Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen[#] and Balraj Singh	NDS 135, 1 (2016)	31-May-2016

Q(β^-)=−6426.10 *10*; S(n)=11480.67 *6*; S(p)=10276.67 *15*; Q(α)=−6257.34 *25* 2012Wa38
S(2n)=19843.49 *15*, S(2p)=18085.29 *15* (2012Wa38).
Identification of stable ^{42}Ca by F.W. Aston, Nature 133, 684 (1934) through mass spectrographic studies.
^{42}Ca(n,n): 1989Ra06: E=thermal. Measured Bragg diffraction patterns, deduced scattering lengths.
^{42}Ca(^{3}He,^{3}He): 1971Ra35: E=13.0 MeV; 1973Mo13: E=28 MeV. Measured $\sigma(\theta)$.
^{42}Ca(^{48}Ti,^{48}Ti): 1990Vo07, 1988Br02: E=240-725 MeV. Measured $\sigma(\theta)$, DWBA analysis.
Hyperfine structure and isotope-shift measurements: 2000Mu17, 2015Go24.
Some recent theoretical structure references (levels, B(E2), etc.): 2016Wo02 (shape coexistence), 2012Ca13, 2012Ca27, 2012Ha26.

Population of levels in decays/reactions labeled with XREF=Y

^{42}K β^- (12.355 h): 0, 1525, 1837, 2424, 2752, 3447
^{42}Sc ε decay (680.79 ms): 0, 1525, 1837
^{42}Sc ε decay (61.7 s): 0, 1525, 2424, 2752, 3189
^{38}Ar(^{6}Li,d): 0, 1525, 1837, 2424, 2752, 3300, 3654, 4443, 4448, 5866, 6016+6020, 6313+6390, 6516, 6716+6720
^{40}Ar(^{3}He,n): 0, 1525, 1837, 2424, 3300(?), 3392, 3654, 9270, 10205, 14700
^{40}Ca(t,pγ): 0, 1520, 2420, 3890, 5850, 6020, 6520, 6700, 6820
^{40}Ca(α,^{2}He): 0, 1530, 2750, 3190, 3660, 4830, 5380, 7280, 8810, 9080, 9330, 9600, 9870, 10160
^{40}Ca(^{14}C,^{12}C),(^{12}C,^{10}C),: 0, 1700, 2800, 3500, 4800
^{40}Ca(^{96}Zr,^{94}Zr): 0, 5866
^{41}Ca(n,γ) E=thermal: 0, 1524.7, 2424.2, 2752.4, 3253.9, 3446.9, 3954.4, 3999.7, 4690.1, 4759.7, 5017.1, 11480.7
^{42}Ca(γ,γ): 0, 1525
^{42}Ca(π+,π+′),(π-,π-′): 0, 1520, 2420, 3440, 4104, 4680, 6300
^{42}Ca(d,d′): 0, 1524, 1835, 2423, 2749, 3445
^{42}Ca(^{16}O,^{16}O′): 0, 1525, 1837, 2424, 2752, 3254, 3447, 4100, 4449, 4690, 4971
Coulomb excitation: 0, 1525
^{45}Sc(p,α),(pol p,α): 0, 1525, 1837, 2424, 2752, 3190, 3254, 3954, 4100, 4117
^{46}Ti(d,^{6}Li): 0, 1525, 1837
^{96}Zr(^{40}Ca,^{42}Caγ): 0, 1525, 1837, 2424, 2752, 3189, 3254, 3447, 3654, 3954, 4443, 4760, 5017, 5866

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^{42}Ca Levels

Cross Reference (XREF) Flags

A	^{24}Mg(^{24}Mg,α2pγ)	P	^{41}Ca(d,p),(pol d,p)	AD	^{40}Ca(t,pγ)
B	^{27}Al(^{18}O,2npγ)	Q	^{42}Ca(e,e′)	AE	^{40}Ca(α,^{2}He)
C	^{27}Al(^{19}F,$\alpha\gamma$)	R	^{42}Ca(p,p′γ)	AF	^{40}Ca(^{14}C,^{12}C),(^{12}C,^{10}C),
D	^{28}Si(^{16}O,2pγ)	S	^{42}Ca(p,p′)	AG	^{40}Ca(^{96}Zr,^{94}Zr)
E	^{30}Si(^{18}O,α2nγ)	T	^{42}Ca(α,α′)	AH	^{41}Ca(n,γ) E=thermal
F	^{38}Ar(α,γ):resonances	U	^{43}Ca(p,d)	AI	^{42}Ca(γ,γ)
G	^{39}K(α,p)	V	^{43}Ca(d,t)	AJ	^{42}Ca(π^+,$\pi^{+\prime}$),(π^-,$\pi^{-\prime}$)
H	^{39}K(α,pγ)	W	^{43}Ca(^{3}He,α)	AK	^{42}Ca(d,d′)
I	^{40}Ca(t,p)	X	^{44}Ca(p,t)	AL	^{42}Ca(^{16}O,^{16}O′)
J	^{41}K(p,γ)	Y	^{42}K β^- decay (12.355 h)	AM	Coulomb excitation
K	^{41}K(p,n),(p,p):resonances	Z	^{42}Sc ε decay (680.79 ms)	AN	^{45}Sc(p,α),(pol p,α)
L	^{41}K(p,α):resonances	Others:		AO	^{46}Ti(d,^{6}Li)
M	^{41}K(^{3}He,dγ)	AA	^{42}Sc ε decay (61.7 s)	AP	^{96}Zr(^{40}Ca,^{42}Caγ)
N	^{41}K(^{3}He,d)	AB	^{38}Ar(^{6}Li,d)		
O	^{41}Ca(n,α):resonances	AC	^{40}Ar(^{3}He,n)		

Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[‡]	XREF	Comments
0.0[b]	0$^+$	stable	ABC E GHIJ MN PQRSTUVWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP The rms charge radius (<r^2>)$^{1/2}$: 3.5081 fm *21* (2013An02 evaluation). J$^{\pi}$: L(t,p)=L(p,t)=0 from 0$^+$. Adopted (1977En02) neutron-stripping spectroscopic factor=1.6 *2* (L=3). Adopted (1977En02) neutron-pickup spectroscopic factor=0.58 *6* (L=3). Adopted (1977En02) proton-stripping spectroscopic factor=3.2 *4* (L=2).
1524.71[b] *3*	2$^+$	0.83 ps *3*	ABCDE GHIJ N PQRSTUVWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AH, AI, AJ, AK, AL, AM, AN, AO, AP μ=+0.08 *12* (2003Sc21,2014StZZ) Q=−0.19 *8* (1973To07,2014StZZ,2013StZZ) J$^{\pi}$: L(t,p)=L(p,t)=2 from 0$^+$. T$_{1/2}$: weighted average of 0.62 ps *21* (α,pγ), 0.97 ps *22* (γ,γ), 1.11 ps *21* (p,p$'\gamma$) and 0.825 ps *28* (coulomb excitation). μ: from transient field integral perturbed angular correlation (2003Sc21). Q: reorientation method (1973To07). Adopted (1977En02) neutron-stripping spectroscopic factor=0.04 *2* (L=1), 0.48 *12* (L=3). Adopted (1977En02) neutron-pickup spectroscopic factor=0.18 *3* (L=3), small (L=1). Adopted (1977En02) proton-stripping spectroscopic factor=0.04 *3* (L=2).
1837.31[c] *18*	0$^+$	387 ps *6*	E GHIJ N PQRSTUVWXYZ	XREF: Others: AB, AC, AF, AK, AL, AN, AO, AP J$^{\pi}$: L(t,p)=L(p,t)=0 from 0$^+$. T$_{1/2}$: from (p,p$'\gamma$). Adopted (1977En02) neutron-stripping spectroscopic factor=0.18 *5* (L=3). Adopted (1977En02) neutron-pickup spectroscopic factor=0.05 *2* (L=3). Adopted (1977En02) proton-stripping spectroscopic factor=0.3 *2* (L=2).
2424.15[c] *4*	2$^+$	140 fs *40*	B E GH J MN PQRSTUVWXY	XREF: Others: AA, AB, AC, AD, AF, AH, AJ, AK, AL, AN, AP J$^{\pi}$: L(t,p)=L(p,t)=2 from 0$^+$. T$_{1/2}$: weighted average of 114 fs *30* (α,pγ) and 210 fs *50* (p,p$'\gamma$). Adopted (1977En02) neutron-stripping spectroscopic factor=0.56 *14* (L=3), small (L=1). Adopted (1977En02) neutron-pickup spectroscopic factor=0.16 *7* (L=3), (0.0) (L=1). Adopted (1977En02) proton-stripping spectroscopic factor=0.05 *5* (L=2).
2752.40[b] *4*	4$^+$	2.8 ps *4*	ABCDE GHIJ M PQRSTUVWXY	XREF: Others: AA, AB, AE, AF, AH, AK, AL, AN, AP J$^{\pi}$: L(t,p)=L(p,t)=4 from 0$^+$. T$_{1/2}$: weighted average of 3.5 ps *3* (^{18}O,2npγ), 2.63 ps *28* (^{16}O,2pγ) and 1.6 ps *7* (α,pγ). Adopted (1977En02) neutron-stripping spectroscopic factor=0.03 *1* (L=1), 0.86 *22* (L=3). Adopted (1977En02) neutron-pickup spectroscopic factor=0.59 *10* (L=3), 0.01 (L=1).

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[‡]	XREF	Comments
3189.26[b] *10*	6$^+$	5.28 ns *15*	ABCDE GHIJ M P R TUVW	XREF: Others: AA, AE, AN, AP μ=−2.49 *9* (1975Yo02,2014StZZ) J$^{\pi}$: L(α,^{2}He)=L(α,α')=6 from 0$^+$. T$_{1/2}$: weighted average of 5.30 ns *16* (α,pγ) and 5.27 ns *14* (α,α'). μ: DPAD (1975Yo02). Adopted (1977En02) neutron-stripping spectroscopic factor=1.2 *3* (L=3). Adopted (1977En02) neutron-pickup spectroscopic factor=0.99 *18* (L=3) (L=3), 0.01 (L=1).
3253.89[c] *5*	4$^+$	123 fs *21*	B E gHIJ P R T V X	XREF: Others: AH, AL, AN, AP J$^{\pi}$: L(α,α')=L(p,t)=4 from 0$^+$. T$_{1/2}$: weighted average of 118 fs *21* (α,pγ) and 210 fs *+100−70* (p,p$'\gamma$). Adopted (1977En02) neutron-stripping spectroscopic factor=0.22 *6* (L=3), small (L=1). Adopted (1977En02) neutron-pickup spectroscopic factor=0.08 *2* (L=3), 0.00 (L=1).
3300.0 *4*	0$^+$	>0.9 ps	gHIJ N RST V X	XREF: Others: AB, AC, AF J$^{\pi}$: L(^{6}Li,d)=L(p,t)=0 from 0$^+$.
3392.01 *24*	2$^+$	135 fs *40*	HIJ P RST V X	XREF: Others: AC J$^{\pi}$: L(t,p)=L(α,α')=2 from 0$^+$. T$_{1/2}$: weighted average of 118 fs *21* in (α,pγ) and 230 fs *50* in (p,p$'\gamma$). Adopted (1977En02) neutron-stripping spectroscopic factor=0.01 *1* (L=1), 0.01 *1* (L=3). Adopted (1977En02) neutron-pickup spectroscopic factor=0.01 (L=3), 0.01 *1* (L=1).
3446.94[d] *5*	3$^-$	0.27 ps *9*	B E GHIJ MN PQRSTUVWXY	XREF: Others: AF, AH, AJ, AK, AL, AP B(E3)↑=0.0110 *18* (1971He08,1989It02) B(E3) from (e,e$'$). J$^{\pi}$: L(t,p)=L(p,t)=3 from 0$^+$. T$_{1/2}$: weighted average of 0.23 ps *7* (α,pγ) and 0.45 ps *14* (p,p$'\gamma$). Adopted (1977En02) neutron-stripping spectroscopic factor=small (L=0 and L=2). Adopted (1977En02) neutron-pickup spectroscopic factor=0.26 *17* (L=0), 0.12 *3* (L=2). Adopted (1977En02) proton-stripping spectroscopic factor=0.28 *4* (L=1+3).
3654.0 *3*	2$^+$	49 fs *35*	GHIJ P RSTUVWX	XREF: Others: AB, AC, AE, AP J$^{\pi}$: L(t,p)=L(p,t)=2 from 0$^+$. T$_{1/2}$: from (α,pγ). Other: 40 fs *+60−40* from (p,p$'\gamma$).
3780 *10*	(2$^+$,3$^-$)		S	J$^{\pi}$: L(p,p$'$)=2 or 3.
3885.0 *4*	1$^-$		HIJ N P RST V	XREF: Others: AD J$^{\pi}$: ΔJ=1 γ to 0$^+$ and L(α,α')=3, L(^{3}He,d)=1(+3).
3954.39[d] *6*	4$^-$	3.36 ps *21*	B E GHI MN P RS V	XREF: Others: AH, AN, AP J$^{\pi}$: γ(θ,lin pol) in (^{18}O,α2nγ) and (α,pγ); L(^{3}He,d)=3; L(^{3}He,α)=0(+2); σ(θ) and Ay(θ) in (pol p,α). T$_{1/2}$: from (α,pγ).
3999.66 *9*	4$^+$		E HIJ P RS	XREF: Others: AH J$^{\pi}$: γ(θ,lin pol) in (^{18}O,α2nγ) and gammas to 2$^+$ and 4$^+$.
4047.0 *4*	3$^-$	0.17 ps *5*	GHIJ N P RST V	J$^{\pi}$: L(^{3}He,d)=1+3 from 3/2$^+$, L(^{3}He,α)=0+2; γ to 2$^+$.

