Title
TABLE OF NUCLEAR MOMENTS

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Table of Isotopes Project

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TABLE OF NUCLEAR MOMENTS†

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This table contains nuclear magnetic and quadrupole moments reported as of September, 1974. It supersedes the *Table of Nuclear Moments* published in the proceedings of the 1970 Rehovot Conference [Cf70 HypInt 1255], and is similar to that table, except for changes described below.

The major innovation concerns a changeover from standard typing and printing methods to direct computer input and typography. The systems used for this purpose were developed in Berkeley, and are currently being used for several LBL projects, including production of the 7th edition of the *Table of Isotopes*. The systems' features include direct generation of final output on film, thorough checking of input data according to specified guidelines, and performance of certain calculations. For the *Table of Nuclear Moments*, the computer checked all data and references for correct syntax, calculated some of the moments from measured frequency or moment ratios, and applied diamagnetic corrections where appropriate.

Nuclear species for which moments are reported are identified in the first four columns of the table. The level-energy column is blank for ground states and contains energies (in units of keV) for most excited states. Several neutron resonances are identified by the resonance energy [=E−BE(n)], in units of eV. Level half-lives and spins are given in the following columns; moments dependent on them are consistent with the listed values.

Magnetic dipole moments (μ) are given in units of nuclear magnetons, and are based on a new value of the uncorrected proton moment, 2.7927740 [JPCR 2 663(73)]. A bracketed isotope (+level) following a value of μ indicates that the moment is dependent on the first listed μ value of that standard.

Magnetic moments are corrected for diamagnetic shielding wherever applicable. The correction for hydrogen [JPCR **2** 663(73)] applies to a spherical sample of water; all others are neutral-atom values taken from the recent calculations by F.D. Feiock and W.R. Johnson [PR **187** 39(69) and private communication]. Their calculations, based on relativistic Hartree-Fock-Slater theory, were complete through Z=90; values for Z=91-100 were obtained by graphical and numerical extrapolation. The following is a list of correction factors [where the effective field at the nucleus is expressed as $(1-\sigma)H$]:

Z	$1/(1-\sigma)$	Z	$1/(1-\sigma)$	Z	$1/(1-\sigma)$	Z	$1/(1-\sigma)$	Z	$1/(1-\sigma)$
1	1.00002564	21	1.001603	41	1.004456	61	1.008897	81	1.0166
2	1.00005994	22	1.001716	42	1.004633	62	1.009188	82	1.0172
3	1.0001048	23	1.001834	43	1.004815	63	1.009487	83	1.0177
4	1.0001531	24	1.001956	44	1.005000	64	1.009789	84	1.0183
5	1.0002068	25	1.002077	45	1.005194	65	1.0101	85	1.0189
6	1.0002672	26	1.002203	46	1.005389	66	1.0104	86	1.0195
7	1.0003332	27	1.002332	47	1.005586	67	1.0108	87	1.0202
8	1.0004059	28	1.002468	48	1.005788	68	1.0111	88	1.0208
9	1.0004844	29	1.002611	49	1.005994	69	1.0115	89	1.0215
10	1.0005693	30	1.002749	50	1.006203	70	1.0118	90	1.0222
11	1.0006495	31	1.002889	51	1.006419	71	1.0122	91	1.023
12	1.0007322	32	1.003031	52	1.006639	72	1.0126	92	1.024
13	1.0008172	33	1.003177	53	1.006861	73	1.0130	93	1.024
14	1.0009056	34	1.003327	54	1.007092	74	1.0134	94	1.025
15	1.0009975	35	1.003479	55	1.007325	75	1.0138	95	1.026
16	1.001093	36	1.003635	56	1.007564	76	1.0143	96	1.027
17	1.001191	37	1.003790	57	1.007811	77	1.0147	97	1.028
18	1.001294	38	1.003950	58	1.008075	78	1.0152	98	1.029
19	1.001394	39	1.004114	59	1.008341	79	1.0157	99	1.029
20	1.001495	40	1.004282	60	1.008616	80	1.0161	100	1.030

Electric quadrupole moments (Q) are given in units of barns. Moments that include a polarization correction are followed by the footnote "st", uncorrected moments by "u". The absence of either footnote means that it is not clear whether or not the moment was corrected, or that the uncertainty in Q is such that a polarization correction is meaningless. All values are taken from the references cited; no attempt has been made to insure consistency in the application of corrections. As with the magnetic moments, a bracketed standard following the moment indicates dependence on the quadrupole moment of another isotope or level.

Signs of magnetic and quadrupole moments are given as reported by the original authors, except for a few positive signs that were added when it was obvious that a positive sign was intended. The absence of a sign in the present table means that the sign is undetermined.

Tabulated uncertainties are printed in italics [1.63 *15* = 1.63±0.15]. The uncertainty in a magnetic or quadrupole moment includes the author's uncertainty and, in the case of a reported ratio, the uncertainty in the moment of the standard isotope. No allowance has been made for uncertainty in the diamagnetic correction or in the uncorrected magnetic moment of the proton.

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Experimental methods are denoted by the following codes:

AB	Atomic beam magnetic resonance (hyperfine structure)
AB/D	Atomic beam magnetic resonance (direct moment determination)
CDPAC	Constant-delay perturbed angular correlations
CEAD	Integral perturbed angular distribution of γ rays following Coulomb excitation
CER	Coulomb-excitation reorientation effect
CERP	Coulomb-excitation reorientation, precession technique
CETD	Time-differential perturbed angular distribution of γ rays following Coulomb excitation
DPAC	Differential perturbed angular correlations
DPAD	Differential perturbed angular distribution of γ rays following nuclear reactions
ENDOR	Electron-nuclear double resonance
EPR	Electron paramagnetic resonance
ES	Electron scattering
IMPAC	Ion implantation perturbed angular correlations
IPAC	Integral perturbed angular correlations
IPAD	Integral perturbed angular distribution of γ rays following nuclear reactions
MA	Microwave absorption in gases
MB	Molecular (or diamagnetic atomic) beam magnetic resonance
ME	Mössbauer effect
MH	Meson hyperfine structure
N	Nuclear magnetic resonance
N/ME	Mössbauer-effect detection of nuclear magnetic resonance
NO/D	Dynamic nuclear orientation
NO/S	Static (low-temperature) nuclear orientation
N/RD	Radiative detection of nuclear magnetic resonance
NRES	Neutron resonance energy shift
NRF	Nuclear resonance fluorescence (integral angular distribution measurement)
O	Optical spectroscopy
OD	Optical double resonance
OL	Optical level crossing
OP	Optical pumping
OP/RD	Radiative detection of optical pumping
PPR	Proton pickup reactions; calculated from spectroscopic factors [see NP **A213** 493(73)]
Q	Quadrupole resonance
QIR	Quadrupole interaction observed by relaxation time measurements
R	Recalculation (or new calculation) based on experimentally determined parameters
RIGV	Recoil into gas and/or vacuum
RIV/D	Recoil into vacuum, differential technique
SOPAD	Stroboscopic observation of perturbed angular distributions

Reference codes for the moment values are given in the new "Table of Isotopes" format. For journals and reports, the code contains the journal (report), plus volume, page, and year. Other types of publications are coded in an obvious fashion. With occasional help from the alphabetical "journal-code" list provided, the reader can use these codes to look up the original papers. For this conference [Cf74 Uppsala], page numbers in the reference codes refer to papers published previously in the the volume of "Contributed Papers". However, citations of a few post-deadline papers and of invited talks (for which no pages were available) are designated PD and IT, respectively. These references are:

PD1	The Magnetic Moment of the 7/2- State in ^{39}K (Z. Berant, S. Dima, M.B. Goldberg, G. Goldring, M. Hass, Y. Horowitz, and D.F.H.Start)
PD2	g-factors of Excited States in Doubly Odd Iodine Isotopes (D. Bloch, D. Frosen, G. Grampp, and F. Gundelfinger)
PD3	The Measurement of Magnetic Moments of Nuclear Levels in Rare Earth Nuclei (N.K. Saghirun, R.A. Fox, and W.D. Hamilton)
PD4	New Magnetic Moments by In-Beam Optical Pumping (R. Neugart, M. Deimling, J. Dietrich, and H. Schweickert)
PD5	[title not available] (E. Bozek, et. al.)
IT1	Relaxation of Excited Nuclei in Liquid Metals (D. Riegel)
IT2	Recent Developments in Moment Studies of Short-Lived Nuclear States (M. Goldberg)
IT3	Transient Fields in Solids and Related Effects (A. Gelberg)

