 11Sa41											**
^{265}Lr	108310#	550#				10# h	1/2$^-$#				α ?;SF ?	
^{265}Rf	108680#	360#				1.6 m 0.6	9/2$^+$#	18	25Og03	TD	SF≈100;α ?	*
^{265}Db	110430#	220#				15# m	9/2$^+$#				α ?	
^{265}Sg	112700#	60#			*	9.2 s 1.3	7/2$^+$#	18	24Og02	T	α≈100;SF ?	*
^{265}Sg^m	112700#	80#	0#	60#	AD*	15.9 s 1.9	1/2$^-$#	18	24Og02	T	α≈100;SF ?	*
^{265}Sg^p	112810#	80#	110#	50#			9/2$^+$#					
^{265}Sg^q	112930#	120#	230#	100#			3/2$^-$#					
^{265}Bh	116370#	240#				1.19 s 0.52	5/2$^-$#	18	04Ga29	TD	α≈100;SF ?	*
^{265}Hs	120903	23				1.96 ms 0.16	3/2$^+$#	18	09He20	T	α≈100;SF ?	*
^{265}Hs^m	121133	23	229	22	AD	360 μs 150	11/2$^-$#	18	09He20	T	α≈100;IT ?	*
^{265}Mt	126600#	440#				2# ms					α ?	
*^{265}Rf	T : symmetrized from 25Og03=1.3(+0.8-0.3), supersedes 17Og01,15Ut02=1.0(+1.2-0.3); others: 16Ho09=1.0(+1.4-0.4) 10El06=1.8(+8.4-0.8), one SF											**
*^{265}Rf	T : event at 152 s											**
*^{265}Sg	T : average 24Og02=8.5(+2.6-1.6) 12Ha05=8.5(+2.6-1.6) 08Du09=8.9(+2.7-1.9)											**
*^{265}Sg	D : %SF 12Ha05<50, no SF observed											**
*^{265}Sg^m	T : average 24Og02=14.4(+3.7-2.5) 13Su04=20(+15-6) 12Ha05=14.4(+3.7-2.5) 08Du09=16.2(+4.7-3.5); others: 08Dv02=15(+7-4) 06Dv01=14.9(+9.1-4.1)											**
*^{265}Sg^m	T : 98Tu01=7.4(+3.3-2.7); 08Mo09 2 events at 23 and 80 s											**
*^{265}Sg^m	D : %SF 12Ha05<50, no SF observed											**
*^{265}Bh	T : symmetrized from 04Ga29=0.94(+0.70-0.31)											**
*^{265}Hs	T : average 09He20=1.9(0.2) 99He11=2.0(+0.3-0.2)											**
*^{265}Hs^m	T : symmetrized from 09He20=300(+200-100); other: 99He11=750(+170-120)											**
^{266}Lr	111660#	540#				22 h 14		19	19Kh04	TD	SF=100	*
^{266}Rf	110120#	410#				4# h	0$^+$				α ?;SF ?	
^{266}Db	112750#	280#				22 m 14		19	22Og08	T	SF≈100;α ?;β^+ ?	*
^{266}Sg	113620#	250#				390 ms 110	0$^+$	19	17He08	D	SF≈100;α ?	*
^{266}Bh	118110#	160#				10.6 s 2.2		19	20Ha27	T	α≈100;β^+ ?;SF ?	*
^{266}Hs	121149	25				3.0 ms 0.6	0$^+$	21	12Ac04	TD	α=?;SF=24 9	*
^{266}Hs^m	122250	90	1100	90	AD	280 ms 220	9$^-$#	21	12Ac04	T	α≈100;SF ?;IT ?	*
^{266}Mt	127750#	150#				2.0 ms 0.5	1$^+$#	19	97Ho14	TD	α≈100;SF ?	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{266}Mt^m	128270	40	520#	160#	AD	4.6 ms 1.6	10^+#		09Ne02	TD	α=100	*
*^{266}Lr	T : symmetrized from 19Kh04,14Kh04=11(+21-5)											**
*^{266}Db	T : 22Og08,23Ko22=11(+21-4), supersedes 17Og01,07Og02=22(+105-10)											**
*^{266}Sg	T : average 13Og03=280(+190-80) 08Dv02=360(+250-100), supersedes 06Dv01=444(+444-148); others: 98Tu01=21(+20-12) s 94La22=10-30 s											**
*^{266}Sg	D : %SF 17He08>90, no α's observed											**
*^{266}Bh	T : symmetrized from 20Ha27=10.0(+2.6-1.7); others: 15Mo25=2.2(+2.9-0.8) 06Qi03=0.66(+0.59-0.26)											**
*^{266}Hs	T : average 12Ac04=2.97(+0.78-0.51) 01Ho06=2.3(+1.3-0.6)											**
*^{266}Hs^m	T : symmetrized from 12Ac04=74(+354-34); other: 01Ho06=6.3(+8.6-2.3) is ruled out by the 12Ac04 data											**
*^{266}Hs^m	J : from 15Ko14, based on expected conf=ν^2(7/2[613],11/2[735])											**
*^{266}Mt	T : symmetrized from 97Ho14=1.7(+0.6-0.4); other: 09Ne02=3.3(+2.5-1.0) associated with an isomer											**
*^{266}Mt^m	T : average 09Ne02=3.3(+2.5-1.0) 97Ho14=3.4(+4.7-1.3), 3 events at 7.8, 2.0 and 5.0 ms											**
^{267}Rf	113440#	580#				55 m 18	$11/2^-$#	21	22Og05	TD	SF=100	*
^{267}Rf^p	113460#	580#	20#	50#								
^{267}Db	114110#	370#				1.8 h 0.7	$9/2^+$#	21	22Og08	TD	SF=100	*
^{267}Sg	115730#	160#				14 m 8	$9/2^+$#	21	24Og02	TD	$\alpha\approx$100;SF ?	*
^{267}Sg^m	115930#	190#	200#	100#		130 s 70	$1/2^-$#		24Og02	TD	SF$\approx$100;α ?	*
^{267}Sg^p	115770#	170#	40#	30#			$11/2^-$#					
^{267}Sg^q	116090#	170#	360#	50#	AD		$3/2^-$#					
^{267}Bh	118770#	260#				19 s 6	$5/2^-$#	21			α=100	*
^{267}Hs	122580	60			*	57 ms 11	$7/2^+$#	21	04Mo40	T	$\alpha\approx$100;SF ?	*
^{267}Hs^m	122620	70	39	24	AD*	988 μs 86	$1/2^-$#		04Fo08	TD	α=?;IT ?	*
^{267}Mt	127830#	500#				10# ms					α ?	