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
				$T_{1/2}$: from (α,pγ).
4099.65[d] *11*	5⁻	0.45 ps *10*	ABCDE GHIJ MN pQRSTUVwX	XREF: Others: AJ, AL, AN Jπ: L(p,t)=L(p,p′)=L(α,α′)=5 from 0⁺; σ(θ) and Ay(θ) in (pol p,α); also γ(θ,lin pol). $T_{1/2}$: from (α,pγ). Adopted (1977En02) neutron-stripping spectroscopic factor=small (L=2). Adopted (1977En02) neutron-pickup spectroscopic factor=0.43 *13* (L=2). Adopted (1977En02) proton-stripping spectroscopic factor=0.46 *9* (L=3).
4117.1 *3*	3⁻		H J N p R w	XREF: Others: AN Jπ: γ(θ,lin pol) in (p,p′γ); σ(θ) and Ay(θ) in (pol p,α).
4180 *2*	0		W	Additional information 1.
4232.0 *4*	1		HIJ N P RS	Jπ: γ(θ,lin pol).
4342.3 *6*	(0⁺ to 4⁺)		g iJ rs w	Jπ: γ to 2⁺. Additional information 2.
4354.0 *5*	4⁻	0.47 ps *7*	gHi P rs Vw	Jπ: γ(θ,lin pol) in (α,pγ); L(d,t)=2. $T_{1/2}$: from (α,pγ).
4418.0 *4*	3⁻		GH J MN P UVWX	Jπ: L(p,t)=3 from 0⁺; also L(d,p)=0+2 from 7/2⁻, L(^{3}He,d)=1+3 from 3/2⁺.
4443.0 *6*	4⁺		H QRST v	XREF: Others: AB, AL, AP XREF: S(4470). Jπ: L(p,p′)=L(α,α′)=4 from 0⁺.
4448.8 *4*	2⁺		HIJ p R v	XREF: Others: AB, AL Jπ: L(t,p)=2 from 0⁺; gammas to 0⁺ and 3⁻.
4505.0 *5*	(2,3,4)⁺		HI P S	Jπ: L(d,p)=1+3 from 7/2⁻; and gammas to 2⁺ and 4⁺.
4566.9 *5*	(1,2⁺)		HIJ P S	Jπ: gammas to 0⁺ and 2⁺.
4666 *10*	(3,4)⁻		i P	XREF: Others: AF Jπ: L(d,p)=0+2 from 7/2⁻ this level was not adopted by 1990En08 since the (d,p) cross section is small.
4690.06 *10*	3⁻		GHi N PQ TuVwX	XREF: Others: AF, AH, AJ, AL Jπ: L(t,p)=L(p,t)=3 from 0⁺.
4717.53[c] *14*	6⁺	83 fs *32*	A E Hi n	XREF: Others: AF Jπ: γγ(θ)(DCO) and γ(lin pol) in (^{18}O,α2nγ). $T_{1/2}$: from (α,pγ).
4717.6 *4*	3⁻		i n P S	XREF: Others: AF Jπ: L(p,p′)=3 from 0⁺; L(d,p)=0+2 from 7/2⁻.
4759.71 *16*	2⁺		HIJ P T X	XREF: Others: AF, AH, AP Jπ: L(t,p)=L(p,t)=2 from 0⁺.
4866.0 *6*	2⁺		HIJ P ST X	XREF: Others: AE, AF Jπ: L(t,p)=L(α,α′)=L(p,p′)=2; but L(α,^{2}He)=4.
4897.0[d] *3*	5⁻	47 fs *21*	E GHi uvwX	XREF: Others: AF Jπ: γ(θ,lin pol). $T_{1/2}$: from (α,pγ).
4904.0 *5*	3⁻		HiJ N P Tuvw	XREF: Others: AF Jπ: L(α,α′)=3. This requires E3 to g.s. E(level): if $T_{1/2}$<50 fs then E3 50% to g.s. is unlikely. In that case another level of Jπ=2⁺ is required.
4946.9 *10*	(1,2,3)⁻		Hi N P	XREF: Others: AF Jπ: L(^{3}He,d)=1(+3) from 3/2⁺ and γ to 2⁺.

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)†	Jπ#	$T_{1/2}$‡	XREF	Comments
4971.0 *5*	3^-		GHiJ N PQ ST X	XREF: Others: AF, AL Jπ: L(p,p′)=L(p,t)=3 from 0^+.
5017.14 *11*	4^+		HI P T V X	XREF: Others: AF, AH, AP Jπ: L(t,p)=L(p,t)=4 from 0^+.
5075.0 *8*	$(1,2,3)^-$		GHI N P	Jπ: L(^{3}He,d)=1(+3) from $3/2^+$ and γ to 3^-.
5158.0 *7*	3^-		GHI N T	Jπ: L(α,α′)=3 from 0^+.
5188.0 *11*	$(2,3,4)^+$		H Vw	Jπ: γ to 3^-; L(d,t)=3.
5210.3 *7*	(2^+)		Hij N p T Vwx	Jπ: γ to 4^+. L(t,p)=L(α,α′)=2. It is assumed that the level at 5200 *5* in (t,p) and 5205 *5* in (α,α′) is the same as 5210 *2* in (α,pγ).
5212.98 *19*	6		E	Jπ: from γ(θ,DCO) in (^{18}O,α2nγ).
5214.1 *6*	(2^+)		H j p wx	Jπ: gammas to 2^+ and 4^+; L(p,t)=2. It is assumed that the level at 5213 in (p,t) is the same as this level. See also comment for 5210 level. Additional information 3.
5320.0 *5*	$(3,4)^-$		GHI N P RS UVw	XREF: Others: AK XREF: U(5340). Jπ: L(d,p)=0(+2) and L(d,t)=0+2 from $7/2^-$.
5345.0 *10*	0^+		H R wX	XREF: Others: AJ, AK XREF: X(5332). Jπ: L(p,t)=0 and γ to 2^+.
5358.0 *6*	2^+		HIJ P X	Jπ: γ to 0^+ and L(d,p)=1 from $7/2^-$.
5380.0 *6*	5^-		HI T V X	XREF: Others: AE Jπ: gammas to 4^+ and 6^+; L(d,t)=2 from $7/2^-$. Inconsistent with L(α,^{2}He)=6.
5393.0 *7*	$(3)^-$		GHi N P t w	Jπ: gammas to 2^+; L(^{3}He,d)=1(+3) from $3/2^+$ and L(d,p)=(0+2).
5407 *4*	3^-		i N P t Vw	Jπ: L(^{3}He,d)=1+3; L(d,p)=0.
5439.0 *10*	$(3,4)^-$		Hi P V	Jπ: L(d,p)=L(d,t)=0 from $7/2^-$.
5466 *5*	$(1\text{ to }5)^-$		i N	Jπ: L(^{3}He,d)=3.
5472.0 *6*	$(2,3,4)^+$		Hi P V X	Jπ: γ to 2^+; L(d,p)=L(d,t)=1 from $7/2^-$; L(p,t)=(4) favors 4^+.
5490.77[d] *13*	6^-	59 fs *14*	ABCDE GH v x	Jπ: from γ(θ,lin pol,DCO). $T_{1/2}$: from (α,pγ).
5491.0 *8*	3^-		H N T v x	Jπ: L(α,α′)=3. But inconsistent with L(d,t)=3(+1) for a level at 5488 *5*.
5510.0 *8*	3^-		Hi N Q T	XREF: Others: AJ, AK, AL XREF: T(5527). Jπ: L(e,e′)=L(α,α′)=3.
5530.0 *7*	2^+		Hi P X	Jπ: L(p,t)=2 and L(d,p)=1.
5578.0 *11*	$(0^+\text{ to }4^+)$		HI	Jπ: γ to 2^+.
5593.0 *5*	3^-		GHiJ N T V x	Jπ: L(^{3}He,d)=1+3 from $3/2^+$; L(d,t)=0+2 from $7/2^-$.
5601.0 *8*	$(3^-,4^-)$		Hi Wx	Jπ: L(^{3}He,α)=(0+2) from $7/2^-$. It is assumed that the level at 5610 *20* in (^{3}He,α) is the same as the level at 5601 *2* in (α,pγ).
5624.0 *7*	3^-		GHi N P T	Jπ: L(^{3}He,d)=1(+3) from $3/2^+$; L(d,p)=0(+2) from $7/2^-$.
5665.0 *6*	(3^-)		gHi n q T w	Jπ: L(α,α′)=L(p,t)=3. It is assumed that the level at 5665 *2* in (α,pγ) is the same as 5667 *5* in (α,α′) and 5664 in (p,t).
5670.0 *7*	(3^-)		gHi Pq w	Jπ: gammas to 2^+ and 3^-; L(d,p)=0+2. It is assumed that the level at 5670 *2* in (α,pγ) is the same as 5669 *10* in (d,p).
5691.77 *17*	6^+		E Hi P T w	Jπ: γ(θ,DCO) in (^{18}O,α2nγ); gammas to 4^+ and 6^+. But L(α,α′)=(4,5) gives (4^+,5^-).
5716.0 *10*	2^+		Hi n t X	Jπ: L(p,t)=2.

