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Table of nuclear electric quadrupole moments



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ABSTRACT

This Table is a compilation of experimental measurements of static electric quadrupole moments of ground states and excited states of atomic nuclei throughout the periodic table. To aid identification of the states, their excitation energy, half-life, spin and parity are given, along with a brief indication of the method and any reference standard used in the particular measurement. Experimental data from all quadrupole moment measurements actually provide a value of the product of the moment and the electric field gradient [EFG] acting at the nucleus. Knowledge of the EFG is thus necessary to extract the quadrupole moment. A single recommended moment value is given for each state, based, for each element, wherever possible, upon a standard reference moment for a nuclear state of that element studied in a situation in which the electric field gradient has been well calculated. For several elements one or more subsidiary EFG/moment reference is required and their use is specified.

The literature search covers the period to mid-2015.

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1. Introduction and motivation

The electric quadrupole moment is a feature of atomic nuclei which finds relevance in a wide range of fields of research and more general measurement. Although the quadrupole moment is most obviously of value in the study of nuclei themselves, being a measure of the deviation of the nuclear charge distribution from a spherical shape, measurement of nuclear quadrupole interactions forms a vital investigatory tool in many areas of condensed matter physics and, aiding into the elucidation of structures of complex molecules and their wave-functions, extending into many areas of chemical, biological and medical science.

Establishing an accepted value of the quadrupole moment of any nucleus faces a fundamental problem. The difficulty lies in the fact that what can actually be measured is the interaction energy of the quadrupole moment, eQ, with its surroundings, usually written as $hv_Q=e^2qQ$. This interaction involves the product of the moment with the electric field gradient [EFG], eq, acting at the nucleus. The situation can be contrasted to the challenge of measuring the nuclear magnetic dipole moment, μ , which similarly involves its product with the magnetic field B acting at the nucleus, $hv_M=\mu B$. In the latter case it is a relatively simple matter to apply a known magnetic field, generated by a suitable arrangement of coils carrying a precisely measured current, which can be varied at the will of the experimenter. The nuclear magnetic moment can be extracted from this product, and hence measured, by a wide range of methods.

However it is not possible to generate EFGs in the laboratory which are sufficiently large to produce measurable energy differences. Given the small scale of nuclear quadrupole moments, of order 1 barn [100 fm²], to provide an energy splitting between levels of order 10 MHz requires an EFG of order 10^{17} V cm². However, such large gradients are to be found at nuclei when in atoms, ions or molecules and also in a wide range of non-cubic solids. This does not solve the problem of extracting the quadrupole moment since difficulty in calculation of the EFG from first principles has been a serious barrier to separation of the nuclear quadrupole moment from the measured product.

This is not the place to enter into a history of multi-electron electric field distribution theory, however until the advent of more powerful computers only the simplest atoms or ions, with few electrons, were open to accurate calculation. For this reason the study of quadrupole hyperfine interactions in muonic atoms, in which the muon wave-function [and hence charge distribution and EFG] at the nucleus can be accurately predicted, was early seen as a fruitful way to establish reliable values of quadrupole moments, especially in heavier elements where the interaction can be readily resolved. For multi-electron atoms and ions, many delicate features of the calculation were beyond the power of computation until the past two decades or so. Prior to this, the best EFG estimates involved approximations and corrections related to the distortion of inner closed electron shells, collectively associated with the name Sternheimer shielding [or anti-shielding] factors, which could be uncertain to 10% or more. Thus, although experimentally

the nuclear quadrupole interaction could be measured to very much better precision, the nuclear quadrupole moments extracted from the measurements were hard to pin down.

In recent years multi-electron computation has advanced to the extent that it is now possible to make calculations of EFGs in most atoms and ions and also in many molecules. The results show admirable self-consistency and are proving reliable to a degree comparable to that of the best muonic atom results. First in 1992 and again in 2001 and 2008, Pyykkö, one of the pioneers in such calculations, published a listing of recommended values of the quadrupole moments of selected, usually stable, nuclear states in the majority of elements, including those most commonly used in applications beyond the realm of nuclear structure physics. Adopting such a set of standard values allows measurements using the standard isotope to be used to calibrate EFGs in other environments and, by extension, to allow moments of other isotopes, and excited states in all isotopes, to be related to the single reference moment. The modern calculations include all effects previously grouped under the name of shielding.

There exist in the literature many excellent experimental results giving rise to values of nuclear quadrupole moments. Each measurement required the authors to specify the EFG at the nucleus in their particular experimental system. The published Q values depend upon the individual choice of EFG and can thus be difficult to compare consistently without considerable effort. This is especially true if the experiments were made many years apart, during which the reference value(s) adopted may have changed. Existing tabulations do not always specify adopted standards and where they do, the standard values can change over the years. Only recently has it been possible, with the aid of much improved EFG calculations, to prepare a tabulation in which the adopted standards are likely to prove stable over at least the medium term, trustworthy in many cases to a few percent or better.

This Table presents a listing of measured quadrupole moments normalised, as far as possible, to a set of identified reference moments, one or more for each element, which have been derived from measurement in a situation in which the EFG has been calculated either by a modern computation or in a simpler system such as a muonic atom. There are still some 17 elements, He, Si, P, Ar, Ag, Cd, Te, Ce, Tm, W, Pt, Tl, Po, At, Cm, Bk and Cf in the sequence to Einsteinium at Z = 99 for which no such basic reference standard has been adopted. For the majority of the remaining elements the reference values chosen by Pyykkö in his most recent listing have been adopted. The few exceptions are noted in the Table. Nevertheless it is frequently not possible to normalise all measurements to the adopted reference for an element. This arises most often in connection with excited state measurements when an equivalent measurement on the reference (usually stable) isotope in the same conditions is not possible. In such cases a secondary standard efg has often been adopted. These are briefly specified in the Table in the heading for each element. Further discussion of the primary and secondary reference EFG's, emphasizing where their adoption has led to major (>5%) change in the moment value, with several

larger than 25%, is given in [1]. Major uncertainty reductions are also listed there.

In contrast to the forgoing discussion there do exist methods of measurement of the quadrupole moment which are free of uncertainty of estimation of an associated EFG. These involve calculation of field gradients provided by free electric charges and thus nothing more than Coulomb's law. They include electron scattering [ES] and re-orientation of the angular distribution during Coulomb excitation [CER] both of which have been extensively used in the study of short lived excited nuclear states. Calculation of the electromagnetic interaction of the charged projectile with the nucleus is straightforward in principle and the quadrupole moment can be readily extracted, although the experiments have limited accuracy. Results based on these methods are not directly related to, or dependent upon, the value of the adopted standard quadrupole moment for that element.

The most recent entries in this tabulation were published in mid-2015.

2. Policies

2.1. Signs

Signs are given when the sign can be determined from experimental data. Where the sign is not given by the measurement, no sign is given in the Table, although it can sometimes be inferred either from systematics or from the magnitude of the result.

2.2. Results and uncertainties

Experimental values and their associated errors are as given by the authors subject to a policy of limiting significant figures. Numerical errors with digits above 15 have, in most cases, been rounded to 2 and errors with first digit 2 or greater rounded down if the second digit is 4 or lower, otherwise rounded up. Results have also been rounded to give no more significant figures than the rounded error would allow. Thus a published value 0.953(65) has been rounded to 0.95(7) and 0.25(16) rounded to 0.3(2).

2.3. Electric quadrupole moments

These are listed in units of barns (1 b = 10^{-28} m²). As explained in the introduction, with modern computations of the EFG, corrections relating shielding caused by polarisation of atomic electrons, known as Sternheimer Corrections, are no longer needed. Where there is more than one reference isotope this is possible without causing any confusion since moment ratios are frequently

determined to far greater precision than their individual values. Reference to original publication is given, both in the form of the Nuclear Structure Reference listing [2] maintained at the National Nuclear Data Center, Brookhaven National Laboratory, and the journal reference (see separate listing at the end of the moment entries). A listing of journal abbreviations is given in Table 1.

Reference moments and EFG's

Justification of the reference values should be sought in the reference(s) given, usually Pyykkö [3], or, for the secondary standards, the measurements in which they have been used.

Recommended values

The Table gives, for each listed state, identified by energy [in keV], half-life and spin, a single value for the quadrupole moment. The method involved in its measurement is identified by one of the abbreviations listed in Table 1. Entries have been normalised to the given value of the reference isotope moment wherever possible, so values will in general differ from those in the original publications. Where several experimental results exist for the same state, attempts to make valid weighted averages have been avoided since frequently there exist non-statistical differences between experiments which cannot be properly taken into account. Most often one of the more recent results, with a relatively small estimated uncertainty, has been chosen. Readers who require a more extended listing of all results on a given state should consult the extended Tables [4,5].

Acknowledgments

The author gratefully acknowledges help and advice from Pekka Pyykkö and assistance from the staff of the National Nuclear Data Center, Brookhaven National Laboratory, in particular Joann B. Totans and Jagdish Tuli. This work builds upon earlier tabulations, notably those by Gladys Fuller [6] and Pramila Raghavan [7]. Research sponsored by the IAEA Nuclear Data Section, Vienna International Centre, 1400 Vienna, Austria.

References

- [1] N.J. Stone, Hyperfine Interactions 230 (2015) 7.
- [2] B. Pritychenko, E. Betak, M.A. Kellett, B. Singh, J. Totans, Nucl. Instrum. Methods Phys. Res. A 640 (2011) 213.
- [3] P. Pyykkö, Mol. Phys. 106 (2008) 1965; Mol. Phys. 99 (2001) 1617; Z. Naturforsch. 47a (1992) 189.
- [4] N.J. Stone, At. Data Nucl. Data Tables 90 (2005) 75.
- [5] N.J. Stone, IAEA Vienna Reports INDC(NDS) 00594 April 2011 and INDC(NDS) 00658 February 2014.
- [6] G.H. Fuller, J. Phys. Chem. Ref. Data 5 (1976) 835.
- [7] P. Raghavan, At. Data Nucl. Data Tables 42 (1989) 189.

Explanation of Tables

Table 1. Table of nuclear electric quadrupole moments

Element Identifies the element for the following isotopes and specifies the reference isotope(s) for that element. Also, in the first row for each element, the system in which the EFG which has been calculated to obtain the reference moment(s) is given briefly. Secondary standards

are listed in subsequent rows and identified by Letters A, B, C.... For more details on the EFG calculations see [2] above.

Nucleus Identifies the nucleus by mass number A and atomic number Z, with its chemical symbol. This is given once for each nucleus. Nuclei are

grouped by element in increasing sequence of atomic number and by increasing mass number for each element.

E(level) Gives the energy of the state on which the measurement is made, rounded to the nearest kilovolt, 0 being the ground state. Where

placement of the level with respect to the ground state is unknown, this is denoted be addition of an offset x or y.

Gives the half-life $T_{1/2}$ the state: Units y = years, d = days, h = hours, m = minutes, s = seconds, ms = milliseconds (10^{-3} s), $\mu s = microseconds$ (10^{-6} s), ns = nanoseconds (10^{-9} s), ps = picoseconds (10^{-12} s) and ps = microseconds (10^{-15} s).

 I^{π} Gives the spin (I) and parity (π) of the state. Uncertain values are given in brackets. Where the measurement was made on unresolved

states, the average spin is given as I_{av} .

Q(b) Gives the measured nuclear electric quadrupole moment Q in units of the barn (1 barn = 10^{-28} m²). No sign is given if it was not determined by the experiment. The uncertainty in the result is given in brackets, subject to the policy declared in the introduction. Thus

+1.27(10) means a value of +1.27 barns with uncertainty 0.10 barns.

Ref. Std. In this column the reference standard upon which the listed result depends is given.

There is no entry when the method used does not depend upon an adopted standard (i.e. a Coulomb Excitation Reorientation (CER)

measurement).

Method The method used in the measurement is briefly identified here. A list of abbreviations used is given below. In view of the great proliferation of specialised methods this method description is limited and for detailed information reference should be made to the

proliferation of specialised methods, this method description is limited and for detailed information reference should be made to the original publication. Re-evaluation of the published result, where it involves re-normalisation to the adopted value of the reference

standard by the tabulator, is not indicated specifically.

References 1. The NSR keynumber reference is given in the main table. These can be further identified by reference to the Brookhaven National

Nuclear Data Center website www.nndc.bnl.gov/nsr.

2. The original journal or other publication reference is given in the listing at the end of the Table.

Experimental method abbreviations

AB Atomic beam magnetic resonance
AB/MS Atomic beam and molecular spectroscopy

ABLDF Atomic beam with laser double resonance detection
ABLFS Atomic beam with laser fluorescence spectroscopy

ABLS Atomic beam laser spectroscopy

 β -NMR NMR of in-beam polarised nuclei with beta asymmetry detection

 β -NQR Nuclear quadrupole resonance with beta detection

 β -RadOP Beta-ray detection of optical pumping

B(E2) Value based on measured E2 transition probability
CER Coulomb excitation reorientation
CERP Precession of coulomb excitation reorientation

CFBLS Collinear fast beam laser spectroscopy

CFBLS/ β -NMR Collinear fast beam laser spectroscopy: NMR with beta detection

CLS Resonance cell laser spectroscopy
EPR Electron paramagnetic resonance

ES Electron scattering

IPAC Integral perturbed angular correlation

LEMS Level mixing spectroscopy

LRFS Laser resonance fluorescence spectroscopy
LRIS Laser resonance ionisation spectroscopy

LS Laser spectroscopy

MA Microwave absorption in gases

MAPON Modulated adiabatic passage NMR on oriented nuclei

MB Molecular beam magnetic resonance

ME Mossbauer effect
MS Molecular spectroscopy
Mu-X Muonic X-ray hyperfine structure

NMR/ON Nuclear magnetic resonance on oriented nuclei

NO/ME Mossbauer effect on oriented nuclei

NO/S Statis and learner in the first and the second of the

NO/S Static nuclear orientation with gamma detection

NQR Nuclear quadrupole resonance
NSLR Nuclear spin-lattice relaxation
O Optical spectroscopy
OD Optical double resonance

OP/RD Optical pumping with radiative detection PAC Perturbed angular correlation Pi-X Pionic X-ray Hyperfine Structure

Q Quadrupole resonance

QI-NMR/ON Quadrupole interaction resolved NMR on oriented nuclei
QIR Quadrupole Interaction deduced from Relaxation Time

R Re-evaluated data, or (for revised reference standard) adjusted by tabulator

RIMS/LS Resonant ionisation mass spectrometry/laser spectroscopy

TDPAC Time-dependent perturbed angular correlation TDPAD Time-dependent perturbed angular distribution

TF Transient field

TFLD Tilted foil time-differential perturbed gamma angular distribution

TLS Trap laser spectroscopy

Literature reference abbreviations

ADNDT Atomic Data and Nuclear Data Tables

AECL Atomic Energy Commission, Chalk River Laboratories, Report

ARHMI Annual Report, Hahn-Meitner Institute, Berlin

AuJP Australian Journal of Physics

BAPS Bulletin of the American Physical Society

Bk88 NFFS Nuclei Far From Stability, AIP Conference 164, Rosseau Lake, Ont. Canada 1988

CERN EP CERN EP Division Report
CPL Chemical Physics Letters
CzJP Czech Journal of Physics
Eur Phys J European Physics Journal
HP Ac Helvetica Physica Acta
HFI Hyperfine Interactions

IoP Conf Institute of Physics Conference Series

IAN Izv. Akad. Nauk. SSSR Ser Fiz (trans. Bull. Acad. Sci. USSR, Phys. Ser.)

J Phys Journal of Physics (London)

J Phys Radium Journal de Physique et el Radium (Paris)

JCP Journal of Chemical Physics

JINC Journal of Inorganic and Nuclear Chemistry
JPCR Journal of Physical and Chemical Reference Data

JPJS Journal of the Physical Society of Japan

JPPa Journal de Physique (Paris)

LNPP Leningrad Nuclear Physics Institute preprint

Mol Phys Molecular Physics

NIM Nuclear Instruments and Methods

NIMPR Nuclear Instruments and Methods in Physics Research

NP Nuclear Physics

ORNL Oak Ridge National Laboratory Report

Ospk PCNeugart Opt. Spektrosk. (trans Optics and Spectroscopy (USSR))

R. Neugart, private communication

Physica Phca

Philosophical Magazine Physics Letters PhMg PL Physical Review Physics Reports Physical Review Letters PR Prep PRL Physica Scripta PS

Report of RIKEN Laboratory, Japan Solid State Communications Springer Texts in Modern Physics RIKEN Sol St Comm STMP B.R.Casserberg, Thesis, Princeton, (1968) University of California Lawrence Berkeley Report Th 68 Cass.

UCRL

UkrF Ukrainskii Fiz. Zh.

Yadern Fys. (trans Soviet Journal of Nuclear Physics) YadF

Zeitschrift fur Naturforschung ZNat

ZP Zeitschrift fur Physik

Table 1Table of nuclear electric quadrupole moments.

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
Hydrogen Reference isotope	Efg at the d 1 H 2	euterium nucleus 0	s calculated for Hi Stable	O and D ₂ 1+	+0.00286(2)		MB, R	1979Bi14
ithium	Efg at the ⁷	Li nucleus calcula	ited for the LiH m	olecule				
	3 Li 6	0	Stable	1+	-0.000806(6)	[7Li]	MB	2005Bo45/1998Ce04
eference isotope	3 Li 7	0	Stable	3/2-	-0.0400(3)		MB	2008Py02
	3 Li 8	0	842 ms	2+	+0.0314(2)	[7Li]	β -NMR	2005Bo45
	3 Li 9	0	178 ms	3/2-	-0.0304(2)	[7Li]	β -NMR	2011AV08
	3 Li 11	0	8.5 ms	3/2-	(-)0.0339(5)	[7Li]	NQR	2014Vo01
eryllium eference isotope	Calculation 4 Be 9	of the quadrupol	le coupling consta Stable	nt for the ³ P 3/2–	2 state of the Be atom +0.0529(4)		AB	1991Su05
				,	` '		ND	15515405
oron	Calculation 5 B 8	of the quadrupol	le coupling consto 0.77s	nt of the ² P ₃ 2+	/2 ground state of the B ato +0.0643(14)	m [11B]	β -NQR	2006Su13
	5 B 10	0	Stable	3+	+0.0845(2)	[11B]	AB	2008Py02/1970Ne2
eference isotope	5 B 10	0	Stable	3/2—	+0.04059(10)	[110]	AB	2008Py02/1970Ne2
gerence isotope	5 B 12	0	20.4 ms	1+	0.0132(3)	[11B]	β -NMR	1992Mi18
	5 B 13	0	17.4 ms	3/2-	(+)0.0365(8)	[11B]	β -NMR	2004Na38
	5 B 14	0	13.8 ms	2-	0.0297(8)	[11B]	β -NMR	1996Iz01
	5 B 15	0	10.3 ms	3/2-	0.0379(11)	[11B]	β -NMR	1996Iz01
	5 B 17	0	5.1 ms	(3/2-)	0.0375(11)	[11B] [11B]	β -NMR	2003Og03
rbon	Calculation	of the auadrupo	le counling const	ent of the ³ D ₂	state of the C atom			
eference isotope	6 C 11	0) the quaarupoi	20.4 m	3/2-	0.0333(2)		AB	2008Py02/1969Sc34
	6 C 12	4438	45 fs	2+	+0.06(3)	[11C]	CER	1983Ve01
itrogen	Calculation	of the quadrupol	le coupling consta	nt of the ¹ P ₁	state of the N ⁺ ion			
Ü	7 N 12	0	11.0 ms	1+	+0.100(9)	[14N]	β -NMR	1998Mi10
eference isotope	7 N 14	0	Stable	1+	+0.02044(3)	. ,	AB/MS	2008Py02/1997To06
, ,	7 N 16	0	7.13 s	2-	(-)0.018(2)	[14N]	β-NMR	2001Ma42
	7 N 18	0	624 ms	1-	+0.027(4)	[14N]	LMR	1999Ne01
					(+)0.0123(12)	[14N]	β -NMR	1999Og03
xygen	Calculation	of the quadrupol	le coupling consta	int of the ³ P ₂	state of the O atom			
	8 O 13	0	86 ms	3/2-	0.0111(8)	[170]	β -NQR	1999Ma46
eference isotope	8 O 17	0	Stable	5/2+	-0.0256(2)		R/EPR	2008Py02/1969Sc34
	8 O 18	1982	2.07 ps	2+	-0.036(9)	[170]	CER	1983Gr28
	8 O 19	0	27 s	5/2+	0.00362(13)	[170]	β -NMR	1999Mi16
uorine	Calculation	of the quadrupol	le coupling consta	ınt of the F ₂ 1				
	9 F 17	0	64.5 s	5/2+	0.076(4)	[19F 197 keV]	β -NMR	1974Mi21
	9 F 18	1121	153 ns	5+	0.071(6)	[19F 197 keV]	β -NMR	1974Mi21
eference isomer	9 F 19	197	88.5 ns	5/2+	-0.0942(9)		PAC	2008Py02
	9 F 20	0	11 s	2+	0.056(4)	[19F 197 keV]	β -NMR	1974Mi21
	9 F 21	0	4.16 s	5/2+	0.011(2)	[19F 197 keV]	β -NMR	1999Mb13
	9 F 22	0	4.2 s	4+	0.003(2)	[19F 197 keV]	β -NMR	2010Mi13
eon	Calculation	of the quadrupol	le coupling consta	int of the ³ P ₂	state of the Ne atom			
	10 Ne 20	1634	0.7 ps	2+	-0.23(3)	[21Ne]	CER	1981Sp07
eference isotope	10 Ne 21	0	Stable	3/2+	+0.102(8)		O/AB	2008Py02/1972Du0
	10 Ne 22	1275	3.6 ps	2+	-0.19(4)	[21Ne]	CER	1981Sp07
	10 Ne 23	0	37.6 s	5/2+	0.145(13)	[21Ne]	CFBLS	2005Ge06
odium		m HFS measuren		_				
	11 Na 20	0	0.446 s	2+	+0.101(8)	[23Na]	β-NMR	2009Mi04
	11 Na 21	0	22.5 s	3/2+	0.138(11)	[23Na]	β-NMR	2009Mi04
	11 Na 22	0	2.60 y	3+	+0.180(11)	[23Na]	ABLS	1998Ga44
			Stable	3/2+	+0.104(1)		0	2008Py02/2006Da1
eference isotope	11 Na 23	0				[00::]	0 11	10040~10
eference isotope	11 Na 25	0	60 s	5/2+	0.0015(3)	[23Na]	β-NMR	2004Og13
eference isotope	11 Na 25 11 Na 26	0 0	60 s 1.07 s	5/2+ 3+	0.0015(3) -0.0053(2)	[23Na]	CFBLS/β-NMR	2000Ke09
ference isotope	11 Na 25 11 Na 26 11 Na 27	0 0 0	60 s 1.07 s 0.29 s	5/2+ 3+ 5/2+	0.0015(3) -0.0053(2) -0.0071(3)	[23Na] [23Na]	CFBLS/ β -NMR CFBLS/ β -NMR	2000Ke09 2000Ke09
ference isotope	11 Na 25 11 Na 26 11 Na 27 11 Na 28	0 0	60 s 1.07 s 0.29 s 30.5 ms	5/2+ 3+ 5/2+ 1+	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11)	[23Na] [23Na] [23Na]	CFBLS/ β -NMR CFBLS/ β -NMR CFBLS/ β -NMR	2000Ke09 2000Ke09 2000Ke09
	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29	0 0 0 0	60 s 1.07 s 0.29 s 30.5 ms 43 ms	5/2+ 3+ 5/2+ 1+ 3/2+	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3)	[23Na] [23Na]	CFBLS/β-NMR CFBLS/β-NMR	2000Ke09 2000Ke09
	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation	0 0 0 0 0 of the quadrupol	60 s 1.07 s 0.29 s 30.5 ms 43 ms	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ant of the ${}^{3}P_{1}$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom	[23Na] [23Na] [23Na] [23Na]	CFBLS/ β -NMR CFBLS/ β -NMR CFBLS/ β -NMR CFBLS/ β -NMR	2000Ke09 2000Ke09 2000Ke09 2000Ke09
	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23	0 0 0 0 0 of the quadrupol	60 s 1.07 s 0.29 s 30.5 ms 43 ms de coupling consta 11.3 s	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ant of the ${}^{3}P_{1}$ $3/2+$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3)	[23Na] [23Na] [23Na]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR	2000Ke09 2000Ke09 2000Ke09 2000Ke09
agnesium	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23 12 Mg 24	0 0 0 0 0 0 of the quadrupol 0 1369	60 s 1.07 s 0.29 s 30.5 ms 43 ms le coupling consta 11.3 s 1.45 ps	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ant of the ${}^{3}P_{1}$ $3/2+$ $2+$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3) -0.29(3)	[23Na] [23Na] [23Na] [23Na]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR	2000Ke09 2000Ke09 2000Ke09 2000Ke09 1999Mb13 1990Gr11
agnesium	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23 12 Mg 24 12 Mg 25	0 0 0 0 0 of the quadrupol	60 s 1.07 s 0.29 s 30.5 ms 43 ms de coupling consta 11.3 s	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ant of the ${}^{3}P_{1}$ $3/2+$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3) -0.29(3) +0.199(2)	[23Na] [23Na] [23Na] [23Na]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR	2000Ke09 2000Ke09 2000Ke09 2000Ke09
l agnesium eference isotope	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23 12 Mg 24 12 Mg 25 12 Mg 26	0 0 0 0 0 of the quadrupol 0 1369 0	60 s 1.07 s 0.29 s 30.5 ms 43 ms le coupling consta 11.3 s 1.45 ps Stable 476 fs	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ant of the ${}^{3}P_{1}$ $3/2+$ $2+$ $5/2+$ $2+$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3) -0.29(3) +0.199(2) -0.21(2)	[23Na] [23Na] [23Na] [23Na]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR	2000Ke09 2000Ke09 2000Ke09 2000Ke09 1999Mb13 1990Gr11 2008Py02
l agnesium eference isotope	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23 12 Mg 24 12 Mg 25 12 Mg 26 Calculation	0 0 0 0 0 of the quadrupoi 0 1369 0 1809	60 s 1.07 s 0.29 s 30.5 ms 43 ms le coupling consta 11.3 s 1.45 ps Stable 476 fs	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ent of the ${}^{3}P_{1}$ $3/2+$ $2+$ $5/2+$ $2+$ ent of the ${}^{3}P_{3}$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3) -0.29(3) +0.199(2) -0.21(2) /2 state of the Al atom	[23Na] [23Na] [23Na] [23Na]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR β-NMR CER AB CER	2000Ke09 2000Ke09 2000Ke09 2000Ke09 1999Mb13 1990Gr11 2008Py02 1991He09
l agnesium eference isotope	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23 12 Mg 24 12 Mg 25 12 Mg 26 Calculation 13 Al 25	0 0 0 0 0 of the quadrupoi 0 1369 0 1809 of the quadrupoi	60 s 1.07 s 0.29 s 30.5 ms 43 ms le coupling consta 11.3 s 1.45 ps Stable 476 fs le coupling consta 7.18 s	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ent of the ${}^{3}P_{1}$ $3/2+$ $2+$ $5/2+$ $2+$ ent of the ${}^{3}P_{3}$ $5/2+$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3) -0.29(3) +0.199(2) -0.21(2) /2 state of the Al atom 0.24(2)	[23Na] [23Na] [23Na] [23Na] [25Mg]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR β-NMR CER AB CER β-NQR	2000Ke09 2000Ke09 2000Ke09 2000Ke09 1999Mb13 1990Gr11 2008Py02 1991He09
lagnesium eference isotope luminium	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23 12 Mg 24 12 Mg 25 12 Mg 26 Calculation 13 Al 25 13 Al 26	0 0 0 0 0 of the quadrupol 0 1369 0 1809 of the quadrupol 0	60 s 1.07 s 0.29 s 30.5 ms 43 ms le coupling consta 11.3 s 1.45 ps Stable 476 fs le coupling consta 7.18 s 7 × 10 ⁵ y	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ent of the ${}^{3}P_{1}$ $3/2+$ $2+$ $5/2+$ $2+$ ent of the ${}^{3}P_{3}$ $5/2+$ $5+$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3) -0.29(3) +0.199(2) -0.21(2) /2 state of the Al atom 0.24(2) +0.26(3)	[23Na] [23Na] [23Na] [23Na]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR β-NMR CER AB CER β-NQR ABLS	2000Ke09 2000Ke09 2000Ke09 2000Ke09 1999Mb13 1990Gr11 2008Py02 1991He09 2007Ma94 1997Le19
agnesium eference isotope	11 Na 25 11 Na 26 11 Na 27 11 Na 28 11 Na 29 Calculation 12 Mg 23 12 Mg 24 12 Mg 25 12 Mg 26 Calculation 13 Al 25	0 0 0 0 0 of the quadrupoi 0 1369 0 1809 of the quadrupoi	60 s 1.07 s 0.29 s 30.5 ms 43 ms le coupling consta 11.3 s 1.45 ps Stable 476 fs le coupling consta 7.18 s	$5/2+$ $3+$ $5/2+$ $1+$ $3/2+$ ent of the ${}^{3}P_{1}$ $3/2+$ $2+$ $5/2+$ $2+$ ent of the ${}^{3}P_{3}$ $5/2+$	0.0015(3) -0.0053(2) -0.0071(3) +0.389(11) +0.085(3) state of the Mg atom 0.114(3) -0.29(3) +0.199(2) -0.21(2) /2 state of the Al atom 0.24(2)	[23Na] [23Na] [23Na] [23Na] [25Mg]	CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR CFBLS/β-NMR β-NMR CER AB CER β-NQR	2000Ke09 2000Ke09 2000Ke09 2000Ke09 1999Mb13 1990Gr11 2008Py02 1991He09