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TABLE OF NUCLEAR MOMENTS

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
0 n	1		11.7 *2* m	1/2	−1.913210 *47* [a]	N	PR 104 283(56)			
1 H	1			1/2	+2.7928456 *11*	R	JPCR 2 663(73)			
	2			1	+0.8574376 *1* [^{1}H]	N	PC74 Fuller, PR 78 204(50)	+0.002875 *20* [st]	MB,R	PRL 29 494(72), PR 57 677(40)
	3		12.262 *4* y	1/2	+2.97896014 *6* [^{1}H]	N	PR 115 1012(59), PR 71 551(47)			
2 He	3			1/2	−2.1276243 *2* [a,i] [^{1}H]	N	PR 185 1251(69)			
3 Li	6			1	+0.8220561 *3* [^{2}H]	N	ZNat 23a 1202(68), PL 25A 440(67), ORNL−1775(54)	−0.000644 *7* [f,st] [^{7}Li]	MB	PR 133 B270(64)
	7			3/2	+3.2564604 *6* [^{2}H]	N	ZNat 23a 1202(68), PL 25A 440(67), ORNL−1775(54)	−0.0366 *3* [st]	MB,R	PR A4 251(71)
								−0.043 *3* [st]	MB,R	PR B1 2025(70)
	8		849 *7* ms	2	1.65335 *35* [a]	N/RD	PR C7 1277(73)			
					+1.6532 *8*	N/RD	YadF 6 657(67)			
					+1.6532 *8*	N/RD	PR 126 1506(62)			
4 Be	9			3/2	−1.17749 *2* [^{1}H]	N	PR 75 1769(49), PR 82 105(51)	+0.053 *3* [st]	AB	PR 153 164(67)
								0.032	N,R	PR 119 70(60)
5 B	8		774 *5* ms	2	1.0355 *3* [h]	N/RD	JPJS 34 156(73)			
	10			3	+1.80065 *1* [^{11}B]	N,MB	CJP 36 632(58), PR 56 165(39)	+0.08472 *56* [st] [^{11}B]	AB,R	PR A2 1208(70)
								+0.08745 [st] [^{11}B]	AB,R	PR 181 137(69)
		717	0.69 ns	1	+0.63 *12*	IPAC	NP A182 359(72)			
	11			3/2	+2.688637 *2* [^{1}H]	N,MB	PPSL 86 53(65), PR 56 165(39)	+0.04065 *26* [st]	AB,R	PR A2 1208(70)
								+0.04196 [st]	AB,R	PR 181 137(69)
								0.037 [st]	AB,R	PR 182 48(69)
	12		20.3 *1* ms	1	+1.00306 $^{+15}_{-14}$ [l]	N/RD	PR C2 1219(70), PR C5 1435(72)	0.0171 *16* [st] [^{11}B]	N/RD	JPJa 30 311(71)
								0.030 *8*	N/RD	PR C2 1219(70), PR C5 1435(72)
	13		18.6 *5* ms	3/2	+3.17778 *51* [l]	N/RD	PR C3 2149(71)	0.0478 *46* [f,st] [^{12}B]	N/RD	JPJS 34 167(73)
6 C	11		20.34 *4* m	3/2	−0.964 *1* [^{13}C]	AB,R	PL 29A 461(69), ZP 236 337(70)	0.03426 [st]	AB,R	PR 181 137(69)
					1.027 *10* [k]	AB	PR 136 B932(64)	0.0308 *6* [k,u]	AB	PR 136 B932(64)
					1.015 [a]	AB,R	PR 181 137(69)	0.031 [st]	AB,R	PR 182 48(69)
	13			1/2	+0.702411 *1* [^{1}H]	N	PR 96 543(54)			
		3850	8.9 *10* ps	5/2	1.50 *13*	RIV/D	Cf73 Munich1 249			
	14	6728	67 *11* ps	3	0.816 *21*	RIV/D	PR C9 1748(74)			
7 N	12		10.95 *5* ms	1	+0.4573 *5*	N/RD	JPJa 25 1258(68)			
	13		10.048 *32* m	1/2	0.32224 *35* [i] [^{14}N]	AB	PR 136 B27(64)			
	14			1	+0.40376077 *6* [^{1}H]	N	PC74 Fuller, PR 81 20(51)	+0.0156	Q,MA,R	JCP 49 5354(68)
								0.0166	MA,R	JCP 50 2940(69)
		5830	12.5 ps	3	$1.5<\mu<2.55$	RIGV	JPJS 34 185(73)			
	15			1/2	−0.2831892 *3* [^{14}N]	N	PR 116 87(59)			
	16	397	4.5 *4* ps	1	1.82 *12*	RIV/D	Cf74 Uppsala 90			
					>1.7 if $t_{1/2}$=5.5 *10* ps	RIGV	Cf74 Uppsala 92			
8 O	15		123.95 *50* s	1/2	0.7189 *8* [^{17}O]	AB	PR 131 700(63)			
	16	6130	17 *2* ps	3	1.65 *9*	RIV/D	PL 44B 36(73)			
					1.66 *20*	RIV/D	NP A215 617(73)			
	17			5/2	−1.89379 *9* [^{2}H]	N	PR 81 1067(51)	−0.02578 [st]	EPR,R	PR 181 137(69)
								−0.026 *3* [st]	EPR	PPSL 70B 897(57)
	18	1980	2.6 ps	2	0.50 $^{+6}_{-4}$	RIGV	Cf74 Uppsala 93			
		3550	18 ps	4	2.48 *40* [^{16}O 6130]	RIGV	WIS−74/21− Ph(74)			
					2.48 *48* [^{16}O 6130]	RIGV	Cf74 Uppsala 94			
	20	1675	9.0 *5* ps	2	0.84 *8*	RIV/D	WIS−74/34− Ph(74), Cf74 Uppsala IT2			
9 F	17		66.0 *5* s	5/2	+4.7223 *12*	N/RD	JPJa 21 213(66), PL 18 38(65)	0.10 *2* [st] [^{19}F 198]	N/RD	Cf73 Munich1 269
	18	1130	153 *15* ns	5	+2.86 *3*	DPAD	PL 24B 457(67)	0.13 *2* [f,st] [^{19}F 198]		Th69 Morgen
	19			1/2	+2.628867 *8* [^{1}H]	N	ArkF 4 1(52), PR 133 A1533(64)			
		198	88.5 *15* ns	5/2	+3.607 *8*	DPAD	NIM 67 169(69)	0.12 *2* [st]	DPAD	PR 134 B539(64)
	20		11.1 *2* s	2	2.0935 *9*	N/RD	YadF 6 657(67)	0.070 *13* [f,st] [^{19}F 198]	N/RD	ZP 269 47(74)
					+2.094 *2*	N/RD	PR 132 1141(63)			
10 Ne	19		17.48 *9* s	1/2	−1.887 *1*	NO/D	PRL 10 347(63)			
		239	17.7 *7* ns	5/2	−0.740 *8* [^{19}F 198]	DPAD	NP A123 65(69)			
	20	1634	0.7 *2* ps	2				−0.24 *3*	CER	NP A150 114(70)
								−0.23 *8*	CER	NP A192 449(72)
								−0.20 *5*	CER	NP A220 541(74)
	21			3/2	−0.661796 *5* [^{2}H]	MB	PR 107 1202(57)	+0.1029 *75* [st]	O,AB	PR A5 1036(72), PRL 1 214(58)
	22	1275	3.4 ps	2	$0.12\leq\mu\leq0.80$	IMPAC	Cf74 Uppsala IT3	−0.21 *4*	CER	NP A150 114(70)
								−0.18 *4*	CER	NP A192 449(72)
								−0.11 $^{+4}_{-3}$	CER	NP A220 541(74)
	23		37.6 *1* s	5/2	−1.08 *1*	AB	BAPS 13 173(68)			
11 Na	20		0.449 *3* s	2	(+)0.3696 *10*	OP/RD	Cf70 Hypint 363			
	21		23.0 *2* s	3/2	+2.38627 *10* [i] [^{23}Na]	AB	PR 137 B1157(65)			
					+2.46 *8*	OP/RD	Cf70 Hypint 363			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
11 Na	22		2.602 2 y	3	+1.746 3 [^{23}Na]	AB	PR 76 1068(49)			
		583	168 2 ns	1	+0.535 10	DPAC	PR 151 910(66)			
					+0.523 11 [^{19}F 198]	DPAD	AR67 HahMt 28			
		2211	15.2 6 ps	1	0.27 4	RIV/D	Cf74 Uppsala 96			
	23			3/2	+2.2176543 6 [^{1}H]	N	PC74 Fuller, ORNL−1775(54)	+0.101 8 [st]	OL,R	PR A3 837(71)
					2.217449 20	AB/D	BAPS 16 1352(71)	0.116 8 [st]	OL,R	OSpk 32 441(72)
	24		15.030 3 h	4	+1.6903 8	AB/D	PR 150 933(66), BAPS 18 727(73)			
	25		60 2 s	5/2	+3.670 30 [a]	OP/RD	Cf74 Uppsala PD4, Cf74 Uppsala 103			
12 Mg	24	1369	1.21 6 ps	2	0.88 8	RIV/D	PL 48B 31(74)	−0.243 35	CER	PRL 22 359(69), CJP 48 35(70)
					+0.84 18 [c]	IMPAC	Cf74 Uppsala 98	−0.24 6	CER	NP A192 449(72)
								−0.305 64	CER	PR C3 718(71)
	25			5/2	−0.85545 8 [^{14}N]	N	PR 82 105(51)	+0.22	AB	PR 126 1768(62)
	26	1809	0.4 ps	2	+2.6 6 [c]	IMPAC	Cf74 Uppsala 98	−0.16 4 or −0.12 4	CER	NP A192 449(72)
13 Al	27			5/2	+3.6415044 8 [^{2}H]	N	ZNat 23a 1413(68), ORNL−1775(54)	+0.140 2 [st]	AB,R	PR A6 1702(72)
								0.155 [st]	N,R	PRL 25 100(70), PRL 25 489(70)
								0.148 [st]	N,R	PRL 25 1622(70)
	28		2.2405 3 m	3	2.791 1	N/RD	ZP 252 242(72)			
		30	1.91 8 ns	2	+4.27 40	IPAC	PR C6 878(72)			
14 Si	28	1780	0.47 ps	2	+1.08 18	IMPAC	Cf74 Uppsala IT3	+0.17 5	CER	NP A192 449(72)
								+0.17 5	CER	PRL 23 320(69)
								+0.11 5	CER	PRL 24 903(70)
	29			1/2	−0.55529 3 [^{2}H]	N	PR 89 923(53)			
15 P	29		4.149 5 s	1/2	1.2349 3	N/RD	Cf70 HypInt 325			
	31			1/2	+1.13167 3 [^{23}Na]	N	ORNL−1775(54)			
	32		14.268 42 d	1	−0.2524 3	ENDOR	PR 107 1462(57)			
16 S	32	2240	0.25 3 ps	2				−0.066 17	CER	NP A221 555(74)
								−0.175 50	CER	NP A175 593(71)
								−0.20 6	CER	PRL 24 903(70)
	33			3/2	+0.643821 1 [^{2}H]	N	ZNat 28a 1370(73)	−0.064 10 [st]	MA	PR 94 1203(54)
					+0.64352 8 [^{14}N]	N	PR 89 923(53)	−0.11	MA,R	JCP 28 691(58)
	34	2127	0.277 22 ps	2				+0.026 23	CER	NP A221 555(74)
	35		87.39 10 d	3/2	+1.00 4 or −1.07 4	MA	PR 93 193(54)	+0.045 10 [st] [^{33}S]	MA	PR 94 1203(54)
17 Cl	35			3/2	+0.8218738 4 [^{2}H]	N	ZNat 27a 72(72)	−0.08249 2 [st]	AB,R	PR A6 1702(72)
	36		3.00 2 ×10^{5} y	2	+1.28547 5 [^{2}H]	N	PR 98 1316(55)	−0.0180 4 [st] [^{35}Cl]	MA,R	PR A6 1702(72)
	37			3/2	+0.6841231 4 [^{2}H]	N	ZNat 27a 72(72)	−0.06493 2 [st]	AB,R	PR A6 1702(72)
	38		37.29 4 m	2	2.05 2	N/RD	ZP 252 242(72)			
18 Ar	35		1.770 6 s	3/2	+0.633 2	NO/D	PR 137 B1453(65)			
	36	1970	0.4 1 ps	2				+0.11 6	CER	PL 34B 389(71)
	37		35.1 1 d	3/2	+0.95 20	O	PR 140 B820(65)			
		1610	4.6 2 ns	7/2	−1.33 5	DPAD	PRL 27 603(71)			
	39		269 3 y	7/2	−1.3 3	O	JOSA 57 1452(67)			
	40	1460	0.83 21 ps	2				+0.01 4	CER	PRL 24 903(70)
19 K	36		341 6 ms	2	0.548 3	OP/RD	JPJS 34 164(73)			
	37		1.23 2 s	3/2	+0.20321 6	OP/RD	ZP 244 44(71)			
		1380	10.5 5 ns	(7/2)	+5.2 3	DPAD	PRL 27 603(71)			
	38		7.613 11 m	3	+1.3739 10 [e] [^{39}K]	AB	PR 138 B773(65)			
		3460	22.1 7 μs	(7)	+3.836 14	DPAD	PL 48B 28(74)			
	39			3/2	+0.391508 6 [^{1}H]	N	PC74 Fuller, PR 93 172(54)	+0.049 4 [st]	OL,R	PR A3 837(71)
					0.391459 9	AB/D	BAPS 17 1128(72)	+0.059 6 [st]	OL	PScr 4 275(71)
								0.056 3 [u]	OL	PR A2 1216(70)
		2810	55 6 ps	(7/2)	5.2 10	RIGV	Cf74 Uppsala PD1			
		3600	41 3 ps	(9/2)	2.0≤μ≤3.6	RIGV	Cf74 Uppsala PD1			
	40		1.267 6 ×10^{9} y	4	−1.2982 4	AB/D	PR 86 73(52)	0.061 5 [st] [^{39}K]	Q	PR B6 757(72)
								−0.067 8 [st]	OL,R	PR A3 837(71)
								−0.075 11 [st]	OL,R	PScr 4 275(71)
		30	4.30 6 ns	3	−1.29 9 [^{19}F 198]	DPAD	PL 49B 261(74)			
	41			3/2	+0.214893 1 [^{2}H]	N	PL 24A 122(67)	+0.060 5 [st] [^{39}K]	MB,R	PR A3 837(71)
		1294	7.3 2 ns	7/2	+4.53 12 [^{19}F 198]	DPAD	Cf74 Uppsala 100			
					+4.42 5 [^{19}F 198]	DPAD	PL 28B 651(69)			
	42		12.361 5 h	2	−1.1425 6	AB/D	PR 184 1102(69), BAPS 18 727(73)			
	43		22.2 1 h	3/2	0.163 2 [^{39}K,^{41}K]	AB	PR 116 734(59)			
	45		20 1 m	3/2	0.1734 4 [^{39}K]	AB	PR 161 1152(67)			
20 Ca	40	3737	41 4 ps	3	+2.5 23	IMPAC	PR C10 919(74)			
		4490	272 8 ps	5	+2.91 50	IPAD	PR C10 919(74)			
					+1.55 25	IPAD	BAPS 15 1666(70)			
	41		1.4 2 ×10^{5} y	7/2	−1.594780 9 [^{2}H]	N	PRL 9 166(62)			
		3831	3.0 4 ns	(15/2)	0.82 18	IMPAC	Cf74 Uppsala PD5			
	42	1524	0.82 3 ps	2				−0.19 8	CER	NP A204 574(73)
		3190	5.30 16 ns	6	−2.49 9	DPAD	Cf74 Uppsala 102			
					−2.52 18	IPAD	PRL 25 1033(70)			
					-3.00^{+12}_{-18} [l]	DPAD	PRL 27 523(71), JPJa 33 286(72)			
	43			7/2	−1.317642 7 [^{2}H]	N	ZNat 28a 1534(73)	<0.23	OL	JPCo 30 C1−15(69)
					−1.31734 60 [^{23}Na]	OP	ZP 249 205(72)			
	44	1156	2.0 7 ps	2				−0.14 7	CER	NP A204 574(73)
21 Sc	41		601 12 ms	7/2	5.43 2 [l]	N/RD	JPJS 34 158(73)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
21 Sc	43		3.891 12 h	7/2	+4.62 4 $[^{45}Sc]$	AB	PR 141 1106(66)	−0.26 6 [u] $[^{45}Sc]$	AB	PR 141 1106(66)
		3123	0.45 2 μs	(19/2)	+3.15 2 [l]	DPAD, SOPAD	PRL 27 155(71)			
	44		3.927 8 h	2	+2.56 3 $[^{45}Sc]$	AB,R	PR 141 1106(66)	+0.10 5 [u] $[^{45}Sc]$	R	PR 141 1106(66)
		68	155.8 16 ns	1	+0.343 6	DPAC	PR 153 1209(67)	0.21 2 [u] $[^{45}Sc]$	DPAC	JCP 58 3339(73)
					+0.346 7	DPAC	NInd 14B 349(72)			
		271	58.6 1 h	6	+3.88 1 $[^{45}Sc]$	AB,R	PR 141 1106(66)	−0.19 2 [u] $[^{45}Sc]$	R	PR 141 1106(66)
	45			7/2	4.756483 2 $[^{2}H]$	N	PL 29A 58(69)	−0.22 1 [u]	AB	ZP 156 416(59)
					+4.75693 6 $[^{1}H]$	N	PR 78 806(50) PR 81 20(51)	−0.216 [u]	AB	PR A4 1767(71)
	46		83.80 3 d	4	+3.03 2 $[^{45}Sc]$	AB	PR 128 1740(62)	+0.119 6 [u] $[^{45}Sc]$	AB	PR 128 1740(62)
	47		3.422 4 d	7/2	+5.34 2 $[^{45}Sc]$	AB	PR 141 1106(66)	−0.22 3 [u] $[^{45}Sc]$	AB	PR 141 1106(66)
		760	274 10 ns	(3/2)	0.35 5	DPAD	PR 168 1228(68)			
22 Ti	45		3.08 1 h	7/2	0.095 2 [j] $[^{47}Ti,^{49}Ti]$	AB	PR 148 1157(66)	0.015 15 [j,u] $[^{47}Ti,^{49}Ti]$	AB	PR 148 1157(66)
	46	889	4.69 ps	2				−0.28 14	CER	NP A174 37(71)
								−0.19 10	CER	NP A150 417(70)
	47			5/2	−0.78856 1 $[^{39}K]$	N	Phil s8v12 1061(65), PR 92 1262(53)	+0.29 1 [u]	AB	PPSL 86 1145(65)
	48	983	4.37 ps	2				−0.177 8	ES	PL 38B 475(72)
								−0.135 83	CER	NP A190 597(72)
								−0.38 13	CER	NP A174 37(71)
	49			7/2	−1.10429 2 $[^{39}K]$	N	Phil s8v12 1061(65), PR 92 1262(53)	+0.24 1 [u]	AB	PPSL 86 1145(65)
	50	1550	0.94 ps	2				−0.02 9	CER	NP A150 417(70)
23 V	48		15.99 8 d	4	1.63 10	NO/S	PPSL 87 927(66)			
		305	7.09 7 ns	2	+0.377 34	IPAC	NP A94 427(67)			
					+0.48 25	IPAC	Cf69 MntrlC 90			
	49		327 20 d	7/2	4.47 5 [f] $[^{51}V]$	EPR	BAPS 2 31(57)			
		153	19.9 4 ns	(3/2)	+1.58 8	DPAD	PL 40B 638(72)			
	50		>4×10¹⁶ y	6	+3.34745 3 $[^{1}H]$	N	PC74 Fuller, ORNL−1775(54)	0.07 [f,u]	N	PPSL 84 326(64)
	51			7/2	+5.1514 1 $[^{50}V]$	N	PPSL 84 326(64), PR 81 20(51)	−0.052 10 [u]	AB	PR 156 64(67), PR 156 71(67)
								−0.04 [u]	O	JPJa 21 1466(66)
								−0.033 10	PPR	NP A213 493(73)
		320	0.17 8 ns	5/2	+3.86 33	CEAD	NP A120 540(68)			
					+4.23 73 [l]	NRF	PR 129 1330(63)			
24 Cr	49		41.9 3 m	5/2	0.476 3 $[^{53}Cr]$	AB	PScr 2 16(70)			
	50	783	6 ps	2				−0.304 91	CER	JPJS 34 439(73)
	51		27.701 6 d	7/2	(−)0.934 5 $[^{53}Cr]$	AB	ArkF 40 457(70)			
		760	11 ns	(3/2)	−0.86 12	DPAD	Cf74 Uppsala 100			
	52	1434	0.7 ps	2				−0.082 16	ES	JPJS 34 387(73)
								−0.09 13 $[^{50}Cr$ 783]	CER	JPJS 34 439(73)
	53			3/2	−0.47454 3 $[^{14}N]$	N	HPAc 26 426(53)	0.022 [st]	N	PL 12 302(64)
					−0.4726 [a]	ENDOR	CJP 45 2265(67)	−0.035 5 [st]	ENDOR	PR B6 4103(72)
					−0.4649	ENDOR	PR B6 4103(72)	+0.04 7	CER	PR C7 1413(73)
	54	835	12 ps	2				−0.12 10 $[^{50}Cr$ 783]	CER	JPJS 34 439(73)
25 Mn	51			5/2	3.568 2 [e] $[^{55}Mn]$	AB	NP A166 306(71)	0.50 10 $[^{55}Mn]$	AB	NP A166 306(71)
	52		5.60 1 d	6	+3.0621 14 [e] $[^{55}Mn]$	AB	ArkF 31 549(66)	+0.60 8 [f] $[^{55}Mn]$	N/RD	Phca 50 259(70)
					+3.0631 13 [f] $[^{55}Mn]$	N/RD	Phca 50 259(70)			
		383	21.1 2 m	2	0.0076 $[^{55}Mn]$	AB	NP A166 306(71)			
	53		3.7 4 ×10⁶ y	7/2	5.024 7 [f] $[^{55}Mn]$	EPR	PR 104 1378(56)			
		377	117 7 ps	5/2	+2.88 43	IPAD	Cf74 Uppsala 104, NP A226 381(74)			
	54		312.99 10 d	3	+3.2818 13 [f] $[^{55}Mn]$	N/RD	Phca 50 259(70)	+0.40 4 [f] $[^{55}Mn]$	N/RD	Phca 50 259(70)
					+3.287 5 [i] $[^{55}Mn]$	N/RD, NO/S	PRL 18 240(67), PR 120 946(60)			
	55			5/2	3.4532 13	ENDOR	CJP 49 2276(71)	+0.40 2	OL	PL 29A 486(69), PL 30A 372(69)
					+3.468717 1 $[^{2}H]$	N	PL 30A 183(69)	+0.35 5 [u]	O	ZP 170 507(62)
					3.4425 15	ENDOR	CJP 45 2975(67)			
	56		2.5785 6 h	3	+3.2266 2 [e] $[^{55}Mn]$	AB	PR 122 891(61)			
26 Fe	54	1409	0.97 ps	2	+2.86 56	IMPAC	PR C9 1954(74)			
		2948	1.22 2 ns	6	8.22 18	DPAC	PRL 27 1587(71)			
	55	931	8.3 21 ps	5/2	+2.8 8 [b]	IPAD	CJP 51 707(73)			
		1316	18 3 ps	7/2	+0.07 7 [b]	IPAD	CJP 51 707(73)			
		1408	42 3 ps	7/2	−2.20 21 [b]	IPAD	CJP 51 707(73)			
	56	847	6.9 ps	2	+1.20 20	IMPAC	PR C9 1954(74)	−0.23 3	CER	PR C4 1699(71)
					+1.31 38 [b]	IPAC	NP 43 393(63)	−0.249 58	CER	NP A190 597(72)
					+1.20 36 [b]	NRF	NP 27 612(61)			
	57			1/2	+0.09044 7	ENDOR	PR 139 A991(65)			
					0.0906228 6 $[^{1}H]$	N	PL 31A 513(70)			
					0.09036 15 [a]	ENDOR	PL 31A 407(70)			
					0.0894 1	ME	PR 181 863(69)			
		14	97.7 2 ns	3/2	−0.1549 2 [f] $[^{57}Fe]$	ME	PR 140 A875(65), PR 128 2207(62)	0.192 18 [st]	ME,R	PRL 26 563(71)
								0.18 2 [st]	ME,R	JINC 32 431(70)
								0.20 1 [st]	ME,N	PL 31A 84(70)
								0.175 20 [st]	R	JCP 49 1648(68)
								+0.20 [st]	ME,R	PR 159 273(67)
		136	8.8 3 ns	5/2	0.915 45	DPAD	Cf64 NPPa2 52			
					+0.85 10	CEAD	NP A137 658(69)			
		367	6.9 ps	3/2	0.0 6	IMPAC	NP A137 658(69)			
	58	810	6.3 14 ps	2	+1.08 34	IPAC	NP A137 278(69)			
	59		44.56 3 d	3/2	<0.9	NO/S	CJP 50 2373(72)			
					1.1 2 $[^{57}Fe]$	NO/S	PR C2 2168(70)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
27 Co	55		17.9 3 h	7/2	4.822 3	N/RD	NP **A201** 561(73)			
					4.3 3	NO/S	PRSL **262A** 541(61)			
	56		78.76 12 d	4	3.830 15 ^{f} [^{59}Co]	EPR	PPSL **69A** 353(56)			
	57		271.65 13 d	7/2	+4.733 17 [^{59}Co]	N/RD	Phca **57** 1(72)	+0.52 9 ^{u} [^{59}Co]	N/RD	Phca **57** 1(72)
					4.719 12 [^{59}Co]	N/ME	PC74 Laurnz			
					4.63 4 ^{f} [^{59}Co]	EPR	PPSL **69A** 353(56)			
		1378	19 4 ps	3/2	+3.0 6 [^{60}Co]	IPAD	ZP **233** 477(70)			
					+2.8 9	IPAC	NP **A98** 154(67)			
	58		70.78 7 d	2	+4.044 8 [^{59}Co]	N/RD	Phca **57** 1(72)	+0.22 3 ^{u} [^{59}Co]	N/RD	Phca **57** 1(72)
					+4.040 14 ^{f} [^{59}Co]	EPR	PR **108** 60(57)			
		54	10.2 6 μs	4	+4.194 8	SOPAD	NP **A151** 193(70)			
		112	0.18 3 ns	3	+2.22 39	IPAD	NP **A194** 249(72)			
	59			7/2	+4.627 9 ^{l}	N	PR **162** 301(67), PR **81** 20(51)	+0.404 40 ^{u}	AB	ZP **159** 230(60)
					4.605 ^{a}	N,R	PR **B1** 146(70)	0.42 3 st	O	JPJa **27** 1690(69)
								+0.36 7 ^{u}	AB	PR **170** 50(68)
								0.39 6	NO/S	PR **C8** 1837(73)
		1292	555 7 ps	3/2	+2.54 12	IPAC	PScr **9** 79(74)			
					+1.67 14 ^{b}	IPAC	ZP **242** 138(71)			
	60		5.2719 11 y	5	+3.799 8 [^{59}Co]	N/RD	Phca **57** 1(72)	+0.44 5 ^{u} [^{59}Co]	N/RD	Phca **57** 1(72)
					+3.790 11 ^{f} [^{59}Co]	EPR	PR **101** 1001(56)			
		59	10.47 2 m	2	+4.40 9	AB	Cf69 MntrlC 91	+0.3 4	AB	Cf69 MntrlC 91
28 Ni	58	1454	0.59 6 ps	2				−0.10 6	CER	NP **A223** 563(74)
	59	339	83 14 ps	5/2	+0.35 15	IPAD	CJP **52** 1137(74)			
	60	1332	0.74 7 ps	2				+0.03 5	CER	NP **A223** 563(74)
								−0.104 18	ES	PL **38B** 475(72)
	61			3/2	−0.75002 4 [^{17}O]	N,R	PL **11** 114(64), ND **A5** 433(69)	+0.162 15 st	AB	PR **170** 136(68)
		67	5.2 4 ns	5/2	+0.420 10 [^{61}Ni]	ME	Cf67 HypStr 124	−0.20 3 st [^{61}Ni]	ME	ZNat **26a** 1931(71)
					+0.480 6 [^{61}Ni]	ME	ZNat **26a** 1931(71)			
	62	1172	1.7 2 ps	2				+0.05 12	CER,R	NP **A223** 563(74)
	63	87	1.72 3 μs	(5/2)	+0.752 3 ^{h}	DPAD	PL **32B** 41(70), Cf70 HypInt 110			
	64	1346	0.98 6 ps	2				+0.35 20	CER	BAPS **16** 625(71)
29 Cu	60		22.9 1 m	2	+1.219 3 ^{e} [^{63}Cu]	AB	PR **169** 917(68)			
	61		3.41 1 h	3/2	+2.14 4 [^{63}Cu]	AB	PR **142** 638(66)			
	62		9.76 2 m	1	−0.380 4 ^{e} [^{63}Cu]	AB	PR **169** 917(68)			
		41	4.77 10 ns	2	+1.32 3	DPAD	ZP **263** 169(73)			
					+1.34 12	DPAC	Cf70 Delft 571			
		390	11.1 2 ns	3	+2.00 10	DPAD	ZP **263** 169(73)			
	63			3/2	+2.2233 2	AB/D	Cf66 Paris 355	−0.209 3 st	O,R	PR **A6** 1702(72)
					2.232 7	Q	BAPS **2** 30(57)	−0.235 10 st	OL	PR **165** 141(68)
					2.2264	N,R	SSC **10** 769(72)	−0.15 2 ^{u}	EPR	JPCL **2** 992(69)
	64		12.71 1 h	1	−0.217 2 [^{63}Cu]	AB	PR **142** 638(66)			
		1594	20.4 7 ns	6	+1.06 3 ^{a}	DPAD	NP **A197** 620(72)			
	65			3/2	+2.3817 3	AB/D	Cf66 Paris 355	−0.195 4 st	O,R	PR **A6** 1702(72)
					2.382 7	Q	BAPS **2** 30(57)	−0.14 2 ^{u}	EPR	JPCL **2** 992(69)
					2.3853	N,R	SSC **10** 769(72)			
	66		5.10 2 m	1	−0.282 2 ^{e} [^{65}Cu]	AB	JPAL **2** 658(69)			
		1154	596 21 ns	(6)	+1.038 3 ^{a}	DPAD	NP **A197** 620(72)			
30 Zn	63		38.5 1 m	3/2	−0.28164 5 [^{67}Zn]	OD	PR **177** 1606(69)	+0.29 3 ^{u} [^{67}Zn]	OD	PR **177** 1606(69)
	64	992	1.75 21 ps	2				−0.135 16	ES	PL **38B** 475(72)
	65		244.0 2 d	5/2	+0.7690 2 ^{i} [^{67}Zn]	OD	PR **134** A47(64)	−0.023 2 ^{f,u} [^{67}Zn]	OD	PR **134** A47(64)
	67			5/2	+0.875478 8 [^{1}H]	OP,N	PL **24A** 430(67)	+0.150 15 ^{u}	R	PR **177** 1606(69)
		93	9.4 μs	1/2	+0.58 3 [^{67}Zn]	ME	PR **B7** 4044(73)			
		184	1.03 5 ns	3/2	+0.50 6	IPAC	APPo **36** 1065(69)			
					+0.37 12 ^{b}	IPAC	NP **A106** 389(67)			
					+0.35 12	DPAC, IPAC	NP **A160** 363(71)			
		605	333 14 ns	9/2	−1.097 9 [^{19}F 198]	DPAD	NP **A215** 486(73)	0.2 $^{+3}_{-1}$ [^{111}Cd 247]	DPAD	PRL **32** 18(74)
	70	884	3.2 ps	2				−0.21 3	ES	PL **38B** 475(72)
31 Ga	66	44	24.6 20 ns	1	−0.505 9 ^{h}	DPAD	RRou **17** 751(72), NP **A188** 417(72)			
	67		78.26 7 h	3/2	+1.8508 3 [^{69}Ga,^{71}Ga]	AB	PR **176** 25(68)	+0.195 st [^{69}Ga,^{71}Ga]	AB,R	PR **A6** 1702(72)
	68		68.33 9 m	1	0.01175 6 ^{k} [^{69}Ga,^{71}Ga]	AB	PR **127** 529(62)	0.0277 14 ^{k,st} [^{69}Ga,^{71}Ga]	AB,R	PR **A6** 1702(72)
	69			3/2	+2.01669 4 [^{23}Na]	N	ORNL−1775(54)	+0.168 st	AB,R	PR **A6** 1702(72)
	71			3/2	+2.56239 2 [^{23}Na]	N	ORNL−1775(54)	+0.106 st	AB,R	PR **A6** 1702(72)
	72		14.12 2 h	3	−0.13225 2 [^{69}Ga,^{71}Ga]	AB	PR **176** 25(68)	+0.52 st [^{69}Ga,^{71}Ga]	AB,R	PR **A6** 1702(72)
32 Ge	67	734	70 7 ns	9/2	−0.948 30	DPAD	JPJS **34** 217(73)			
	69		39.05 10 h	5/2	0.735 7 [^{73}Ge]	AB	PR **C2** 228(70)	0.024 5 st	AB	PR **C2** 228(70)
		398	2.8 1 μs	9/2	−1.0011 32 ^{l}	SOPAD	PR **C1** 613(70)			
	70	1040	1.33 14 ps	2	+1.76 42	IMPAC, R	PR **C9** 1954(74)	+0.003 100	CER	NP **A138** 529(69)
	71		11.4 1 d	1/2	+0.547 5 [^{73}Ge]	AB,R	PR **141** 15(66), PR **C1** 750(70)			
		175	79 2 ns	5/2	+1.018 10 [^{19}F 198]	DPAD	PL **27B** 370(68)			
		198	20.2 5 ms	9/2	1.0413 7	N/RD	Cf70 HypInt 313	0.34 2	QIR	Cf74 Uppsala IT1
					−1.0399 23	SOPAD	NP **A150** 282(70)			
	72	835	3.15 36 ps	2	+1.16 28	IMPAC, R	PR **C9** 1954(74)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
32 Ge	73			9/2	-0.879466 4 [^{2}H]	N	ZNat 26a 1384(71)	-0.173 26 [u]	AB,R	PR 141 15(66), PR C1 750(70), PR C2 228(70)
					-0.879462 4 [^{2}H]	N	PL 25A 653(67)	-0.21 [u]	MA,R	OSpk 12 163(62)
	74	596	11.9 10 ps	2	+0.92 42	IPAC	Cf72 Kiev 62			
	75		82.78 4 m	1/2	+0.510 5 [^{73}Ge]	AB	PR C2 228(70)			
	76	563	17.5 19 ps	2	+0.72 16	IMPAC, R	PR C9 1954(74)	+0.05 14 or -0.18 14	CER	NP A138 529(69)
								-0.15 10 or -0.05 10	CER	NP A196 216(72)
33 As	71	1000	19.8 4 ns	9/2	+5.15 9	DPAD	AR71 HahMt 58			
	72	215	80 2 ns	3	+1.580 18	DPAD	JPJS 34 258(73)			
	73	66	5.0 1 ns	5/2	+1.63 10	DPAC	PL 6 290(63)			
					+1.63 11	IPAC	BMwF-FB K-68-22 41			
		426	5.6 2 μs	9/2	+5.234 14 [a]	SOPAD	PRL 25 102(70)			
					+5.173 32 [l]	N/RD	PL 30B 329(69)			
	74		17.93 6 d	2	1.597 3 [^{75}As]	N/RD	NP A193 410(72)			
		274	26.8 5 ns	(3)	+2.429 30 [^{19}F 198]	DPAD	NP A164 367(71)			
	75			3/2	+1.43947 6 [^{2}H]	N	PR 89 595(53), PR 85 478(52)	+0.29 [u]	O,R	OSpk 12 163(62)
		265	11.9 7 ps	3/2	+1.11 33	IPAC	Cf70 Delft 543			
					+0.93 24 [^{75}As 280]	IPAC	JPJS 34 416(73), NInd 15B 427(72)			
		280	0.28 2 ns	5/2	+0.911 120	IPAC	Cf70 Delft 543			
					+0.82 13 [b]	IPAC	NInd 15B 427(72)			
					+2.41 34 [b]	IPAC	IzVU 1970n8 114(70)			
	76		26.30 4 h	2	-0.906 5 [d] [^{75}As]	NO/D	PR 109 1423(58)	7 8	AB	PR 122 1302(61)
		45	2.60 5 μs	(1)	+0.559 1 [^{19}F 198]	SOPAD	Cf70 Delft 564			
	77	264	312 21 ps	5/2	+0.82 13	IPAC	Cf74 Uppsala 106			
					+0.84 9 [b]	IPAC	NP A217 177(73)			
					+2.20 90 [b]	IPAC	Cf72 Kiev 62			
		473	116 μs	9/2	+5.525 9	SOPAD	AR69 HahMt 53			
		632	60 6 ps	5/2	+2.53 40	IPAC	Cf74 Uppsala 108, PR C10 774(74)			
					+3.88 87 [b]	IPAC	Cf74 Uppsala 106			
34 Se	75		120.4 2 d	5/2	0.67 4	N/RD	Cf74 Uppsala 70	+1.0 [f,u] [^{79}Se]	MA,R	PR 98 1224(55)
	76	559	11.1 11 ps	2	+0.80 22	IMPAC	NP A133 310(69)			
					+0.81 22 [b]	IPAC	CJP 45 1821(67)			
	77			1/2	+0.53509 1 [^{23}Na]	N	PR 89 923(53)			
					+0.534270 8 [^{2}H]	N	ORNL-1775(54)			
		248	9.32 18 ns	5/2	+1.05 10	IPAC	BMwF-FB K-68-22 41			
					+1.20 15	DPAC	PL 11 57(64)			
		440	23.9 24 ps	5/2	1.02 28	IMPAC	Cf69 Heidlb 419			
	78	614	8.6 9 ps	2	+0.82 22	IMPAC	NP A133 310(69)			
	79		≤6.5×10^{4} y	7/2	-1.018 15	MA	PR 92 1532(53)	+0.8 [u]	MA,R	OSpk 12 163(62)
	80	666	8.0 9 ps	2	+0.84 24	IMPAC	NP A133 310(69)			
	82	655	11.3 12 ps	2	+0.86 24	IMPAC	NP A133 310(69)			
35 Br	76		16.1 2 h	1	0.5482 1 [k] [^{79}Br,^{81}Br]	AB	PR 119 1053(60)	0.27 1 [k,st]	AB	PR 119 1053(60)
	78	32	14.2 3 ns	2	-1.12 4 [h] [^{19}F 198]	DPAD	NP A215 471(73)			
		182	120 μs	(4)	+4.114 12	N/RD	Cf74 Uppsala 258			
					+4.09 8	DPAD	RRou 17 751(72), NP A171 241(71)			
	79			3/2	+2.106399 4 [^{2}H]	N	ZNat 27a 72(72)	+0.293 [u]	AB,R	OSpk 12 163(62)
	80		17.57 7 m	1	0.5140 6 [j] [^{79}Br,^{81}Br]	AB	PR 136 B584(64)	0.199 8 [j,st]	AB	PR 136 B584(64)
		37	7.4 3 ns	2	-1.67 12 [h] [^{19}F 198]	DPAD	NP A215 471(73)	0.18 2 [f,st] [^{80}Br]	DPAC	Cf73 Munich1 270
		86	4.42 1 h	5	+1.3177 6 [^{79}Br,^{81}Br]	AB	PR 136 B584(64)	+0.76 3 [st]	AB	PR 136 B584(64)
	81			3/2	+2.270560 4 [^{2}H]	N	ZNat 27a 72(72)	+0.27 2 [st]	AB	PR 94 1610(54)
		536	36.6 10 μs	9/2	5.694 45 [h]	SOPAD	RRou 17 751(72), PL 35B 501(71)			
					5.86 7	N/RD	ZP 244 375(71)			
	82		35.344 13 h	5	+1.6270 5 [^{79}Br,^{81}Br]	AB, NO/S	PR 116 393(59), Cf70 HypInt 335	+0.76 3 [st]	AB, NO/S	PR 116 393(59), Cf70 HypInt 335
36 Kr	79	148	77.7 15 ns	(5/2)	+1.124 10 [^{19}F 198]	DPAD	PL 26B 134(68)			
	83			9/2	-0.97077 1 [^{39}K]	N,AB	PL 27A 466(68), RMP 18 323(46)	+0.270 13 [u]	AB	PR 129 1214(63)
								+0.251 5 [u]	AB	ZP 165 402(61)
		9	144 2 ns	7/2	-0.942 2 [^{83}Kr]	ME	PR 178 1728(69)	+0.459 6 [u] [^{83}Kr]	ME	PR 147 348(66)
	85		10.701 23 y	9/2	1.005 2 [f] [^{83}Kr]	O	ZP 141 160(55)	+0.45 3 [f,u] [^{83}Kr]	O	ZP 141 160(55)
37 Rb	80		34 4 s	1	-0.0834 3 [a]	OP/RD	Cf74 Uppsala 103			
	81		4.58 1 h	3/2	+2.05 2	AB	PR 107 723(57)			
					+2.42 44	AB	BAPS 7 476(62)			
	82	280	6.3 h	5	+1.51 2	AB	PR 107 723(57)			
	83		85.7 13 d	5/2	+1.43 2	AB	PR 107 723(57)	+0.27 5 [st] [^{85}Rb,^{87}Rb]	OD,OL	ZP 260 87(73)
	84		33.0 2 d	2	-1.297 11 [^{85}Rb]	OD,OL	ZP 260 87(73)	+0.005 13 [st]	OD,OL	ZP 260 87(73)
					-1.33 2	AB	PR 107 723(57)			
	85			5/2	+1.35305 1 [g]	OP	PR 174 23(68)	+0.274 2 [st]	OD	ZP 261 1(73)
					+1.35302 3 [g]	AB/D	PR 167 1062(68)	+0.273 2 [i,st] [^{87}Rb]	MB,R	PR A3 837(71)
					+1.3533507 8 [^{1}H]	N	PC74 Fuller, ORNL-1775(54)			
		514	1.015 1 μs	9/2	+6.075 63	DPAD	Cf74 Uppsala 30			
	86		18.66 3 d	2	-1.6920 14	AB/D	PR 123 1801(61)	+0.20 3 [st] [^{85}Rb,^{87}Rb]	OD,OL	ZP 260 87(73)

