Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 172,1 (2021)	31-Jan-2021

Q(β^-)=−172.1 *14*; S(n)=8294.2 *4*; S(p)=11147 *12*; Q(α)=−3179.1 *3* 2017Wa10
S(2n)=14219.7 *3*, S(2p)=19484 *8*, Q($2\beta^-$)=3034.36 *17* (2017Wa10).
Other reactions:
Giant-dipole resonances, (γ,X) reactions: 1980St26, 1974Be33, 1974Ca05. (p,p′) reaction at E(p)=200 MeV (1982Dj04). Additional information 1.
Giant-quadrupole resonances, ^{100}Mo(α,α'), ^{100}Mo(^{3}He,^{3}He′): 1976Yo02, 1978Mo10, 1979Mo12. Resonance at 13.76 MeV with Γ=5.2 MeV.
Low energy octupole resonances, ^{100}Mo(α,α'): 1978Mo10.
^{100}Mo(^{20}Ne,F) E=146 MeV: 1984Na12.
^{100}Mo(^{58}Ni,^{58}Ni) E=137.5 MeV: 1995Re06, measured $\sigma(\theta)$.
^{100}Mo(^{32}S,^{32}S): 1995He17, measured cross section.
^{100}Mo(^{14}C,^{14}C′) E=71 MeV: 1982Ma30, $\sigma(\theta)$ for g.s. and first 2^+.
^{100}Mo(^{12}C,^{12}C′) E=48 MeV: 1981Vi01, 1980Lo01.
^{100}Mo(e,e′) E=120, 200, 274 MeV: 1975Dr06, charge radii and charge distributions deduced. Other: 1972EhZZ.
^{100}Mo(t,t) E=12 MeV: 2006Ch64, measured $\sigma(\theta)$, deduced optical model parameters.
Mesic atoms, ^{100}Mo(μ^-,X): 1978Du21, 1980Sc01. Theory: 1980Ba56, 1976Le08.
Antiprotonic atoms, ^{100}Mo(antiproton,x): 1999Sc35, 1994Ha51, 1986Ka08, 1985Kl02.
Isotope-shift measurements: 1986Ol03, 1985Go10, 1984Br09, 1978Au05.
Mass measurements: 2015Gu09, 2012Ka13, 2008Ra09, 2006Jo14, 2004Ko42, 1963Bi12, 1963Ri07.

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Measurements of half-life of $\beta\beta$ decay of ^{100}Mo:

$T_{1/2}(2\nu\beta\beta)$(to ^{100}Ru g.s.): 7.12×10^{18} y *+21−17* (2020Ar09, CUPID-Mo, Modane, earlier value of 6.90×10^{18} y *15*(stat) *37*(syst) in 2017Ar18); 6.81×10^{18} y *1*(stat) *+38−40*(syst) (2019Ar04, earlier value: 7.17×10^{18} y *1*(stat) *54*(syst) in 2011Fl06, NEMO-3, also 2006Ar01,2005Ar27,2005Sa07, 2005Si06, 2004Ar29); 7.15×10^{18} y *37*(stat) *66*(syst) (2014Ca46, NIIC, Russia); 2.1×10^{18} y *3* (2004Hi19, geochemical); 7.6×10^{18} y *+22−14* (1997Al02); 11.5×10^{18} y *+30−20* (1991Ej05,1996Ej04, 1991Ej02); 9.5×10^{18} y *4* (stat) *9* (syst) (1995Da37, NEMO-2); 11.6×10^{18} y *+34−8* (1991El04, also 1987El13); 0.33×10^{19} y *+20−10* (1990Va10). A small contribution of ≈1% to total half-life is made by $T_{1/2}(2\nu\beta\beta)$(to 1130,0^+ level in ^{100}Ru)=7.5×10^{20} y *6*(stat) *6*(syst) (2014Ar08); 6.9×10^{20} y *+10−8*(stat) *7*(syst) (2010Be34); 5.7×10^{20} y *+15−12* (2007Ar02); 6.0×10^{20} y *+20−13* (2009Ki04,2006Ho17,2006Ba35); 6.1×10^{20} y *+18−11* (1995Ba29). Decay modes of $2\nu\beta\beta$ to other excited states in ^{100}Ru, and $0\nu\beta\beta$ modes make almost no contributions.

$T_{1/2}(0\nu,\beta\beta$ to g.s.): >2.6×10^{22} y (2017Ar18); >1.1×10^{24} y (2014Ar08,2011Ba55,NEMO-3, 90% εL; also >1.0×10^{24} y in 2012Si23 and 2011Fl06), >4.6×10^{23} y (2005Ar27,NEMO-3); >5.5×10^{22} y (2002Fu05,2001Ej03,ELEGANT-5); >4.9×10^{21} y (2001As06, 2001As05); >2.2×10^{22} y (1997Al02); >5.2×10^{22} y (1996Ej04); >1.2×10^{22} y (1995Da37).
$T_{1/2}(0\nu,\beta\beta$, Majorana neutrino to g.s.)>5.4×10^{21} y (1996Ej04,1991Ej02), >7.5×10^{20} y (1995Da37).
Planned $T_{1/2}(0\nu,\beta\beta)$ experiment: CROSS collaboration at Canfranc Underground Laboratory described in a review article by 2020Ce04, and by I.C. Bandac et al., Jour. High Energy Physics 1, 18 (2020).
$T_{1/2}(0\nu,\beta\beta$,Majorana neutrino emission)>2.7×10^{27} y (2006Ar01).

$T_{1/2}(2\nu+0\nu,\beta\beta$ to 539,2^+ level)>25×10^{20} y (2014Ar08).
$T_{1/2}(2\nu,\beta\beta$ to 539.5,2^+ level)>11×10^{20} y (2007Ar02) (90% confidence limit); >16×10^{20} y (1995Ba29); >5×10^{20} y (1992Bl06).
$T_{1/2}(0\nu,\beta\beta$ to 539.5,2^+ level)>1.6×10^{23} y (2007Ar02) (90% confidence limit); >1.1×10^{21} y (1995Da37).

$T_{1/2}(2\nu,\beta\beta$ to 1130,0^+ level)=7.5×10^{20} y *6*(stat) *6*(syst) (2014Ar08).
$T_{1/2}(2\nu+0\nu,\beta\beta$ to 1130,0^+ level)=6.9×10^{20} y *+10−8*(stat) *7*(syst) (2010Be34).
$T_{1/2}(0\nu+2\nu)$=6.0×10^{20} y *+20−13* (2009Ki04,2006Ho17) for decay to the 1130, 0^+ state. The statistical uncertainty of +1.9−1.1 and systematic uncertainty of 0.6 have been combined in quadrature. Earlier value from the same group=5.9×10^{20} y *+18−13* in 2001De17.
$T_{1/2}(2\nu,\beta\beta$ to 1130,0^+ level)=5.7×10^{20} y *+15−12* (2007Ar02) (90% confidence limit); 6.1×10^{20} y *+18−11* (1995Ba29);

Adopted Levels, Gammas (continued)

>12×10^{20} y (1992Bl06).
$T_{1/2}$(0ν,ββ to 1130,0$^+$ level)>8.9×10^{22} y (2007Ar02) (90% confidence limit); >1.7×10^{21} y (1995Da37).

$T_{1/2}$(2ν+0ν,ββ to 1362,2$^+$ level)>108×10^{20} y (2014Ar08).
$T_{1/2}$(ββ)>44×10^{20} y at 90% confidence level for decay to 1362.2 keV 2$^+$ level (2009Ki04,2006Ho17).
$T_{1/2}$(2ν,ββ to 1362,2$^+$ level)>13×10^{20} y (1995Ba29); >6×10^{20} y (1992Bl06).

$T_{1/2}$(2ν+0ν,ββ to 1741,0$^+$ level)>40×10^{20} y (2014Ar08).
$T_{1/2}$(ββ)>48×10^{20} y at 90% confidence level for decay to 1741.0 keV 0$^+$ level (2009Ki04,2006Ho17).
$T_{1/2}$(2ν,ββ to 1741,0$^+$ level)>13×10^{20} y (1995Ba29).

$T_{1/2}$(2ν+0ν,ββ to 1865,2$^+$ level)>49×10^{20} y (2014Ar08).

$T_{1/2}$(2ν+0ν,ββ to 2051,0$^+$ level)>43×10^{20} y (2014Ar08).
$T_{1/2}$(ββ)>38×10^{20} y at 90% confidence level for decay to 2051.7 keV 0$^+$ level (2009Ki04,2006Ho17).

$T_{1/2}$(ββ)>40×10^{20} y at 90% confidence level for decay to 2387.2 keV 0$^+$ level (2009Ki04,2006Ho17).

Measurements of ββ decay of ^{100}Mo: 2020Ar09, 2019Ar04, 2017Ar18, 2014Ar05, 2014Ar08, 2014Ca46, 2012Si23, 2011Ba55, 2011Fl06, 2010Be34, 2010Si06, 2009Da25, 2009Ki04, 2009KoZY, 2008KoZV, 2007Ar02, 2006Ho17, 2006Ba35, 2006Ar01 (also 2005Ar27,2005Ba01,2005Ba33,2005Sa07,2005Si06, 2004Ar29,2004Ba27,2004Ba97,2004Ko61,2003Ba22,2003Oh07,2002As05, 2002Ba52,2001As05,2001As06,2001Va34,2000Ar16,1999As01,1999As09, 1999Bb18,1999Bb19,1999Pi08,1999Sa02,1998As04); 2004Hi19 (geochemical method); 2002Fu05 (also 2002Ej05,2001Ej01, 2001Ej03,2000Ej01,2000Ku21,1998Ku09,1997Ej01); 2001Be19 (also 2000Be57); 1997Al02 (also 1993Al11,1989Al20), 1996Ej04 (also 1996Ej06, 1992Ku18,1991Wa31,1991Ej05,1991Ej02,1988Ok01), 1995Ba29 (also 1996Bb02,1990Ba63,1990Ba52), 1995Da37 (also 1994La42,1992Bl06), 1991El04 (also 1987El13), 1990Va10. Others: 1997De40, 1993Ko28, 1984Fi16 (also 1982Be20), 1983Zd01, 1955Wi33, 1954Se93, 1952Fr23.
Theory references: consult the NSR database (www.nndc.bnl.gov/nsr/) for 342 primary references, 136 dealing with nuclear structure calculations and 206 with double-beta decay nuclear matrix elements and half-life for ^{100}Mo 2β decay.

^{100}Mo Levels

Cross Reference (XREF) Flags

A	^{100}Nb β^- decay (1.4 s)	G	^{100}Mo(γ,γ′)	M	Coulomb excitation
B	^{100}Nb β^- decay (2.99 s)	H	^{100}Mo(n,n′)	N	^{100}Mo(^{136}Xe,Xγ)
C	^{100}Tc ε decay (15.65 s)	I	^{100}Mo(n,n′γ)	O	^{102}Ru(^{14}C,^{16}O)
D	^{9}Be(^{109}Tc,xγ)	J	^{100}Mo(p,p′)	P	^{104}Ru(d,^{6}Li)
E	^{96}Zr(^{7}Li,p2nγ)	K	^{100}Mo(α,α′)	Q	^{110}Pd(^{86}Kr,Xγ)
F	^{98}Mo(t,p),(t,pγ)	L	^{100}Mo(d,d′)	R	^{168}Er(^{30}Si,Xγ)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
0.0[b]	0$^+$	7.01×10^{18} y *+21−17*	ABCDEFGHIJKLMNOPQR	%2β^-=100 J^{π}: measurement by optical method (1951Ar29). $T_{1/2}$: $T_{1/2}$=7.01×10^{18} y *+21−17* for 2νββ decay to ^{100}Ru g.s. obtained from weighted average of 7.05×10^{18} y *+21−17* (2020Ar09, CUPID-Mo, Modane, earlier value of 6.90×10^{18} y *40* in 2017Ar18); 6.81×10^{18} y *1*(stat) *+38−40*(syst) (2019Ar04, earlier value of 7.17×10^{18} y *54* in 2011Fl06, NEMO-3, see also previous papers e.g. 2005Ar27); 7.15×10^{18} y *76* (2014Ca46, NIIC, Russia); 7.2×10^{18} y *20* (2001As06, Gran Sasso, see also 2002As05,2001As05 and

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)†	J^{π}#	$T_{1/2}$‡	XREF	Comments
				previous papers); 7.6×10^{18} y *26* (1997Al02, Silver mine at Osburn, Idaho); 6.82×10^{18} y *86* (1997De40, Valve house, Hoover Dam, USA; note that value listed in 2015Ba11 evaluation from 1997De40 is for ^{150}Nd $2\nu\beta\beta$ decay, not for ^{100}Mo). Half-life in 2015Ba11 evaluation is: 7.1×10^{18} y *4*, where some of the original values taken from literature seemed erroneous. About 1% $2\nu\beta\beta$ decay is found to proceed to the 1130, 0^+ level in ^{100}Ru with weighted averaged partial $T_{1/2}=6.9\times10^{20}$ y *9*, obtained from 7.5×10^{20} y *9* (2014Ar08, NEMO-3); 6.9×10^{20} y *12* (2010Be34, ARMONIA, Gran Sasso); 6.0×10^{20} y *+20−13* (2009Ki04, TUNL, ITEP); 6.1×10^{20} y *+18−11* (1995Ba29, Soudan mine, Minnesota). Value is 6.7×10^{20} y *+5−4* in 2015Ba11 evaluation which included somewhat different set of measurements. Note that in all cases, evaluators combined statistical and systematic uncertainties in quadrature. Decays to other excited states of ^{100}Ru make almost no contribution, as suggested by recent measurements by 2014Ar08 (NEMO-3) and 2009Ki04 (TUNL, ITEP). Additional information 2. Evaluated rms charge radius $<r^2>^{1/2}$=4.4468 fm *25* (2013An02). Evaluated δr^2(^{100}Mo,^{92}Mo)=+1.177 fm^2 *1* (2013An02). Measured $\delta<r^2>$(^{100}Mo,^{92}Mo)=+1.139 fm^2 *39* (2009Ch09); uncertainty is systematic. Laser spectroscopy technique at JYFL. Measured Isotope shift(^{100}Mo,^{92}Mo)=−2645 MHz *33* (2009Ch09); total uncertainty is given; statistical uncertainty is 1. Laser spectroscopy technique at JYFL. $\delta<r^2>$(^{96}Mo−^{100}Mo)=−0.525 fm^2 *6* (1985Go10). From experimental studies of one-neutron removal reactions (d,p), (p,d), (^{3}He,α) and proton removing reaction (^{3}He,d) on ^{100}Mo target, 2017Fr08 deduced following values of neutron and proton vacancies in the g.s. of ^{100}Mo: 0.33 *2* for $\nu 2s_{1/2}$, 3.40 *7* for ν1d, 2.48 *19* for $\nu 0g_{7/2}$, 1.89 *13* for $\nu 0h_{11/2}$, 1.49 *7* for π1p, 0.47 *2* for $\pi 0f_{5/2}$ and 5.94 *30* for $\pi 0g_{9/2}$ orbitals, with a total vacancy of 8.09 *29* for neutrons and 7.89 *31* for protons, compared with expected value of 8 for each.
535.59[b] *4*	2^+	12.4 ps *3*	AB DEFGHIJKLMNOPQR	μ=+0.94 *7* (2001Ma17,2014StZZ) Q=−0.25 *7* (2011Wr01,2016St14) J^{π}: L(t,p)=L(p,p′)=L(α,α')=2 from 0^+. $T_{1/2}$: weighted average of 13.6 ps *7* (recoil-distance Doppler-shift method in Coul. ex.,1975Bo39), and half-lives of 12.56 ps *22* (1976Pa13), 12.2 ps *6* (1972Ba90), 10.5 ps *12* (1962Ga13), 10.2 ps *16* (1962Er05), 10.5 ps *11* (1958St32) and 9.7 ps *15* (1956Te26), deduced from respective B(E2)↑ values determined in the measurement of Coulomb excitation yields. Others: 13.9 ps *4*, deduced by evaluators from B(E2) in 2012Wr03, where 13.6 ps *7* (1975Bo39) was used as input data in their GOSIA analysis of Coul. Ex. data; 10.3 ps *+51−35* (DSAM in ^{9}Be(^{109}Tc,Xγ), 2017Ra05); 16 ps *5* (2013RuZX, $\gamma\gamma$(t) fast-timing technique in study of prompt γ rays from neutron-induced fission of actinides). 2016Pr01 evaluation gives $T_{1/2}$=12.1 ps *5*, from the same original data as here but using ≈5% uncertainty in the value given by 1976Pa13. μ: from g−factor=+0.471 *33*, value adopted by 2001Ma17 from weighted average of g=+0.515 *42* (transient-field technique,2001Ma17) and g=+0.404 *52* (original g=+0.43 *6* from 1978HaYJ re-evaluated by 2001Ma17 for consistent field parameters). Other: 0.34 *18* (IMPAC