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
	13 Al 31	0	644 ms	(5/2+)	0.134(2)	[27Al]	β -NQR	2009De25
	13 Al 32	0	33 ms	1+	0.025(2)	[27Al]	β -NQR	2007Ka68
	13 Al 33	0	44 ms	(5/2+)	0.132(16)	[27Al]	β -NMR	2012Sh22
Silicon		adopted reference						
			d from band strue					
	14 Si 27	0	4.1 s	5/2+	0.063(14)	Α	β -NQR	1999Mb13
	14 Si 28	1779	0.49 ps	2+	+0.16(3)		CER	1981Sp07
	14 Si 30	2235	0.25 ps	2+	-0.05(6)		CER	1981Sp07
Phosphorus	There is no o	adopted referenc	e efg for P.					
		d efg at P site in o						
	15 P 28	0	270 ms	3+	0.137(14)	Α	β -NQR	2012Zh36
Sulphur	Calculation	of the auadrupol	e coupling consta	nt of the S ⁻ io	on			
	A. Efg at S si							
	16 S 32	2230	0.16 ps	2+	-0.16(2)		CER	1982Ve09
eference isotope	16 S 33	0	Stable	3/2+	-0.0678(13)		MA	2008Py02
	16 S 34	2128	0.32 ps	2+	+0.04(3)		CER	1981Sp07
eference isotope	16 S 35	0	87.4 d	3/2+	+0.0471(9)		MA	2008Py02
	16 S 43	320	415 ns	7/2—	0.23(3)	Α	TDPAD	2012Ch16
Chlorine	Calculation	of the quadrupol	e interaction at C	l in the HCl m	olecule			
eference isotope	17 Cl 35	0	Stable	3/2+	-0.0817(8)		AB	2008Py02
	17 Cl 36	0	$3.0 \times 10^{5} \text{ y}$	2+	-0.178(4)	[35Cl]	MA	1972St38
Reference isotope	17 Cl 37	0	Stable	3/2+	-0.0644(6)	1	AB	2008Py02
•		-641		·	` '			-
rgon			e coupling consta			[27.4]	CEDIC / O NIMED	10061/104
	18 Ar 35 18 Ar 36	0	1.78s	3/2+ 2+	-0.084(15)	[37Ar]	CFBLS/β-NMR	1996Kl04
eference isotope	18 Ar 37	1970 0	0.28 ps 35.0 d	2+ 3/2+	+0.11(6)	Calc B value	CER CFBLS/β-NMR	1971Na06 1996Kl04
ejerence isotope	18 Ar 39	0	269 y	3/2+ 7/2-	+0.076(9) $-0.12(3)$	[37Ar]	CFBLS	2008Bl01
	18 Ar 40	1461	1.12 ps	2+	+0.01(4)	[37711]	CER	1971Na05
	18 Ar 41	0	1.82 h	7/2-	-0.042(4)	[37Ar]	CFBLS	2008Bl01
	18 Ar 43	0	5.37 m	5/2-	+0.142(14)	[37Ar]	CFBLS	2008Bl01
						. ,		
otassium					2 state of the K atom			
	19 K 37	0	1.22 s	3/2+	+0.106(4)	[39K]	β -NQR	2008Mi07
Reference isotope	19 K 39	0	Stable	3/2+	+0.0585(6)		AB	2008Py02/1998Ke05
leference isotope	19 K 40	0	$1.3 \times 10^9 \text{ y}$	4-	-0.073(1)		AB	2008Py02/1998Ke05
deference isotope	19 K 41	0	Stable	3/2+	+0.0711(7)		AB	2008Py02/1998Ke05
Calcium	Calculation	of the quadrupol	e coupling consta	int of the 1D_2 .	state of the Ca atom			
	20 Ca 39	0	0.86 s	3/2+	0.036(7)	calc efg	β -NMR	1999MaZI
Reference isotope	20 Ca 41	0	$1.0 \times 10^{5} \text{ y}$	7/2-	-0.0665(18)		AB	2008Py02
	20 Ca 42	1525	1.1 ps	2+	-0.19(8)		CER	1973To07
Reference isotope	20 Ca 43	0	Stable	7/2—	-0.0408(8)		AB	2008Py02
	20 Ca 44	1157	3.0 ps	2+	-0.14(7)		CER	1973To07
	20 Ca 45	0	165 d	7/2—	+0.038(12)	[41Ca]	ABLFS	1983Ar25
Scandium	Calculation	of the anadrupol	e counling consta	ints in ScF Sc(Cl and ScBr molecules			
cunurum	21 Sc 41	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.59 s	7/2-	-0.145(3)	[45Sc]	β -NQR	2002Mi37
	21 Sc 43	0	3.89 h	7/2-	-0.27(5)	[45Sc]	CLS	2011Av01
		3123	473 ns	19/2-	0.199(14)	[45Sc]	TDPAD	1981Da06
	21 Sc 44	0	3.89 h	2+	+0.10(5)	[45Sc]	CLS	2011Av01
		68	153 ns	1-	0.21(2)	[45Sc]	TDPAC	1973Ha61
		271	58.6 h	6+	-0.19(2)	[45Sc]	CLS	2011Av01
Reference isotope	21 Sc 45	0	Stable	7/2-	-0.220(2)		MS	2008Py02
		12.4	318 ms	3/2+	+0.28(5)	[45Sc]	CLS	2011Av01
	21 Sc 46	0	83.81 d	4+	+0.119(6)	[45Sc]	AB	1962Pe21
	21 Sc 47	0	3.42 d	7/2—	-0.22(3)	[45Sc]	AB	1966Co13
itanium	Calculation	of the quadrupol	e coupling consta	nts in states o	of the Ti ⁺ ion			
	22 Ti 43	3066	560 ns	19/2-	0.33(8)	[47Ti]	TDPAD	1981Da06
	22 Ti 45	0	3.09 h	7/2-	0.015(15)	[47Ti][49Ti]	AB	1966Co19
	22 Ti 46	889	5.36 ps	2+	$-0.21(\hat{6})$		CER	1975To06
Reference isotope	22 Ti 47	0	Stable	5/2-	+0.302(10)		AB	2008Py02
.j	22 Ti 48	984	4.29 ps	2+	-0.177(8)		ES	1972Li12
		^	Stable	7/2-	+0.247(11)		AB	2008Py02
,	22 Ti 49	0						
	22 Ti 49 22 Ti 50	1554	1.12 ps	2+	+0.08(16)		CER	1975To06
Reference isotope	22 Ti 50	1554	1.12 ps	2+			CER	1975To06
eference isotope	22 Ti 50 Calculation	1554 of the quadrupol		2+ ents in states o			CER	1975To06
Reference isotope Vanadium Reference isotope	22 Ti 50 Calculation	1554 of the quadrupol	1.12 ps e coupling consta	2+ ents in states o			CER ABLDF	1975To06 2008Py02/1979Er04

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
Chromium	Calculation	of the quadrupol	e coupling const	ants in states	of the Cr atom			
	24 Cr 50	783	9.2 ps	2+	-0.36(7)		CER	1975To06
	24 Cr 52	1434	0.707 ps	2+	-0.08(2)		ES	1989Ra17(1)
eference isotope	24 Cr 53	0	Stable	3/2-	-0.15(5)		AB	2008Py02
ejerence isotope	24 Cr 54	835	8.0 ps	2+	-0.21(8)		CER	1975To06
	24 (1 34	033	0.0 рз	2+	-0.21(0)		CLK	13731000
langanese	Calculation			ınt for the ⁶ D	states of the Mn atom			
	25 Mn 50	229	1.75 m	5+	+0.83(12)	[Mn55]	TLS	2010Ch15
	25 Mn 51	0	Stable	5/2-	0.41(8)	[Mn55]	AB	1971]o10
	25 Mn 52	0	5.80 d	6+	+0.50(7)	[Mn55]	NMR/ON	1970Ni11
	25 Mn 53	0	$3.7 \times 10^6 \text{ y}$	7/2-	+0.17(3)	[Mn55]	TLS	2010Ch15
	25 Mn 54	0	3.7 × 10 y		* *			
				3+	+0.37(3)	[Mn55]	TLS	2010Ch15
eference isotope	25 Mn 55	0	Stable	5/2-	+0.330(10)		AB	2008Py02
	25 Mn 56	0	2.58 h	3+	+0.48(15)	[Mn55]	TLS	2010Ch15
on	Efg calculati	ions in many Fe o	compounds					
	26 Fe 54	1408	0.80 ps	2+	-0.05(14)		CER	1981Le02
		6527	367 ns	10+	+0.30(4)	[57Fe 14 keV]	TDPAD/TF	1984Ha07
	26 Fe 56	847	6.9 ps	2+	-0.23(3)	. ,	CER	1971Th14
eference isomer	26 Fe 57	14	98 ns	3/2-	+0.160(8)		ME	2008Py02/1995Du1
ejerence isomer	26 Fe 58	811	6.7 ps	2+	-0.27(5)		CER	1981Le02
	26 Fe 58 26 Fe 61				* *	[57Eo 14 koV]		
	20 re 61	861	245 ns	(9/2+)	0.44(6)	[57Fe 14 keV]	TDPAD	2007Ve05
obalt		of the quadrupol	e coupling const	ınts in states	of the Co atom			
	27 Co 56	0	78.8 d	4+	+0.25(9)	[59Co]	MAPON	1988Ba87
	27 Co 57	0	271 d	7/2-	+0.54(10)	[59Co]	NMR/ON	1972Ni01
	27 Co 58	0	70.8 d	2+	+0.23(3)	[59Co]	NMR/ON	1972Ni01
Reference isotope	27 Co 50 27 Co 59	0	Stable	7/2-	+0.42(3)	[5500]	AB	2008Py02
ejerence isotope	27 Co 59 27 Co 60	0	5.271 y	7/2- 5+	+0.42(3) +0.46(6)	[59Co]	NMR/ON	1972Ni01
			-			[55 25]	, 011	10, 21, 101
lickel			e coupling const		•			
	28 Ni 58	1454	0.644 ps	2+	-0.10(6)		CER	1974Le13
	28 Ni 60	1332	0.713 ps	2+	-0.10(2)		ES	1972Li12
Reference isotope	28 Ni 61	0	Stable	3/2-	+0.162(15)		AB	2008Py02/1968Ch1
		67	5.34 ns	5/2-	-0.20(3)	[61Ni]	ME	1971Go31
	28 Ni 62	1173	1.43 ps	2+	+0.05(12)		CER	1974Le13
	28 Ni 64	1346	0.85 ps	2+	+0.4(2)		CER	1971ChZK
	Max :	w V mg I ~	a atmist					
Copper		m X-ray hyperfin 0	e structure 3.2 s	1 :	0.16(2)	[650:1]	CIS	201117502
	29 Cu 58			1+	-0.16(3)	[65Cu]	CLS	2011Vi03
	29 Cu 59	0	81.5 s	3/2-	-0.20(2)	[65Cu]	CLS	2011Vi03
	29 Cu 60	0	23.4 m	2+	+0.121(13)	[65Cu]	CLS	2011Vi03
	29 Cu 61	0	3.41 h	3/2-	-0.221(10)	[65Cu]	CLS	2011Vi03
	29 Cu 62	0	9.73 m	1+	-0.022(4)	[65Cu]	CLS	2011Vi03
	29 Cu 63	0	Stable	3/2-	-0.220(15)		Mu-X	2008Py02/1982Ef01
Reference isotope			12.7 h	1+	+0.075(9)	[65Cu]	CLS	2010Vi07
Reference isotope		0						
	29 Cu 64	0			. ,		M11_Y	
	29 Cu 64 29 Cu 65	0	Stable	3/2-	-0.204(14)	[CEC]	Mu-X	2008Py02/1982Ef01
	29 Cu 64	0 0	Stable 5.1 m	3/2- 1+	-0.204(14) +0.059(14)	[65Cu]	CLS	2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66	0 0 1154	Stable 5.1 m 0.60 ms	3/2- 1+ 6-	-0.204(14) +0.059(14) (+)0.195(13)	[63Cu,65Cu]	CLS TDPAD	2010Vi07 2011Lo01
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67	0 0 1154 0	Stable 5.1 m	3/2- 1+	-0.204(14) +0.059(14)		CLS TDPAD CLS	2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66	0 0 1154 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s	3/2- 1+ 6-	$\begin{array}{c} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu]	CLS TDPAD CLS CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68	0 0 1154 0	Stable 5.1 m 0.60 ms 61.83 h	3/2- 1+ 6- 3/2- 1+ 6-	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8)	[63Cu,65Cu] [65Cu]	CLS TDPAD CLS CLS CLS	2010Vi07 2011Lo01 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67	0 0 1154 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s	3/2- 1+ 6- 3/2- 1+	$\begin{array}{c} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu]	CLS TDPAD CLS CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07
Reference isotope Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 69	0 0 1154 0 0 637	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m	3/2- 1+ 6- 3/2- 1+ 6-	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS CLS CLS CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68	0 0 1154 0 0 637 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6-	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS CLS CLS CLS CLS CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 69	0 0 1154 0 0 637 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3-	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS CLS CLS CLS CLS CLS CLS CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 69 29 Cu 70	0 0 1154 0 0 637 0 0 101 242	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 69 29 Cu 70	0 0 1154 0 0 637 0 0 101 242	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2-	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70	0 0 1154 0 0 637 0 0 101 242 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2-	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \\ +0.08(2) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73	0 0 1154 0 0 637 0 0 101 242 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 3/2-	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \\ +0.08(2) \\ -0.210(10) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74	0 0 1154 0 0 637 0 0 101 242 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2-	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \\ +0.08(2) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73	0 0 1154 0 0 637 0 0 101 242 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 3/2-	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \\ +0.08(2) \\ -0.210(10) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
Ceference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75	0 0 1154 0 0 637 0 0 101 242 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 3/2- 2- 5/2-	$\begin{array}{l} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \\ +0.08(2) \\ -0.210(10) \\ +0.27(3) \\ -0.281(17) \\ \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation	0 0 1154 0 0 637 0 0 101 242 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 3/2- 2- 5/2- ants in states	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 75 Calculation 30 Zn 63	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 3/2- 2- 5/2- ants in states 3/2-	$\begin{array}{c} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \\ +0.08(2) \\ -0.210(10) \\ +0.27(3) \\ -0.281(17) \\ of the Zn atom \\ +0.29(3) \end{array}$	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07
Ceference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 3/2- 2- 5/2- ants in states 3/2- 2+	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 1969La05 1981Ko06/1976Ne0
Ceference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 65	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 5/2- ants in states 3/2- 2+ 5/2-	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 1969La05 1981Ko06/1976NeC
Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 70 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 65 30 Zn 66	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 of the quadrupol 992 0 1039	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps	3/2- $1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 3/2 2 5/2-$ ants in states $3/2 2+$ $5/2 2+$	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2) -0.081(13)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 1969La05 1981Ko06/1976NeC
Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 65	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d	3/2- 1+ 6- 3/2- 1+ 6- 3/2- 6- 3- 1+ 3/2- 2- 5/2- ants in states 3/2- 2+ 5/2-	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 1969La05 1981Ko06/1976NeC
	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 70 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 65 30 Zn 66	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 of the quadrupol 992 0 1039	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps	3/2- $1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 3/2 2 5/2-$ ants in states $3/2 2+$ $5/2 2+$	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2) -0.081(13)	[63Cu,65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 1969La05 1981Ko06/1976Ne0 2008Py02/1969La00
Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 66 30 Zn 66	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps Stable 333 ns	3/2- $1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 3/2 2 5/2-$ ents in states $3/2 2+$ $5/2 2+$ $5/2 2+$ $5/2 9/2+$	$\begin{array}{c} -0.204(14) \\ +0.059(14) \\ (+)0.195(13) \\ -0.182(8) \\ -0.086(14) \\ -0.46(2) \\ -0.154(17) \\ -0.298(15) \\ -0.14(4) \\ -0.12(3) \\ -0.200(17) \\ +0.08(2) \\ -0.210(10) \\ +0.27(3) \\ -0.281(17) \\ \\ of the Zn atom \\ +0.29(3) \\ -0.14(2) \\ -0.023(2) \\ -0.081(13) \\ +0.150(15) \\ +0.54(5) \\ \end{array}$	[63Cu,65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 1969La05 1981Ko06/1976Ne0 1964By01 1981Ko06/1976Ne0 2008Py02/1969La0.
Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 66 30 Zn 67	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps Stable 333 ns 1.61 ps	3/2- $1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 3/2 2 5/2-$ ants in states $3/2 2+$ $5/2 2+$ $5/2 2+$ $5/2 2+$ $5/2 2+$	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2) -0.081(13) +0.150(15) +0.54(5) -0.106(16)	[63Cu,65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07
Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 66 30 Zn 66	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps Stable 333 ns 1.61 ps 13.72 h	3/2- $1+$ $6 3/2 1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 5/2 2+$ $5/2 2+$ $5/2 9/2+$	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.081(13) +0.150(15) +0.54(5) -0.106(16) -0.45(7)	[63Cu,65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 201
Reference isotope Linc Reference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 66 30 Zn 67 30 Zn 68 30 Zn 69 30 Zn 70	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps Stable 333 ns 1.61 ps 13.72 h 3.2 ps	3/2- $1+$ $6 3/2 1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 5/2 2+$ $2+$ $2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 2+$ $3/2 3/2 2+$ $3/2 3$	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2) -0.081(13) +0.150(15) +0.54(5) -0.106(16) -0.45(7) -0.24(3)	[63Cu,65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07
eference isotope iinc deference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 66 30 Zn 67 30 Zn 68 30 Zn 69 30 Zn 70 Calculation Calculation	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps Stable 333 ns 1.61 ps 13.72 h 3.2 ps e coupling consta	3/2- $1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 3/2 2 5/2-$ ants in states $3/2 2+$ $5/2 2+$ $5/2 2+$ $2+$ $9/2+$ $2+$ ants in GaF, G	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2) -0.081(13) +0.150(15) +0.54(5) -0.106(16) -0.45(7) -0.24(3) accl and GaBr molecules	[63Cu,65Cu] [65Cu] [67Zn] [67Zn]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 1969La05 1981K006/1976Ne0 1964By01 1981K006/1976Ne0 1976Ch37/1979Ka4 1981K006/1976Ne0 1983Oe01 1981K006/1976Ne0
eference isotope iinc deference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 68 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 66 30 Zn 67 30 Zn 68 30 Zn 69 30 Zn 70 Calculation 31 Ga 63	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1039 0 604 1077 439 885	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps Stable 333 ns 1.61 ps 13.72 h 3.2 ps e coupling consta 32.4 s	3/2- $1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 3/2 2 5/2-$ ants in states $3/2 2+$ $5/2 2+$ $5/2 2+$ $5/2 2+$ $2+$ $2+$ $3/2-$ ants in GaF, G	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2) -0.081(13) +0.150(15) +0.54(5) -0.106(16) -0.45(7) -0.24(3) sacl and GaBr molecules +0.212(4)	[63Cu,65Cu] [65Cu]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 2010Vi07 1969La05 1981Ko06/1976Ne0 2008Py02/1969La0: 1976Ch37/1979Ka4 1981Ko06/1976Neo 1983Oe01 1981Ko06/1976Neo 1983Oe01 1981Ko06/1976Neo
Ceference isotope	29 Cu 64 29 Cu 65 29 Cu 66 29 Cu 67 29 Cu 68 29 Cu 70 29 Cu 70 29 Cu 71 29 Cu 72 29 Cu 73 29 Cu 74 29 Cu 75 Calculation 30 Zn 63 30 Zn 64 30 Zn 66 30 Zn 67 30 Zn 68 30 Zn 69 30 Zn 70 Calculation Calculation	0 0 1154 0 0 637 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 101 242 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stable 5.1 m 0.60 ms 61.83 h 31.1 s 3.75 m 2.85 m 44.5 s 33 s 6.6 s 19.5 s 6.62 s 4.2 s 1.63 s 1.22 s e coupling consta 38.1 m 1.85 ps 244.1 d 1.56 ps Stable 333 ns 1.61 ps 13.72 h 3.2 ps e coupling consta	3/2- $1+$ $6 3/2 1+$ $6 3/2 6 3 1+$ $3/2 2 3/2 2 5/2-$ ants in states $3/2 2+$ $5/2 2+$ $5/2 2+$ $2+$ $9/2+$ $2+$ ants in GaF, G	-0.204(14) +0.059(14) (+)0.195(13) -0.182(8) -0.086(14) -0.46(2) -0.154(17) -0.298(15) -0.14(4) -0.12(3) -0.200(17) +0.08(2) -0.210(10) +0.27(3) -0.281(17) of the Zn atom +0.29(3) -0.14(2) -0.023(2) -0.081(13) +0.150(15) +0.54(5) -0.106(16) -0.45(7) -0.24(3) accl and GaBr molecules	[63Cu,65Cu] [65Cu] [67Zn] [67Zn]	CLS TDPAD CLS	2010Vi07 2011Lo01 2010Vi07 1969La05 1981Ko06/1976NeC 1964By01 1981Ko06/1976NeC 1964By01 1981Ko06/1976NeC 1964By01 1981Ko06/1976NeC

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
	31 Ga 67	0	78.3 h	3/2-	+0.197(2)	[69Ga][71Ga]	AB	1968Eh02/2001Py02
	31 Ga 68	0	68.1 m	1+	-0.0277(14)	[69Ga][71Ga]	AB	1972St38
		1230	64 ns	7—	+0.72(2)	[69Ga][71Ga]	TDPAD	1985Ra33
Reference isotope	31 Ga 69	0	Stable	3/2-	+0.171(2)		MS	2008Py02
, ,	31 Ga 70	0	21.1 m	1+	+0.105(7)	[69Ga]	CLS	2012Pr11
Reference isotope	31 Ga 71	0	Stable	3/2-	+0.107(1)	[]	MS	2008Py02
tejerence tootope	31 Ga 72	0	14.1 h	3-	+0.530(6)	[69Ga][71Ga]	AB	1968Eh02/2001Py02
	31 Ga 72	0	4.86 h	3/2-	+0.209(2)	[71Ga]	CLS	2010Ch16
	31 Ga 73	0	8.12 m	3– or 4–	* *		LRS	
					+0.55(4) or $+0.60(4)$	[71Ga]	CLS	2011Ma45
	31 Ga 75	0	126 s	3/2-	-0.285(17)	[71Ga]		2010Ch16
	31 Ga 76	0	32.6 s	(2+)	+0.33(2)	[71Ga]	LRS	2011Ma45
	31 Ga 77	0	13.2 s	3/2-	-0.208(13)	[71Ga]	CLS	2010Ch16
	31 Ga 78	0	5.1 s	(2+)	+0.33(2)	[71Ga]	LRS	2011Ma45
	31 Ga 79	0	2.85 s	3/2-	+0.158(10)	[71Ga]	CLS	2010Ch16
	31 Ga 80	0?	0.2-1.7 s	(3-)	+0.38(2)	[71Ga]	CLS	2010Ch50
		0?	0.2-1.7 s	(6-)	+0.48(3)	[71Ga]	CLS	2010Ch50
	31 Ga 81	0	1.22 s	5/2-	-0.048(8)	[71Ga]	CLS	2010Ch16
Germanium		of the quadrupol in Zn single cryst	e coupling constar al	ıts in GeO, Ge	S molecules			
	32 Ge 67	752	146 ns	9/2+	0.92(9)	[73Ge]	TDPAD	1993Co17/1981Vi05
	32 Ge 69	0	39.0 h	5/2-	+0.027(5)	[73Ge]	AB	19700l02
		398	2.8 ms	9/2+	0.75(8)	[73Ge]	TDPAD	1993Co17/1981Vi05
	32 Ge 70	1039	1.32 ps	2+	+0.03(6)	[30]	CER	1980Le16/2000To12
	32 Ge 70	175	84 ns	5/2+	0.18(4)	Α	TDPAD	1993Co17/1981Vi05
	J2 GC / I	199	20.2 ms	3/2+ 9/2+	1 7	11	QIR	1975Ri03/1976Br41
	32 Ge 72	834			0.34(5)		CER	'
Reference isotope			3.29 ps	2+	-0.13(6)			1980Le16/2000To12
ejerence isotope	32 Ge 73	0	Stable	9/2+	-0.196(1)	٨	MS	2008Py02/1999Ke17
	22.0- 74	13	2.86 ms	5/2+	0.70(8)	Α	TDPAC	1993Co17/1981Vi05
	32 Ge 74	596	12.5 ps	2+	-0.19(2)		CER	2000To12
	32 Ge 76	1204 563	4.9 ps 18.6 ps	2+ 2+	-0.26(6) -0.19(6)		CER CER	2000To12 1980Le16/2000To12
			•	2+	-0.15(0)		CLK	130010 10/20001012
rsenic	Muonic ato 33 As 70	m X-ray hyperfin 0	e structure 53 m	4+	+0.09(2)	[75As]	AB	1980Но02
	33 As 70	0	65.3 h	5/2-	* *		NO/S	
				,	-0.021(6)	[75As]		1988Wh03
	33 As 72	0	26 h	2-	-0.08(2)	[75As]	AB	1980Ho02
Reference isotope	33 As 73 33 As 75	66 0	5.0 ns Stable	5/2— 3/2—	+0.356(12) +0.314(6)	[75As]	TDPAC Mu-X	1992Sc21
ejerence isotope	33 AS /3	U	Stable	3/2-	+0.514(0)		IVIU-A	2008Py02/1982Ef01
elenium			e coupling constar		0.26(7)		CED	10701 22
	34 Se 74	635	7.08 ps	2+	-0.36(7)	[776]	CER	1978Le22
	34 Se 75	0	118.5 d	5/2+	1.1(2)	[77Se]	MA	1955Aa06
	34 Se 76	559	12.3 ps	2+	-0.34(7)		CER	1977Le11
Reference isotope	34 Se 77	250	9.56 ns	5/2-	+0.76(5)		TDPAC	2008Py02/1983Un02
	34 Se 78	614	8.6 ps	2+	-0.26(9)		CER	1977Le11
	34 Se 79	0	$< 6.5 \times 10^4 \text{ y}$	7/2+	+0.8(2)	[77Se]	MA	1989Ra17(2)
	34 Se 80	666	8.0 ps	2+	-0.31(7)		CER	1977Le11
	34 Se 82	654	11.3 ps	2+	-0.22(7)		CER	1977Le11
romine	Calculation	of the quadrupol	e counling consta	nts in states of	f the Br atom and in HBr			
	35 Br 76	0	16.1 h	1—	+0.255(4)	[79Br]	AB	1960Li11
	35 Br 77	0	57 h	3/2-	+0.50(2)	[79Br]	MAPON	1998Se09
eference isotope	35 Br 79	0	Stable	3/2-	+0.313(3)	[]	AB/MS	2008Py02/2001Bi17
2, 2. ccc isotope	35 Br 80	0	17.6 m	1+	+0.185(3)	[79Br]	AB/NIS	1964Wh05
	33 DI 00	37	7.4 ns	2-	0.164(6)	[79Br]	AB	1978Ta24
				2— 5—				
lafamamaa /	25 D- 01	86	4.42 h		+0.710(10)	[79Br]	AB /N/C	1964Wh05
Reference isotope	35 Br 81 35 Br 82	0 0	Stable 35.3 h	3/2- 5-	+0.262(3) +0.707(10)	[79Br] [79Br]	AB/MS AB	2008Py02/2001Bi17 1959Ga12
	55 DI 02	•	55.5 11	J	, 5 5. (10)	[, 551]		.000 Ju 12
Krypton	Calculation 36 Kr 75		e coupling constar		i 1 127/12\	[63][+]	CEDIC	100EV-04
		0	4.3 m	5/2+	+1.137(13)	[83Kr]	CFBLS	1995Ke04
	36 Kr 77	0	74.4 m	5/2+	+0.948(10)	[83Kr]	CFBLS	1995Ke04
	36 Kr 79	130	50 s	7/2+	+0.404(5)	[83Kr]	CFBLS	1995Ke04
		147	77.7 ns	5/2-	+0.45(3)	[83Kr]	TDPAD	1978HaXP
			$2.3 \times 10^{5} \text{ y}$	7/2+	+0.644(4)	[83Kr]	LRFS	1993Ca41
	36 Kr 81	0		0/2 :	+0.259(1)		MS	2008Py02
Reference isotope	36 Kr 81 36 Kr 83	0	Stable	9/2+				•
deference isotope			Stable 147 ns	9/2+ 7/2+	+0.507(3)	[83Kr]	ME	1977Ho33
deference isotope		0				[83Kr] [83Kr]	ME LEMS	
'eference isotope	36 Kr 83 36 Kr 84	0 9 3236	147 ns 1.84 ms	7/2+ 8+	+0.507(3) +0.36(4)	[83Kr]	LEMS	1977Ho33 2006Sc22
eference isotope	36 Kr 83 36 Kr 84 36 Kr 85	0 9 3236 0	147 ns 1.84 ms 10.76 y	7/2+ 8+ 9/2+	+0.507(3) +0.36(4) +0.443(3)	[83Kr] [83Kr]	LEMS LRFS	1977Ho33 2006Sc22 1993Ca41
Reference isotope	36 Kr 84 36 Kr 85 36 Kr 87	0 9 3236 0	147 ns 1.84 ms 10.76 y 76.3 m	7/2+ 8+ 9/2+ 5/2+	+0.507(3) +0.36(4) +0.443(3) -0.300(3)	[83Kr] [83Kr] [83Kr]	LEMS LRFS CFBLS	1977Ho33 2006Sc22 1993Ca41 1995Ke04
Reference isotope	36 Kr 84 36 Kr 85 36 Kr 87 36 Kr 87	0 9 3236 0 0	147 ns 1.84 ms 10.76 y 76.3 m 3.15 m	7/2+ 8+ 9/2+ 5/2+ 3/2+	+0.507(3) +0.36(4) +0.443(3) -0.300(3) +0.166(2)	[83Kr] [83Kr] [83Kr] [83Kr]	LEMS LRFS CFBLS CFBLS	1977Ho33 2006Sc22 1993Ca41 1995Ke04 1995Ke04
Reference isotope	36 Kr 84 36 Kr 85 36 Kr 87	0 9 3236 0	147 ns 1.84 ms 10.76 y 76.3 m	7/2+ 8+ 9/2+ 5/2+	+0.507(3) +0.36(4) +0.443(3) -0.300(3)	[83Kr] [83Kr] [83Kr]	LEMS LRFS CFBLS	1977Ho33 2006Sc22 1993Ca41 1995Ke04

Table 1 (continued)