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
37 Rb	87		4.72 *4* $\times 10^{10}$ y	3/2	+2.75128 *1* ^{g}	OP	PR 174 23(68)	+0.132 *1* st	OD	ZP 261 1(73)
					2.751816 *2* [^{2}H]	N	PL 25A 440(67), ZNat 23a 1202(68)	+0.127 *1* st	OD,R	PR A3 837(71)
					+2.75119 *4*	AB/D	Cf66 Paris 355	+0.132 *9* st	OL	PScr 4 269(71)
	88		17.78 *11* m	2	0.508 *5* [^{85}Rb]	AB	PR 166 1131(68)			
38 Sr	86	2958	0.46 *3* μs	8	−1.93 *12*	DPAD	JPJa 35 337(73)			
	87			9/2	−1.09289 *65* [^{23}Na]	OP	ZP 249 205(72)	0.15 *6* st	EPR	PR 140 A1181(65), PR 151 734(66)
					−1.093576 *5* [^{73}Ge]	N	ZP 265 165(73)	+0.36 *3* ^{u}	OD	ZP 175 543(63)
					−1.0929 *9*	MB	ZETF 37 582(59)			
39 Y	86	243	28.5 *21* ns	2	−1.06 *6*	DPAC	Cf67 HypStr 145			
	88	678	13.9 *3* ms	8	4.98 *48*	DPAD	BAPS 19 450(74)			
	89			1/2	−0.1374208 *4* [^{14}N]	N	PR 137 A1828(65), PR 93 172(54)			
	90		64.21 *8* h	2	−1.630 *8* [^{89}Y]	AB	PR 125 284(62)	−0.155 *3* ^{u}	AB	PR 125 284(62)
		202	250 *7* ps	3	−0.852 *69* ^{h}	IPAC	NP A224 1(74)			
	91		58.51 *6* d	1/2	0.1641 *8* [^{89}Y]	AB	PR 128 1740(62)			
40 Zr	90	3590	130 ns	8	+10.91 *15* ^{l}	DPAD	SJap 66 39(72)			
	91			5/2	−1.30362 *2* [^{2}H]	N	PR 105 1929(57)			
		>2265	29.0 *8* ns	(15/2)	5.3 *1* ^{a}	DPAD	JPJS 34 260(73)			
41 Nb	91	2378	10.0 *4* ns	17/2	10.6 *4* ^{a}	DPAD	JPJS 34 260(73)			
	92	227	4.3 *5* μs	(2)	−1.398 *14* ^{h}	DPAD, SOPAD	NP A221 319(74)			
	93			9/2	+6.1705 *3* [^{45}Sc]	N,O	PR 82 651(51), PR 72 451(47)	−0.20 ^{u}	O,R	OSpk 12 163(62)
								−0.32 *2*	MH	NP A217 573(73)
	95		35.15 *3* d	(9/2)	6.3 *6*	NO/S	PPSL 90 1089(67)			
42 Mo	92	2761	192 *7* ns	8	+11.35 *15* ^{l}	DPAD	SJap 66 39(72)			
					11.3 *6*	DPAD	PL 33B 297(70), PR C3 1352(71)			
	93	2425	6.95 *5* h	21/2	(+)9.21 *20*	N/RD	PR C8 315(73)			
	94	2953	98 *2* ns	(8)	+10.54 *16* ^{a}	DPAD	JPJS 34 261(73)			
	95			5/2	−0.9142 *1* [^{97}Mo]	N	PR 81 20(51)	−0.019 *12* ^{u}	AB	ZP 266 271(74)
								0.12 *3* ^{u}	N	PR 143 328(66)
		204	755 *15* ps	3/2	−0.55 *5* ^{b}	IPAC	NP 77 298(66)			
					−0.39 *3*	IPAC	PR C2 1887(70)			
					−0.36 *5*	IMPAC	PR C9 2080(74)			
	97			5/2	−0.9335 *1* [^{14}N]	N	PR 81 20(51)	−0.102 *39* ^{u}	AB	ZP 266 271(74)
								1.1 *2* ^{u} [^{95}Mo]	N	PR 143 328(66)
	98	787	3.5 *4* ps	2	+0.68 *36*	IMPAC	NP A133 310(69)			
	100	536	10.3 *11* ps	2	+0.68 *36*	IMPAC	NP A133 310(69)	−0.29 *8*	CER	Cf73 Munich1 271
43 Tc	96		4.35 *4* d	6	+4.60 *15* ^{q}	N/RD	Cf70 HypInt 339			
	99		2.14 *5* $\times 10^{5}$ y	9/2	+5.6847 *4* [^{2}H]	N	PR 85 479(52)	(+)0.34 *34*	O	PR 92 303(53)
		141	164 *10* ps	7/2	3.60 *88* [^{99}Tc]	ME	JPAL 6 L144(73)			
					+5.6 *14* ^{b}	IPAC,R	PR 188 605(69)			
					+4.6 *14* ^{b}	IPAC	Cf67 HypStr 151			
		181	3.57 *5* ns	5/2	+3.291 *63*	DPAC	ZP 243 166(71)			
					+3.62 *30*	IPAC	NP 66 545(65)			
					+3.62 *33*	IPAC	ZP 153 423(59)			
44 Ru	98	654	5.9 *4* ps	2	+0.78 *60*	IMPAC, R	PR C9 1954(74)			
	99			5/2	−0.623 *19* [^{99}Ru 90]	DPAC, ME	PR 139 B532(65)	+0.077 *15* ^{u} [^{101}Ru]	AB	ZP 269 189(74)
					−0.597 *120*	AB	ZP 269 189(74)	+≥0.078 ^{u} [^{99}Ru 90]	ME	CPL 20 130(73)
		90	20.7 *3* ns	3/2	−0.284 *6*	DPAC	PR 139 B532(65)	+≥0.23 ^{u}	ME	CPL 20 130(73)
								0.34 *7*	Q	JDal 1972 2643(72)
	100	540	11.9 *8* ps	2	+1.02 *13* ^{b}	IPAC	PL 23 367(66)			
					+0.94 *30*	IMPAC, R	PR C9 1954(74)			
	101			5/2	0.698 *24* [^{99}Ru]	N	JPJa 36 634(74)	+0.45 *9* ^{u}	AB	ZP 269 189(74)
					−0.669 *134*	AB	ZP 269 189(74)			
					−0.68 *3* ^{f}	EPR	PPSL 65A 951(52)			
		127	0.55 *3* ns	3/2	−0.311 *26*	IPAC	PL 23 367(66)			
					−0.13 *3* ^{b}	IPAC	Th66 Connors			
	102	475	17.6 *13* ps	2	+0.742 *62* ^{b}	IPAC	NP A188 600(72)	−1.06 *40* or −0.99 *40*	CERP	Cf74 Uppsala 134
					+0.80 *18* ^{b}	IPAC	PL 23 367(66)	−0.19 *24* or −0.37 *24*	CER	JPAL 6 L57(73)
					+0.62 *24*	IMPAC, R	PR C9 1954(74)			
	103		39.35 *5* d	(5/2)	>0.15	NO/S	Th73 Daly			
	104	358	57.9 *41* ps	2	+0.82 *10*	IMPAC, R	PR C9 1954(74)	−0.63 *20*	CER	AdNP 1 1(68)
								−0.53 *21* or −0.84 *21*	CER	JPAL 6 L57(73)
45 Rh	100	75	214.5 *20* ns	2	+4.324 *8* ^{l}	DPAC	NIM 45 309(66)			
					4.304 *30* ^{l}	DPAC	NP A163 161(71)			
	101	157	4.34 *1* d	9/2	(+)5.51 *9*	NO/S, N/RD	PR C8 1074(73)			
	103			1/2	−0.08840 *2* ^{l} [^{2}H]	N	PR 98 1316(55)			
		40	56.116 *9* m	7/2	+4.78 *10*	N/RD	Cf74 Uppsala 110			
		93	1.06 *5* ns	9/2	+4.85 *76*	IPAC	PScr 8 90(73)			
					+6.65 *96* ^{b}	IPAC	Cf70 HypInt 1173			
		298	6.3 *5* ps	3/2	0.97 *29* ^{l} [^{104}Ru 358]	RIGV	JPJS 34 107(73)	−0.57 *40*	CERP	Cf74 Uppsala 134
					1.72 *46*	IMPAC	Cf70 HypInt 1081			
					0.42 *24*	CEAD	NP A196 58(72)			
					0.03 *39*	IMPAC	Cf69 Heidlb 419			