^{267}Ds	133880	90				10 μs 8	$3/2^+$#	21	95Gh04	T	α=100	*
*^{267}Rf	T : symmetrized from 22Og05,23Ib01=48(+23-12); others: 17Og01,06Og05=1.3(+2.3-0.5) h; 04Og12 one event at 2.3 h											**
*^{267}Db	T : symmetrized from 22Og08,23Ko22=1.4(+1.0-0.4), supersedes 17Og01=1.3(+1.6-0.5)											**
*^{267}Sg	T : symmetrized from 24Og02=9.8(+11.3-4.5), combined with 08Dv02 data											**
*^{267}Sg^m	T : symmetrized from 24Og02=100(+92-39), combined with 08Dv02 data; others: 08Dv02=80(+60-20) 99Og.B=19 ms											**
*^{267}Sg^m	D : other: 08Dv02: %α=17, %SF=83											**
*^{267}Bh	T : average 00Wi15=17(+14-6) 00Ei05=14(+9-4)											**
*^{267}Hs	T : average 04Mo40=53(+22-12) [from τ=77(+31-17)] 98Ho13=50(+19-11) [from τ=72(+28-16)]											**
*^{267}Hs^m	T : 04Fo08(2 events)=940(+120-45); other: 04Mo40(1 event)=800(+3800-370)											**
*^{267}Ds	T : 95Gh04=2.8(+13.0-1.3), one event with τ=4 μs											**
^{268}Rf	115480#	660#				1# h	0^+				α ?;SF ?	
^{268}Db	117160#	530#				17 h 5		19	22Og08	TD	α=52 13;SF=?	*
^{268}Db^p	117300#	530#	140	60								
^{268}Sg	116790#	470#				21 s 11	0^+		23Og03	TD	SF=100	*
^{268}Bh	120720#	390#				190# s					α ?;SF ?	
^{268}Hs	122970#	300#				1.4 s 1.1	0^+	19	10Ni14	TD	α=100	*
^{268}Mt	129140#	220#				23 ms 7		19	04Mo26	T	α=100	*
^{268}Ds	133650#	300#				100# μs	0^+				α ?	
*^{268}Db	T : symmetrized from 22Og07,23Ko22=16(+6-4) using E_α=7.6-8.0 MeV vs time; others: 17Og01=28.3(+3.3-2.6) 16Fo10=28(3) 13Ru11=26(+7-5)											**
*^{268}Db	T : 13Og01=25.9(+6.2-4.2) 12Og02=27.9(+7.8-5.0) 05Og02=29(+9-6) 04Og03=16(+19-6) 07St18=28(+11-4) using ^{272}Bh E_α-SF time differences											**
*^{268}Db	D : symmetrized from 22Og08,23Ko22=51(+14-12), supersedes 22Og07=55(+20-15)											**
*^{268}Sg	T : symmetried from 13(+17-4)											**
*^{268}Hs	T : symmetrized from 10Ni14=0.38(+1.8-0.17)											**
*^{268}Mt	T : symmetrized from 04Mo26=21(+8-5), 14 events; other: 02Ho11=42(+29,-12), 6 events											**
^{269}Db	119220#	620#				3# h	$9/2^+$#				α ?;SF ?	
^{269}Sg	119650#	360#				16 m 4		21	26Ib.1	T	α=76 16;SF ?	*
^{269}Bh	121590#	370#				1# m	$5/2^-$#				α ?	
^{269}Hs	124530#	80#			*	16 s 5	$9/2^+$#	21	24Og02	TDJ	α=100	*
^{269}Hs^m	124570#	120#	30#	120#	*	11 s 9	$3/2^-$#		24Og02	TDJ	α=100	*
^{269}Hs^p	124690#	100#	160#	50#			$11/2^-$#					
^{269}Mt	129320#	310#				100# ms					α ?	
^{269}Ds	134840	30				230 μs 110		21	95Ho03	T	α=100	*
*^{269}Sg	T : average 26Ib.1=14(+9-3) 25Og03=13(+6-4), supersedes 17Og01,15Ut02=3.1(+3.7-1.1); others: 16Ho09=185(+254-68) s 10El06=128(+613-58) s, one α											**
*^{269}Sg	T : event at 185 s											**
*^{269}Sg	D : %α symmetrized from 25Og03=87(+6-23)											**
*^{269}Hs	T : average 24Og02=13(+10-4) 15Mo25,13Su04=12(+9-4); others: 02Ho11=14(+26-6), 2 events at 19.7 s and 22.0 s, 84Sc13 and 08Mo09 2 events at 14 and											**
*^{269}Hs	T : 0.3 s											**
*^{269}Hs^m	T : symmetrized from 24Og02=2.8(+13.6-1.3)											**
*^{269}Ds	T : symmetrized from 95Ho03=170(+160-60)											**
^{270}Db	122400#	580#				1.7 h 1.0		19	14Kh04	TD	$\alpha\approx$83;SF$\approx$17	*

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference		Decay modes and intensities (%)	
^{270}Sg	121420#	460#				3# m	0^+				α ?;SF ?	