Element	Nucleus	E (level) keV		I^{π}	Q(b)	Ref. Std.	Method	Reference
Rubidium	Calculation	of the quadrupo	le coupling consta	ints in RbF				
	37 Rb 76	0	39 s	1(-)	+0.46(20)	[85Rb]	ABLS	1981Th04
	37 Rb 77	0	3.8 m	3/2-	+0.84(17)	[85Rb]	ABLS	1981Th04
	37 Rb 78	103	6.3 m	4-	+0.99(20)	[85Rb]	ABLS	1981Th04
	37 Rb 78				* *			
		0	23 m	5/2+	-0.12(4)	[85Rb]	ABLS	1981Th04
	37 Rb 80	0	30 s	1+	+0.42(8)	[85Rb]	ABLS	1981Th04
	37 Rb 81	0	4.58 h	3/2-	+0.48(10)	[85Rb]	ABLS	1981Th04
		86	32 m	9/2+	-0.90(19)	[85Rb]	ABLS	1981Th04
	37 Rb 82	0	1.25 m	1+	+0.23(10)	[85Rb]	ABLS	1981Th04
	37 NB 02	~100	6.47 h	5-	+1.22(27)	[85Rb]	ABLS	1981Th04
	27 Db 02		86.2 d					
	37 Rb 83	0		5/2-	+0.24(5)	[85Rb]	ABLS	1981Th04
	37 Rb 84	0	33 d	2-	-0.02(4)	[85Rb]	ABLS	1981Th04
		465	20.4 m	6—	+0.70(36)	[85Rb]	ABLS	1981Th04
eference isotope	37 Rb 85	0	Stable	5/2-	+0.276(1)		MS	2008Py02
•		514	1.02 ms	9/2+	-0.9(3)	[85Rb]	OPD	1991Ma21
	37 Rb 86	0	18.65 d	2-	+0.23(6)	[85Rb]	ABLS	1981Th04
	37 Kb 00							
_		556	1.02 m	(6-)	+0.45(14)	[85Rb]	ABLS	1981Th04
eference isotope	37 Rb 87	0	$4.9 \times 10^{10} \text{ y}$	3/2-	+0.1335(5)		MS	2008Py02
	37 Rb 88	0	17.7 m	2-	-0.01(11)	[85Rb]	ABLS	1981Th04
	37 Rb 89	0	15.2 m	3/2-	+0.17(3)	[85Rb]	ABLS	1981Th04
	37 Rb 90	107	4.26 m	3-	+0.25(7)	[85Rb]	ABLS	1981Th04
			T.20 III					
	37 Rb 91	0	58 s	3/2(-)	+0.19(5)	[85Rb]	ABLS	1981Th04
	37 Rb 93	0	5.85 s	5/2-	+0.21(6)	[85Rb]	ABLS	1981Th04
	37 Rb 94	0	2.73 s	3(-)	+0.20(7)	[85Rb]	ABLS	1981Th04
	37 Rb 95	0	0.38 s	5/2-	+0.26(9)	[85Rb]	ABLS	1981Th04
	37 Rb 96	0	0.20 s	2+			ABLS	1981Th04
				2/2	+0.30(9)	[85Rb]		
	37 Rb 97	0	0.17 s	3/2-	+0.70)15)	[85Rb]	ABLS	1981Th04
rontium	Calculation	of the anadruss	le counling const	inte in the Ad	$^2D_{5/2}$ and $^5P_{9/2}$ states of the 5	Sr+ ion		
rontium	38 Sr 77	of tne quaarupo 0	e coupling consta 9 s	nts in the 4a = 5/2+	$^{2}D_{5/2}$ and $^{3}P_{9/2}$ states of the S $+1.27(5)$	sr'ion [87Sr]	CFBLS	1992Li11
	38 Sr 79	0	2.25 m	(3/2-)	+0.661(6)	[87Sr]	CFBLS	1990Bu12
	38 Sr 83	0	32.4 h	7/2+	+0.708(11)	[87Sr]	CFBLS	1990Bu12
	38 Sr 85	0	64.8 d	9/2+	+0.263(14)	[87Sr]	CFBLS	1990Bu12
eference isotope	38 Sr 87	0	Stable	9/2+	+0.305(2)	[0,01]	AB	2008Py02/2006Sa21
Jerence isotope						[070]		
	38 Sr 89	0	50.5 d	5/2+	-0.253(8)	[87Sr]	CFBLS	1990Bu12
	38 Sr 91	0	9.5 h	5/2+	+0.042(10)	[87Sr]	CFBLS	1990Bu12
	38 Sr 93	0	7.4 m	5/2+	+0.240(10)	[87Sr]	CFBLS	1990Bu12
	38 Sr 99	0	0.269 s	3/2+	+0.76(4)	[87Sr]	CFBLS	1991Li05
		6.1			= 2 op			
ttrium					5s ² 2D states of the Y atom	[aarr]	GT G	000001.00
	39 Y 87	381	13.4 h	9/2+	-0.50(6)	[90Y]	CLS	2007Ch07
	39 Y 88	0	106 d	4—	+0.16(3)	[90Y]	CLS	2007Ch07
		675	14 ms	8+	+0.06(6)	[90Y]	CLS	2007Ch07
	39 Y 89	909	16.1 s	9/2+	-0.43(6)	[90Y]	CLS	2007Ch07
oforonco icotono	39 Y 90	0	64.1 h	2-	* *	[501]		
eference isotope	39 1 90				-0.125(11)	[0011]	AB	2008Py02/1998Bi20
		682	3.19 h	7+	-0.65(8)	[90Y]	CLS	2007Ch07
	39 Y 92	0	3.54 h	2-	0.00(2)	[90Y]	CLS	2007Ch07
	39 Y 93	758	0.82 s	9/2+	-0.64(8)	[90Y]	CLS	2007Ch07
	39 Y 94	0	18.7 m	2-		[90Y]	CLS	2007Ch07
					-0.03(3)			
	39 Y 96	1140	9.6 s	8+	-0.98(11)	[90Y]	CLS	2007Ch07
	39 Y 97	668	1.17 s	9/2+	-0.76(8)	[90Y]	CLS	2007Ch07
		3522	142 ms	(27/2)	-1.21(14)	[90Y]	CLS	2007Bi14
				` ' '			CLS	2007Bi14
	39 V 98			4 or 5	+1.7(2) or +1.8(2)	190Y1		
	39 Y 98	410	2.0 s	4 or 5	+1.7(2) or $+1.8(2)$	[90Y]		
	39 Y 99	410 0	2.0 s 1.47 s	5/2+	+1.55(17)	[90Y]	CLS	2007Bi14
	39 Y 99 39 Y 100	410	2.0 s 1.47 s 0.94 s	5/2+ 4	+1.55(17) +1.85(20)	[90Y] [90Y]	CLS CLS	2007Bi14 2007Bi14/2010Ba31
	39 Y 99	410 0	2.0 s 1.47 s	5/2+	+1.55(17)	[90Y]	CLS	2007Bi14
	39 Y 99 39 Y 100	410 0 (143)	2.0 s 1.47 s 0.94 s	5/2+ 4	+1.55(17) +1.85(20)	[90Y] [90Y]	CLS CLS	2007Bi14 2007Bi14/2010Ba31
	39 Y 99 39 Y 100 39 Y 101 39 Y 102	410 0 (143) 0 0+x	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s	5/2+ 4 5/2+ 2 or 3	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16)	[90Y] [90Y] [90Y]	CLS CLS CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14
irconium	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation	$\begin{array}{c} 410 \\ 0 \\ (143) \\ 0 \\ 0+x \end{array}$	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s	5/2+ 4 5/2+ 2 or 3	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) and ZrS molecules	[90Y] [90Y] [90Y]	CLS CLS CLS	2007Bi14 2007Bi14/2010Ba3 2007Bi14 2007Bi14
irconium	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87	410 0 (143) 0 0 + x of the quadrupo 0	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h	5/2+ 4 5/2+ 2 or 3 ants in the ZrO 9/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) and ZrS molecules +0.42(5)	[90Y] [90Y] [90Y] [90Y]	CLS CLS CLS CLS	2007Bi14 2007Bi14/2010Ba3 2007Bi14 2007Bi14 2003Th03
irconium	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation	410 0 (143) 0 $0 + x$ of the quadrupo	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s	5/2+ 4 5/2+ 2 or 3	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) and ZrS molecules	[90Y] [90Y] [90Y]	CLS CLS CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03
irconium	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88	410 0 (143) 0 0 + x of the quadrupo 0 2889	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms	5/2+ 4 5/2+ 2 or 3 ants in the ZrO 9/2+ 8+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) O and ZrS molecules +0.42(5) +0.44(3)	[90Y] [90Y] [90Y] [90Y] [91Zr]	CLS CLS CLS CLS TDPAD/TFLD	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0
irconium	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89	410 0 (143) 0 0 + x of the quadrupo 0 2889 0	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h	5/2+ 4 5/2+ 2 or 3 ants in the ZrC 9/2+ 8+ 9/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr]	CLS CLS CLS CLS CLS CLS CLS CLS TDPAD/TFLD CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be00 2003Th03
	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns	5/2+ 4 5/2+ 2 or 3 ants in the ZrC 9/2+ 8+ 9/2+ 8+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3)	[90Y] [90Y] [90Y] [90Y] [91Zr]	CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be00 2003Th03 1985Ra09/1986Be00
	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable	5/2+ 4 5/2+ 2 or 3 sunts in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr]	CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be00 2003Th03 1985Ra09/1986Be00 2008Py02/2000Ke0
	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns	5/2+ 4 5/2+ 2 or 3 ants in the ZrC 9/2+ 8+ 9/2+ 8+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr]	CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be00 2003Th03 1985Ra09/1986Be00
	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr]	CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be00 2003Th03 1985Ra09/1986Be00 2008Py02/2000Ke00
	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [5-90mZr calc]	CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09
	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr]	CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD	2007Bi14 2007Bi14/2010Ba3 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09
eference isotope	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 90 40 Zr 91 40 Zr 95 40 Zr 101	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d 2.4s	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [5-90mZr calc]	CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON	2007Bi14 2007Bi14/2010Ba3 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01
eference isotope	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91 40 Zr 91 40 Zr 101 Muonic aton	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 1.34 ns Stable 3.6 ms 64.0 d 2.4s	5/2+ 4 5/2+ 2 or 3 suts in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr]	CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 19985e01 2002Ca37
eference isotope	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 90 40 Zr 91 40 Zr 95 40 Zr 101	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0 m X-ray hyperfir	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 1.34 ns Stable 3.6 ms 64.0 d 2.4s	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [5—90mZr calc] [91Zr] [93Nb]	CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01 2002Ca37
eference isotope	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 91 40 Zr 91 40 Zr 91 Muonic atot 41 Nb 90	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0 m X-ray hyperfir 0 125	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s the coupling constant 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d 2.4s the structure 14.6 h 18.8 s	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+ 8+ 4-	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6) +0.01(4) -0.26(4)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [5-90mZr calc] [91Zr] [93Nb] [93Nb]	CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS CLS CLS	2007Bi14 2007Bi14/2010Ba3 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01 2002Ca37
eference isotope	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91 40 Zr 91 Muonic ator 41 Nb 90 41 Nb 91	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0 m X-ray hyperfir	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d 2.4s le structure 14.6 h 18.8 s 680 y	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+ 8+ 4- 9/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) 0 and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [5—90mZr calc] [91Zr] [93Nb]	CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS CLS CLS CLS	2007Bi14 2007Bi14/2010Ba3 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01 2002Ca37
eference isotope	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91 40 Zr 91 Muonic ator 41 Nb 90 41 Nb 91	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0 m X-ray hyperfir 0 125	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d 2.4s le structure 14.6 h 18.8 s 680 y	5/2+ 4 5/2+ 2 or 3 ints in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+ 8+ 4- 9/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6) +0.01(4) -0.26(4) -0.25(3)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [5-90mZr calc] [91Zr] [93Nb] [93Nb] [93Nb]	CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS CLS CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01 2002Ca37 2009Ch25 2009Ch25 2009Ch25
eference isotope iobium	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91 40 Zr 91 Muonic ator 41 Nb 90 41 Nb 91 41 Nb 92	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0 n X-ray hyperfir 0 125 0	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d 2.4s le structure 14.6 h 18.8 s 680 y 3.5 × 10 ⁷ y	5/2+ 4 5/2+ 2 or 3 ants in the ZrC 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+ 8+ 4- 9/2+ 7+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) O and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6) +0.01(4) -0.26(4) -0.25(3) -0.35(3)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [5-90mZr calc] [91Zr] [93Nb] [93Nb]	CLS CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS CLS CLS CLS CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01 2002Ca37 2009Ch25 2009Ch25 2009Ch25 2009Ch25
eference isotope iobium	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 90 40 Zr 91 40 Zr 91 40 Zr 91 Muonic ator 41 Nb 90 41 Nb 91 41 Nb 92 41 Nb 93	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0 m X-ray hyperfir 0 125 0 0	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d 2.4s le structure 14.6 h 18.8 s 680 y 3.5 × 10 ⁷ y Stable	5/2+ 4 5/2+ 2 or 3 ants in the ZrO 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+ 8+ 4- 9/2+ 7+ 9/2+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) O and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6) +0.01(4) -0.26(4) -0.25(3) -0.35(3) -0.32(2)	[90Y] [90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [91Zr] [93Nb] [93Nb] [93Nb]	CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS CLS CLS CLS CLS CLS CLS Mu-X	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01 2002Ca37 2009Ch25 2009Ch25 2009Ch25 2009Ch25 2009Ch25 2009Ch25 2009Ch25 2009Ch25
irconium eference isotope liobium eference isotope	39 Y 99 39 Y 100 39 Y 101 39 Y 102 Calculation 40 Zr 87 40 Zr 88 40 Zr 89 40 Zr 90 40 Zr 91 40 Zr 91 Muonic ator 41 Nb 90 41 Nb 91 41 Nb 92	410 0 (143) 0 0 + x of the quadrupo 0 2889 0 3589 0 3167 0 0 n X-ray hyperfir 0 125 0	2.0 s 1.47 s 0.94 s 0.45 s 0.3 s le coupling consta 1.68 h 1.32 ms 78.4 h 134 ns Stable 3.6 ms 64.0 d 2.4s le structure 14.6 h 18.8 s 680 y 3.5 × 10 ⁷ y	5/2+ 4 5/2+ 2 or 3 ants in the ZrC 9/2+ 8+ 9/2+ 8+ 5/2+ 21/2+ 5/2+ 3/2+ 8+ 4- 9/2+ 7+	+1.55(17) +1.85(20) +1.53(17) +1.17(13) or +1.36(16) O and ZrS molecules +0.42(5) +0.44(3) +0.28(10) -0.44(3) -0.176(3) 0.71(4) +0.22(2) +0.81(6) +0.01(4) -0.26(4) -0.25(3) -0.35(3)	[90Y] [90Y] [90Y] [90Y] [91Zr] [91Zr] [91Zr] [91Zr] [5-90mZr calc] [91Zr] [93Nb] [93Nb] [93Nb]	CLS CLS CLS CLS CLS CLS TDPAD/TFLD CLS TDPAD/TFLD MS TDPAD MAPON CLS CLS CLS CLS CLS	2007Bi14 2007Bi14/2010Ba31 2007Bi14 2007Bi14 2003Th03 1985Ra09/1986Be0 2003Th03 1985Ra09/1986Be0 2008Py02/2000Ke0 1985Ra09 1998Se01 2002Ca37 2009Ch25 2009Ch25 2009Ch25

Table 1 (continued)

Molybdenum Reference isotope Reference isotope Technetium Reference isotope Ruthenium	A. Normalise 42 Mo 90 42 Mo 92 42 Mo 94 42 Mo 95 42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation of		7.1 s 1.5 s coupling constan 1760 keV state es 1.1 ms 190 ns 2.9 ps 98 ns Stable 3.7 ps Stable			[93Nb] [93Nb] A From B(E2)	CLS CLS TDPAD Not measured	2009Ch25 2009Ch25 1985Ra09 1991Ha04
Reference isotope Reference isotope Fechnetium Reference isotope Ruthenium	Estimation o, A. Normalise 42 Mo 90 42 Mo 92 42 Mo 94 42 Mo 95 42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation o, 43 Tc 99	f the quadrupole d to Q of 92Mo 2 2875 2760 871 2956 0 778 0	coupling consta 1760 keV state es 1.1 ms 190 ns 2.9 ps 98 ns Stable 3.7 ps	nt in states of stimated from 8+ 8+ 2+ 8+	of the Mo atom n B(E2) 0.61(3) (-)0.36	A	TDPAD	1985Ra09
eference isotope eference isotope echnetium eference isotope tuthenium	A. Normalise 42 Mo 90 42 Mo 92 42 Mo 94 42 Mo 95 42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation of	d to Q of 92Mo 2 2875 2760 871 2956 0 778 0	2760 keV state es 1.1 ms 190 ns 2.9 ps 98 ns Stable 3.7 ps	stimated from 8+ 8+ 2+ 8+	n B(E2) 0.61(3) (-)0.36			
eference isotope echnetium eeference isotope euthenium	42 Mo 90 42 Mo 92 42 Mo 94 42 Mo 95 42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation of 43 Tc 99	2875 2760 871 2956 0 778 0	1.1 ms 190 ns 2.9 ps 98 ns Stable 3.7 ps	8+ 8+ 2+ 8+	0.61(3) (-)0.36			
eference isotope echnetium eeference isotope euthenium	42 Mo 92 42 Mo 94 42 Mo 95 42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation of 43 Tc 99	2760 871 2956 0 778 0 787	190 ns 2.9 ps 98 ns Stable 3.7 ps	8+ 2+ 8+	(-)0.36			
Reference isotope Sechnetium Reference isotope Ruthenium	42 Mo 94 42 Mo 95 42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation of 43 Tc 99	871 2956 0 778 0 787	2.9 ps 98 ns Stable 3.7 ps	2+ 8+		110111 D(L2)		1991 H J H J
Reference isotope Fechnetium Reference isotope Ruthenium	42 Mo 95 42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation o 43 Tc 99	2956 0 778 0 787	98 ns Stable 3.7 ps	8+	0.13(0) 01 0.01(0)		CER	1976Pa13
deference isotope Gechnetium deference isotope Ruthenium	42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation of 43 Tc 99	0 778 0 787	Stable 3.7 ps		0.50(1)	Α	TDPAD	1985Ra09
deference isotope Gechnetium deference isotope Ruthenium	42 Mo 96 42 Mo 97 42 Mo 98 42 Mo 100 Estimation of 43 Tc 99	778 0 787	3.7 ps		-0.022(1)	Л	AB	2008Py02/1982BuZE
echnetium deference isotope duthenium	42 Mo 97 42 Mo 98 42 Mo 100 Estimation o 43 Tc 99	0 787	•	2+	-0.022(1)) -0.20(8) or $+0.04(8)$		CER	1976Pa13
echnetium Reference isotope Ruthenium	42 Mo 98 42 Mo 100 Estimation o 43 Tc 99	787	Stable					
deference isotope	42 Mo 100 Estimation of 43 Tc 99			5/2+	+0.255(13)		AB	2008Py02/1982BuZI
deference isotope	Estimation o		3.5 ps	2+ 2+	-0.26(9) -0.25(7)		CER CER	1979Pa11 2011Wr01
eference isotope cuthenium	43 Tc 99	330	10.3 ps	2+	-0.25(7)		CEK	201100101
tuthenium			coupling consta				4.0	20000 02/40020 77
		0	$2.1 \times 10^5 \text{ y}$	9/2+	-0.129(6)		AB	2008Py02/1982BuZE
			e in the 5F multi					
	44 Ru 93	2082	2.4 ms	21/2+	+0.04(1)	[99Ru]	TDPAD	1991Ha04
	44 Ru 96	833	2.7 ps	2+	-0.15(8)		CER	1998Hi01
	44 Ru 98	653	5.9 ps	2+	-0.21(8) or $-0.01(9)$		CER	1998Hi01
leference isotope	44 Ru 99	0	Stable	5/2+	+0.079(4)		AB	2008Py02/1982BuZE
•		90	20.5 ns	3/2+	+0.231(13)	[99Ru]	ME	1976Ki02
	44 Ru 100	540	12 ps	2+	-0.44(4) or $-0.27(7)$	- •	CER	1998Hi01
eference isotope	44 Ru 101	0	Stable	5/2+	+0.46(2)		AB	2008Py02/1982BuZI
,	44 Ru 101	475	18 ps	2+	-0.63(4) or -0.34(3)		CER	1998Hi01
	44 Ru 102	0	39.4 d	3/2+	+0.62(2)	[99Ru 90 keV]	NO/S	1986Gr26
	44 Ru 103	358	58 ps	2+	-0.78(7) or $-0.20(12)$	[JJKu JJ KCV]	CER	1998Hi01
hodium	Calculation	f the anadronal	e counling consta	ints in Rh int	termetallic compounds			
eference isotope	45 Rh 100	у іне циаатирою 74	214 ns	(2)+	0.153 (18)		PAC	2008Py02/1996Bl15
ejerence isotope					• •			
	45 Rh 103	295	6.7 ps	3/2 <i>—</i>	-0.3(2)		CERP CERP	1976Ge19
		357	73 ps	5/2—	-0.4(2)		CERP	1976Ge19
alladium		ı X-ray hyperfine						
	46 Pd 102	556	11.3 ps	2+	-0.20(15)		CERP	1977Fa11
	46 Pd 104	556	9.7 ps	2+	-0.46(11)		CERP	1977Fa11
leference isotope	46 Pd 105	0	Stable	5/2+	+0.660(11)		Mu-X	2008Py02/1978Vu0
	46 Pd 106	512	12 ps	2+	-0.51(7)		ES	1973Ho05
	46 Pd 108	434	23 ps	2+	-0.58(4)		ES	1978Ar07
	46 Pd 110	374	46 ps	2+	-0.47(3)		ES	1976Li19
ilver	Calculation o	of the auadrupole	coupling consta	ınt in the Ag	atom			
	47 Ag 101	0	11.4 m	9/2+	+0.35(5)	[110Ag 118 keV]	CLS	1989Di12
	47 Ag 103	0	1.10 h	7/2+	+0.84(9)	[110Ag 118 keV]	CLS	1989Di12
	47 Ag 104	0	69 m	5+	+1.06(11)	[110Ag 118 keV]	CLS	1989Di12
	47 Ag 105	25	7.2 m	7/2+	+0.85(11)	[110Ag 118 keV]	CLS	1989Di12
	47 Ag 106	90	8.5 d	6+	1.11(11)	[110Ag 118 keV]	CLS	1989Di12
	47 Ag 107	93	44.3 s	7/2+	0.98(11)	[110Ag 118 keV]	LMR	1986Be01/1984Be53
	47 Ag 107 47 Ag 108	110	44.5 s 418 y	6+	+1.32(7)	[110Ag 118 keV]	O	1984Be53
	47 Ag 108 47 Ag 109	88	418 y 39.8 s		* *		LMR	1986Be01/1984Be53
	47 Ag 109			7/2+	(+)1.02(12)	[110Ag 118 keV]		
		311	5.9 ps	3/2-	-0.7(3)		CER	1972Th16
	47 4 410	415	35 ps	5/2-	-0.3(3)		CER	1972Th16
afaranca ica	47 Ag 110	0	24.4 s	1+	0.24(12)		QIR	1981Do17
eference isomer		118	252 d	6+	+1.44(10)		0	1984Be53
Cadmium		dopted reference						
		2 state of the Cd						
					see 1969La06/1978Sp09			
	48 Cd 102	2718	56 ns	8+	0.76(9)	[efg Cd in Cd]	TDPAD	1992Al17
	48 Cd 103	0	7.3 m	5/2+	-0.7(6)	A	CLS	1987Bu01
	48 Cd 105	0	56 m	5/2+	+0.37(4)	A	OD	1969La06
		2517	4.5 ms	21/2+	+1.02(10)	В	TDPAC	1978Sp09
	48 Cd 106	633	7.3 ps	2+	-0.28(8)		CER	1976Es02
	48 Cd 107	0	6.50 h	5/2+	+0.60(2)	A	CLS	2013Yo02
	-	846	70 ns	11/2-	-0.94(10)	В	TDPAC	1978Sp09
		2679	56 ns	21/2+	+1.05(11)	В	TDPAC	1978Sp09
	48 Cd 108	633	6.8 ps	21/2+	-0.45(8)	2	CER	1976Es02
	48 Cd 108	0	453 d	2+ 5/2+		Α	CLS	2013Yo02
	40 CU 109	0 463	453 a 10.9 ms	5/2+ 11/2-	+0.60(3) [-0.92(9)]	A Systematic	Not measured	1978Sp09
						extrapolation		-
	48 Cd 110	658	5.0 ps	2+	-0.40(4)		ES	1977Gi13
				E 10 ·		R	TDDAC	10700 00
	48 Cd 111	245	84 ns	5/2+	+0.74(7)	В	TDPAC	1978Sp09
	48 Cd 111	245 396	84 ns 48.6 m	5/2+ 11/2-	+0.74(7) -0.75(3)	A A	CLS	1978Sp09 2013Yo02
	48 Cd 111 48 Cd 112							

Table 1 (continued)

Element	Nucleus	E (level) keV	$T_{1/2}$	I^{π}	Q(b)	Ref. Std.	Method	Reference
	48 Cd 113	264	14 y	11/2-	-0.61(3)	Α	CLS	2013Yo02
	48 Cd 114	558	9.0 ps	2+	-0.348(12)		ES	1981Ko06
	48 Cd 115	173	44.8 d	11/2-	-0.48(2)	Α	CLS	2013Yo02
	48 Cd 116	514	15 ps	2+	-0.42(4)		ES	1977Gi13
	48 Cd 117	136	3.36 h	11/2-	-0.320(13)	Α	CLS	2013Yo02
	48 Cd 119	147	2.20 m	11/2—	-0.135(6)	A	CLS	2013Yo02
	48 Cd 113	215	8.3 s	11/2—	+0.009(6)	A	CLS	2013Yo02
	48 Cd 121	317	1.82 s	11/2-	+0.135(7)	A	CLS	2013Yo02 2013Yo02
	48 Cd 125	0	0.68 s	3/2+	+0.209(10)	A	CLS	2013Yo02
	40.61.407	X	0.48 s	11/2-	+0.269(13)	A	CLS	2013Yo02
	48 Cd 127	0	0.37 s	3/2+	+0.239(11)	A	CLS	2013Yo02
		X	_	11/2-	+0.34(2)	A	CLS	2013Yo02
	48 Cd 129	0	0.27 s	3/2+	+0.132(9)	Α	CLS	2013Yo02
		X	_	11/2—	+0.57(3)	Α	CLS	2013Yo02
Indium	Calculated e	electric quadrupo	le interactions in	indium halid	les			
	49 In 104	0	1.7 m	5+	+0.63(10)	[115In]	CFBLS	1987Eb02
	49 In 105	0	5.07 m	9/2+	+0.79(5)	[115In]	CFBLS	1987Eb02
	49 In 106	0	6.2 m	7+	+0.92(6)	[115In]	CFBLS	1987Eb02
	49 In 100 49 In 107	0	32.4 min	9/2+	+0.92(6) +0.77(5)		CFBLS	1987Eb02 1987Eb02
	49 In 107 49 In 108	0				[115In]		1987Eb02 1987Eb02
	49 111 108		58 m	7+	+0.955(7)	[115In]	CFBLS	
	40.1.400	29	40 m	2+	'+0.444(13)	[115In]	CFBLS	1987Eb02
	49 In 109	0	4.2 h	9/2+	+0.80(3)	[115In]	CFBLS	1987Eb02
	49 In 110	0*	69.1 m	2+	+0.32(2)	[113In]	AB	1968CaZX
		0*	4.9 h	7+	+0.95(2)	[115In]	CFBLS	1987Eb02
	49 In 111	0	2.83 d	9/2+	+0.76(2)	[115In]	CFBLS	1987Eb02
	49 In 112	0*	14.4 m	1+	+0.082(5)	[113In]	AB	1968CaZX
		157	20.9 m	4+	+0.679(10)	[115In]	CFBLS	1987Eb02
		351	0.69 ms	7+	1.00(3)	[117In 660 keV]	TDPAD	1993Io02
		614	2.82 ms	8-	0.092(3)	[117In 660 keV]	TDPAD	1993Io02
Reference isotope	49 In 113	0	Stable	9/2+	0.759(8)		AB/MS	2008Py02
rejerence isotope	49 In 114	190	49.5 d	5+	+0.703(11)	[115In]	CFBLS	1987Eb02
Reference isotope	49 In 115	0	$4.4 \times 10^{14} \text{ y}$	9/2+	0.770(8)	[115111]	AB/MS	2008Py02
Rejerence isotope	49 111 113					[117] CCO [1/]		
	40.1.440	829	5.78 ns	3/2+	-0.59(4)	[117In 660 keV]	TDPAC	1973Ha61
	49 In 116	0	14.1 s	1+	0.11(1)	[115In]	NSLR	1982Gr17
		127	54.2 m	5+	+0.762(11)	[115In]	CFBLS	1987Eb02
		290	2.18 s	8-	+0.295(9)	[115In]	CFBLS	1987Eb02
	49 In 117	0	42 m	9/2+	+0.788(10)	[115In]	CFBLS	1987Eb02
		660	53.6 ns	3/2+	-0.57(4)	[115In]	TDPAC	1972Ra27
	49 In 118	\sim 60	4.45 m	5+	+0.757(8)	[115In]	CFBLS	1987Eb02
		~200	8.5 s	8-	+0.419(7)	[115In]	CFBLS	1987Eb02
	49 In 119	0	2.4 m	9/2+	+0.812(7)	[115In]	CFBLS	1987Eb02
		654	130 ns	3/2+	0.59(4)	[115In]	TDPAC	1980HaYW
	49 In 120	(0)	44.4 s	5+	+0.770(16)	[115In]	CFBLS	1987Eb02
	15 111 120	(0)	47.3 s	8-	+0.504(10)	[115In]	CFBLS	1987Eb02
	49 In 121	0	23.1 s	9/2+	+0.774(10)	[115In]	CFBLS	1987Eb02
	49 In 121						CFBLS	
	49 111 122	0 + x	9.2 s	5+	+0.77(2)	[115In]		1987Eb02
	40.1.422	~220	10.5s	8-	+0.56(2)	[115In]	CFBLS	1987Eb02
	49 In 123	0	6.68 s	9/2+	+0.720(9)	[115In]	CFBLS	1987Eb02
	49 In 124	0	3.09 s	3+	+0.58(7)	[115In]	CFBLS	1987Eb02
		190	3.7 s	8-	+0.631(9)	[115In]	CFBLS	1987Eb02
	49 In 125	0	2.50 s	9/2+	+0.68(3)	[115In]	CFBLS	1987Eb02
	49 In 126	(0)	1.60 s	3+	+0.47(5)	[115In]	CFBLS	1987Eb02
		(0)	1.64 s	8-	+0.649(11)	[115In]	CFBLS	1987Eb02
	49 In 127	0	1.22 s	9/2+	+0.56(3)	[115In]	CFBLS	1987Eb02
				-, .	,	ι - 1	-	
Γin	There is no	adopted reference	e efg for Sn.					

There is no adopted reference efg for Sn. A-relative to 119Sn 24 keV – calculation of the quadrupole coupling constants in many molecular tin compounds. B-relative to 117Sn 315 keV – calculation of quadrupole interaction in 5p6s 3P_1 state of tin atom. Calculation is accurate only to +/-10%-20%. C-relative to 116Sn 3548 keV 10+ moment estimated from theory. Accuracy estimated at 10%. D-relative to 118Sn 3106 keV 10+ moment estimated from theory. Accuracy estimated at 10%.