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)†	Jπ#	$T_{1/2}$‡	XREF	Comments
5725.0 *10*	(2$^+$ to 6$^+$)		Hi n t	Jπ: γ to 4$^+$.
5738.0 *5*	(2$^+$)		J S	Jπ: gammas to 0$^+$ and 2$^+$; L(p,p′)=2,3.
5744.01[d] *11*	7$^-$	0.42 ps *10*	ABCDE GHi	Jπ: ΔJ=2 γ to 5$^-$; γ to 6$^+$ from γ(θ,lin pol,DCO). $T_{1/2}$: from (α,pγ). Other: 10.5 ps *10* is reported in (^{16}O,2pγ) using RDM. It may suggest two closely spaced levels.
5769.0 *7*	3$^-$		Hi Vwx	Jπ: gammas to 2$^+$ and 4$^+$; L(d,t)=2 from 7/2$^-$.
5774.9 *7*	(4,5)$^+$		Hi P wx	Jπ: gammas to 4$^+$ and 6$^+$; L(d,p)=1 from 7/2$^-$.
5797.0 *6*	(1,2)$^+$		HI p V	XREF: Others: AK, AL XREF: I(5790). Jπ: gammas to 0$^+$ and 2$^+$; L(d,t)=3 from 7/2$^-$.
5802.0 *10*	3$^-$		GH N pQ STUVWx	XREF: Others: AK, AL XREF: G(5791)N(5795)T(5794)U(5790)W(5790). Jπ: L(α,α′)=3.
5822.0 *10*	(1,2,3)$^-$		H N x	Jπ: γ to 2$^+$; L(^{3}He,d)=1 from 3/2$^+$.
5860 *10*	0$^+$		I	Jπ: L(t,p)=0.
5866.0 *8*	(1,2,3$^-$)		gH	XREF: Others: AB, AD, AG, AP Jπ: gammas to 0$^+$ and 2$^+$. If this level is the same as 5860 in (t,p) with L=0, then placement of 4028.5γ is incorrect as it would be E0.
5875.0 *7*	2$^+$		gH N T	Jπ: L(α,α′)=2.
5924.0 *5*	(3,4)$^-$		GHI N P t V	XREF: Others: AJ, AK XREF: I(5920). Jπ: gammas to 4$^+$, 4$^-$ and 5$^-$; L(d,p)=0+2 from 7/2$^-$.
5925.5 *3*	(5)		E HI st V	XREF: Others: AJ, AK XREF: I(5920). Jπ: ΔJ=1, γ to 6$^+$ from DCO in (^{18}O,α2nγ); γ from 4$^+$.
5956 *10*	(3,4)$^-$		P	Jπ: L(d,p)=0+2 from 7/2$^-$.
5980 *5*	3$^-$		I N UV	XREF: Others: AK XREF: I(5980). Jπ: L(^{3}He,d)=1 from 3/2$^+$; L(d,t)=0(+2) from 7/2$^-$.
5994.0 *8*	3$^-$		HI P UV	XREF: Others: AK XREF: I(5980). Jπ: γ to 2$^+$; L(d,p)=0+2; L(d,t)=0+(2) from 7/2$^-$.
6003.0 *10*	3$^-$,4$^-$		HI p UV	XREF: Others: AK XREF: I(5980). Jπ: L(d,p)=0+2 from 7/2$^-$.
6016 *5*	0$^+$		I n T	XREF: Others: AB Jπ: L(t,p)=0. L(α,α′)=2 is inconsistent. Additional information 4.
6020.0 *7*	(4$^+$,5,6$^-$)		H n	XREF: Others: AB Jπ: gammas to 4$^-$ and 6$^+$; 5$^-$ or 6$^-$ are supported by 11/2$^-$ transfer in (α,p) from 3/2$^+$. Additional information 5.
6028.0 *6*	(3)$^-$		H P tuvw	Jπ: L(d,p)=0+2 from 7/2$^-$; γ to 2$^+$.
6038.0 *7*	(1,2,3)$^-$		H N T v	XREF: Others: AD, AJ XREF: AD(6020). Jπ: L(^{3}He,d)=(1+3) from 3/2$^+$; L(d,t)=2(+0) from 7/2$^-$; γ to 2$^+$. Additional information 6.
6080	0$^+$		X	Jπ: L(p,t)=0.
6093.5 *8*	(3$^-$ to 7$^-$)		H n q v	Jπ: γ to 5$^-$.
6104.0 *7*	(0$^+$ to 4$^+$)		H n q v	Jπ: γ to 2$^+$.
6113.0 *8*	4$^+$		GHI PQ T V	XREF: Others: AK XREF: G(6096)I(6105).

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
				Jπ: L(t,p)=4.
6140.8 *6*	6^-	49 fs *+21−14*	gHi p	Jπ: γ(θ) to 6^- in (α,pγ); γ to 4^-,5^-. $T_{1/2}$: from (α,pγ).
6144.72[d] *14*	7^-	<70 fs	ABCDE gHI p	Jπ: from γ(θ,lin pol,DCO). $T_{1/2}$: from (α,pγ).
6158 *5*	3^-		i N P T V	Jπ: L(α,α′)=3.
6182.0 *7*	$(1,2,3^-)$		Hi N T	Jπ: E=6182 γ to 0^+.
6212.0 *10*	3^-		Hi P S Vw	Jπ: L(d,p)=0+2 from $7/2^-$; L(p,p′)=2 or 3 from 0^+.
6240 *5*	3^-		N P T V	Jπ: L(α,α′)=3.
6247.9 *6*	$(4^+,5,6^-)$		H	Jπ: gammas to 4^- and 6^+.
6274 *7*	2^+		I P	Jπ: L(t,p)=2.
6313 *7*	$(2\text{ to }5)^+$		G I P T VW	XREF: Others: AB, AJ XREF: I(6290). Jπ: L(d,p)=1 and Ay(θ).
6390 *10*	$(3,4)^-$		I P RST	XREF: Others: AB, AJ XREF: I(6400)AJ(6300). Jπ: L(d,p)=0 from $7/2^-$; L(π^+,$\pi^{+\prime}$)=(3).
6408.57[d] *12*	8^-	31.0 ps *25*	ABCDE GH w	Jπ: ΔJ=2 E2 γ to 6^-; ΔJ=1 γ to 7^- from γ(θ,lin pol,DCO). $T_{1/2}$: from (^{16}O,2pγ).
6426 *10*	$(2\text{ to }5)^+$		i P w	Jπ: L(d,p)=1 from $7/2^-$.
6462 *10*	$(3,4)^-$		i P	Jπ: L(d,p)=0+2 from $7/2^-$.
6516.0 *6*			I P TU W	XREF: Others: AB, AD Jπ: L(d,p)=1 from $7/2^-$. L(p,d)=0+2 from $7/2^-$ is incompatible. L(t,p)=(0) suggests (0^+) and L(^{3}He,α)=(4) suggests (4^+).
6541.8 *6*	5^+		H P	Jπ: gammas to 5^-,6^+, and 6^-; L(d,p)=1 from $7/2^-$.
6553.72[d] *12*	9^-	42 ps *3*	ABCDE GH	Jπ: ΔJ=2 E2 γ to 7^-; ΔJ=1 γ to 8^- from γ(θ,lin pol,DCO).
6572 *15*	$(2\text{ to }5)^+$		i P w	Jπ: L(d,p)=1 from $7/2^-$.
6584.7 *8*	$(5^-\text{ to }8^-)$		GHi w	Jπ: gammas to 7^- and 6^-.
6614 *15*	$(3,4)^+$		i P T	Jπ: L(d,p)=1 and analyzing power in (d,p).
6636.30[c] *15*	8^+	36 fs *15*	E HI P RST W	XREF: Others: AK XREF: I(6640)P(6653)W(6660). Jπ: from γ(θ,DCO) in (^{18}O,α2nγ). $T_{1/2}$: from (α,pγ).
6674.8 *10*	$(4^+\text{ to }8^+)$		H P T W	XREF: Others: AL XREF: P(6670)W(6660). Jπ: γ to 6^+.
6715.9 *7*	(4^+)		H P	XREF: Others: AB Jπ: γ to 6^+; γ to (2^+); L(d,p)=(1+3) from $7/2^-$.
6718.14 *17*	7		E	Jπ: ΔJ=1 γ to 6^+ from γ(θ,DCO) in (^{18}O,α2nγ).
6720 *8*	0^+		I	XREF: Others: AB, AD XREF: AD(?). Jπ: L(t,p)=0.
6746.5 *8*	4^+		GHI P T X	XREF: Others: AL XREF: P(6760). Jπ: L(d,p)=1 from $7/2^-$; J_n=1/2+3/2 in (pol d,p); γ transitions to 5^- in (α,pγ). But $3/2^+$ transfer in (α,p) favors 3^+.
6781 *7*			G I P TU W	XREF: I(6800).
6816.8 *10*	$(4,5)^+$		HI P	XREF: Others: AD

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	XREF	Comments
				Jπ: γ to 6+; L(d,p)=1 from 7/2−.
6895.8 *6*	4+		HI P	Jπ: gammas to 3− and 6+; L(d,p)=1 from 7/2−.
6920 *4*	(3,4)+		I P	Jπ: L(d,p)=1 from 7/2−; Jn=1/2 in (pol d,p).
6931 *7*	(2,3)+		G I P ST V	XREF: I(6940). Jπ: 3/2+ transfer in (α,p) from 3/2+ and L(d,p)=1+3 from 7/2−.
6940.2 *6*	(5−,6,7−)		Hi t	Jπ: gammas to 5− and 7−.
6961 *15*	(3,4)+		P	Jπ: L(d,p)=1 from 7/2−; Jn=1/2 in (pol d,p).
6975.5 *5*	(5+)		GH P	Jπ: gammas to 5−, 6+, and 6−; 13/2+ transfer in (α,p) from 3/2+.
7020 *12*	4+		G I PQ s w	XREF: Others: AL XREF: I(7010). Jπ: 11/2+ transfer in (α,p) from 3/2+; L(d,p)=1+3 from 7/2−; Jn=1/2+5/2 in (pol d,p).
7041 *15*	(3−,4−)		P s w	Jπ: L(d,p)=(0+2) from 7/2−.
7103 *7*	(1 to 4)−		G I Q	XREF: Others: AL XREF: I(7110). Jπ: 5/2− transfer in (α,p) from 3/2+.
7129.9 *10*	4+		Hi P	Jπ: L(d,p)=1 from 7/2−; Jn=1/2+3/2 in (pol d,p); γ to 6+.
7153 *7*	(3,4)+		G i P	Jπ: L(d,p)=1 from 7/2−; Jn=1/2 in (pol d,p); 11/2+ transfer in (α,p) favors 4+.
7180 *20*	2+		I	Jπ: L(t,p)=2.
7197.9 *10*			H P	Jπ: γ to 6+, but L(d,p)=(0+2) from 7/2− suggests (3−,4−).
7228 *7*	(3−,4−)		G P	Jπ: 5/2− transfer in (α,p) from 3/2+ gives (1 to 4)(−) and L(d,p)=(0+2) from 7/2− gives (3−,4−).
7273 *7*	(3,4)+		G I P	XREF: Others: AJ, AK, AL XREF: I(7257). Jπ: L(d,p)=1 from 7/2−; Jn=1/2 in (pol d,p); 3/2+ transfer in (α,p) from 3/2+ favors 3+.
7282.02 *14*	9−		A E HI U	XREF: Others: AE, AJ, AL XREF: I(7280). Jπ: gammas to 8− and 9−; γ(θ,DCO) in (^{18}O,α2nγ). But L(α,^{2}He)=(5,6,7) suggest (7−).
7344.7 *10*	(6− to 10−)		G I R	XREF: Others: AJ, AL XREF: I(7320). Jπ: γ to 8−.
7348 *15*	(3,4)+		P	Jπ: L(d,p)=1 from 7/2−; Jn=1/2 in (pol d,p).
7360.6 *10*	(5− to 9−)		H	Jπ: γ to 7−.
7368.46[d] *15*	10−	1.9 ps *8*	ABCDE H	Jπ: from γ(θ,lin pol,DCO). $T_{1/2}$: weighted average of 2.6 ps *11* in (^{18}O,2npγ) and 1.5 ps *8* in (^{16}O,2pγ).
7388.8 *10*	4+		HI PQ S	XREF: Others: AL XREF: P(7401). Jπ: γ to 6+; L(d,p)=1 from 7/2−; Jn=1/2+3/2 in (pol d,p).
7415.87 *15*	8+		E H P S w	XREF: Others: AJ, AL XREF: P(7422). Jπ: from γ(θ,DCO) in (^{18}O,α2nγ); γ to 6+.
7421.2 *8*	(4+ to 8+)		H P RS U w	XREF: Others: AL XREF: P(7438). Jπ: γ to 6+.
7468 *15*	(2 to 5)(+)		P	Jπ: L(d,p)=(1+3) from 7/2−.
7520 *15*	(3,4)+		P	Jπ: L(d,p)=1 from 7/2−; Jn=1/2 in (pol d,p).