^{270}Bh	124290#	290#				5 m 3		19	22Og08	TD	α=100	*
^{270}Bh^{p}	125010#	350#	720#	200#								
^{270}Hs	125110#	250#				9 s 4	0^+	19	13Og03	TD	$\alpha\approx$100;SF ?	*
^{270}Mt	130710#	190#				800 ms 400		19	15Mo25	TD	α=100	*
^{270}Ds	134690	40				205 μs 48	0^+	19	12Ac04	TD	$\alpha\approx$100;SF ?	*
^{270}Ds^{m}	136080	60	1390	60	AD	4.3 ms 1.2	10^-#	19	12Ac04	T	$\alpha\approx$70;IT$\approx$30	*
*^{270}Db	T : symmetrized from 14Kh04=1.0(+1.5-0.4), combines 14Kh04 and 13Og04 data; others: 19Kh04,14Kh04=1.0(+1.9-0.4)											**
*^{270}Bh	T : symmetrized from 22Og08,23Ko22=2.4(+4.4-0.9), supersedes 17Og01=61(+292-28) s											**
*^{270}Hs	T : symmetrized from 13Og03=7.6(+4.9-2.2); other: 03Tu05=3.6(+0.8-1.4)											**
*^{270}Mt	T : symmetrized from 15Mo25=0.48(+0.66-0.18) s											**
*^{270}Ds	T : average 12Ac04=200(+70-40) 01Ho06=100(+140-40)											**
*^{270}Ds^{m}	T : symmetrized from 12Ac04=3.9(+1.5-0.8); other: 01Ho06=6.0(+8.2-2.2)											**
*^{270}Ds^{m}	J : from 15Ko14, based on expected conf=ν^2(9/2[615],11/2[725]),$K^\pi = 10^-$											**
^{271}Sg	124510#	580#				35 s 10		21	22Og05	TD	α=70 13;SF=?	*
^{271}Bh	125900#	380#				3.7 s 1.6	$5/2^-$#	21	22Og08	TD	α=100	*
^{271}Hs	127670#	170#			*	70 s 40	$11/2^-$#	21	24Og02	TD	$\alpha\approx$100;SF ?	*
^{271}Hs^{m}	127700#	170#	30#	30#	*	11 s 6	$3/2^-$#		24Og02	TDJ	$\alpha\approx$100;SF ?	*
^{271}Mt	131140#	330#				400# ms					α ?	
^{271}Ds	135870	70				141 ms 51		21	16Ho09	T	α=100	*
^{271}Ds^{m}	135940	70	68	27	AD	1.7 ms 0.4					α=100	*
*^{271}Sg	T : symmetrized from 22Og05,23Ib01=31(+13-7); others: 17Og01=1.6(+1.5-0.5) m 06Og05=1.9(+2.4-0.6) m 04Og12=2.4(4.3-1.0) m											**
*^{271}Sg	D : %α symmetrized from 22Og05=73(+10-15); others: %SF 17Og01=58(23) 06Og05,04Og12=50											**
*^{271}Bh	T : symmetrized from 22Og08,23Ko22=2.9(+2.2-0.9), supersedes 17Og01=1.5(+2.8-0.6)											**
*^{271}Hs	T : symmetrized from 24Og02=46(+56-16)											**
*^{271}Hs^{m}	T : symmetrized from 24Og02=7.1(+8.4-2.5)											**
*^{271}Ds	T : average 16Ho09=96(+96-32) 04Mo40=86(+117-22); others:											**
*^{271}Ds^{m}	T : symmetrized from 04Mo40=1.63(+0.44-0.29), combining the 04Mo40 [τ=2.9(+1.3-0.7)] and 98Ho13 [τ=1.8(+0.8-0.4)] data; others:											**
*^{271}Ds^{m}	T : 04Fo08(6 events)=1.6 ms 04Mo40(11 events)=2.0 03Gi05(2 events)=1.4											**
*^{271}Ds^{m}	T : 98Ho13(8 events)=1.1											**
^{272}Sg	126450#	690#				4# m	0^+				α ?;SF ?	
^{272}Bh	128890#	530#				8.8 s 0.7		19	22Og08	TD	α=100	*
^{272}Hs	128990#	470#				0.24 s 0.13	0^+		23Og03	TD	α=100	*
^{272}Mt	133490#	490#				400# ms					α ?;SF ?	
^{272}Ds	136120#	420#				200# ms	0^+				SF ?	
^{272}Rg	142760#	220#				4.2 ms 1.1		19	15Mo25	T	α=100	*
*^{272}Bh	T : 22Og08,23Ko22=8.8(0.7), supersedes 22Og07=7.2(+1.3-0.9) 17Og01=10.6(+1.6-1.1) 16Fo10=10.5(+1.5-1.1) 13Ru11=9.2(+3.1-1.8)											**
*^{272}Bh	T : 13Og01=12.0(+3.1-2.1) 12Og02=8.2(+2.5-1.6) 04Og03=9.8(+11.7-3.5)											**
*^{272}Hs	T : symmetried from 23Og03=0.16(+0.19-0.06)											**
*^{272}Rg	T : symmetrized from 15Mo25=3.8(+1.4-0.8); other: 02Ho11=1.6(+1.1-0.5)											**
^{273}Sg	129760#	400#				5# m					SF ?	
^{273}Bh	130720#	660#				1# m					α ?;SF ?	
^{273}Hs	131730#	370#				770 ms 235		21	25Og03	TD	$\alpha\approx$100; SF ?	*
^{273}Hs^{p}	131780#	370#	50#	40#							α ?;SF ?	
^{273}Mt	134780#	420#				800# ms					α ?;SF ?	
^{273}Ds	138210#	100#				110 ms 90	$11/2^-$#	21	24Og02	TDJ	α=100	
^{273}Ds^{m}	138320#	130#	110#	130#		227 μs 65	$3/2^-$#		24Og02	TDJ	α=100	*
^{273}Rg	142900#	400#				2# ms					α ?	