D-retutive to	110311 3100 KEV	$10\pm 10000000000000000000000000000000000$	imuteu ji o	ili tilebiy. Accuracy estii	nuteu ut 10%.		
50 Sn 109	0	18.0 m	5/2+	+0.33(11)	В	ABLFS	1987Eb01
50 Sn 110	2480	5.6 ns	6+	0.30(4)	D	TDPAD	1989Vo17
50 Sn 111	0	35 m	7/2+	+0.20(10)	В	ABLFS	1987Eb01
50 Sn 112	1257	0.35 ps	2+	-0.09(10)		CER	1975Gr30
	2550	13.7 ns	6+	(-)0.25(5)	C	TDPAD	1975Vi03
50 Sn 113	739	82 ns	11/2-	(-)0.41(4)	С	TDPAD	1975Di02
50 Sn 114	3088	765 ns	7—	(-)0.32(3)	С	TDPAD	1975Di02
50 Sn 115	613	3.26 ps	7/2+	(-)0.26(3)	D	TDPAD	1976Be59
	714	159 μs	11/2-	0.38(6)		QIR	1975Ri03
50 Sn 116	1294	0.36 ps	2+	-0.17(4)		ES	1976Li19
	2366	370 ns	5-	(-)0.26(3)	C	TDPAD	1975Di02
	3548	904 ns	10+	[(-)0.41(4)]	C	Not measured	1975Di02
50 Sn 117	315	13.6 d	11/2-	-0.42(5)	В	ABLFS	1986An24
50 Sn 118	1230	0.46 ps	2+	-0.14(10)		CER	1975Gr30

Table 1 (continued)

	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
		2321	21.7 ns	5-	(-)0.22(3)	С	TDPAD	1975Di02
		2575	217 ns	7—	0.32(3)	D	TDPAD	1976Be59
		3106	2.65 ms	10+	[0.41(4)]	D	Not measured	1976Be59
eference Isotope	50 Sn 119	24	17.8 ns	3/2+	-0.132(1)		ME	2008Py02/2008Ba56
•		90	293.1 d	11/2-	-0.29(3)	Α	ME	1972Be79
	50 Sn 120	1171	0.64 ps	2+	+0.02(7)		CER	1975Gr30
		2285	5.53 ns	5—	0.046(2)	A	TDPAC	1970Wo02
	50 Sn 121	0	27.1 h	3/2+	-0.02(2)	В	ABLFS	1986An24
		6.3	55 y	11/2-	-0.14(3)	В	ABLFS	1986An24
	50 Sn 122	1140	0.76 ps	2+	-0.13(10)	_	CER	1975Gr30
	50 Sn 123	0	129 d	11/2-	+0.03(4)	В	ABLFS	1986An24
	50 Sn 124	1132	0.97 ps	2+	+0.03(13)	2	CER	1975Gr30
	50 Sn 121	0	9.62 d	11/2-	+0.2(2)	В	ABLFS	2005Le34
	30 311 123	28	9.5 m	3/2+	+0.86(8)	В	ABLFS	2004Le13
	50 Sn 126	1141	1.0 ps	2+	0.0(2)	Б	CER	2011Al35
	50 Sn 127	0	2.1 h	11/2-	+0.32(14)	В	ABLFS	2005Le34
	30 311 127	5	4.13 m	3/2+	+0.65(7)	В	ABLFS	2004Le13
	50 Sn 128	2492	2.7 μs	10+	-0.1(3)	ь	CER	2011Al35
	50 Sn 120	0	2.23 m	3/2+	+0.05(12)	В	ABLFS	2004Le13
	JU 311 129	35	6.9 m	3/2∓ 11/2−	-0.20(19)	В	ABLFS	2004Le13 2005Le34
	E0 Cn 120	1947				В		
	50 Sn 130 50 Sn 131	0	1.7 m 56 s	7- 3/2+	-0.39(12)	В	ABLFS ABLFS	2005Le34 2004Le13
	20 20 121	0 242	58.4 s		-0.04(9)	В	ABLFS	2004Le13 2005Le34
		Z 4 Z	30,45	11/2—	0.0(2)	D	ADLES	20031634
ntimony	Calculated e	fg's in SbN, SbP,	SbF and SbCl mol	ecues				2008Py02
-	51 Sb 112	796	536 ns	8-	1.06(2)	[121Sb]	TDPAD	1982Ma29
	51 Sb 114	496	219 ms	8-	1.02(16)	[121Sb]	QIR, R	1982Ma29
	51 Sb 115	2796	152 ns	19/2—	0.79(4)	[121Sb]	TDPAD	1983Se04
	51 Sb 116	1844	11.9 ns	7+	2.5(6)	[121Sb]	TDPAD(ampl)	1992Io01
	51 Sb 117	0	2.80 h	5/2+	0.2(12)	[121Sb]	AB	1974Ek01
		3131	340 ms	(25/2)+	1.14(5)	[121Sb]	QIR,R	1982Ma29
		3231	290 ns	23/2-	3.7(4)	[121Sb]	TDPAD	1988Io01
	51 Sb 118	51	20.6 ms	(3)+	0.9(2)	[121Sb]	TDPAD	1982Ma29
	3135110	270	13.4 ns	3–	0.39(8)	[121Sb]	TDPAD(ampl)	1985Di07
		927	22.8 ns	7+	2.6(5)	[121Sb]	TDPAD(ampl)	1988Io01
	51 Sb 119	2554	128 ns	19/2-	3.18(13)	[121Sb]	TDPAD	1991Io02
	51 Sb 119	78	247 ns	3+	0.63(2)	[121Sb]	TDPAD	1982Ma29
Reference Isotope	51 Sb 120	0	Stable	5/2+	-0.543(11)	[12130]	0	2008Py02/1978Bu24
ejerence isotope	J 1 JU 1 Z I	0 37	3.5 ns		, ,	[121Sb]	ME	1970St13
	51 Ch 122	0	2.68 d	7/2+ 2-	-0.727(16)	[121Sb] [121Sb]	O	
	51 Sb 122	0 61			+1.28(8)		TDPAD	1960Fe08
n.c		OI	1.86 ms	3+	0.63(2)	[121Sb]	IDLVD	1982Ma29
	51 Ch 122		Stable	7/2	0.602(14)		0	200000002/1070024
Reference Isotope	51 Sb 123 51 Sb 124	0	Stable 60.2 d	7/2+ 3-	-0.692(14) +2.8(2)	[121Sh]	O NO/S	2008Py02/1978Bu24 1985He16
eference Isotope	51 Sb 123 51 Sb 124		Stable 60.2 d	7/2+ 3-	-0.692(14) +2.8(2)	[121Sb]	O NO/S	2008Py02/1978Bu24 1985He16
	51 Sb 124 There is no d	0 0 adopted reference	60.2 d ce efg for Te.	3—	+2.8(2)	[121Sb]		
	51 Sb 124 There is no a A. Efg in the	0 0 adopted referend lased state of th	60.2 d ce efg for Te. ne Te atom calcula	3– ted by semi-e	+2.8(2) mpirical methods	[121Sb]	NO/S	1985He16
	51 Sb 124 There is no a A. Efg in the 52 Te 122	0 0 adopted referend lased state of th 564	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps	3– ted by semi-e 2+	+2.8(2) mpirical methods -0.57(5)	[121Sb]	NO/S CER	1985He16 1976Bo12
	51 Sb 124 There is no a A. Efg in the	0 0 adopted referend lased state of th	60.2 d ce efg for Te. ne Te atom calcula	3– ted by semi-e	+2.8(2) mpirical methods	[121Sb]	NO/S	1985He16
	51 Sb 124 There is no a A. Efg in the 52 Te 122	0 0 adopted referend lased state of th 564	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps	3– ted by semi-e 2+	+2.8(2) mpirical methods -0.57(5)	[121Sb] [129I]	NO/S CER	1985He16 1976Bo12
	51 Sb 124 There is no of A. Efg in the 52 Te 122 52 Te 124	0 0 adopted reference lased state of th 564 603 36 145	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d	3- ted by semi-e 2+ 2+ 3/2+ 11/2-	+2.8(2) mpirical methods	[129I] A	NO/S CER CER ME CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40
	51 Sb 124 There is no of A. Efg in the 52 Te 122 52 Te 124	0 0 adopted reference lased state of th 564 603 36	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns	3– ted by semi-e 2+ 2+ 3/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2)	[1291]	NO/S CER CER ME	1985He16 1976Bo12 1976Bo12 1977La03
Reference Isotope Tellurium	51 Sb 124 There is no of A. Efg in the 52 Te 122 52 Te 124	0 0 adopted reference lased state of th 564 603 36 145	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d	3- ted by semi-e 2+ 2+ 3/2+ 11/2-	+2.8(2) mpirical methods	[129I] A	NO/S CER CER ME CLS	1976Bo12 1976Bo12 1977La03 2006Si40
	51 Sb 124 There is no of A. Efg in the 52 Te 122 52 Te 124 52 Te 125	0 0 adopted reference lased state of the 564 603 36 145 321	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2-	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9)	[129I] A	NO/S CER CER ME CLS IPAC	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28
	51 Sb 124 There is no of A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126	0 0 adopted reference lased state of the 564 603 36 145 321 666	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d	3- ted by semi-e 2+ 2+ 3/2+ 11/2- 9/2- 2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5)	[129I] A [125Te 36 keV]	NO/S CER CER ME CLS IPAC CER	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12
	51 Sb 124 There is no of A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 126 52 Te 127	0 0 adopted reference lased state of the 564 603 36 145 321 666 88	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2-	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12)	[129I] A [125Te 36 keV]	NO/S CER CER ME CLS IPAC CER CLS	1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40
	51 Sb 124 There is no a. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps	3- ted by semi-end 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13)	[129I] A [125Te 36 keV] A [129I]	NO/S CER CER ME CLS IPAC CER CLS CER	1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12
	51 Sb 124 There is no a. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d	3- ted by semi-e. 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2-	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3)	[129I] A [125Te 36 keV]	CER CER ME CLS IPAC CER CLS CER NO/ME	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40
	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps	3- ted by semi-e. 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2- 2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5)	[129I] A [125Te 36 keV] A [129I]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12
	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131	0 0 adopted reference 10sed state of the 564 603 36 145 321 666 88 743 0 106 840 182	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h	3- ted by semi-e 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 2+ 11/2- 2+ 11/2-	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14)	[129I] A [125Te 36 keV] A [129I] A	NO/S CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40
	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2- 2+ 11/2- 3/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9)	[129I] A [125Te 36 keV] A [129I] A	NO/S CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CER CLS CER CLS CER	1976Bo12 1976Bo12 1977Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40
	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 130 52 Te 131 52 Te 133	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334	60.2 d ce efg for Te. the Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2- 2+ 11/2- 3/2+ 11/2-	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14)	[1291] A [125Te 36 keV] A [1291] A A A	NO/S CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CER CLS CER CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40
Tellurium	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 133	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2- 2+ 11/2- 3/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9)	[129I] A [125Te 36 keV] A [129I] A	NO/S CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CER CLS CER CLS CER	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40
Tellurium	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 133 52 Te 135 Calculated et	0 0 adopted reference 1ased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI	3- ted by semi-e. 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 2+ 11/2- 3/2+ 11/2- 3/2- 11/2-	+2.8(2) mpirical methods	[129I] A [125Te 36 keV] A [129I] A A A A	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CER CLS CER CLS CLS CLS CLS	1976Bo12 1976Bo12 1977Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40
Tellurium	51 Sb 124 There is no a. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 135 Calculated e 53 I 125	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 2+ 11/2- 3/2+ 11/2- 3/2+ 5/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14) 0.29(9) -0.761(17)	[1291] A [125Te 36 keV] A [1291] A A A	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CER CLS CLS CLS CLS CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2008Si40
Tellurium	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 133 52 Te 135 Calculated et	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2- 2+ 11/2- 3/2+ 11/2- 5/2+ 5/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14) 0.29(9) -0.761(17) -0.696(12)	[129I] A [125Te 36 keV] A [129I] A A A A A [127I]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CLS CLS CLS CLS CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40
Tellurium	51 Sb 124 There is no a. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 135 Calculated e 53 I 125	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 2+ 11/2- 3/2+ 11/2- 3/2+ 5/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14) 0.29(9) -0.761(17)	[129I] A [125Te 36 keV] A [129I] A A A A	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CER CLS CLS CLS CLS CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2008Si40
Tellurium	51 Sb 124 There is no a. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 135 Calculated e 53 I 125	0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable 1.95 ns	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2- 2+ 11/2- 3/2+ 11/2- 5/2+ 5/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14) 0.29(9) -0.761(17) -0.696(12)	[129I] A [125Te 36 keV] A [129I] A A A A A [127I] [127I]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CLS CLS CLS CLS CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40
Tellurium	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 130 52 Te 131 52 Te 133 52 Te 135 Calculated et 53 I 125 53 I 127	0 0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable 1.95 ns 1.6 × 10 ⁷ y	3- ted by semi-end 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 2+ 11/2- 3/2+ 11/2- 7/2- 5/2+ 5/2+ 7/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14) 0.29(9) -0.761(17) -0.696(12) -0.624(11) -0.488(8)	[129I] A [125Te 36 keV] A [129I] A A A A A [127I] [127I] [127I]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CLS CLS CLS CLS CLS CLS CLS CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 1976Fu06 1958Fl39 1976Fu06 1964Pe15 1953Li16
Tellurium	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 130 52 Te 131 52 Te 133 52 Te 135 Calculated et 53 I 125 53 I 127 53 I 129	0 0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0 fg's in atomic Le 0 58 0	60.2 d ce efg for Te. ne Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable 1.95 ns 1.6 × 10 ⁷ y 16.8 ns	3- ted by semi-e. 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 2+ 11/2- 7/2- 5/2+ 5/2+ 7/2+ 5/2+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14) 0.29(9) -0.761(17) -0.696(12) -0.624(11) -0.488(8) -0.604(10)	[129I] A [125Te 36 keV] A [129I] A A A A [127I] [127I] [127I] [127I]	CER CER ME CLS IPAC CER NO/ME CLS CER CLS CER CLS CLS CLS CLS CLS CLS CLS CLS CLS	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 1976Fu06 1958Fl39 1976Fu06 1964Pe15 1953Li16 1972Ro41
Tellurium	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 130 52 Te 131 52 Te 133 52 Te 135 Calculated et 53 I 125 53 I 127	0 0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0 (g's in atomic I	60.2 d ce efg for Te. the Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable 1.95 ns 1.6 × 10 ⁷ y 16.8 ns 8.04 d	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 3/2+ 11/2- 7/2- 5/2+ 5/2+ 7/2+ 5/2+ 7/2+	+2.8(2) mpirical methods	[129I] A [125Te 36 keV] A [129I] A A A A [127I] [127I] [127I] [127I] [127I] [127I]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CES CLS CLS CLS CLS CLS CLS MA AB ME Q.MA ME AB	1976Bo12 1976Bo12 1977Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2008Py02 1958Fl39 1976Fu06 1964Pe15 1953Li16 1972Ro41 1960Li13
Tellurium	51 Sb 124 There is no A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 135 Calculated e 53 I 125 53 I 127 53 I 129 53 I 131	0 0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0 (g's in atomic I	60.2 d ce efg for Te. the Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable 1.95 ns 1.6 × 10 ⁷ y 16.8 ns 8.04 d 5.9 ns	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 3/2+ 11/2- 7/2- 5/2+ 7/2+ 7/2+ 5/2+ 7/2+ (15/2)-	+2.8(2) mpirical methods	[129I] A [125Te 36 keV] A [129I] A A A A A [127I] [127I] [127I] [127I] [127I] [127I] [127I] [127I] [127I] [129I 28 keV]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CLS CLS CLS CLS CLS CLS TOTAL MA AB ME Q,MA ME AB TDPAC	1976Bo12 1976Bo12 1977Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 1976Fu06 1958Fl39 1976Fu06 1964Pe15 1953Li16 1972Ro41 1960Li13 1973Ha61
Tellurium	51 Sb 124 There is no at A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 130 52 Te 131 52 Te 133 52 Te 135 Calculated et 53 I 125 53 I 127 53 I 129	0 0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0 (g's in atomic I of 0 0 58 0 28 0	60.2 d ce efg for Te. the Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable 1.95 ns 1.6 × 10 ⁷ y 16.8 ns 8.04 d 5.9 ns 2.28 h	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 3/2+ 11/2- 2+ 11/2- 3/2+ 11/2- 7/2- 5/2+ 7/2+ 7/2+ 5/2+ 7/2+ 7/2+ 5/2+ 7/2+ 4+	+2.8(2) mpirical methods -0.57(5) -0.45(5) -0.31(2) 0.0(2) 0.12(+5,-9) -0.23(5) 0.17(12) -0.22(5) 0.055(13) 0.40(3) -0.12(5) 0.25(14) 0.23(9) 0.28(14) 0.29(9) -0.761(17) -0.696(12) -0.624(11) -0.488(8) -0.604(10) -0.34(2) 0.66(6) 0.08(1)	[129I] A [125Te 36 keV] A [129I] A A A A A [127I] [127I] [127I] [127I] [127I] [127I] [127I] [129I 28 keV] [127I]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CLS CLS CLS CLS TOPAC AB	1985He16 1976Bo12 1976Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 1976Bo12 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 1976Fu06 1964Pe15 1953Li16 1972Ro41 1960Ui13 1973Ha61 1960Wh06
	51 Sb 124 There is no A. Efg in the 52 Te 122 52 Te 124 52 Te 125 52 Te 126 52 Te 127 52 Te 128 52 Te 129 52 Te 130 52 Te 131 52 Te 135 Calculated e 53 I 125 53 I 127 53 I 129 53 I 131	0 0 0 adopted reference lased state of the 564 603 36 145 321 666 88 743 0 106 840 182 0 334 0 (g's in atomic I	60.2 d ce efg for Te. the Te atom calcula 7.52 ps 6.25 ps 1.48 ns 58 d 695 ps 4.41 ps 109 d 3.2 ps 69.5 m 33.5 d 2.3 ps 30 h 12.5 m 55.4 m 19 s and in HI 60.2 d Stable 1.95 ns 1.6 × 10 ⁷ y 16.8 ns 8.04 d 5.9 ns	3- ted by semi-e. 2+ 2+ 3/2+ 11/2- 9/2- 2+ 11/2- 2+ 11/2- 3/2+ 11/2- 7/2- 5/2+ 7/2+ 7/2+ 5/2+ 7/2+ (15/2)-	+2.8(2) mpirical methods	[129I] A [125Te 36 keV] A [129I] A A A A A [127I] [127I] [127I] [127I] [127I] [127I] [127I] [127I] [127I] [129I 28 keV]	CER CER ME CLS IPAC CER CLS CER NO/ME CLS CER CLS CLS CLS CLS CLS CLS CLS TOTAL MA AB ME Q,MA ME AB TDPAC	1976Bo12 1976Bo12 1977Bo12 1977La03 2006Si40 1976Va28 1976Bo12 2006Si40 1976Bo12 1987Be36 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 2006Si40 1976Fu06 1958Fl39 1976Fu06 1964Pe15 1953Li16 1972Ro41 1960Li13 1973Ha61

Table 1 (continued)

Element	Nucleus	E (level) ke\	J T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
Xenon		fg in XeH ⁺ and	d XeD ⁺					
		ed from B(E2)	ti i Tt	1				
	<i>B-Е</i> Ј <i>g</i> estimo	atea jrom syste 0	matics in Te meta 1.02 m	5/2+	+1.14((4)	[131Xe]	CLS	1990NeZY
	54 Xe 119	0	5.8 m	5/2+	+1.14((4) +1.29(5)	[131Xe]	CLS	1990NeZY
	54 Xe 121	0	39 m	5/2+	+1.31(5)	[131Xe]	CLS	1990NeZY
	54 Xe 123	180 + x	5.2 ms	7/2(-)	1.4(3)	[125Xe 296 keV]	TDPAD	1982Ze05
		201 + x	17 ns	9/2-	1.1(6)	[125Xe 296 keV]	TDPAD(ampl)	1982Ze05
	54 Xe 125	253	57 s	9/2-	+0.417(15)	[131Xe]	CLS	1990NeZY
		296	140 ns	7/2+	1.40(15)	A	Not measured	1982Ze05
	54 Xe 127	297	1.15 m	9/2-	+0.68(2)	[131Xe]	CLS	1990NeZY
	54 Xe 129	40	0.98 ns	3/2+	-0.393(10)	[131Xe]	ME	1964Pe06
Dafaranca icatana	E / Vo 121	236	8.89 d Stable	11/2- 3/2+	+0.63(2)	[131Xe]	CLS CLS	1990NeZY 1989Bo03
Reference isotope	54 Xe 131	0 164	11.8 d	3/2+ 11/2-	-0.114(1) +0.72(3)	[131Xe]	CLS	1989B003 1990NeZY
	54 Xe 132	2214	90 ns	7-	0.010(5)	B	TDPAD	1987Le31
	54 Xe 133	0	5.24 d	3/2+	+0.140(5)	[131Xe]	CLS	1990NeZY
	0 1 1 10 100	233	2.19 d	11/2-	+0.76(5)	[131Xe]	CLS	1990NeZY
	54 Xe 135	0	9.10 h	3/2+	+0.210(7)	[131Xe]	CLS	1990NeZY
		527	15.3 m	11/2-	+0.61(2)	[131Xe]	CLS	1990NeZY
	54 Xe 137	0	3.82 m	7/2—	-0.47(2)	[131Xe]	CLS	1989Bo03
	54 Xe 139	0	39.7 s	3/2-	+0.39(2)	[131Xe]	CLS	1989Bo03
	54 Xe 141	0	1.73 s	5/2+	-0.57(2)	[131Xe]	CLS	1989Bo03
	54 Xe 143	0	0.30 s	5/2—	+0.91(3)	[131Xe]	CLS	1989Bo03
Caesium	Calculated e	fg in CsF molec	rule.					2008Py02
		l efg at Cs in Go		2	+ 1 21/17)	[1226-]	ADLC	10076-10
	55 Cs 118 55 Cs 119	(0)	14 s 36 s	2 9/2+	+1.31(17) +2.65(17)	[133Cs]	ABLS ABLS	1987Co19 1981Th06
	55 CS 119	(0) (0)	28 s	9/2+ 3/2+	+2.85(17) +0.85(12)	[133Cs] [133Cs]	ABLS	1981Th06
	55 Cs 120	0	64 s	3/2+ 2+	+0.85(12) +1.36(7)	[133Cs]	ABLS	1981Th06
	55 Cs 120	0	2.27 m	3/2+	+0.79(4)	[133Cs]	ABLS	1981Th06
	33 63 121	~36	2.02 m	9/2+	+2.53(13)	[133Cs]	ABLS	1981Th06
	55 Cs 122	(0)	21 s	1+	-0.179(10)	[133Cs]	ABLS	1981Th06
		(0)	4.2 m	8-	+3.09(8)	[133Cs]	ABLS	1981Th06
	55 Cs 124	o ´	30.8 s	1+	-0.69(4)	[133Cs]	ABLS	1981Th06
	55 Cs 126	0	1.64 m	1+	-0.64(3)	[133Cs]	ABLS	1981Th06
	55 Cs 127	66	24.9 ns	5/2(+)	0.58(12)	Α	TDPAC	1999Co22
	55 Cs 128	0	3.62 m	1+	-0.54(3)	[133Cs]	ABLS	1981Th06
	55 Cs 130	0	29.9 m	1+	-0.056(6)	[133Cs]	ABLS	1981Th06
	EE Cc 121	0 + x	3.7 m 9.69 d	5(-) 5/2+	+1.36(8)	[133Cs]	ABLS ABLS	1981Th06
	55 Cs 131	0 134	8.7 ns	5/2+	+0.59(2) 0.20(2)	[133Cs] [133Cs 81 keV]	TDPAC	1975Ac01 2000De13
	55 Cs 132	0	6.47 d	2(-)	+0.48(2)	[133Cs]	ABLS	1975Ac01
Reference isotope	55 Cs 133	0	Stable	7/2+	-0.00343(10)	[15565]	MB	1998Pe18
ejerence wotope	00 00 100	81	6.31 ns	5/2+	0.30(2)	[133Cs]	ME	1977Ca30
	55 Cs 134	0	2.06 y	4+	+0.37(2)	[133Cs]	ABLS	1975Ac01
		139	2.90 h	8-	+0.92(8)	[133Cs]	ABLS	1981Th06
	55 Cs 135	0	$3 \times 10^6 \text{ y}$	7/2+	+0.048(3)	[133Cs]	ABLS	1975Ac01
		1633	53 m	19/2-	+0.83(7)	[133Cs]	ABLS	1981Th06
	55 Cs 136	0	13.2 d	5+	+0.213(15)	[133Cs]	ABLS	1975Ac01
		0 + x	19 s	8-	+0.70(3)	[133Cs]	ABLS	1981Th06
	55 Cs 137	0	30.17 y	7/2+	+0.048(2)	[133Cs]	ABLS	1975Ac01
	55 Cs 138	0	32.2 m	3-	+0.112(17)	[133Cs]	ABLS	1981Th06
	EE Cc 120	80	2.9 m	6—	-0.37(5)	[133Cs]	ABLS	1981Th06
	55 Cs 139 55 Cs 140	0 0	9.4 m 65 s	7/2+ 1-	-0.063(14) -0.094(15)	[133Cs] [133Cs]	ABLS ABLS	1979Bo01 1981Th06
	55 Cs 140	0	25.1 s	7/2+	-0.094(13) -0.42(7)	[133Cs]	ABLS	1981Th06
	55 Cs 141	0	1.78 s	3/2+	+0.44(3)	[133Cs]	ABLS	1981Th06
	55 Cs 144	0	1.00 s	1	+0.29(2)	[133Cs]	ABLS	1981Th06
	55 Cs 145	0	0.59 s	3/2+	+0.58(6)	[133Cs]	ABLS	1981Th06
	55 Cs 146	0	0.34 s	1	+0.21(3)	[133Cs]	ABLS	1987Co19
arium	Efg calculati	ons in the 6n ²	P _{3/2} state of the Bo	ı II spectrum				2008Py02
·uUIII	56 Ba 121	0 iii iiie op	30 s	5/2(+)	+1.96(13)	[135Ba]	CLS	1988We14
	56 Ba 123	0	2.7 m	5/2(+) 5/2+	+1.63(13)	[135Ba]	CLS	1988We14
	56 Ba 127	80	1.9 s	$\frac{3/2}{7/2}$	+1.78(14)	[135Ba]	CLS	1992Da06
	56 Ba 129	8.4	2.16h	7/2+	+1.75(14)	[135Ba]	CLS	1979Be25
	56 Ba 130	357	37 ps	2+	-1.02(15) or -0.09(15)		CER	1989Bu07
		2476	9.54 ms	8-	+2.40(6)	[135Ba]	CLS	2002Mo31
		2170				[135Ba]	CLS	
	56 Ba 131	188	14.6 m	9/2—	+1.60(14)	[133bu]		1983Mu12
	56 Ba 131 56 Ba 133		14.6 m 38.9 h	11/2-	+1.60(14) +0.96(6)	[135Ba]	CLS	1979Be25
	56 Ba 133 56 Ba 134	188 288 605	38.9 h 5.1 ps	11/2- 2+	+0.96(6) -0.26(12) or +0.15(12)		CLS CER	1979Be25 1989Bu07
Reference isotope	56 Ba 133	188 288 605 0	38.9 h 5.1 ps Stable	11/2- 2+ 3/2+	+0.96(6) -0.26(12) or +0.15(12) +0.160(3)	[135Ba]	CLS CER CFBLS	1979Be25 1989Bu07 1984We15
'eference isotope	56 Ba 133 56 Ba 134	188 288 605	38.9 h 5.1 ps	11/2- 2+	+0.96(6) -0.26(12) or +0.15(12)		CLS CER	1979Be25 1989Bu07

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
Reference isotope	56 Ba 137	0	Stable	3/2+	+0.245(4)		CFBLS	1984We15
		662	2.55 m	11/2-	+0.85(10)	[135Ba]	CLS	1983Mu12
	56 Ba 138	1436	0.206 ps	2+	-0.14(6) or $+0.08(6)$		CER	1989Bu07
	56 Ba 139	0	84.6 m	7/2—	-0.573(13)	[135Ba]	CFBLS	1988We07
	56 Ba 140	602	7.2 ps	2+	-0.5(3)	-	CER	2012Ba40
	56 Ba 141	0	18.7 m	3/2-	+0.454(10)	[135Ba]	CFBLS	1988We07
	56 Ba 143	0	14.5 s	5/2(+)	-0.88(2)	[135Ba]	CFBLS	1988We07
	56 Ba 145	0	4.31 s	5/2(-)	+1.22(2)	[135Ba]	CFBLS	1988We07
anthanum	Calculated e	g's in La halides						2008Py02
	57 La 135	0	19.5 h	5/2+	-0.4(4)	[139La]	CLS	2003Ii03
	57 La 137	0	$6 \times 10^4 \text{ y}$	7/2+	+0.21(4)	[139La]	CLS	2003Ii03
	57 La 138	0	$1.1 \times 10^{11} \text{ y}$	5+	+0.39(3)	[139La]	CLS	2003Ii03
) of our on a contain o			Stable		. ,	[139La]		
eference isotope	57 La 139 57 La 140	0 0	40.3 h	7/2+ 3-	+0.200(6) +0.084(13)	[139La]	MB NO/S	2007Ja16 1966Bl05
aui		dontad ofa calcu					,	
erium			lation for cerium. odel estimate of (O 138Ce 353	8 keV.			
	58 Ce 129	108	60 ns	9/2-	1.32(13)	Α	TDPAD	1998Io01
	58 Ce 123	2454	109 ns	7-	1.8(2)	A	TDPAD	1999Io02
	58 Ce 130	162	88 ns	9/2—	0.92(10)	A	TDPAD	1998Io01
	58 Ce 131	3209	308 ns	10+		A	TDPAD	1983Da29
					+1.32(12)			
	58 Ce 136	3095	2.2 ms	10+	+1.11(11)	Α	TDPAD	1983Da29
	58 Ce 138	3538	82 ns	10+	Estimated +0.77 eb	[120]	Not measured	1983Da29
	58 Ce 140	2084	3.4 ns	4+	0.35(7)	[139La]	TDPAC	1973KIZV
	58 Ce 142	641	5.7 ps	2+	-0.16(5) or $-0.37(5)$		CER	1988Ve08/1989Sp07
raseodymium			with estimated S adopted by Pyyk		correction. 2) who gives Q ¹⁴¹ Pr — 0.05	59(4) b.		
deference isotope	59 Pr 141	0	Stable	5/2+	-0.077(6)		CLS	1994Ii01
	59 Pr 142	0	19.2 h	2-	0.039(17)	[141Pr]	AB	1962Ca10
	59 Pr 143	0	13.57 d	7/2+	+0.77(16)	[141Pr]	CLS	1994Ii01
eodymium			with estimated S	ternheimer c	orrection. N.B. Deviation fro	m standard adopte	ed by Pyykkö (2008P	y02) who
	60 Nd 135	$\begin{array}{c} 1 - 0.63(6) b. \\ 0 \end{array}$	12.4 m	9/2-	+1.9(5)	[143Nd]	CLS	1992Le09
	60 Nd 139	0	30 m	3/2+	+0.28(9)	[143Nd]	CLS	1992Le09
	60 Nd 141	0	2.49 h	3/2+	+0.32(13)	[143Nd]	CLS	1992Le09
eference isotope	60 Nd 143	0	Stable	7/2-	-0.61(2)	[]	AB	1992Au04
ejerence worope	60 Nd 144	697	4.51 ps	2+	-0.15(6) or $-0.28(6)$		CER	1989Sp07
	60 Nd 145	0	Stable	7/2-	-0.314(12)	[143Nd]	AB	1992Au04
	60 Nd 146	454		2+		[IFSING]	CER	1970Ge08
			27.5 ps		-0.78(9)	[142N]		
	60 Nd 147	0	11.0 d	5/2-	+0.9(3)	[143Nd]	AB	1970PiZR
	60 Nd 148	302	78 ps	2+	-1.46(13)	[4 4037]]	CER	1970Ge08
	60 Nd 149	0	1.73 h	5/2-	+1.3(3)	[143Nd]	AB	1970PiZR
	60 Nd 150	130	2142 ps	2+	-2.0(5)		CER	1970Ge08
romethium		g estimate in Pm		F /2 ·	. 0.22(0)	[4.470.]	CI C	10024102
	61 Pm 145	0	17.7 y	5/2+	+0.23(8)	[147Pm]	CLS	1992Al03
Reference isotope	61 Pm 147	0	2.623 y	7/2+	+0.74(20)		0	1966Re04
	61 Pm 148		5.37 d	1-	+0.2(2)	[147Pm]	AB	1963Bu14
	61 Pm 151	0	28.4 h	5/2 +	2.2(9)	[147Pm]	AB	1963Bu14
amarium	Muonic aton	n X-ray hyperfine		10 :	17(5)	[1540 00]	TDDAD	100ED-33
aiiiai iuiii		2172		10+	1.7(5)	[154Sm 82]	TDPAD CLS	1985Be23
amamum	62 Sm 140	3172	19.4 ns	11/2	1.1.C(E)		1.15	1992Le09
amanum	62 Sm 140 62 Sm 141	176	22.6 m	11/2-	+1.6(5)	[147Sm]		
amarum	62 Sm 140 62 Sm 141 62 Sm 142	176 2372	22.6 m 170 ns	7—	+1.1(3)	[154Sm 82]	TDPAD	1985Be23/1986Da22
amarum	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143	176 2372 0	22.6 m 170 ns 8.83 m	7- 3/2+	+1.1(3) +0.4(2)	[154Sm 82] [147Sm]	TDPAD CLS	1985Be23/1986Da22 1992Le09
amarum	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145	176 2372 0 0	22.6 m 170 ns 8.83 m 340 d	7- 3/2+ 7/2-	+1.1(3)	[154Sm 82]	TDPAD	1985Be23/1986Da22 1992Le09 1990En01
	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143	176 2372 0	22.6 m 170 ns 8.83 m	7- 3/2+	+1.1(3) +0.4(2)	[154Sm 82] [147Sm]	TDPAD CLS	1985Be23/1986Da22 1992Le09 1990En01
	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145	176 2372 0 0	22.6 m 170 ns 8.83 m 340 d	7- 3/2+ 7/2-	+1.1(3) +0.4(2) -0.60(7)	[154Sm 82] [147Sm]	TDPAD CLS LRFS	1985Be23/1986Da2 1992Le09 1990En01
	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145	176 2372 0 0	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y	7— 3/2+ 7/2— 7/2— 5/2—	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2)	[154Sm 82] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X	1985Be23/1986Da2: 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04
	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 148	176 2372 0 0 0 121 550	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps	7- 3/2+ 7/2- 7/2- 5/2- 2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3)	[154Sm 82] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1)
	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147	176 2372 0 0 0 121 550	22.6 m 170 ns 8.83 m 340 d 1.1×10^{11} y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2-	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le08
	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 148 62 Sm 149	176 2372 0 0 0 121 550 0 23	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2-	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9)	[154Sm 82] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28
	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 148 62 Sm 149	176 2372 0 0 0 121 550 0 23 334	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06
eference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 145 62 Sm 147 62 Sm 148 62 Sm 149 62 Sm 150 62 Sm 151	176 2372 0 0 0 121 550 0 23 334	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2-	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06 1990En01
eference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152	176 2372 0 0 0 121 550 0 23 334 0	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y 1.40 ns	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.6666(16)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06 1990En01 1979Po05
eference isotope eference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153	176 2372 0 0 0 121 550 0 23 334 0 122	22.6 m 170 ns 8.83 m 340 d 1.1×10^{11} y 0.78 ns 7.3 ps >2 × 10^{15} y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 3/2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.6666(16) +1.30(12)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS LRFS	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01
eference isotope eference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153 62 Sm 154	176 2372 0 0 0 121 550 0 23 334 0 122 0 82	22.6 m 170 ns 8.83 m 340 d 1.1×10^{11} y 0.78 ns 7.3 ps $>2 \times 10^{15}$ y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h 3.01 ns	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 5/2- 2+ 5/2- 2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.666(16) +1.30(12) -1.87(4)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS Mu-X LRFS Mu-X	1985Be23/1986Da2 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le08 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01 1979Po05
eference isotope eference isotope eference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153 62 Sm 154 62 Sm 155	176 2372 0 0 0 121 550 0 23 334 0 122 0 82	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h 3.01 ns 22.4 m	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 3/2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.6666(16) +1.30(12)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS LRFS	1985Be23/1986Da2: 1992Le09 1990En01 2008Py02/1981Ba2: 1971Pa04 1989Ra17(1) 1972Ch55/1992Le0: 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01
eference isotope deference isotope deference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153 62 Sm 155 Muonic aton	176 2372 0 0 0 121 550 0 23 334 0 122 0 82 0	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h 3.01 ns 22.4 m	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 3/2+ 2+ 3/2-	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.666(16) +1.30(12) -1.87(4) 1.13(13)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS Mu-X LRFS Mu-X AB	1985Be23/1986Da2: 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le08 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01 1979Po05 1976Fu06
deference isotope deference isotope deference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153 62 Sm 155 Muonic aton 63 Eu 140	176 2372 0 0 0 121 550 0 23 334 0 122 0 82 0	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h 3.01 ns 22.4 m	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 3/2+ 2+ 3/2- 1(+)	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.666(16) +1.30(12) -1.87(4) 1.13(13)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS Mu-X LRFS Mu-X LRFS Mu-X AB	1985Be23/1986Da2: 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01 1979Po05 1976Fu06
deference isotope deference isotope deference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153 62 Sm 155 Muonic atom 63 Eu 140 63 Eu 141	176 2372 0 0 0 0 121 550 0 23 334 0 122 0 82 0	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h 3.01 ns 22.4 m	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 3/2+ 3/2- 1(+) 5/2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.666(16) +1.30(12) -1.87(4) 1.13(13) +0.31(4) +0.85(4)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS Mu-X LRFS Mu-X AB	1985Be23/1986Da2: 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01 1979Po05 1976Fu06
Reference isotope Reference isotope Reference isotope	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153 62 Sm 155 Muonic aton 63 Eu 140	176 2372 0 0 0 121 550 0 23 334 0 122 0 82 0 1 X-ray hyperfine 0 + x 0	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h 3.01 ns 22.4 m	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 3/2+ 2+ 3/2- 1(+) 5/2+ 1+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.666(16) +1.30(12) -1.87(4) 1.13(13) +0.31(4) +0.85(4) +0.12(5)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS Mu-X LRFS Mu-X AB CLS CLS CLS	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01 1979Po05 1996Fu06
Reference isotope Reference isotope Reference isotope Europium	62 Sm 140 62 Sm 141 62 Sm 142 62 Sm 143 62 Sm 145 62 Sm 147 62 Sm 149 62 Sm 150 62 Sm 151 62 Sm 152 62 Sm 153 62 Sm 155 Muonic atom 63 Eu 140 63 Eu 141	176 2372 0 0 0 0 121 550 0 23 334 0 122 0 82 0	22.6 m 170 ns 8.83 m 340 d 1.1 × 10 ¹¹ y 0.78 ns 7.3 ps >2 × 10 ¹⁵ y 7.6 ns 49 ps 90 y 1.40 ns 46.8 h 3.01 ns 22.4 m	7- 3/2+ 7/2- 7/2- 5/2- 2+ 7/2- 5/2- 2+ 5/2- 2+ 3/2+ 3/2- 1(+) 5/2+	+1.1(3) +0.4(2) -0.60(7) -0.26(3) -0.5(2) -1.0(3) +0.078(8) +1.01(9) -1.3(2) +0.71(7) -1.666(16) +1.30(12) -1.87(4) 1.13(13) +0.31(4) +0.85(4)	[154Sm 82] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm] [147Sm]	TDPAD CLS LRFS Mu-X ME CER AB Mu-X CER LRFS Mu-X LRFS Mu-X LRFS Mu-X AB	1985Be23/1986Da22 1992Le09 1990En01 2008Py02/1981Ba28 1971Pa04 1989Ra17(1) 1972Ch55/1992Le09 1981Ba28 1973Gr06 1990En01 1979Po05 1990En01 1979Po05 1976Fu06