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
				method, 1969He11, using $T_{1/2}$(536 level)=10.3 ps *10*). Q: reorientation effect in Coul. ex. Other measurements: −0.39 *8* or −0.13 *8* (1977Na06); −0.42 *9* or −0.10 *9* (1976Pa13). β_2=0.20 (from (p,p′) and (α,α')).
695.13[e] *4*	0^+	1.62 ns *4*	AB FGHIJ LM P	J^{π}: L(t,p)=L(p,p′)=L(d,d′)=0 from 0^+; E0 transition to 0^+. $T_{1/2}$: weighted average of 1.58 ns *4* ($\beta\gamma\gamma$(t) in β decay of 1.5-s ^{100}Nb,1990Ma01), 1.65 ns *4* ($\beta\gamma$(t) quoted by 1990Ma01 from a later report of 1989OhZY), 1.7 ns *2* (p ce(t) in (p,p′γ) 1972AnZP), 2.2 ns *3* (B(E2) in Coul. ex.,1972Ba90). Others: 1.52 ns *+5−8*, deduced by evaluators from B(E2) in 2012Wr03, where 1.580 ns *40* (1990Ma01) was used as input data in their GOSIA analysis of Coul. Ex. data; 1.53 ns *30* (2013RuZX, $\gamma\gamma$(t) fast-timing technique in study of prompt γ rays from neutron-induced fission of actinides). Value of 3.0 ns *1* from (proton)(ce)(t) in (p,t) (1987Es01) seems discrepant.
1063.82[d] *4*	2^+	6.6 ps *6*	AB FGHIJKLM R	J^{π}: L(t,p)=L(p,p′)=L(α,α')=2 from 0^+. $T_{1/2}$: others: 5.0 ps *5* from B(E2) value from 1972Ba90 in Coul. ex.; 5.3 ps *+3−4*, deduced by evaluators from B(E2) (from 536,2^+ level) in 2012Wr03, where 6.45 ps *58* (1985Mu09) was used as input data in their GOSIA analysis of Coul. ex. data. β_2=0.037 (from (p,p′) and (α,α')).
1136.02[b] *4*	4^+	3.8 ps *3*	AB DEF HIJKLMN QR	J^{π}: L(t,p)=L(p,p′)=4 from 0^+. $T_{1/2}$: others: 4.9 ps *+19−14* (DSAM in ^{9}Be(^{109}Tc,Xγ), 2017Ra05); 3.67 ps *+12−16*, deduced by evaluators from B(E2) (from 536,2^+ level) in 2012Wr03, where 3.83 ps *34* (1985Mu09) was used as input data in their GOSIA analysis of Coul. ex. data. β_4=−0.027 (from (p,p′)). B(E4)(W.u.)=0.99 *21* (from (p,p′) and (d,d′) 1992Pi08).
1463.93[e] *5*	2^+	2.9 ps *7*	AB FGHIJ LM	J^{π}: L(t,p)=L(p,p′)=2 from 0^+. $T_{1/2}$: other: 2.25 ps *+9−10*, deduced by evaluators from B(E2) (from 695, 0^+ level) in 2012Wr03, where 2.93 ps *68* (1985Mu09) was used as input data in their GOSIA analysis of Coul. ex. data.
1504.66 *6*	0^+		A F IJ L	XREF: J(1510)L(1510) E(level): in (p,p′), it may be a different level. J^{π}: $\gamma\gamma(\theta)$ in ^{100}Nb β^- and L(t,p)=0.
1607.37[d] *5*	(3^+)		AB IJ L R	XREF: J(?) J^{π}: 471.4γ to 4^+, 543.6γ to 2^+, and no γ to 0^+ suggests 3, 4^+. Absence in Coul. ex. and systematics support 3^+.
1766.52 *11*	(2^+)		hIJ l	XREF: h(1770)J(1770)l(1768) J^{π}: L(p,p′)=(2); possible γ to 0^+. In (n,n′γ), 1997Ko62 propose (0^+) based on the comparison of experimental and calculated populations of this state. In that case level in (p,p′) must be different and possible γ to 0^+ will not exist.
1771.44 *5*	(4^+)	2.5 ps *4*	B hI lM	XREF: h(1770)l(1768) J^{π}: γs to 2^+, 4^+ and population in Coul. ex., probably through a two-step process from 2^+ and 4^+ states. $T_{1/2}$: other: 1.78 ps *+17−19*, deduced by evaluators from B(E2) in Coul. Ex.(from 1064,2^+ level) in 2012Wr03, where 2.45 ps *41* (1985Mu09) was used as input data in their GOSIA analysis.
1847.17[b] *8*	6^+[a]	1.20 ps *17*	B E IJ MN QR	XREF: I(?) $T_{1/2}$: other: 1.21 ps *+9−8*, deduced by evaluators from B(E2) (from 1136,4^+ level) in 2012Wr03, where 1.20 ps *17* (1985Mu09) was used as input data in their GOSIA analysis of Coul. ex. data.
1908.19[c] *6*	3^-	14 ps *3*	F HIJKLM P R	J^{π}: L(p,p′)=L(α,α')=3 from 0^+.

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	J^{π}[#]	XREF	Comments
			B(E3)=0.143 *12* (2002Ki06, evaluation). $T_{1/2}$: weighted average of 12 ps *3* (RDDS in Coul. ex.) and 20 ps *5* (B(E3) values in Coul. ex.). 2012Wr03 in Coul. Ex. used 12.0 ps *30* (1985Mu09) in their GOSIA analysis to deduce several matrix elements. β_3=0.17 ((p,p′) and (α,α′)).
1977.34 *7*	(1,2$^+$)	A G I	XREF: G(?) J^{π}: 1281.8γ to 0$^+$; 1$^+$ favored by 1997Ko62 using comparison of experimental and calculated yields in (n,n′γ) reaction.
2037.60 *17*	0$^+$	A FG IJKL	XREF: F(2035)G(2033)I(?)J(2040) J^{π}: γγ(θ) in ^{100}Nb β^- (1.5 s); L(t,p)=0.
2042.78 *7*	(2)$^+$	G IJ	XREF: G(2040)J(2046) J^{π}: L(p,p′)=2 from 0$^+$; 2042.9γ to 0$^+$.
2082 *10*		F H J	XREF: F(2082)H(2100)J(2070?) E(level): This group may correspond to the 2087 level but L(t,p)=(0,1) and L(p,p′)=(3,5) are mutually inconsistent as well as inconsistent with J^{π}(2086)=0$^+$. If L-transfers are correct, there are two levels near 2082 in addition to the 2086 level. L(t,p)=(0) could correspond to 2086, 0$^+$ level. In (n,n′), J^{π}=2$^+$ is deduced.
2086.33 *15*	0$^+$	A I	J^{π}: γγ(θ) in ^{100}Nb β^- (1.5 s). Parity from RUL. See also J^{π} comment for 2082 level.
2103.13 *9*	4$^+$	B F IJKL	XREF: K(2121) J^{π}: L(p,p′)=L(α,α′)=4 from 0$^+$.
2156 *2*	1$^-$	J L	J^{π}: L(p,p′)=L(d,d′)=1 from 0$^+$.
2189.56 *15*	(0$^+$,1,2)	A f IJk	XREF: f(2186)I(?)J(2192?) J^{π}: 1125.8γ and 1653.9γ to 2$^+$; β feeding (log *ft*=5.8) from 1$^+$ parent.
2201.22 *11*	(2$^-$)	f IJkL	XREF: f(2186)J(2200) J^{π}: σ(θ) in (p,p′) and (d,d′), but L(t,p)=2 for a group at 2186.
2286.47 *17*	2$^+$	F IJ L	J^{π}: L(t,p)=L(p,p′)=2 from 0$^+$.
2289.5 *4*	(4,5$^+$)	B R	J^{π}: 682.1γ to (3$^+$); log *ft*=6.3 from (5)$^+$.
2310 *2*	6$^+$	J L	J^{π}: L(p,p′)=L(d,d′)=6 from 0$^+$.
2310.12[d] *20*	(4$^+$)	B	J^{π}: log *ft*=5.9 from (5)$^+$; 1246.4γ to 2$^+$.
2320.3 *3*	(0$^+$,1,2)	A F	XREF: F(2312) J^{π}: 856.3γ and 1257.0γ to 2$^+$; β feeding (log *ft*=5.8) from 1$^+$ parent.
2339.8[c] *4*	(5$^-$)	F H JKL QR	XREF: F(2334)H(2330)K(2330) J^{π}: L(p,p′)=5. But L(p,p′)=2 is also reported. Also L(α,α′)=2. E(level): The partially resolved group in (t,p) at 2334 with L=0 may be a different level.
2369.68 *11*	3$^-$	F IJ L	J^{π}: L(t,p)=L(p,p′)=3.
2397.0 *3*	(1$^-$)	F IJKL	XREF: F(2392)I(?)K(2384) E(level): from particle transfer reactions. J^{π}: from L(p,p′)=(1). However, L(t,p)=2 and L(α,α′)=5 are inconsistent with this assignments. It is possible that there are different levels near this energy.
2416.58 *22*	(4$^+$)	B F IJKL	J^{π}: log *ft*=5.4 from (5)$^+$; γ to 2$^+$. Also L(p,p′)=L(d,d′)=(4). But L(α,α′)=3 and L(p,p′)=3 in one of the studies suggest 3$^-$ also. (1280γ)(600γ)(θ) measurement in ^{100}Nb β^- decay (2.99 s) gives unrealistic δ(M2/E1)<−0.28 for J^{π}(2416)=3$^-$. There may be two closely spaced levels near this energy.
2432 *2*	1$^-$	JK	XREF: K(2444) J^{π}: L(p,p′)=1.
2464 *20*	4$^+$	K	J^{π}: L(α,α′)=4.
2514 *5*	(4$^+$)	f J L	XREF: f(2518) J^{π}: L(p,p′)=4. Other: L(t,p)=2 for a group at 2518 *15*, probably a doublet.
2527 *5*	(2$^+$)	f J L	XREF: f(2518) J^{π}: L(p,p′)=(2). Other: L(t,p)=2 for a group at 2518 *15*, probably a doublet.
2564.20 *14*	(4)$^+$	B F IJKL	J^{π}: log *ft*=5.2 from (5)$^+$; L(p,p′)=4, assuming the levels populated in (p,p′) at 2563 *5* and in β^- decay are the same.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
2580.89 *22*	(1,2^+)		I	J^{π}: 1886.0γ to 0^+.
2607 *5*	(4^+,5^-)		F JKL P	XREF: F(2602)P(2600) J^{π}: L(α,α')=L(d,^{6}Li)=L(t,p)=4. Although L(t,p)=5,6 also reported (1981Fl06) and L(p,p$'$)=5.
2627.5[b] *5*	8^+[a]	0.58 ps *9*	E MN QR	$T_{1/2}$: from B(E2)↓=0.34 *5* (1985Mu09) in Coul. ex.
2628 *5*	(2^+)		J L	J^{π}: L(p,p$'$)=(2).
2632.4 *3*	(1)[&]	0.51 ps *10*	G	
2652.87 *21*	(4^+,5^+)		B	J^{π}: log *ft*=5.5 from $(5)^+$; γs to 4^+ and (3^+).
2659 *5*	(1^-)		F JKL	XREF: F(2652)K(2656) E(level): unresolved in (t,p). This level may correspond to 2663 from (n,n$'\gamma$). J^{π}: in (p,p$'$), 1987Fr07 assign 4^-, treating this as an unnatural parity state. But L(t,p)=2 for a 2652 group is in disagreement. Also, L(α,α')=(4,5). L(p,p$'$)=1.
2662.6? *3*			I	
2725 *5*			J L	
2738.02 *22*	(2^+)		F I K P	XREF: K(2707)P(2730) J^{π}: L(t,p)=2; however, L(d,^{6}Li)=(4) is inconsistent.
2747 *5*	4^+		J L	J^{π}: L(p,p$'$)=4.
2791.3 *5*			R	J^{π}: 944.1γ to (6^+).
2807 *5*	(4^+)		F JKL	XREF: F(2803)K(2790) J^{π}: L(t,p)=L(α,α')=(4).
2822.21 *11*	2^+		IJ L	XREF: I(?) J^{π}: L(p,p$'$)=2.
2838 *5*			F JK P	XREF: F(2835)J(?)K(2852)P(2830) J^{π}: L(α,α')=4, L(t,p)=(4) suggest (4^+), but L(p,p$'$)=(5) suggests (5^-). Also L(d,^{6}Li)=(6).
2843.2[c] *4*	(7^-)		QR	J^{π}: γs to (5^-) and (6^+).
2858 *5*	(3^-)		F JKL	XREF: F(2873)K(2869) J^{π}: L(p,p$'$)=3. But L(α,α')=(2) suggests (2^+).
2901 *5*	4^+		JK	XREF: K(2882) J^{π}: L(α,α')=4.
2901.05 *10*	(1)[&]	0.32 ps *4*	G	
2905.75 *10*	(1)[&]	0.37 ps *4*	G	
2924 *5*	4^+		J L	J^{π}: L(p,p$'$)=4.
2928.7 *5*	(7^-)		R	J^{π}: γ from (9^-) and to (5^-).
2934.8 *10*	(4^+)		A F J	XREF: F(2923) J^{π}: L(t,p)=(4); L(p,p$'$)=4. But L(p,p$'$)=(3) is also reported.
2961.2 *3*	2^+		IJ L	XREF: I(?) J^{π}: L(p,p$'$)=2.
2970.1 *4*	4^+		A F I K	XREF: I(?)K(2970) J^{π}: L(α,α')=4.
2984 *5*	(6^+)		J L	J^{π}: L(p,p$'$)=(6).
2996.31 *21*	(4^+,3^-)		Ij l	XREF: I(?) J^{π}: L(p,p$'$)=4 suggests 4^+ for 2996 or 3004. But L(p,p$'$)=3 is also reported.
3004.4 *10*	(4^+,3^-)		A F Ij l	XREF: F(2994)I(?) J^{π}: L(p,p$'$)=4 suggests 4^+ for 2996 or 3004. But L(p,p$'$)=3 is also reported.
3021 *5*	(4^+)		JK	XREF: K(3029) J^{π}: L(α,α')=(6) suggests (6^+) but L(p,p$'$)=(4).
3039.4 *10*	(4^+)		A F K	XREF: F(3039)K(3041) J^{π}: L(α,α')=4.
3041 *5*	(5^-)		J L	J^{π}: L(p,p$'$)=5.