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)†	Jπ#	$T_{1/2}$‡	XREF	Comments
7543.1 *6*	$(4^+$ to $7^-)$		H w	Jπ: gammas to 5^- and 6^+.
7562.5 *10*	$(4^+,5^+)$		H PQ w	XREF: Others: AK, AL XREF: P(7571). Jπ: γ to 6^+; L(d,p)=(1) from $7/2^-$.
7600 *15*	$(2^+$ to $5^+)$		P	Jπ: L(d,p)=(1+3) from $7/2^-$.
7634.03 *23*	$(6,8^+)$		E H	Jπ: γ to 6^+; γ(θ,DCO) in (^{18}O,α2nγ).
7643 *15*	$3^+,4^+$		P	Jπ: L(d,p)=1 from $7/2^-$; J_n=1/2+3/2 in (pol d,p).
7696.8 *10*	4^+		H P	Jπ: L(d,p)=1 from $7/2^-$; J_n=1/2+3/2 in (pol d,p); γ to 6^+.
7726.5 *10*	$(4^+$ to $8^+)$		H	Jπ: γ to 6^+.
7750.66 *17*	$(11)^-$	<2.1 ps	CD	Jπ: ΔJ=1 γ to 10^-; γ(lin pol). $T_{1/2}$: from (^{16}O,2pγ).
7758.0 *6*	$(6^-,7^-)$		H	Jπ: gammas to 5^-, 6^-, 7^- and 8^-.
7760 *15*	$(3,4)^+$		P	Jπ: L(d,p)=1 from $7/2^-$; J_n=(1/2) in (pol d,p).
7793 *15*	$(3,4)^+$		P	Jπ: L(d,p)=1 from $7/2^-$; J_n=1/2 in (pol d,p).
7800.7 *10*	$(5^-$ to $9^-)$		H	Jπ: γ to 7^-.
7838.9 *12*	$(2^+$ to $6^+)$		H	Jπ: γ to (4^+).
7921.2 *8*	$(4^+$ to $8^+)$		H	Jπ: γ to 6^+.
7939.8 *8*	$(4^+$ to $8^+)$		H	Jπ: gammas to 6^+.
8052.6 *10*	$(4^+$ to $8^+)$		H	Jπ: γ to 6^+.
8059.7 *8*	$(6^-$ to $9^-)$		H	Jπ: gammas to 7^- and 8^-.
8082.7 *10*	$(7^-$ to $11^-)$		H	Jπ: γ to 9^-.
8103.2 *8*	$(4^+$ to $8^+)$		H	Jπ: gammas to 6^+.
8170 *20*			W	
8297.46[d] *15*	11^-	<1.7 ps	ABCDE H TU W	XREF: Others: AJ XREF: W(8260). Jπ: ΔJ=1 M1 γ to 10^-; γ to 9^-; γ(θ,pol,DCO). $T_{1/2}$: from (^{18}O,2npγ).
8364.8 *8*	$(6^-,7,8^+)$		H R U W	XREF: W(8330). Jπ: gammas to 6^+ and 8^-.
8449.7 *6*	$(7,8)^-$		H Q S U W	XREF: W(8410). Jπ: gammas to 6^- and 9^-.
8450	0^+		X	Jπ: L(p,t)=0 from 0^+.
8511.7 *8*	$(6^-$ to $9^-)$		U	XREF: Others: AB, AJ, AK XREF: AK(8520). Jπ: gammas to 7^- and 8^-.
8517.0 *11*	(3 to 9)		H U W	XREF: Others: AJ, AK XREF: W(8520). Jπ: γ to (5,7).
8522.3 *3*	(10)		C U W	XREF: Others: AJ, AK XREF: W(8520). Jπ: ΔJ=1 γ to $(11)^-$; γ(θ) in (^{19}F,αγ).
8580.9 *12*	$(2^+$ to $6^+)$		H TU W	XREF: W(8600). Jπ: γ to (4^+).
8611.9 *12*	$(2^+$ to $6^+)$		H TU W	XREF: W(8600). Jπ: γ to (4^+).
8615.13 *15*	9		E	Jπ: from γ(θ,DCO) in (^{18}O,α2nγ).
8722.30 *15*	9		E	Jπ: from γ(θ,DCO) in (^{18}O,α2nγ).
8744.9 *11*	$(8^-$ to $12^-)$		H	Jπ: γ to 10^-.
8773.7 *8*	(5,6,7)		H Q U	XREF: Others: AE XREF: AE(8810). Jπ: gammas to 6^- and 6^+.
8847.97[c] *20*	(10^+)		E H Q U W	XREF: Others: AE XREF: AE(8810). Jπ: gammas to 8^+; γ(θ,DCO) in (^{18}O,α2nγ).

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)†	Jπ#	XREF	Comments
8951.3 *11*	(6$^+$ to 10$^+$)	H	Jπ: γ to 8$^+$.
9015.01 *14*	10$^+$	A E	Jπ: from γ(θ,DCO) in (^{18}O,α2nγ); gammas to 8$^+$, 9$^-$ and 11$^-$.
9036.9 *11*	(8$^-$ to 12$^-$)	H UV	XREF: Others: AE XREF: AE(9080). Jπ: γ to 10$^-$.
9115 *5*		F	
9191 *5*		F	
9205.9 *8*	(7$^-$ to 9$^-$)	H UV	XREF: Others: AE XREF: AE(9080). Jπ: gammas to 7$^-$ and 9$^-$.
9241.9? *9*		E	Jπ: from γ(θ,DCO) in (^{18}O,α2nγ).
9270			XREF: Others: AC
9280 *5*	1$^-$@	F	
9311.08 *16*	(8,10$^+$)	E	Jπ: ΔJ=(0,2) γ to (6,8$^+$); γ to 8$^+$; γ(θ,DCO) in (^{18}O,α2nγ).
9330 *50*			XREF: Others: AE
9367 *5*		F	
9377.7 *10*	(5$^-$ to 9$^-$)	H	Jπ: γ to 7$^-$.
9426 *5*		F	
9470 *5*		F	
9561 *5*		F	
9600 *50*	(5$^-$,6$^+$)		XREF: Others: AE Jπ: L(α,^{2}He)=(5,6).
9635 *5*		F	
9672 *5*		F	
9699 *5*		F	
9723 *5*		F	
9750 *10*	(2$^-$)	M Q S UVW	XREF: Others: AL T=2 XREF: W(9740). Jπ: M2 excitation in (e,e′); g.s. analog of ^{42}Ca.
9757 *5*		F	
9759.7 *10*	(7$^-$ to 11$^-$)	H	Jπ: γ to 9$^-$.
9770	(2$^+$)	Q	Jπ: E2 excitation in (e,e′).
9784 *5*		F	
9786.29 *14*	(9$^-$,11)	A E	Jπ: from γ(θ,DCO) in (^{18}O,α2nγ); gammas to 9, 10$^+$, 10$^-$ and 11$^-$.
9841.6 *10*	(5,6)$^-$	H UVW	XREF: Others: AE, AL XREF: AE(9870). Jπ: γ to 7$^-$; L(p,d)=L(^{3}He,α)=2 from 7/2$^-$.
9850 *10*	(3$^-$)	M X	T=2 Jπ: possible IAS of ^{42}Ca at 107 keV.
9947 *5*		F	
10000 *10*	(4)$^-$	M u w	T=2 Jπ: possible IAS of ^{42}Ca at 258 keV; L(^{3}He,d)=3 from 3/2$^+$.
10035.6 *10*	(5$^-$ to 9$^-$)	H u w	Jπ: γ to 7$^-$.
10038 *5*		F	
10160 *50*			XREF: Others: AE
10168.69 *16*	(10,12$^+$)	A E	Jπ: from γ(θ,DCO) in (^{18}O,α2nγ); gammas to 10$^+$ and 11$^-$.
10205 *5*		F	XREF: Others: AC
10231 *5*		F	
10282 *5*	1$^-$@	F	
10314 *5*		F	
10358 *5*	1$^-$@	F	
10389 *5*		F	
10450.0 *10*	(5)$^-$	M QRS U W	T=2

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)†	Jπ#	XREF	Comments
			XREF: U(10430)W(10430).
			Jπ: possible IAS of ^{42}Ca at 699. L(^{3}He,d)=3 from 3/2^{+}.
10453 *5*		F	
10500 *5*	1^{-}@	F	
10510 *20*		W	T=2
10527 *5*		F	
10561 *5*		F	
10588 *5*		F	
10610 *20*		W	T=2
10612 *5*		F	
10633 *5*		F	
10652 *5*		F	
10673 *5*	1^{-}@	F	
10700 *5*	@	F	
10726 *5*	1^{-}@	F	
10783 *5*	1^{-}@	F	
10805 *5*	1^{-}@	F	
10842 *5*	1^{-}@	F	
10884 *5*	1^{-}@	F	
10905 *5*	1^{-}@	F	
10916 *5*	1^{-}@	F	
10968 *5*		F	
10970 *20*	3^{-}	U WX	T=2 Jπ: L(p,t)=3 from 0^{+} and L(p,d)=0 from 7/2^{-}.
10985 *5*		F	
11013 *5*	1^{-}@	F	
11048 *5*		F	
11076 *5*	1^{-}@	F	
11108 *5*	1^{-}@	F	
11149 *5*	1^{-}@	F	
11165.7 *9*	(10,12)	E	Jπ: $\gamma(\theta$,DCO) in (^{18}O,α2nγ).
11185 *5*	1^{-}@	F	
11223 *5*	1^{-}@	F	
11235 *5*	(1^{+})	Q	T=2 Jπ: M1 excitation in (e,e′).
11279 *5*		F	
11303.7 *10*		F J	
11309.5 *10*		J	
11319.3 *10*		J	
11326.1 *10*		J	
11331.0 *10*		J	
11335.9 *10*	1^{-}@	F J	
11343.7 *10*		J	
11361.3 *7*	(1,2^{+})	J	Jπ: $\gamma(\theta)$ in (p,γ).
11363.2 *10*		J	
11380.8 *10*	1^{-}@	F J	
11398.4 *10*		J	
11401.3 *10*		F J	
11405.1[c] *11*	(12^{+})	E	Jπ: $\gamma(\theta$,DCO) in (^{18}O,α2nγ).
11409.1 *10*		J	
11412.0 *10*		J	
11416.9 *10*		J	

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)†	Jπ#	XREF	Comments
11426.0 *10*		J L	
11429.6 *15*	(0+,1−,2+)&	L	
11432.3 *10*		J L	
11436.1 *10*	(1−,2+)&	J L	
11439.7 *10*	1−@	F J L	
11440 *20*	3−,4−	U WX	T=2 Jπ: L(p,d)=L(^{3}He,α)=0 from 7/2−.
11445.6 *10*		J L	
11447.7 *15*	(0+,1−,2+)&	L	
11449.0 *15*		L	
11450.5 *15*		L	
11453.1 *15*		L	
11464.7 *15*		L	
11468.1 *15*		L	
11469.3 *15*	(1−,2+)&	L	
11473.5 *15*	(1−,2+)&	L	
11475.8 *15*		L	
11477.7 *15*		L	
(11480.64 *7*)	3−,4−		XREF: Others: AH Jπ: s-wave capture in ^{41}Ca g.s. (Jπ=7/2−).
11481.77 *9*		0	
11485.20 *6*	(2+)&	L 0	
11486.86 *6*		0	
11488.7 *15*	1−@	F L	
11490.40 *9*		L 0	
11493.6 *15*		L	
11495.41 *6*		0	
11499.0 *1*		L 0	
11500.20 *6*		L 0	
11503.70 *11*		L 0	
11507.10 *15*	(0+,1−,2+)&	L 0	
11508.8 *15*		L	
11510.34 *16*	(1−)&	L 0	
11512.5 *15*		L	
11514.36 *15*		0	
11516.6 *15*	(1−)&	L	
11519.5 *3*		F L 0	
11523.3 *15*	(1−,2+)&	L 0	
11525.4 *15*		L	
11527.4 *15*	(1−,2+)&	L	
11529.3 *15*	(0+,1−,2+)&	L	
11530.7 *3*		L 0	
11532.6 *15*		L	
11537.12 *25*		0	
11540.0 *15*	(1−)&	L	
11542.3 *15*	(0+,1−,2+)&	L	
11543.6 *15*		L	
11544.4 *15*	1−@	F L	
11550.0 *15*	(0+,1−,2+)&	L	
11551.5 *15*		L	
11555.4 *15*	(1−)&	L	
11556.3 *15*		L	