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
	63 Eu 143	0	2.6 m	5/2+	+0.51(3)	[153Eu]	CLS	1985Ah02
	63 Eu 144	0	10 s	1+	+0.10(3)	[153Eu]	CLS	1985Ah02
	63 Eu 145	0	5.93 d	5/2+	+0.29(2)	[153Eu]	CLS	1985Ah02
	63 Eu 146	0	4.59 d	4-	-0.18(6)	[153Eu]	CLS	1985Ah02
	63 Eu 147	0	24.1 d	5/2+	+0.55(3)	[153Eu]	CLS	1985Ah02
	63 Eu 148	0	54.5 d	5-	+0.35(6)	[153Eu]	CLS	1985Ah02
	63 Eu 149	0	93.1 d	5/2+	+0.75(2)	[153Eu]	CLS	1985Ah02
	63 Eu 150	0	35.8 y				CLS	1985Ah02
				5(-)	+1.13(5)	[153Eu]		
	63 Eu 151	0	Stable	5/2+	+0.903(10)	[153Eu]	Mu-X	1984Ta04
	CO E 450	22	9.5 ns	7/2+	+1.28(2)	[4EDE]	Mu-X	1984Ta05
	63 Eu 152	0	13.54 y	3-	+2.72(3)	[153Eu]	CLS	1986Al33
Reference isotope	63 Eu 153	0	Stable	5/2+	+2.41(2)		Mu-X	1984Ta04
		83	0.80 ns	7/2+	+0.44(2)		Mu-X	1984Ta05
		103	3.9 ns	3/2+	+1.253(12)	[153Eu]	ME	1973Ar19
	63 Eu 154	0	8.6 y	3—	+2.85(10)	[153Eu]	CLS	1986Al33
	63 Eu 155	0	4.68 y	5/2+	+2.5(3)	[153Eu]	CLS	1990Al34
	63 Eu 157	0	15.2 h	5/2+	+2.6(3)	[153Eu]	CLS	1990Al34
	63 Eu 158	0	45.9 m	1(-)	+0.66(14)	[153Eu]	CLS	1990Al34
	63 Eu 159	0	18.1 m	5/2+	+2.7(3)	[153Eu]	CLS	1990Al34
	03 Eu 133	o .	10.1 111	3/2	12.7(3)	[155E4]	CLS	1550/1154
Gadolinium		n X-ray hyperfine						
	64 Gd 144	3433	130 ns	10+	-1.40(6)	[155Gd]	TDPAD	1982Ha20/1985Da2
	64 Gd 147	997	22.2 ns	13/2+	-0.70(8)	[155Gd]	TDPAD	1982Ha20/1985Da2
		3582	27 ns	27/2—	-1.21(9)	[155Gd]	TDPAD	1982Ha20/1985Da2
		8587	510 ns	49/2+	-3.00(18)	[155Gd]	TDPAD	1982Ha20/1985Da2
	64 Gd 148	2695	16.5 ns	9-	0.96(5)	[155Gd]	TDPAD	1982Ha20
	64 Gd 154	123	1.17 ns	2+	-1.82(4)	[10004]	Mu-X	1983La08
Reference isotope	64 Gd 154	0	Stable	3/2-	+1.27(3)		Mu-X	1983La08
ajerence isotope	0-1 GU 133					[15504]		
		87	6.35 ns	5/2+	+0.110(8)	[155Gd]	ME	1974Ar23
		105	1.18 ns	3/2+	+1.27(5)	[155Gd]	ME	1974Ar23
	64 Gd 156	89	2.21 ns	2+	-1.93(4)		Mu-X	1983La08
Reference isotope	64 Gd 157	0	Stable	3/2-	+1.35(3)		Mu-X	1983La08
		64	0.46 ms	5/2+	+2.43(7)	[157Gd]	ME	1974Ar23
	64 Gd 158	80	2.52 ns	2+	-2.01(4)		Mu-X	1983La08
	64 Gd 160	75	2.70 ns	2+	-2.08(4)		Mu-X	1983La08
Terbium	Muonic ator	n X-ray hyperfine	structure					
C. Diuiii		ite at Tb in yttriu						
	65 Tb 148	0	60 m	2-	_0.3(2)	[150Tb]	CLS	10004136
					-0.3(2)	[159Tb]		1990Al36
	65 Tb 150	0 + x	3.48 h	2(-)	0.00(13)	[159Tb]	CLS	1990Al36
	65 Tb 152	0	17.5 h	2-	+0.34(13)	[159Tb]	CLS	1990Al36
	65 Tb 153	0	2.34 d	5/2+	+1.08(14)	[159Tb]	CLS	1990Al36
	65 Tb 154	0 + x	9.4 h	3-	+2.4(13)	[159Tb]	NO/S	1983Be03
	65 Tb 155	0	5.32 d	3/2+	+1.41(6)	[159Tb]	CLS	1990Al36
			5.35 d	3-	+2.3(8)	[159Tb]	NO/S	1979Ri17/1983Be03
	65 Th 156	0		_		[13310]		
	65 Tb 156 65 Tb 157	0		3/2⊥	$\pm 1.40(8)$	[150Th]		
	65 Tb 157	0	99 y	3/2+	+1.40(8)	[159Tb] 4	CLS	1990Al36
Defense : '	65 Tb 157 65 Tb 158	0 0	99 y 150 y	3—	+2.7(5)	[159Tb] A	CLS EPR/NO/S	1990Al36 1968Ea04
Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159	0 0 0	99 y 150 y Stable	3- 3/2+	+2.7(5) +1.432(8)	A	CLS EPR/NO/S Mu-X	1990Al36 1968Ea04 1984Ta04
Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160	0 0 0	99 y 150 y Stable 72.1 d	3- 3/2+ 3-	+2.7(5) +1.432(8) +3.85(5)	A [159Tb]	CLS EPR/NO/S Mu-X NMR/ON	1990Al36 1968Ea04 1984Ta04 1987Ma42
Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159	0 0 0	99 y 150 y Stable	3- 3/2+	+2.7(5) +1.432(8)	A	CLS EPR/NO/S Mu-X	1990Al36 1968Ea04 1984Ta04
Reference isotope Dysprosium	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161	0 0 0	99 y 150 y Stable 72.1 d 6.9 d	3- 3/2+ 3-	+2.7(5) +1.432(8) +3.85(5)	A [159Tb]	CLS EPR/NO/S Mu-X NMR/ON	1990Al36 1968Ea04 1984Ta04 1987Ma42
	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish	0 0 0 0 0 n X-ray hyperfind ted results from N	99 y 150 y Stable 72.1 d 6.9 d e structure Neugart, PC to Rag	3- 3/2+ 3- 3/2+ ghavan (1987	+2.7(5) +1.432(8) +3.85(5)	A [159Tb] [159Tb]	CLS EPR/NO/S Mu-X NMR/ON	1990Al36 1968Ea04 1984Ta04 1987Ma42
	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish B. Analysis o	0 0 0 0 0 n X-ray hyperfin ded results from N f perturbation of	99 y 150 y Stable 72.1 d 6.9 d e structure Jeugart, PC to Rag TDPAC in liquid s	3- 3/2+ 3- 3/2+ ghavan (1987 sources	+2.7(5) +1.432(8) +3.85(5) +1.3(6)	A [159Tb] [159Tb] teraction analysis.	CLS EPR/NO/S Mu-X NMR/ON NO/S	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis o 66 Dy 147	0 0 0 0 0 n X-ray hyperfine ted results from N f perturbation of 751	99 y 150 y Stable 72.1 d 6.9 d e structure Jeugart, PC to Ray TDPAC in liquid s 59 s	3- 3/2+ 3- 3/2+ ghavan (1987 sources (11/2-)	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 2). No information on in +0.67(10)	A [159Tb] [159Tb] teraction analysis.	CLS EPR/NO/S Mu-X NMR/ON NO/S	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15
	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis o 66 Dy 147 66 Dy 149	0 0 0 0 0 n X-ray hyperfine ted results from N f perturbation of 751 0	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m	3- 3/2+ 3- 3/2+ ghavan (1987 sources (11/2-) 7/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5)	A [159Tb] [159Tb] teraction analysis. A A	CLS EPR/NO/S Mu-X NMR/ON NO/S	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17
	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis o 66 Dy 147	0 0 0 0 0 n X-ray hyperfine ted results from N f perturbation of 751	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Ray TDPAC in liquid s 59 s 4.23 m 17 m	3- 3/2+ 3- 3/2+ ghavan (1987 sources (11/2-)	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 2). No information on in +0.67(10)	[159Tb] [159Tb] steraction analysis. A A A	CLS EPR/NO/S Mu-X NMR/ON NO/S	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15
	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis o 66 Dy 147 66 Dy 149	0 0 0 0 0 n X-ray hyperfine ted results from N f perturbation of 751 0	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m	3- 3/2+ 3- 3/2+ ghavan (1987 sources (11/2-) 7/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5)	A [159Tb] [159Tb] teraction analysis. A A	CLS EPR/NO/S Mu-X NMR/ON NO/S	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 149 66 Dy 151	0 0 0 0 0 0 x-ray hyperfine fresults from 1 fresults from 1 from 5 from 5 from 5 from 5 from 6 from	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Ray TDPAC in liquid s 59 s 4.23 m 17 m	3- 3/2+ 3- 3/2+ ghavan (1987 sources (11/2-) 7/2- 7/2- 7/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9)	[159Tb] [159Tb] steraction analysis. A A A [163Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1989Ra17
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish B. Analysis of 66 Dy 147 66 Dy 149 66 Dy 151 66 Dy 153 66 Dy 153	0 0 0 0 0 x-ray hyperfine led results from N f perturbation of 751 0 0	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Ray TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h	3- 3/2+ 3- 3/2+ ghavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2)	A [159Tb] [159Tb] teraction analysis. A A A A [163Dy] [163Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1989Ra17 1973Ek01 1973Ek01
,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 149 66 Dy 151 66 Dy 153 66 Dy 155 66 Dy 157	0 0 0 0 0 n X-ray hyperfine led results from N f perturbation of 751 0 0 0	99 y 150 y Stable 72.1 d 6.9 d estructure Neugart, PC to Ray TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 2). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS AB AB AB	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1989Ra17 1973Ek01 1973Ek01
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 149 66 Dy 151 66 Dy 153 66 Dy 155 66 Dy 157 66 Dy 159	0 0 0 0 0 0 n X-ray hyperfine led results from N f perturbation of 751 0 0 0 0	99 y 150 y Stable 72.1 d 6.9 d estructure Reugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d	3- 3/2+ 3- 3/2+ ghavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 3/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 2). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2)	A [159Tb] [159Tb] teraction analysis. A A A A [163Dy] [163Dy] [163Dy] A	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS AB AB AB CLS	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1989Ra17
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 155 66 Dy 157 66 Dy 159 66 Dy 160	0 0 0 0 0 m. X-ray hyperfine ned results from N f perturbation of 751 0 0 0 0 0	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns	3- 3/2+ 3- 3/2+ sqhavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 3/2- 2+	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 5). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB AB CLS TDPAC	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1989Ra17 1989Ra17
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 149 66 Dy 151 66 Dy 153 66 Dy 155 66 Dy 157 66 Dy 159	0 0 0 0 0 n X-ray hyperfine led results from N f perturbation of 751 0 0 0 0 0 87	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable	3- 3/2+ 3- 3/2+ shavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 3/2- 2+ 5/2+	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] A B [163Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB CLS TDPAC AB	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1974Fe05
,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 155 66 Dy 157 66 Dy 159 66 Dy 160	0 0 0 0 0 n X-ray hyperfine led results from 1 ferturbation of 751 0 0 0 0 0 0 87 0 0 26	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns	3- 3/2+ 3- 3/2+ Sources (11/2-) 7/2- 7/2- 3/2- 3/2- 3/2- 2+ 5/2+ 5/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] A [163Dy] [163Dy] [161Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB CLS TDPAC AB ME	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1989Ra17 1970Wa25 1974Fe05 1973St23
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 155 66 Dy 157 66 Dy 159 66 Dy 160	0 0 0 0 0 x-ray hyperfine led results from N f perturbation of 751 0 0 0 0 0 87 0 26 44	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable	3- 3/2+ 3- 3/2+ shavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 3/2- 2+ 5/2+	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] A B [163Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB CLS TDPAC AB	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1979Ek01 1989Ra17 1990Wa25 1974Fe05
, ,	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 155 66 Dy 157 66 Dy 159 66 Dy 160	0 0 0 0 0 n X-ray hyperfine led results from 1 ferturbation of 751 0 0 0 0 0 0 87 0 0 26	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns	3- 3/2+ 3- 3/2+ Sources (11/2-) 7/2- 7/2- 3/2- 3/2- 3/2- 2+ 5/2+ 5/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 1). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] A [163Dy] [163Dy] [161Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB CLS TDPAC AB ME	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1989Ra17 1970Wa25 1974Fe05 1973St23
Dysprosium	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 155 66 Dy 157 66 Dy 159 66 Dy 160	0 0 0 0 0 x-ray hyperfine led results from N f perturbation of 751 0 0 0 0 0 87 0 26 44	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Ray TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 3/2- 3/2- 3/2- 3/2- 5/2+ 5/2- 7/2+ 3/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS CLS TDPAC AB ME ME	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01
Dysprosium	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 153 66 Dy 155 66 Dy 157 66 Dy 159 66 Dy 160 66 Dy 161	0 0 0 0 0 m. X-ray hyperfine the results from N f perturbation of 751 0 0 0 0 0 0 0 0 0 26 44 75 0	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TTDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 3/2- 3/2- 3/2- 2+ 5/2+ 5/2- 7/2+ 3/2- 5/2- 5/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 2). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS CLS TDPAC AB ME ME ME ME ME ME MU-X	1990Al36 1968Ea04 1984Ta04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1989Ra17 1970Wa25 1974Fe05 1973St23 1973St23 1973St23 1984Ta04
Dysprosium	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 149 66 Dy 151 66 Dy 155 66 Dy 157 66 Dy 159 66 Dy 160 66 Dy 161	0 0 0 0 0 0 x-ray hyperfine led results from N f perturbation of 751 0 0 0 0 0 87 0 26 44 75	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Ray TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 3/2- 3/2- 3/2- 3/2- 5/2+ 5/2- 7/2+ 3/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB AB AB AB ME ME ME ME	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1974Fe05 1974Fe05 1973St23 1973Sy01 1973St23
Dysprosium Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 159 66 Dy 160 66 Dy 161	0 0 0 0 0 0 x-ray hyperfine ed results from N f perturbation of 751 0 0 0 0 0 0 0 0 26 44 75 0 73	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable 2.39 ns 2.33 h	3- 3/2+ 3- 3/2+ shavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 3/2- 2+ 5/2+ 5/2- 7/2+ 3/2- 2- 5/2- 7/2+ 3/2- 2- 2- 2- 2- 2- 2- 2- 2- 2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 9). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2) -2.08(15)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [163Dy] [161Dy] [161	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS CLS AB AB AB AB AB ME	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973St23 1973St23 1973St23 1984Ta04 1968Mu01
Dysprosium Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish B. Analysis of 66 Dy 147 66 Dy 153 66 Dy 155 66 Dy 155 66 Dy 157 66 Dy 160 66 Dy 161 66 Dy 161 66 Dy 163 66 Dy 163 66 Dy 164 66 Dy 165 Pionic atom	0 0 0 0 0 0 x-ray hyperfine eld results from N f perturbation of 751 0 0 0 0 0 87 0 26 44 75 0 73 0 X-ray hyperfine	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Ray TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable 2.33 h structure	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 3/2- 3/2- 3/2- 2- 5/2+ 5/2- 7/2+ 3/2- 2+ 7/2+	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2) -2.08(15) +3.48(7)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [161Dy] [161	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS CLS TDPAC AB ME ME ME ME ME ME ME MB AB	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973St23 1974Fe05 1973St23 1973Sy01 1973St23 1984Ta04 1968Mu01 1968 Ra03
	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 159 66 Dy 160 66 Dy 161	0 0 0 0 0 0 n X-ray hyperfine sed results from N f perturbation of 751 0 0 0 0 0 0 87 0 0 26 44 75 0 73 0 X-ray hyperfine sed of 10	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Rag TTDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable 2.39 ns 2.33 h estructure 161.8 s	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 3/2- 3/2- 3/2- 3/2- 5/2+ 5/2- 7/2+ 3/2- 5/2- 2+ 7/2+	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2) -2.08(15) +3.48(7)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [165Ho]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS CLS TDPAC AB ME	1990Al36 1968Ea04 1984Ta04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1989Ra17 1970Wa25 1974Fe05 1973St23 1973St23 1984Ta04 1968Mu01 1968 Ra03
Dysprosium Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 155 66 Dy 160 66 Dy 161 66 Dy 163 66 Dy 164 66 Dy 165 Pionic atom 67 Ho 152	0 0 0 0 0 n X-ray hyperfine led results from N f perturbation of 751 0 0 0 0 0 87 0 26 44 75 0 73 0 73 0 X-ray hyperfine so	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable 2.39 ns 2.33 h structure 161.8 s 49.5 s	3- 3/2+ 3- 3/2+ shavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 3/2- 2+ 5/2+ 5/2- 7/2+ 3/2- 7/2+ 3/2- 7/2+ 3/2- 7/2+ 3/2- 7/2+ 3/2- 7/2+ 3/2- 9+	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2) -2.08(15) +3.48(7) +0.1(2) -1.3(8)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [165Ho] [165Ho]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB AB ME ME ME ME ME ME ME ME AB ME AB ME LRIS LRIS	1990Al36 1968Ea04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973St23 1974Fe05 1973St23 1973St23 1984Ta04 1968Mu01 1968 Ra03
Dysprosium Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish B. Analysis of 66 Dy 149 66 Dy 151 66 Dy 153 66 Dy 155 66 Dy 157 66 Dy 160 66 Dy 161 66 Dy 163 66 Dy 164 66 Dy 165 Pionic atom 67 Ho 152	0 0 0 0 0 n X-ray hyperfine sed results from N f perturbation of 751 0 0 0 0 0 0 0 0 26 44 75 0 73 0 X-ray hyperfine sed 60 0	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable 2.39 ns 2.33 h estructure 161.8 s 49.5 s 2.0 m	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 2+ 5/2+ 5/2- 7/2+ 3/2- 2/2+ 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2- 9+ 11/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2) -2.08(15) +3.48(7) +0.1(2) -1.3(8) -1.1(5)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [165Ho] [165Ho] [165Ho] [165Ho]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB CLS TDPAC AB ME ME ME ME AB AB LRIS LRIS LRIS	1990Al36 1968Ea04 1984Ta04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1968Ra17 1970Wa25 1974Fe05 1973St23 1974Fe05 1973St23 1984Ta04 1968Mu01 1968 Ra03
Dysprosium Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic aton A. Unpublish B. Analysis of 66 Dy 147 66 Dy 151 66 Dy 155 66 Dy 155 66 Dy 155 66 Dy 160 66 Dy 161 66 Dy 163 66 Dy 164 66 Dy 165 Pionic atom 67 Ho 152	0 0 0 0 0 n X-ray hyperfine led results from N f perturbation of 751 0 0 0 0 0 87 0 26 44 75 0 73 0 73 0 X-ray hyperfine so	99 y 150 y Stable 72.1 d 6.9 d estructure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable 2.39 ns 2.33 h structure 161.8 s 49.5 s	3- 3/2+ 3- 3/2+ Sphavan (1987 sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 2+ 5/2+ 5/2- 7/2+ 3/2- 2+ 5/2- 7/2+ 3/2- 2+ 5/2- 7/2+ 3/2- 2- 1/2- 1/2- 2- 9- 11/2- 2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2) -2.08(15) +3.48(7) +0.1(2) -1.3(8)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [161Dy] [165Ho] [165Ho]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB AB ME ME ME ME ME ME ME ME AB ME AB ME LRIS LRIS	1990Al36 1968Ea04 1984Ta04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973St23 1974Fe05 1973St23 1973Sy01 1973St23 1984Ta04 1968Mu01 1968 Ra03
Dysprosium Reference isotope	65 Tb 157 65 Tb 158 65 Tb 159 65 Tb 160 65 Tb 161 Muonic atom A. Unpublish B. Analysis of 66 Dy 149 66 Dy 151 66 Dy 153 66 Dy 155 66 Dy 157 66 Dy 160 66 Dy 161 66 Dy 163 66 Dy 164 66 Dy 165 Pionic atom 67 Ho 152	0 0 0 0 0 n X-ray hyperfine sed results from N f perturbation of 751 0 0 0 0 0 0 0 0 26 44 75 0 73 0 X-ray hyperfine sed 60 0	99 y 150 y Stable 72.1 d 6.9 d e structure leugart, PC to Rag TDPAC in liquid s 59 s 4.23 m 17 m 6.3 h 10.0 h 8.1 h 144 d 1.96 ns Stable 29 ns 0.78 ns 3.2 ns Stable 2.39 ns 2.33 h estructure 161.8 s 49.5 s 2.0 m	3- 3/2+ 3- 3/2+ sources (11/2-) 7/2- 7/2- 7/2- 3/2- 3/2- 2+ 5/2+ 5/2- 7/2+ 3/2- 2/2+ 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2+ 3/2- 5/2- 7/2- 9+ 11/2-	+2.7(5) +1.432(8) +3.85(5) +1.3(6) 7). No information on in +0.67(10) -0.62(5) -0.30(5) -0.15(9) +0.96(2) +1.29(2) +1.37(2) 1.8(4) +2.51(2) +2.51(2) +0.53(13) +1.45(6) +2.65(2) -2.08(15) +3.48(7) +0.1(2) -1.3(8) -1.1(5)	A [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [159Tb] [163Dy] [163Dy] [163Dy] [161Dy] [161Dy] [161Dy] [161Dy] [165Ho] [165Ho] [165Ho] [165Ho]	CLS EPR/NO/S Mu-X NMR/ON NO/S CLS CLS CLS CLS AB AB AB CLS TDPAC AB ME ME ME ME AB AB LRIS LRIS LRIS	1990Al36 1968Ea04 1984Ta04 1984Ta04 1987Ma42 1983Ri15 1989Ra17 1989Ra17 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1973Ek01 1968Ra17 1970Wa25 1974Fe05 1973St23 1974Fe05 1973St23 1984Ta04 1968Mu01 1968 Ra03