*^{273}Hs	T : symmetrized from 25Og03=680(+300-160), supersedes 18Ut02=510(+300-140) 17Og01,15Ut02=760(+710-240); others: 16Ho09=765(+765-255)											**
*^{273}Hs	T : 10El06(1 event at 346 ms)=240(+1150-110) 99Ni03=1.2(+1.7-0.6) s, retracted by authors in 02Ni10											**
*^{273}Ds	T : symmetrized from 24Og02=30(+140-15)											**
*^{273}Ds^{m}	T : average 24Og02=180(+110-50) 15Mo25,13Su04=190(+140-60); others: 08Mo09(2 events)=520 and 40, 02Ho11=310; 96Ho13=110 96La12=300(+1300-200)											**
^{274}Bh	133760#	580#				57 s 27		19	17Og01	TD	α=100	*
^{274}Bh^{p}	133910#	590#	150#	100#								
^{274}Hs	133380#	470#				500# ms	0^+				α ?;SF ?	
^{274}Mt	137340#	370#				980 ms 530		19	22Og08	TD	α=100	*
^{274}Ds	138970#	390#				10# ms	0^+				α ?;SF ?	
^{274}Rg	144610#	210#				20 ms 12		19	15Mo25	TD	α=100	*
*^{274}Bh	T : symmetrized from 17Og01=44(+34-13), based on 14Kh04=30(+54-12) 13Og04=54(+65-19)											**
*^{274}Mt	T : symmetrized from 22Og08,23Ko22=640(+760-230), supersedes 17Og01=440(+810-170), based on data from 07Og02											**
*^{274}Rg	T : symmetrized from τ=18(+24-7) in 15Mo25											**
^{275}Bh	135780#	600#				1# m					SF ?	

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)		Excitation energy (keV)			Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
^{275}Hs	136400#	580#				660 ms 180		21	22Og05 TD	$\alpha\approx100$;SF ?	*
^{275}Hs^{p}	136630#	580#	230#	60#							
^{275}Mt	138820#	380#				24 ms 10		21	22Og08 TD	α=100	*
^{275}Mt^{p}	138910#	390#	90#	50#							
^{275}Ds	141330#	340#				0.54 ms 0.21	$3/2^-$#	24	Og02 TDJ	$\alpha\approx100$;SF ?	*
^{275}Rg	145340#	450#				5# ms				α ?	
*^{275}Hs	T : symmetrized from 22Og05,23Ib01=600(+230-130); others: 17Og01=200(+180-60) 06Og05=190(+220-70) 04Og12=150(+270-60) 16Ho09=201(+201-67)										**
*^{275}Hs	D : %α 22Og05>89%, no SF observed										**
*^{275}Mt	T : symmetrized from 22Og08,23Ko22=20(+13-6), supersedes 17Og01=20(+24-7); others: 13Ru11(1 event)=51.3 04Og03(1 event)= 9.7										**
*^{275}Ds	T : symmetrized from 24Og02=0.43(+0.29-0.12)										**
^{276}Bh	138950#	600#				60# s				α ?;SF ?	
^{276}Hs	138130#	720#				100# ms	0^+			α ?;SF ?	
^{276}Mt	141470#	530#				630 ms 50		19	22Og08 TD	α=100	*
^{276}Mt^{m}	141720#	540#	250#	100#	EU	7 s 3		19	17Og01 TD	α=100	*
^{276}Mt^{p}	141630#	540#	160#	50#							
^{276}Ds	142310#	470#				0.19 ms 0.07	0^+	23	Og03 TD	SF=55 17;α=?	*
^{276}Rg	147400#	630#				10# ms				α ?;SF ?	
^{276}Cn	150420#	500#				100# μs	0^+			α ?;SF ?	
*^{276}Mt	T : symmetrized from 23Ko22,22Og08=620(+60-40), supersedes 22Og07=510(+80-70) 17Og01=520(100); other: 16Fo10=690(+90-70)										**
*^{276}Mt^{m}	T : symmetrized from 17Og01=4(+5-1)										**
*^{276}Ds	T : symmetrized from 23Og03=0.15(+0.10-0.04)										**
*^{276}Ds	D : %SF symmetrized from 23Og03=57(+15-18)										**
^{277}Bh	141130#	600#				10# s				α ?;SF ?	
^{277}Hs	141220#	450#			*	50 ms 25	$1/2^+$#	21	26Ga05 T	SF$\approx$100;α ?	*
^{277}Hs^{m}	141420#	460#	200#	100#	*	130 s 104	$13/2^-$#	12	Ho12 TDJ	SF$\approx$100;IT ?	*
^{277}Hs^{p}	141850#	460#	630#	100#							
^{277}Mt	143080#	660#				5.4 ms 2.6		21	22Og07 T	SF$\approx$100;β^+ ?	*
^{277}Ds	144900#	370#				4.5 ms 1.4		21	25Og03 TD	$\alpha\approx100$;SF ?	*
^{277}Rg	148330#	470#				4# ms				α ?;SF ?	
^{277}Cn	152260#	110#				790 μs 330		21	15Mo25 TD	α=100	*
*^{277}Hs	T : symmetrized from 26Ga05=35(+35-12), analysis includes 3 previously published events (see also 23Co04) and 1 event in 26Ga05=83(+397-37)										**
*^{277}Hs^{m}	T : symmetrized from 12Ho12=34(+166-16) (SF 1 event)										**
*^{277}Mt	T : symmetrized from 22Og07=3.9(+3.6-1.3), supersedes 17Og01,13Og04=5(+9-2)										**
*^{277}Ds	T : symmetrized from 25Og03=4.0(+1.8-1.0), supersedes 18Ut02=3.5(+2.1-0.9) 17Og01,15Ut02=4.1(+3.7-1.3); others: 16Ho09=4.1(+4.1-1.4)										**
*^{277}Ds	T : 10El06(1 event)=8.21 ms 99Ni03=3.0(+4.7-1.5),retracted in 02Ni10										**
*^{277}Cn	T : symmetrized from 15Mo25,13Su04=610(+460-180)										**
^{278}Bh	144440#	400#				2# s		19	16Ho09 TD	SF$\approx$100;α ?	*
^{278}Hs	143120#	300#				2# s	0^+	19	16Ho09 TD	SF$\approx$100;α ?	*
^{278}Mt	145920#	590#				6 s 3		19	17Og01 TD	α=100	*
^{278}Mt^{p}	146500#	600#	580#	100#							
^{278}Ds	146140#	510#				270# ms	0^+			α ?;SF ?	