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	XREF	Comments
3042.2? *6*			I	E(level): possible γ to 2^+ suggests that this level is different from 3041, (5^-).
3053.70 *21*	(≤ 4)[@]		f I	XREF: I(?)
3062.60 *25*	$(0^+,1,2)$		A f	J^{π}: 2527γ to 2^+; β feeding (log *ft*=5.8) from 1^+ parent.
3066.25 *20*	(1)[&]	0.207 ps *19*	G	
3068 *5*	(5^-)		J L	J^{π}: L(p,p′)=5.
3070.2 *4*	$(0^+,1,2)$		A	J^{π}: 2535γ to 2^+; β feeding (log *ft*=5.7) from 1^+ parent.
3085 *5*	(4^+)		F JKL	XREF: F(3106)K(3085) J^{π}: L(p,p′)=4 but L(α,α')=5.
3112 *5*	(3^-)		F JKL	XREF: F(3119)K(3114) J^{π}: L(p,p′)=3.
3129.6 *4*	$(0^+,1,2)$		A	J^{π}: 1666γ to 2^+; β feeding (log *ft*=6.1) from 1^+ parent.
3140 *5*	(1^-)		J L	J^{π}: L(p,p′)=1.
3143.0 *8*			R	
3154 *5*	(3^-)		F JKL	XREF: F(3148)K(3153) J^{π}: L(p,p′)=3. E(level): multiplet in (t,p).
3172 *5*	(3^-)		J L	J^{π}: L(p,p′)=3. E(level): multiplet in (t,p).
3190 *5*	(4^+)		JKL	XREF: K(3196) J^{π}: L(α,α')=L(p,p′)=4.
3198.4 *4*	(1)[&]	0.23 ps *4*	G	
3217 *5*	(1^-)		J	J^{π}: L(p,p′)=1.
3237 *5*	(3^-)		F JKL	XREF: F(3235)K(3216) J^{π}: L(α,α')=3.
3242.76 *10*	1[&]	0.138 ps *7*	G	
3265 *5*	(3^-)		J L	J^{π}: L(p,p′)=3.
3282 *5*	(3^-)		F JKL	XREF: F(3263)K(3276) J^{π}: L(p,p′)=3 but L(α,α')=(5) suggests (5^-).
3290.27 *9*	$1^{(+)}$[&]	43 fs *6*	G	J^{π}: parity from Alaga rule (2006Ru06).
3294 *5*	(2^+)		F J L	XREF: F(3282) J^{π}: L(p,p′)=2.
3299.2[c] *6*	(9^-)		R	J^{π}: γ to (7^-).
3311 *5*			J L	
3324 *5*			F J L	XREF: F(3306)
3342.06 *10*	(1)[&]	0.175 ps *20*	G	
3354 *15*	(2^+)		F	J^{π}: L(t,p)=2.
3367.0[b] *8*	(10^+)[a]		E N QR	
3376 *5*	(3^-)		J	J^{π}: L(p,p′)=3.
3406 *5*	(4^+)		F JKL	XREF: F(3409)K(3398) J^{π}: L(p,p′)=L(α,α')=4.
3437 *5*	(5^-)		J	J^{π}: L(p,p′)=5.
3448 *5*	(0^+)		F J L	XREF: F(3445) J^{π}: L(p,p′)=(0).
3468 *5*	(2^+)		J L	J^{π}: L(p,p′)=2.
3479 *5*	(2^+)		F J L	XREF: F(3475) J^{π}: L(p,p′)=2.
3483.82 *7*	(1^+)[&]	8.3 fs *8*	G	J^{π}: parity from Alaga rule (2006Ru06).
3529 *5*	(3^-)		J	J^{π}: L(p,p′)=3.
3537 *5*	(2^+)		J L	J^{π}: L(p,p′)=2.
3557 *5*	(3^-)		F J L	XREF: F(3535) J^{π}: L(p,p′)=3.
3557 *15*	(2^+)		F	E(level),J^{π}: partially resolved. L(t,p)=2 for one component.

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
3570.77 *10*	(1)[&]	18.9 fs *15*	G	
3586 *5*			J L	
3595 *5*	(3⁻)		J L	Jπ: L(p,p′)=3.
3599.87 *20*	(1)[&]	0.18 ps *3*	G	
3606 *5*	(4⁺)		F JKL	XREF: F(3587)K(3603) Jπ: L(α,α′)=3 and L(t,p)=(3); but L(p,p′)=(4).
3615.57 *20*	1[&]	56 fs *6*	G	
3626.5 *5*	(4⁺,5,6)		B J L	Jπ: 1779γ to 6⁺; β feeding (log *ft*=5.8) from (5)⁺.
3627.3 *3*	(1)[&]	32 fs *3*	G	
3647.3 *6*	(5⁻)		B F J L	XREF: J(3652)L(3652) Jπ: L(p,p′)=5; γ to 6⁺, assuming that the levels in (p,p′) and in β⁻ decay are the same.
3658.96 *22*	1^(+)[&]	18 fs *3*	G	Jπ: parity from Alaga rule (2006Ru06).
3682 *5*	(5⁻)		F JKL	XREF: F(3674)K(3701) Jπ: L(α,α′)=5.
3718 *5*	(4⁺)		J	Jπ: L(p,p′)=4.
3726 *5*	(3⁻)		J L	Jπ: L(p,p′)=3.
3743 *5*	(4⁺)		J	Jπ: L(p,p′)=4.
3747 *5*	(5⁻)		J L	Jπ: L(p,p′)=5.
3773 *5*	(3⁻)		F J L	XREF: F(3771) Jπ: L(p,p′)=3, but L(t,p)=5,6.
3783.5 *9*			R	
3797 *5*	(4⁺)		J	Jπ: L(p,p′)=4.
3810 *5*	(4⁺)		J L	Jπ: L(p,p′)=(4).
3823 *5*	(5⁻)		J L	Jπ: L(p,p′)=(5).
3887.98 *10*	1[&]		G	
3894 *5*			J L	
3896.68 *10*	(1)[&]		G	
3915 *5*			J L	
3925 *5*	(2⁺)		J L	Jπ: L(p,p′)=(2).
3925.98 *10*	(1)[&]		G	
3947 *5*			J L	
4026 *5*	(3⁻)		J L	Jπ: L(p,p′)=(3).
4032.7[c] *8*	(11⁻)		R	Jπ: γ to (9⁻).
4043 *5*	(4⁺)		J L	Jπ: L(p,p′)=(4).
4062.6[b] *9*	(12⁺)[a]		E N QR	
4081.59 *10*	1[&]		G	
4156.5 *3*	1[&]		G	
4158 *5*	(3⁻)		L	Jπ: L(d,d′)=3.
4205 *5*	(2⁺)		J L	Jπ: L(p,p′)=(2).
4217.60 *10*	1[&]		G	
4232.10 *20*	(1)[&]		G	
4243 *5*			J L	
4260 *5*	(3⁻)		L	Jπ: L(d,d′)=3.
4329.90 *20*	1[&]		G	
4516.81 *10*	1[&]		G	
4565.51 *10*	1[&]		G	
4583.11 *10*	1[&]		G	
4594.91 *10*	1[&]		G	
4689.02 *10*	1[&]		G	

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	Jπ[#]	XREF	Comments
4730.32 *20*	1[&]	G	
4875.2[b] *10*	(14+)[a]	N QR	
4939.8[c] *9*	(13−)	R	Jπ: 907.1γ to (11−).
4989.63 *20*	1[&]	G	
5007.33 *20*	1[&]	G	
5034.54 *20*	1[&]	G	
5062.9 *3*	(2)[&]	G	
5071.24 *20*	(1)[&]	G	
5101.3 *6*	1[&]	G	
5109.3 *9*	(1)[&]	G	
5136.04 *10*	(1)[&]	G	
5158.3 *3*	1[&]	G	
5169.6 *3*	1[&]	G	
5181.8 *3*	1[&]	G	
5186.9 *15*	1	G	
5190.4 *5*	1[&]	G	
5204.6 *4*	(1)[&]	G	
5216.0 *8*	(1)[&]	G	
5271.2 *6*	1[&]	G	
5277.6 *3*	1[&]	G	
5310.5 *4*	1[&]	G	
5335.65 *20*	1[&]	G	
5347.85 *10*	1[&]	G	
5359.8 *3*	1[&]	G	
5369.6 *6*	1[&]	G	
5382.5 *10*	1[&]	G	
5390.3 *6*	1[&]	G	
5402.26 *10*	1[&]	G	
5412.6 *8*	1[&]	G	
5435.5 *6*	1[&]	G	
5442.9 *6*	1[&]	G	
5449.6 *6*	(1)[&]	G	
5502.7 *4*	1[&]	G	
5519.4 *4*	1[&]	G	
5532.2 *5*	1[&]	G	
5547.9 *3*	1[&]	G	
5554.4 *11*	1[&]	G	
5584.9 *4*	1[&]	G	
5596.8 *7*	1[&]	G	
5604.7 *12*	1[&]	G	
5612.67 *10*	1[&]	G	
5618.6 *3*	1[&]	G	
5656.5 *5*	(2)[&]	G	

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	Jπ[#]	XREF
5670.67 *10*	1[&]	G
5680.9 *7*	(1)[&]	G
5686.5 *5*	1[&]	G
5715.9 *3*	1[&]	G
5725.3 *3*	1[&]	G
5732.9 *3*	1[&]	G
5742.6 *7*	1[&]	G
5764.0 *15*	(1)[&]	G
5770.4 *4*	1[&]	G
5798.2 *3*	1[&]	G
5808.98 *10*	1[&]	G
5826.5 *6*	(2)[&]	G
5840.2[b] *15*	(16^+)[a]	N R
5840.7 *6*	1[&]	G
5879.39 *20*	1[&]	G
5901.0 *6*	1[&]	G
5947.79 *20*	1[&]	G
5957.2 *6*	1[&]	G
5964.0 *6*	1[&]	G
5972.99 *20*	1[&]	G
5988.9 *4*	1[&]	G
6009.6 *4*	1[&]	G
6019.5 *11*	(1)[&]	G
6035.5 *8*	1[&]	G
6061.3 *9*	(2)[&]	G
6065.9 *7*	1[&]	G
6082.9 *3*	1[&]	G
6089.3 *4*	1[&]	G
6122.5 *5*	1[&]	G
6133.6 *7*	1[&]	G
6147.1 *9*	1[&]	G
6174.0 *5*	1[&]	G
6194.51 *10*	(1)[&]	G
6249.4 *5*	1[&]	G
6257.61 *20*	1[&]	G
6270.5 *8*	1[&]	G
6278.71 *10*	1[&]	G
6293.1 *4*	1[&]	G
6310.3 *15*	(1)[&]	G
6321.2 *9*	1[&]	G
6327.6 *9*	1[&]	G
6337.5 *4*	1[&]	G

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF
6354.32 *20*	1[&]		G
6365.6 *19*	(1)[&]		G
6375.6 *5*	1[&]		G
6402.0 *8*	1[&]		G
6414.3 *4*	1[&]		G
6419.4 *18*	1^-[&]	9 fs *6*	G
6421.4 *6*	1[&]		G
6426.6 *9*	(1)[&]		G
6434.1 *5*	1[&]		G
6459.0 *6*	1[&]		G
6473.5 *6*	1[&]		G
6483.2 *20*	(1)[&]		G
6497.6 *6*	1[&]		G
6518.5 *13*	1^-[&]	2.5 fs *14*	G
6519.1 *5*	1[&]		G
6526.6 *3*	1[&]		G
6570.2 *4*	1[&]		G
6597.0 *4*	(2)[&]		G
6622.3 *4*	(1)[&]		G
6628.3 *5*	(2)[&]		G
6641.0 *3*	1[&]		G
6658.2 *4*	1[&]		G
6669.14 *20*	1[&]		G
6685.3 *4*	1[&]		G
6764.1 *8*	1[&]		G
6772.7 *8*	1[&]		G
6790.6 *10*	1[&]		G
6797.5 *9*	(1)[&]		G
6807.9 *10*	(2)[&]		G
6829.5 *3*	(1)[&]		G
6844.6 *11*	(2)[&]		G
6851.3 *15*	1[&]		G
6870.0 *8*	(1)[&]		G
6886.5 *8*	1[&]		G
6893.2 *4*	1[&]		G
6906.1 *6*	1[&]		G
6912.9 *11*	(1)[&]		G
6919.5 *13*	1[&]		G
6924.9 *10*	(1)[&]		G
6934.2 *12*	(1)[&]		G
6949.2[b] *18*	(18^+)[a]		N
6949.9 *11*	1[&]		G

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF
6957.7 *11*	(2)[&]		G
6974.2 *8*	1[&]		G
6981.1 *12*	(2)[&]		G
6994.5 *5*	(2)[&]		G
7001.2 *5*	1[&]		G
7018.3 *6*	1[&]		G
7032.1 *5*	1[&]		G
7037.8 *10*	(1)[&]		G
7060.2 *11*	1[&]		G
7068.1 *3*	1[&]		G
7095.4 *5*	1[&]		G
7103.5 *7*	(1)[&]		G
7115.3 *3*	1[&]		G
7136.6 *5*	1[&]		G
7171.7 *7*	(1)[&]		G
7181.5 *9*	(1)[&]		G
7194.4 *3*	1[&]		G
7204.0 *7*	1[&]		G
7219.4 *9*	(2)[&]		G
7225.4 *13*	(1)[&]		G
7299.6 *5*	1[&]		G
7312.3 *3*	1[&]		G
7330.8 *3*	1[&]		G
7357.7 *6*	1[&]		G
7380.3 *7*	(1)[&]		G
7403.3 *8*	1[&]		G
7450.6 *10*	1[&]		G
7471.0 *4*	1[&]		G
7487.2 *7*	1[&]		G
7494.8 *11*	(1)[&]		G
7503.5 *12*	(2)[&]		G
7526.1 *6*	1[&]		G
7546.3 *20*	1[&]		G
7559.1 *15*	(1)[&]		G
7577.2 *9*	1[&]		G
7606.9 *4*	1[&]		G
7638.6 *10*	1^-[&]	3.3 fs *9*	G
7744.5 *8*	1[&]		G
7758.4 *10*	(1)[&]		G
7771.5 *12*	1[&]		G
7796.9 *14*	1[&]		G
7831.2 *8*	1[&]		G

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Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
7863.1 *7*	(1)[&]		G	
7875.4 *6*	1[&]		G	
7887.2 *10*	1[&]		G	
7935.7 *10*	1[&]		G	
7955.7 *6*	1[&]		G	
7988.0 *7*	1[&]		G	
8002.0 *6*	1[&]		G	
8033.5 *8*	1[&]		G	
8052.2 *6*	1[&]		G	
8063.7 *9*	1[&]		G	
8083.3 *16*	1[&]		G	
8095.9 *11*	1[&]		G	
8108.1 *12*	1[&]		G	
8114.2[b] *20*	(20+)[a]		N	
8127.7 *10*	1[&]		G	
8194.4 *9*	1[&]		G	
8208.8 *6*	1[&]		G	
8218.2 *6*	(1)[&]		G	
8238.6 *9*	1[&]		G	
8257.1 *14*	1[&]		G	
8269.6 *6*	1[&]		G	
8283.6 *6*	1[&]		G	
8294.5 *13*	(1)[&]		G	
13.0×10³ *3*	1−	11.6 MeV *12*	K	Jπ: isoscalar giant-dipole resonance (ISGDR). %E1 EWSR=18 *3* for ISGDR in (α,α′) (2015Yo04).
13.2×10³ *4*	0+	2.6 MeV *6*	K	Jπ: isoscalar giant-monopole resonance (ISGMR). %E0 EWSR=32 *4* for ISGMR in (α,α′) (2020Ho11).
13.60×10³ *26*	2+	4.75 MeV *38*	K	Jπ: isoscalar giant-quadrupole resonance (ISGQR). %E2 EWSR=79 *14* for ISGQR in (α,α′) (2015Yo04).
16.8×10³ *4*	0+	2.5 MeV *5*	K	Jπ: isoscalar giant-monopole resonance (ISGMR). %E0 EWSR=60 *3* for ISGMR in (α,α′) (2020Ho11).
21.5×10³ *4*	3−	3.7 MeV *3*	K	Jπ: isoscalar giant-octupole resonance (ISGOR). %E3 EWSR=53 *7* for ISGOR in (α,α′) (2015Yo04).
30.1×10³ *7*	1−	12.5 MeV *38*	K	Jπ: isoscalar giant-dipole resonance (ISGDR). %E1 EWSR=47 *10* for ISGDR in (α,α′) (2015Yo04).

† From least-squares fit to Eγ data, for levels seen in γ-ray studies. In other cases weighted averages of available values.

‡ For excited states, values are from recoil-distance Doppler-shift (RDDS) method and/or B(E2) values determined from excitation yields in Coulomb excitation unless otherwise stated. For levels populated in (γ,γ′), level half-lives are deduced (by evaluators) from total widths given in different experiments.

Above≈3 MeV excitation, the assignments are generally from L(p,p′), L(d,d′) or L(α,α′). These assignments are given in parentheses due to tentative level associations (in different reactions) and some possibility of S=1 transfer in (p,p′) and (d,d′) at higher excitation energies.

@ γ to 2+.

& Dipole γ to g.s. from γ(θ) measurements in (γ,γ′). Also in (γ,γ′) nuclear resonance fluorescence reaction from 0+ g.s., main

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{100}Mo Levels (continued)

population is expected via dipole (E1 or M1) transitions to J=1 states, through scissors mode (for M1) and pygmy dipole resonances (for E1).

[a] Member of g.s. band from γ cascade in (^{7}Li,p2nγ), ^{100}Mo(^{136}Xe,Xγ), ^{110}Pd(^{86}Kr,Xγ) and ^{168}Er(^{30}Si,Xγ).

[b] Band(A): $J^{\pi}=0^{+}$ band. Backbend at 10^{+}.

[c] Band(B): 3^{-} octupole band.

[d] Band(C): Possible $K^{\pi}=2^{+}$, γ band.

[e] Band(D): Possible $K^{\pi}=0^{+}$ band.