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
	67 Ho 155	0	48 m	5/2+	+1.56(12)	[165Ho]	LRIS	1989Al27
	67 Ho 156	0	56 m	4(+)	+2.40(18)	[165Ho]	LRIS	1989Al27
	67 Ho 157	0	12.6 m	7/2-	+3.05(13)	[165Ho]	LRIS	1989Al27
	67 Ho 158	0	11.3 m	5+	+4.2(4)	[165Ho]	LRIS	1989Al27
	07 110 150	67.2	28 m	2-	+1.66(17)	[165Ho]	LRIS	1989Al27
	C7 Us 150							
	67 Ho 159	0	35.05 m	7/2-	+3.27(13)	[165Ho]	LRIS	1989Al27
	67 Ho 160	0	25.6 m	5+	+4.0(2)	[165Ho]	LRIS	1989Al27
		60	5.02 h	2-	+1.83(17)	[165Ho]	LRIS	1989Al27
	67 Ho 161	0	2.48 h	7/2—	+3.30(11)	[165Ho]	LRIS	1989Al27
	67 Ho 162	106	67 m	6-	+4.0(7)	[165Ho]	LRIS	1989Al27
	67 Ho 163	0	4570 y	7/2—	+3.7(6)	[165Ho]	LRIS	1989Al27
eference isotope	67 Ho 165	0	Stable	7/2—	+3.58(2)		Pi-X	1983Ol03
ejerence isotope	07 110 103	95	22 ps	9/2-	+3.52(4)	[165Ho]	Mu-X	1976Po05
rbium	Muonic aton	n X-ray hyperfine	e structure					
	A-Estimated	l efg in Er metal.						
	68 Er 153	0	37.1 s	(7/2-)	-0.42(2)	[167Er]	CLS	1987OtZW
	68 Er 155	0	5.3 m	7/2-	-0.27(2)	[167Er]	CLS	1987OtZW
	68 Er 157	0	25 m	3/2-	+0.92(1)	[167Er]	CLS	19870tZW
	68 Er 159	0	36 m	3/2-	+1.17(1)	[167Er]	CLS	19870tZW
	68 Er 161	0	3.21 h	3/2-	+1.363(8)	[167Er]	AB	1972Ek03
	68 Er 162	102	1.3 ns	2+	<0		CER	1981Hu02
		901	1.24 ps	2+	1.8(6)		CER	1983Hu01
	68 Er 163	0	75.1 m	5/2-	+2.56(2)	[167Er]	CLS	1987OtZW
	68 Er 164	92	1.48 ns	2+	<0		CER	1981Hu02
	30 2. 10 1	860	1.9 ps	2+	2.4(3)		CER	1983Hu01
	CO F., 105					[167F=1		
	68 Er 165	0	10.36 h	5/2-	+2.71(3)	[167Er]	CLS	19870tZW
	68 Er 166	81	1.85 ns	2+	-1.9(4)	Α	ME	1965Hu01
		265	118 ps	4+	-2.7(9)		CER	1970McZQ
		786	4.6 ps	2+	2.2(3)		CER	1983Hu01
deference isotope	68 Er 167	0	Stable	7/2+	+3.57(3)		Mu-X	1984Ta04
ererence isotope	68 Er 168	264	121 ps	4+	-2.2(10)		CER	1970McZQ
	00 EI 100							_
		821	2.9 ps	2+	2.3(2)		CER	1983Hu01
	68 Er 170	79	1.90 ns	2+	-1.9(2)		CER	1973Lu02
		260	\sim 135 ps	4+	-2.2(10)		CER	1970McZQ
		934	1.81 ps	2+	2.0(3)		CER	1983Hu01
		224	1.01 ps	2+	2.0(3)		CLIC	
	68 Er 171	0	7.52 h	5/2-	2.86(9)	[167Er]	AB	1964Bu09
Thulium	There is no a A. For details B. Includes e	0 dopted reference s of the efg used s stimated Sternhe	7.52 h e efg for Tm. see 1973Ek01/198 simer correction	5/2— 8Al04	2.86(9)		AB	1964Bu09
Thulium	There is no a A. For details B. Includes e 69 Tm 153	0 dopted reference s of the efg used s stimated Sternhe 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s	5/2- 8Al04 (11/2-)	2.86(9) +0.5(10)	[169Tm]	AB LRIS	1964Bu09 2000Ba16
Thulium	There is no a A. For details B. Includes e	0 dopted reference s of the efg used s stimated Sternhe	7.52 h e efg for Tm. see 1973Ek01/198 simer correction	5/2- 8Al04 (11/2-) (2-)	2.86(9)		AB	1964Bu09
Thulium	There is no a A. For details B. Includes e 69 Tm 153	0 dopted reference s of the efg used s stimated Sternhe 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s	5/2- 8Al04 (11/2-) (2-)	2.86(9) +0.5(10) +0.4(9)	[169Tm]	AB LRIS	1964Bu09 2000Ba16
hulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154	0 dopted references of the efg used stimated Sternher 0 0 0+ x	7.52 h e efg for Tm. eee 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s	5/2- 8Al04 (11/2-) (2-) (9+)	2.86(9) +0.5(10) +0.4(9) -0.2(4)	[169Tm] A A	AB LRIS LRIS LRIS LRIS	1964Bu09 2000Ba16 2000Ba16 2000Ba16
hulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154	0 Idopted references s of the efg used s stimated Sternhe 0 0 0+x 0	7.52 h e efg for Tm. see 1973Ek01/198 imer correction 1.48 s 8.1 s 3.30 s 1.3 m	5/2- 8Al04 (11/2-) (2-) (9+) 2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11)	[169Tm] A A	AB LRIS LRIS LRIS LRIS LRIS	1964Bu09 2000Ba16 2000Ba16 2000Ba16 1987AlZb
hulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 158	0 dopted reference s of the efg used s stimated Sternhe 0 0 0 + x 0 0	7.52 h e efg for Tm. eee 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11)	[169Tm] A A A	LRIS LRIS LRIS LRIS LRIS LRIS	1964Bu09 2000Ba16 2000Ba16 2000Ba16 1987AlZb 1988Al04
hulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 158 69 Tm 159	odopted references of the efg used stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7)	[169Tm] A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AlZb 1988Al04 1988Al04
hulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 158 69 Tm 159 69 Tm 160	0 dopted reference s of the efg used s stimated Sternhe 0 0 0+x 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4)	[169Tm] A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AlZb 1988Al04 1988Al04 1988Al04
Thulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 158 69 Tm 159	odopted references of the efg used stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7)	[169Tm] A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04
Thulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 158 69 Tm 159 69 Tm 160	0 dopted reference s of the efg used s stimated Sternhe 0 0 0+x 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7)	[169Tm] A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04
Thulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 160 69 Tm 161 69 Tm 161	0 dopted reference s of the efg used s stimated Sternhe 0 0 0+ x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3)	[169Tm] A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
Thulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 158 69 Tm 160 69 Tm 160 69 Tm 161 69 Tm 161 69 Tm 162 69 Tm 164	0 Idopted references s of the efg used s stimated Sternhe 0 0 0+ x 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. e et 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5)	[169Tm] A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
Thulium	There is no a A. For details B. Includes e. 69 Tm 154 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 162 69 Tm 164 69 Tm 164 69 Tm 164	odopted references of the efg used stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. e et 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3)	[169Tm] A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
Thulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 166 69 Tm 168	o dopted reference s of the efg used s stimated Sternhe 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7)	[169Tm] A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
Thulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 158 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 166 69 Tm 168 69 Tm 168 69 Tm 168	odopted references of the efg used statimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1)	[169Tm] A A A A A A A A A A A A B	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
Thulium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 166 69 Tm 168	o dopted reference s of the efg used s stimated Sternhe 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7)	[169Tm] A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton	o dopted references of the efg used stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 1+ 2+ 3+ 3/2+ 1+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r	o dopted references of the efg used s stimated Sternhei 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d e structure cocopic) = 2Q(inti	5/2- 88Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and 0	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) Q(intrinsic) 2+(84 keV) 170	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton	o dopted references of the efg used stimated Sternhell 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 eimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 1+ 2+ 3+ 3/2+ 1+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r	o dopted references of the efg used s stimated Sternhei 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d e structure cocopic) = 2Q(inti	5/2- 88Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and 0	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) Q(intrinsic) 2+(84 keV) 170	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 159	odopted references s of the efg used s stimated Sternhe 0 0 0+x 0 0 0 0 0 0 0 0 0 0 0 0 n X-ray hyperfine elation Q(spectre 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure oscopic) = 2Q(into 1.59 s 1.58 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-)	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(10) -0.5(3) -0.22(2)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 166 69 Tm 167 m 168 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 159 70 Yb 161	odopted references s of the efg used s stimated Sternhe 0 0 0+x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure coscopic) = 2Q(into 1.59 s 1.58 m 4.2 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 160 69 Tm 160 69 Tm 164 69 Tm 166 69 Tm 166 69 Tm 167 Tm 168 69 Tm 170 Muonic atom A. Assumes r 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163	odopted references s of the efg used s stimated Sternhe 0 0 0+x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d estructure socopic) = 2Q(inti 1.59 s 1.58 m 4.2 m 11.0 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 3/2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) Q(intrinsic) 2+(84 keV) 170 -0.5(3) -0.22(2) +1.03(2) +1.24(2)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1964Co08 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 159 69 Tm 160 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes of 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165	odopted references of the efg used s stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d e structure oscopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4)	[169Tm] A A A A A A A A A A A A A A A A A A B A A [173Yb] [173Yb] [173Yb] [173Yb] [173Yb] [173Yb]	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 165 70 Yb 165 70 Yb 167	dopted references of the efg used statimated Sternhell 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure coscopic) = 2Q(into) 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 170 -0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 155 69 Tm 159 69 Tm 160 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes of 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165	odopted references of the efg used s stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d e structure oscopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4)	[169Tm] A A A A A A A A A A A A A A A A A A B A A [173Yb] [173Yb] [173Yb] [173Yb] [173Yb] [173Yb]	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 159 69 Tm 160 69 Tm 160 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes 70 Yb 155 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 169	odopted references of the efg used stimated Sternhell O 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure socopic) = 2Q(inti 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) Q(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13
	There is no a A. For details Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 163 70 Yb 163 70 Yb 165 70 Yb 165 70 Yb 167 70 Yb 169 70 Yb 170	dopted references s of the efg used s stimated Sternhe 0 0 0+x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure oscopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+ 2+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3)	[169Tm] A A A A A A A A A A A A A A A A A B A A [173Yb]	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 159 69 Tm 160 69 Tm 160 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes 70 Yb 155 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 169	dopted references s of the efg used s stimated Sternhe 0 0 0+x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure coscopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+ 2+ 3/2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 171	dopted references of the efg used stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d e structure oscopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+ 2+ 3/2- 5/2- 5/2- 5/2- 5/2- 5/2- 5/2- 5/2- 5	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13
	There is no a A. For details Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 168 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 163 70 Yb 163 70 Yb 165 70 Yb 165 70 Yb 167 70 Yb 169 70 Yb 170	dopted references of the efg used s stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure cocopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns 1.6 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+ 2+ 3/2- 5/2- 2+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7) -2.22(4)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 171	dopted references of the efg used stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d e structure oscopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+ 2+ 3/2- 5/2- 5/2- 5/2- 5/2- 5/2- 5/2- 5/2- 5	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 171	dopted references of the efg used statimated Sternhell 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure coscopic) = 2Q(into) 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns 1.6 ns 0.122 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+ 2+ 3/2- 5/2- 2+ 4+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7) -2.22(4) -2.3(12)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AlZb 1988Al04 1988Al04 1988Al04 1988Al04 1988Al04 1988Al04 1988Al04 1988Al04 1988Al04 1988Al04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1971Pl03 1971Pl03 1971Pl03 1971Pl03 1971Pl03
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 171	dopted references of the efg used stimated Sternhell 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 2.1 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure socopic) = 2Q(inti 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns 1.6 ns 0.122 ns 7.8 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 7/2+ 2+ 3/2- 5/2- 2+ 4+ 3+	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) Q(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(4) -2.3(12) -2.9(3)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1971PI03 1971PI03 1971PI03 1971PI03 1971PI03 1971PI03 1971PI03 1970McZQ 1970Wa25
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 171	dopted references of the efg used stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h seefa for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d se structure oscopic) = 2Q(inti 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.6 ns 0.122 ns 7.8 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 5/2- 5/2- 4+ 3+ (1-)	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7) -2.22(4) -2.3(12) -2.9(3) -3.44(10)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1971PI03 197
Ytterbium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 168 69 Tm 169 69 Tm 160 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 167 70 Yb 170 Yb 171 70 Yb 172	0 dopted references of the efg used stimated Sternher 0 0 0+x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h to efg for Tm. the e1973Ek01/198 thimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d to estructure to escopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns 1.64 ns 0.122 ns 7.8 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 5/2- 5/2- 2+ 4+ 3+ (1-) (3-)	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7) -2.22(4) -2.3(12) -2.9(3) -3.44(10) +1.97(10)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1971PI03 197
	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 156 69 Tm 160 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 166 69 Tm 169 69 Tm 170 Muonic aton A. Assumes r 70 Yb 155 70 Yb 163 70 Yb 165 70 Yb 167 70 Yb 167 70 Yb 171 70 Yb 171	dopted references of the efg used s stimated Sternher 0 0 0 + x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h e efg for Tm. see 1973Ek01/198 simer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d e structure oscopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns 1.6 ns 0.122 ns 7.8 ns Stable	5/2- 8Al04 (11/2-) (2-) (9+) 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 5/2- 5/2- 2+ 4+ 3+ (1-) (3-) 5/2-	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7) -2.22(4) -2.3(12) -2.9(3) -3.44(10) +1.97(10) +2.80(4)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1964Co08 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1971PI03 197
/tterbium	There is no a A. For details B. Includes e 69 Tm 153 69 Tm 154 69 Tm 156 69 Tm 159 69 Tm 160 69 Tm 161 69 Tm 162 69 Tm 164 69 Tm 168 69 Tm 169 69 Tm 160 70 Yb 155 70 Yb 159 70 Yb 161 70 Yb 163 70 Yb 167 70 Yb 170 Yb 171 70 Yb 172	0 dopted references of the efg used stimated Sternher 0 0 0+x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7.52 h to efg for Tm. the e1973Ek01/198 thimer correction 1.48 s 8.1 s 3.30 s 1.3 m 4.3 m 9.0 m 9.4 m 38 m 21 m 2.0 m 7.7 h 85 d 3.9 ns 128.6 d to estructure to escopic) = 2Q(into 1.59 s 1.58 m 4.2 m 11.0 m 9.9 m 17.5 m 32.0 d 1.57 ns 0.81 ns 1.64 ns 1.64 ns 0.122 ns 7.8 ns	5/2- 8Al04 (11/2-) (2-) (9+) 2- 2- 5/2+ 1- 7/2+ 1- 1+ 2+ 3+ 3/2+ 1+ rinsic)/7 and (7/2-) 5/2(-) 3/2- 5/2- 5/2- 5/2- 5/2- 2+ 4+ 3+ (1-) (3-)	2.86(9) +0.5(10) +0.4(9) -0.2(4) -0.48(11) +0.74(11) +1.93(7) +0.58(4) +2.90(7) +0.69(3) +0.71(5) +2.14(3) +3.23(7) -1.2(1) +0.74(2) 2(intrinsic) 2+(84 keV) 17(-0.5(3) -0.22(2) +1.03(2) +1.24(2) +2.48(4) +2.70(4) +3.54(6) -2.18(3) -2.34(7) -2.22(7) -2.22(4) -2.3(12) -2.9(3) -3.44(10) +1.97(10)	[169Tm] A A A A A A A A A A A A A A A A A A A	LRIS LRIS LRIS LRIS LRIS LRIS LRIS LRIS	2000Ba16 2000Ba16 2000Ba16 2000Ba16 1987AIZb 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 1988AI04 2000Ba16 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1983Ne13 1971PI03

Table 1 (continued)

Element	Nucleus	E (level) keV	$T_{1/2}$	I^{π}	Q(b)	Ref. Std.	Method	Reference
		253	144 ps	4+	-1.8(12)		CER	1970McZQ
	70 Yb 175	0	4.19 d	7/2-	+3.52(5)	[173Yb]	CLS	2012Fl05
	70 Yb 176	82	1.8 ns	2+	-2.28(6)	[170Yb 84 keV]	ME	1967Ec01
		272	0.11 ns	4+	-0.9(12)		CER	1970McZQ
		1050	11.4 s	8-	+5.30(8)	[173Yb]	CLS	2007Bi14
	70 Yb 177	0	1.91 h	9/2+	+4.03(6)	[173Yb]	CLS	2012Fl05
utetium	Muonic ator	n X-ray hyperfine	structure					
	71 Lu 162	0	1.37 m	1-	+0.519(8)	[175Lu]	CLS	1998Ge13
	71 Lu 164	0	3.14 m	1-	+0.608(7)	[175Lu]	CLS	1998Ge13
	71 Lu 166	0	2.65 m	6—	+4.33(4)	[175Lu]	CLS	1998Ge13
		34	1.41 m	3—	+2.72(2)	[175Lu]	CLS	1998Ge13
	71 Lu 167	0	51.5 m	7/2+	+3.28(2)	[175Lu]	CLS	1998Ge13
	71 Lu 168	0	5.5 m	6-	+4.77(6)	[175Lu]	CLS	1998Ge13
		220	6.7 m	3+	+2.43(2)	[175Lu]	CLS	1998Ge13
	71 Lu 169	0	34.1 h	7/2+	+3.48(3)	[175Lu]	CLS	1998Ge13
	71 Lu 171	0	8.24 d	7/2+	+3.53(3)	[175Lu]	CLS	1998Ge13
	71 Lu 172	0	6.70 d	4-	+3.80(4)	[175Lu]	CLS	1998Ge13
		42	3.7 m	1-	+0.76(3)	[175Lu]	CLS	1998Ge13
	71 Lu 173	0	1.37 y	7/2+	+3.53(2)	[175Lu]	CLS	1998Ge13
	71 Lu 174	0	3.3 y	1-	+0.773(7)	[175Lu]	CLS	1998Ge13
		171	142 d	6-	+4.80(5)	[175Lu]	CLS	1998Ge13
Reference isotope	71 Lu 175	0	Stable	7/2+	+3.49(2)	-	Mu-X	1979De29
	71 Lu 176	0	$3.6 \times 10^{10} \text{ y}$	7—	+4.92(3)	[175Lu]	Α	1985Br09
		127	3.68 h	1-	-1.450(12)	[175Lu]	CLS	1998Ge13
	71 Lu 177	0	6.71 d	7/2+	+3.39(3)	[175Lu]	CLS	1998Ge13
		970	160 d	23/2	+5.71(5)	[175Lu]	CLS	1998Ge13
	71 Lu 178	0	28.4 m	1+	+0.708(10)	[175Lu]	CLS	1998Ge13
	, . Lu 1/0	120	23.1 m	9-	+5.39(10)	[175Lu]	CLS	1998Ge13
	71 Lu 179	0	4.59 h	7/2+	+3.32(3)	[175Lu]	CLS	1998Ge13
łafnium	Muonic ator	n X-ray hyperfine	structure					
	72 Hf 171	0	12.1 h	7/2+	+3.46(3)	[177Hf]	CLS	2000Ye02
	72 Hf 175	0	70 d	5/2—	+2.72(2)	[177Hf]	CLS	2002Ni12
	72 Hf 176	88	1.47 ns	2+	-2.10(2)	[177Hf]	Mu-X	1984Ta10
Reference isotope	72 Hf 177	0	Stable	7/2-	+3.37(3)	. ,	Mu-X	1984Ta04
.,			490 ps	9/2-	+1.30(2)	[177Hf]	Mu-X	1984Ta10
	72 Hf 178	93	1.47 ns	2+	-2.02(2)	[177Hf]	Mu-X	1984Ta10
		1147	4 s	23/2-	+4.99(4)	[177Hf]	CLS	2007Bi14
		2446	31 y	16+	+6.00(7)	[177Hf]	CLS	1994Bo15
Reference isotope	72 Hf 179	0	Stable	9/2+	+3.79(3)	[]	Mu-X	1984Ta04
		123	37 ps	11/2+	+1.88(3)	[177Hf]	Mu-X	1984Ta10
	72 Hf 180	93	1.53 ns	2+	-2.00(2)	[177Hf]	Mu-X	1984Ta10
	72111 100	1142	5.5 h	8-	+4.6(3)	[177Hf]	NO/S	1973Ka31
Tantalum	Pionic atom	X-ray hyperfine :	structure					
	73 Ta 171	184	45 ns	9/2-	(+)3.1(2)	[181Ta]	TDPAD	1995Do32
	73 Ta 173	0	3.14 h	5/2-	-1.8(2)	[181Ta]	NO/S	1983Ed01
	73 Ta 175	0	10.5 h	7/2+	+3.5(3)		NIOIC	
						[181Ta]	NO/S	1983Ed01
	73 Ta 178	0 + x	9.3 m	1+	+0.63(6)	[1811a] [181Ta]	NO/S NO/S	1983Ed01 1983Ha49
	73 Ta 178 73 Ta 179		9.3 m 1.82 y	1+ 7/2+	+0.63(6) +3.27(4)			
		0 + x	9.3 m			[181Ta]	NO/S	1983Ha49
Reference isotope	73 Ta 179	$0 + x \\ 0$	9.3 m 1.82 y	7/2+	+3.27(4)	[181Ta] [181Ta]	NO/S CLS	1983Ha49 1996Wa02
eference isotope	73 Ta 179 73 Ta 180	0 + x 0 75	9.3 m 1.82 y $> 1.2 \times 10^{15}$ y	7/2+ 9-	+3.27(4) +4.80(3)	[181Ta] [181Ta]	NO/S CLS CLS	1983Ha49 1996Wa02 1994Wa34
eference isotope	73 Ta 179 73 Ta 180	0 + x 0 75 0	9.3 m 1.82 y $> 1.2 \times 10^{15}$ y Stable	7/2+ 9- 7/2+ 9/2-	+3.27(4) +4.80(3) +3.17(2)	[181Ta] [181Ta] [181Ta]	NO/S CLS CLS Pi-X	1983Ha49 1996Wa02 1994Wa34 19830103
Reference isotope	73 Ta 179 73 Ta 180	0 + x 0 75 0 6	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms	7/2+ 9- 7/2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2)	[181Ta] [181Ta] [181Ta] [181Ta]	NO/S CLS CLS Pi-X ME	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02
Reference isotope Fungsten	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no o	0 + x 0 75 0 6 482 0 dopted reference	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d	7/2+ 9- 7/2+ 9/2- 5/2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta]	NO/S CLS CLS Pi-X ME ME	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no c A. Efg calcul	0 + x 0 75 0 6 482 0 dopted reference	9.3 m 1.82 y $>1.2 \times 10^{15} \text{ y}$ Stable 6.05 ms 10.8 ns 115 d efg for W	7/2+ 9- 7/2+ 9/2- 5/2+ 3-	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta]	NO/S CLS CLS Pi-X ME ME NO/S	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no c A. Efg calcul- 74 W 176	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns	7/2+ 9- 7/2+ 9/2- 5/2+ 3-	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta]	NO/S CLS CLS Pi-X ME ME NO/S	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no c A. Efg calcul	0 + x 0 75 0 6 482 0 dopted reference	9.3 m 1.82 y $>1.2 \times 10^{15} \text{ y}$ Stable 6.05 ms 10.8 ns 115 d efg for W	7/2+ 9- 7/2+ 9/2- 5/2+ 3-	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A	NO/S CLS CLS Pi-X ME ME NO/S	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no c A. Efg calcul- 74 W 176	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns	7/2+ 9- 7/2+ 9/2- 5/2+ 3-	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta]	NO/S CLS CLS Pi-X ME ME NO/S	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no o A. Efg calcul 74 W 176 74 W 179	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2-	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A	NO/S CLS CLS Pi-X ME ME NO/S	1983Ha49 1996Wa02 1994Wa34 19830I03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcul 74 W 176 74 W 179 74 W 180	0 + x 0 75 0 6 482 0 adopted reference attion in TI metal 3746 3348 104	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A	NO/S CLS CLS Pi-X ME ME NO/S	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcul. 74 W 176 74 W 179 74 W 180 74 W 182	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcul. 74 W 176 74 W 179 74 W 180 74 W 182	0 + x 0 75 0 6 482 0 adopted reference ation in TI metal 3746 3348 104 100 47	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 184 ps	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 3/2-	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME	1983Ha49 1996Wa02 1994Wa34 1983OI03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 179 74 W 180 74 W 182 74 W 183	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100 47 99	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 184 ps 0.71 ns	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 3/2- 5/2-	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV] [182W 100 keV] [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME ME ME	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 179 74 W 180 74 W 183 74 W 184	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100 47 99 111 904	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 184 ps 0.71 ns 1.25 ns 1.73 ps	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 3/2- 5/2- 2+ 2+ 2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV] [182W 100 keV] [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER ME CER CER CER	1983Ha49 1996Wa02 1994Wa34 19830I03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 179 74 W 180 74 W 182 74 W 183	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100 47 99 111 904 123 396	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 184 ps 0.71 ns 1.25 ns 1.73 ps 1.05 ns 36 ps	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 3/2- 5/2- 2+ 2+ 2+ 4+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4) -1.6(3) -2.6(13)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV] [182W 100 keV] [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER CER CER CER CER CER	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02 1977RuZV 1970McZQ
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 179 74 W 180 74 W 183 74 W 184	0 + x 0 75 0 6 482 0 adopted reference ation in TI metal 3746 3348 104 100 47 99 111 904 123	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 184 ps 0.71 ns 1.25 ns 1.73 ps 1.05 ns	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 3/2- 5/2- 2+ 2+ 2+ 2+ 2+ 2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4) -1.6(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV] [182W 100 keV] [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER CER CER CER	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02 1977RuZV
ungsten	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 180 74 W 182 74 W 183 74 W 184 74 W 186	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100 47 99 111 904 123 396	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.27 ns 1.84 ps 0.71 ns 1.25 ns 1.73 ps 1.05 ns 36 ps 4.4 ps	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 3/2- 5/2- 2+ 2+ 2+ 4+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4) -1.6(3) -2.6(13)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV] [182W 100 keV] [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER CER CER CER CER CER	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02 1977RuZV 1970McZQ
ungsten	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 180 74 W 182 74 W 183 74 W 184 74 W 186	0 + x 0 75 0 6 482 0 idopted reference ation in TI metal 3746 3348 104 100 47 99 111 904 123 396 737	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.27 ns 1.84 ps 0.71 ns 1.25 ns 1.73 ps 1.05 ns 36 ps 4.4 ps	7/2+ 9- 7/2+ 9/2- 5/2- 3- 14+ 35/2- 2+ 2+ 3/2- 5/2- 2+ 2+ 2+ 2+ 2+ 2+ 2+ 2+ 2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4) -1.6(3) -2.6(13) 1.3(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER CER CER CER CER	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02 1977RuZV 1970McZQ
ungsten	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 180 74 W 182 74 W 183 74 W 184 74 W 186 Pionic atom	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100 47 99 111 904 123 396 737 X-ray hyperfine s	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 1.84 ps 0.71 ns 1.25 ns 1.73 ps 1.05 ns 36 ps 4.4 ps etructure 64.0 h	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 3/2- 5/2- 2+ 2+ 2+ 4+ 2+ 7+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4) -1.6(3) -2.6(13) 1.3(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER CER CER CER CER CER CER CER CER CE	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02 1977RuZV 1970McZQ 1977Ob02
	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no A. Efg calcul. 74 W 176 74 W 180 74 W 183 74 W 184 74 W 186 Pionic atom 75 Re 182	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100 47 99 111 904 123 396 737 X-ray hyperfine s 0 0 + x	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 184 ps 0.71 ns 1.25 ns 1.73 ps 1.05 ns 36 ps 4.4 ps structure 64.0 h 12.7 h	7/2+ 9- 7/2+ 9/2- 5/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 2+ 2+ 2+ 2+ 2+ 2+ 2+ 2+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4) -1.6(3) -2.6(13) 1.3(3) +4.1(3) +1.8(2)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER CER CER CER CER CER CER CER COR COR COR COR COR COR COR COR COR CO	1983Ha49 1996Wa02 1994Wa34 1983Ol03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02 1977RuZV 1970McZQ 1977Ob02
'ungsten	73 Ta 179 73 Ta 180 73 Ta 181 73 Ta 182 There is no a A. Efg calcult 74 W 176 74 W 180 74 W 182 74 W 183 74 W 184 74 W 186 Pionic atom	0 + x 0 75 0 6 482 0 dopted reference ation in TI metal 3746 3348 104 100 47 99 111 904 123 396 737 X-ray hyperfine s	9.3 m 1.82 y >1.2 × 10 ¹⁵ y Stable 6.05 ms 10.8 ns 115 d efg for W 41 ns 750 ns 1.22 ns 1.37 ns 1.84 ps 0.71 ns 1.25 ns 1.73 ps 1.05 ns 36 ps 4.4 ps etructure 64.0 h	7/2+ 9- 7/2+ 9/2- 5/2+ 3- 14+ 35/2- 2+ 2+ 3/2- 5/2- 2+ 2+ 2+ 4+ 2+ 7+	+3.27(4) +4.80(3) +3.17(2) +3.59(2) +2.28(2) +2.6(3) 6.0(8) +3.9(10) -2.1(4) -2.1(4) -1.8(4) -2.0(3) -1.9(2) +0.1(4) -1.6(3) -2.6(13) 1.3(3)	[181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] [181Ta] A A [182W 100 keV]	NO/S CLS CLS Pi-X ME ME NO/S TDPAD LEMS ME CER ME CER CER CER CER CER CER CER CER CER CE	1983Ha49 1996Wa02 1994Wa34 19830I03 1983Ei02 1983Bu11 1991Fa12 2002Io01 2001Ba04 1973Zi02 1977RuZV 1966Sh07 1967Ag02/1974Ge17 1974Ge17/1977RuZV 1977Ob02 1977RuZV 1970McZQ 1977Ob02