^{278}Rg	150610#	370#				7 ms 4		19	22Og08 TD	α=100	*
^{278}Cn	152610#	440#				2# ms	0^+			α ?;SF ?	
^{278}Nh	159030#	220#				2.3 ms 1.3		20	15Mo25 TD	α=100	*
*^{278}Bh	T : other: 16Ho09=690(+3300,-310) s not trusted by NUBASE										**
*^{278}Hs	T : other: 16Ho09=690(+3300,-310) s not trusted by NUBASE										**
*^{278}Mt	T : symmetrized from 17Og01=4.5(+3.5-1.3), based on 14Kh04=3.6(+6.5-1.4) 13Og04=5.2(+6.2-1.8) data										**
*^{278}Rg	T : symmetrized from 22Og08,22Ko22=4.6(+5.5-1.6), supersedes 17Og01,07Og02=4.2(+7.5-1.7)										**
*^{278}Nh	T : symmetrized from τ=2.0(+2.7-0.7) in 15Mo25,08Mo09										**
^{279}Hs	146410#	600#				1# s				α ?;SF ?	
^{279}Mt	147660#	670#				20# s				α ?;SF ?	
^{279}Ds	148880#	590#				210 ms 20		21	26Ga05 TD	SF=84.6 36;α=15.4 36	*
^{279}Ds^{p}	149180#	590#	300#	100#							
^{279}Rg	151770#	390#				112 ms 44		21	22Og08 TD	α=78 13; SF ?	*
^{279}Rg^{p}	151920#	400#	150#	100#							
^{279}Cn	154680#	400#				60# μs				α ?;SF ?	
^{279}Nh	159380#	600#				1# ms				α ?;SF ?	
*^{279}Ds	T : from 26Ga05=210(20), analysis includes 97 previously published events (see others) and 1 event in 26Ga05 others: 22Og05,23Ib01=186(+21-17)										**
*^{279}Ds	T : 17Og01=210(40) 16Ho09=290(+69-47) 06Og05=200(+50-40) 04Og12=180(+50-30) 04Og07=290(+350-100) 09St21(1 SF event)=185 07Ei02(1 SF event)=536										**
*^{279}Ds	T : 17Ka31=110(+530-50) ms 07Ho18=180(+320-70)										**
*^{279}Ds	D : %α symmetrized from 15.0(+3.9-3.2), derived from 15 α and 85 SF events reported in 26Ga05 using the available world data										**
*^{279}Rg	T : symmetrized from 22Og08,23Ko22=90(+60-25), supersedes 17Og01=90(+170-40);others: 13Ru11(1 event)=16.1 04Og03(1 event)=170										**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{279}$Rg	D : %α symmetrized from 22Og08,23Ko22=87(+5-19)							**
^{280}Hs	148420# 600#		100# ms	0^+			α ?;SF ?	
^{280}Mt	150550# 670#		10# s				α ?;SF ?	
^{280}Ds	150320# 750#		1.4 ms 1.1	0^+	19	21Sa01 TD	SF=100	*
^{280}Rg	154200# 540#		3.9 s 0.3		19	22Og08 TD	α=100	*
^{280}Rg^p	154360# 540#	170 60						
^{280}Cn	155430# 510#		19 μs 12	0^+		25Og03 TD	SF≈100;α ?	*
^{280}Nh	161140# 400#		10# ms				α ?;SF ?	
$*^{280}$Ds	T : average 21Sa01=0.36(+1.72-0.16) 17Ka66=6.7(+31.9-3); other: 01Og01 3 events at 6.93 s, 14.3 s and 7.4 s yield 6.6(+9.0-2.4) s, but data were							**
$*^{280}$Ds	T : later reassigned to the ^{293}Lv chain							**
$*^{280}$Rg	T : from 22Og08,23Ko22=3.9(0.3), supersedes 22Og07=3.2(+0.6-0.4) 17Og01=4.2(+0.6,-0.4) 16Fo10=4.4(+0.5-0.4) 13Ru11=6.4(+2.1-1.3)							**
$*^{280}$Rg	T : 13Og01=3.61(+0.90-0.60); 12Og02=3.53(+0.99-0.63) 04Og03=3.6(+4.3-1.3)							**
$*^{280}$Cn	T : symmetrized from 25Og03=10(+18-4)							**
^{281}Mt	152460# 670#		1# s				α ?;SF ?	
^{281}Ds	153160# 460#	*	26.6 s 4.5	$3/2^+$#	21	26Ga05 TD	SF=88 6;α=12 6	*
^{281}Ds^m	153300# 460#	130# 150# AD*	0.9 s 0.7			12Ho12 TD	α=100	*
^{281}Ds^p	153230# 470#	70# 100# *						
^{281}Rg	155520# 770#		12.3 s 2.1		21	22Og08 TD	SF=?;α=18 7	*
^{281}Cn	157740# 370#		220 ms 60		21	26Og02 TD	α=83 10;SF=?	*
^{281}Nh	161810# 300#		100# ms				α ?;SF ?	