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	Jπ[#]	XREF	Comments
11558.1 *15*		L	
11562.8 *15*		L	
11569.2 *15*	1^-[&]	L	
11571.7 *15*	$(0^+,1^-,2^+)$[&]	L	
11572.8 *15*	$(1^-,3^-,4^+)$[&]	L	
11575.2 *15*	$(3^-,4^+)$[&]	L	
11576.2 *15*		L	
11589.8 *15*	(1^-)[&]	L	
11591.1 *15*		L	
11592.6 *15*		L	
11594.6 *15*		L	
11596.7 *15*	1^-[&]	L	
11599.4 *15*	$(1^-,2^+)$[&]	L	
11601.8 *15*	1^-[&]	L	
11603.5 *15*		L	
11612.5 *15*	1^-[&]	F KL	
11614.0 *15*		L	
11616.0 *15*	1^-[&]	L	
11621.0 *15*	$(1^-,2^+)$[&]	L	
11632.8 *15*		L	
11634.5 *15*	$(1^-,2^+)$[&]	L	
11636.1 *15*	$(1^-,2^+)$[&]	L	
11637.4 *15*	$(1^-,2^+)$[&]	L	
11639.4 *15*	1^-[&]	KL	E(level): possible analog of 1927 level in ^{42}Ca.
11641.1 *15*		L	
11643.5 *15*		L	
11644.1 *4*	$(1^-,2^+)$[&]	JKL	
11646.2 *15*	(4^+)[&]	L	
11651.2 *15*	$(1^-,2^+)$[&]	J L	
11653.4 *15*		JKL	
11654.2 *15*	(1^-)[&]	L	
11656.8 *15*	(1^-)[&]	L	
11658		JK	
11662.2 *15*	$(1^-,2^+)$[&]	F JKL	
11664.9 *15*		L	
11670.9 *4*	2^+[&]	JKL	
11674.0 *5*	$(1^-,2^+)$[a]	JK	
11680		J	
11685		JK	
11689.2 *15*	$(1^-,2^+)$[&]	L	
11693.0 *4*	$(1^-,2^+)$[a]	JK	
11695.0 *15*	(3^-)[&]	L	
11697.3 *15*		J L	
11699.7 *15*		J L	
11707.5 *4*	2^+[&]	J L	
11709.2 *15*	$(1^-,2^+)$[&]	JKL	
11710.1 *15*		JKL	
11718.3 *15*		JKL	
11725.7 *9*	$(8^-$ to 11)	E	Jπ: γ to 9 and 10^-.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	Jπ[#]	XREF
11727.1 *3*	2+[&]	JKL
11728.2 *15*		L
11729.3 *15*		L
11733.0 *15*		JKL
11737.4 *15*	(0+,1−,2+)[&]	L
11738.4 *4*	1−[&]	JKL
11743.4 *5*	(1−,2+)[a]	JKL
11748.0 *15*		L
11752.3 *15*		JKL
11756.6 *15*	(1−)[&]	JKL
11758		J
11760		JK
11763		JK
11768		JK
11772.7 *15*	(1−,2+)[&]	J L
11775.0 *4*	(1−,2+)[a]	JK
11777.2 *15*		L
11778.5 *15*	(0+,1−,2+)[&]	JKL
11783.0 *15*	(1−,2+)[&]	L
11784.7 *15*	(1−),2+[&]	L
11786.1 *15*		JKL
11787.5 *15*		L
11789.8 *15*		L
11792		J
11795.2 *4*	(1−,2+)[a]	J L
11798.3 *15*	(1−,2+)[&]	JKL
11805.4 *4*	(1−,2+)[&]	JKL
11809.7 *15*	(1−,2+)[&]	JKL
11811.1 *15*	(1−,2+)[&]	L
11814		JK
11818.0 *15*		L
11821.1 *4*		E
11822.4 *4*	(1−)[&]	JKL
11824.0 *15*	(1−,2+)[&]	L
11829.0 *15*	(1−,2+)[&]	JKL
11830.2 *15*	(2+)[&]	L
11831.8 *15*		JKL
11836.4 *15*	(4+)[&]	JKL
11843.3 *5*	(1−,2+)[&]	JKL
11844.9 *15*	(1−,2+)[&]	L
11846.8 *15*		L
11850		JK
11852.6 *15*	1−[&]	JKL
11856.4 *15*		JKL
11865.6 *15*	(0+,1−,2+)[&]	KL
11868.0 *4*	(1−,2+)[a]	JK
11871.5 *4*	(1−,2+)[a]	JKL
11872.8 *15*		L
11873.7 *4*	(1−,2+)[a]	JKL
11881		JK
11885.2 *15*	(1−,2+,3−)[&]	JKL

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	Jπ[#]	XREF	Comments
11887		JK	
11895.3 *15*	(1⁻,2⁺)[&]	JKL	
11902.0 *15*	(1⁻,2⁺)[&]	JKL	
11906.3 *15*	(1⁻,3⁻)[&]	JKL	
11910.6 *15*	(1⁻,2⁺)[&]	JKL	
11916		JK	
11921		JK	
11923.3 *15*	(1⁻,2⁺)[&]	L	
11925.6 *5*	(1⁻,2⁺)[a]	JKL	
11929		K	
11933.1 *15*	(1⁻,2⁺)[&]	KL	
11937		JK	
11941.9 *15*	2⁺[&]	L	
11944.4 *15*	1⁻[&]	J L	
11950.1 *15*		JKL	
11953		JK	
11959.2 *5*	(1⁻)	J L	
11962.8 *15*	(1⁻,2⁺)[&]	JKL	
11967		JK	
11970.2 *15*	1⁻[&]	KL	
11976.8 *15*	(2⁺)[&]	L	
11980.3 *4*	1⁻[&]	JKL	
11989.0 *15*	(2⁺,3⁻)[&]	L	
11992.1 *15*	(1⁻,2⁺)[&]	L	
12000.2 *15*	2⁺[&]	L	
12005.0 *15*	(1⁻,2⁺)[&]	L	
12006.3 *15*		L	
12012.0 *15*	(2⁺)[&]	L	
12013.6 *15*		L	
12020.4 *15*	(1⁻,2⁺)[&]	L	
12029.5 *15*	(0⁺,1⁻,2⁺)[&]	L	
12032.5 *15*	(3⁻)[&]	L	
12039.8 *15*	1⁻[&]	L	
12041.8 *15*		L	
12042.8 *15*		L	
12050.9 *15*	(1⁻,2⁺)[&]	L	
12052.0 *15*		L	
12061.8 *15*		L	
12066.2 *15*	(1⁻,2⁺)[&]	L	
12070.1 *15*	(2⁺)[&]	L	
12071.4 *15*		L	
12082.8 *15*		L	
12085.2 *15*		L	
12091.9 *15*		L	
12099		L	
12101.3 *15*	1⁻[&]	JKL	E(level): possible analog of 2356 level in ^{42}Ca.
12105.1 *15*		J L	
12109		JK	
12112.2 *15*	1⁻[&]	JKL	

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)[†]	Jπ[#]	XREF		Comments
12116.5 *15*	(2+)[&]	KL		
12123.8 *15*	(1−,2+)[&]	JKL		
12127.6 *15*		JKL		
12130		J		
12135.2 *15*		JKL		
12137.9 *15*		L		
12142		JK		
12144.7 *15*		JKL		
12146.8 *15*		L		
12148.5 *15*		J L		
12153.7 *15*	2+[&]	JKL		
12156		J		
12158.6 *15*	1−[&]	KL		
12160		JK		
12163.1 *15*	1−[&]	JKL		
12168 *3*	(1−)[&]	JKL		
12172.0 *5*	(1,2+)[a]	JK		
12175.7 *15*	1−[&]	KL		
12180		JK		
12182.8 *15*	1−[&]	KL		
12185		JK		
12187.7 *15*		JKL		
12198		JK		
12198.1 *11*		E		
12203.0 *15*	(1−,3−)[&]	JKL		
12204.1 *15*		JKL		
12207.9 *15*	(0+,1−,2+)[&]	JKL		
12210.4 *15*		L		
12212.2 *15*		JKL		
12216		JK		
12221.0 *15*		L		
12222.7 *15*		J L		
12226.3 *15*		JKL		
12230.5 *15*	(1−,2+,3−)[&]	JKL		
12236		JK		
12238.4 *15*	(1−,3−)[&]	JKL		
12239.4 *15*		J L		
12246.4 *15*	(1−,2+)[&]	L		
12247.6 *15*		L		
12251.8 *15*	(1−)[&]	L		
12255		JK		
12260.2 *15*	(2+,3−)[&]	L		
12263		JK		
12265.2 *15*	1−[&]	L		
12268.1 *15*	3−[&]	L		
12270		JK		
12271.8 *15*	(1−,2+)[&]	L		
12277.2 *15*	(0+,1−,2+,3−,4+)[&]	JKL		
12278.7 *15*		JKL		
12280	0+	J	X	Jπ: L(p,t)=0 from 0+.
12285.7 *15*	(1−,2+)[&]	J L		

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

E(level)†	Jπ#	XREF	Comments
12287.7 *15*		JKL	
12291.3 *15*		JKL	
12294.9 *15*		L	
12298.6 *15*	(1⁻,2⁺,3⁻)&	JKL	
12300.6 *15*		JKL	
12304.9 *15*		JKL	
12308.2 *15*		KL	
12310.9 *15*		JKL	
12314		JK	
12316		J	
12320.6 *15*	(0⁺,1⁻,2⁺)&	L	
12323.2 *15*	(1⁻,2⁺)&	JKL	
12327.0 *15*		JKL	
12330		JK	
12336		JKL	
12340		KL	
12344		JK	
12348		JKL	
12351		JKL	
12358		J L	
12362		JKL	
12369		JKL	
12374		JKL	
12377		L	
12381		JKL	
12383		L	
12386		JKL	
12390		J	
12397		J L	
12701.4 *4*		E	
12814.7 *8*		E	
13712.8 *11*		E	
13762.8 *13*		E	
14700 *50*	0^+		XREF: Others: AC Jπ: L(^{3}He,n)=0.
15251.7 *13*		E	
17.4×10^3 *1*	1^-	J	Γ=3.3 MeV *5* (1973Di03) Jπ: GDR, T=1 (p,γ).
20.4×10^3 *1*	1^-	J	Γ=4.4 MeV *1* (1973Di03) Jπ: GDR, T=2 (p,γ).

† From least-squares adjustment to measured Eγ data when such data are available. Otherwise weighted averages of available level energies from different reactions are taken.

‡ Primarily from (α,pγ) and (p,p′γ) by Doppler Shift Attenuation Method (DSAM) or Recoil Distance Method (RDM), unless otherwise noted.

When L-transfer arguments are used, the target spin-parity is $J^\pi=3/2^+$ for ^{41}K; $J^\pi=0^+$ for ^{40}Ca, ^{42}Ca and ^{44}Ca; $J^\pi=7/2^-$ for ^{43}Ca. When assigning J^π to a level based on γ transitions from this level to a level of known J^π, evaluators use the following rules: if Eγ<4 MeV, transitions are considered to be E1, M1 or E2; if Eγ>4 MeV, M2 and E3 are also considered as possible.

@ From angular distributions of the ground-state γ-rays from resonant states in (α,γ).

& From comparison of experimental data of angular distributions with theoretical predictions in (p,α):resonance.

a From γ(θ) and analysis of proton-resonance data in (p,γ).

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Adopted Levels, Gammas (continued)

^{42}Ca Levels (continued)

[b] Band(A): g.s., Yrast band.
[c] Band(B): Excited 0^+ band.
[d] Band(C): Negative-parity structure.