Nucleus Z El A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
45 Rh 103	360	59.0 42 ps	5/2	1.20 23	IMPAC	Cf70 HypInt 1081	−1.65 40	CERP	Cf74 Uppsala 134
				1.30 45 [i] [^{104}Ru 358]	RIGV	JPJS 34 107(73)			
				1.35 8	CEAD	NP A196 58(72)			
				+1.30 20	IMPAC	Cf74 Uppsala 62			
105		35.47 8 h	7/2	+1.2650 36	N/RD	Cf74 Uppsala 112			
46 Pd 104	556	9.7 7 ps	2	+0.70 10	IMPAC, R	PR C9 1954(74)	−0.28 12 or +0.01 10	CER	NP A142 591(70)
105			5/2	−0.642 3 [l]	N	PR 136 A1119(64)	+0.8 1 [u]	AB	PPSL 86 1145(65)
106	512	12.8 9 ps	2	+0.72 4	IPAC,R	PR C9 1954(74)	−0.56 8 or −0.41 8	CER,R	PR C6 1385(72)
				+0.68 10	IMPAC, R	PR C9 1954(74)	−0.52 11 or −0.25 12	CER	NP A142 591(70)
				+0.748 54 [b]	IPAC	NP A188 600(72)			
				+0.722 56 [b]	IPAC	JPJa 29 1111(70)			
	1128	2.49 28 ps	2	+0.77 23	IPAC	JPJa 29 1111(70)			
				+0.73 20 [b]	IPAC	PRL 20 1176(68), NP A122 577(68)			
108	434	23.8 17 ps	2	+0.76 6	IMPAC, R	PR C9 1954(74)	−0.51 6 or −0.30 6	CER	PR C6 1385(72)
							−0.58 13 or −0.37 12	CER	NP A162 161(71)
110	374	45.7 28 ps	2	+0.70 6	IMPAC, R	PR C9 1954(74)	−0.56 20 or −0.52 20	CERP	Cf74 Uppsala 136
							−0.28 3	ES	JPJS 34 387(73)
							−0.55 8 or −0.35 8	CER,R	PR C6 1385(72)
							−0.72 12 or −0.45 12	CER	NP A162 161(71)
47 Ag 102	9	7.7 5 m	2	+4.14 25 [^{107}Ag]	AB	PR C9 2028(74)			
103		1.11 3 h	7/2	+4.47 5	AB/D	PScr 1 238(70)			
104		66 1 m	5	+4.0$^{+2}_{-5}$ [^{107}Ag]	AB	PR 123 1793(61)			
	≈15	29.8 5 m	2	+3.7 2 [^{107}Ag]	AB	PR 123 1793(61)			
105		41.2 3 d	1/2	0.1014 10 [^{107}Ag]	AB	PR 129 1617(63)			
106		23.96 4 m	1	+2.85 20 [^{107}Ag]	AB	PR C9 2028(74)			
107			1/2	−0.113570 20	AB/D	PC73 Boekln			
				−0.1136794 9 [^{73}Ge]	N	ZNat 28a 1753(73)			
	325	5.0 ps	3/2	0.87 30 [i] [^{110}Pd 374]	RIGV	JPJS 34 107(73)			
				1.46 53 [b]	IMPAC	Cf69 Heidlb 419			
	423	30 ps	5/2	1.23 46 [i] [^{110}Pd 374]	RIGV	JPJS 34 107(73)			
				1.75 75 [b]	IMPAC	Cf69 Heidlb 419			
108		2.42 2 m	1	+2.6877 15	N/RD	Cf74 Uppsala 114			
				+2.81 3 [^{107}Ag]	AB	JPAL 2 658(69)			
	215	55 5 ns	2	+2.589 12 [l] [^{19}F 198]	DPAD	NP A229 72(74)			
109			1/2	0.13057 3 [f] [^{107}Ag]	N	PR 93 174(54)			
				−0.1306904 10 [^{73}Ge]	N	ZNat 28a 1753(73)			
				0.131363 3 [h] [^{2}H]	N	PR 163 232(67), PR 175 696(68)			
	88	39.8 2 s	7/2	+4.27 13	AB/D	CJP 49 906(71)			
	311	5.9 ps	3/2	0.95 32 [i] [^{110}Pd 374]	RIGV	JPJS 34 107(73)	−≈0.7	CER	PL 41B 585(72)
				1.51 62 [b]	IMPAC	Cf69 Heidlb 419			
	415	35 ps	5/2	0.95 32 [i] [^{110}Pd 374]	RIGV	JPJS 34 107(73)	−≈0.3	CER	PL 41B 585(72)
				1.13 52 [b]	IMPAC	Cf69 Heidlb 419			
110		24.42 14 s	1	2.7235 5	N/RD	ZP 228 329(69)			
				+2.86 5 [^{107}Ag]	AB	JPAL 2 658(69)			
	118	252.5 15 d	6	+3.607 4	AB/D	PR 154 1142(67)			
	119	37 5 ns	3	+3.833 45 [l] [^{19}F 198]	DPAD	NP A229 72(74)			
111		7.45 1 d	1/2	−0.146 2 [^{109}Ag]	AB	PPSL 69A 581(56)			
112		3.16 2 h	2	0.0547 5 [^{109}Ag]	AB	PR 133 B1138(64)			
113		5.37 5 h	1/2	0.159 2 [^{109}Ag]	AB	PR 133 B1138(64)			
48 Cd 105		56.0 5 m	5/2	−0.7393 2 [^{109}Cd]	OD	PR 177 1615(69)	+0.43 4 [u] [^{109}Cd]	OD	PR 177 1615(69)
106	633	6.0 7 ps	2				−0.15 11 or +0.01 11	CER	JPAL 7 50(74)
							−0.77 26 [i] [^{114}Cd 558]	CER	NP A155 1(70)
107		6.49 5 h	5/2	−0.615055 1 [^{111}Cd]	OP,N, OD	PL 42A 273(72), PR 132 1181(63)	+0.68 7 [u] [^{109}Cd]	OD,R	PR 177 1615(69)
	845	77 7 ns	11/2	−1.041 11 [l] [^{19}F 198]	DPAD	PC74 Spell1, NP A222 399(74)			
108	633	5.3 11 ps	2				−0.35 13 or −0.20 13	CER	JPAL 7 50(74)
							−0.77 26 [i] [^{114}Cd 558]	CER	NP A155 1(70)
109		453 2 d	5/2	−0.827846 1 [^{111}Cd]	OP,N, OD	PL 42A 273(72), PR 131 707(63)	+0.69 7 [u]	OD,R	PR 177 1615(69)
	469	8.9 6 μs	(11/2)	−1.096 2	SOPAD	Cf70 HypInt 356, Th70 Jaesch			
110	658	5.0 5 ps	2	+0.64 14 [b]	IPAC	NP A188 600(72)	−0.42 10 or −0.21 10	CER	NP A196 312(72), PRL 27 110(71)
				+0.54 24 [b]	IPAC	Cf67 HypStr 155	−0.22 8 [i] [^{114}Cd 558]	CER	NP A155 1(70)
				+1.00 44	IMPAC, R	PR C9 1954(74)	−0.55 8 or −0.31 7	CER	NP A162 161(71)
111			1/2	−0.5948857 8 [^{1}H]	OP,N	PL 42A 273(72), PR 79 35(50)			
				0.595543 2 [^{2}H]	N	ZP 266 233(74)			
	247	84.1 5 ns	5/2	−0.7656 25	DPAC	PC74 Spell2, ZP 270 203(74)	0.52 [st] [^{115}In]	DPAC	JPJS 34 178(73)
				−0.795 6	DPAC	PL 4 343(63)	0.72 11 [i,st] [^{117}In 659]	DPAC	PRL 30 10(73)
				−0.784 23	CDPAC	PR 103 126(56)	+0.44 7 [st] [^{115}In]	DPAC	PR B6 2909(72)
				0.58	IPAC	NP A147 143(70)			
	396	48.6 3 m	11/2	−1.1051 4 [^{109}Cd]	OD	PR 177 1615(69)	−0.85 9 [u] [^{109}Cd]	OD	PR 177 1615(69)
112	617	6.2 5 ps	2	+0.72 22	IMPAC, R	PR C9 1954(74)	−0.40$^{+14}_{-20}$	CER	NP A175 593(71)
							−0.15 7 [^{114}Cd 558]	CER	NP A155 1(70)
113		9.3 19 ×10^{15} y	1/2	0.6223006 9 [^{111}Cd]	OP,N	PL 42A 273(72)			
				−0.62309 7 [^{23}Na]	N	PR 79 35(50)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
48 Cd	113	265	14.6 *5* y	11/2	−1.087784 *2* [^{111}Cd]	OP,N	PL 29A 103(69)	−0.71 *7* ^{u} [^{109}Cd]	OD,R	PR 177 1615(69)
	114	558	9.0 *8* ps	2	+0.90 *12* ^{b}	IPAC	PRL 18 223(67)	−0.35 *7*	CER	PL 40B 360(72), NP A195 119(72)
					+0.62 *38*	IMPAC, R	PR C9 1954(74)	−0.28 *9* or −0.03 *9*	CER	NP A196 312(72), PRL 27 110(71)
								−0.29 *3*	ES	JPJS 34 387(73)
								−0.53 *17*	CER	PL 32B 187(70), ZhPi 11 369(70)
	115		53.38 *4* h	1/2	−0.648426 *1* [^{111}Cd]	OP,N	PL 29A 103(69)			
		180	44.8 *3* d	11/2	−1.041034 *2* [^{111}Cd]	OP,N	PL 29A 103(69)	−0.54 *5* ^{u} [^{113}Cd 265]	OL	PL 46A 211(73)
	116	513	13.7 *10* ps	2	+0.80 *62*	IMPAC, R	PR C9 1954(74)	−0.81 *23* ^{i} [^{114}Cd 558]	CER	NP A155 1(70)
49 In	109		4.2 *1* h	9/2	+5.53 *6* ^{e} [^{115}In]	AB	UCRL–8721(59)	+0.89 ^{f,st} [^{115}In]	AB,R	UCRL–8721(59)
	110	(0)^{r}	69.1 *5* m	2	+4.365 *4* [^{113}In]	AB	Th68 Casserb	+0.37 ^{f,st} [^{115}In]	AB,R	Th68 Casserb
		(0)^{r}	4.9 *2* h	7	+10.4 *1* or −10.7 *1* ^{e} [^{115}In]	AB	UCRL–8721(59)	−0.215 or +0.230 ^{f,st} [^{115}In]	AB,R	UCRL–8721(59)
	111		2.81 *1* d	9/2	+5.53 *6* ^{e} [^{115}In]	AB	UCRL–8721(59)	+0.87 ^{f,st} [^{115}In]	AB,R	UCRL–8721(59)
	112		14.4 *2* m	1	+2.82 *3* [^{113}In]	AB	Th68 Casserb	+0.093 ^{f,st} [^{115}In]	AB,R	Th68 Casserb
	113			9/2	+5.5289 *2* [^{115}In]	N	PR 106 953(57)	+0.846 st	AB,R	PR 86 148(52)
								+0.777 ^{u}	AB,R	OSpk 12 163(62)
		393	99.47 *7* m	1/2	−0.21074 *2* [^{115}In]	AB	PR 118 1578(60)			
	114		70.0 *105* s	1	+1.7 *4*	NO/S	ZETF 43 828(62)			
		192	49.51 *1* d	5	+4.7 *1*	AB	PR 108 1524(57)			
	115		6 *2* ×10^{14} y	9/2	+5.5408 *2* [^{1}H]	N	PPSL 76 301(60)	+0.861 st	AB,R	PR 86 148(52)
		335	4.50 *2* h	1/2	−0.24398 *5* [^{115}In]	AB	CJP 40 931(62)			
		828	5.4 *2* ns	(3/2)	+0.80 *14*	IPAC	NP A222 168(74)	−0.62 *8* ^{i,st} [^{117}In 659]	DPAC	JCP 58 3339(73), PC74 Raghavn
	116		14.10 *3* s	1	2.7867 *8*	N/RD	ZP 252 242(72)	0.09 *2*	N/RD	ZP 244 289(71)
					2.7889 *10*	N/RD	ZP 244 289(71)	0.03	NO/D	ZP 197 389(66)
					1.13	NO/D	ZP 197 389(66)			
		127	54.12 *5* m	5	+4.22 *8*	AB	Phil s8v1 587(56)			
					+4.4 *1*	AB	PR 108 1524(57)			
	117	314	1.95 *3* h	1/2	−0.25174 *3* [^{115}In]	AB	CJP 46 177(68)			
		659	58.7 *20* ns	3/2	+0.96 *8*	DPAC	NP A104 525(67)	0.60 *6* st [^{115}In]	DPAC	JCP 58 3339(73)
								0.64 *4* st [^{115}In]	DPAC	PRL 28 54(72)
50 Sn	112	1257	0.35 *1* ps	2				−0.15 *18*	CER	PR C2 2015(70)
	113		115.07 *30* d	1/2	0.880 *9* [^{119}Sn]	AB	PR 181 1665(69)			
		731	89 ns	11/2	−1.300 *22*	DPAD	Cf74 Uppsala 116	(−)0.46 *10* ^{i,st} [^{117}In 659]	DPAD	Cf74 Uppsala 138
					−1.292 *28* ^{a}	DPAD	BAPS 18 1424(73)			
	114	3091	726 *25* ns	(7)	−0.567 *21* ^{l}	DPAD	JPJS 34 262(73)			
					−0.567 *4* ^{h}	DPAD	Cf73 Munich1 256			
	115			1/2	−0.91889 *7* [^{23}Na]	N	PR 79 35(50)			
		715	159 *1* μs	11/2	1.369 *4*	N/RD	PL 34B 54(71)	0.40 *2*	QIR	Cf74 Uppsala IT1
					1.411 *83*	DPAC	PL 40B 192(72)	0.8 *3*	QIR	JPJS 34 181(73)
					−1.33 *11*	DPAD	Cf70 HypInt 1180			
	116	1293	0.42 *3* ps	2				−0.14 *3*	ES	JPJS 34 387(73)
								+0.6 *3*	CER	AdNP 1 1(68)
								+0.09 *13*	CER	NP A154 499(70)
		2367	370 ns	5	−0.376 *3* ^{h}	DPAD	Cf73 Munich1 256	0.165 *60* ^{u} [^{119}Sn 24]	DPAC	Cf74 Uppsala 140, NP A228 15(74)
					−0.327 *25*	DPAC	NP 89 305(66)			
		3548	904 ns	(10)	−2.326 *15* ^{h}	DPAD	Cf73 Munich1 256			
	117			1/2	−1.00110 *7* [^{23}Na]	N	PR 79 35(50)			
		159	279 *9* ps	3/2	$+0.68^{+22}_{-45}$	DPAC, IPAC	ZP 254 142(72)			
	118	1230	0.46 *6* ps	2				−0.23 *16*	CER	PR C2 2015(70)
		2321	21.7 *2* ns	5	−0.342 *35*	IPAC	ZP 168 370(62)	0.10 *4* ^{u} [^{119}Sn 24]	DPAC	Cf74 Uppsala 140, NP A228 15(74)
					−0.300 *25*	DPAC	Bk64 PAC 186			
		2575	217 ns	7	−0.689 *4* ^{h}	DPAD	Cf73 Munich1 256			
					−0.693 *77* ^{l}	DPAD	JPJS 34 262(73)			
		3112	2.93 μs	(10)	−2.447 *7* ^{h}	DPAD	Cf73 Munich1 256			
	119			1/2	−1.04734 *7* [^{23}Na]	N	PR 79 35(50)			
		24	17.75 *12* ns	3/2	+0.633 *3* [^{119}Sn]	ME	ZP 258 56(73)	−0.06 *2* ^{u}	ME,R	PR 159 239(67)
					+0.644 *9* [^{119}Sn]	ME	PL 45A 335(73)	0.065 *5* ^{u}	ME,R	PR B5 1704(72)
					+0.675 *2* ^{d,f} [^{119}Sn]	ME	PL 34A 155(71)	−0.044 *14* ^{i} [^{121}Sb]	Q	JDal 1972 2643(72)
					0.688 *3* ^{d} [^{119}Sn]	ME	PL 35A 27(71)	0.05 *3* ^{u}	ME	JINC 26 915(64)
		90	≈250 d	11/2	−1.40 *8*	ME	PL 40A 297(72)	−0.13 *4* ^{u} [^{119}Sn 24]	ME	PL 42B 349(72)
	120	1172	0.5 ps	2				+0.09 *10*	CER	PR C2 2015(70)
		2285	5.53 *6* ns	5	−0.37 *5*	IPAC	ZP 168 370(62)	0.021 *8* ^{u} [^{119}Sn 24]	DPAC	ZP 232 256(70)
					−0.280 *25*	DPAC	Bk64 PAC 186			
	121		27.06 *4* h	3/2	0.699 *7* ^{k} [^{119}Sn]	AB	PR 181 1665(69)	0.08 *4* ^{k,u}	AB	PR 181 1665(69)
	122	1140	0.60 *7* ps	2				−0.28 *17*	CER	PR C2 2015(70)
	124	1131	0.79 *9* ps	2				−0.46 *25*	CER	AdNP 1 1(68)
								−0.24 *15*	CER	NP A154 499(70)
51 Sb	115		32.3 *3* m	5/2	+3.46 *1* [^{121}Sb]	AB	PR 175 65(68)	−0.20 *4* ^{u} [^{121}Sb]	AB	PR 175 65(68)
	117		2.80 *1* h	5/2	3.43 *6* [^{121}Sb]	AB	NP A226 219(74)	0.2 *12* ^{u} [^{121}Sb]	AB	NP A226 219(74)
					+2.68 *1* [^{121}Sb]	AB	PR 175 65(68)	−0.30 *5* ^{u} [^{121}Sb]	AB	PR 175 65(68)
		3130	390 *20* μs	(21/2)	1.258 *16* ^{a}	N/RD	BAPS 18 1425(73)			
					1.23 *4*	DPAC	PL 40B 192(72)			
					+1.22 *16*	DPAD	Cf70 HypInt 1180			
	118		3.5 m	1	2.47 *7* [^{121}Sb]	AB	PR 175 65(68)			
		54	18.2 μs	(3)	+2.48 *5* ^{n}		Cf71 Predeal			
		190	4.96 *2* h	8	2.32 *4* [^{122}Sb]	N/RD	NP A221 1(74)			
	119		38.0 *1* h	5/2	+3.45 *1* [^{121}Sb]	AB	PR 175 65(68)	−0.21 *4* ^{u} [^{121}Sb]	AB	PR 175 65(68)
	120	(0)^{r}	15.89 *4* m	1	2.34 *22* [^{121}Sb]	AB	PR 175 65(68)			

Nucleus Z	El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
51	Sb	120	(0)[r]	5.76 2 d	8	2.34 1 [^{122}Sb]	N/RD,R	NP A221 1(74)			
		121			5/2	+3.3635 3 [^{23}Na]	N	PR 81 20(51)	−0.20 3 [u]	AB	Phil s8v5 1291(60)
						+3.3641 15	ENDOR	PR 109 1172(58)	−0.26 10 [u]	ME,R	PR 159 239(67)
									−0.54 8 [u]	O	APPo 20 775(61)
			37	3.5 2 ns	7/2	+2.52 3 [^{121}Sb]	ME	PL 26A 60(67)	−0.27 4 [f,u] [^{121}Sb]	ME	PL 32A 91(70)
						+2.45 2 [^{121}Sb]	ME	ZETF 59 419(70)			
		122		2.681 3 d	2	−1.905 20 [^{121}Sb,^{123}Sb]	NO/D	PR 112 935(58)	+0.47 3 [u] [^{121}Sb]	AB	Phil s8v5 1309(60)
			61	1.86 8 μs	3	+2.983 12 [h]	SOPAD	PR C7 2128(73)			
		123			7/2	+2.5498 2 [^{2}H]	N	PR 81 20(51)	−0.26 4 [u]	AB	Phil s8v5 1291(60)
						+2.5515 11	ENDOR	PR 109 1172(58)	−0.68 10 [st]	O,R	PR 100 1369(55)
		124		60.20 3 d	3	1.20 2 [^{122}Sb]	N/RD,R	NP A221 1(74)			
						1.26 7	NO/S	PR 170 1051(68)			
						1.42 10	NO/S	NP A156 19(70)			
		125		2.71 2 y	7/2	2.630 35 [^{122}Sb]	NO/S,R	NP A221 1(74)			
		126		12.4 1 d	(8)	1.28 7	NO/S	PR C6 2268(72)			
		127		3.91 7 d	7/2	2.59 12	NO/S	PR C6 2268(72)			
		128		9.01 3 h	(8)	1.31 19	NO/S	PR C6 2268(72)			
52	Te	115	279	7.52 2 μs	(11/2)	−1.030 38	DPAD	PL 42B 54(72)			
						−0.963 22	DPAD	BAPS 19 474(74)			
		119		15.9 3 h	1/2	0.25 5	AB	ArkF 30 111(65)			
		120	560	9.3 18 ps	2	+0.58 16	IMPAC,R	PR C9 1954(74)			
		122	564	7.6 8 ps	2	+0.62 6	IPAC	PL 24B 651(67)	−0.50 22	CER	AdNP 1 1(68)
						+0.79 10 [b]	IPAC	PL 22 297(66)	+0.32 10 or +0.08 10	CER	BAPS 17 536(72)
						+0.91 12 [b]	IPAC	PL 22 299(66)	−0.43 8	CER	NP A221 26(74)
						+0.64 10	IMPAC,R	PR C9 1954(74)			
		123		>7×10[12] y	1/2	−0.73684 2 [^{23}Na]	N	PR 89 923(53)			
			159	0.19 10 ns	3/2	0.72 12	IPAC	ZP 240 396(70)			
			247	119.7 1 d	11/2	−1.00 5	NO/S	NP A210 307(73)			
		124	603	6.6 4 ps	2	+0.70 11 [b]	IPAC	CJP 45 1600(67)	+0.20 10 or −0.13 10	CER	BAPS 17 536(72)
						+0.40 7 [b]	IPAC	PL 24B 651(67)	−0.49 8	CER	NP A221 26(74)
						+0.54 8	IMPAC,R	PR C9 1954(74)	−0.50 10 or −0.27 10	CER	JPJS 34 440(73)
						+0.53 31 [b]	IPAC	NIM 58 325(68)			
		125			1/2	−0.88833 3 [^{23}Na]	N	PR 89 923(53)			
			36	1.482 6 ns	3/2	+0.60 2 [^{125}Te]	ME	PL 26A 452(68)	−0.25 3 [^{127}I]	ME	PR 163 297(67)
						+0.74 7 [^{125}Te]	ME	PL 25A 731(67)	0.20 +2 −3	ME	PL 5 230(63)
						+0.57 7	IPAC	ZP 255 390(72)	positive	ME	ZETF 56 167(69)
			145	58 1 d	11/2	(−)0.93 5	NO/S	NP A193 367(72)			
			321	695 15 ps	(9/2)	−0.918 32	IPAC	NP A154 369(70)			
						−0.909 72	IPAC	PL 29B 581(69), PL 30B 178(69)			
						−0.263 27	IPAC	NP A131 92(69)			
						−0.66 9	IPAC	NP A170 240(71)			
			444	21 4 ps	(3/2)	+0.52 17	IMPAC	Cf70 HypInt 1182, PC72 Borchrs			
			463	13 2 ps	5/2	+0.79 30	IPAC	NP A170 240(71)			
						−1.98 60	IPAC	NP A131 92(69)			
						0.30 13	IMPAC	Cf70 HypInt 1182			
						−0.58 27	IPAC	NP A154 369(70)			
			525	≤160 ps	(7/2)	negative	IPAC	NP A170 240(71)			
		126	666	4.41 48 ps	2	+0.62 16	IMPAC,R	PR C9 1954(74)	−0.20 9 or 0.00 9	CER	JPJS 34 440(73)
									−0.50<Q<−0.16	CER	NP A99 507(67)
		127		9.35 10 h	3/2	0.66 5	NO/S	NP A202 467(73)			
			88	109 2 d	11/2	−0.91 5	NO/S	NP A210 307(73)			
			341	411 17 ps	9/2	−0.963 63	IPAC	NP A224 358(74)			
		128	743	3.18 41 ps	2	+0.54 14	IMPAC,R	PR C9 1954(74)	−0.07 9 or +0.12 9	CER	JPJS 34 440(73)
									−0.40<Q<−0.01	CER	NP A99 507(67)
		129		69.5 5 m	3/2	0.66 5	NO/S	NP A202 467(73)			
			106	33.52 12 d	11/2	−1.15 5	NO/S	NP A210 307(73)			
		130	840	1.99 21 ps	2	+0.64 18	IMPAC,R	PR C9 1954(74)	−0.16 19	CER	NP A142 591(70)
									−0.08 8	CER	NP A221 26(74)
53	I	125		60.25 6 d	5/2	3.0 10	MA	PR 110 536(58)	−0.889 [f] [^{127}I]	MA	PR 110 536(58)
			188	0.35 1 ns	3/2	1.06 7	IPAC	ZP 265 65(73)			
						2.2 6	IPAC	Cf73 Munich1 257			
		126	>0	123 3 ns	(4)	−1.514 16	DPAD	Cf74 Uppsala PD2			
		127			5/2	+2.81327 8 [^{1}H]	N,O	PR 82 750(51), ZP 112 199(39)	−0.789	AB,R	PC59 Stroke, ND A5 433(69)
			58	1.95 7 ns	7/2	+2.54 5 [^{127}I]	ME	PR C6 228(72)	−0.71 [^{127}I]	ME	PL 13 198(64)
						+2.03 15	IPAC	NP A95 653(67)			
			203	0.388 6 ns	3/2	1.06 16	IPAC	Cf73 Munich1 257			
						0.97 8	IPAC,R	Cf73 Munich1 257			
		128	>0	0.82 μs		g=−0.180 7 [n]		Th71 Bloch			
		129		1.57 4 ×10[7] y	7/2	+2.6210 3 [^{2}H]	N	PR 82 97(51)	−0.553 [f] [^{127}I]	Q,MA	PR 90 609(53), PR 76 149(49)
			28	14.4 5 ns	5/2	+2.801 3 [f] [^{129}I]	ME	PL 33B 413(70)	0.685 [f] [^{129}I]	ME	NIM 105 509(72)
									−0.68 [f] [^{129}I]	ME	PR 140 A1892(65)
		130	>0	229 14 ns	(5)	−0.126 15	DPAD	Cf74 Uppsala PD2			
		131		8.040 1 d	7/2	+2.742 1 [^{127}I]	AB	PR 119 2022(60)	−0.40 1 [^{127}I]	AB	PR 119 2022(60)
			150	0.95 5 ns	5/2	+2.79 50	IPAC	NP A102 203(67)			
			1797	5.9 2 ns	(11/2)	−0.89 28	IPAC	NP A102 203(67)	0.75 [f] [^{129}I 28]	DPAC	JCP 58 3339(73)
		132		2.2846 4 h	4	3.088 7 [k] [^{127}I]	AB	BAPS 5 504(60)	0.09 1 [k] [^{127}I]	AB	BAPS 5 504(60)
			50	951 22 ps	3	+2.24 30	IPAC	NP A132 221(69)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
53 I	133		20.9 *1* h	7/2	(+)2.856 *5* [^{127}I]	AB	BAPS 5 273(60)	(−)0.27 *1* [^{127}I]	AB	BAPS 5 273(60)
54 Xe	124	356	58 *5* ps	2	0.90 *46* ^{i} [^{132}Xe 668]	IMPAC	Cf73 Munich1 259			
	126	388	41.3 *14* ps	2	+0.75 *14*	IPAC	Cf74 Uppsala 118			
					0.97 *51* ^{i} [^{132}Xe 668]	IMPAC	Cf73 Munich1 259			
	128	443	24 *2* ps	2	+0.66 *14* [^{126}Xe 388]	IMPAC	Cf74 Uppsala 118			
					1.07 *44* ^{i} [^{132}Xe 668]	IMPAC	Cf73 Munich1 259			
	129			1/2	−0.777976 *9* [^{2}H]	N	HPAc 41 367(68)			
		40	1.01 *4* ns	3/2	+0.67 *30* [^{129}Xe]	ME	Cf67 HypStr 161	−0.41 ^{u} [^{131}Xe]	ME	PR 135 B1102(64)
					+0.89 *26*	IPAC	PR C10 402(74)			
					0.44 *22* ^{c}	IPAC	HPAc 45 939(72)			
		236	8.0 *2* d	11/2	−0.80 *10*	NO/S	ZP 267 145(74)			
	130	536	10 *2* ps	2	+0.72 *14* [^{126}Xe 388]	IMPAC	Cf74 Uppsala 118			
					0.65 *22* ^{i} [^{132}Xe 668]	IMPAC	Cf73 Munich1 259			
	131			3/2	+0.691861 *4* [^{2}H]	N	HPAc 41 367(68)	−0.120 *12* ^{u}	AB	PR 123 198(61)
		164	12.00 *2* d	11/2	−0.80 *10* [^{131}Xe]	NO/S	ZP 267 145(74)			
	132	668	4.7 *2* ps	2	+0.92 *15* ^{b}	IPAC	ZP 264 423(73)			
					+0.94 *30*	IPAC	Cf69 MntrlC 88, PC74 Tandon			
					+0.70 *10* [^{126}Xe 388]	IMPAC	Cf74 Uppsala 118			
		2753	8.4 *8* ms	10	−1.96 *5*	DPAD	Cf74 Uppsala 116			
	133	233	2.19 *3* d	11/2	−0.87 *12* [^{131}Xe]	NO/S	ZP 267 145(74)			
55 Cs	125		45 *1* m	1/2	+1.41 *2* [^{133}Cs]	AB	PR C3 1326(71)			
	127		6.25 *10* h	1/2	+1.46 *2* [^{133}Cs]	AB	PR C3 1326(71)			
					+1.43 *4* [^{133}Cs]	AB	PR 112 186(58)			
	129		32.06 *6* h	1/2	+1.482 *9*	AB	BAPS 7 476(62)			
	130		29.11 *12* m	1	+1.37 *8* or −1.45 *8* [^{133}Cs]	AB	PR 112 186(58)			
	131		9.70 *3* d	5/2	+3.543 *2*	AB/D	PR 140 B1483(65)	−0.575 *6* st	OL,OD, R	PR A3 837(71)
		133	9.75 *30* ns	5/2	1.86 *8*	DPAC	JPJS 34 427(73)			
					+1.98 *13*	IPAC	NP A130 545(69)			
					+2.50 *15*	DPAC	NP 56 65(64)			
	132		6.465 *12* d	2	+2.24 *1* [^{131}Cs]	OD	ZP 224 461(69)	+0.469 *10* st	OL,OD, R	PR A3 837(71)
					+2.23 *2* [^{133}Cs]	AB	PR 112 186(58)			
	133			7/2	+2.582065 *9* $^{\&}$ [^{87}Rb]	OP	PR A7 1178(73) PL 25A 440(67),	−0.003 *1* st	OL	PScr 5 209(72)
					+2.582911 *2* [^{2}H]	N	ZNat 23a 1202(68), ORNL−1775(54)	−0.0030 *11* st	OD,R	PR A3 837(71)
								0.0023 *3*	QIR	BAPS 15 110(70)
		81	6.31 *5* ns	5/2	+3.45 *2* [^{133}Cs]	ME	NP A109 59(68)			
					3.51 *7* ^{f} [^{133}Cs]	ME	ZP 257 29(72)			
					3.25 *15*	CDPAC	NP 58 651(64)			
					3.58 *40*	DPAC	ZNat 23a 786(68)			
		161	190 *15* ps	5/2	1.48 *50*	IPAC,R	JPCo 35 C1−7(74)			
	134		2.046 *4* y	4	+2.9937 *9* ^{f} [^{133}Cs]	AB/D	PR 105 590(57)	+0.364 *2* st	OD,R	PR A3 837(71)
		11	47 *1* ns	5	+3.349 *65*	DPAC	Cf70 Delft 549			
		139	2.895 *5* h	8	+1.0978 *2* [^{133}Cs]	AB/D	PR 127 517(62)			
	135		2.95 *30* ×10^{6} y	7/2	+2.7324 *2* ^{f} [^{133}Cs]	AB/D	PR 105 590(57)	+0.044 *2* st [^{134}Cs]	OD,R	PR A3 837(71)
								+0.052 *4* st	OL	PScr 5 209(72)
	136		13.00 *2* d	5	+3.71 *4* [^{133}Cs]	AB	PR C3 1326(71)			
	137		29.901 *45* y	7/2	+2.8413 *4* ^{f} [^{133}Cs]	AB/D	PR 105 590(57)	+0.045 *2* st [^{134}Cs]	OD,R	PR A3 837(71)
								+0.053 *4* st	OL	PScr 5 209(72)
	138		32.2 *1* m	3	0.48 *10* [^{133}Cs]	AB	CJP 45 3393(67)			
56 Ba	130	357	63 *16* ps	2				−1.10 *34*	CER	AdNP 1 1(68)
								+0.37 *18*	CER	JPJS 34 442(73)
	134	605	5 ps	2				−0.64 *14*	CER	PR C6 1016(72)
								+0.15 *14*	CER	JPJS 34 442(73)
	135			3/2	+0.837943 *17*	OP	ZP 249 205(72)	0.17 *2* ^{u}	O	ZP 216 142(68)
					+0.83858 *2* [^{35}Cl]	N,MB	PR 102 1334(56), ZETF 37 582(59)	+0.18 *2* ^{u}	OD	APLz s7v11 248(63)
	136	818	1.5 ps	2				−0.19 *17*	CER	PR C6 1016(72)
								+0.43 *52*	CER	JPJS 34 442(73)
	137			3/2	+0.937365 *20*	OP	ZP 249 205(72)	+0.28 *3* ^{u}	OD	APLz s7v11 248(63)
					+0.93810 *4* [^{35}Cl]	N,MB	PR 102 1334(56), ZETF 37 582(59)	0.26 *3* ^{u} [^{135}Ba]	O	ZP 216 142(68)
								0.20	O,R	PR 136 A376(64)
		662	2.5513 *7* m	11/2				negative	NO/S	Phca 31 153(65)
	138	1436	0.18 ps	2				−0.07 *15*	CER	PR C6 1016(72)
57 La	133	535	60 ns	11/2	7.8	DPAC	JPPa 34 753(73)			
	137		6 *2* ×10^{4} y	7/2	+2.695 *6* [^{139}La]	O	ZP 254 127(72)	+0.26 *8* st [^{139}La]	O	ZP 254 127(72)
	138		1.040 *14* ×10^{11} y	5	+3.7139 *3* ^{f} [^{139}La]	N	PR 99 613(55)	+0.51 *9* st [^{139}La]	O	PL 40B 87(72)
	139			7/2	+2.7832 *2* [^{2}H]	N,O	PR 82 651(51), ZP 116 547(40)	+0.22 *3* st	AB	PR A3 25(71)
	140		40.27 *5* h	3	+0.730 *15* [^{139}La]	AB	Cf69 MntrlC 91	+0.103 *11* st [^{139}La]	NO/S, AB	PR 143 911(66), PR A3 25(71)
								+0.15 *7* st [^{139}La]	AB	Cf69 MntrlC 91
58 Ce	137		9.0 *3* h	3/2	0.91 *15*	NO/S	PR 129 1607(63)			
		254	34.4 *3* h	11/2	0.70 *3*	NO/S	PR 143 78(66)			
	139		137.2 *4* d	3/2	0.96 *20*	NO/S	PR 129 1607(63)			
					0.86 *20*	NO/S	Phil s8v7 1087(62)			
	140	2083	3.4 *4* ns	4	+4.09 *15*	DPAC	PR 140 B811(65)	0.386 *77* st [^{139}La]	DPAC	JPJS 34 265(73)
					+4.48 *16*	DPAC	ZP 173 203(63)			
					+4.64 *32*	DPAC	PL 3 291(63)			
					4.68 *32*	DPAC	InJP 45 225(71)			