$*^{281}$Ds	T : symmetrized from 26Ga05=26(+5-4), analysis includes 37 previously published events (see 23Co04) and 2 events in 26Ga05=186(+449-77)							**
$*^{281}$Ds	D : %α symmetrized from 10.3(+7.4-4.8), derived from 4 α and 35 SF events reported in 26Ga05 using the available world data							**
$*^{281}$Ds^m	T : symmetrized from 12Ho12=0.25(+1.18-0.11)							**
$*^{281}$Rg	T : symmetrized from 22Og08,22Og07,23Ko22=11(+3-1), supersedes 17Og01=17(+6-3), 16Fo16=21(+10-5), reanalyzed data of 13Og04=17(+6-3),							**
$*^{281}$Rg	T : 12Og06=26(+25-8), 10Og01=26(+25-8)							**
$*^{281}$Rg	D : %α symmetrized from 22Og08,23Ko22=14(+10-4); other: %SF 17Og01=88(+7-9)							**
$*^{281}$Cn	T : symmetrized from 26Og02=190(+80-40), supersedes 25Og03=190(+80-50) 17Og01,15Ut02=130(+120-40); others: 16Ho09=128(+128-43)							**
$*^{281}$Cn	T : (analyzing same data as 17Og01) 10El06 (1 event)=140 ms 99Ni03=0.89(+1.30-0.45),retracted in 02Ni10							**
$*^{281}$Cn	D : %α symmetrized from 26Og02=91(+3-16)							**
^{282}Mt	155530# 450#		100# ms		19	16Ho09 TD	α≈100;SF ?	*
^{282}Ds	154730# 360#		2.2 m 1.7	0^+	19	23Sa03 TD	SF≈100;α ?	*
^{282}Rg	158080# 600#		130 s 50		19	17Og01 TD	α=100	*
^{282}Cn	158710# 550#		0.92 ms 0.16	0^+	19	24Ga31 TD	SF=100	*
^{282}Nh	163810# 380#		90 ms 50		19	22Og08 TD	α=100	*
$*^{282}$Mt	T : 16Ho09=67(+320-30) s not trusted by NUBASE							**
$*^{282}$Ds	T : symmetrized from 23Sa03=35(+165-15) s; other: 16Ho09=67(+320-30) s							**
$*^{282}$Rg	T : symmetrized from 17Og01=100(+70-30)							**
$*^{282}$Cn	T : symmetrized from 24Ga31=0.88(+0.19-0.13) includes previously published data; others: 22Og05,23Ib01=0.83(+0.18-0.13) 21Sa01=0.98(+0.33-0.20)							**
$*^{282}$Cn	T : 17Og01,15Og05=0.91(0.33-0.19) 16Ho09=0.96(0.35-0.20) 06Og05=0.82(+0.30-0.18) 04Og12=0.50(+0.33-0.14) also 10El06 one SF event at 522 μs;							**
$*^{282}$Cn	T : 09St21 one SF at 3600 μs							**
$*^{282}$Nh	T : symmetrized from 22Og08,23Ko22=61(+73-22), supersedes 17Og01,07Og02=73(+134-29)							**
^{283}Ds	157700# 630#		8.2 s 4.6			23Co04 TD	SF≈100;α ?	*
^{283}Rg	159580# 680#		2# m				α ?;SF ?	
^{283}Cn	161280# 600#		3.8 s 0.4		21	26Ga05 TD	α=84.3 33;SF=15.7 33	*
^{283}Nh	164710# 410#		150 ms 60		21	22Og08 TD	α=100	*
$*^{283}$Ds	T : symmetrized from 23Co04=5.0(+6.8-1.8)							**
$*^{283}$Ds	I : observed in 23Co04; tentative assignment to ^{283}Ds made by NUBASE							**
$*^{283}$Cn	T : symmetrized from 26Ga05=3.7(+0.4-0.3), analysis includes 108 previously published events (see others) and 1 event in 26Ga05 others:							**
$*^{283}$Cn	T : 22Og05,23Ib01=3.81(+0.45-0.36) 17Og01=4.2(+1.1-0.7) 16Ho09=4.48(+0.98-0.68) 06Og05=3.8(+1.2-0.7) 04Og12=4.0(+1.3-0.7) 04Og07=6.1(+7.2-2.2)							**
$*^{283}$Cn	T : 07Ho18=6.9(+6.9-2.3) 09St21(1 event)=1.92 17Ka31=6.9(+12.6-2.7); four SF events at 99Og07=9.3 m, 3.8 m, 99Og05=3.0 m, 0.9 m;							**
$*^{283}$Cn	D : %α symmetrized from 84.7(+3.0-3.6) derived from 100 α and 18 SF events reported in 26Ga05 using the available world data							**
$*^{283}$Nh	T : symmetrized from 22Og08,23Ko22=123(+80-35), supersedes 17Og01=75(+136-30); others: 13Ru11(1 event)=68.4 04Og03(1 event)=100							**
^{284}Ds	159390# 500#		1# m	0^+			α ?;SF ?	
^{284}Rg	162270# 700#		1# m				α ?;SF ?	
^{284}Cn	162420# 760#		113 ms 15	0^+	19	26Ga05 TD	SF=96.7 28;α=3.3 28	*
^{284}Nh	166880# 540#		0.91 s 0.07		19	22Og08 TD	α=100	*
^{284}Fl	168580# 510#		3.2 ms 0.8	0^+	19	26Ib.1 T	SF=70 14;α=?	*
$*^{284}$Cn	T : symmetrized from 26Ga05=110(+17-13), analysis includes 49 previously published events (see also 21Sa01) and 7 events in 26Ga05=36(+22-10)							**
$*^{284}$Cn	D : %α symmetrized from 1.7(+3.9-1.4), derived from 1 α and 57 SF events reported in 26Ga05 using the available world data							**
$*^{284}$Nh	T : symmetrized from 22Og08,23Ko22=0.90(+0.07-0.06), supersedes 22Og07=0.77(+0.13-0.09) 17Og01=0.97(0.12-0.10) 16Fo10=0.97(0.12-0.10)							**
$*^{284}$Nh	T : 13Ru11=810(+230-150) 13Og01=970(+250-170) 12Og02=940(+290-180) 04Og03=480(+580-170)							**
$*^{284}$Fl	T : average 26Ib.1=3.2(+2.0-0.9) 25Og03=2.5(+1.2-0.6), supersedes 17Og01=2.5(+1.8-0.8); other: 16Ho09=2.0(+2.7,-0.7)							**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{284}$Fl	D : %SF symmetrized from 25Og03=76(+9-19)							**
^{285}Rg	163930# 600#		30# s				α ?;SF ?	