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
	75 Re 184	0	38.0 d	3-	+2.8(2)	[185,187Re]	NO/S	1983Ha49
Reference isotope	75 Re 185	0	Stable	5/2+	+2.18(2)		Pi-X	1981Ko11
	75 Re 186	0	90.6 h	1—	+0.618(6)	[185,187Re]	AB	1981Bu13
Reference isotope	75 Re 187	0	$4 \times 10^{10} \text{ y}$	5/2+	+2.07(2)	. , ,	Pi-X	1981Ko11
ejerence isotope	75 Re 107	206	555 ns	9/2-	+3.04(5)	[187Re]	TDPAC	1973Ha61
	75 Re 188	0	16.9 h	1-	+0.572(6)	[185,187Re]	AB	1981Bu13
				•	(0.072(0)	[100,107.10]		10012413
Osmium		n X-ray hyperfine		25.	4.2(2)	[4000 455] 17]	TDDAD	1001P 25
	76 Os 182	7049	150 ns	25+	4.2(2)	[1880s 155 keV]	TDPAD	1991Br25
	76 Os 183	0	13.0 h	9/2+	+3.1(3)	[1880s 155 keV]	NO/S	1985Ha41
	76 Os 184	120	1.18 ns	2+	-2.7(12)	[1880s 155 keV]	CER	1972La16
	76 Os 186	137	830 ps	2+	-1.63(4)		Mu-X	1981Ho22
Reference isotope	76 Os 188	155	710 ps	2+	-1.46(4)		Mu-X	1981Ho22
		633	6.3 ps	2+	+1.0(3)	[188Os 155 keV]	CER	1980Ba42
		2121	_	(3-)	+1.69(9)		Mu-X	1979Ho23
	76 Os 189	0	Stable	3/2-	+0.86(3)	[1880s 155 keV]	ME	1972Wa24
		70	1.63 ns	5/2—	-0.63(2)	[1880s 155 keV]	ME	1972Wa24
	76 Os 190	187	366 ps	2+	-1.18(3)		Mu-X	1981Ho22
	70 00 100	558	12.5 ps	2+	+0.8(5)	[1880s 155 keV]	CER	1980Ba42
	76 Os 191	0	15.4 d	9/2-	+2.53(16)	[1880s 155 keV]	NO/S	1979Er09
	76 Os 192	206	289 ps	2+	-0.96(3)	[18803 133 KCV]	Mu-X	1981Ho22
	70 OS 192					[1000a 155 kaV]		
	=00.400	489	30.1 ps	2+	-0.7(3)	[1880s 155 keV]	CER	1980Ba42
	76 Os 193	0	30.5 h	3/2-	+0.48(6)	[1880s 155 keV]	NO/S,R	1985Be03/1979Er09
ridium	A. Estimated	n X-ray hyperfine l efg at Ir in hcp C l efg at Ir in Os m	To metal crystal					
	77 Ir 182	0	15 m	3+	-1.7(6)	[191Ir]	RIMS/LS	2006Ve10
	77 Ir 183	0	55 m	5/2-	-1.8(7)	[191Ir]	RIMS/LS	2006Ve10
	77 Ir 184	0	3.14 h	5-	+2.41(3)	A	QI-NMR/ON	1996Se15
	77 Ir 185	0	14.4 h	5/2-	-1.84(12)	A	NMR/ON R	1988Oh02
	77 Ir 186	0	16.64 h	5+	-1.54(12) -2.55(3)	A	QI-NMR/ON	1996Se15
	// 11 100		10.04 11		, ,		- ,	
	===	X	40.51	2(-)	+1.456(17)	A	QI-NMR/ON	1996Se15
	77 Ir 187	0	10.5 h	3/2+	+0.941(11)	Α	QI-NMR/ON	1996Se15
		434	152 ns	11/2-	2.33(14)	[193Ir]	TDPAC	1978HaXO
	77 Ir 188	0	40.5 h	1(-)	+0.484(6)	Α	QI-NMR/ON	1996Se15
	77 Ir 189	0	13.1 d	3/2+	+0.82(8)	[191Ir]	RIMS/LS	2006Ve10
					['+0.878(10)]		Estimated	1996Se15
	77 Ir 190	0	11.8 d	(4)+	+2.87(16)	Α	NO/S	1980Mu07
Reference isotope	77 Ir 191	0	Stable	3/2+	+0.816(9)		Mu-X	1984Ta04
	77 Ir 192	0	74.2 d	4—	+2.15(6)	Α	QI-NMR/ON	1996Se15
	77 Ir 193	0	Stable	3/2+	+0.751(9)		Mu-X	1984Ta04
	77 Ir 194	0	19.4 h	1-	+0.339(12)	[191Ir]	NMR/ON	1985Ed02
Platinum	A. For detail:	adopted reference s of the efg used s	see 1992Hi07					
		l efg at Pt in osmi						
	78 Pt 183	35	43 s	7/2—	+3.4(3)	A	LS	1999Le52/1992Hi0
			43 s 70.9 m	7/2- 9/2+	+3.4(3) +3.73(17)	A A	LS	
	78 Pt 183	35	43 s				LS RIMS/LS	1999Le52/1992Hi0
	78 Pt 183 78 Pt 185 78 Pt 187	35 0 0	43 s 70.9 m 2.35 h	9/2+ 3/2-	+3.73(17) -1.02(4)	A A	LS RIMS/LS	1999Le52/1992Hi0 1992Hi07/1989Du0
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189	35 0 0 0	43 s 70.9 m 2.35 h 10.9 h	9/2+ 3/2- 3/2-	+3.73(17) -1.02(4) -0.95(4)	A A A	LS RIMS/LS RIMS/LS	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191	35 0 0 0 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d	9/2+ 3/2- 3/2- 3/2-	+3.73(17) -1.02(4) -0.95(4) -0.87(4)	A A	LS RIMS/LS RIMS/LS RIMS/LS	1999Le52/1992Hi0* 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192	35 0 0 0 0 0 317	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps	9/2+ 3/2- 3/2- 3/2- 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2)	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194	35 0 0 0 0 0 317 328	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps	9/2+ 3/2- 3/2- 3/2- 2+ 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14)	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER CER	1999Le52/1992Hi0 1992Hi07/1989DuC 1992Hi07/1989DuC 1992Hi07/1989DuC 1987Gy01 1986Gy04
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195	35 0 0 0 0 0 317 328 259	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6)	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER CER NO/S	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194	35 0 0 0 0 317 328 259 356	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8)	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER CER NO/S CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195	35 0 0 0 0 317 328 259 356 689	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16)	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER CER NO/S CER CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195	35 0 0 0 0 317 328 259 356 689 877	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12)	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER CER CER CER CER CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196	35 0 0 0 0 317 328 259 356 689	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps 0.98 ps	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+	+3.73(17) $-1.02(4)$ $-0.95(4)$ $-0.87(4)$ $+0.6(2)$ $+0.48(14)$ $+1.4(6)$ $+0.62(8)$ $-0.39(16)$ $+1.03(12)$ $-0.2(3)$	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14
	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195	35 0 0 0 0 317 328 259 356 689 877	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 2+ 4+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12)	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER CER CER CER CER CER	1999Le52/1992Hi0 1992Hi07/1989Du(1992Hi07/1989Du(1992Hi07/1989Du(1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14
- Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196	35 0 0 0 0 317 328 259 356 689 877 1526 407	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps 0.98 ps 22.3 ps	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 2+ 4+ 6+	+3.73(17) $-1.02(4)$ $-0.95(4)$ $-0.87(4)$ $+0.6(2)$ $+0.48(14)$ $+1.4(6)$ $+0.62(8)$ $-0.39(16)$ $+1.03(12)$ $-0.2(3)$	A A A	LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps 0.98 ps 22.3 ps	9/2+ 3/2- 3/2- 3/2- 2+ 13/2+ 2+ 2+ 4+ 6+ 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12)	A A A B	LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196	35 0 0 0 0 317 328 259 356 689 877 1526 407	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.8 ps 22.3 ps e structure 21 s	9/2+ 3/2- 3/2- 3/2- 2+ 13/2+ 2+ 2+ 4+ 6+ 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12)	A A A B	LS RIMS/LS RIMS/LS RIMS/LS CER CER COER COER CER CER CER CER CER CER CER CER CER C	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1997Le22
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.8 ps 0.98 ps 22.3 ps estructure 21 s 49 s	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 2+ 4+ 6+ 2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16)	A A A B [197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS CER CER CER COER CER CER CER CER CER CER CER CER CER C	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li21 1986Gy04
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.8 ps 22.3 ps e structure 21 s 49 s 4.2 m	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 2+ 4+ 6+ 2+ 5 2 5/2-	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10)	A A A B [197Au] [197Au] [186Au, 197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0' 1992Hi07/1989Du0' 1992Hi07/1989Du0' 1992Hi07/1989Du0' 1987Gy01' 1986Gy04' 1985Ed05' 1992Li14' 1992Li14' 1992Li14' 1992Li14' 1992Li14' 1992Li14' 1996Gy04' 1997Le22' 1997Le22' 1997Le22' 1992Ki30/1994Pa3'
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 186	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps 0.98 ps 22.3 ps e structure 21 s 49 s 4.2 m 10.7 m	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3-	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6)	A A A A B [197Au] [197Au] [186Au, 197Au] [186Au, 197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1986Gy04 1997Le22 1997Le22 1997Le22 1992Ki30/1994Pa3
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 186 79 Au 191	35 0 0 0 317 328 259 356 689 877 1526 407 <i>n X-ray hyperfine</i> 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps 0.98 ps 22.3 ps e structure 21 s 49 s 4.2 m 10.7 m 3.18 h	9/2+ 3/2- 3/2- 3/2- 2+ 13/2+ 2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3/2- 3/2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6) +0.72(2)	A A A A B [197Au] [197Au] [186Au, 197Au] [186Au, 197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1986Gy04 1997Le22 1997Le22 1997Le22 1997Le22 1992Ki30/1994Pa3 1994Pa37
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 186	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps 0.98 ps 22.3 ps estructure 21 s 49 s 4.2 m 10.7 m 3.18 h 5.0 h	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3-	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6)	A A A A B [197Au] [197Au] [186Au, 197Au] [186Au, 197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1986Gy04 1997Le22 1997Le22 1997Le22 1992Ki30/1994Pa3
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 186 79 Au 191	35 0 0 0 317 328 259 356 689 877 1526 407 <i>n X-ray hyperfine</i> 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 3.6 ps 0.98 ps 22.3 ps e structure 21 s 49 s 4.2 m 10.7 m 3.18 h	9/2+ 3/2- 3/2- 3/2- 2+ 13/2+ 2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3/2- 3/2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6) +0.72(2)	A A A A B [197Au] [197Au] [186Au, 197Au] [186Au, 197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1986Gy04 1997Le22 1997Le22 1997Le22 1997Le22 1992Ki30/1994Pa3 1994Pa37
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 186 79 Au 191 79 Au 192	35 0 0 0 0 317 328 259 356 689 877 1526 407 In X-ray hyperfine 0 0 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.8 ps 22.3 ps 22.3 ps 21 s 49 s 4.2 m 10.7 m 3.18 h 5.0 h 17.65 h	9/2+ 3/2- 3/2- 3/2- 2+ 13/2+ 2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3- 3/2+ 1- 3/2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6) +0.72(2) -0.228(8) +0.66(2)	A A A A B [197Au] [197Au] [186Au, 197Au] [186Au, 197Au] [197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li22 1997Le22 1997Le22 1997Le22 1997Le30/1994Pa3' 1994Pa37
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 186 79 Au 191 79 Au 192 79 Au 193	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0 0 0 0 0 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.8 ps 22.3 ps estructure 21 s 49 s 4.2 m 10.7 m 3.18 h 5.0 h 17.65 h 3.9 s	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3- 3/2+ 1- 3/2+ 11/2-	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6) +0.72(2) -0.228(8) +0.66(2) +1.98(6)	A A A A B [197Au] [197Au] [197Au] [186Au, 197Au] [197Au] [197Au] [197Au] [197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1986Gy04 1997Le22 1997Le22 1997Le22 1997Le22 1992Ki30/1994Pa3' 1994Pa37 1994Pa37 1994Pa37
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 191 79 Au 192 79 Au 193 79 Au 193	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0 0 0 0 0 0 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.8 ps 22.3 ps e structure 21 s 49 s 4.2 m 10.7 m 3.18 h 5.0 h 17.65 h 3.9 s 39.5 h	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3- 3/2+ 1- 3/2+ 1- 1-	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6) +0.72(2) -0.228(8) +0.66(2) +1.98(6) -0.240(9)	A A A A A B [197Au] [197Au] [197Au] [186Au, 197Au] [197Au] [197Au] [197Au] [197Au] [197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER CER CER CER CER CER CER CER CER CLS	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1996Gy04 1997Le22 1997Le22 1997Le22 1992Ki30/1994Pa3' 1994Pa37 1994Pa37 1994Pa37 1994Pa37
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 186 79 Au 191 79 Au 192 79 Au 193	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0 0 0 0 0 0 0 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.9 ps 22.3 ps 22.3 ps 21 s 49 s 4.2 m 10.7 m 3.18 h 5.0 h 17.65 h 3.9 s 39.5 h 183 d	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3- 3/2+ 1- 3/2+ 11/2- 1- 3/2+	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6) +0.72(2) -0.228(8) +0.66(2) +1.98(6) -0.240(9) +0.607(18)	A A A A A B [197Au] [197Au] [186Au, 197Au] [186Au, 197Au] [197Au] [197Au] [197Au] [197Au] [197Au] [197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER CER CER CER CER CER CER CER CLS	1999Le52/1992Hi0 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1992Li14 1996Gy04 1997Le22 1997Le22 1997Le22 1997Le22 1992Ki30/1994Pa3' 1994Pa37 1994Pa37 1994Pa37 1994Pa37 1994Pa37 1994Pa37 1996Se06 1994Pa37
Gold	78 Pt 183 78 Pt 185 78 Pt 187 78 Pt 189 78 Pt 191 78 Pt 192 78 Pt 194 78 Pt 195 78 Pt 196 78 Pt 198 Muonic ator 79 Au 184 79 Au 185 79 Au 191 79 Au 192 79 Au 193 79 Au 193	35 0 0 0 0 317 328 259 356 689 877 1526 407 n X-ray hyperfine 0 0 0 0 0 0 0	43 s 70.9 m 2.35 h 10.9 h 2.9 d 43.7 ps 41.8 ps 4.02 d 34 ps 36.8 ps 36.8 ps 36.8 ps 22.3 ps e structure 21 s 49 s 4.2 m 10.7 m 3.18 h 5.0 h 17.65 h 3.9 s 39.5 h	9/2+ 3/2- 3/2- 3/2- 2+ 2+ 13/2+ 2+ 4+ 6+ 2+ 5 2 5/2- 3- 3/2+ 1- 3/2+ 1- 1-	+3.73(17) -1.02(4) -0.95(4) -0.87(4) +0.6(2) +0.48(14) +1.4(6) +0.62(8) -0.39(16) +1.03(12) -0.2(3) +0.42(12) +4.7(3) +1.90(16) -1.10(10) +3.10(6) +0.72(2) -0.228(8) +0.66(2) +1.98(6) -0.240(9)	A A A A A B [197Au] [197Au] [197Au] [186Au, 197Au] [197Au] [197Au] [197Au] [197Au] [197Au] [197Au]	LS RIMS/LS RIMS/LS RIMS/LS RIMS/LS CER CER CER CER CER CER CER CER CER CLS	1999Le52/1992Hi07 1992Hi07/1989Du0 1992Hi07/1989Du0 1992Hi07/1989Du0 1987Gy01 1986Gy04 1985Ed05 1992Li14 1992Li14 1992Li14 1992Li14 1996Gy04 1997Le22 1997Le22 1997Le22 1997Le337 1994Pa37 1994Pa37 1994Pa37 1994Pa37 1996Se06 1994Pa37

Table 1 (continued)

	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
Reference isotope	79 Au 197	0	Stable	3/2+	+0.547(16)		Mu-X	1974Po02
		409	7.8 s	11/2-	+1.68(5)	[197Au]	MAPON	1996Se06
	79 Au 198	0	2.696 d	2-	+0.640(19)	[197Au]	NMR/ON	1993Hi10
	79 Au 199	0	3.14 d	3/2+	+0.510(16)	[197Au]	NMR/ON	1993Hi10
lercury			ate of neutral Hg					
	80 Hg 185	99.3	27 s	13/2+	+0.2(3)	[201Hg]	β -RADOP	1979Da06
	80 Hg 187	0	2.4 m	13/2+	+0.5(3)	[201Hg]	β -RADOP	1979Da06
		134	1.9 m	3/2-	-0.75(18)	[201Hg]	β -RADOP	1986Ul02/1979Da0
	80 Hg 188	2724	135 ns	12+	0.91(11)	[199Hg 158 keV]	TDPAD	1984Dr09
	80 Hg 189	0	7.6 m	3/2-	-0.8(3)	[201Hg]	β -RADOP	1986Ul02/1979Da0
		0 + x	8.6 m	13/2+	+0.66(19)	[201Hg]	β -RADOP	1979Da06
	80 Hg 190	2621	21 ns	12+	1.17(14)	[199Hg 158 keV]	TDPAD	1984Dr09
	80 Hg 191	0	49 m	3/2-	-0.80(13)	[201Hg]	β-RADOP	1986Ul02/1979Da0
		140	50.8 m	13/2+	+0.6(2)	[201Hg]	β -RADOP	1979Da06
	80 Hg 193	0	3.80 h	3/2-	-0.7(3)	[201Hg]	0	1974Fu06/1966Da0
		141	11.8 h	13/2+	+0.92(2)	[201Hg]	0	1974Re05
	80 Hg 195	176	41.6 h	13/2+	+1.08(2)	[201Hg]	0	1965Sm01
	80 Hg 197	134	8.1 ns	5/2-	+0.081(6)	[199Hg 158 keV]	TDPAC	1980He05
		299	23.8 h	13/2+	+1.25(3)	[201Hg]	0	1961Br17
	80 Hg 198	412	23 ps	2+	+0.68(12) or $+0.84(12)$		CER	1979Bo16/1984Fe08
	80 Hg 199	158	2.45 ns	5/2-	+0.95(7)		Mu-X	1979Ha08
		208	69 ps	3/2-	+0.62(15)		Mu-X	1979Ha08
		532	42.6 m	13/2+	+1.2(3)	[201Hg]	β -RADOP	1979Da06
	80 Hg 200	368	46.6 ps	2+	+0.96(11) or $+1.11(11)$		CER	1979Bo16
Reference isotope	80 Hg 201	0	Stable	3/2-	+0.387(6)			2005Bi03/1961Ko05
	80 Hg 202	440	27.3 ps	2+	+0.87(13) or $+1.01(13)$		CER	1980Sp05
	80 Hg 203	0	46.8 d	5/2-	+0.344(7)	[201Hg]	0	1970Re14
	80 Hg 204	437	40.2 ps	2+	+0.4(2)		CER	1981Es03
	80 Hg 206	2102	2.15 ms	5—	0.74(15)	[199Hg 158 keV]	TDPAD	1984Ma43
Γhallium	A. For refere B. Estimated	efg in In metal	ed in CLS studies s		(PR C36 2560 (1987)			
	81 Tl 187	335	15.6 s	(9/2-)	-2.43(5)	A	CLS	1993ScZW
	81 Tl 188	0 + x	71 s	7+	+0.129(4)	A	CLS	1992Me07
	81 Tl 189	281	1.4 m	9/2-	-2.29(4)	A	CLS	1987Bo44
	81 Tl 190	0 + x	2.6 m	2-	-0.329(9)	A	CLS	1992Me07
		0 + y	3.7 m	7+	+0.285(14)	A	CLS	1992Me07
							CIC	
	81 Tl 191	299	5.2 m	9/2-	-2.23(2)	A	CLS	1992Me07
	81 Tl 191 81 Tl 192	299 0 + x	9.6 m	2-	-0.328(11)	A	CLS	1992Me07
		299 0 + x 0 + y	9.6 m 10.8 m	2- 7+	-0.328(11) +0.46(2)	A A	CLS CLS	1992Me07 1992Me07
	81 Tl 192	$ \begin{array}{r} 299 \\ 0 + x \\ 0 + y \\ 251 + x \end{array} $	9.6 m 10.8 m 296 ns	2- 7+ 8-	-0.328(11) +0.46(2) 0.44(7)	A A B	CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27
	81 Tl 192 81 Tl 193	$ \begin{array}{r} 299 \\ 0 + x \\ 0 + y \\ 251 + x \\ 365 \end{array} $	9.6 m 10.8 m 296 ns 2.11m	2- 7+ 8- 9/2-	-0.328(11) +0.46(2) 0.44(7) -2.20(2)	A A B A	CLS CLS TDPAD CLS	1992Me07 1992Me07 1982Sc27 1987Bo44
	81 Tl 192	299 0 + x 0 + y 251 + x 365 0	9.6 m 10.8 m 296 ns 2.11m 34 m	2- 7+ 8- 9/2- 2-	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7)	A A B A	CLS CLS TDPAD CLS CLS	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07
	81 Tl 192 81 Tl 193 81 Tl 194	299 0 + x 0 + y 251 + x 365 0 0 + y	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m	2- 7+ 8- 9/2- 2- 7+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16)	A A B A A	CLS CLS TDPAD CLS CLS CLS	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07
	81 Tl 192 81 Tl 193	299 0 + x 0 + y 251 + x 365 0	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h	2- 7+ 8- 9/2- 2- 7+ 2-	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7)	A A B A	CLS CLS TDPAD CLS CLS CLS CLS	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07
	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196	299 0 + x 0 + y 251 + x 365 0 0 + y	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16)	A A B A A	CLS CLS TDPAD CLS CLS CLS	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07
	81 Tl 192 81 Tl 193 81 Tl 194	299 0+x 0+y 251+x 365 0 0+y 0 394 204	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15)	A A B A A A	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS Mu-X	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07
	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196	299 0+x 0+y 251+x 365 0 0+y 0 394	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h	2- 7+ 8- 9/2- 2- 7+ 2- 7+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2)	A A B A A A	CLS CLS TDPAD CLS CLS CLS CLS CLS	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07
Lead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 atte of neutral Pb state in neutral ed to estimated (from theory of re	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 kelaxation in Hg me	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)-	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2)	A A B A A A A	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS Mu-X Mu-X	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral d to estimated (from theory of re 138	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5)	A A B A A A A A	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS Mu-X Mu-X	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral ed to estimated (from theory of re 138 2581+d	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k 2 of 20fens in Hg man 2.18 m 1.07 ms	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 12+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4)	A A B A A A A B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral rd to estimated 0 from theory of rt 138 2581+d 2743	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 12+ 11-	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3)	A A A A A A B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS TDPAD TDPAD TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral d to estimated (from theory of re 138 2581+d 2743 100	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10)	A A A A A A A A A A A A A A A A A A A	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD TDPAD TDPAD CLS	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral ed to estimated (from theory of ra 138 2581+d 2743 100 1586 + x	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-)	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2)	A A A A A A B B B A B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD TDPAD TDPAD TDPAD CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral d to estimated (from theory of re 138 2581+d 2743 100	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-)	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3)	A A A A A A A B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral continuated (from theory of recommendate) 138 2581+d 2743 100 1586 + x 2585 + x	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 kelaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 12+ 11- 13/2+ (21/2-) (27/2-) (29/2-)	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3)	A A A A A A A B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral ed to estimated (from theory of re 138 2581+d 2743 100 1586 + x 2585 + x	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg me 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-) (29/2-) (33/2+)	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4)	A A A A A A B B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2004Ba31
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral pb state in neutral rad to estimated 0 from theory of ra 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-) (29/2-) (33/2+) 12+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3)	A A A A A A A B B B B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2004Ba31 2004Ba31 1985St16
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained, 82 Pb 191 82 Pb 192 82 Pb 193	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral Pb state in neutral do to estimated of from theory of re 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-) (29/2-) (33/2+) 12+ 11-	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4)	A A B A A A A A A B B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 2004Ba31 2004Ba31 2004Ba31 2004Ba31 2004Ba31 2007Io03
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral ed to estimated (from theory of re 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-) (29/2-) (33/2+) 12+ 11- 13/2+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15)	A A A A A A A B B B B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 2004Ba31 1985St16 2007Io03 1991Du07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained, 82 Pb 191 82 Pb 192 82 Pb 193	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral Pb state in state in (200) 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203 2694	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg me 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-) (29/2-) (33/2+) 12+ 11- 13/2+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5)	A A A A A A A A B B B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ st A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 193 82 Pb 193 82 Pb 194 82 Pb 195 82 Pb 196	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral dt to estimated 0 from theory of re 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203 2694 3191	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k 2 of 206Pb 4027 k 2 18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 85 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (29/2-) (33/2+) 12+ 11- 13/2+ 11- 13/2+ 12+ 11-	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7)	A A A A A A A B B B B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02 2002Vy01
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral pb state in neutral row to estimated 0 from theory of row 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203 2694 3191 0	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 20 f 206Pb 4027 k elaxation in Hg me 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 85 ns 8 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (29/2-) (33/2+) 12+ 11- 13/2+ 11- 13/2+ 11- 13/2+ 11- 13/2+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7) -0.08(17)	A A B A A A A A A A B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS TDPAD TDPA	1992Me07 1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02 2002Vy01 1986An06
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained, 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195 82 Pb 196 82 Pb 197	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral rb state in neutral rb state in neutral rb state in settral rb state in neutral	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg me 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 85 ns 8 m 43 m	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- ev etal 13/2+ 11- 13/2+ (21/2-) (29/2-) (33/2+) 12+ 11- 13/2+ 11- 13/2+ 11- 13/2+ 11- 13/2+	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7) -0.08(17) +0.378(19)	A A B A A A A A A A B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2004Ba31 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02 2002Vy01 1986An06 1991Du07
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195 82 Pb 196 82 Pb 197 82 Pb 198	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral rd to estimated 0 from theory of ra 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203 2694 3191 0 319 2820	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg me 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 85 ns 8 m 43 m 212 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-) (33/2+) 12+ 11- 13/2+ 11- 13/2+ 12+ 12- 13/2+ 12- 13/2+ 12- 13/2+ 12- 13/	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7) -0.08(17) +0.378(19) 0.75(5)	A A B A A A A A A A B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS TDPAD	1992Me07 1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 2007Io03 1991Du07 2004Ba31 2004Ba31 2004Ba31 2004Ba31 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02 2002Vy01 1986An06 1991Du07 1981Zy02
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195 82 Pb 196 82 Pb 197 82 Pb 198 82 Pb 199	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 atte of neutral Pb state in neutral Pb state in neutral rb state in neutral rb state in state in neutral rb state in state in neutral rb state in neutral r	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 8 m 43 m 212 ns 1.5 h	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (29/2-) (33/2+) 12+ 11- 13/2+ 11- 13/2+ 11- 13/2+ 11- 13/2+ 12+ 11- 13/2+ 12+ 11- 13/2+ 12+ 11- 13/2+ 12- 13/2	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7) -0.08(17) +0.378(19) 0.75(5) '+0.08(9)	A A A A A A A A A B B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS Mu-X Mu-X Mu-X CLS TDPAD CLS	1992Me07 1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 2004Ba31 2004Ba31 201991Du07 1981Zy02 2002Vy01 1986An06 1991Du07 1981Zy02 1986An06
ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195 82 Pb 196 82 Pb 197 82 Pb 198	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral d at to estimated 0 from theory of re 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203 2694 3191 0 319 2820 0 2154	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 85 ns 8 m 43 m 212 ns 1.5 h 44 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- ev etal 13/2+ 11- 13/2+ (21/2-) (29/2-) (33/2+) 12+ 11- 13/2- 12+ 11- 13/2- 12+ 11- 13/2- 12+ 12- 13/2- 13/2- 13/2	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7) -0.08(17) +0.378(19) 0.75(5) '+0.08(9) 0.32(2)	A A B A A A A A A A B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS TDPAD CLS TDPAD CLS TDPAD CLS TDPAD CLS TDPAD	1992Me07 1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 2011Ba02 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02 2002Vy01 1986An06 1991Du07 1981Zy02 1986An06 1991MaYq
æad	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195 82 Pb 196 82 Pb 197 82 Pb 198 82 Pb 199	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral pb state in neutral ed to estimated to from theory of re 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203 2694 3191 0 319 2820 0 2154 2183	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k 2 of 206Pb 1027 k 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 85 ns 8 m 43 m 212 ns 1.5 h 44 ns 480 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- eV etal 13/2+ 11- 13/2+ (21/2-) (27/2-) (29/2-) (33/2+) 12+ 11- 13/2+ 11- 13/2+ 12- 13/2- 12+ 11- 3/2- 13/2- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 13/2- 13/2- 12- 13/2- 12- 13/2- 12- 13/2- 13/2- 12- 13/2-	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7) -0.08(17) +0.378(19) 0.75(5) '+0.08(9) 0.32(2) 0.40(2)	A A B A A A A A A A A B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS TDPAD CLS TDPAD CLS TDPAD TDPAD TDPAD TDPAD TDPAD	1992Me07 1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02 2002Vy01 1986An06 1991Du07 1981Zy02 1986An06 1991Du07 1981Zy02 1986An06 1979MaYq 1979MaYq
.ead	81 Tl 192 81 Tl 193 81 Tl 194 81 Tl 196 81 Tl 205 Efg in ³ P ₁ str. A. Efg in ¹ D ₂ B. Normalise C. Obtained 82 Pb 191 82 Pb 192 82 Pb 193 82 Pb 194 82 Pb 195 82 Pb 196 82 Pb 197 82 Pb 198 82 Pb 199	299 0 + x 0 + y 251 + x 365 0 0 + y 0 394 204 2623 ate of neutral Pb state in neutral d at to estimated 0 from theory of re 138 2581+d 2743 100 1586 + x 2585 + x 2613 + x 2628 2933 203 2694 3191 0 319 2820 0 2154	9.6 m 10.8 m 296 ns 2.11m 34 m 32.8 m 1.84 h 1.41 h 1.5 ns short Pb 2 of 206Pb 4027 k elaxation in Hg ma 2.18 m 1.07 ms 756 ns 5.8 m 22 ns 9.4 ns 135 ns 350 ns 122 ns 15.0 m 269 ns 85 ns 8 m 43 m 212 ns 1.5 h 44 ns	2- 7+ 8- 9/2- 2- 7+ 2- 7+ 3/2+ (5/2)- ev etal 13/2+ 11- 13/2+ (21/2-) (29/2-) (33/2+) 12+ 11- 13/2- 12+ 11- 13/2- 12+ 11- 13/2- 12+ 12- 13/2- 13/2- 13/2	-0.328(11) +0.46(2) 0.44(7) -2.20(2) -0.282(7) +0.607(16) -0.178(14) +0.76(2) +0.74(15) -0.5(2) +0.085(5) 0.32(4) 2.9(3) +0.195(10) 0.22(2) 2.6(3) 2.8(3) 0.45(4) 0.49(3) 3.6(4) +0.306(15) 0.65(5) (-)3.4(7) -0.08(17) +0.378(19) 0.75(5) '+0.08(9) 0.32(2)	A A B A A A A A A A B B B B B B B B B B	CLS CLS TDPAD CLS CLS CLS CLS CLS CLS CLS TDPAD CLS TDPAD CLS TDPAD CLS TDPAD CLS TDPAD	1992Me07 1992Me07 1992Me07 1982Sc27 1987Bo44 1992Me07 1992Me07 1992Me07 1992Me07 1972Ch07 1972Ch07 1972Ch07 1991Du07 2007Io03 2007Io03 1991Du07 2004Ba31 2011Ba02 2004Ba31 2004Ba31 1985St16 2007Io03 1991Du07 1981Zy02 2002Vy01 1986An06 1991Du07 1981Zy02 1986An06 1991Du07 1981Zy02 1986An06 1979MaYq

Table 1 (continued)