Nucleus Z El A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
58 Ce 141		32.55 1 d	7/2	0.970 30	EPR	PR 108 54(57), Cf63 QuantE1 595			
				1.31 20	NO/S	PR 129 1607(63)			
				0.9 1	NO/S	Phil s8v7 1087(62)			
142	641	6 ps	2				−0.12 9	CER	PR C1 734(70)
143		33.0 2 h	3/2	≈1	NO/S	PR 129 1607(63)			
59 Pr 141			5/2	4.136 2 [a]	AB	BAPS 15 795(70)	−0.0589 42 [u]	AB	Cf63 QuantE1 595
				+4.09 6	O	PR 137 B784(65), PR 140 AB3(65)			
				4.28 10	EPR	PRSL 245A 156(58), Cf63 QuantE1 595			
	145	1.85 3 ns	7/2	$+2.80^{+12}_{-6}$ [^{141}Pr]	ME	PR C3 1419(71)			
				+2.8 2 [^{141}Pr]	ME	ZNat 26a 357(71)			
				3.1 2 [^{141}Pr]	ME	PR B7 1974(73)			
	1117	4.80 25 ns	11/2	+7.21 44 [l]	DPAD	NP A221 211(74)			
142		19.2 1 h	2	+0.234 1 [a]	AB,R, NO/D	PCan 29n4 47(73), BAPS 15 628(70)	+0.0297 85 [u]	AB	PR 126 1004(62), Cf63 QuantE1 595
	4	14.6 5 m	5	2.2 1	AB	PCan 29n4 47(73)			
143	57	4.17 9 ns	5/2	+3.28 13	DPAC	Cf64 NPPa2 481			
				+2.60 20	IPAC	NP 89 225(66)			
144	80	0.12 2 ns	1	−4.3 14	IPAC	PR C7 350(73)			
60 Nd 143			7/2	−1.065 5	AB/D	PPSL 86 1249(65)	−0.484 20	AB	PPSL 86 1249(65)
				−1.088 61	ENDOR	PR 127 1940(62)	+0.0206 30 [u]	EPR	PR 127 1940(62)
							−0.57 6 [u]	AB	PPSL 81 156(63)
							−0.56 6 [st]	AB	PR A6 1772(72)
144	696	3.4 14 ps	2	+0.54 15 [f] [^{148}Nd 300]	CEAD	NP A96 138(67)	−0.39 21	CER	PR C3 2049(71)
				+0.26 4	IMPAC	NP A186 513(72)	−0.07 15	CER	NP A151 282(70)
	1315	20.5 37 ps	4	+0.80 84 [b]	IPAC	ArkF 33 329(67)			
145			7/2	−0.656 4	AB/D	PPSL 86 1249(65)	−0.253 10	AB	PPSL 86 1249(65)
				−0.677 40	ENDOR	PR 127 1940(62)	+0.0105 20 [u]	EPR	PR 127 1940(62)
							−0.30 3 [u]	AB	PPSL 81 156(63)
							−0.29 3 [st]	AB	PR A6 1772(72)
	73	0.72 5 ns	5/2	−0.320 4 [^{145}Nd]	ME	ZP 240 100(70)			
146	454	19.4 55 ps	2	+0.494 55 [f] [^{148}Nd 300]	CEAD	NP A96 138(67)	−0.78 9	CER	NP A151 282(70)
				+0.44 6	IMPAC	NP A186 513(72)	−0.72 20	CER	PR C3 2049(71)
147		10.98 1 d	5/2	0.578 3 [f] [^{143}Nd]	EPR	PR 108 54(57)	0.9 3 [k] [^{145}Nd]	AB	BAPS 15 769(70)
				0.554 10 [k] [^{145}Nd]	AB	BAPS 15 769(70)			
148	300	85.4 20 ps	2	+0.398 42 [i] [^{150}Nd 132]	RIGV	NP A151 401(70)	−1.46 13	CER	NP A151 282(70)
				+0.66 14 [b]	CEAD	NP A96 138(67)	−1.36 30	CER	PR C3 2049(71)
				+0.50 8	IMPAC	NP A186 513(72)			
149		1.73 1 h	5/2	0.351 10 [k] [^{145}Nd]	AB	BAPS 15 769(70)	1.3 3 [k] [^{145}Nd]	AB	BAPS 15 769(70)
150	132	1.51 2 ns	2	0.625 42	CETD	PR 161 1185(67)	−2.00 51	CER,R	NP A151 282(70)
				+0.644 18	RIGV	NP A151 401(70)			
	397	55.9 29 ps	4	+1.28 20	IMPAC	NP A186 513(72)			
61 Pm 143		265 10 d	5/2	3.9 5	NO/S	PR 130 1100(63)			
144		377 16 d	(6)	1.77 14	NO/S	PR 121 558(61)			
147		2.6234 2 y	7/2	+2.58 7	O	PR 141 1123(66)	+0.74 20 [u]	O	PR 141 1123(66)
				2.55 6	EPR	PR 124 1455(61), Cf63 QuantE1 595	0.59 16 [u]	AB,R	PR 141 1123(66)
				2.77 8	AB	PR 132 723(63), Cf63 QuantE1 595			
	91	2.59 2 ns	5/2	3.55 10 [^{147}Pm]	ME	PL 32B 678(70)	0.6 3 [f,u]	ME	PL 32B 678(70)
				+3.9 6 [b]	IPAC	ZP 160 33(60)			
				+3.94 74	IPAC	IApP 10 23(72)			
148		5.370 9 d	1	1.84 19	NO/S	PR 130 1100(63)	+0.2 2 [u]	AB	PR 138 B1356(65)
				±2.08 21	AB	PR 138 B1356(65)			
	137	41.29 11 d	6	1.82 18	NO/S	PR 130 1100(63)			
149		53.07 10 h	7/2	3.3 5	NO/S	PRSL 259A 377(60), PR 130 1100(63)			
	114	2.54 4 ns	5/2	+2.13 15 [b]	IPAC	IzUz 1970n2 65(70)			
				2.0 2	DPAC	NP A159 494(70)			
				2.57 33	IPAC	IApP 7 1(69)			
				+2.40 30 [b]	IPAC	NP 89 348(66)			
	188	3.24 ns	(3/2)	+1.09 15	IPAC	IzUz 1970n2 65(70)			
				2.2 6	DPAC	NP A159 494(70)			
	210	80 ps	(5/2)	+2.20 35	IPAC	IzUz 1970n2 65(70)			
	269	2.64 ns	(7/2)	+2.19 11	IPAC	IzUz 1970n2 65(70)			
				3.6 2	DPAC	NP A159 494(70)			
151		28.40 4 h	5/2	1.8 2	AB	PR 132 723(63)	1.9 3 [u]	AB	PR 132 723(63)
	256	0.93 3 ns	(3/2)	0.62 27	IPAC	Cf72 Kiev 62			
62 Sm 145		340 3 d	7/2	0.92 6 [f] [^{147}Sm]	NO/S	PR 184 1177(69)			
147		1.06 2 ×10^{11} y	7/2	−0.8148 7	AB	PRSL 293A 117(66)	−0.18 3 [u]	AB,R	JPBL 2 1257(69)
				−0.8109 14	ENDOR	PR B5 3387(72)			
	121	0.78 ns	5/2	−0.449 25 [^{147}Sm]	ME	PR C3 841(71)	−0.31 12 [u] [^{147}Sm]	ME	PR C3 841(71)
				−0.26 15	IPAC	IzUz 1970n2 65(70)			
				−0.52 30	IPAC,R	PR C3 841(71)			
	197	1.35 11 ns	3/2	−0.27 6	IPAC	IzUz 1970n2 65(70)			
				−0.29 11	IPAC	NP A122 184(68)			
148	551	7.3 2 ps	2	+0.342 92	IMPAC	NP A186 513(72)	−0.97 27 [^{152}Sm 122]	CER	JPJS 34 443(73)
							−0.73 38	CER	AdNP 1 1(68)
149			7/2	−0.6717 7 [^{147}Sm]	AB	PRSL 293A 117(66)	+0.052 9 [f,u] [^{147}Sm]	AB	PRSL 293A 117(66)
				−0.6692 11	ENDOR	PR B5 3387(72)	0.060 15 [u]	ME	Cf70 HypInt 720
	23	7.6 5 ns	5/2	0.6238 8 [f] [^{149}Sm]	ME	Cf70 HypInt 720	0.50 1 [u]	ME	Cf70 HypInt 720
				−0.625 6 [f] [^{149}Sm]	ME	NP A93 689(67)	0.40 6 [u]	ME	NP A93 689(67)
150	335	47.9 11 ps	2	+0.636 34 [^{152}Sm 122]	RIGV	NP A151 401(70)	−1.31 19 [^{152}Sm 122]	CER	JPJS 34 443(73)
				+0.546 62	IMPAC	NP A186 513(72)	−1.25 20	CERP	PRL 30 453(73)