$\gamma(^{100}Mo)$

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[†]	E_f	J^{π}_f	Mult.	δ	α[b]	$I_{(\gamma+ce)}$	Comments
535.59	2^+	535.61 *6*	100	0.0	0^+	E2		0.004		B(E2)(W.u.)=37.6 *9* E_{γ}: unweighted average 535.666 *14* from ^{100}Nb β^- decay and 535.547 *13* from (n,n′γ). Others: 535.3 *5* in (t,pγ), 535.6 *5* in (^{30}Si,Xγ), 536 *1* in (^{136}Xe,Xγ). Mult.: ΔJ=2, Q from $\gamma(\theta)$ in (n,n′γ); M2 ruled out by RUL.
695.13	0^+	159.547 *13*	100 *1*	535.59	2^+	E2		0.223		B(E2)(W.u.)=89 *3* E_{γ}: from (n,n′γ). Others: 159.5 *1* in ^{100}Nb β^- decay, 159.1 *5* in (t,pγ). I_{γ}: from Coulomb excitation. Mult.: ΔJ^{π} and $T_{1/2}$(level) are consistent with only E2, not M2.
		695.1		0.0	0^+	E0			15 *2*	E_{γ}: from level energy difference. Transition observed only in ce data. $I_{(\gamma+ce)}$: deduced from Ice(K)(695γ)/Ice(K)(159γ)=0.63 *8* (unweighted average of 0.62 *5* and 0.76 *5* from (p,p′γ), and 0.50 *3* from (t,pγ)). q^2_K(E0/E2)=0.61 *10*, X(E0/E2)=0.014 *2*, ρ^2(E0)=0.036 *6* (2005Ki02, evaluation). B(E0)(Wilkinson units)=0.17 *2*.
1063.82	2^+	369.1 *1*	1.76 *20*	695.13	0^+	[E2]		0.0122		B(E2)(W.u.)=5.7 *+14−11* E_{γ}: weighted average of 368.6 *5* from ^{100}Nb β^- decay (1.5 s) and 369.1 *1* from (n,n′γ). I_{γ}: weighted average of 1.4 *3* from ^{100}Nb β^- decay (1.5 s), 2.01 *21* from (n,n′γ), and 1.70 *20* from Coulomb excitation.
		528.248 *18*	100.0 *16*	535.59	2^+	E2+M1	+4.4 *+15−9*	0.004		B(E2)(W.u.)=52 *7*; B(M1)(W.u.)=0.0008 *+6−4* E_{γ}: weighted average of 528.263 *18* from ^{100}Nb β^- decay (1.5 s), 528.263 *18* from ^{100}Nb β^- decay (2.99 s), 528.4 *5* from (t,p), 528.21 *2* from (n,n′γ), and 528.4 *5* from (^{30}Si,Xγ). I_{γ}: from (n,n′γ). Others: 100.0 *20* from Coul. ex., 100.0 *22* from ^{100}Nb β^- decay (1.5 s), 100 *13* from ^{100}Nb β^- decay (2.99 s). Mult.: from $\gamma\gamma(\theta)$ in ^{100}Nb β^- decay, $\gamma(\theta)$ in (n,n′γ); M2 ruled out by RUL. δ: from $\gamma\gamma(\theta)$ in ^{100}Nb β^- decay (1.5 s). Other: +3.4 *4* from $\gamma(\theta)$ in (n,n′γ).
		1063.78 *5*	38.0 *4*	0.0	0^+	E2				B(E2)(W.u.)=0.62 *6*

γ(^{100}Mo) (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.	δ	α[b]	Comments
									E_γ: weighted average of 1063.7 *1* from ^{100}Nb β^- decay (1.5 s), 1063.7 *2* from ^{100}Nb β^- decay (2.99 s), 1064.1 *1* from (γ,γ'), 1063.76 *3* from (n,n$'\gamma$), and 1064 *1* from (^{30}Si,Xγ). I_γ: weighted average of 36.3 *22* from ^{100}Nb β^- decay (1.5 s), 42 *9* from ^{100}Nb β^- decay (2.99 s), 38.1 *4* from (n,n$'\gamma$), 58 *25* from (^{30}Si,Xγ), and 38.0 *10* from Coulomb excitation. Mult.: Q from $\gamma(\theta)$ in (n,n$'\gamma$) and $\gamma\gamma(\theta)$ in ^{100}Nb β^- decay (1.5 s); M2 ruled out by RUL.
1136.02	4^+	600.40 *2*	100	535.59	2^+	(E2)		0.003	B(E2)(W.u.)=69 *6* E_γ: weighted average of 600.5 *1* from ^{100}Nb β^- decay (1.5 s), 600.5 *1* from ^{100}Nb β^- decay (2.99 s), and 600.39 *2* from (n,n$'\gamma$). Others: 599.8 *5* from (t,p), 601 *1* from (^{136}Xe,Xγ), and 600.3 *5* from (^{30}Si,Xγ). Mult.: from $T_{1/2}$(level), ΔJ^π and RUL.
1463.93	2^+	327 *1*	3.5 *15*	1136.02	4^+	[E2]		0.0181 *4*	B(E2)(W.u.)=36 *+34−20* E_γ: from ^{100}Nb β^- decay (1.5 s). I_γ: from Coulomb excitation.
		400.17 *9*	5.2 *7*	1063.82	2^+				E_γ: from (n,n$'\gamma$). Other: 400 *1* from ^{100}Nb β^- decay (1.5 s). I_γ: weighted average of 5 *3* from ^{100}Nb β^- decay (1.5 s), 4.9 *7* from (n,n$'\gamma$), and 5.8 *11* from Coulomb excitation.
		768.77 *3*	100.0 *10*	695.13	0^+	E2			B(E2)(W.u.)=15 *+5−3* E_γ: weighted average of 768.7 *1* from ^{100}Nb β^- decay (1.5 s), 768.8 *2* from ^{100}Nb β^- decay (2.99 s), and 768.77 *3* from (n,n$'\gamma$). I_γ: from Coulomb excitation. Other: 100.0 *13* from (n,n$'\gamma$), 100 *9* from ^{100}Nb β^- decay (1.5 s). Mult.: Q from $\gamma(\theta)$ in (n,n$'\gamma$) and $\gamma\gamma(\theta)$ in ^{100}Nb β^- decay (1.5 s); M2 ruled out by RUL.
		928.34 *3*	72.9 *9*	535.59	2^+	M1+E2	−0.27 *2*		B(M1)(W.u.)=0.0036 *+13−8*; B(E2)(W.u.)=0.28 *+15−9* E_γ: weighted average of 928.3 *1* from ^{100}Nb β^- decay (1.5 s), 928.4 *2* from ^{100}Nb β^- decay (2.99 s), and 928.34 *3* from (n,n$'\gamma$). I_γ: weighted average of 74 *3* from ^{100}Nb β^- decay (1.5 s), 71 *8* from ^{100}Nb β^- decay (2.99 s), 72.8 *9* from (n,n$'\gamma$), and 73.0 *10* from Coulomb excitation. Mult.,δ: from $\gamma\gamma(\theta)$ ^{100}Nb β^- decay (1.5 s) and RUL. Other: −0.36 *7* from $\gamma(\theta)$ in (n,n$'\gamma$).
1504.66	0^+	440.84 *5*	37 *4*	1063.82	2^+				E_γ: weighted average of 440.9 *1* from ^{100}Nb β^- decay (1.5 s) and 440.83 *5* from (n,n$'\gamma$). I_γ: unweighted average of 41.2 *19* from ^{100}Nb β^- decay (1.5 s) and 33.6 *21* from (n,n$'\gamma$).
		969.07 *7*	100 *8*	535.59	2^+	(E2)			E_γ: weighted average of 969.1 *1* from ^{100}Nb β^- decay (1.5 s) and 969.06

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$\gamma(^{100}$Mo) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	Comments
							7 from (n,n′γ). Mult.: γγ(θ) in ^{100}Nb β^- decay (1.5 s), ΔJ^π and RUL (βγ coin in ^{100}Nb β^- decay (1.5 s) suggests 1504.6 level has $T_{1/2}$<50 ns).
1607.37	(3$^+$)	471.37 *9*	17 *2*	1136.02	4$^+$		E_γ: weighted average of 471 *1* from ^{100}Nb β^- decay (1.5 s), 471.2 *3* from ^{100}Nb β^- decay (2.99 s), and 471.39 *9* from (n,n′γ). I_γ: weighted average of 23 *14* from ^{100}Nb β^- decay (1.5 s), 18 *7* from ^{100}Nb β^- decay (2.99 s), and 16.8 *20* from (n,n′γ).
		543.58 *8*	100 *7*	1063.82	2$^+$		E_γ: weighted average of 543.4 *2* from ^{100}Nb β^- decay (1.5 s), 543.2 *2* from ^{100}Nb β^- decay (2.99 s), 543.62 *6* from (n,n′γ), and 544.1 *5* from (^{30}Si,Xγ). I_γ: from ^{100}Nb β^- decay (1.5 s). Others: 100 *8* from (n,n′γ), 100 *15* from ^{100}Nb β^- decay (2.99 s).
		1071.77[c] *3*	74 *1*	535.59	2$^+$		E_γ: weighted average of 1071.6 *2* from ^{100}Nb β^- decay (1.5 s) and 1071.77 *3* from (n,n′γ). Others: 1071.6 *3* from ^{100}Nb β^- decay (2.99 s) and 1071.9 *5* from (^{30}Si,Xγ). I_γ: weighted average of 69 *13* from ^{100}Nb β^- decay (2.99 s), 74.0 *12* from (n,n′γ), and 52 *16* from (^{30}Si,Xγ); the transition mainly deexcites the 1607 level. Other: 116 *19* from ^{100}Nb β^- decay (1.5 s) is in disagreement.
1766.52	(2$^+$)	702.7 *1*	100	1063.82	2$^+$		E_γ: from (n,n′γ).
		1071.77[cd] *3*		695.13	0$^+$		E_γ: from (n,n′γ).
1771.44	(4$^+$)	635.31 *4*	55 *3*	1136.02	4$^+$		E_γ: from (n,n′γ). Other: 635.4 *3* from ^{100}Nb β^- decay (2.99 s). I_γ: weighted average of 53 *8* from ^{100}Nb β^- decay (2.99 s), 55 *3* from (n,n′γ), and 55 *3* from Coulomb excitation.
		707.68 *3*	100 *2*	1063.82	2$^+$	(E2)	B(E2)(W.u.)=30 *+7−5* E_γ: weighted average of 707.5 *2* from ^{100}Nb β^- decay (2.99 s) and 707.68 *3* from (n,n′γ). I_γ: from (n,n′γ) and Coulomb excitation. Other: 100 *14* from ^{100}Nb β^- decay (2.99 s). Mult.: from $T_{1/2}$(level), ΔJ^π and RUL.
1847.17	6$^+$	711.15 *6*	100	1136.02	4$^+$	(E2)	B(E2)(W.u.)=94 *+16−12* E_γ: weighted average of 711.0 *2* from ^{100}Nb β^- decay (2.99 s), 711.16 *6* from (n,n′γ), 711 *1* from (^{136}Xe,Xγ), and 711.1 *5* from (^{30}Si,Xγ). Mult.: from $T_{1/2}$, ΔJ^π and RUL.
1908.19	3$^-$	844.37 *4*	100.0 *10*	1063.82	2$^+$	[E1]	B(E1)(W.u.)=2.5×10^{-5} *+8−5* E_γ: from (n,n′γ). Other: 844.5 *5* from (^{30}Si,Xγ). I_γ: from Coulomb excitation. Others: 100 *14* from (^{30}Si,Xγ), ≈100 in (n,n′γ).
		1372.1 *7*	46 *4*	535.59	2$^+$	[E1]	B(E1)(W.u.)=2.7×10^{-6} *+10−6* E_γ: unweighted average of 1372.73 *4* from (n,n′γ) and 1371.4 *5* from (^{30}Si,Xγ). I_γ: from Coulomb excitation. Other: 20 *6* in ^{168}Er(^{30}Si,Xγ), 36.1 *15* from (n,n′γ).
		1908.2 *5*	4.6 *10*	0.0	0$^+$	[E3]	B(E3)(W.u.)=48 *+29−18* E_γ: from (n,n′γ). I_γ: from Coulomb excitation. Other: 3.6 *7* from (n,n′γ).

γ(^{100}Mo) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.	α[b]	Comments
1977.34	(1,2⁺)	513.2‡ *2*	74 *19*	1463.93	2⁺			
		913.70 *9*	79 *4*	1063.82	2⁺			E_γ: weighted average of 913.2 *5* from ^{100}Nb β^- decay (1.5 s) and 913.72 *9* from (n,n′γ). I_γ: from (n,n′γ). Other: 70 *30* from ^{100}Nb β^- decay (1.5 s).
		1281.8‡ *5*	52 *15*	695.13	0⁺			
		1441.67 *7*	100 *5*	535.59	2⁺			E_γ: weighted average of 1441.5 *2* from ^{100}Nb β^- decay (1.5 s) and 1441.69 *7* from (n,n′γ). I_γ: from (n,n′γ). Other: 100 *22* from ^{100}Nb β^- decay (1.5 s).
2037.60	0⁺	573.6‡ *2*	6.6 *9*	1463.93	2⁺			
		1502.2 *3*	100 *7*	535.59	2⁺	(E2)		E_γ: unweighted average of 1501.9 *1* from ^{100}Nb β^- decay (1.5 s) and 1502.4 *2* from (n,n′γ). Mult.: $\gamma\gamma(\theta)$ in ^{100}Nb β^- decay (1.5 s), ΔJ^π and RUL ($\beta\gamma$ coin in ^{100}Nb β^- decay (1.5 s) suggests 1504.6 level has $T_{1/2}$<50 ns).
2042.78	(2)⁺	435.5@ *2*	24@ *5*	1607.37	(3⁺)			
		578.8@ *1*	100@ *10*	1463.93	2⁺			
		978.95@ *9*	71@ *5*	1063.82	2⁺			
		1507.5@ *4*	29@ *7*	535.59	2⁺			
		2042.9@ *2*	68@ *10*	0.0	0⁺			
2086.33	0⁺	622.5‡ *2*	31 *6*	1463.93	2⁺	(E2)	0.003	Mult.: see comment for 1022.5γ.
		1022.5 *3*	100 *12*	1063.82	2⁺	(E2)		Mult.: $\gamma\gamma(\theta)$ in ^{100}Nb β^- decay (1.5 s), ΔJ^π and RUL ($\beta\gamma$ coin in ^{100}Nb β^- decay (1.5 s) suggests 1504.6 level has $T_{1/2}$<50 ns).
		1550.5‡ *3*	14 *2*	535.59	2⁺			
2103.13	4⁺	495.4‡d *9*	3.5 *23*	1607.37	(3⁺)			
		639.1 *2*	25 *3*	1463.93	2⁺			E_γ: weighted average of 639.0 *3* from ^{100}Nb β^- decay (2.99 s) and 639.2 *2* from (n,n′γ). I_γ: weighted average of 22 *3* from ^{100}Nb β^- decay (2.99 s) and 29 *4* from (n,n′γ).
		967.1 *1*	100 *4*	1136.02	4⁺			E_γ: weighted average of 966.9 *2* from ^{100}Nb β^- decay (2.99 s) and 967.1 *1* from (n,n′γ). I_γ: from (n,n′γ). Other: 100 *11* from ^{100}Nb β^- decay (2.99 s).
		1567.7 *2*	53 *18*	535.59	2⁺			E_γ: weighted average of 1567.4 *3* from ^{100}Nb β^- decay (2.99 s) and 1567.8 *2* from (n,n′γ). I_γ: unweighted average of 35 *5* from ^{100}Nb β^- decay (2.99 s) and 70 *4* from (n,n′γ).
2189.56	(0⁺,1,2)	1125.8‡ *2*	25 *5*	1063.82	2⁺			
		1653.9 *2*	100 *8*	535.59	2⁺			
2201.22	(2⁻)	1137.4 *1*	100 *7*	1063.82	2⁺			

Adopted Levels, Gammas (continued)