Element	Nucleus	E (level) keV	$T_{1/2}$	I^{π}	Q(b)	Ref. Std.	Method	Reference
	82 Pb 201	0	9.33 h	5/2-	0.01(4)		CLS	1986An06
		2719	63 ns	25/2-	0.46(2)	В	TDPAD	1979MaYq
	82 Pb 202	2170	3.62 h	9_	+0.58(9)		CLS	1986An06
		2208	65 ns	7—	0.28(2)	В	TDPAD	1979MaYq
	82 Pb 203	0	51.9 h	5/2-	+0.10(5)		CLS	1986An06
	02.0200	1921	56 ns	21/2+	0.85(3)	В	TDPAD	1979MaYq
	82 Pb 204	899	2.94 ps	2+	+0.23(9)	D	CER	1978Jo04
	02 I D 204	1274	280 ns	2+ 4+		В	TDPAD	
	02.01.205		_		0.44(2)	D		1979MaYq
	82 Pb 205	0	$1.5 \times 10^{7} \text{ y}$	5/2-	+0.23(4)		CLS	1986An06
		1014	5.55 ms	13/2+	0.30(5)	С	QIR	1974Ri03
		3196	217 ns	25/2—	0.63(3)	В	TDPAD	1979MaYq
	82 Pb 206	803	8.4 ps	2+	+0.05(9)		CER	1978Jo04
		2200	123 ms	7—	0.33(5)	С	QIR	1974Ri03
		4027	185 ns	12+	[0.51(2)]	From B(E2)	Not measured	1979Ma37
	82 Pb 208	2615	15 ps	3—	-0.34(15)		CER	1984Ve07
		4086	0.74 fs	2+	-0.7(3)		CER	1984Ve07
Reference isotope	82 Pb 209	0	3.25 h	9/2+	-0.27(17)		CLS	1986An06
ejerence worope	82 Pb 211	0	36.1 m	9/2+	+0.09(6)		CLS	1986An06
	0210211	· ·	30.1 111	3/2 1	10.03(0)		CES	1300/1100
ismuth	Efg calculati	ons in the $^4P_{3/2}$ s	state of neutral Bi					2001Bi23
	83 Bi 202	0	1.72 h	(5+)	-1.00(9)	[209Bi]	LFRS	1996Ca02/2001Bi23
				(6+)	-1.21(9)	[209Bi]	LFRS	1996Ca02/2001Bi23
		615	3.04 ms	10-	0.14(2)	[209Bi]	TDPAD	1987Ma65
		2607	310 ns	17+	0.45(2)	[209Bi]	TDPAD	1987Ma65
	83 Bi 203	0	11.8 h	9/2-	-0.93(7)	[209Bi]	LFRS	1996Ca02/2001Bi23
	83 Bi 203	0	11.8 II 11.22 h	9/2— 6+			LFRS	
	0.5 DI 204				-0.68(20)	[209Bi]		1996Ca02/2001Bi23
	00 B: 00=	806	13.0 ms	10-	0.074(2)	[209Bi]	LEMS	1991Sc14
	83 Bi 205	0	15.3 d	9/2-	-0.81(3)	[209Bi]	LRFS	2000Pe30/2001Bi23
	83 Bi 206	0	6.243 d	6+	-0.54(4)	[209Bi]	LRFS	2000Pe30/2001Bi23
		1045	0.89 ms	(10-)	0.057(11)	[209Bi]	LEMS	1991Sc14
	83 Bi 207	0	32.2 y	9/2-	-0.76(2)	[209Bi]	LRFS	2000Pe30/2001Bi23
		2101	182 ms	21/2+	0.051(9)	[209Bi]	LEMS	1991Sc14
	83 Bi 208	0	$3.7 \times 10^{5} \text{ y}$	5+	-0.70(8)	[209Bi]	LRFS	2000Pe30/2001Bi23
Reference isotope	83 Bi 209	0	Stable	9/2-	-0.516(15)		AB	1970Hu05/2001Bi2
,		2563	14 fs	(9/2)+	+0.15(7)	[209Bi]	Mu-X	1972Le07
		2741	12 ps	15/2+	0.0(5)	[209Bi]	Mu-X	1972Le07
	83 Bi 210	0	5.01 d	1-	+0.190(6)	[209Bi]	AB	1962Al02/2001Bi23
	03 DI 2 IU	U			$\pm 0.130(0)$	[20301]	AD	
		274	20 406		0.00(7)	[2000]	IDEC	
	00 5' 040	271	$3.0 \times 10^6 \text{ y}$	9-	-0.66(7)	[209Bi]	LRFS	
	83 Bi 212	0	60.6 m	1(-)	+0.1(4)	[209Bi]	LRFS	2000Pe30/2001Bi23 2000Pe30/2001Bi23
	83 Bi 212 83 Bi 213							
Polonium	83 Bi 213	0	60.6 m 45.6 m	1(-)	+0.1(4)	[209Bi]	LRFS	2000Pe30/2001Bi23
Polonium	83 Bi 213 There is no a	0 0 adopted reference	60.6 m 45.6 m e efg for Po.	1(-) 9/2-	+0.1(4) -0.83(5)	[209Bi] [209Bi]	LRFS LRFS	2000Pe30/2001Bi23
Polonium	83 Bi 213 There is no a	0 0 adopted reference ents quoted are b	60.6 m 45.6 m e efg for Po. ased on a calcula	1(—) 9/2— ted value for	+0.1(4) -0.83(5) - the 1557 keV, 8 ⁺ state	[209Bi] [209Bi] in 210Po [1991Be03, NP/	LRFS LRFS 4522 483 (1991)].	2000Pe30/2001Bi23 2000Pe30/2001Bi23
² olonium	83 Bi 213 There is no a A. The mome	0 0 adopted reference ents quoted are b 1774	60.6 m 45.6 m e efg for Po. based on a calcular 61 ns	1(-) 9/2- ted value for 8+	+0.1(4) -0.83(5) -the 1557 keV, 8 ⁺ state (-)1.38(7)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A	LRFS LRFS 4522 483 (1991)]. TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65
Polonium	83 Bi 213 There is no a A. The mone 84 Po 200 84 Po 202	0 0 adopted reference ents quoted are b 1774 1712	60.6 m 45.6 m e efg for Po. based on a calcular 61 ns 110 ns	1(-) 9/2- ted value for 8+ 8+	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A	LRFS LRFS 4522 483 (1991)]. TDPAD LEMS	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06
Polonium	83 Bi 213 There is no a A. The mome 84 Po 200 84 Po 202 84 Po 204	0 0 adopted reference ents quoted are b 1774 1712 1639	60.6 m 45.6 m e efg for Po. pased on a calcular 61 ns 110 ns 158 ns	1(-) 9/2- ted value for 8+ 8+ 8+	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65
Polonium	83 Bi 213 There is no a A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206	0 0 adopted reference ents quoted are b 1774 1712 1639 1586	60.6 m 45.6 m e efg for Po. lased on a calcular 61 ns 110 ns 158 ns 212 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+	+0.1(4) -0.83(5) • the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65
² olonium	83 Bi 213 There is no a A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528	60.6 m 45.6 m e efg for Po. lased on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ 8+	+0.1(4) -0.83(5) • the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65
Polonium	83 Bi 213 There is no a A. The mon 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473	60.6 m 45.6 m e efg for Po. assed on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-)	+0.1(4) -0.83(5) -the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A A A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1983Da01
Polonium	83 Bi 213 There is no a A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557	60.6 m 45.6 m e efg for Po. assed on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)]	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A A A From B(E2)	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD TDPAD Not measured	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03
Polonium	83 Bi 213 There is no a A. The mon 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849	60.6 m 45.6 m e efg for Po. assed on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11-	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A A A From B(E2) A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD TDPAD Not measured TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03 1991Be03
Polonium	83 Bi 213 There is no a A. The mon 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849	60.6 m 45.6 m e efg for Po. rased on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11- 13-	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)]	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A A A From B(E2)	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD Not measured TDPAD TDPAD	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03
olonium	83 Bi 213 There is no a A. The mon 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849	60.6 m 45.6 m e efg for Po. assed on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11-	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A A A From B(E2) A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD TDPAD Not measured TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03 1991Be03
	83 Bi 213 There is no at A. The mom. 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209 84 Po 210	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058	60.6 m 45.6 m e efg for Po. assed on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11- 13-	+0.1(4) -0.83(5) -the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A A From B(E2) A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD Not measured TDPAD TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03 1991Be03
	83 Bi 213 There is no a A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209 84 Po 210 There is no a	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058	60.6 m 45.6 m e efg for Po. cased on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11- 13- 16+	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2)	[209Bi] [209Bi] in 210Po [1991Be03, NP/ A A A A A A From B(E2) A A	LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD Not measured TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD	2000Pe30/2001Bi23 2000Pe30/2001Bi23 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03 1991Be03 1991Be03 1991Be03
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sstitine	83 Bi 213 There is no at A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209 84 Po 210 There is no at A. The mome 85 At 208 85 At 210 85 At 211 Estimated el	0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom	60.6 m 45.6 m 45.6 m e efg for Po. assed on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns e efg for At. assed on a calcular 48 ns 26 ns 890 ns 28.4 ns 480 ns 5.9 ms 35.1 ns 50.8 ns	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2-	+0.1(4) -0.83(5) *the 1557 keV, 8+ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) *the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19)	[209Bi] [209Bi] in 210Po [1991Be03, NP/A A A A A A From B(E2) A A A A A A A A A A A A A A A A A A A	LRFS LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1981Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03
Astitine	83 Bi 213 There is no at A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209 84 Po 210 There is no at A. The mome 85 At 208 85 At 210 85 At 211 Estimated el A. Normalise	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom	60.6 m 45.6 m e efg for Po. tased on a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns e efg for At. tased on a calcular 48 ns 26 ns 890 ns 28.4 ns 480 ns 5.9 ms 35.1 ns 50.8 ns 4.2 ms	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat	+0.1(4) -0.83(5) *the 1557 keV, 8+ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) *the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19)	[209Bi] [209Bi] in 210Po [1991Be03, NP/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	LRFS LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD Not measured TDPAD LEMS Not measured TDPAD LEMS	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1981Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03
Astitine	83 Bi 213 There is no a A. The mom 84 Po 200 84 Po 202 84 Po 204 84 Po 208 84 Po 209 84 Po 210 There is no a A. The mom 85 At 208 85 At 211 Estimated e A. Normalis 86 Rn 203	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom	60.6 m 45.6 m 45.9 m 46.9 m 46	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat (13/2+)	+0.1(4) -0.83(5) *the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) *the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) *ted from B(E2). +1.28(13)	[209Bi] [209Bi] in 210Po [1991Be03, NP/A A A A A From B(E2) A A A ate in 211At [1995Ba66 N A A A A A A A A A A A A A A A A A A A	LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD LEMS Not measured TDPAD LEMS CLS	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Sc15 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1991Sc15 1995Ba66 1983Ma08 1991Sc15
Astitine	83 Bi 213 There is no at A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 208 84 Po 209 84 Po 210 There is no at A. The mome 85 At 208 85 At 211 Estimated ej A. Normalisa 86 Rn 203 86 Rn 203 86 Rn 205	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atomed to Q of 1694 ka 361 0	60.6 m 45.6 m 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns 48 ns 26 ns 890 ns 28.4 ns 480 ns 5.9 ms 35.1 ns 50.8 ns 4.2 ms 40.8 ms 40.8 ms 40.8 ms 40.9 ms	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat (13/2+) 5/2-	+0.1(4) -0.83(5) • the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) • the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) ed from B(E2). +1.28(13) +0.062(6)	[209Bi] [209Bi] in 210Po [1991Be03, NP/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD LEMS Not measured TDPAD LEMS CLS CLS	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Sc15 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1991Sc15 1995Ba66 1983Ma08 1991Sc15
Astitine	83 Bi 213 There is no a A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 208 84 Po 209 84 Po 210 There is no a A. The mome 85 At 208 85 At 210 85 At 211 Estimated e A. Normalisa 86 Rn 203 86 Rn 205 86 Rn 207	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom ed to Q of 1694 kd 361 0	60.6 m 45.6 m 45.6 m 46.6 m 47.6 m 48.6 efg for Po. 48.6 as a calcular 61 ns 110 ns 158 ns 212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns 48 ns 26 ns 890 ns 28.4 ns 480 ns 5.9 ms 35.1 ns 50.8 ns 4.2 ms 42.8 s 2.83 m 9.3 m	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ (17/2-) 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat (13/2+) 5/2- 5/2-	+0.1(4) -0.83(5) the 1557 keV, 8 ⁺ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.67(18) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) ted from B(E2). +1.28(13) +0.062(6) +0.22(2)	[209Bi] [209Bi] [209Bi] in 210Po [1991Be03, NP/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD LEMS TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD TDPAD LEMS Not measured TDPAD LEMS CLS CLS CLS	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1987Ma65 1987Ma65 1983Da01 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Sc15 1983Ma08
sstitine	83 Bi 213 There is no at A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 208 84 Po 209 84 Po 210 There is no at A. The mome 85 At 208 85 At 210 85 At 211 Estimated ej A. Normalis 86 Rn 203 86 Rn 205 86 Rn 207 86 Rn 207 86 Rn 208	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom ed to Q of 1694 kd 361 0 0 1826	60.6 m 45.6 m 46.6 m 46	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat (13/2+) 5/2- 5/2- 8+	+0.1(4) -0.83(5) *the 1557 keV, 8+ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) *the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) *ted from B(E2). +1.28(13) +0.062(6) +0.22(2) 0.41(5)	[209Bi] [209Bi] in 210Po [1991Be03, NP/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	LRFS LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD LEMS Not measured TDPAD LEMS CLS CLS CLS CLS TDPAD	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1997Ne06 1987Ma65 1987Ma65 1983Ma05 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Sc15 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1991Sc15 1995Ba66 1983Ma08 1991Sc15
sstitine	83 Bi 213 There is no at A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209 84 Po 210 There is no at A. The mome 85 At 208 85 At 210 85 At 211 Estimated ey A. Normalise 86 Rn 203 86 Rn 203 86 Rn 207 86 Rn 208 86 Rn 209	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom ed to Q of 1694 k 361 0 0 1826 0	60.6 m 45.6 m 45.10 ns 110 ns 110 ns 1212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns 48 ns 26 ns 890 ns 28.4 ns 480 ns 5.9 ms 35.1 ns 50.8 ns 4.2 ms 480 ns 59.9 ms 490 ns 29.9 m	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat (13/2+) 5/2- 5/2- 8+ 5/2-	+0.1(4) -0.83(5) *the 1557 keV, 8+ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.99(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) *the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) *the 1417 keV, 21/2-, state (-)1.67(18) (-)1.49(9) (-)1.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) *the 1417 keV, 21/2-, state (-)1.49(9) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19)	[209Bi] [209Bi] [209Bi] in 210Po [1991Be03, NP/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD Not measured TDPAD LEMS Not measured TDPAD LEMS CLS CLS CLS CLS CLS CLS TDPAD efg in Rn atom	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1981Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03
Astitine	83 Bi 213 There is no at A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 208 84 Po 209 84 Po 210 There is no at A. The mome 85 At 208 85 At 210 85 At 211 Estimated ej A. Normalis 86 Rn 203 86 Rn 205 86 Rn 207 86 Rn 207 86 Rn 208	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom ed to Q of 1694 k 361 0 0 1826 0 1665 + x	60.6 m 45.6 m 46.6 m 46	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat (13/2+) 5/2- 5/2- 8+ 5/2- (8+)	+0.1(4) -0.83(5) *the 1557 keV, 8+ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.39(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) *the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) *ted from B(E2). +1.28(13) +0.062(6) +0.22(2) 0.41(5) +0.31(3) 0.32(4)	[209Bi] [209Bi] [209Bi] in 210Po [1991Be03, NP/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	LRFS LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD Not measured TDPAD LEMS Not measured TDPAD LEMS CLS CLS CLS CLS TDPAD efg in Rn atom TDPAD	2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 2000Pe30/2001Bi2: 1987Ma65 1987Ma65 1987Ma65 1987Ma65 1981Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be05 1991Be05 1991Be05 1991Be05 1991Be05 1991Be05 1991Be06 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1991Sc15 1995Ba66 1983Ma08 1991Sc15 1987OtZW 1987OtZW 1987OtZW 1987OtZW 1987OtZW 1986Be40 1987OtZW 1986Be40
	83 Bi 213 There is no at A. The mome 84 Po 200 84 Po 202 84 Po 204 84 Po 206 84 Po 208 84 Po 209 84 Po 210 There is no at A. The mome 85 At 208 85 At 210 85 At 211 Estimated ey A. Normalise 86 Rn 203 86 Rn 203 86 Rn 207 86 Rn 208 86 Rn 209	0 0 0 adopted reference ents quoted are b 1774 1712 1639 1586 1528 1473 1557 2849 4372 5058 adopted reference ents quoted are b 1090 1428 2429 1363 2550 4028 1417 2641 4816 fg in Rn atom ed to Q of 1694 k 361 0 0 1826 0	60.6 m 45.6 m 45.10 ns 110 ns 110 ns 1212 ns 380 ns 98.1 ns 96 ns 20.1 ns 51 ns 265 ns 48 ns 26 ns 890 ns 28.4 ns 480 ns 5.9 ms 35.1 ns 50.8 ns 4.2 ms 480 ns 59.9 ms 490 ns 29.9 m	1(-) 9/2- ted value for 8+ 8+ 8+ 8+ 11- 13- 16+ ted value for 10- 21/2- 29/2+ 11+ 15- 19+ 21/2- 29/2+ 39/2- 2Rn estimat (13/2+) 5/2- 5/2- 8+ 5/2-	+0.1(4) -0.83(5) *the 1557 keV, 8+ state (-)1.38(7) (-)1.21(16) (-)1.14(5) (-)1.02(4) (-)0.90(4) (-)0.99(8) [-0.55(2)] (-)0.86(11) (-)0.90(7) (-)1.30(2) *the 1417 keV, 21/2-, state (-)1.67(18) (-)0.78(6) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) *the 1417 keV, 21/2-, state (-)1.67(18) (-)1.49(9) (-)1.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19) *the 1417 keV, 21/2-, state (-)1.49(9) (-)1.49(9) (-)0.64(5) (-)1.21(7) (-)2.16(18) [(-)0.524(10)] (-)1.01(7) (-)1.88(19)	[209Bi] [209Bi] [209Bi] in 210Po [1991Be03, NP/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	LRFS LRFS LRFS A522 483 (1991)]. TDPAD LEMS TDPAD TDPAD TDPAD TDPAD Not measured TDPAD LEMS Not measured TDPAD LEMS CLS CLS CLS CLS CLS CLS TDPAD efg in Rn atom	2000Pe30/2001Bi23 2000Pe30/2001Bi23 2000Pe30/2001Bi23 1997Ne06 1987Ma65 1987Ma65 1987Ma65 1981Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Be03 1991Sc15 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1983Ma08 1991Sc15 1995Ba66 1983Ma08 1991Sc15

Table 1 (continued)

Element	Nucleus	E (level) keV	T _{1/2}	I^{π}	Q(b)	Ref. Std.	Method	Reference
	86 Rn 211	1578 + x	596 ns	17/2-	0.19(2)	Α	TDPAD	1985Da14
		8855 + v	201 ns	63/2-	1.6(2)	Α	TDPAD	1985Da14
	86 Rn 212	1694	0.91 ms	8+	[-0.18(2)]	From B(E2)	Not measured	1985Da13
	86 Rn 219	0	3.96 s	5/2+	+1.15(12)	209Rn	CLS	1987OtZW
	86 Rn 221	0	25 m	7/2+	-0.47(5)	209Rn	CLS	1987OtZW
					, ,			
	86 Rn 223	0	23.2 m	7/2	+0.80(8)	209Rn	CLS	1988NeZZ
	86 Rn 225	0	4.5 m	7/2—	+0.84(8)	209Rn	CLS	1988NeZZ
rancium	Efg calculate A. Normalis	ed in the ² P _{3/2} sto ed to calculated (ate of the Fr aton O of the 2538 ke	n (PR A27-333 / 29/2 ⁺ state	32 (1983) revised (PL B1 e in 211Fr.	63 (1985)).		
	87 Fr 207	0	14.8 s	9/2—	-0.16(5)	223Fr	ABLS	1985Co24
	87 Fr 208	0	58.6 s	7+	0.00(4)	223Fr	ABLS	1985Co24
	87 Fr 209	0	50 s	9/2-	-0.24(2)	223Fr	ABLS	1985Co24
	87 Fr 210	0	3.2 m	6+	+0.19(2)	223Fr	ABLS	1985Co24
		0				223Fr 223Fr		
	87 Fr 211		3.1 m	9/2-	-0.19(3)		ABLS	1985Co24
		2423	146 ns	29/2+	(-)1.07(18)	A	LEMS	1991Ha02
		4657	123 ns	45/2-	(-)2.0(6)	Α	LEMS	1991Ha02
	87 Fr 212	0	19.3 m	5+	-0.10(1)	223Fr	ABLS	1985Co24
		2492	604 ns	(15-)	(-)0.84(13)	Α	TDPAD	1990By03
		5854	312 ns	(27–)	(-)1.7(3)	Α	TDPAD	1990By03
	87 Fr 213	0	34.7 s	9/2-	-0.14(2)	223Fr	ABLS	1985Co24
		2538	243 ns	29/2+	[-0.70(7)]	calculated	Not measured	1990By03
		8095	3.1 ms	65/2-	(-)2.2(5)	A	LEMS	1991Ha02
	97 Er 214			,		A		
	87 Fr 214	640	103 ns	11+	0.8(2)		LEMS	1995Ne06
		6477+D'	108 ns	32/33+	2.2(5)	A	LEMS	1995Ne06
	87 Fr 220	0	27.4 s	1+	+0.47(3)	223Fr	ABLS	1985Co24/1987Co1
	87 Fr 221	0	4.8 m	5/2—	-0.98(6)	223Fr	ABLS	1985Co24/1987Co1
	87 Fr 222	0	14.2 m	2-	+0.51(4)	223Fr	ABLS	1985Co24
eference isotope	87 Fr 223	0	21.8 m	3/2(-)	+1.17(1)		ABLS	1985Co24
	87 Fr 224	0	3.3 m	1(-)	+0.517(4)	223Fr	ABLS	1985Co24
	87 Fr 225	0	3.9 m	3/2-	"+1.32(5)	223Fr	ABLS	1985Co24/1987Co1
	87 Fr 226	0	48 s	3/2— 1		223Fr 223Fr	ABLS	1985Co24/1987Co1
					-1.35(2)			
	87 Fr 228	0	39 s	2-	+2.38(5)	223Fr	ABLS	1985Co24
adium	Efg calculate 88 Ra 209	ed in 7s7p states 0	of the Ra atom 4.7 s	5/2-	+0.39(4)	223Ra	CLS	1989Ne03
	88 Ra 211	0	13s	5/2-	+0.46(4)	223Ra	CLS	1989Ne03
	88 Ra 221	0	30 s	5/2—	+1.92(6)	223Ra	CLS	1989Ne03
eference isotope	88 Ra 223	0	11.44 d	3/2+	+1.21(3)		CLS	2008Py02/1989Ne0
	88 Ra 227	0	42.2 m	3/2+	+1.53(6)	223Ra	CLS	1989Ne03
	88 Ra 229	0	4.0 m	5/2(+)	+2.99(12)	223Ra	CLS	1989Ne03
Actinium		adopted reference						
	The quoted 89 Ac 227	value and its erro 0	or are both quite 21.77 y	uncertain. 3/2–	+1.7(2)		O	1955Fr26
horium	There is no	adopted reference	e efa for Th					
		estimated efg in						
	90 Th 229	0	7340 y	5/2+	+4.3(9)	Α	0	1974Ge06
			· ·	-1-1	(0)	÷ •	-	
Protactinium		adopted reference						
		l from B(E2) valu						
		estimated efg in						
	91 Pa 231	0	$3.3 \times 10^{4} \text{ y}$	3/2-	[-1.72(5)]	From B(E2)	Not measured	1978Fr28
		84.2	41 ns	5/2+	+0.7(2)	231Pa	ME	1978Fr28
	91 Pa 233	0	27.0 d	3/2-	-3.0(4)	В	AB	1961Ma42
ranium	Muonic ato	n X-ray hyperfin	e structure					
				E/2 :	1.2 ((2)(0)		M., V	100 4702
Reference isotope	92 U 233	0	$1.6 \times 10^5 \text{ y}$	5/2+	+3.663(8)		Mu-X	1984Zu02
_		40	50 ps	7/2+	+0.64(3)		Mu-X	1984Zu02
eference isotope	92 U 235	0	$7.0 \times 10^{8} \text{ y}$	7/2—	+4.936(6)		Mu-X	1984Zu02
		46	<60 ps	9/2-	+1.87(3)		Mu-X	1984Zu02
leptunium	Muonic ato	m X-ray hyperfin	e structure					
Reference isotope	93 Np 237	0	$2.1 \times 10^{6} \text{ y}$	5/2+	+3.886(6)		Mu-X	1987De10
ejerence isotope	22 IVP 23/	60	68 ns	5/2+ 5/2-	+3.85(4)	237Np	ME	1968Pi01/1968St03
_				-, <u>-</u>	1 5.55(1)	23.119		13001101/10000103
lutonium		m X-ray hyperfin						
		d efg of the ⁸ F _{3/2}						
Reference isotope	94 Pu 239	8	36 ps	3/2+	-2.319(7)		Mu-X	1986Zu01
		57	101 ps	5/2+	-3.345(13)		Mu-X	1986Zu01
		76	83 ps	7/2+	-3.83(3)		Mu-X	1986Zu01
	94 Pu 241	0	14.4 y	5/2+	+6(2)	Α	0	1964Ch12
		m X-ray hyperfin 0		5/2-	+4 34(5)		M11-X	19851004
mericium Leference isotope	Muonic ator 95 Am 241		e structure 432.7 y	5/2—	+4.34(5)		Mu-X	1985Jo04 (continued on next p

Table 1 (continued)

Element	Nucleus	E (level) keV	$T_{1/2}$	I^{π}	Q(b)	Ref. Std.	Method	Reference
	95 Am 242	0	16.0 h	1-	-2.44((3)	241Am	AB	1966Ar04
		49	152 y	5—	+6.7(4)	241Am	ABLS	1988Be30
	95 Am 243	0	7370 y	5/2-	+4.32(6)		Mu-X	1985Jo04
		84	2.3 ns	5/2+	+4.2(2)	241Am	ME	1976Bo13
Einsteinium	Efg calculate	d in the Es atom						
Reference isotope	99 Es 253	0	20.4 d	7/2+	+6.7(8)		AB	1975Go05
Reference isotope	99 Es 254	78	39.3 h	2+	+3.7(5)		AB	1975Go05

Listing of NSR and corresponding journal references

LISTING OF NSK and COL	responding Journal references		
NSR Keynumber	Journal reference		
1953Li16	PR 90 609 (1953)	1971Na06	PL 34B 389 (1971)
1333E110	11.30 003 (1333)	1971Pa04	PR C3 841 (1971)
1955Aa06	PR 98 1224 (1955)	1971Pl03	NP A165 97 (1971)
1955Fr26	PR 98 1514 (1955)/PR 111 1747 (1958)	1971Th14	PR C4 1699 (1971)
		1972Be79	PL B42 349 (1972)
1958Fl39	PR 110 536 (1958)	1972Ch07	NP A181 25 (1972)
	,	1972Ch55	PR A6 2011 (1972)
1959Ga12	PR 116 393 (1959)	1972Du06	PR A5 1036(1972)
	, ,	1972Ek03	NP A194 237 (1972)
1960Fe08	PhMg 5 1309 (1960)	1972La16	PR C6 613 (1972)
1960Li11	PR 119 1053 (1960)	1972Le07	NP A180 14 (1972)
1960Wh06	BAPS 5 504 (1960)	1972Li12	PL B38 475 (1972)
		1972Li12	PL B38 475 (1972)
1961Al20	UCRL 9850 (1960)	1972Ni01	Phca 57 1 (1972)
1961Br17	J Phys Radium 22 412 (1961)	1972Ra27	PRL 28 54 (1972)
1961Ko05	PR 121 1104 (1961)	1972Ro41	NIM 105 509 (1972)
1961Ma42	NP 23 90 (1961)	1972St38	PR A6 1702 (1972)
		1972Th16	PL 41B 585 (1972)
1962Al02	PR 125 256 (1962)	1972Th16	PL 41B 585 (1972)
1962Ca10	PR 126 1004 (1962)	1972Wa24	ZP A254 112 (1972)
1962Pe21	PR 128 1740 (1962)		
		1973Ar19	PL A44 279 (1973)
1963Bu14	PR 132 723 (1963)	1973Ek01	PS 7 31 (1973)
		1973Gr06	PRL 30 453 (1973)
1964Bu09	PR 135 B1281 (1964)	1973Ha61	JCP 58 3339 (1973)
1964By01	PR 134 A47 (1964)	1973Ho05	PRL 30 388 (1973)
1964Ch12	JPPa 25 825 (1964)	1973Ka31	PL B46 62 (1973)
1964Co08	PR 134 A94 (1964)	1973KlZV	JPJS 34 265 (1973)
1964Pe06	PR 135B 1102 (1964)	1973Lu02	PR C8 391 (1973)
1964Pe15	PL 13 198 (1964)	1973Po15	NP A217 573 (1973)
1964Wh05	PR 136 B584 (1964)	1973St23	JPCR 5 1093 (1973)
		1973Sy01	PR C7 2056 (1973)
1965Hu01	ZP 182 499 (1965)	1973To07	NP A204 574 (1973)
1965Sm01	PR A137 330 (1965)	1973To07	NP A204 574 (1973)
		1973Zi02	ZP 262 413 (1973)
1966Ar04	PR 144 994 (1966)	40744.00	ND 4000 005 (405 4)
1966Bl05	PR 143 911 (1966)	1974Ar23	NP A233 385 (1974)
1966Co13	PR 141 1106 (1966)	1974Ek01	NP A226 219 (1974)
1966Co19	PR 148 1157 (1966)	1974Fe05	PL A49 287 (1974)
1966Re04	PR 141 1123 (1966)	1974Ge06	JPPa 35 483 (1974)
1966Sh07	JPSJ 21 829 (1966)	1974Ge17	ZP 267 61 (1974)
10074-02	DD 155 1242 (1067)	1974Le13	NP A223 563 (1974)
1967Ag02	PR 155 1342 (1967)	1974Mi21	NP A236 415 (1974)
1967Ec01	PR 156 246 (1967)	1974Po02	NP A230 413 (1974)
1968Ra03	PR 165 1360 (1968)	1974Re05 1974Ri03	PR A9 1776 (1974) PS 11 228 (1975)
1968CaZX	Th 68 Cass.	1974103	F3 11 228 (1973)
1968CaZX	Th 68 Cass.	1975Ac01	NP A248 157 (1975)
1968Ch10	PR 170 136 (1968)	1975Di02	PL B55 293 (1975)
1968Ea04	PR 170 1083 (1968)	1975Go05	PR A11 499 (1975)
1968Eh02	PR 176 25 (1968)	1975Gr30	PR C12 1462 (1975)
1968Ma23	PRS A305 139 (1968)	1975Ri03	PS 11 228 (1975)
1968Mu01	ZP A208 184 (1968)	1975Ri03	Phys Scr 11 228 (1975)
1968Pi01	BAPS 13 28 (1968)	1975To06	NP A250 381 (1975)
1968St03	PR 165 1319 (1968)	1975Vi03	NP A243 29 (1973)
-5000.00	(1555)	1975Ze04	NP A254 315 (1975)
1969La05	PR 177 1606 (1969)	13,02001	
1969La06	PR 177 1615 (1969)	1976Be59	HFI 2 326 (1976)
1969Sc34	PR 181 137 (1969)	1976Bo12	NP A261 498 A261
	()	1976Bo13	JINC 38 1291 (1976)
1970Ge08	NP A151 252 (1970)	1976Br41	HFI 2 265 (1976)
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1970Ni11	Phca 50 259 (1970)	1976Ge19	Z Phys A 279 183 (1976)
19700102	PR C2 228 (1970)	1976Ki02	PR C13 1132 (1976)
1970PiZR	BAPS 15 769 (1970)	1976Li19	PR C14 952 (1976)
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1970Wa25	ZP A238 35 (1970)	1976Po05	NP A262 493 (1976)
1970Wo02	ZP 232 256 (1970)	1976Va28	HFI 2 321 (1976)
1971ChZK	BAPS 16 625 (1971)	1977Ca30	PR B15 3318 (1977)
1971Go31	ZNat 26a 1931 (1971)	1977Fa11	NIM 146 329 (1977)
1971Jo10	NP A166 306 (1971)	1977Gi13	J Phys G3 L169 (1977)
1971Na05	PRL 24 903 (1970)	1977Ho33	JCP 66 2627 (1977)

1977La03			
	PR B15 2504	1983Hu01	PR C27 550 (1983)
1977Le11	NP A284 123 (1977)	1983La08	PR C27 1772 (1983)
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1977RuZV	BAPS 22 1032 (1977)	1983Hu01	PR C27 550 (1983)
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1978Bu24	JPC A112 1666 (2008)	1983Mu12	NP A403 234 (1983)
1978Fr28	PL A69 225 (1975)	1983Ne13	HFI 15 181 (1983)
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1978HaXP	ARHMI 50 (1977)	19830103	NP A403 572 (1983)
1978Jo04	PL B72 307 (1978)	1983Ri15	HFI 15 83 (1(83)
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1978Sp09	HFI 4 229 (1978)	1983Ve01	PL B122 23 (1983)
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1978St31	HFI 4 170 (1978)		
1978Ta24	HP Ac 51 755 (1978)	1984Be53	PR C30 2028 (1984)
1978Vu01	NP A294 273 (1978)	1984Dr09	PL B149 311 (1984)
1376 V UO 1	NI 11254 275 (1576)		· · ·
		1984Fe08	NP A425 373 (1984)
1979Be25	ZP A291 219 (1979)	1984Ha07	NP A414 316 (1984)
1979Bi14	PR A20 381 (1979)	1984Ma43	PR C30 1702 (1984)
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1979Bo16	ZP A291 245 (1979)	1984Ta05	PR C29 1897 (1984)
1979Da06	PL B82 199 (1979)	1984Ta10	PR C30 350 (1984)
1979De29	NP A326 418 (1979)	1984Ve07	AuJP 37 123 (1984)
1979Er04	PL B85 319 (1979)	1984We15	ZP A318 125 (1984)
1979Er09	NP A332 41 (1979)	1984Zu02	PRL 53 1888 (1984)
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1979Ha08	NP A314 361 (1979)		
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1979Ka44	Sol St Comm 29 375 (1979)	1985Be03	,
	` ,		JPhys G11 287 (1985)
1979Ma37	PL B88 48 (1979)	1985Be23	ZP A321 403 (1985)
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1979Pa11	PR C20 1201 (1979)	1985Da13	NP A441 501 (1985)
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1980Mu07 1980Sp05 1981Ba28 1981Bu13 1981Da06 1981Do17 1981Er01 1981Es03 1981Ho22 1981Hu02 1981Ko06	HFI 7 481 (1980) NP A345 252 (1980) NP A364 446 (1981) ZP A302 290 (1981) PR C23 1612 (1981) HFI 10 727 (1981) PR C23 1739 (1981) NP A362 227 (1981) PR C24 1667 (1981) PR C23 240 (1981) JPhys G7 L63 (1981)	1985Ra09 1985Ra33 1985St16 1986Al33 1986An06 1986An24 1986Be01 1986Be06 1986Be40 1986Da22 1986Gr26	HFI 26 855 (1985)/BAPS 24 632 (1979) ZP A322 83 (1985) YadF 44 1134 (1986) ZP A451 471 (1986) PR C34 1052 (1986) PR C33 390 (1986) PR C33 1517 (1986) PL B182 11 (1986) PL B181 21 (1986) HFI 30 355 (1986)
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	, ,		, ,
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•	, ,		
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	, ,	10000803	12210111(1000)
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	, ,		
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	, ,		, ,
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	, ,	20001602	J Filys G20 659 (2000)
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			, ,
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	· · ·		, ,
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	, ,		, ,
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	` ,		, ,
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		20021:02	DD CG0 0E 4220 (2002)
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		200311103	J - 1130 CEO EE 17 (2003)
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		20050'00	PD 474 042502 (2005)
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	` '	200CD c 1 4	I Dhya D 20 2111 (2000)
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1337VV dJ4	1 K C30 T033 (133T)		, ,
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	` ,		, ,
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	, ,		, ,
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	, ,		, ,
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		2007 1000	
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1996Wa02	PR C53 611 (1996)		

2008Ba56 2008Bl01 2008Mi07 2008Py02	JPC A112 1666 (2008) NP A799 30 (2008) PL B662 389 (2008) Mol Phys 106 1965 (2008)	2011Lo01 2011Ma45 2011Vi03 2011Wr01	PL B694 316 (2011) PR C84 024303 (2011) PL B703 34 (2011) Acta Phys Pol B42 803 (2011)
2009Ch25 2009De25 2009Mi04	PRL 102 222501 (2009) PL B678 344 (2009) PL B672 120 (2009)	2012Al03 2012Ba40 2012Ch16 2012Fl05	PRL 108 062701 (2012) PR C86 034310 (2012) PRL 108 162501 (2012) IPhys G39 125101 (2012)
2010Ba31 2010Ch15 2010Ch16 2010Ch50	J Phys G37 105103 (2010) PL B690 346 (2010) PRL 104 252502 (2010) PR C82 051302(R) (2010)	2012Fi03 2012Or05 2012Pr11 2012Sh22 2012Zh36	PR C86 041303 (2012) PR C86 034329 (2012) PL B714 246 (2012) Chin Phys Lett 29 092102 (2012)
2010Mi13 2010Vi07	NP A834 75c (2010) PR C82 064311 (2010)	2013Yo02	PRL 110 192501 (2013)
2011Al35 2011Av01 2011Av08	PR C84 1303 (2011) J Phys G38 025104 (2011) J Phys G 38 075102 (2011)	2014Se07 2014Vo01	PR C89 034323 (2014) J Phys G 41 (2014)
2011Ba02	PR C83 014304 (2011)	2015Pr05	Eur. Phys. J. A 51 23 (2015)