Adopted Levels, Gammas (continued)

γ(^{42}Ca)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	α#	$I_{(\gamma+ce)}$	Comments
1524.71	2^+	1524.67 *3*	100	0.0	0^+	E2				B(E2)(W.u.)=9.5 *4*
1837.31	0^+	312.60 *25*	100 *6*	1524.71	2^+	E2		0.00349		B(E2)(W.u.)=55 *5*
										I_γ: represents 97.95% 17 decay branching for level.
		1837.3		0.0	0^+	E0			2.05 *17*	ρ^2(E0)=0.140 *12*, q_K^2(E0/E2)=0.92 *8*, X(E0/E2)=0.089 *8* (2005Ki02 evaluation). Decay takes place by pair formation. Γ (pair production)=1.6×10^{-8} eV *2* from (e,e′) (1978Gr02). $I_{(\gamma+ce)}$: from (p,p′γ).
2424.15	2^+	586.9@	<1.5	1837.31	0^+					
		899.41 *4*	100 *2*	1524.71	2^+	M1+E2	−0.17 *2*			B(M1)(W.u.)=0.15 *5*; B(E2)(W.u.)=15 *6*
		2424.16 *7*	43 *2*	0.0	0^+	E2				B(E2)(W.u.)=1.7 *5*
2752.40	4^+	328.2	1.0 *4*	2424.15	2^+	[E2]				B(E2)(W.u.)=60 *30*
		1227.65 *3*	100.0 *4*	1524.71	2^+	E2				B(E2)(W.u.)=8.3 *12*
3189.26	6^+	436.84 *12*	100	2752.40	4^+	E2				B(E2)(W.u.)=0.777 *22*
3253.89	4^+	501.46 *3*	64 *7*	2752.40	4^+	[M1]				B(M1)(W.u.)=0.50 *11*
		829.7	18 *9*	2424.15	2^+	[E2]				B(E2)(W.u.)=1.3×10^2 *8*
		1729.19 *5*	100 *7*	1524.71	2^+	E2(+M3)	+0.05 *4*			B(E2)(W.u.)=19 *4*
3300.0	0^+	875.8	100 *1*	2424.15	2^+	E2				B(E2)(W.u.)<1.3×10^2
		1775.3	8 *4*	1524.71	2^+	E2				B(E2)(W.u.)<0.31
3392.01	2^+	967.8	45 *10*	2424.15	2^+					
		1554.7	15 *3*	1837.31	0^+	[E2]				B(E2)(W.u.)=3.2 *+14−7*
		1867.3	100 *4*	1524.71	2^+	M1+E2	+1.7 *4*			B(M1)(W.u.)=0.0026 *+11−6*; B(E2)(W.u.)=6.4 *+27−15*
		3391.9	87 *8*	0.0	0^+	E2				B(E2)(W.u.)=0.43 *9*
3446.94	3^-	692.0 *8*	6.6 *18*	2752.40	4^+	[E1]				B(E1)(W.u.)=0.00025 *11*
		1022.77 *4*	57 *2*	2424.15	2^+	[E1]				B(E1)(W.u.)=0.00068 *23*
		1922.18 *7*	100 *3*	1524.71	2^+	E1(+M2)	+0.02 *7*			B(E1)(W.u.)=0.00018 *6*; B(M2)(W.u.)<0.7
3654.0	2^+	1229.8	4.2 *10*	2424.15	2^+					
		1816.7	7 *4*	1837.31	0^+	[E2]				B(E2)(W.u.)=4 *+18−3*
		2129.2	100 *3*	1524.71	2^+	M1(+E2)	−0.06 *17*			B(M1)(W.u.)=0.035 *25*; B(E2)(W.u.)<0.55
		3653.8	22.2 *10*	0.0	0^+	E2				B(E2)(W.u.)=0.34 *25*
3885.0	1^-	1460.8	4 *2*	2424.15	2^+					
		2047.6	93 *3*	1837.31	0^+	E1				
		3884.8	100 *4*	0.0	0^+	E1				
3954.39	4^-	507.45 *3*	100 *4*	3446.94	3^-	M1+E2	+0.11 *5*			B(M1)(W.u.)=0.042 *4*; B(E2)(W.u.)=6 *+6−4*
		1202.0	18 *4*	2752.40	4^+	E1				B(E1)(W.u.)=1.5×10^{-5} *4*
3999.66	4^+	1247.2	7 *4*	2752.40	4^+					
		1575.5	49 *5*	2424.15	2^+					
		2474.80 *10*	100 *5*	1524.71	2^+					
4047.0	3^-	600.1	22 *5*	3446.94	3^-	M1+E2	+0.21 *12*			B(M1)(W.u.)=0.07 *3*; B(E2)(W.u.)=30 *+70−25*
		1294.6	29 *8*	2752.40	4^+	[E1]				B(E1)(W.u.)=0.00024 *11*
		1622.8	29 *10*	2424.15	2^+	[E1]				B(E1)(W.u.)=0.00012 *6*
		2522.2	100 *11*	1524.71	2^+	[E1]				B(E1)(W.u.)=0.00011 *4*

$^{42}_{20}Ca_{22}$-19

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
4099.65	5^-	652.8		3446.94	3^-			
		910.37 *15*	100 *3*	3189.26	6^+	E1(+M2)	+0.04 *2*	B(E1)(W.u.)=0.00102 *24*
		1347.26 *14*	61 *3*	2752.40	4^+	E1+M2	−0.09 *4*	B(E1)(W.u.)=0.00019 *5*
4117.1	3^-	670.1	61 *11*	3446.94	3^-			
		1692.8	21 *6*	2424.15	2^+			
		2592.2	100 *7*	1524.71	2^+			
4232.0	1	1807.8	27 *5*	2424.15	2^+			
		4231.8	100 *5*	0.0	0^+			
4342.3	(0^+ to 4^+)	1918.1	100	2424.15	2^+			
4354.0	4^-	399.6	9 *2*	3954.39	4^-	M1+E2	>0.09	B(M1)(W.u.)<0.046; B(E2)(W.u.)>3.9 δ: also,<−0.09.
		907.0	53 *9*	3446.94	3^-			
		1100.1	20 *5*	3253.89	4^+	[E1]		B(E1)(W.u.)=0.00010 *3*
		1601.6	100 *9*	2752.40	4^+	E1		B(E1)(W.u.)=0.00016 *3*
4418.0	3^-	971.0	67 *12*	3446.94	3^-			
		1993.8	25 *8*	2424.15	2^+			
		2893.2	100 *13*	1524.71	2^+			
4443.0	4^+	1189.1	10 *3*	3253.89	4^+			
		1690.6	100 *5*	2752.40	4^+			
		2018.8	16 *4*	2424.15	2^+			
4448.8	2^+	794.8	34 *6*	3654.0	2^+			
		1001.8	37 *9*	3446.94	3^-			
		2611.4	49 *11*	1837.31	0^+			
		2924.0	100 *17*	1524.71	2^+			
		4448.5	66 *14*	0.0	0^+			
4505.0	$(2,3,4)^+$	1113.0	34 *6*	3392.01	2^+			
		1251.1	15 *4*	3253.89	4^+			
		1752.6	64 *11*	2752.40	4^+			
		2980.2	100 *13*	1524.71	2^+			
4566.9	$(1,2^+)$	682.0	47 *9*	3885.0	1^-			
		2142.8	100 *9*	2424.15	2^+			
		3042.2	100 *9*	1524.71	2^+			I_γ: Iγ(3043)/Iγ(2143)=78/44 in (p,γ).
		4566		0.0	0^+			I_γ: Iγ(4566)/Iγ(2143)=100/44 in (p,γ).
4690.06	3^-	2265.8	22 *6*	2424.15	2^+			
		3165.24 *11*	100 *6*	1524.71	2^+			
4717.53	6^+	1463.7 *3*	95 *5*	3253.89	4^+	[E2]		B(E2)(W.u.)=48 *+30−13*
		1525.5	35 *7*	3189.26	6^+			
		1965.2 *4*	100 *3*	2752.40	4^+	[E2]		B(E2)(W.u.)=12 *+7−3*
4759.71	2^+	2335.70 *30*	57 *29*	2424.15	2^+			
		2922.5	43 *14*	1837.31	0^+			
		3235.1	86 *29*	1524.71	2^+			
		4759.6	100 *29*	0.0	0^+			
4866.0	2^+	2441.8	100 *9*	2424.15	2^+			

$^{42}_{20}Ca_{22}$-20

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
4866.0	2$^+$	3341.2	22 *9*	1524.71	2$^+$			
		4865.7	22 *9*	0.0	0$^+$			I_γ: Iγ(4866)/Iγ(3341)=100/100 in (p,γ).
4897.0	5$^-$	779.0	8 *1*	4117.1	3$^-$	[E2]		B(E2)(W.u.)=3.1×10^2 *15* I_γ: branching most likely incorrect.
		797.8 *3*	100 *4*	4099.65	5$^-$	M1+E2	+0.14 *8*	B(M1)(W.u.)=0.7 *4*; B(E2)(W.u.)=70 *+230−60*
		1449.0	18 *4*	3446.94	3$^-$	E2		B(E2)(W.u.)=31 *16*
4904.0	3$^-$	2151.5	36 *9*	2752.40	4$^+$			
		2479.8	45 *9*	2424.15	2$^+$			
		4903.7	100 *18*	0.0	0$^+$	[E3]		
4946.9	(1,2,3)$^-$	2522.7	100	2424.15	2$^+$			
4971.0	3$^-$	1016.6	91 *14*	3954.39	4$^-$			
		2546.7	100 *17*	2424.15	2$^+$			
		3446.1	94 *17*	1524.71	2$^+$			E_γ: (p,γ) reported 1526, 2281 and 4968 γ transitions instead of the three transition given here from (α,pγ).
5017.14	4$^+$	1763.12 *12*	100 *7*	3253.89	4$^+$			
		3492.2	21 *7*	1524.71	2$^+$			
5075.0	(1,2,3)$^-$	657.0	47 *10*	4418.0	3$^-$			
		1628.0	100 *10*	3446.94	3$^-$			
5158.0	3$^-$	2733.7	85 *17*	2424.15	2$^+$			
		3633.1	100 *17*	1524.71	2$^+$			
5188.0	(2,3,4)$^+$	770.0	100	4418.0	3$^-$			
5210.3	(2$^+$)	1956.1	100 *5*	3253.89	4$^+$			
		2457.5	14 *5*	2752.40	4$^+$			
5212.98	6	1213.2 *3*	100 *10*	3999.66	4$^+$			
		1959.1 *4*	75 *9*	3253.89	4$^+$			
5214.1	(2$^+$)	1217 *3*	100 *8*	3999.66	4$^+$			
		2789.7	25 *7*	2424.15	2$^+$			
		3689.1	39 *8*	1524.71	2$^+$			
		5213.7[@]		0.0	0$^+$			γ reported in (p,γ) only.
5320.0	(3,4)$^-$	902.0	61 *11*	4418.0	3$^-$			
		1220.3	61 *11*	4099.65	5$^-$			
		1273.0	26 *5*	4047.0	3$^-$			
		1365.6	100 *13*	3954.39	4$^-$			
		2066.1	16 *5*	3253.89	4$^+$			
5345.0	0$^+$	3820.1	100	1524.71	2$^+$			
5358.0	2$^+$	2933.7	33 *20*	2424.15	2$^+$			
		5357.6	100 *20*	0.0	0$^+$			
5380.0	5$^-$	2126.1	52 *10*	3253.89	4$^+$			
		2190.5	86 *12*	3189.26	6$^+$			
		2627.5	100 *14*	2752.40	4$^+$			
5393.0	(3)$^-$	2968.7	33 *12*	2424.15	2$^+$			
		3868.1	100 *12*	1524.71	2$^+$			
5439.0	(3,4)$^-$	1339.3	100	4099.65	5$^-$			