$\gamma(^{100}$Mo) (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.	δ	Comments
2201.22	(2⁻)	1665.4^{d} *1*	84 *7*	535.59	2⁺			Placement uncertain since a transition of similar energy is assigned to the 3129 level in ^{100}Nb β^- decay.
2286.47	2⁺	822.7$^{@}$ *3*	32$^{@}$ *4*	1463.93	2⁺			
		1750.8$^{@}$ *2*	100$^{@}$ *6*	535.59	2⁺			
2289.5	(4,5⁺)	682.1 *4*	100	1607.37	(3⁺)			E_γ: weighted average of 681.8 *4* from ^{100}Nb β^- decay (2.99 s) and 682.5 *5* from (^{30}Si,Xγ).
2310.12	(4⁺)	538.6‡ *4*	27 *9*	1771.44	(4⁺)			
		702.7‡ *3*	100 *14*	1607.37	(3⁺)			
		1246.4‡ *3*	48 *7*	1063.82	2⁺			
2320.3	(0⁺,1,2)	856.3‡ *3*	44 *18*	1463.93	2⁺			
		1257.0‡ *6*	100 *9*	1063.82	2⁺			
2339.8	(5⁻)	431.5 *5*	100 *14*	1908.19	3⁻			E_γ,I_γ: from (^{30}Si,Xγ) only.
		1203.6 *5*	82 *9*	1136.02	4⁺			E_γ,I_γ: from (^{30}Si,Xγ) only.
2369.68	3⁻	1305.9$^{@}$ *1*	100$^{@}$ *12*	1063.82	2⁺			
		1833.7$^{@}$ *3*	56$^{@}$ *9*	535.59	2⁺			
2397.0	(1⁻)	1861.4$^{@d}$ *3*	100$^{@}$	535.59	2⁺			
2416.58	(4⁺)	952.5‡ *3*	21 *3*	1463.93	2⁺			
		1280.7 *3*	100 *11*	1136.02	4⁺	(M1+E2)	−0.7 *+10−13*	E_γ: weighted average of 1280.4 *2* from ^{100}Nb β^- decay (2.99 s) and 1280.9 *2* from (n,n′γ). I_γ: from ^{100}Nb β^- decay (2.99 s). Mult.,δ: from $\gamma\gamma(\theta)$ in ^{100}Nb β^- decay (2.99 s).
2564.20	(4)⁺	461.1 *2*	100 *6*	2103.13	4⁺			E_γ: weighted average of 461.2 *2* from ^{100}Nb β^- decay (2.99 s) and 461.0 *2* from (n,n′γ). I_γ: from ^{100}Nb β^- decay (2.99 s). Other: 100 *21* from (n,n′γ).
		792.8‡ *2*	51 *7*	1771.44	(4⁺)			
		1428.0 *3*	51 *6*	1136.02	4⁺			E_γ: weighted average of 1427.9 *3* from ^{100}Nb β^- decay (2.99 s) and 1428.1 *3* from (n,n′γ). I_γ: from ^{100}Nb β^- decay (2.99 s). Other: 120 *20* in (n,n′γ).
		1500.2$^{\#@d}$ *3*	50$^{@}$ *17*	1063.82	2⁺			
2580.89	(1,2⁺)	1516.8$^{@}$ *3*	100$^{@}$ *20*	1063.82	2⁺			
		1886.0$^{@}$ *3*	80$^{@}$ *13*	695.13	0⁺			
2627.5	8⁺	780.3 *5*	100	1847.17	6⁺	(E2)		B(E2)(W.u.)=122 *+23−17* E_γ: weighted average of 781 *1* from (^{136}Xe,Xγ) and 780.1 *5* from (^{30}Si,Xγ). Mult.: from $T_{1/2}$, ΔJ^π and RUL.

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γ(^{100}Mo) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	Comments
2632.4	(1)	2632.4 *3*	100	0.0	0^+	(D)[a]	
2652.87	(4^+,5^+)	549.7[‡] *3*	50 *10*	2103.13	4^+		
		1045.8[‡] *6*	25 *10*	1607.37	(3^+)		
		1516.8[‡] *3*	100 *15*	1136.02	4^+		
2662.6?		1598.8[@d] *3*	100[@]	1063.82	2^+		E_γ: placement considered uncertain since a transition of similar energy is assigned to the 3062 level in ^{100}Nb β^- decay.
2738.02	(2^+)	1674.3[@] *3*	53[@] *11*	1063.82	2^+		
		2202.3[@] *3*	100[@] *11*	535.59	2^+		
2791.3		944.1 *5*	100	1847.17	6^+		E_γ: from (^{30}Si,Xγ) only.
2822.21	2^+	1358.3[@d] *1*	100[@]	1463.93	2^+		
2843.2	(7^-)	503.2 *5*	100 *14*	2339.8	(5^-)		E_γ,I_γ: from (^{30}Si,Xγ).
		996.3 *5*	88 *8*	1847.17	6^+		E_γ,I_γ: from (^{30}Si,Xγ).
2901.05	(1)	2901.0 *1*	100	0.0	0^+	(D)[a]	
2905.75	(1)	2905.7 *1*	100	0.0	0^+	(D)[a]	
2928.7	(7^-)	588.8 *5*	100	2339.8	(5^-)		E_γ: from (^{30}Si,Xγ).
2934.8	(4^+)	1871[‡] *1*	100	1063.82	2^+		
2961.2	2^+	1897.4[@d] *3*	100[@]	1063.82	2^+		
2970.1	4^+	1362.5[‡] *10*	7 *5*	1607.37	(3^+)		
		1906.6[‡] *5*	28 *10*	1063.82	2^+		
		2434.1 *5*	100 *8*	535.59	2^+		E_γ: weighted average of 2434.6 *5* from ^{100}Nb β^- decay (1.5 s) and 2434.0 *2* from (n,n′γ).
2996.31	(4^+,3^-)	1532.4[@d] *2*	100[@]	1463.93	2^+		
3004.4	(4^+,3^-)	1397[‡] *1*	100	1607.37	(3^+)		
3039.4	(4^+)	1432[‡] *1*	100	1607.37	(3^+)		
3042.2?		1978.4[@d] *6*	100[@]	1063.82	2^+		
3053.70	(≤4)	1989.9[@d] *2*	100[@]	1063.82	2^+		
3062.60	(0^+,1,2)	1598.7[‡] *3*	62 *15*	1463.93	2^+		
		2526.9[‡] *4*	100 *15*	535.59	2^+		
3066.25	(1)	3066.2 *2*	100	0.0	0^+		E_γ: from (γ,γ′) only.
3070.2	(0^+,1,2)	2534.6[‡] *4*	100	535.59	2^+		
3129.6	(0^+,1,2)	1665.7[‡] *4*	100	1463.93	2^+		
3143.0		351.7 *5*	100	2791.3			E_γ: from (^{30}Si,Xγ) only.
3198.4	(1)	3198.3 *4*	100	0.0	0^+	(D)[a]	
3242.76	1	3242.7 *1*	100	0.0	0^+	D[a]	
3290.27	$1^{(+)}$	2595.3 *3*	21 *6*	695.13	0^+	(D)[a]	

$^{100}_{42}Mo_{58}$-20

$\gamma(^{100}Mo)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	Comments
3290.27	$1^{(+)}$	2755.4 *3*	21 *4*	535.59	2^+	(D)[a]	
		3290.1 *1*	100 *6*	0.0	0^+	D[a]	
3299.2	(9^-)	370.5 *5*	66 *13*	2928.7	(7^-)		E_γ,I_γ: from (^{30}Si,Xγ) only.
		456.1 *5*	100 *17*	2843.2	(7^-)		E_γ,I_γ: from (^{30}Si,Xγ) only.
3342.06	(1)	3342.0 *1*	100	0.0	0^+	(D)[a]	
3367.0	(10^+)	739.5 *5*	100	2627.5	8^+		E_γ: from (^{30}Si,Xγ).
3483.82	(1^+)	2419.8 *1*	11.1 *12*	1063.82	2^+		E_γ,I_γ: from (γ,γ') only.
		2948.2 *1*	12.4 *12*	535.59	2^+		E_γ,I_γ: from (γ,γ') only.
		3483.9 *1*	100.0 *20*	0.0	0^+	(D)[a]	E_γ,I_γ: from (γ,γ') only.
3570.77	(1)	3570.7 *1*	100	0.0	0^+	(D)[a]	
3599.87	(1)	3599.8 *2*	100	0.0	0^+		E_γ: from (γ,γ') only.
3615.57	1	3615.5 *2*	100	0.0	0^+	D[a]	
3626.5	$(4^+,5,6)$	1779.3[‡] *5*	100	1847.17	6^+		
3627.3	(1)	3627.2 *3*	100	0.0	0^+	(D)[a]	
3647.3	(5^-)	1800.1[‡] *6*	100	1847.17	6^+		
3658.96	$1^{(+)}$	2595.3 *3*	20 *5*	1063.82	2^+	D[a]	
		3658.7 *3*	100 *5*	0.0	0^+	D[a]	
3783.5		640.5 *5*	100	3143.0			E_γ: from (^{30}Si,Xγ) only.
3887.98	1	3887.9 *1*		0.0	0^+	D[a]	
3896.68	(1)	3896.6 *1*		0.0	0^+	(D)[a]	
3925.98	(1)	3925.9 *1*		0.0	0^+	(D)[a]	
4032.7	(11^-)	733.5 *5*	100	3299.2	(9^-)		E_γ: from (^{30}Si,Xγ) only.
4062.6	(12^+)	695.6 *5*	100	3367.0	(10^+)		E_γ: weighted average of 696 *1* from (^{136}Xe,Xγ) and 695.5 *5* from (^{30}Si,Xγ).
4081.59	1	4081.5 *1*		0.0	0^+	D[a]	
4156.5	1	4156.4 *3*		0.0	0^+	D[a]	
4217.60	1	4217.5 *1*		0.0	0^+	D[a]	
4232.10	(1)	4232.0 *2*		0.0	0^+	(D)[a]	
4329.90	1	4329.8 *2*		0.0	0^+	D[a]	
4516.81	1	4516.7 *1*		0.0	0^+	D[a]	
4565.51	1	4565.4 *1*		0.0	0^+	D[a]	
4583.11	1	4583.0 *1*		0.0	0^+	D[a]	
4594.91	1	4594.8 *1*		0.0	0^+	D[a]	
4689.02	1	4688.9 *1*		0.0	0^+	D[a]	
4730.32	1	4730.2 *2*		0.0	0^+	D[a]	
4875.2	(14^+)	812.6 *5*	100	4062.6	(12^+)		E_γ: weighted average of 813 *1* from (^{136}Xe,Xγ) and 812.5 *5* from (^{30}Si,Xγ).
4939.8	(13^-)	907.1 *5*	100	4032.7	(11^-)		E_γ: from (^{30}Si,Xγ) only.
4989.63	1	4989.5 *2*		0.0	0^+	D[a]	
5007.33	1	5007.2 *2*		0.0	0^+	D[a]	

$^{100}_{42}Mo_{58}$-21

Adopted Levels, Gammas (continued)

$\gamma(^{100}Mo)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.
5034.54	1	5034.4 *2*		0.0	0^+	D[a]
5062.9	(2)	5062.8 *3*		0.0	0^+	(Q)[a]
5071.24	(1)	5071.1 *2*		0.0	0^+	(D)[a]
5101.3	1	5101.2 *6*		0.0	0^+	D[a]
5109.3	(1)	5109.2 *9*		0.0	0^+	(D)[a]
5136.04	(1)	5135.9 *1*		0.0	0^+	(D)[a]
5158.3	1	5158.2 *3*		0.0	0^+	D[a]
5169.6	1	5169.5 *3*		0.0	0^+	D[a]
5181.8	1	5181.7 *3*		0.0	0^+	D[a]
5186.9	1	4651 *2*	84 *13*	535.59	2^+	
		5187 *2*	100 *15*	0.0	0^+	D[a]
5190.4	1	5190.3 *5*		0.0	0^+	D[a]
5204.6	(1)	5204.5 *4*		0.0	0^+	(D)[a]
5216.0	(1)	5215.9 *8*		0.0	0^+	(D)[a]
5271.2	1	5271.1 *6*		0.0	0^+	D[a]
5277.6	1	5277.5 *3*		0.0	0^+	D[a]
5310.5	1	5310.3 *4*		0.0	0^+	D[a]
5335.65	1	5335.5 *2*		0.0	0^+	D[a]
5347.85	1	5347.7 *1*		0.0	0^+	D[a]
5359.8	1	5359.6 *3*		0.0	0^+	D[a]
5369.6	1	5369.4 *6*		0.0	0^+	D[a]
5382.5	1	5382.3 *10*		0.0	0^+	D[a]
5390.3	1	5390.1 *6*		0.0	0^+	D[a]
5402.26	1	5402.1 *1*		0.0	0^+	D[a]
5412.6	1	5412.4 *8*		0.0	0^+	D[a]
5435.5	1	5435.3 *6*		0.0	0^+	D[a]
5442.9	1	5442.7 *6*		0.0	0^+	D[a]
5449.6	(1)	5449.4 *6*		0.0	0^+	(D)[a]
5502.7	1	5502.5 *4*		0.0	0^+	D[a]
5519.4	1	5519.2 *4*		0.0	0^+	D[a]
5532.2	1	5532.0 *5*		0.0	0^+	D[a]
5547.9	1	5547.7 *3*		0.0	0^+	D[a]
5554.4	1	5554.2 *11*		0.0	0^+	D[a]
5584.9	1	5584.7 *4*		0.0	0^+	D[a]
5596.8	1	5596.6 *7*		0.0	0^+	D[a]
5604.7	1	5604.5 *12*		0.0	0^+	D[a]
5612.67	1	5612.5 *1*		0.0	0^+	D[a]
5618.6	1	5618.4 *3*		0.0	0^+	D[a]

Adopted Levels, Gammas (continued)

$\gamma(^{100}Mo)$ (continued)

E_i(level)	J^{π}_i	E_{γ} †	I_{γ} †	E_f	J^{π}_f	Mult.	Comments
5656.5	(2)	5656.3 *5*		0.0	0^+	(Q)[a]	
5670.67	1	5670.5 *1*		0.0	0^+	D[a]	
5680.9	(1)	5680.7 *7*		0.0	0^+	(D)[a]	
5686.5	1	5686.3 *5*		0.0	0^+	D[a]	
5715.9	1	5715.7 *3*		0.0	0^+	D[a]	
5725.3	1	5725.1 *3*		0.0	0^+	D[a]	
5732.9	1	5732.7 *3*		0.0	0^+	D[a]	
5742.6	1	5742.4 *7*		0.0	0^+	D[a]	
5764.0	(1)	5763.8 *15*		0.0	0^+	(D)[a]	
5770.4	1	5770.2 *4*		0.0	0^+	D[a]	
5798.2	1	5798.0 *3*		0.0	0^+	D[a]	
5808.98	1	5808.8 *1*		0.0	0^+	D[a]	
5826.5	(2)	5826.3 *6*		0.0	0^+	(Q)[a]	
5840.2	(16^+)	965 *1*	100	4875.2	(14^+)		E_{γ}: from $(^{30}Si,X\gamma)$ and $(^{137}Xe,X\gamma)$.
5840.7	1	5840.5 *6*		0.0	0^+	D[a]	
5879.39	1	5879.2 *2*		0.0	0^+	D[a]	
5901.0	1	5900.8 *6*		0.0	0^+	D[a]	
5947.79	1	5947.6 *2*		0.0	0^+	D[a]	
5957.2	1	5957.0 *6*		0.0	0^+	D[a]	
5964.0	1	5963.8 *6*		0.0	0^+	D[a]	
5972.99	1	5972.8 *2*		0.0	0^+	D[a]	
5988.9	1	5988.7 *4*		0.0	0^+	D[a]	
6009.6	1	6009.4 *4*		0.0	0^+	D[a]	
6019.5	(1)	6019.3 *11*		0.0	0^+	(D)[a]	
6035.5	1	6035.3 *8*		0.0	0^+	D[a]	
6061.3	(2)	6061.1 *9*		0.0	0^+	(Q)[a]	
6065.9	1	6065.7 *7*		0.0	0^+	D[a]	
6082.9	1	6082.7 *3*		0.0	0^+	D[a]	
6089.3	1	6089.1 *4*		0.0	0^+	D[a]	
6122.5	1	6122.3 *5*		0.0	0^+	D[a]	
6133.6	1	6133.4 *7*		0.0	0^+	D[a]	
6147.1	1	6146.9 *9*		0.0	0^+	D[a]	
6174.0	1	6173.8 *5*		0.0	0^+	D[a]	
6194.51	(1)	6194.3 *1*		0.0	0^+	(D)[a]	
6249.4	1	6249.2 *5*		0.0	0^+	D[a]	
6257.61	1	6257.4 *2*		0.0	0^+	D[a]	
6270.5	1	6270.3 *8*		0.0	0^+	D[a]	
6278.71	1	6278.5 *1*		0.0	0^+	D[a]	

Adopted Levels, Gammas (continued)

γ(^{100}Mo) (continued)