^{285}Cn	165060# 470#		43 s 7	$1/2^+$#	21	26Ga05 TD	α=100	*
^{285}Cn^m	165570# 460#	510# 190# AD	15 s 12			12Ho12 TD	α=100	*
^{285}Nh	167960# 780#		2.3 s 0.5		21	22Og08 TD	α=?;SF=19 10	*
^{285}Fl	170760# 380#		100 ms 30		21	26Og02 TD	α≈100;SF ?	*
$*^{285}$Cn	T : symmetrized from 26Ga05=42(+8-6), analysis includes 34 previously published events (see also 23Co04) and 1 event in 26Ga05=110(+523-49)							**
$*^{285}$Cn^m	T : symmetrized from 12Ho12=4.0(+19.1-1.8) s							**
$*^{285}$Nh	T : symmetrized from 22Og08,22Og07,23Ko22=2.1(+0.6-0.3), supersedes 17Og01=4.2(+1.4-0.8), 16Fo16=2.9(+1.4-0.7), reanalyzed data of							**
$*^{285}$Nh	T : 13Og04=4.2(+1.4-0.8), 12Og06=4.9(+6.7-1.8), 10Og01=5.5(+5.0-1.8)							**
$*^{285}$Nh	D : %SF symmetrized from 22Og08,23Ko22=18(+10-9)							**
$*^{285}$Fl	T : symmetrized from 26Og02=87(+40-21), supersedes 25Og03=86(+43-21) 17Og01,15Ut02=150(+140-50); others: 16Ho09=152(+152-51), reanalyzed same							**
$*^{285}$Fl	T : data as 17Og01, 10El06 (1 ovent)=181 ms 99Ni03=580(+870-290), retracted in 02Ni10							**
^{286}Rg	166740# 450#		10# s		19	16Ho09 TD	α≈100;SF ?	*
^{286}Cn	166440# 370#		72 s 57	0^+	19	23Sa03 TD	α≈100;SF ?	*
^{286}Nh	170300# 600#		12 s 5		19	17Og01 TD	α=100	*
^{286}Fl	171460# 550#		109 ms 15	0^+	19	24Ga31 TD	α=55 8;SF=45 8	*
^{286}Mc	177100# 380#		80 s 60			22Og08 T	α≈100;SF ?	*
$*^{286}$Rg	T : 16Ho09=640(+3100-300) s not trusted by evaluator, based on TNN							**
$*^{286}$Cn	T : symmetrized from 23Sa03,23Co04=19(+91-8); others: 17Ka66=8.4(+40.5-3.9) 16Ho09=640(+3100-300)							**
$*^{286}$Nh	T : symmetrized from 17Og01=9.5(+6.3-2.7), based on data from 14Kh04=2.9(+5.5-1.1) 13Og04=13(+12-4)							**
$*^{286}$Fl	T : symmetrized from 24Ga31=106(+17-13) includes previously published data; others: 22Og05,23Ib01=105(+17-13) 21Sa01=121(+31-21)							**
$*^{286}$Fl	T : 17Og01=120(+40-20) 16Ho09=166(+40-27) 06Og05=130(+40-20) 04Og12=160(+70-30) 04Og07=290(+540-110); also one α each: 10El06=76 09St21=301							**
$*^{286}$Fl	D : %α from 22Og05=55(8); others: 21Sa01=55 16Ho09=52 17Og01=60(+10-11) 06Og05=50 04Og12=40							**
$*^{286}$Mc	T : symmetrized from 22Og08,23Ko22=20(+98-9)							**
^{287}Cn	169290# 640#		41 s 23			23Co04 TD	α≈100;SF ?	*
^{287}Nh	171660# 710#		20# s				α ?;SF ?	
^{287}Fl	173860# 600#		376 ms 45		21	22Og05 TD	α≈100;SF ?	*
^{287}Mc	177840# 410#		46 ms 17		21	22Og08 TD	α=100	*
$*^{287}$Cn	T : symmetrized from 23Co04=25(+34-9)							**
$*^{287}$Cn	I : observed in 23Co04; tentative assignment to ^{287}Cn made by NUBASE							**
$*^{287}$Fl	T : symmetrized from 26Ga05=370(+50-40), analysis includes 79 previously published events (see others) and 1 event in 26Ga05 others:							**
$*^{287}$Fl	T : 22Og05,23Ib01=360(+45-36) 16Ho09=540(+170-100) 17Og01,06Og05=480(+160-90) 04Og12=510(+180-100) 04Og07=1.1(+1.3-0.4) 99Og07(2 events)=1.32 s							**
$*^{287}$Fl	T : 14.4 s, 09St21(1 events)=815							**
$*^{287}$Fl	D : %α 22Og05>70							**
$*^{287}$Mc	T : symmetrized from 22Og08,23Ko22=38(+22-10), supersedes 17Og01=37(+44-13); others: 13Ru11(1 events)=67.6 ms 04Og03(1 events)=32 ms							**
^{288}Cn	170900# 700#		10# s	0^+			α ?;SF ?	
^{288}Nh	174180# 700#		20# s				α ?;SF ?	
^{288}Fl	174900# 760#		633 ms 90	0^+	19	26Ga05 TD	α≈100;SF ?	*
^{288}Mc	179880# 540#		194 ms 14		19	22Og08 TD	α=100	*
^{288}Lv	182240# 510#		3.0 ms 1.6			25Og03 TD	α≈100;SF ?	*
$*^{288}$Fl	T : symmetrized from 26Ga05=620(+100-80), analysis includes 43 previously published events (see also 21Sa01) and 7 events in 26Ga05=430(+260-120)							**
$*^{288}$Mc	T : symmetrized from 22Og08,23Ko22=193(+15-13),supersedes 22Og07=228(+36-28) 17Og01=174(+22-18) 16Fo10=170(20) 13Ru11=150(+43-28)							**
$*^{288}$Mc	T : 13Og01=171(+42-28) 12Og02=173(+52-32) 04Og03=87(+105-30)							**
$*^{288}$Lv	T : symmetrized from 25Og03=2.0(+2.3-0.7)							**
^{289}Nh	175750# 500#		30# s				α ?;SF ?	