$^{42}_{20}Ca_{22}$-21

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	Comments
5472.0	(2,3,4)$^+$	2218.1	100 *10*	3253.89	4$^+$			
		2719.5	43 *8*	2752.40	4$^+$			
		3947.1	16 *10*	1524.71	2$^+$			
5490.77	6$^-$	2301.6 *2*	100	3189.26	6$^+$	E1(+M2)	+0.10 *8*	B(E1)(W.u.)=0.00077 *19*
5491.0	3$^-$	1374.0	100 *13*	4117.1	3$^-$			
		3966.1	45 *13*	1524.71	2$^+$			
5510.0	3$^-$	1463.0	47 *12*	4047.0	3$^-$			
		2063.0	100 *12*	3446.94	3$^-$			
5530.0	2$^+$	3105.7	100 *13*	2424.15	2$^+$			
		4005.1	43 *13*	1524.71	2$^+$			
5578.0	(0$^+$ to 4$^+$)	2185.9	100	3392.01	2$^+$			
5593.0	3$^-$	1638.6	100 *15*	3954.39	4$^-$			
		3168.7	56 *8*	2424.15	2$^+$			
		4068.1	52 *15*	1524.71	2$^+$			
		5592.6	52 *15*	0.0	0$^+$	[E3]		E_γ: reported only in (p,γ).
5601.0	(3$^-$,4$^-$)	1096.0	49 *15*	4505.0	(2,3,4)$^+$			
		1601.3	100 *15*	3999.66	4$^+$			
5624.0	3$^-$	1624.3	100 *15*	3999.66	4$^+$			
		5623.6	60 *15*	0.0	0$^+$	[E3]		
5665.0	(3$^-$)	1247.0	51 *11*	4418.0	3$^-$			
		1710.6	100 *16*	3954.39	4$^-$			
		3240.7	71 *13*	2424.15	2$^+$			
5670.0	(3$^-$)	2223.0	100 *16*	3446.94	3$^-$			
		4145.1	79 *16*	1524.71	2$^+$			
5691.77	6$^+$	974.1 *2*	100 *13*	4717.53	6$^+$			
		2437.8 *3*	83 *13*	3253.89	4$^+$			
		2502.4	30 *9*	3189.26	6$^+$			
5716.0	2$^+$	2462.0	100	3253.89	4$^+$			
5725.0	(2$^+$ to 6$^+$)	2972.5	100	2752.40	4$^+$			
5738.0	(2$^+$)	3313.7	33 *17*	2424.15	2$^+$			
		4213.1	33 *17*	1524.71	2$^+$			
		5737.6	100 *33*	0.0	0$^+$			
5744.01	7$^-$	253.3 *1*	2.6 *2*	5490.77	6$^-$			
		1026.3 *2*	4.0 *4*	4717.53	6$^+$			
		1644.29 *11*	100 *3*	4099.65	5$^-$	E2(+M3)	−0.02 *3*	B(E2)(W.u.)=7.2 *18*
		2554.75 *21*	73 *3*	3189.26	6$^+$	E1+M2	−0.04 *2*	B(E1)(W.u.)=3.2×10^{-5} *8*; B(M2)(W.u.)<0.12
5769.0	3$^-$	3016.5	100 *11*	2752.40	4$^+$			
		3344.7	59 *11*	2424.15	2$^+$			
5774.9	(4,5)$^+$	2521.0	100 *3*	3253.89	4$^+$			
		2585.5	12 *3*	3189.26	6$^+$			
5797.0	(1,2)$^+$	3372.7	100 *18*	2424.15	2$^+$			
		4272.1	72 *15*	1524.71	2$^+$			
		5796.6	85 *18*	0.0	0$^+$			

$^{42}_{20}Ca_{22}$-22

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
5802.0	3^-	1802.3	100	3999.66	4^+			
5822.0	$(1,2,3)^-$	3397.7	100	2424.15	2^+			
5866.0	$(1,2,3^-)$	4028.5	122 *22*	1837.31	0^+			
		4341.1	100 *22*	1524.71	2^+			
5875.0	2^+	3122.5	41 *11*	2752.40	4^+			
		3450.7	100 *11*	2424.15	2^+			
5924.0	$(3,4)^-$	1419.0	27 *8*	4505.0	$(2,3,4)^+$			
		1570.0	32 *8*	4354.0	4^-			
		1824.2	100 *14*	4099.65	5^-			
		1969.6	57 *11*	3954.39	4^-			
		3171.5	54 *11*	2752.40	4^+			
5925.5	(5)	2736.2 *4*	100	3189.26	6^+			
5994.0	3^-	1023.0	20 *6*	4971.0	3^-			
		3569.7	100 *6*	2424.15	2^+			
6003.0	$3^-,4^-$	3250.5	100	2752.40	4^+			
6020.0	$(4^+,5,6^-)$	2065.6	23 *7*	3954.39	4^-			
		2830.5	100 *7*	3189.26	6^+			
6028.0	$(3)^-$	2073.6	91 *16*	3954.39	4^-			
		3275.5	100 *16*	2752.40	4^+			
		4503.0	36 *11*	1524.71	2^+			
6038.0	$(1,2,3)^-$	3613.7	33 *8*	2424.15	2^+			Additional information 7.
		4513.0	100 *8*	1524.71	2^+			Additional information 8.
6093.5	(3^- to 7^-)	1197.0	100 *8*	4897.0	5^-			
		1993.2	47 *8*	4099.65	5^-			
6104.0	(0^+ to 4^+)	3679.7	100 *14*	2424.15	2^+			
		4579.0	79 *14*	1524.71	2^+			
6113.0	4^+	1695.0	16 *5*	4418.0	3^-			
		2859.0	100 *5*	3253.89	4^+			
6140.8	6^-	649.8	16 *6*	5490.77	6^-	(M1+E2)	−0.25 *+25−10*	B(M1)(W.u.)=0.16 *+8−10*; B(E2)(W.u.)<210
		1787.0	17 *3*	4354.0	4^-	[E2]		B(E2)(W.u.)=8 *+3−4*
		2041.2[@]	26 *5*	4099.65	5^-	[M1]		B(M1)(W.u.)=0.009 *+3−5* Placement possibly incorrect.
		2186.5	100 *9*	3954.39	4^-	E2(+M3)	≈0	B(E2)(W.u.)=13 *5*
6144.72	7^-	2955.42 *20*	100	3189.26	6^+	E1(+M2)	+0.02 *2*	B(E1)(W.u.)>0.00031
6182.0	$(1,2,3^-)$	4657.0	100 *13*	1524.71	2^+			
		6181.5	47 *13*	0.0	0^+			
6212.0	3^-	3459.4	100	2752.40	4^+			
6247.9	$(4^+,5,6^-)$	2293.5	74 *13*	3954.39	4^-			
		3058.4	100 *15*	3189.26	6^+			
		3495.4	82 *13*	2752.40	4^+			
6408.57	8^-	263.84 *8*	20.3 *9*	6144.72	7^-	M1(+E2)	0.00 *2*	B(M1)(W.u.)=0.0055 *6*
		664.6 *2*	5.0 *7*	5744.01	7^-			
		917.77 *12*	100 *3*	5490.77	6^-	E2(+M3)	+0.03 *2*	B(E2)(W.u.)=2.28 *21*

$^{42}_{20}Ca_{22}$-23

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
6408.57	8^-	3219.2 *3*	16.3 *17*	3189.26	6^+	M2+E3	+0.85 *23*	B(M2)(W.u.)=0.016 *5*; B(E3)(W.u.)=5.0 *18* δ: weighted average of +0.8 *2* in (^{16}O,2pγ) and +2.0 *10* in (α,pγ).
6516.0		2630.9		3885.0	1^-			E_γ: from (^{14}C,^{12}C) only.
		4091.6		2424.15	2^+			E_γ: from (^{14}C,^{12}C) only.
		4991.0		1524.71	2^+			E_γ: from (^{14}C,^{12}C) only.
6541.8	5^+	1050.8	43 *7*	5490.77	6^-			
		2442.2	29 *7*	4099.65	5^-			
		3352.4	100 *10*	3189.26	6^+			
6553.72	9^-	145.12 *10*	36.8 *17*	6408.57	8^-	M1(+E2)	0.00 *2*	B(M1)(W.u.)=0.042 *4*
		409.1 *2*	3.0 *5*	6144.72	7^-			E_γ: reported only in (^{18}O,α2nγ).
		809.73 *10*	100 *2*	5744.01	7^-	E2(+M3)	−0.03 *2*	B(E2)(W.u.)=2.96 *23*
		3364.4 *3*	11 *1*	3189.26	6^+	[E3]		B(E3)(W.u.)=4.1 *5* E_γ: reported only in (^{18}O,α2nγ).
6584.7	(5^- to 8^-)	840.7	100 *11*	5744.01	7^-			
		1093.8	85 *11*	5490.77	6^-			
6636.30	8^+	1918.6 *2*	100 *4*	4717.53	6^+			
		3447.1 *4*	100 *3*	3189.26	6^+			
6674.8	(4^+ to 8^+)	3485.4	100	3189.26	6^+			
6715.9	(4^+)	1505.0	100 *13*	5210.3	(2^+)			
		1999.9	83 *13*	4717.53	6^+			
		3525.4	68 *13*	3189.26	6^+			
6718.14	7	1505.1 *2*	100 *9*	5212.98	6			
		2000.4 *3*	64 *7*	4717.53	6^+			
		3528.8 *5*	52 *5*	3189.26	6^+			
6746.5	4^+	1850.0	100 *18*	4897.0	5^-			
		2646.2	96 *18*	4099.65	5^-			
6816.8	$(4,5)^+$	3627.4	100	3189.26	6^+			
6895.8	4^+	970.5	32 *6*	5925.5	(5)			
		1404.8	8 *3*	5490.77	6^-			
		3706.4	100 *6*	3189.26	6^+			
6940.2	(5^-,6,7^-)	1195.7	43 *9*	5744.01	7^-			
		2043.9	100 *13*	4897.0	5^-			
		2840.2	74 *11*	4099.65	5^-			
6975.5	(5^+)	1483.8	36 *7*	5490.77	6^-			
		2259.9	27 *7*	4717.53	6^+			
		2875.2	60 *9*	4099.65	5^-			
		3785.4	100 *11*	3189.26	6^+			
7129.9	4^+	3940.4	100	3189.26	6^+			
7197.9		4008.4	100	3189.26	6^+			
7282.02	9^-	728.3 *1*	30 *3*	6553.72	9^-			
		873.5 *2*	100 *5*	6408.57	8^-			
7344.7	(6^- to 10^-)	936.1	100	6408.57	8^-			
7360.6	(5^- to 9^-)	1215.9	100	6144.72	7^-			

$^{42}_{20}Ca_{22}$-24

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	Comments
7368.46	10^-	814.70 *19*	100 *3*	6553.72	9^-	M1+E2		
		959.9 *2*	3.5 *6*	6408.57	8^-	[E2]		B(E2)(W.u.)=1.4 *+10−4*
7388.8	4^+	4199.3	100	3189.26	6^+			
7415.87	8^+	779.6 *2*	35 *3*	6636.30	8^+			
		1723.9 *3*	30 *5*	5691.77	6^+			
		2699.9	4.0 *12*	4717.53	6^+			
		4225.3	100 *5*	3189.26	6^+			
7421.2	(4^+ to 8^+)	2704.9	33 *5*	4717.53	6^+			
		4230.3	100 *5*	3189.26	6^+			
7543.1	(4^+ to 7^-)	2645.9	100 *19*	4897.0	5^-			
		2826.9	100 *19*	4717.53	6^+			
		4352.3	63 *19*	3189.26	6^+			
7562.5	(4^+,5^+)	2844.9	100	4717.53	6^+			
7634.03	(6,8^+)	1708.5 *4*	51 *9*	5925.5	(5)			
		1942.2 *3*	54 *9*	5691.77	6^+			
		2916.3 *3*	100 *14*	4717.53	6^+			
		4444.3	80 *11*	3189.26	6^+			
7696.8	4^+	4507.3	100	3189.26	6^+			
7726.5	(4^+ to 8^+)	3008.9	100	4717.53	6^+			
7750.66	$(11)^-$	382.20 *8*	100	7368.46	10^-	M1(+E2)	+0.02 *7*	
7758.0	(6^-,7^-)	1349.1	56 *9*	6408.57	8^-			
		2013.6	75 *13*	5744.01	7^-			
		2266.7	100 *13*	5490.77	6^-			
		2861.9	81 *13*	4897.0	5^-			
7800.7	(5^- to 9^-)	1655.9	100	6144.72	7^-			
7838.9	(2^+ to 6^+)	1123.0	100	6715.9	(4^+)			
7921.2	(4^+ to 8^+)	3204.9	100 *13*	4717.53	6^+			
		4730.3	61 *13*	3189.26	6^+			
7939.8	(4^+ to 8^+)	2248.0	75 *12*	5691.77	6^+			
		4750.3	100 *12*	3189.26	6^+			
8052.6	(4^+ to 8^+)	3334.9	100	4717.53	6^+			
8059.7	(6^- to 9^-)	1651.1	100 *2*	6408.57	8^-			
		2315.6	6 *2*	5744.01	7^-			
8082.7	(7^- to 11^-)	1529.0	100	6553.72	9^-			
8103.2	(4^+ to 8^+)	2410.0	49 *8*	5691.77	6^+			
		3386.9	100 *8*	4717.53	6^+			
8297.46	11^-	928.98 *10*	100 *4*	7368.46	10^-	M1+E2	−0.11 *5*	B(M1)(W.u.)>0.0095; B(E2)(W.u.)>0.040
		1743.8 *2*	67 *4*	6553.72	9^-	[E2]		
8364.8	(6^-,7,8^+)	1956.1	100 *18*	6408.57	8^-			
		5175.2	75 *18*	3189.26	6^+			
8449.7	$(7,8)^-$	1896.0	69 *12*	6553.72	9^-			
		2041.0	69 *12*	6408.57	8^-			
		2958.7	100 *12*	5490.77	6^-			