Nucleus Z El A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
62 Sm 151		87 *9* y	5/2	0.355 *15* [^{147}Sm]	EPR	CJP **49** 2227(71)			
	92	77 *1* ns	9/2	−0.95 *5*	DPAC	NP **A223** 195(74)			
	105	0.48 ns	3/2	+0.31 *11* ^{q}	IPAC	IzF **35** 135(71)			
	168	0.38 *4* ns	5/2	+1.8 *5*	IPAC,R	NP **A223** 195(74)			
152	122	1.42 *2* ns	2	+0.678 *24*	RIGV	NP **A151** 401(70)	−1.653	R	JPJS **34** 443(73)
				+0.71 *6*	IPAC	PR **128** 751(62)	−1.8 *6*	CER	AdNP **1** 1(68)
				0.84 *5* [^{149}Sm]	ME	PL **26B** 81(67)			
				0.559 *57*	CETD	PR **160** 866(67)			
				+0.601 *67*	IPAC	NIM **97** 243(71)			
	366	56.6 *15* ps	4	+1.22 *15*	IMPAC	NP **A186** 513(72)			
153		46.8 *1* h	3/2	−0.0216 *1*	AB	ND **A5** 433(69), PC68 Wadding	+1.0 *1* ^{u}	AB	ND **A5** 433(69), PC68 Wadding
154	82	3.01 *4* ns	2	0.784 *36* [^{149}Sm]	ME	PR **186** 1280(69)	−1.33 *46* ^{u}	ME	PR **186** 1280(69)
				+0.622 *63* ^{i} [^{152}Sm 122]	RIGV,R	NP **A151** 401(70)			
				0.581 *59*	CETD	PR **160** 866(67)			
	267	165 *5* ps	4	+1.35 *15*	IMPAC	NP **A186** 513(72)			
	544	23.5 *4* ps	6	+1.90 *28*	IMPAC	NP **A186** 513(72)			
155		22.4 *3* m	3/2				0.9 *1* ^{u} [^{153}Sm]	AB	ND **A5** 433(69), PC68 Wadding
63 Eu 147	625	0.765 *15* μs	(11/2)	+6.06 *33*	DPAC	YadF **12** 460(70)			
149	497	2.43 *4* μs	(11/2)	+6.11 *17*	DPAC	YadF **12** 460(70)			
151			5/2	+3.4717 *6*	AB/D	PRSL **289A** 114(65)	+1.15 *9* ^{u}	O	PL **16** 156(65)
				+3.474 *1*	ENDOR	PRSL **267A** 283(62), Cf63 QuantE1 595	1.12 *7*	O	ZP **214** 332(68)
							1.16 *8*	O	ZP **183** 303(65)
	22	9.5 *5* ns	7/2	+2.591 *2* ^{f} [^{151}Eu]	ME	ZP **256** 155(72)	+1.47 *12* ^{f,u} [^{151}Eu]	ME	PR **186** 355(69), PL **30A** 124(69)
							1.54 *12* ^{f,u} [^{151}Eu]	ME	PL **38A** 427(72)
							1.50 *13* ^{f,u} [^{151}Eu]	ME	PR **187** 1503(69)
152		12.5 *2* y	3	−1.9414 *13* [^{151}Eu]	AB,O,R	PR **129** 1344(63), PL **31B** 295(70), ZP **245** 411(71)	+3.16 *35* ^{i,u} [^{151}Eu]	AB,O,R	PR **129** 1344(63), PL **31B** 295(70), ZP **245** 411(71)
153			5/2	+1.5330 *8*	AB/D	PRSL **289A** 114(65)	+2.94 *23* ^{u}	O	PL **16** 156(65)
				+1.534 *2*	ENDOR	PRSL **267A** 283(62), Cf63 QuantE1 595	2.85 *18*	O	ZP **214** 332(68)
							2.92 *20*	O	ZP **183** 303(65)
	83	0.75 *4* ns	7/2	+1.81 *6* [^{153}Eu]	ME	ZP **218** 223(69)			
	97	158 *13* ps	5/2	+3.22 *23* or −0.52 *23* ^{f} [^{153}Eu]	ME	PR **145** 915(66)			
	103	3.80 *2* ns	3/2	2.044 *6* ^{f} [^{153}Eu]	ME	ZP **256** 155(72)	1.54 *14* ^{f,u} [^{153}Eu]	ME	PL **28A** 528(69)
				2.047 *11* ^{f} [^{153}Eu]	ME	PL **28A** 528(69)			
				+1.07 *28* ^{b}	IPAC	IzF **35** 135(71), IzF **35** 2295(71)			
154		12.3 *3* y	3	2.005 *6* ^{f} [^{153}Eu]	EPR	PR **108** 58(57)	+3.9 *5* ^{u} [^{152}Eu]	NO/S, O,R	PR **128** 1733(62), PL **31B** 295(70), ZP **245** 411(71)
155	104	0.4 ns	5/2	+2.49 *27*	IPAC	IzF **35** 135(71), IzF **35** 2295(71)			
64 Gd 151	108	3.00 *10* ns	5/2	−1.72 *43*	IPAC	Cf74 Uppsala 113			
	395	0.31 *4* ns	3/2	−1.35 *41* or −2.24 *62*	IPAC	Cf74 Uppsala 113			
152	344	28.6 *20* ps	2	+0.856 *62* [^{154}Gd 123]	RIGV	NP **A151** 401(70)			
				+1.19 *25* ^{b}	IPAC	NP **A130** 541(69)			
154	123	1.17 *2* ns	2	+0.854 *28*	RIGV	NP **A151** 401(70)			
				0.880 *66* ^{f} [^{156}Gd 89]	DPAC	ZP **238** 69(70)			
				+0.75 *8*	IPAC	PR **128** 751(62)			
155			3/2	−0.2591 *5*	AB/D	JPBL **2** 122(69)	+1.59 *16* ^{u}	AB	JPBL **2** 122(69)
				−0.2592 *6*	ENDOR	JPCL **2** 862(69)	+1.1 *3* ^{u}	O	PR **101** 1725(56)
				−0.2574 *10*	ENDOR	JCP **49** 4880(68)			
	87	6.35 *9* ns	5/2	−0.532 *4* ^{f} [^{155}Gd]	ME	PL **43B** 380(73)	0.55 *6* ^{f,u} [^{155}Gd]	ME	Cf67 HypStr 245
				−1.01 *23* ^{b}	IPAC	NP **80** 608(66)	+0.14 *2* or −0.13 *2* ^{f,u} [^{155}Gd]	ME	PL **43B** 380(73)
				−0.955 *76*	DPAC	NP **80** 608(66)	−0.1 *3* ^{f,u} [^{155}Gd]	ME	ZP **212** 415(68)
				−0.98 *11* ^{b}	IPAC	IzF **35** 135(71)	+3.45 *52* ^{u} [^{155}Gd]	ME	YadF **9** 1116(69)
				+0.91 *14* ^{f} [^{155}Gd]	ME	ZETF **51** 95(66)			
	105	1.180 *20* ns	3/2	−0.52 *2* or +0.14 *2* [^{155}Gd]	ME	PL **43B** 380(73)	1.59 *17* or 1.84 *20* ^{f,u} [^{155}Gd]	ME	PL **43B** 380(73)
				+0.13 *4* or −0.39 *6* [^{155}Gd]	ME	PR **170** 1076(68)	$1.3<Q\lesssim1.6$ ^{f,u} [^{155}Gd]	ME	PR **170** 1076(68)
				+0.64 *17* ^{b}	IPAC	IzF **35** 135(71)			
				+0.068 *20*	IPAC	Cf74 Uppsala PD3			
156	89	2.15 *4* ns	2	0.790 *14* ^{i} [^{157}Gd]	ME	PL **27A** 189(68)	1.89 *21* ^{f,u} [^{155}Gd]	ME	Cf67 HypStr 245
				+0.690 *26* [^{154}Gd 123]	RIGV	NP **A151** 401(70)	1.70 *19* ^{f,u} [^{155}Gd]	ME	PR **158** 1118(67)
				0.598 *36*	CETD	PR **160** 866(67)			
				+0.67 *6* ^{b}	IPAC	PR **128** 751(62)			
	288	115 *3* ps	4	+1.48 *20*	IPAC	ZP **216** 459(68)			
				+1.68 *59* [^{156}Gd 89]	CEAD, ME	IzF **31** 55(67), PL **27A** 189(68)			
				+1.36 *32*	IPAC	IzUz **1970n5** 81(70)			
	1511	190 *6* ps	4	+3.12 *20* [^{156}Gd 288]	IPAC	ZP **216** 459(68)			
				2.72 *34*	IPAC	IzUz **1970n5** 81(70)			
157			3/2	−0.3398 *7* [^{155}Gd]	AB/D, ENDOR	JPBL **2** 122(69), JPCL **2** 862(69)	+2.03 *26* ^{f,u} [^{155}Gd]	O	ZETF **37** 882(59)
				−0.3396 *12*	ENDOR	JPCL **2** 862(69)	2.04 *26* ^{f,u} [^{155}Gd]	ME	ZP **212** 415(68)
				−0.3346 *10*	ENDOR	JCP **49** 4880(68)	1.69 *18* ^{f,u} [^{155}Gd]	EPR	PR **B3** 2141(71)
							+1.0 *3*	O	PR **101** 1725(56)
	64	0.46 *4* μs	5/2	−0.515 *7* [^{157}Gd]	ME	ZP **251** 185(72)	3.6 *5* ^{f,u} [^{157}Gd]	ME	ZP **212** 415(68)
158	80	2.56 *5* ns	2	0.722 *8*	ME	Th71 Rork	1.96 *15*	ME	Th71 Rork
				+0.654 *36* [^{154}Gd 123]	RIGV	NP **A151** 401(70)	1.83 *20* ^{f,u} [^{155}Gd]	ME	PR **158** 1118(67)
				0.636 *50*	CETD	PR **160** 866(67)			
				0.822 *47* ^{i} [^{155}Gd]	ME	ZP **207** 225(67)			
159		18.0 *1* h	3/2	−0.44 *3*	NO/S	PR **C4** 1942(71)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
64 Gd	160	75	2.70 *4* ns	2	+0.646 *30* [^{154}Gd 123]	RIGV	NP A151 401(70)	1.89 *23* [f,u] [^{155}Gd]	ME	PR 158 1118(67)
					0.612 *53*	CETD	PR 160 866(67)			
65 Tb	156		5.35 *10* d	(3)	1.41 *18*	NO/S	NP 30 452(62), Cf63 QuantE1 595	+1.40 *45* [u]	NO/S	NP 30 452(62), Cf63 QuantE1 595
	157		150 *30* y	3/2	2.0 *1* [^{159}Tb]	EPR	PR 170 1083(68)			
	158		150 *30* y	3	+1.758 *7* [^{159}Tb]	EPR	PR 170 1083(68)	+2.7 *5* [st]	NO/S, EPR	PR 170 1083(68)
	159			3/2	+2.014 *4*	EPR, ENDOR	PRSL 286A 352(65)	1.18 *12* [u]	O	Phca 46 119(70)
								+1.34 *11* [st]	AB	PR A2 316(70)
								+1.32 *13* [u]	O	JOSA 56 177(66)
		58	0.13 *4* ns	5/2	1.59 *8* [n]	IPAC	DUzb 1972n1 32(72)			
					1.62 *9* or 2.32 *13* [^{159}Tb]	ME	NP 89 433(66)			
	160		72.1 *3* d	3	+1.702 *8* [^{159}Tb]	EPR	PR 170 1083(68)	+3.0 *5* [st]	NO/S, EPR	PR 170 1083(68)
66 Dy	153		6.29 *10* h	7/2	−0.72 *9* [^{161}Dy]	AB	PScr 6 24(72)	−0.15 *8* [i,st] [^{161}Dy]	AB	PScr 6 24(72)
	155		10.3 *3* h	3/2	−0.34 *3* [^{161}Dy]	AB	PScr 6 24(72)	+0.94 *10* [i,st] [^{161}Dy]	AB	PScr 6 24(72)
					0.21 *5*	NO/S	PR 123 186(61)			
	157		8.06 *8* h	3/2	−0.30 *3* [^{161}Dy]	AB	PScr 6 24(72)	+1.27 *14* [i,st] [^{161}Dy]	AB	PScr 6 24(72)
					0.32 *2*	NO/S	PR 123 186(61)			
	158	317	75 *8* ps	4	+1.44 *24* [m]	IMPAC	PR C8 757(73)			
	160	87	2.05 *2* ns	2	+0.736 *22* [m]	DPAC	ZP 183 472(65)	1.76 *39* [u]	DPAC	ZP 238 35(70)
					+0.712 *34*	RIGV	NP A151 401(70)			
					+0.711 *38*	IPAC	ZP 183 472(65)			
					0.78 *5* [f] [^{161}Dy]	ME	NP 69 173(65)			
		284	92 *9* ps	4	+1.37 *20* [^{160}Dy 966]	IPAC	NInd 15B 343(72)			
		966	2.1 *6* ps	2	+0.36 *12*	IPAC	PL 28B 590(69)			
					+0.46 *22*	IPAC	PCan 24n3 18(68)			
	161			5/2	−0.4805 *51*	AB/D	Th72 Ferch	+2.44 *17* [st]	AB	Th72 Ferch
					−0.472 *13* [a]	R	ZP 208 184(68)	+2.37 *28* [st]	AB	PR A2 1692(70)
					−0.470 *25*	O	PR A7 416(73)	+2.33 *20* [st]	O	PR A7 416(73)
		26	29 *2* ns	5/2	+0.594 *7* [f] [^{161}Dy]	ME	Cf70 HypInt 613	2.44 *17* [f,st] [^{161}Dy]	ME	Cf70 HypInt 613
					+0.596 *7* [f] [^{161}Dy]	ME	PL 33A 219(70)	+2.46 *19* [f,st] [^{161}Dy]	ME	PPSL 91 612(67)
					+0.78 *9*	DPAC, IPAC	IzF 35 135(71)			
		44	0.78 *6* ns	7/2	−0.140 *5* [f] [^{161}Dy]	ME	PR C7 2056(73)	+0.51 *13* [f,st] [^{161}Dy]	ME	PR C7 2056(73)
		75	3.0 *2* ns	3/2	−0.409 *7* [f] [^{161}Dy]	ME	ZP 207 505(67)	1.42 *14* [f,st] [^{161}Dy]	ME	NP A110 577(68)
					−0.398 *7* [f] [^{161}Dy]	ME	NP A110 577(68)	+1.46 *16* [f,st] [^{161}Dy]	ME	ZP 207 505(67)
					−0.39 *6*	IPAC	IzF 35 135(71)	+1.17 *13* [f,st] [^{161}Dy]	ME	PPSL 91 612(67)
	162	81	2.25 *7* ns	2	+0.707 *50* [i,m] [^{160}Dy 87]	RIGV	NP A151 401(70)			
					0.732 *51*	CETD	PR 161 1185(67)			
					+0.95 *10* [i] [^{161}Dy]	ME	ZP 207 505(67)			
		E_n^{res}= 2.72 eV			g=−0.1 *2*	NRES	Cf74 Uppsala 120			
		E_n^{res}= 3.69 eV			g=−0.90 *45*	NRES	Cf74 Uppsala 120			
		E_n^{res}= 4.35 eV			g=+0.25 *60*	NRES	Cf74 Uppsala 120			
	163			5/2	+0.6726 *35*	AB/D	Th72 Ferch	+2.57 *17* [st]	AB	Th72 Ferch
					0.658 *37*	O	PR A7 416(73)	+2.51 *30* [st]	AB	PR A2 1692(70)
								+2.46 *21* [st]	O	PR A7 416(73)
	164	73	2.39 *4* ns	2	+0.684 *24* [^{161}Dy]	ME	ZP 208 184(68)	−2.03 *20* [f,st] [^{161}Dy]	ME	ZP 208 184(68)
					+0.752 *53* [i] [^{160}Dy 87]	RIGV	NP A151 401(70)			
					0.649 *51*	CETD	PR 161 1185(67)			
		E_n^{res}= 1.71 eV			g=+1.40 *25*	NRES	Cf74 Uppsala 120			
	165		2.334 *6* h	7/2	0.51 [k]	AB	PR 165 1360(68)	2.8 [k,u]	AB	PR 165 1360(68)
67 Ho	165			7/2	+4.173 *27*	AB/D,R	ZP 267 239(74)	+2.73 *6* [u]	AB	ZP 267 229(74)
								+2.4 [u]	AB	ZP 178 235(64)
		95	22 *1* ps	9/2	4.13 *17* [f] [^{165}Ho]	ME	ZP 257 29(72)			
	166	9	1200 *180* y	(7)	4.1 *6* [i] [^{165}Ho]	NO/S	Phca 25 671(59)			
68 Er	161		3.1 *1* h	3/2	−0.370 *5* [^{167}Er]	AB	NP A194 237(72)	+1.20 *9* [st] [^{167}Er]	AB	NP A194 237(72)
	163		75.1 *4* m	5/2	+0.57 *2* [^{167}Er]	AB	NP A194 237(72), PC74 Ekstrm	+2.2 *2* [st] [^{167}Er]	AB	NP A194 237(72)
	164	92	1.48 *8* ns	2	0.706 *20* [^{167}Er]	ME	ZP 208 184(68)			
	165		10.34 *5* h	5/2	0.66 *3* [j] [^{167}Er]	AB	PR 138 B1356(65)	2.2 *1* [j,u] [^{167}Er]	AB	PR 138 B1356(65)
	166	81	1.82 *2* ns	2	0.640 *16* [^{167}Er]	ME	ZP 208 184(68)	−1.9 *4* [st]	ME	ZP 182 499(65)
					0.627 *12* [f] [^{167}Er]	ME	PL 10 319(64)	−≈1.6 [u]	ME	PR 134 B503(64)
					0.665 *55*	CETD	PR 161 1185(67)			
					+0.607 *73*	IPAC,R	ZP 170 355(62)			
		265	119 *6* ps	4	+1.209 *69*	IPAC	JPJS 34 370(73)			
					+1.28 *16*	IMPAC	Cf67 HypStr 731			
					+1.10 *10* [b]	IPAC	ZP 174 389(63)			
		545	16 *2* ps	6	+1.78 *30* [^{166}Er 265]	IPAC	PScr 6 247(72)			
	167			7/2	−0.5665 *24*	AB/D	PPSL 86 1249(65)	+2.827 *12* [u]	AB,EPR	PPSL 86 1249(65), JPPa 27 313(66)
	168	80	1.97 *3* ns	2	0.666 *16* [^{167}Er]	ME	ZP 208 184(68)			
					+0.610 *20*	RIGV	NP A151 401(70)			
					0.696 *57*	CETD	PR 161 1185(67)			
					+0.54 *6* [b]	IPAC	ZP 170 355(62)			
		264	121 *8* ps	4	+1.21 *15* [i] [^{166}Er 265]	IMPAC	Cf67 HypStr 731			
		1095	107.3 *22* ns	(4)	+1.82 *8*	DPAC	PR C8 1920(73)			
		E_n^{res}= 0.46 eV			0.9 *4*	NRES	YadF 17 13(73)			
					−0.45 *74*	NRES	PR C1 726(70)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
68 Er	168	E_n^{res}= 0.58 eV			1.8 9	NRES	YadF 17 13(73)			
					+5.9 12	NRES	PR C1 726(70)			
	169		9.6 1 d	1/2	+0.515 25	AB/D	PR 131 1586(63)			
	170	79	1.90 2 ns	2	0.641 18 [f] [^{166}Er 81]	ME	PR 177 1786(69)	2.0 5 [f,st] [^{166}Er 81]	ME	PR 177 1786(69)
					+0.780 45 [i] [^{168}Er 80]	RIGV	NP A151 401(70)	−1.94 23	CER	PR C8 391(73)
					0.665 51	CETD	PR 161 1185(67)			
		261	≈135 ps	4	+1.11 15 [i] [^{166}Er 265]	IMPAC	Cf67 HypStr 731			
	171		7.52 3 h	5/2	0.70 5 [k] [^{169}Er]	AB	PR 135 B1281(64)	2.4 2 [k,u]	AB	PR 135 B1281(64)
69 Tm	163		1.82 8 h	1/2	0.081 2 [^{169}Tm]	AB	BAPS 12 1046(67)			
	166		7.70 8 h	2	+0.092 2 [^{169}Tm]	AB	NP A198 380(72)	+1.85 15 [st]	AB	NP A198 380(72)
					0.048 15 [^{169}Tm]	AB,R	ZP 199 244(67)	4.36 17 [u] [^{170}Tm]	AB	PR 127 1739(62), Cf63 QuantE1 595
	167		9.25 2 d	1/2	−0.197 2 [^{169}Tm]	AB	PC74 Ekstrm			
	169			1/2	−0.2316 15	AB/D	ZP 199 244(67)			
					−0.235 3	ENDOR	PRSL 285A 430(65)			
		8	3.9 2 ns	3/2	+0.540 11 [f] [^{169}Tm]	ME	ZP 172 231(63)	−1.3 1 [st]	ME	PR 134 A94(64)
					+0.514 15 [f] [^{169}Tm]	ME	PR 169 432(68)	−1.1 1 [st]	ME	ZP 175 416(63)
		118	62 3 ps	5/2	+0.743 54	IPAC	NP A123 386(69)			
					+0.80 8	IPAC	NP A119 417(68)			
		139	313 12 ps	7/2	+1.333 66	IPAC	NP A123 386(69)			
					+1.35 7	IPAC	NP A119 417(68)			
		316	650 ns	7/2	+0.156 8	DPAC	NP A181 298(72)			
		379	36 1 ns	7/2	0.963 75	DPAC	Cf67 KanpurA 435			
	170		128.6 3 d	1	0.2476 36 [j] [^{169}Tm]	AB,R	ZP 199 244(67)	0.574 9 [j,u]	AB	PR 120 920(60), Cf63 QuantE1 595
	171		1.92 1 y	1/2	0.2303 36 [^{169}Tm]	AB,R	ZP 199 244(67)			
		117	55 13 ps	5/2	+0.82 37	IPAC	NP A119 417(68)			
		129	362 15 ps	7/2	+1.46 14	IPAC	NP A119 417(68)			
70 Yb	169		31.8 2 d	7/2	0.63 9	NO/S	NP A197 352(72)			
	170	84	1.57 5 ns	2	0.675 12 [^{172}Yb 79]	ME	ZP 208 184(68)	2.12 36 [f,u] [^{172}Yb 79]	ME	NP A165 97(71)
					0.673 10 [f] [^{171}Yb]	ME	PL 15 269(65)			
					+0.67 4	CETD	PL 16 154(65)			
	171			1/2	+0.493695 8 [^{23}Na]	OP	ZP 249 205(72)			
					+0.4949 4 [^{35}Cl]	N	PR 133 A881(64)			
		67	0.87 10 ns	3/2	0.3488 24 [f] [^{171}Yb]	ME	PL 22 446(66)	1.59 27 [f,u] [^{170}Yb 84]	ME	NP A165 97(71)
					0.351 3 [^{171}Yb]	ME	PL 22 443(66)			
		76	1.7 3 ns	5/2	+1.015 5 [f] [^{171}Yb]	ME	PR C2 2414(70)	2.16 37 [f,u] [^{170}Yb 84]	ME	NP A165 97(71)
	172	79	1.80 5 ns	2	0.669 16 [^{171}Yb]	ME	ZP 208 184(68)	2.16 37 [u]	DPAC	ZP 238 35(70)
					+0.565 28	CETD	PR 141 1062(66)			
					+0.615 69	DPAC	PL 10 77(64)			
					+0.62 3 [b]	IPAC	DUzb 1972n1 32(72)			
		260	130 ps	4	+1.37 5	IPAC	DUzb 1972n1 32(72)			
		1172	7.78 22 ns	3	+0.650 42	DPAC	NP 61 65(65)	2.87 57 [u] [^{172}Yb 79]	DPAC	ZP 238 35(70)
					+0.62 9 [f] [^{172}Yb 79]	IPAC	ZP 242 292(71)	2.87 60 [f,u] [^{172}Yb 79]	DPAC	PRL 23 181(69), PR B1 1995(70)
	173			5/2	−0.679930 33 [^{23}Na]	OP	ZP 249 205(72)	+2.8 2 [st]	O	JPJa 19 249(64)
	174	77	1.79 5 ns	2	+0.676 8 [a]	ME	ZP 241 138(71)	2.12 36 [f,u] [^{170}Yb 84]	ME	NP A165 97(71)
					0.679 16 [^{170}Yb 84]	ME	ZP 208 184(68)	2.12 36 [f,u] [^{170}Yb 84]	ME	ZP 241 138(71)
					+0.500 26	CETD	PR 141 1062(66)			
	175		100.56 24 h	7/2	0.40 5	NO/S	NP A197 352(72)			
					0.29 3	NO/S,R	NP A197 352(72)			
	176	82	2.0 2 ns	2	0.675 30 [^{171}Yb 67]	ME	PR 163 1295(67)	2.22 38 [f,u] [^{170}Yb 84]	ME	PR 156 246(67)
					+0.605 30	CETD	PR 141 1062(66)			
71 Lu	175			7/2	+2.23799 6 [^{2}H]	N,AB	PR 126 1493(62), PR 126 240(62)	3.46 6	MH	HPAc 45 924(72)
					2.213 10	O	JOSA 61 1693(71)	+5.68 6 [u]	AB	PR 126 240(62)
		114	100 5 ps	9/2	+2.01 15	IPAC,R	PhSS 32 151(69)			
					+1.52 51 [b]	IPAC	NP 15 166(60)			
		251	42 ps	11/2	+2.0 7	IPAC	PL 21 659(66)			
	176		3.27 5 ×10^{10} y	7	+3.197 15 [e] [^{175}Lu]	AB	PPSL 79 787(62)	+8.0 7 [u]	AB	PPSL 79 787(62)
					+3.148 22 [f] [^{175}Lu]	O	JPPa 22 417(61)	+8.0 2 [f,u] [^{175}Lu]	O	JPPa 22 417(61)
		290	3.69 4 h	1	+0.319 3 [^{175}Lu]	AB	PR 137 B477(65)	−2.39 4 [u]	AB	PR 137 B477(65)
	177		6.74 4 d	7/2	+2.245 10 [^{175}Lu]	AB	PR 126 252(62)	+5.51 6 [u] [^{175}Lu]	AB	PR 126 252(62)
		122	116 ps	9/2	+2.21 78	IPAC	IzUz 1973n4 79(73)			
		970	161.0 3 d	23/2	2.75 21 [^{177}Lu]	NO/S	PR C10 825(74)			
72 Hf	168	≥1212	≈1 ps	≥8	g=0.07 4 [p]	IMPAC	PC74 Kalish			
	172	≥1033	≈0.5 ps	≥8	g=0.14 4 [p]	IMPAC	PC74 Kalish			
	175		70 2 d	5/2				+2.7 4	NO/S	PL 46B 62(73)
	176	88	1.39 5 ns	2	+0.539 41	CEAD	NP A109 201(68)			
	177			7/2	+0.7935 6	AB/D	PL 43B 479(73), ZP 260 157(73)	+4.5 5 [st]	AB	ZP 260 157(73)
		113	0.490 15 ns	9/2	+1.107 54	IPAC,R	PScr 6 177(72)			
		250	55 5 ps	11/2	+2.74 93 [i] [^{177}Hf 113]	IPAC,R	JPJS 34 430(73)			
		321	0.67 2 ns	9/2	−0.725 85	IPAC	NP A127 609(69)			
	178	93	1.47 3 ns	2	+0.480 28	CEAD	NP A109 201(68)			
					+0.60 4 [b]	IPAC	ArkF 22 257(62)			
					+0.731 71 [b]	IPAC	ZP 168 103(62)			

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
72 Hf	179			9/2	−0.6409 13	AB/D	PL 43B 479(73), ZP 260 157(73)	+5.1 5 st	AB	ZP 260 157(73)
	180	93	1.50 2 ns	2	+0.533 30	CEAD	NP A109 201(68)			
					+0.767 65 ^{b}	IPAC	ZP 165 57(61)			
		309	71 9 ps	4	+2.3 4 ^{b}	IPAC	ZP 165 57(61)			
		1142	5.5 1 h	8	+8.7 10 [^{180}Hf 93]	ME	PRL 27 1593(71)	+4.4 5	NO/S	PL 46B 62(73)
73 Ta	181			7/2	2.371 1	N	JCP 59 3911(73)	+3.9 ^{u}	O,R	OSpk 12 163(62)
					+2.370 1	N	PR 120 1812(60)			
		6	6.8 4 μs	9/2	+5.33 11 [^{181}Ta]	ME	PL 32B 364(70)	+4.4 5 ^{u} [^{181}Ta]	ME	PRL 28 952(72)
					+5.18 15 [^{181}Ta]	ME	PRL 21 961(68)			
		136	42 3 ps	9/2	+1.22 18	IPAC	CJP 49 2646(71)			
					+1.98 63	IPAC	Cf72 Kiev 150			
		482	10.8 2 ns	5/2	3.35 4	DPAC	PL 1 126(62)	+2.80 20 ^{i,u} [^{181}Ta]	DPAC	NP A208 503(73)
					3.24 5	CDPAC	NP 58 651(64)			
					+3.24 5	DPAC	NP 40 656(63)			
74 W	180	104	1.22 3 ns	2	0.516 34 ^{i} [^{182}W 100]	ME	ZP 262 413(73)			
	182	100	1.37 1 ns	2	+0.528 12	CEAD	CJP 50 736(72)			
					0.532 18 [^{183}W]	ME	PR 170 1066(68)			
					+0.520 22	RIGV	NP A151 401(70)			
					+0.484 41	CETD	NP 58 658(64)			
					+0.440 40	ME	PR 186 381(69)			
					+0.440 36	IPAC	AKyo 6 58(73)			
					+0.542 42 [^{184}W 111]	IMPAC	PR C9 2399(74)			
		329	64 ps	4	+0.88 17	IPAC	DUzb 1972n1 32(72)			
					+0.84 28 ^{b}	CEAD,R	NP A91 633(67), PRL 19 373(67)			
					+0.72 31 ^{i} [^{182}W 100]	CEAD	IzF 31 55(67)			
		1289	1.12 2 ns	2	+1.74 22	IPAC	NP A211 573(73)			
					+0.94 21 ^{b}	IPAC	PL 26B 583(68)			
					+0.66 3 ^{b}	IPAC	DUzb 1972n1 32(72)			
		1374	78 10 ps	3	0.96 27	IPAC	NP A187 49(72)			
					1.95 30 ^{b}	IPAC	NP A211 573(73)			
	183			1/2	+0.11777 1	N,O	BAPS 6 104(61), AnP s13v10 673(65)			
		47	184 5 ps	3/2	−0.1 1	ME	PR 155 1342(67)			
					−0.264 80 ^{n}		Cf72 Kiev 127			
		99	0.71 4 ns	5/2	0.930 43 [^{183}W]	ME,R	PR 170 1066(68)			
					+0.56 30	CEAD	NP A91 633(67)			
					+1.010 62 ^{n}		Cf72 Kiev 127			
	184	111	1.25 2 ns	2	+0.576 14	CEAD	CJP 50 736(72)			
					0.590 20 [^{183}W]	ME	PR 170 1066(68)			
					+0.417 32 ^{b}	CEAD	PR 127 929(62)			
					+0.64 8	DPAC	Bk64 PAC 200			
					+0.557 51	CETD	PR 137 B26(65)			
		364	43.5 ps	4	+1.27 10 ^{f} [^{184}W 111]	IPAC	BMBW-FB K70-09 22			
					+1.18 17 ^{f} [^{184}W 111]	IPAC	ZP 235 124(70)			
	186	122	1.01 4 ns	2	0.624 22 [^{183}W]	ME	PR 170 1066(68)			
					+0.653 40 ^{i} [^{182}W 100]	RIGV	NP A151 401(70)			
					0.711 61	CETD	PR 161 1185(67)			
					+0.722 36 [^{184}W 111]	IMPAC	PR C9 2399(74)			
	187		23.85 8 h	3/2	0.688 21	NO/S	PR C7 1555(73)			
75 Re	181		19.9 7 h	5/2	3.242 65	N/RD	Cf74 Uppsala 122			
	182	(0)^{r}	63.9 5 h	(6,7)	g=0.399 8	N/RD	Cf74 Uppsala 122			
	183		71 2 d	5/2	3.03 11	NO/S	NP A210 317(73)			
					3.30 13	NO/S	ZP 254 312(72)			
					(+)3.19 15	NO/S	PR C7 263(73)			
		496	7.89 16 ns	(9/2)	5.38 32	DPAC	Cf67 HypStr 183			
	184		38.0 5 d	3	2.499 51	N/RD	Cf74 Uppsala 124			
					2.53 9	NO/S	NP A210 317(73)			
					(+)2.48 12	NO/S	PR C7 263(73)			
		188	168 7 d	8	2.86 13	NO/S	NP A210 317(73)			
					(+)2.90 15	NO/S	PR C7 263(73)			
	185			5/2	+3.1872 3 [^{23}Na]	N	PR 82 105(51)	2.36 50 ^{u}	O	Nwis 56 84(69)
								+2.30 90 ^{u}	O	ZP 196 365(66), ZP 186 380(65)
		125	10.0 ps	7/2	+2.10 81 ^{n}		Cf72 Kiev 150			
	186		92.8 2 h	1	+1.739 3	AB/D	PR 138 B310(65)	≈0.4 [^{185}Re,^{187}Re]	O	ZP 196 365(66)
	187		4.3 5 ×10^{10} y	5/2	+3.2199 3 [^{23}Na]	N	PR 82 105(51)	2.24 50 ^{u}	O	Nwis 56 84(69)
								+2.20 90 ^{u}	O	ZP 196 365(66), ZP 186 380(65)
		134	9.9 ps	7/2	+1.92 88 ^{n}		Cf72 Kiev 150			
		206	563 8 ns	9/2	+4.73 14	DPAC	NP 49 161(63)	3.3 7 ^{u} [^{187}Re]	DPAC	JCP 58 3339(73)
					+4.70 18	DPAC	NP A164 411(71)			
					+5.09 6	DPAC	ZP 175 520(63)			
					+5.11 14	DPAC	NInd 15B 349(72)			
	188		16.98 2 h	1	+1.788 5	AB/D	PR 138 B310(65)	≈0.4 [^{185}Re,^{187}Re]	O	ZP 196 365(66)
76 Os	184	120	1.18 5 ns	2				−2.4 11	CER	PR C6 613(72)
	186	137	845 20 ps	2	0.562 16	ME	ZP 230 80(70)	−1.71 19 ^{f,u} [^{189}Os]	ME	ZP 254 112(72)
					+0.552 39 ^{b}	CEAD	NP A91 85(67)	−1.47 54	CER	PR C6 613(72)
					+0.641 57	IPAC	ZP 163 1(61)			
					+0.48 10	IMPAC	PR C6 2245(72)			
	187			1/2	0.0646517 4 [^{1}H]	N	ZP 213 482(68)			
					+0.0665 6 [^{189}Os]	O	JPJa 17 891(62)			
	188	155	698 11 ps	2	0.610 30	ME	ZP 230 80(70)	−1.55 17 ^{f,u} [^{189}Os]	ME	ZP 254 112(72)
					+0.58 2	RIGV,R	NP A151 401(70), PR C6 2245(72)	−1.32 23	CER	PR C6 613(72)
		633	5.6 6 ps	2	+0.85 16 ^{b}	IPAC	CJP 45 1597(67)			
					+1.15 28 ^{b}	IPAC	NP A91 692(67)			
	189			3/2	0.659933 4 [^{1}H]	N	PL 26A 258(68)	+0.91 10 ^{u}	O	ZP 211 68(68)
					+0.803	O	AnP s13v10 673(65)	+0.8 2 st	O	JPJa 17 891(62)