^{289}Fl	177420# 470#		2.4 s 0.5		21	26Ga05 TD	α≈100;SF ?	*
^{289}Fl^m	178160# 470#	750# 210# AD	1.1 s 0.8	$3/2^+$#		12Ho12 TD	α=100	*
^{289}Mc	180890# 780#		260 ms 40		21	22Og08 TD	α=100	*
^{289}Lv	184250# 380#		18 ms 10			26Og02 TD	α≈100;SF ?	*
$*^{289}$Fl	T : symmetrized from 26Ga05=2.3(+0.6-0.4), analysis includes 25 previously published events (see also 23Co04) and 1 event in							**
$*^{289}$Fl	T : 26Ga05=0.8(+3.85-0.36)							**
$*^{289}$Fl^m	T : symmetrized from 12Ho12=0.28(+1.35-0.13) s							**
$*^{289}$Mc	T : symmetrized from 22Og08,23Ko22=250(+51-35), supersedes 22Og07=260(+55-39), 17Og01=330(+120-80) 16Fo16=270(+120-60), reanalyzed data of							**
$*^{289}$Mc	T : 13Og04=330(+120-80), 12Og06=430(+590-160) and 10Og01=220(+260-80)							**
$*^{289}$Lv	T : symmetrized from 26Og02=12(+14-4), supersedes 25Og03=2.4(+4.4-0.9); other: 99Ni03=600(+860-300),retracted by authors in 02Ni10							**
^{290}Nh	178420# 540#		8 s 6		19	16Ho09 TD	α≈100;SF<50	*
^{290}Fl	178720# 380#		1.17 s 0.09	0^+	19	23Sa03 TD	α≈100;SF<50	*
^{290}Mc	183130# 600#		840 ms 360		19	17Og01 T	α=100	*
^{290}Lv	184880# 550#		9 ms 3	0^+	19	24Ga31 TD	α≈100;SF ?	*
$*^{290}$Nh	T : symmetrized from 16Ho09=2.0(+9.6-0.9)							**
$*^{290}$Fl	T : symmetrized from 23Sa03,23Co04=0.31(+1.48-0.14); other: 16Ho09=21(+101-10) [α(t)], 19(+91-9) [via β^+ branch]							**

Table I. The NUBASE2026 table of fundamental nuclear physics properties – *continued*

Nuclide	Mass excess (keV)	Excitation energy (keV)	Half-life	J^π	Ens	Reference	Decay modes and intensities (%)	
$*^{290}$Mc	T : symmetrized from 17Og01=650(+490,-200); based on data from 13Og04=240(+280-90) 14Kh04=1300(+2300-500)							**
$*^{290}$Lv	T : symmetrized from 24Ga31=8.2(+3.2-1.8), includes earlier published data; others: 17Og01=8.3(+3.5-1.9) 16Ho09=8.3(+3.6-1.9)							**
$*^{290}$Lv	T : 06Og05=7.1(+3.2-1.7), supersedes 04Og07=15(+26-6)							**
^{291}Fl	181420#	640#	4.8 s 2.6			23Co04	TD $\alpha\approx100$;SF ?	*
^{291}Mc	184380#	740#	1# s				α ?;SF ?	
^{291}Lv	187180#	610#	26 ms 12		21	17Og01	T $\alpha\approx100$;SF ?	*
^{291}Ts	191920#	510#	2# ms				α ?;SF ?	
$*^{291}$Fl	T : symmetrized from 23Co04=2.9(+3.9-1.0)							**
$*^{291}$Fl	I : observed in 23Co04; tentative assignment to ^{291}Fl made by NUBASE							**
$*^{291}$Lv	T : symmetrized from 17Og01=19(+17-6); others: 16Ho09=18(+25-7) 06Og05=18(+22-6) 04Og07=6.3(+11.6-2.5)							**
^{292}Mc	186820#	730#	5# s				α ?;SF ?	
^{292}Lv	188120#	760#	15 ms 5	0^+	19	21Sa01	TD $\alpha\approx100$;SF ?	*
^{292}Ts	193780#	620#	10# ms				α ?;SF ?	
$*^{292}$Lv	T : symmetrized from 21Sa01=13(+6-3); others: 17Og01=13(+7-4) 17Ka66=11.9(+21.7-2.6) 16Ho09=12.8(+7.0-3.3)							**
^{293}Lv	190520#	480#	70 ms 30		21	17Og01	T $\alpha\approx100$;SF ?	*
^{293}Lv^m	191240#	470# 720# 220# AD	80 ms 60			12Ho12	TDI α=100	*
^{293}Ts	194620#	780#	25 ms 6		21	17Og01	TD α=100	*
^{293}Og	198700#	490# EU	1# ms			02Ni10	I α ?	*
$*^{293}$Lv	T : symmetrized from 17Og01,15Og05=57(+43-17); others: 16Ho09=57(+46-18) 17Ka66=188(+342-74) 07Og01=61(+57-20) 04Og07=53(+62-19)							**
$*^{293}$Lv^m	T : symmetrized from 12Ho12=20(+96-9)							**
$*^{293}$Ts	T : symmetrized from 17Og01,15Og05=22(+8-4); others: 16Fo16=18(+8-4), reanalyzed data of 13Og04=22(+8-4), 12Og06=27(+12-6), 10Og01=14(+11-4)							**
$*^{293}$Og	T : other: 99Ni03=120(+180-60) α decay retracted in 02Ni10							**
^{294}Ts	196740#	600#	70 ms 30		19	17Og01	TD α=100	*
^{294}Og	199170#	550#	0.7 ms 0.3	0^+	19	18Br13	T $\alpha\approx100$;SF ?	*
$*^{294}$Ts	T : symmetrized from 17Og01,15Og05=51(+38-16); based on data from 14Kh04=51(+94-20) 13Og04=50(+60-18)							**
$*^{294}$Og	T : symmetrized from 18Br13=0.58(+0.44-0.18), supersedes 17Og01=0.69(+0.64-0.22) 16Ho09=0.69(+69-23)							**
^{295}Og	201300#	640# EU	680 ms 540		21	16Ho09	TD $\alpha\approx100$	*
$*^{295}$Og	T : symmetrized from 16Ho09=181(+866-83)							**
$*^{295}$Og	I : 17He11 reanalysis of the 16Ho09 data did not confirm the existence							**