E$_i$(level)	J$^\pi_i$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$^\pi_f$	Mult.	δ	Comments
6293.1	1	6292.9 *4*		0.0	0$^+$	D[a]		
6310.3	(1)	6310.1 *15*		0.0	0$^+$	(D)[a]		
6321.2	1	6321.0 *9*		0.0	0$^+$	D[a]		
6327.6	1	6327.4 *9*		0.0	0$^+$	D[a]		
6337.5	1	6337.3 *4*		0.0	0$^+$	D[a]		
6354.32	1	6354.1 *2*		0.0	0$^+$	D[a]		
6365.6	(1)	6365.4 *19*		0.0	0$^+$	(D)[a]		
6375.6	1	6375.4 *5*		0.0	0$^+$	D[a]		
6402.0	1	6401.8 *8*		0.0	0$^+$	D[a]		
6414.3	1	6414.1 *4*		0.0	0$^+$	D[a]		
6419.4	1$^-$	3788[d] *4*	7 *2*	2632.4	(1)			
		4385 *4*	19 *4*	2037.60	0$^+$			
		4444[d] *4*	6 *2*	1977.34	(1,2$^+$)			
		5355 *4*	11 *3*	1063.82	2$^+$	(E1+M2)[&]	+0.21[&] *12*	B(E1)(W.u.)=1.7×10^{-6} *+60−11*
		5723 *4*	0.8 *4*	695.13	0$^+$			
		5883 *4*	1.2 *6*	535.59	2$^+$			
		6418 *4*	100 *15*	0.0	0$^+$	E1[&]		B(E1)(W.u.)=9×10^{-5} *+22−4*
6421.4	1	6421.2 *6*		0.0	0$^+$	D[a]		
6426.6	(1)	6426.4 *9*		0.0	0$^+$	(D)[a]		
6434.1	1	6433.9 *5*		0.0	0$^+$	D[a]		
6459.0	1	6458.8 *6*		0.0	0$^+$	D[a]		
6473.5	1	6473.3 *6*		0.0	0$^+$	D[a]		
6483.2	(1)	6483 *2*		0.0	0$^+$	(D)[a]		
6497.6	1	6497.4 *6*		0.0	0$^+$	D[a]		
6518.5	1$^-$	3445[d] *3*	18 *3*	3066.25	(1)			
		4477 *3*	23 *5*	2042.78	(2)$^+$			
		5055 *3*	28 *5*	1463.93	2$^+$			
		5455 *3*	8 *2*	1063.82	2$^+$			
		5823 *3*	10 *2*	695.13	0$^+$			
		5982 *3*	32 *5*	535.59	2$^+$			
		6517 *3*	100 *15*	0.0	0$^+$	E1[&]		B(E1)(W.u.)=21×10^{-5} *+35−10*
6519.1	1	6518.9 *5*		0.0	0$^+$	D[a]		
6526.6	1	6526.4 *3*		0.0	0$^+$	D[a]		
6570.2	1	6570.0 *4*		0.0	0$^+$	D[a]		
6597.0	(2)	6596.8 *4*		0.0	0$^+$	(Q)[a]		
6622.3	(1)	6622.1 *4*		0.0	0$^+$	(D)[a]		
6628.3	(2)	6628.1 *5*		0.0	0$^+$	(Q)[a]		
6641.0	1	6640.8 *3*		0.0	0$^+$	D[a]		

Adopted Levels, Gammas (continued)

γ(^{100}Mo) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.
6658.2	1	6658.0 *4*		0.0	0^+	D[a]
6669.14	1	6668.9 *2*		0.0	0^+	D[a]
6685.3	1	6685.1 *4*		0.0	0^+	D[a]
6764.1	1	6763.9 *8*		0.0	0^+	D[a]
6772.7	1	6772.5 *8*		0.0	0^+	D[a]
6790.6	1	6790.4 *10*		0.0	0^+	D[a]
6797.5	(1)	6797.3 *9*		0.0	0^+	(D)[a]
6807.9	(2)	6807.7 *10*		0.0	0^+	(Q)[a]
6829.5	(1)	6829.2 *3*		0.0	0^+	(D)[a]
6844.6	(2)	6844.3 *11*		0.0	0^+	(Q)[a]
6851.3	1	6851.0 *15*		0.0	0^+	D[a]
6870.0	(1)	6869.7 *8*		0.0	0^+	(D)[a]
6886.5	1	6886.2 *8*		0.0	0^+	D[a]
6893.2	1	6892.9 *4*		0.0	0^+	D[a]
6906.1	1	6905.8 *6*		0.0	0^+	D[a]
6912.9	(1)	6912.6 *11*		0.0	0^+	(D)[a]
6919.5	1	6919.2 *13*		0.0	0^+	D[a]
6924.9	(1)	6924.6 *10*		0.0	0^+	(D)[a]
6934.2	(1)	6933.9 *12*		0.0	0^+	(D)[a]
6949.2	(18^+)	1109 *1*	100	5840.2	(16^+)	
6949.9	1	6949.6 *11*		0.0	0^+	D[a]
6957.7	(2)	6957.4 *11*		0.0	0^+	(Q)[a]
6974.2	1	6973.9 *8*		0.0	0^+	D[a]
6981.1	(2)	6980.8 *12*		0.0	0^+	(Q)[a]
6994.5	(2)	6994.2 *5*		0.0	0^+	(Q)[a]
7001.2	1	7000.9 *5*		0.0	0^+	D[a]
7018.3	1	7018.0 *6*		0.0	0^+	D[a]
7032.1	1	7031.8 *5*		0.0	0^+	D[a]
7037.8	(1)	7037.5 *10*		0.0	0^+	(D)[a]
7060.2	1	7059.9 *11*		0.0	0^+	D[a]
7068.1	1	7067.8 *3*		0.0	0^+	D[a]
7095.4	1	7095.1 *5*		0.0	0^+	D[a]
7103.5	(1)	7103.2 *7*		0.0	0^+	(D)[a]
7115.3	1	7115.0 *3*		0.0	0^+	D[a]
7136.6	1	7136.3 *5*		0.0	0^+	D[a]
7171.7	(1)	7171.4 *7*		0.0	0^+	(D)[a]
7181.5	(1)	7181.2 *9*		0.0	0^+	(D)[a]
7194.4	1	7194.1 *3*		0.0	0^+	D[a]

Adopted Levels, Gammas (continued)

$\gamma(^{100}Mo)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.	δ	Comments
7204.0	1	7203.7 *7*		0.0	0^+	D[a]		
7219.4	(2)	7219.1 *9*		0.0	0^+	(Q)[a]		
7225.4	(1)	7225.1 *13*		0.0	0^+	(D)[a]		
7299.6	1	7299.3 *5*		0.0	0^+	D[a]		
7312.3	1	7312.0 *3*		0.0	0^+	D[a]		
7330.8	1	7330.5 *3*		0.0	0^+	D[a]		
7357.7	1	7357.4 *6*		0.0	0^+	D[a]		
7380.3	(1)	7380.0 *7*		0.0	0^+	(D)[a]		
7403.3	1	7403.0 *8*		0.0	0^+	D[a]		
7450.6	1	7450.3 *10*		0.0	0^+	D[a]		
7471.0	1	7470.7 *4*		0.0	0^+	D[a]		
7487.2	1	7486.9 *7*		0.0	0^+	D[a]		
7494.8	(1)	7494.5 *11*		0.0	0^+	(D)[a]		
7503.5	(2)	7503.2 *12*		0.0	0^+	(Q)[a]		
7526.1	1	7525.8 *6*		0.0	0^+	D[a]		
7546.3	1	7546 *2*		0.0	0^+	D[a]		
7559.1	(1)	7558.8 *15*		0.0	0^+	(D)[a]		
7577.2	1	7576.9 *9*		0.0	0^+	D[a]		
7606.9	1	7606.6 *4*		0.0	0^+	D[a]		
7638.6	1^-	4569[d] *4*	4 *1*	3066.25	(1)			
		5007[d] *2*	6 *2*	2632.4	(1)			
		5597 *4*	5 *1*	2042.78	$(2)^+$			
		5604 *4*	5 *1*	2037.60	0^+			
		6176 *2*	4 *1*	1463.93	2^+			
		6574 *2*	15 *3*	1063.82	2^+			
		7102 *2*	101 *15*	535.59	2^+	(E1+M2)[&]	−0.06[&] *2*	B(E1)(W.u.)=11×10^{-5} *+7−4*; B(M2)(W.u.)=0.04 *+7−3*
		7637 *2*	100 *15*	0.0	0^+	E1[&]		B(E1)(W.u.)=9×10^{-5} *+6−3*
7744.5	1	7744.2 *8*		0.0	0^+	D[a]		
7758.4	(1)	7758.1 *10*		0.0	0^+	(D)[a]		
7771.5	1	7771.2 *12*		0.0	0^+	D[a]		
7796.9	1	7796.6 *14*		0.0	0^+	D[a]		
7831.2	1	7830.9 *8*		0.0	0^+	D[a]		
7863.1	(1)	7862.8 *7*		0.0	0^+	(D)[a]		
7875.4	1	7875.1 *6*		0.0	0^+	D[a]		
7887.2	1	7886.9 *10*		0.0	0^+	D[a]		
7935.7	1	7935.4 *10*		0.0	0^+	D[a]		
7955.7	1	7955.4 *6*		0.0	0^+	D[a]		
7988.0	1	7987.7 *7*		0.0	0^+	D[a]		

Adopted Levels, Gammas (continued)

γ(^{100}Mo) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.
8002.0	1	8001.7 *6*		0.0	0^+	D[a]
8033.5	1	8033.2 *8*		0.0	0^+	D[a]
8052.2	1	8051.9 *6*		0.0	0^+	D[a]
8063.7	1	8063.4 *9*		0.0	0^+	D[a]
8083.3	1	8082.9 *16*		0.0	0^+	D[a]
8095.9	1	8095.5 *11*		0.0	0^+	D[a]
8108.1	1	8107.7 *12*		0.0	0^+	D[a]
8114.2	(20^+)	1165 *1*	100	6949.2	(18^+)	
8127.7	1	8127.3 *10*		0.0	0^+	D[a]

E_i(level)	J^π_i	E_γ[†]	E_f	J^π_f	Mult.
8194.4	1	8194.0 *9*	0.0	0^+	D[a]
8208.8	1	8208.4 *6*	0.0	0^+	D[a]
8218.2	(1)	8217.8 *6*	0.0	0^+	(D)[a]
8238.6	1	8238.2 *9*	0.0	0^+	D[a]
8257.1	1	8256.7 *14*	0.0	0^+	D[a]
8269.6	1	8269.2 *6*	0.0	0^+	D[a]
8283.6	1	8283.2 *6*	0.0	0^+	D[a]
8294.5	(1)	8294.1 *13*	0.0	0^+	(D)[a]

† For γ-rays from low-spin (J≤6 or so) up to 3647, values are from weighted averages of Eγ and Iγ branching ratios values available from ^{100}Nb β^- decay (1.5 s), ^{100}Nb β^- decay (2.99 s), and ^{100}Mo(n,n′γ), when values of comparable precision are available from more than one datasets. For γ rays from high-spin (J>6) levels, values are mainly from ^{168}Er(^{30}Si,Xγ). For levels above 3647, values are from (γ,γ'). Exceptions are noted. Intensities are photon branching ratios.

‡ γ reported in ^{100}Nb β^- decay, but not in (n,n′γ).

Placement considered uncertain by evaluators since no such transition is reported in ^{100}Nb β^- decay.

@ From (n,n′γ) only.

& From γ(θ,lin pol) in (γ,γ').

a From γ(θ) in (γ,γ').

b Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with “Frozen Orbitals” approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

c Multiply placed.

d Placement of transition in the level scheme is uncertain.

$^{100}_{42}Mo_{58}$-27

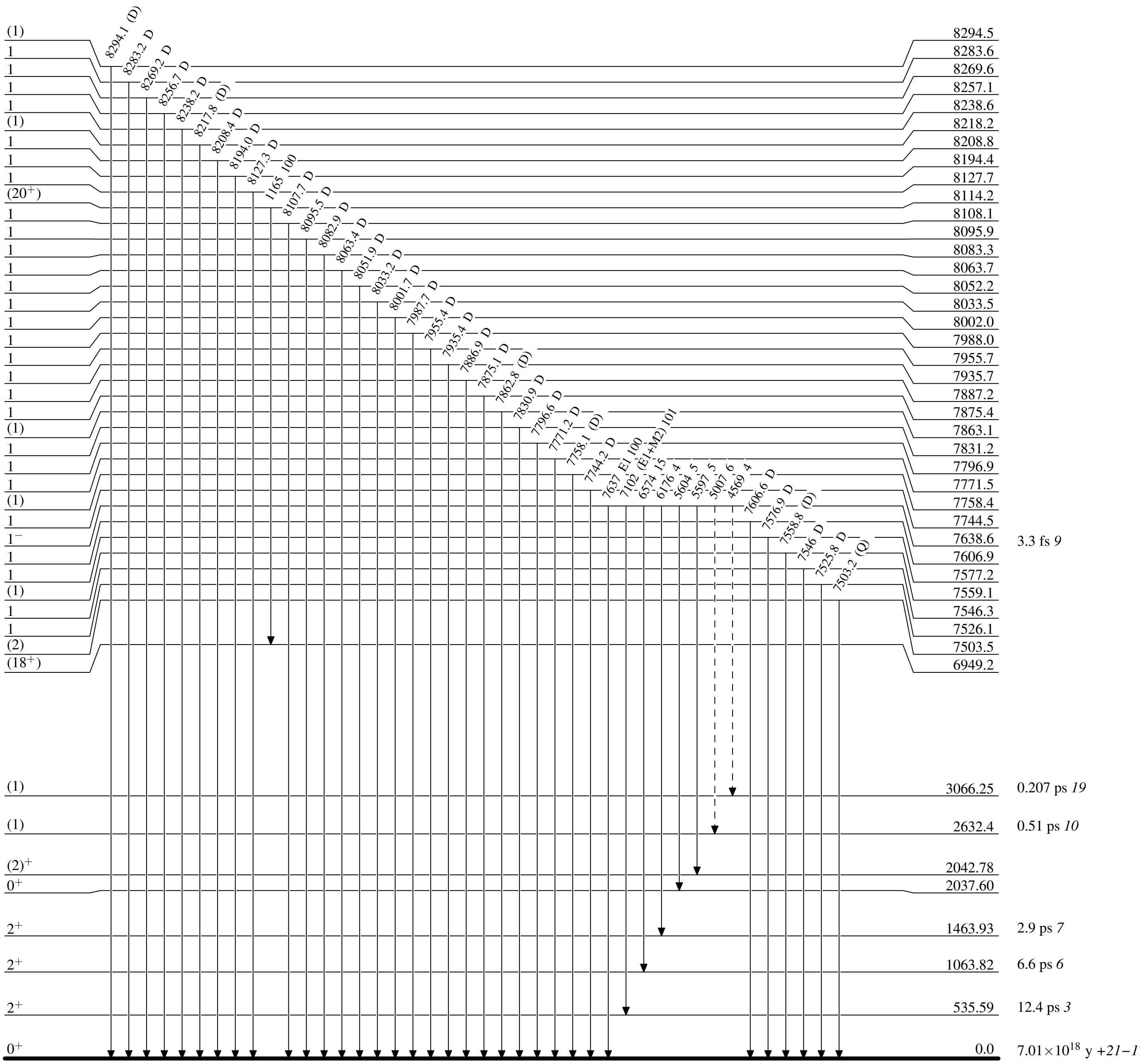
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