Nucleus Z El A			Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
76	Os	189	36	0.50 3 ns	1/2	+0.226 29 [^{189}Os]	ME	PL 28B 548(69)			
			70	1.63 4 ns	5/2	0.984 8^{f} [^{189}Os]	ME	ZP 254 112(72)	−0.67 7^{f,u} [^{189}Os]	ME	ZP 254 112(72)
						0.988 10 [^{189}Os]	ME	PR 174 1509(68)			
						+0.82 23^{b}	IPAC	IzF 35 2295(71)			
			95	<0.3 ns	3/2	−0.320 46	IPAC	IzF 35 2295(71)			
		190	187	370 23 ps	2	+0.709 57^{i} [^{188}Os 155]	RIGV	NP A151 401(70)	−1.34 17^{f,u} [^{189}Os]	ME	ZP 254 112(72)
						+0.78 6	IMPAC	PR C6 2245(72)	−0.95 21	CER	PR C6 613(72)
						+0.42 4	IPAC,R	NP A144 369(70), PL 39B 343(72)			
						0.662 32^{a}	MH	JPJS 34 586(73)			
			548	28 14 ps	4	+0.88 48	IPAC	NP A144 369(70)			
		192	206	287 11 ps	2	+0.797 36 [^{187}Os]	IPAC	PR C4 1382(71)	1.30 26^{f} [^{190}Os 187]	IMPAC	Cf70 HypInt 1037
						+0.556 38	IMPAC	Cf70 HypInt 129	−0.50 20	CER	PR C6 613(72)
						+0.78 6	IMPAC	PR C6 2245(72)			
						+0.764 77^{b}	CEAD	NP A91 85(67)			
						0.797 36^{a}	MH	JPJS 34 586(73)			
			489	31.6 20 ps	2	+0.56 20^{c}	IMPAC	Cf70 HypInt 129			
		193		30.6 4 h	3/2	1.30 19	NO/S	PR C7 1555(73)			
77	Ir	191			3/2	+0.1461 6^{l}	N	PR 165 506(68), PR 175 696(68)	0.78 20^{u}	AB	ZP 263 341(73)
						+0.147 8	ENDOR	JPCL 2 1405(69)	+1.5 10^{f} [^{193}Ir]	ME	PL 25B 253(67)
									1.6 11^{f} [^{193}Ir]	ENDOR	JPCL 2 1405(69)
									+1.2 6 [^{193}Ir]	O	PR 87 1048(52)
			82	3.8 4 ns	1/2	+0.540 5^{d,l} [^{193}Ir]	ME	ZP 207 500(67)			
						+0.515 25^{d,l} [^{191}Ir]	ME	PR 185 1555(69)			
			129	131 9 ps	5/2	+0.42 5^{b,l} [^{191}Ir]	IPAC	PR 185 1555(69)			
						+0.58 10 [^{193}Ir 139]	RIGV	NP A147 200(70)			
						+0.59 7^{b}	IPAC	IzUz 1973n4 79(73)			
			171	4.96 2 s	11/2	6.026 36^{d}	N/RD	PL 36B 328(71)			
			179	40 ps	3/2	+1.40 38	IPAC	IzUz 1973n4 79(73)			
		192		74.17 7 d	4	1.880 11^{d}	N/RD	PL 36B 328(71)			
						1.41 8^{d}	NO/S	NP A129 273(69)			
		193			3/2	+0.1591 6^{l}	N	PR 165 506(68), PR 175 696(68)	0.70 18^{u}	AB	ZP 263 341(73)
						+0.163 6	ENDOR	JPCL 2 1405(69)	+1.5 10	O	APLz s6v13 136(53)
									+1.0 5	O	PR 87 1048(52)
			73	6.2 2 ns	1/2	+0.504 3^{l} [^{193}Ir]	ME	PRL 23 680(69)			
			139	88 9 ps	5/2	+0.73 13	RIGV	NP A147 200(70)			
						+0.49 8^{b}	IPAC	ArkF 34 169(67)			
						+0.39 17^{b}	IPAC	IzUz 1973n4 79(73)			
			180	55 ps	3/2	+1.10 42	IPAC	IzUz 1973n4 79(73)			
		194		19.17 3 h	1	0.37 4^{d}	NO/S	NP A129 273(69)			
78	Pt	192	316	37.4 17 ps	2	+0.550 32	IPAC,R	JPJS 34 375(73), PR C6 1098(72)			
						0.685 75^{f} [^{196}Pt 356]	RIGV	ZP 254 339(72)			
			612	30 ps	2	+0.618 88	IPAC,R	JPJS 34 375(73), PR C6 1098(72)			
			784	12 2 ps	4	+0.56 40	IPAC	CJP 47 2395(69)			
		194	328	35.3 18 ps	2	+0.596 36	IPAC,R	JPJS 34 375(73), PR C6 1098(72)	+0.84 18	CER	PR 188 1905(69)
						+0.64 9^{b}	IMPAC,R	NP A137 500(69)	+0.77 50	CERP	PRL 30 453(73)
						+0.79$^{+36}_{-24}$^{b}	CEAD	NP 63 477(65)			
						0.640 60^{f} [^{196}Pt 356]	RIGV	ZP 254 339(72)			
			622	35 4 ps	2	+0.562 94	IPAC,R	JPJS 34 375(73), PR C6 1098(72)			
		195			1/2	+0.60952 6 [^{23}Na]	N	PR 81 20(51)			
			99	0.17 2 ns	3/2	−0.62 6 [^{195}Pt]	ME	PR 155 1339(67)			
						−0.60 15 [^{195}Pt]	ME	PR 163 286(67)			
						−0.65 15 [^{195}Pt]	ME	PL 21 699(66)			
			130	0.62 9 ns	5/2	0.90 8 [^{195}Pt]	ME	HPAc 46 735(74)			
						0.88 11 [^{195}Pt]	ME	NP A181 289(72)			
						+0.81$^{+15}_{-27}$ [^{195}Pt]	ME	ZP 246 123(71)			
			211	67 5 ps	3/2	+0.156 32	CEAD	PR C6 388(72)			
			239	97 14 ps	5/2	0.61 11^{i} [^{194}Pt 328]	RIGV	NP A185 403(72)			
						0.464 61^{b}	CEAD	PR C6 388(72)			
			259	4.020 9 d	13/2	0.597 15^{d}	N/RD	PRL 28 720(72)			
		196	356	30.1 12 ps	2	+0.646 40	IPAC,R	JPJS 34 375(73), PR C6 1098(72)	+0.56 18	CER	PR 188 1905(69)
						+0.69 15^{b}	IMPAC,R	NP A137 500(69)			
						0.632 76^{f} [^{194}Pt 328]	RIGV	NP A185 403(72)			
		198	408	17.7 ps	2	+0.56 8	IMPAC	PR 161 1196(67)	+1.22 50	CER	PR 188 1905(69)
						0.64 16^{f} [^{196}Pt 356]	RIGV	ZP 254 339(72)			
						0.60 16^{f} [^{194}Pt 328]	RIGV	NP A185 403(72)			
79	Au	190		43 1 m	1	0.066 [^{197}Au]	AB	PR 144 1020(66)			
						0.063 [^{197}Au]	AB	ArkF 25 107(64)			
		191		3.18 8 h	3/2	0.138 7 [^{197}Au]	AB	PR 135 A358(64)			
		192		5.03 10 h	1	0.0079 11^{i} [^{197}Au]	AB	UCRL-8756(59)			
		193		17.5 2 h	3/2	0.140 7 [^{197}Au]	AB	PR 135 A358(64)			
		194		39.5 5 h	1	0.074 4 [^{197}Au]	AB	PR 137 B1129(65)			
		195		182.9 5 d	3/2	0.148 7 [^{197}Au]	AB	PR 137 B1129(65)			
						0.137 40^{i} [^{198}Au,^{199}Au]	NO/S	PRSL 283A 379(65)			
		196		6.183 10 d	2	+0.5914 14	AB/D	PR C2 225(70)			
			595	9.7 1 h	12	5.35 20 [^{197}Au,^{198}Au]	NO/S	PL 37B 181(71)			

Nucleus Z El A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
79 Au 197			3/2	+0.145746 *9* [g]	AB/D	ZP 200 456(67)	0.594 *10* [u]	AB	PR 161 60(67), PR 141 176(66)
				+0.148158 *8* [h] [^{2}H]	N	PR 163 232(67), PR 175 696(68)	+0.56 *10*	O	APLz s6v13 158(53)
	77	1.892 *14* ns	1/2	0.420 *4* [d] [^{197}Au]	ME	Cf67 HypStr 557			
				+0.419 *5* [d] [^{197}Au]	ME	PR 171 343(68)			
198		2.697 *3* d	2	+0.5934 *4*	AB/D	PR 158 1078(67)			
	312	123 *4* ns	5	6.00 *40* [a]	DPAD	VDeu 6 530(70)			
	>697	2.27 *5* d	12	5.55 *34* [^{197}Au,^{198}Au]	NO/S	JPJS 34 243(73)			
199		3.148 *10* d	3/2	+0.2715 *7*	AB/D	PR 158 1078(67)			
200	≈1000	18.7 *5* h	12	6.10 *20* [^{197}Au,^{198}Au]	N/RD	PR C7 1654(73)			
80 Hg 181		3.6 *3* s	1/2	+0.507 *2*	OP/RD	PC73 Otten			
183		8.8 *5* s	1/2	+0.521 *9*	OP/RD	PL 38B 308(72)			
185		51 *2* s	1/2	+0.507 *4*	OP/RD	PL 38B 308(72)			
187		3.0 *2* m	3/2	−0.59 *3*	OP/RD	PL 36B 41(71)	≈1	OP/RD	PL 36B 41(71)
189		8.9 *5* m	3/2	−0.606 *6*	OP/RD	PC73 Otten			
193		3.5 *5* h	3/2	−0.62757 *18* [^{199}Hg]	OP	PR C4 620(71)	−2.0 *10* [^{201}Hg]	O	PR 147 861(66)
	141	11.1 *5* h	13/2	−1.058429 *3* [^{199}Hg]	OP,N	PR C7 2065(73)	+1.2 *1* [u] [^{201}Hg]	OL,O	PR A9 1776(74), NP 60 614(64)
				−1.0698 *55* [e] [^{199}Hg]	OL	PR 137 A330(65)			
195		9.5 *5* h	1/2	+0.541475 *1* [^{199}Hg]	OP,N	PR C7 2065(73)			
				+0.542272 *34* [e] [^{199}Hg]	OL	PR 137 A330(65)			
	176	40.0 *5* h	13/2	−1.044647 *3* [^{199}Hg]	OP,N	PR C7 2065(73)	+1.41 *55* [f,u] [^{201}Hg]	O	NP 60 614(64)
				−1.05565 *13* [e] [^{199}Hg]	OL	PR 137 A330(65)	1.5 *10* [u] [^{197}Hg 299]	O	JOSA 53 822(63)
197		64.14 *5* h	1/2	+0.5273741 *9* [^{199}Hg]	OP,N	PR C7 2065(73)			
	134	7.3 *2* ns	5/2	+0.965 *66*	DPAC	ZP 230 72(70)			
				1.12 *25*	DPAC	Cf74 Uppsala 100			
	299	23.8 *1* h	13/2	−1.027684 *3* [^{199}Hg]	OP,N	PR C7 2065(73)	+1.61 *13* [f,u] [^{201}Hg]	OD,OL	JOSA 51 1192(61)
				−1.0381 *8* [f] [^{199}Hg]	OD,OL	JOSA 51 1192(61)			
198	412	22 *1* ps	2	+1.12 *22*	IPAC	Cf64 NPPa2 481			
				+0.72 *12*	R	PR B7 4132(73)			
				+0.76 *22*	IPAC	PL 8 195(64)			
				0.81 *18* [i] [^{199}Hg 158]	RIGV	NP A221 13(74)			
199			1/2	+0.5058852 *9* [^{1}H]	OP,N	AnP s13v6 467(61)			
	158	2.32 *12* ns	5/2	+1.04 *8*	IPAC	PR 124 1897(61)	0.91 *12* [u] [^{201}Hg]	DPAC	JCP 58 3339(73)
	208	68 *4* ps	3/2	0.52 *16* [^{198}Hg 412]	IMPAC	NP A206 558(73)			
				>0.32	RIGV	NP A221 13(74)			
	532	42.6 *2* m	13/2	−1.014703 *3* [^{199}Hg]	OP,N	PR C7 2065(73)	+2.0 *13*	OP/RD	JPJS 34 317(73)
				−1.030 *6* [^{199}Hg]	O	PR C5 1397(72)			
200	368	41.6 *50* ps	2	+0.74 *18* [^{198}Hg 412]	IMPAC, R	PR B8 3093(73)			
				0.93 *18* [i] [^{199}Hg 158]	RIGV	NP A221 13(74)			
201			3/2	0.560225 *1* [^{199}Hg]	OP,N	PR C7 2065(73)	+0.50 *4* [u]	AB	PR 119 134(60)
				0.560226 *3* [^{1}H]	OP,N	AnP s13v6 461(61)	+0.50 *5* [u]	O	JPPa 18 193(57)
202	440	25.6 *31* ps	2	+1.10 *28* [^{198}Hg 412]	IMPAC, R	PR B8 3093(73)			
				1.15 *30* [i] [^{199}Hg 158]	RIGV	NP A221 13(74)			
203		47.0 *1* d	5/2	+0.84895 *13* [^{201}Hg]	OP,O	PL 31B 567(70), PL 8 257(64)	0.46 *4* [u] [^{201}Hg]	OL	PR A2 1135(70)
				0.856 *8* [d] [^{199}Hg]	OL	PR A2 1135(70)			
204	437	46.2 *51* ps	2	+0.66 *18* [^{198}Hg 412]	IMPAC, R	PR B8 3093(73)			
				0.77 *20* [i] [^{199}Hg 158]	RIGV	NP A221 13(74)			
205		5.2 *1* m	1/2	+0.6006 *5*	OP/RD	JPJS 34 317(73)			
81 Tl 194		33.0 *5* m	2	0.136 *3* [d] [^{205}Tl]	AB	Cf74 Uppsala 126			
195		1.16 *5* h	1/2	+1.58 *4* [^{205}Tl]	O	PR 188 1897(69)			
				+1.66 *12* [^{205}Tl]	AB	Cf74 Uppsala 126			
196		1.84 *3* h	2	0.0705 *2* [d] [^{205}Tl]	AB	Cf74 Uppsala 126			
197		2.84 *4* h	1/2	+1.58 *2* [^{205}Tl]	O	JOSA 56 1604(66)			
				+1.66 *12* [^{205}Tl]	AB	Cf74 Uppsala 126			
198		5.3 *5* h	2	0.001214 *2* [d] [^{205}Tl]	AB	Cf74 Uppsala 126			
	544	1.87 *3* h	7	0.64 *7* [d] [^{205}Tl]	AB	Cf74 Uppsala 126			
				≤0.08 [^{205}Tl]	O	PR 188 1897(69)			
199		7.42 *8* h	1/2	+1.60 *2* [^{203}Tl,^{205}Tl]	O	JOSA 51 1203(61), PR 122 1574(61)			
				+1.64 *10* [^{205}Tl]	AB	Cf74 Uppsala 126			
200		26.1 *1* h	2	−0.0359190 *30* [d] [^{205}Tl]	AB	Cf74 Uppsala 126			
201		73.5 *8* h	1/2	+1.61 *2* [^{203}Tl,^{205}Tl]	O	JOSA 51 1203(61), PR 122 1574(61)			
				1.69 *11* [^{205}Tl]	AB	Cf74 Uppsala 126			
202		12.4 *1* d	2	−0.0569 *2* [d] [^{205}Tl]	AB	Cf74 Uppsala 126			
	950	572 μs	7	+0.896 *42* [l]	DPAD	NP A218 180(74)			
203			1/2	+1.622257 *1* [^{1}H]	N	RSI 34 238(63), PR 79 35(50)			
	279	281 *4* ps	3/2	+0.16 *5*	IPAC	NP 61 582(65)			
				+0.36 *26*	NRF	PR 126 1168(62)			
204		3.773 *1* y	2	0.0908	AB	BAPS 3 415(58)			
	1118	63 *2* μs	7	+1.187 *6* [l]	DPAD	NP A195 577(72)			
205			1/2	+1.6382136 *1* [^{1}H]	N	RSI 34 238(63), PR 79 35(50)			
				1.6372 *9*	MB	ZP 179 285(64)			
	204	1.5 *1* ns	3/2	0.41 *5*	MH	NP A181 25(72)	0.74 *15*	MH	NP A181 25(72)
	2630	short	(5/2)	0.71 *15*	MH	NP A181 25(72)	−0.54 *20*	MH	NP A181 25(72)