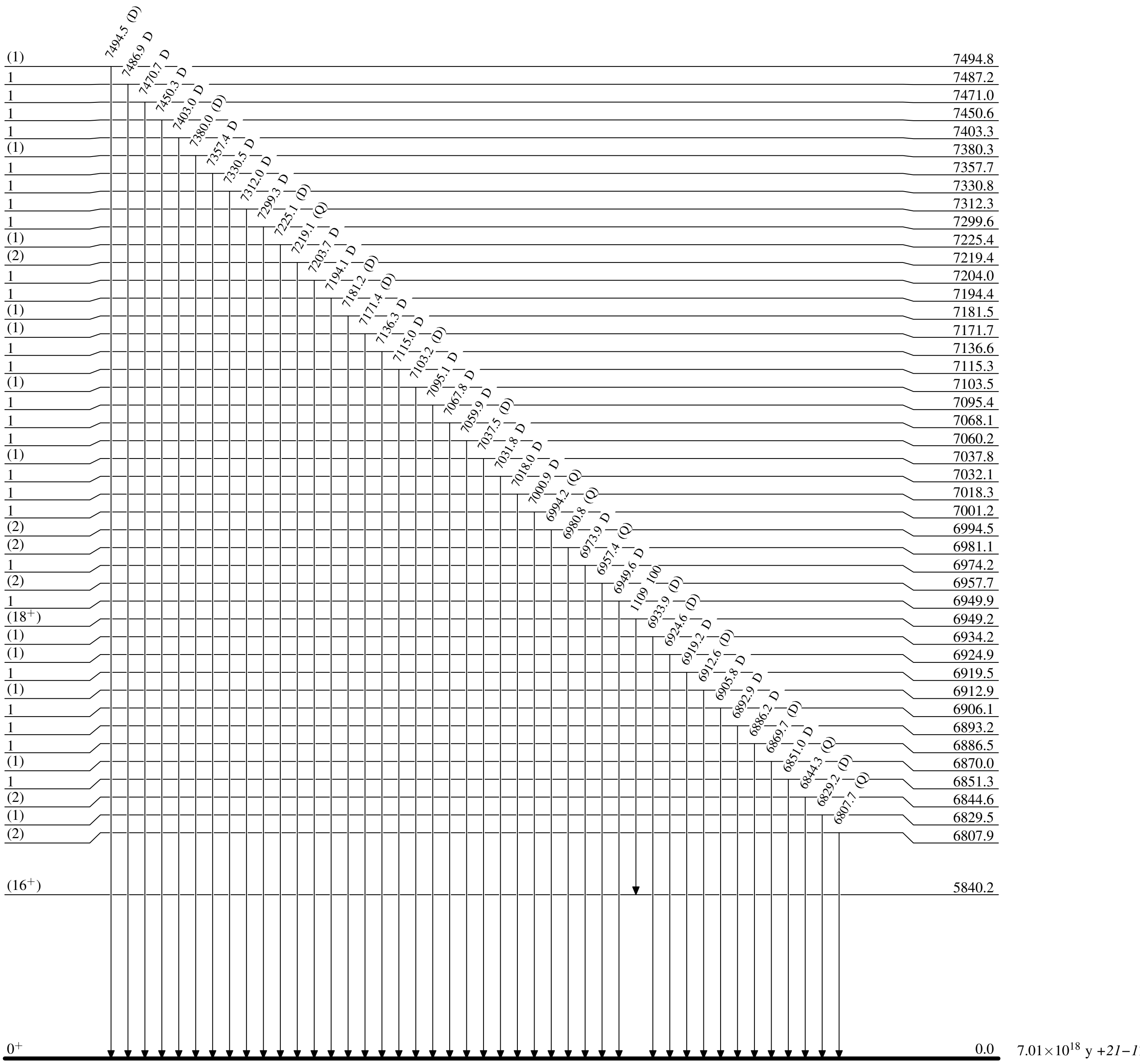


$^{100}_{42}Mo_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



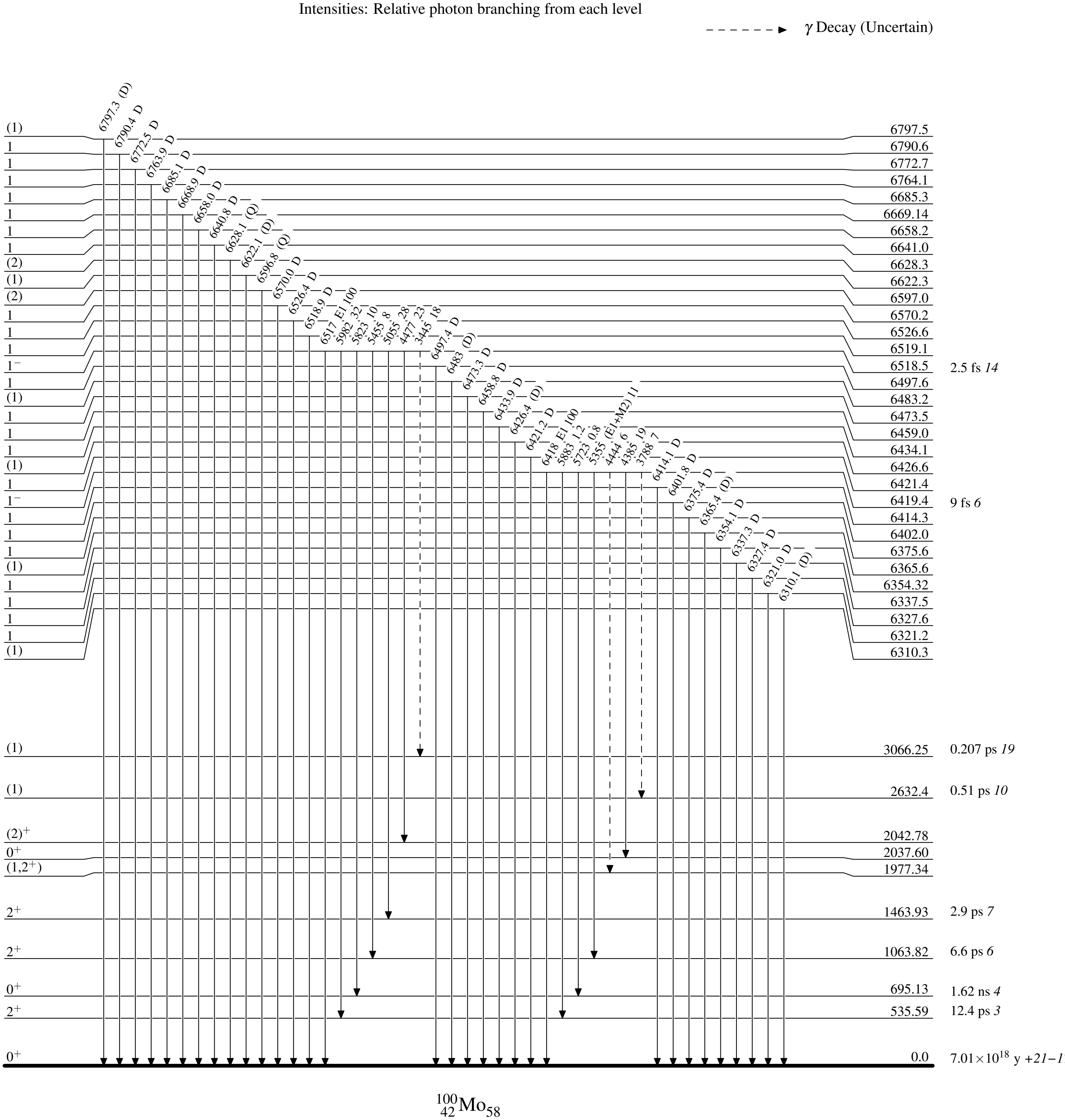
$^{100}_{42}Mo_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

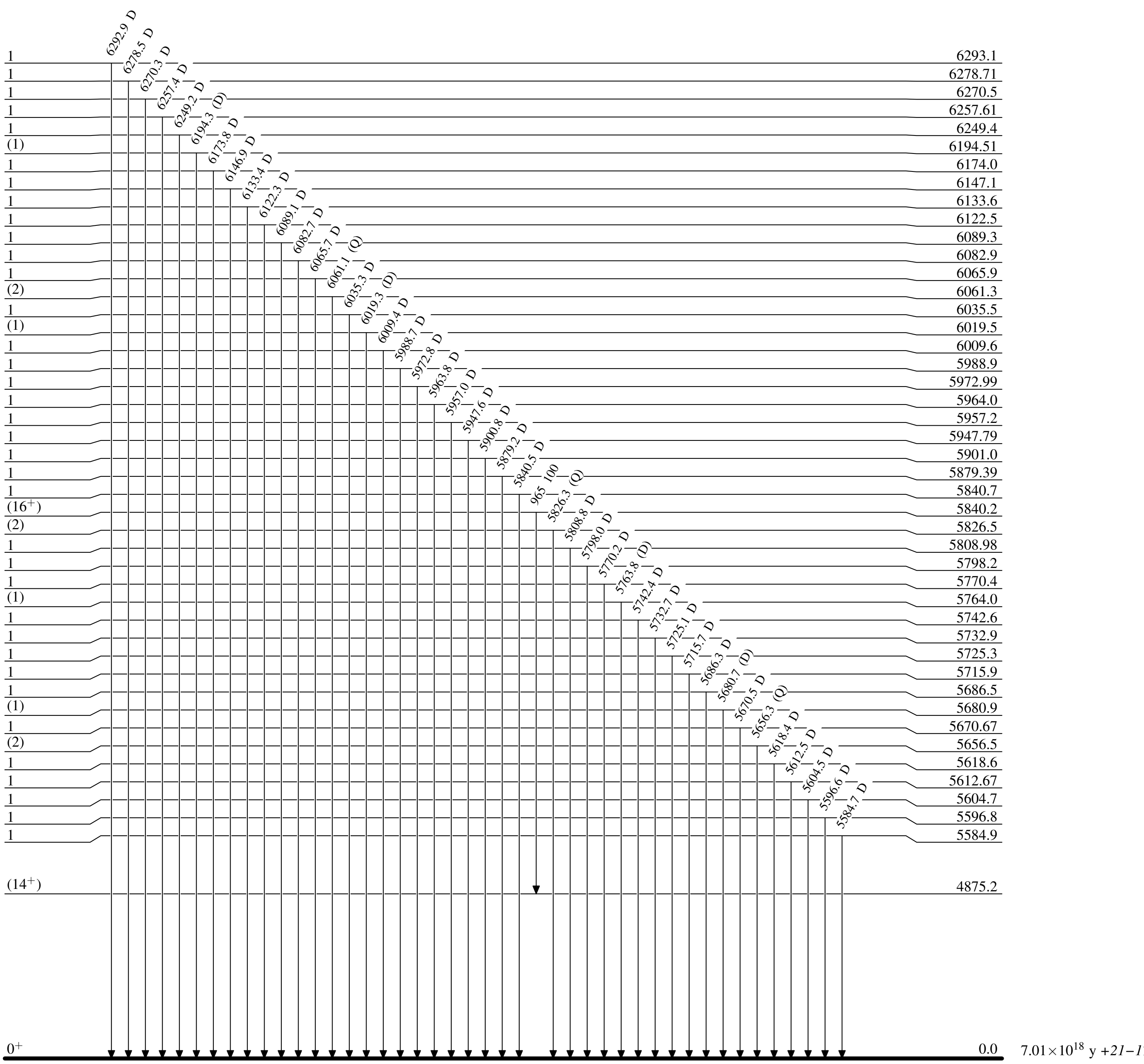
Legend



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

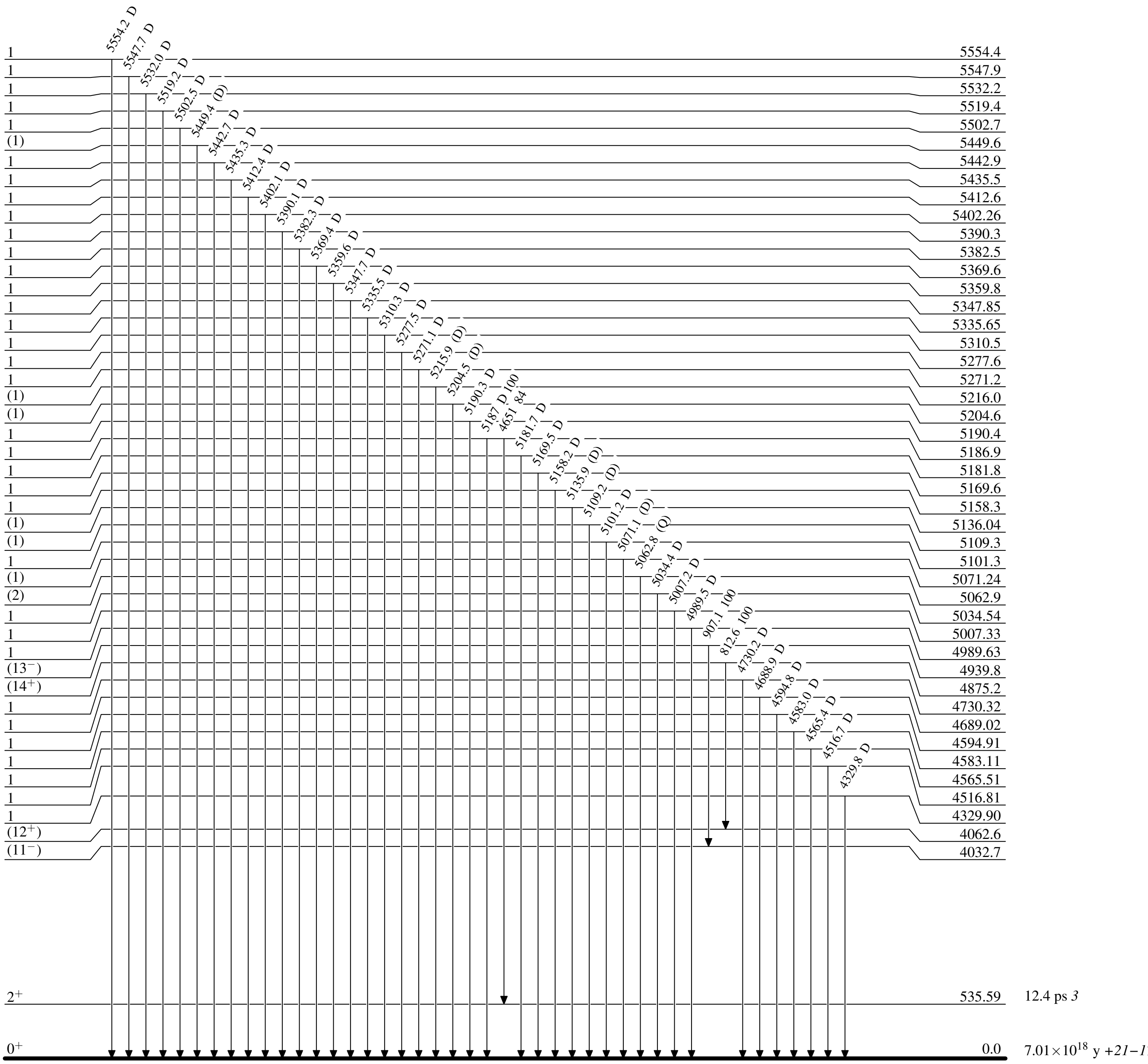


$^{100}_{42}Mo_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

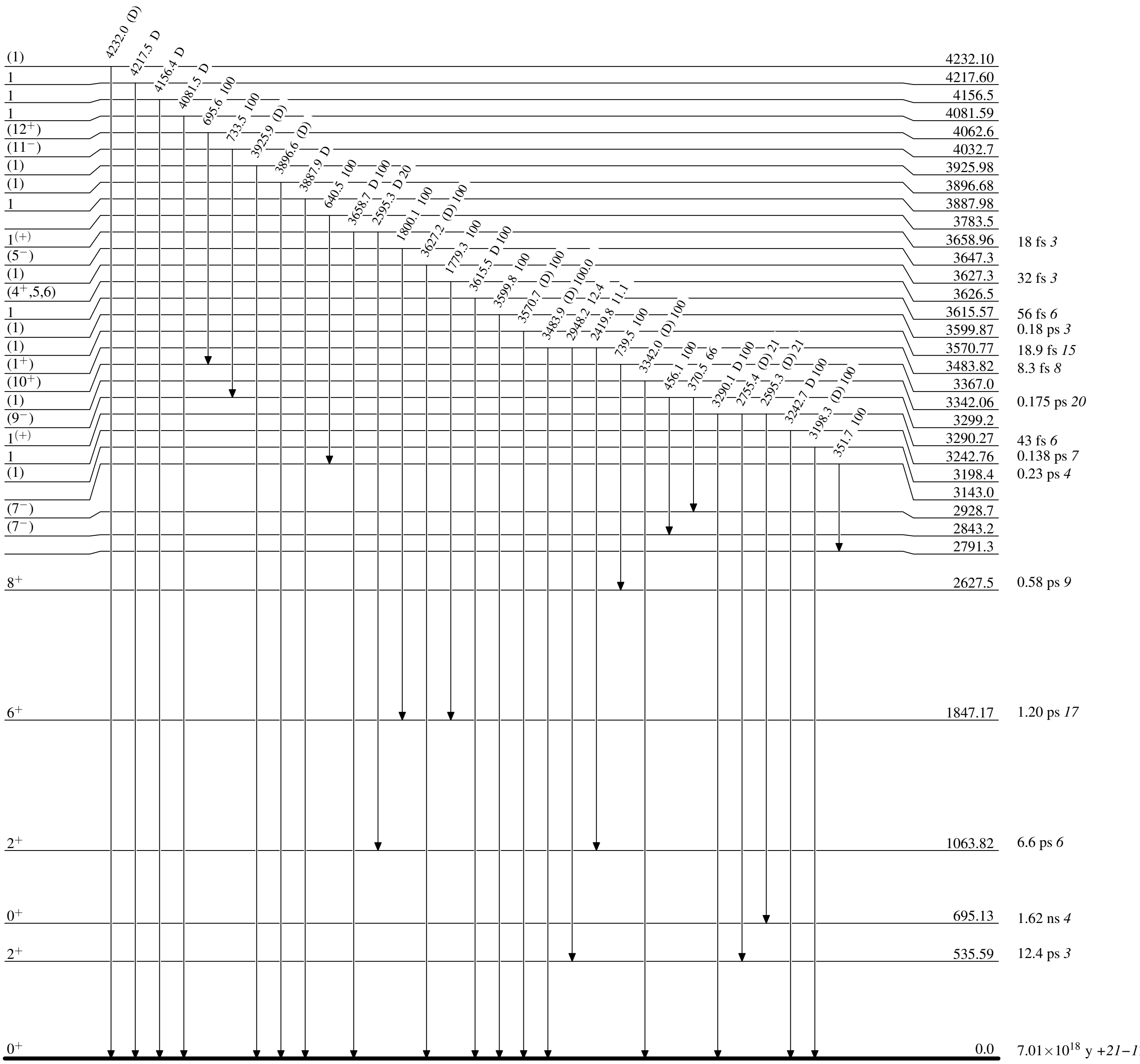


$^{100}_{42}Mo_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

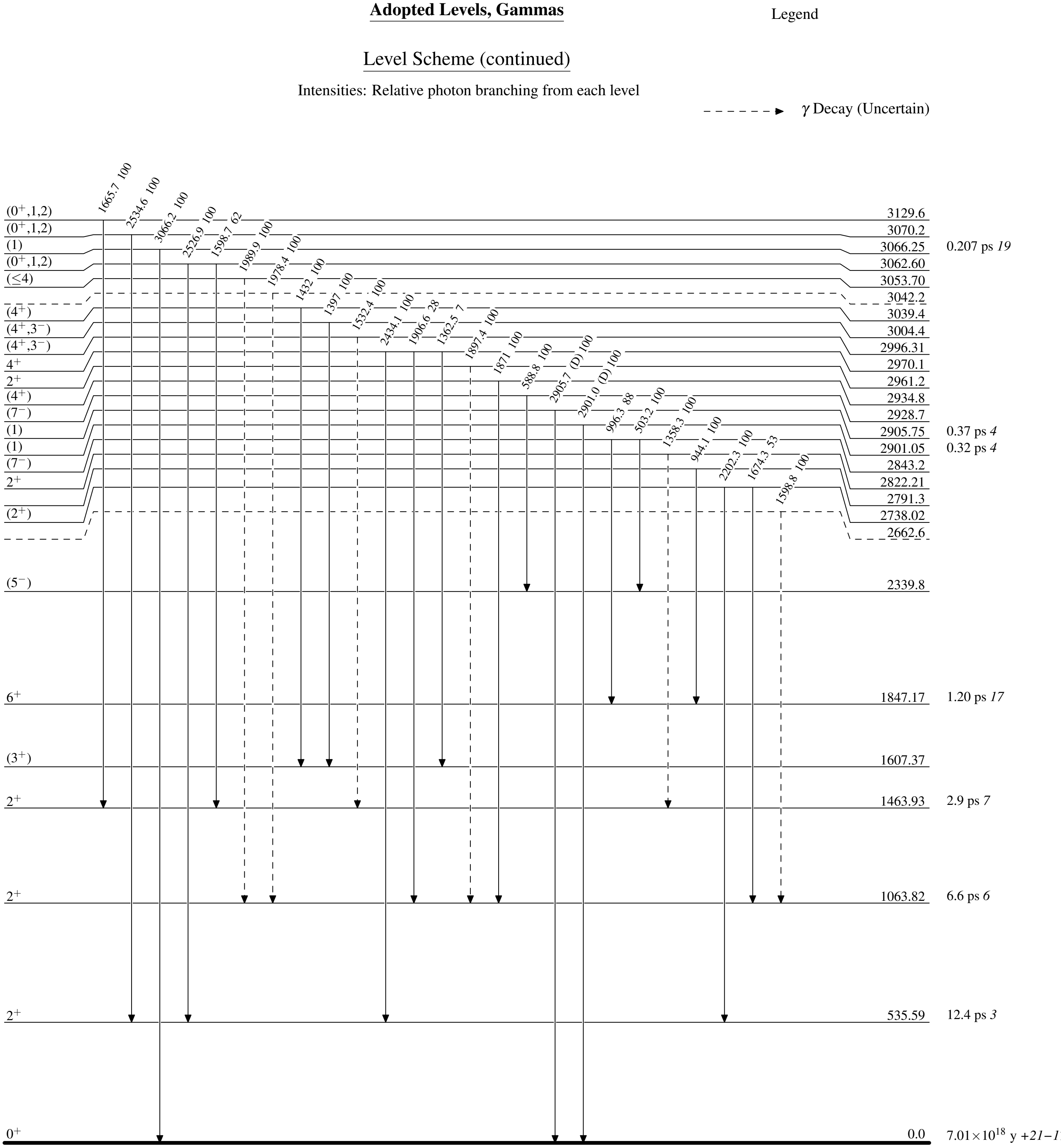


$^{100}_{42}Mo_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

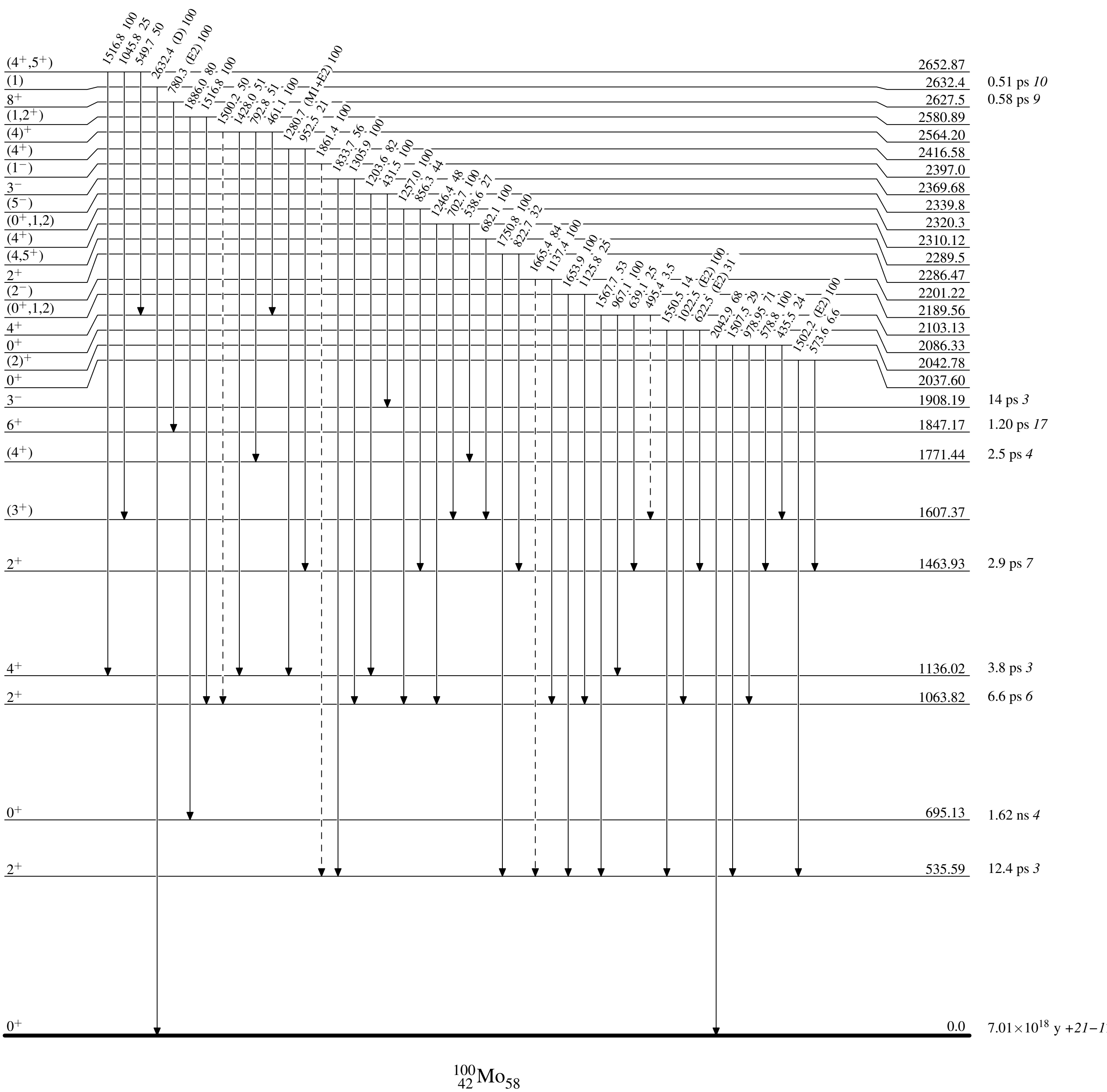


$^{100}_{42}Mo_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

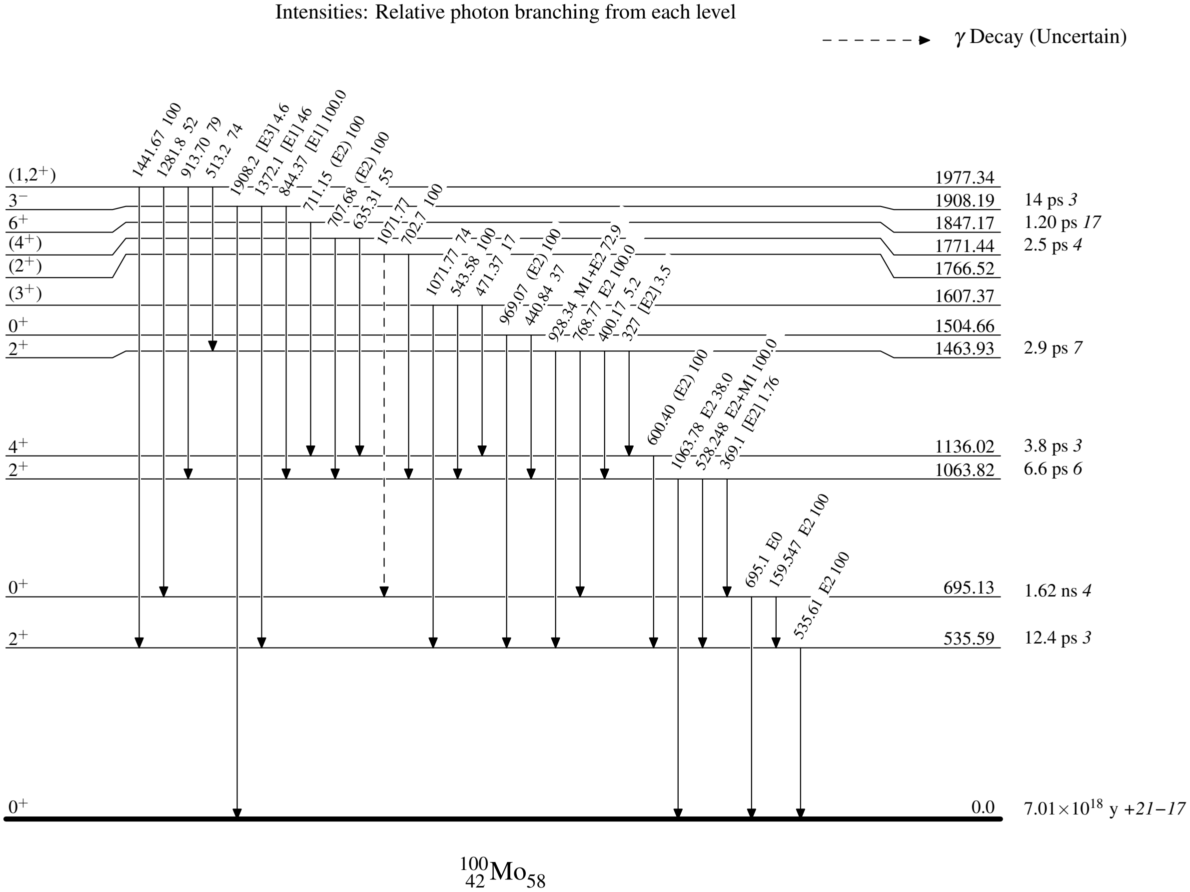


Adopted Levels, Gammas

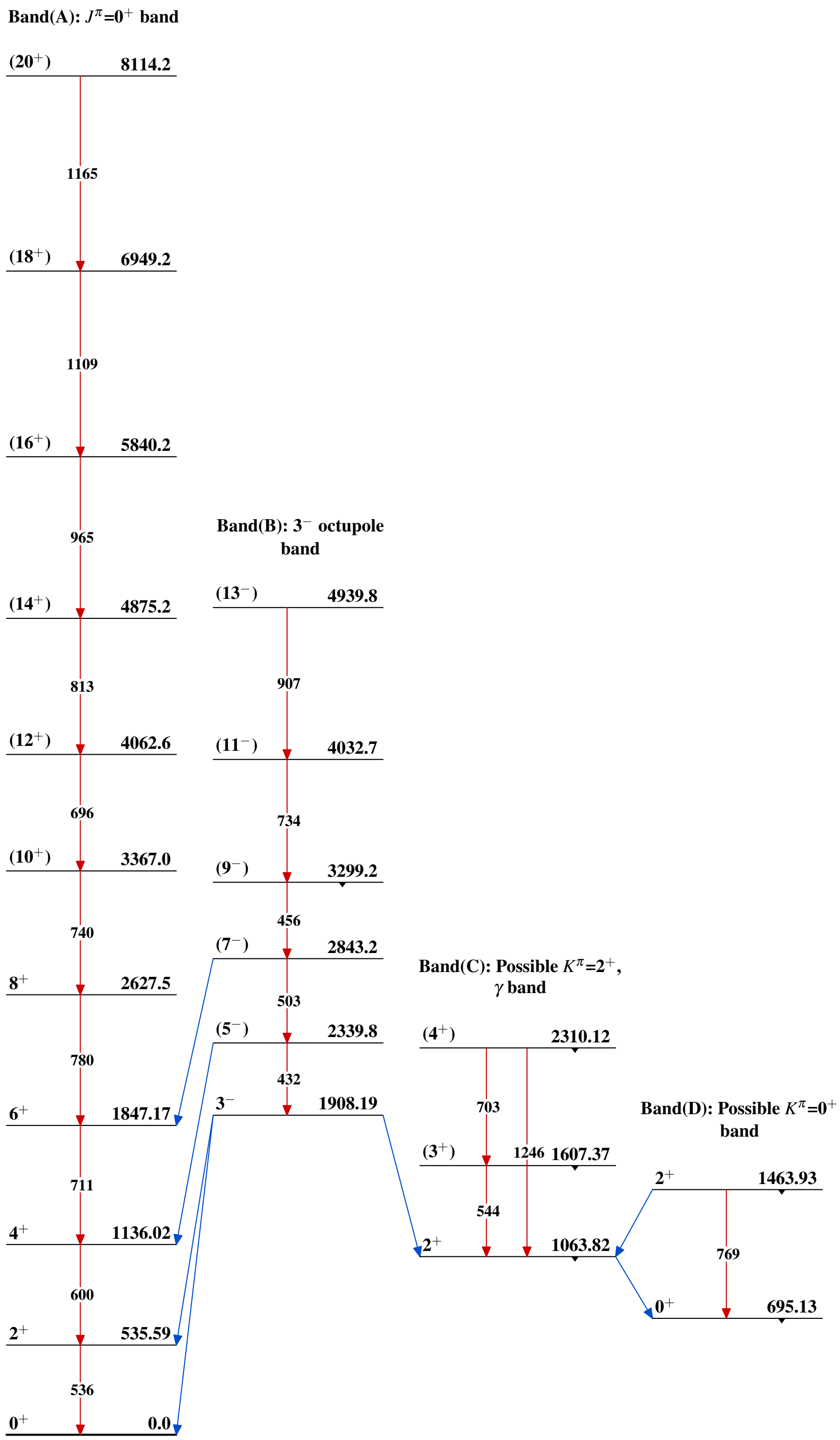
Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend



Adopted Levels, Gammas



$^{100}_{42}Mo_{58}$