Nucleus Z El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
82 Pb	200	2237	480 20 ns	9	−0.256 10 [l]	DPAD	Cf74 Uppsala 128, NP **A229** 230(74)			
					(−)0.27 3	DPAD	Cf74 Uppsala 129			
		3100	156 ns	12	−1.91 8	DPAD	Cf74 Uppsala 129			
	204	899	3.2 ps	2	<0.16	RIGV	NP **A221** 555(74)	+0.19 14	CER	NP **A221** 555(74)
		1274	280 12 ns	4	+0.230 8	DPAC	NP **46** 377(63)	0.3	DPAC	ZP **206** 29(67), Cf70 Delft 577
					+0.224 12	DPAC	ZP **206** 29(67)			
	205	1014	5.55 20 ms	13/2	−0.975 40 [l]	DPAD	NP **A176** 497(71)	0.27 5	QIR	Cf74 Uppsala IT1, Cf74 Uppsala 254
	206	803	8.9 ps	2	0.14^{+14}_{-5}	RIGV	NP **A221** 555(74)			
					−0.02 14	IPAC	NP **A146** 215(70)			
		2200	123 1 μs	7	−0.1519 28 [l]	SOPAD	NP **A186** 97(72)	0.30 6	QIR	Cf74 Uppsala IT1, Cf74 Uppsala 254
					−0.249 142	IPAD	ZNat **25a** 975(70)			
		2385	29 8 ps	(6)	+0.78 42	IPAC	NP **A146** 215(70)			
		4027	200 ns	12	−1.86 5 [l]	DPAD	NP **A189** 526(72)			
	207			1/2	0.58219 2 [^{199}Hg]	OP	PR **188** 180(69)			
					+0.592583 9 [^{2}H]	N	PL **35A** 397(71), PR **79** 35(50)			
		570	129 3 ps	5/2	+0.80 3	IPAC	JPJS **34** 271(73)			
					+0.66 5	DPAC	APAu **21** 43(66)			
					+0.66 10	IPAC	NP **86** 395(66)			
	208	2614	15 1 ps	3	+1.77 43	IPAC	PL **29B** 226(69)	−≈1	CER	JPJS **34** 389(73)
					+1.92 29	IPAC	JPJS **34** 271(73)			
					0.51 45 [b]	IPAC	BAPS **12** 539(67)			
		3198	297 17 ps	5	+0.106 35 [^{208}Pb 2614]	IPAC	NP **A138** 90(69)			
					0.215 50	IPAC	BAPS **12** 539(67)			
83 Bi	203		11.76 5 h	9/2	+4.62 5 [^{209}Bi]	AB	ArkF **15** 445(59)	−0.64 5 [u]	AB	ArkF **15** 445(59)
	204		11.22 10 h	6	+4.28 5 [^{209}Bi]	AB	ArkF **15** 445(59)	−0.41 5 [u]	AB	ArkF **15** 445(59)
	205		15.31 4 d	9/2	+≈5.5 [^{209}Bi]	AB	ArkF **15** 445(59)			
	206		6.243 3 d	6	+4.59 5 [^{209}Bi]	AB	ArkF **15** 445(59)	−0.19 5 [u]	AB	ArkF **15** 445(59)
		1043	0.88 ms	10	2.631 24 [l]	N/RD	PL **46B** 65(73)			
	207		30.2 5 y	9/2	4.100 12 [^{209}Bi]	O	JOSA **61** 218(71), PRL **32** 784(74)	−0.50 15	O	JOSA **61** 218(71), NP **A211** 381(73)
					4.63 25	NO/S	PRL **32** 784(74)			
		2102	182 μs	(21/2)	+3.41 6 [l]	SOPAD	NP **A186** 97(72)			
	208	1571	2.53 5 ms	(10)	2.666 27 [l]	N/RD	Cf74 Uppsala 130, NP **A227** 421(74)			
	209		2.0 8 ×10^{17} y	9/2	+4.1106 2 [^{2}H]	N	PR **89** 595(53), PR **81** 20(51)	−0.46 [u]	R	PScr **6** 37(72)
					4.28 14	AB	PR **A1** 1330(70)	−0.37 3	MH	NP **A181** 14(72)
					4.27 6	O	CJP **48** 730(70)	−0.37 4	O	CJP **45** 2249(67)
								−0.41 4	O	JOSA **60** 869(70)
		2563	0.014^{+21}_{-14} ps	(9/2)	3.52 70	MH	NP **A181** 14(72)	+0.11 5	MH	NP **A181** 14(72)
		2741	12 4 ps	(15/2)	6.2 12	MH	NP **A181** 14(72)	−0.03 40	MH	NP **A181** 14(72)
	210		5.013 5 d	1	−0.0446 1 [^{209}Bi]	AB, NO/S	PR **125** 256(62), JPJS **34** 113(73)	+0.13 1 [u]	AB, NO/S	PR **125** 256(62), JPJS **34** 113(73)
		433	56.8 11 ns	7	+2.11 5 [a]	DPAD	PRL **29** 496(72)			
		439	37.0 14 ns	5	+1.53 5 [a]	DPAD	PRL **29** 496(72)			
	211	405	315 20 ps	(7/2)	+4.53 71	IPAC	PL **19** 578(65)			
84 Po	204	≈1650	143 5 ns	8	+7.28 32 [l]	SOPAD	NP **A211** 381(73)			
					+7.38 10 [l]	SOPAD	NP **A206** 452(73)			
	205		1.80 4 h	5/2	+≈0.26	AB	ArkF **19** 469(61)	+0.17 [u]	AB	ArkF **19** 469(61)
		880	640 μs	13/2	−0.953 47	DPAD	Cf74 Uppsala 116			
	206	≈1590	212 5 ns	8	+7.24 14 [l]	SOPAD	NP **A211** 381(73)			
					+7.41 14 [l]	DPAD	NP **A211** 381(73)			
					+7.35 10 [l]	SOPAD	NP **A206** 452(73)			
	207		5.7 1 h	5/2	+≈0.27	AB	ArkF **19** 469(61)	+0.28 [u]	AB	ArkF **19** 469(61)
		1115	47 μs	13/2	−0.910 14 [l]	DPAD	PL **44B** 456(73)			
	208	≈1530	380 90 ns	8	+7.29 9 [l]	SOPAD	NP **A211** 381(73)			
	209		102 5 y	1/2	+≈0.77	O	JOSA **56** 1292(66)			
		1473	98.1 16 ns	(17/2)	+7.62 13 [l]	SOPAD	NP **A211** 381(73), NIM **114** 349(74)			
					7.65 43 [a]	DPAD	NIM **111** 125(73)			
	210	1473	41.4 ns	6	+5.58 12 [l]	SOPAD	NIM **114** 349(74)			
					+5.56 12 [l] [^{210}Po 1557]	DPAD	PL **43B** 483(73)			
		1557	112 ns	8	+7.27 9 [l]	DPAD	PL **43B** 483(73)			
					+7.28 11 [l]	SOPAD	NIM **114** 349(74)			
		2849	24 ns	11	+12.18 21 [l]	DPAD	SJap **66** 39(72)			
		4372	93 ns	13	+7.10 16 [l]	DPAD	PL **44B** 440(73)			
	211	1065	16 2 ns	(15/2)	−0.39 15	IPAD	JPJS **34** 287(73)			
85 At	210	2549	0.75 10 μs	(15)	+15.7 3 [l]	SOPAD	PScr **5** 27(72)			
	211	1416	50 ns	(21/2)	+9.42 17 [a]	DPAD	JPJS **34** 288(73)			
					9.66 26 [a]	DPAD	BAPS **17** 927(72)			
		2641	70 ns	(29/2)	+14.9 6 [a]	DPAD	JPJS **34** 289(73)			
		4816	4.2 4 μs	(39/2, 41/2)	g=0.73 7	DPAD	JPCo **32** C6−221(71)			
86 Rn	212	≈1700	1.0 1 μs	(8)	+7.2 3	DPAD	JPCo **32** C6−221(71)			
	222	186	0.32 2 ns	2	+0.92 14	IPAC	NP **A148** 516(70)			
87 Fr	213	2535	≈0.5 μs	(29/2)	15.1 3 [l]	SOPAD	Cf73 Munich1 268			
88 Ra	214	>1810	67 μs	(8)	7.21 3	N/RD	Cf73 Munich1 266			
	223	50	0.63 7 ns	3/2	+0.43 6	IPAC	PR **C2** 672(70)			
	224	84	0.74 2 ns	2	+0.92 22	IPAC	ZP **260** 57(73)			

Nucleus Z	El	A	Level energy	Half-life	Spin	μ [Standard] (nm)	Method (μ)	Reference (μ)	Q [Standard] (b)	Method (Q)	Reference (Q)
89	Ac	227		21.773 3 y	3/2	+1.1 1	O	PR 98 1514(55), PR 11 1747(58)	+1.7 2	O	PR 98 1514(55), PR 111 1747(58)
90	Th	229		7340 160 y	5/2	+0.46 4 [^{239}Pu]	O	JPPa 35 483(74)	+4.3 9	O	JPPa 35 483(74)
						+0.42 10	O	OSpk 16 549(64)	≈4.6	O	OSpk 16 549(64)
						+0.35 7	O	ND A5 433(69), PC64 Tomkns			
91	Pa	231		3.234 23 ×10^4 y	3/2	2.01 2	ENDOR	PR 121 1630(61)			
		233		26.95 6 d	3/2	+3.5 8	AB	NP 23 90(61)	−3.0	AB	NP 23 90(61)
92	U	233		1.553 10 ×10^5 y	5/2	+0.55	EPR	PR 105 1307(57), JCP 29 754(58), ORNL–2236 35(56)	+3.5	EPR	PR 105 1307(57), JCP 29 754(58), ORNL–2236 35(56)
						0.75	O	JPCo 30 Cl–78(69)	7.9	O	JPCo 30 Cl–78(69)
		235		7.13 9 ×10^8 y	7/2	−0.35	ENDOR, NO/D	PC70 Lerner, JCP 53 809(70), NP A218 84(74)	4.55 9	MH	JPJS 34 582(73)
						−0.36	EPR	PR 105 1307(57), JCP 29 754(58), ORNL–2236 35(56)	+4.1	EPR	PR 105 1307(57), JCP 29 754(58), ORNL–2236 35(56)
93	Np	237		2.14 1 ×10^6 y	5/2	+3.14 4	EPR,R	JCP 53 809(70)	+4.1 7 [u] [^{241}Am]	R	PR 186 1296(69)
						+3.3 9	EPR,R	JNBS 69A 217(65)			
						+≈2.9	ME	PR 165 1319(68)			
			60	63 5 ns	5/2	+1.68 3 [f] [^{237}Np]	ME	PR 171 316(68), JCP 53 809(70)	+4.1 8 [f,u] [^{237}Np]	ME	PR 171 316(68), PR 186 1296(69)
						+1.95 15	DPAC	NP A104 588(67)			
		239	75	1.40 6 ns	5/2	+2.03 25 [^{237}Np 60]	IPAC	NP A104 588(67)			
94	Pu	237	fiss. isom.	100 ns		g=+0.52 5	DPAD	Cf74 Uppsala 132			
			fiss. isom.	1.1 μs		g=+0.16 2	DPAD	Cf74 Uppsala 132, PRL 32 1009(74)			
		239		2.439 3 ×10^4 y	1/2	+0.203 4	AB/D	PL 16 71(65)			
			286	1.12 5 ns	5/2	−1.25 29	IPAC	PR C9 1515(74)			
		241		14.89 11 y	5/2	−0.683 15 [^{239}Pu]	O	Phca 42 581(69)	+5.6 20 [u]	O	JPPa 25 825(64)
						−0.728 17 [^{239}Pu]	ENDOR	PL 33A 233(70)			
						−0.714 19 [f] [^{239}Pu]	EPR	JCP 60 607(74)			
95	Am	241		432.7 7 y	5/2	+1.61 3	AB/D	PR 144 994(66)	+4.9 [u]	O	PR 102 1108(56)
		242		16.01 2 h	1	+0.3878 15	AB/D	PR 144 994(66)	−2.76 [u] [^{241}Am]	AB	PR 124 1904(61), PR 144 994(66)
		243		7370 40 y	5/2	+1.61 4 [f] [^{241}Am]	O	PR 102 1108(56), PR 144 994(66)	+4.9 [u] [^{241}Am]	O	PR 102 1108(56)
96	Cm	243		28.5 8 y	5/2	0.41 [^{241}Am]	EPR	PL 44A 527(73)			
		245		8542 53 y	7/2	0.5 1 [^{241}Am]	EPR	PR B1 3555(70)			
		247		1.56 5 ×10^7 y	9/2	0.37 [^{241}Am]	EPR	PL 44A 527(73)			
97	Bk	249		314 8 d	7/2	2.0 4 [^{241}Am]	EPR	PL 42A 93(72)	+5.79 [n]		PC72 Bemis, PL 42A 93(72)
99	Es	253		20.47 2 d	7/2	4.10 7 [a]	AB/D	PC73 Goodmn	6.13 [u]	AB	PC73 Goodmn
						(+)3.72 51	EPR	JCP 54 2488(71)			
						+5.2 13	O	JOSA 60 1297(70)			
		254	78	39.3 2 h	2	2.87 6 [a]	AB/D	PC73 Goodmn	3.39 [u]	AB	PC73 Goodmn

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a Reported as published by the original authors. Corrections, as described in the Introduction, were not made because the authors made their own correction analysis (often including other effects).
b Lifetime–dependent value recalculated for consistency with the listed half–life
c Lifetime–dependent value not necessarily consistent with the listed half–life. (Adequate information was not reported.)
d Subject to a hyperfine anomaly correction
e Calculated with the use of a hyperfine–structure ratio and the magnetic moment value of the listed standard. No additional error allowance was made for hyperfine–structure–anomaly effects.
f Calculated with the use of a moment ratio and the magnetic or quadrupole moment value of the listed standard.
g Calculated from a reported value of g_I and the values of the Bohr and Nuclear magnetons in JPCR 2 663(73)
h Does not include a Knight–shift correction
i Recalculated for consistency with the listed standard
j $\mu/Q > 0$ (Signs of μ and Q are the same.)
k $\mu/Q < 0$ (Signs of μ and Q are different.)
l Includes estimated Knight–shift correction
m g–factors for ground–state band are approximately constant for levels with spins up to and including I=8.
n No experimental details available
p Average value for "prerotational" states above listed energy. Half–life value is an approximate estimate based on theory.
q Recalculated for consistency with the listed (newly–reported) spin value
r Relative positions of isomers unknown
st "Sternheimer" or other polarization correction included
u No polarization correction included

Journal–Code List

AdNP	Advan. Nucl. Phys. (Ed: M. Baranger and E. Vogt, Plenum Press, New York)
AKyo	Annu. Rep. Res. Reactor Inst., Kyoto Univ.
AnP	Ann. Phys. (Paris)
APAu	Acta Phys. Austr.
APLz	Ann. Phys. (Leipzig)
APPo	Acta Phys. Pol.
ArkF	Ark. Fys. (superseded by Phys. Scr.)
AR67 HahMt	Hahn–Meitner–Inst. fuer Kernforschung, Berlin, Annual report (1967)
AR69 HahMt	Hahn–Meitner–Inst. fuer Kernforschung, Berlin, Annual report (1969)
AR71 HahMt	Hahn–Meitner–Inst. fuer Kernforschung, Berlin, Annual report (1971)
BAPS	Bull. Am. Phys. Soc., Ser. II
Bk64 PAC	E. Karlsson, E. Matthias, and K. Siegbahn (editors), Perturbed Angular Correlations; North–Holland Publ. Co., Amsterdam (1964)
BMBW–FB	Bundesministerium fuer Bildung und Wissenschaft, Report
BMwF–FB	Bundesministerium fuer wissenschaftliche Forschung, Report
Cf63 QuantE1	Proc. 3rd Internatl. Congr. Quantum Electronics, Vol. 1, Paris (1963); Ed: P. Grivet and N. Bloembergen, Columbia Univ. Press, New York (1964)
Cf64 NPPa2	Compt. Rend. Congr. Internatl. Phys. Nucl., Vol. 2, Paris (1964); Ed: P. Gugenberger, Centre Nat. de la Recherche Sci., Paris (1964)
Cf66 Paris	Proc. Colloq. Internatl. Sur la Structure Hyperfine Magnetique des Atomes et des Molecules, Paris (1966); Centre Nat. de la Recherche Sci., Paris (1967)
Cf67 HypStr	Proc. Internatl. Conf. Hyperfine Structure and Nuclear Radiations, Asilomar, Pacific Grove, Calif. (1967); Ed: E. Matthias and D.A. Shirley, North–Holland Publ. Co., Amsterdam (1968)
Cf67 KenpurA	Proc. 11th Nucl. Phys. and Solid State Phys. Symp., Pt. A, Nucl. Phys., Kanpur (1967); published by Dept. of Atomic Energy, Bombay (1967)
Cf69 Heidlb	Proc. Internatl. Conf. Nucl. Reactions Induced by Heavy Ions, Heidelberg (1969); Ed: R. Bock and W.R. Hering, North–Holland Publ. Co., Amsterdam (1970)
Cf69 MntrlC	Contributions to Internatl. Conf. Properties of Nuclear States, Montreal (1969); Ed: M. Harvey, R.Y. Cusson, J.S. Geiger, and J.M. Pearson, Univ. of Montreal Press (1969)
Cf70 Delft	Proc. Internatl. Conf. Angular Correlations in Nuclear Disintegration, Delft (1970); Ed: H. van Krugten and B. van Nooijen, Rotterdam Univ. Press, Wolters–Noordhoff Publ., Groningen (1971)
Cf70 HypInt	Proc. Internatl. Conf. Hyperfine Interactions in Excited Nuclei, Rehovot (1970); Ed: G. Goldring and R. Kalish, Gordon and Breach Science Publ., New York, London, Paris (1971)
Cf71 Predeal	Summer School on Interaction of Radiation with Matter, Predeal, Roumania (1971); to be published in Rev. Roum. Phys.
Cf72 Kiev	Proc. 22nd Annual Conf. Nucl. Spectroscopy and Structure of Atomic Nuclei, Kiev (1972)
Cf73 Munich1	Proc. Internatl. Conf. Nuclear Physics, Vol. 1, Munich (1973); Ed: J. de Boer and H.J. Mang, North–Holland Publ. Co., Amsterdam, London, American Elsevier Publ. Co., Inc., New York (1973)
Cf74 Uppsala	Contributed papers to Internatl. Conf. Hyperfine Interactions Studied in Nuclear Reactions and Decay, Uppsala (1974); Ed: E. Karlsson and R. Wappling, Upplands Grafiska AB, Uppsala (1974)
CJP	Can. J. Phys.
CPL	Chem. Phys. Lett.
DUzb	Dokl. Akad. Nauk Uzb. SSR
HPAc	Helv. Phys. Acta
IApP	Indian J. Pure Appl. Phys.
InJP	Indian J. Phys.
IzF	Izv. Akad. Nauk SSSR, Ser. Fiz. (Trans.: Bull. Acad. Sci. USSR, Phys. Ser.)
IzUz	Izv. Akad. Nauk Uzb. SSR, Ser. Fiz.–Mat. Nauk
IzVU	Izv. Vyssh. Ucheb. Zaved., Fiz. (Trans.: Soviet Physics Journal)
JCP	J. Chem. Phys.
JDal	J. Chem. Soc., Dalton Trans. (supersedes in part J. Chem. Soc. (London))
JINC	J. Inorg. Nucl. Chem.
JNBS	J. Res. Nat. Bur. Stand.
JOSA	J. Opt. Soc. Amer.
JPAL	J. Phys., A (London) (supersedes in part Proc. Phys. Soc. (London))
JPBL	J. Phys., B (London) (supersedes in part Proc. Phys. Soc. (London))
JPCL	J. Phys., C (London) (supersedes in part Proc. Phys. Soc. (London))
JPCo	J. Phys. (Paris), Colloq.
JPCR	J. Phys. Chem. Ref. Data
JPJa	J. Phys. Soc. Jap.
JPJS	J. Phys. Soc. Jap., Suppl.
JPPa	J. Phys. (Paris) (name changed from J. Phys. Radium, 1963)
ND	Nucl. Data (Section A: Nuclear Data Tables – superseded by At. Data and Nucl. Data Tables; Section B: Nuclear Data Sheets – supersedes looseleaf Nucl. Data Sheets)
NIM	Nucl. Instrum. Methods (name changed from Nucl. Instrum. as of volume 4, 1959)
NInd	Nucl. Phys. and Solid St. Phys. (India), Section B, Nucl. Phys.
NP	Nucl. Phys.
Nwis	Naturwissenschaften
ORNL–	Oak Ridge National Lab., Oak Ridge, Tenn., Report
OSpk	Opt. Spektrosk. (Trans.: Optics and Spectroscopy (USSR))
PCan	Phys. Can.
PC59 Stroke	H.H. Stroke, private communication to G.H. Fuller and V.W. Cohen (1959), quoted in ND **A5** 433
PC64 Tomkns	F.S. Tomkins, private communication to G.H. Fuller and V.W. Cohen (Aug., 1964), quoted in ND **A5** 433
PC68 Wadding	J.C. Waddington, private communication to G.H. Fuller and V.W. Cohen (1968), quoted in ND **A5** 433
PC70 Lerner	N.R. Lerner and C.A. Hutchison, Jr., unpublished data (1970), quoted in JCP **53** 809
PC72 Bemis	C.E. Bemis, Jr., private communication to L.A. Boatner, R.W. Reynolds, C.B. Finch, and M.M. Abraham (1972), quoted in PL **42A** 93
PC72 Borchrs	R.R. Borchers, private communication to Nuclear Data Group (May, 1972), quoted in ND **B7** 465
PC73 Boekln	K.D. Boeklen, private communication to C.–W. Burges, R. Koschmieder, W. Sahm, and A. Schwenk (1973), quoted in ZNat **28a** 1753
PC73 Goodmn	L.S. Goodman, H. Diamond, and H.E. Stanton, private communication (1973)
PC73 Otten	E.W. Otten, private communication (Dec., 1973)
PC74 Ekstrm	C. Ekstrom, private communication (June, 1974) (summary of results of atomic–beam groups at Goteborg and Uppsala)
PC74 Fuller	G.H. Fuller, preprint, to be published in J. Phys. Chem. Ref. Data (1974)
PC74 Kalish	R. Kalish, private communication (Aug., 1974)
PC74 Laurnz	R. Laurenz, E. Klein, and W.D. Brewer, private communication (June, 1974)
PC74 Raghavn	R.S. Raghavan and P. Raghavan, private communication to T. Badica, et al., quoted in NP **A222** 168
PC74 Spell1	B. Spellmeyer, private communication (Oct., 1974) (erratum for NP **A222** 399)
PC74 Spell2	B. Spellmeyer, private communication (Oct., 1974) (erratum for ZP **270** 203)
PC74 Tandon	P.N. Tandon, private communication (June, 1974)
Phca	Physica
Phil	Phil. Mag.
PhSS	Phys. Status Solidi
PL	Phys. Lett.
PPSL	Proc. Phys. Soc. (London) (superseded by J. Phys., A,B,C (London))
PR	Phys. Rev.
PRL	Phys. Rev. Lett.
PRSL	Proc. Roy. Soc. (London), Ser. A
PScr	Phys. Scr. (supersedes Ark. Fys.)
RMP	Rev. Mod. Phys.
RRou	Rev. Roum. Phys.
RSI	Rev. Sci. Instrum.
SJap	Sci. Pap. Inst. Phys. Chem. Res. (Jap.) (supersedes J. Sci. Res. Inst. (Japan))
SSC	Solid State Commun.
Th66 Connors	P.I. Connors, Thesis, Pennsylvania State Univ. (1966)
Th68 Casserb	B.R. Casserberg, Thesis, Princeton Univ. (1968)
Th69 Morgen	J. Morgenstern, Thesis, Hamburg Univ. (1969)
Th70 Jaesch	E.J. Jaeschke, Thesis, Univ. of Erlangen (1970)
Th71 Bloch	D. Bloch, Thesis, Univ. of Erlangen (1971)
Th71 Rork	E.W. Rork, Thesis, Ohio State Univ. (1971)
Th72 Ferch	J. Ferch, Thesis, University of Bonn (1972)
Th73 Daly	P.W. Daly, Thesis, Univ. of British Columbia (1973)
UCRL–	Univ. of California Radiation Lab., Report (superseded in part by LBL– for Lawrence Berkeley Lab. Reports)
VDeu	Verh. Deut. Phys. Ges.
WIS–	Weizmann Inst. of Science, Rehovoth, Israel, Report
YadF	Yadern. Fiz. (Trans.: Sov. J. Nucl. Phys.)
ZETF	Zh. Eksp. Teor. Fiz. (Trans.: Sov. Phys. JETP)
ZhPi	Zh. Eksp. Teor. Fiz., Pis'ma Red. (Trans.: JETP Lett.)
ZNat	Z. Naturforsch.
ZP	Z. Phys.