$^{42}_{20}Ca_{22}$-25

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	δ ‡
8511.7	(6$^-$ to 9$^-$)	2103.0	89 *13*	6408.57	8$^-$		
		2767.6	100 *13*	5744.01	7$^-$		
8517.0	(3 to 9)	2591.4	100	5925.5	(5)		
8522.3	(10)	771.61 *20*	100	7750.66	(11)$^-$	D(+Q)	0.00 *4*
8580.9	(2$^+$ to 6$^+$)	1865.0		6715.9	(4$^+$)		
8611.9	(2$^+$ to 6$^+$)	1896.0	100	6715.9	(4$^+$)		
8615.13	9	1199.3 *3*	34 *4*	7415.87	8$^+$		
		1896.9 *2*	100 *8*	6718.14	7		
		1978.7 *3*	54 *7*	6636.30	8$^+$		
		2061.1	9 *2*	6553.72	9$^-$		
8722.30	9	1306.4 *2*	90 *9*	7415.87	8$^+$		
		1440.3 *3*	30 *5*	7282.02	9$^-$		
		2004.0 *3*	86 *15*	6718.14	7		
		2085.9 *2*	100 *10*	6636.30	8$^+$		
		2168.6 *3*	36 *6*	6553.72	9$^-$		
8744.9	(8$^-$ to 12$^-$)	1376.4		7368.46	10$^-$		
8773.7	(5,6,7)	3282.7	100 *11*	5490.77	6$^-$		
		5584.2	41 *11*	3189.26	6$^+$		
8847.97	(10$^+$)	2211.6 *2*	100	6636.30	8$^+$		
8951.3	(6$^+$ to 10$^+$)	2314.9	100	6636.30	8$^+$		
9015.01	10$^+$	292.7 *2*	11 *2*	8722.30	9		
		399.9 *1*	26 *2*	8615.13	9		
		717.6 *3*	5 *1*	8297.46	11$^-$		
		1599.1 *1*	100 *4*	7415.87	8$^+$		
		1733.0 *2*	67 *10*	7282.02	9$^-$		
		2378.6 *3*	13 *2*	6636.30	8$^+$		
		2461.3 *3*	15 *2*	6553.72	9$^-$		
9036.9	(8$^-$ to 12$^-$)	1668.4	100	7368.46	10$^-$		
9205.9	(7$^-$ to 9$^-$)	1924.0	92 *13*	7282.02	9$^-$		
		3060.8	100 *13*	6144.72	7$^-$		
9241.9?		1959.9		7282.02	9$^-$		
9311.08	(8,10$^+$)	1677.0 *3*	90 *6*	7634.03	(6,8$^+$)		
		2674.7 *3*	100 *12*	6636.30	8$^+$		
9377.7	(5$^-$ to 9$^-$)	3633.5	100	5744.01	7$^-$		
9759.7	(7$^-$ to 11$^-$)	3205.9	100	6553.72	9$^-$		
9786.29	(9$^-$,11)	475.2 *1*	14 *1*	9311.08	(8,10$^+$)		
		771.3 *1*	100 *3*	9015.01	10$^+$		
		938.3 *2*	16 *1*	8847.97	(10$^+$)		
		1063.9 *3*	24.0 *14*	8722.30	9		
		1171.0 *2*	16.0 *15*	8615.13	9		
		1488.8 *1*	44 *2*	8297.46	11$^-$		
		2417.8 *2*	28 *2*	7368.46	10$^-$		
9841.6	(5,6)$^-$	3696.7	100	6144.72	7$^-$		

$^{42}_{20}Ca_{22}$-26

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Comments
10035.6	(5$^-$ to 9$^-$)	3890.7	100	6144.72	7$^-$	
10168.69	(10,12$^+$)	382.4 *1*	100 *3*	9786.29	(9$^-$,11)	
		1153.6 *3*	29 *2*	9015.01	10$^+$	
		1871.2 *2*	11 *1*	8297.46	11$^-$	
10450.0	(5)$^-$	6349.8	100	4099.65	5$^-$	I_γ: represents>60% decay branching for level.
11165.7	(10,12)	2868.1 *8*	100	8297.46	11$^-$	
11361.3	(1,2$^+$)	9835.4		1524.71	2$^+$	
		11359.6		0.0	0$^+$	
11405.1	(12$^+$)	2557.0	100	8847.97	(10$^+$)	
(11480.64)	3$^-$,4$^-$	6462.79 *17*		5017.14	4$^+$	
		6720.46 *18*		4759.71	2$^+$	
		6790.05 *17*		4690.06	3$^-$	
		7480.07 *18*		3999.66	4$^+$	
		7525.47 *10*		3954.39	4$^-$	
		8033.03 *18*		3446.94	3$^-$	
		8225.86 *13*		3253.89	4$^+$	
		8727.42 *14*		2752.40	4$^+$	
11644.1	(1$^-$,2$^+$)	7194.6	6	4448.8	2$^+$	
		7411.4	50	4232.0	1	
		7526.4	19	4117.1	3$^-$	
		7596.4	19	4047.0	3$^-$	
		7758.3	19	3885.0	1$^-$	
		7989.3	19	3654.0	2$^+$	
		8251.2	9	3392.01	2$^+$	
		9218.8	16	2424.15	2$^+$	
		9805.6	12	1837.31	0$^+$	
		10118.1	100	1524.71	2$^+$	
		11642.4	44	0.0	0$^+$	
11670.9	2$^+$	7221.4	38	4448.8	2$^+$	
		7553.2	34	4117.1	3$^-$	
		8016.1	28	3654.0	2$^+$	
		8278.0	31	3392.01	2$^+$	
		9245.6	59	2424.15	2$^+$	
		9832.4	100	1837.31	0$^+$	
		10144.9	55	1524.71	2$^+$	
11674.0	(1$^-$,2$^+$)	7556.3	100	4117.1	3$^-$	
		8281.1	59	3392.01	2$^+$	
		9248.7	48	2424.15	2$^+$	
		9835.5	48	1837.31	0$^+$	
		10148.0	90	1524.71	2$^+$	
11693.0	(1$^-$,2$^+$)	6932.5	90	4759.71	2$^+$	
		7460.3	62	4232.0	1	
		7575.3	33	4117.1	3$^-$	

$^{42}_{20}Ca_{22}$-27

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	Comments
11693.0	(1⁻,2⁺)	8038.2	71	3654.0	2⁺			
		8300.1	62	3392.01	2⁺			
		8392.1	14	3300.0	0⁺			
		9267.7	100	2424.15	2⁺			
		10167.0	43	1524.71	2⁺			
11707.5	2⁺	6114.0	32	5593.0	3⁻			
		7364.5	20	4342.3	(0⁺ to 4⁺)			
		7474.8	36	4232.0	1			
		7821.7	20	3885.0	1⁻			
		8052.7	32	3654.0	2⁺			
		8314.6	24	3392.01	2⁺			
		8406.6	12	3300.0	0⁺			
		9282.2	32	2424.15	2⁺			
		9869.0	100	1837.31	0⁺			
		10181.5	56	1524.71	2⁺			
11725.7	(8⁻ to 11)	2483.8		9241.9?				
		4357.0		7368.46	10⁻			
11727.1	2⁺	6966.6	27	4759.71	2⁺	D(+Q)	+0.02 *4*	δ: or +3.0 *10*.
		7277.6	67	4448.8	2⁺	(D+Q)	+0.70 *10*	
		7308.4	27	4418.0	3⁻			
		7494.4	47	4232.0	1	(D+Q)	+0.30 *15*	δ: or +2.0 *10*.
		7609.4	47	4117.1	3⁻			
		8072.3	20	3654.0	2⁺			
		8334.2	40	3392.01	2⁺	D+Q	+3.7 *1*	
		8426.2	40	3300.0	0⁺			
		9301.8	93	2424.15	2⁺	D+Q	+0.65 *5*	
		9888.5	67	1837.31	0⁺			
		10201.1	93	1524.71	2⁺	D+Q	−0.20 *5*	
		11725.3	100	0.0	0⁺			
11738.4	1⁻	6523.9	45	5214.1	(2⁺)			
		6833.8	82	4904.0	3⁻			
		7288.9	18	4448.8	2⁺			
		7505.7	32	4232.0	1			
		7620.7	100	4117.1	3⁻			
		7852.6	45	3885.0	1⁻			
		8083.6	27	3654.0	2⁺			
		8345.5	50	3392.01	2⁺			
		9899.8	9	1837.31	0⁺			
		10212.4	23	1524.71	2⁺			
		11736.6	23	0.0	0⁺			
11743.4	(1⁻,2⁺)	7510.7	35	4232.0	1			
		7625.7	29	4117.1	3⁻			
		8350.5	79	3392.01	2⁺			

$^{42}_{20}Ca_{22}$-28

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
11743.4	(1⁻,2⁺)	9904.8	26	1837.31	0⁺
		10217.4	100	1524.71	2⁺
		11741.6	24	0.0	0⁺
11775.0	(1⁻,2⁺)	7207.3	33	4566.9	(1,2⁺)
		7542.3	29	4232.0	1
		7657.3	19	4117.1	3⁻
		7774.6	76	3999.66	4⁺
		7889.2	29	3885.0	1⁻
		8327.2	100	3446.94	3⁻
		8382.1	62	3392.01	2⁺
		9349.7	76	2424.15	2⁺
		10249.0	24	1524.71	2⁺
		11773.2	29	0.0	0⁺
11795.2	(1⁻,2⁺)	7677.4	50	4117.1	3⁻
		8347.4	25	3446.94	3⁻
		8402.3	100	3392.01	2⁺
		9369.9	92	2424.15	2⁺
		9956.6	46	1837.31	0⁺
		10269.2	33	1524.71	2⁺
		11793.4	71	0.0	0⁺
11805.4	(1⁻,2⁺)	6211.9	86	5593.0	3⁻
		7355.9	38	4448.8	2⁺
		7386.7	52	4418.0	3⁻
		7462.4	100	4342.3	(0⁺ to 4⁺)
		7757.6	71	4047.0	3⁻
		8357.6	24	3446.94	3⁻
		8412.5	52	3392.01	2⁺
		9380.1	14	2424.15	2⁺
		10279.3	19	1524.71	2⁺
		11803.6	19	0.0	0⁺
11821.1		1652.3 *4*	83 *11*	10168.69	(10,12⁺)
		2034.6 *8*	100 *7*	9786.29	(9⁻,11)
11822.4	(1⁻)	7589.7	100	4232.0	1
		8167.5	56	3654.0	2⁺
		8429.5	52	3392.01	2⁺
		9397.1	48	2424.15	2⁺
		9983.8	36	1837.31	0⁺
		10296.3	92	1524.71	2⁺
		11820.6	16	0.0	0⁺
11843.3	(1⁻,2⁺)	6871.7	68	4971.0	3⁻
		6976.7	100	4866.0	2⁺
		8188.4	39	3654.0	2⁺
		8542.4	26	3300.0	0⁺
11843.3	(1⁻,2⁺)	9418.0	29	2424.15	2⁺
		10317.2	61	1524.71	2⁺
11868.0	(1⁻,2⁺)	6963.4	87	4904.0	3⁻
		7750.2	87	4117.1	3⁻
		7820.2	87	4047.0	3⁻
		8213.1	73	3654.0	2⁺
		8475.1	87	3392.01	2⁺
		9442.7	100	2424.15	2⁺
		10029.4	33	1837.31	0⁺
		10341.9	53	1524.71	2⁺
		11866.2	60	0.0	0⁺
11871.5	(1⁻,2⁺)	6133.0	59	5738.0	(2⁺)
		6513.0	59	5358.0	2⁺
		7753.7	82	4117.1	3⁻
		7823.7	47	4047.0	3⁻
		7985.7	71	3885.0	1⁻
		8478.6	29	3392.01	2⁺
		9446.2	100	2424.15	2⁺
		10032.9	29	1837.31	0⁺
		10345.4	47	1524.71	2⁺
		11869.7	55	0.0	0⁺
11873.7	(1⁻,2⁺)	7641.0	100	4232.0	1
		7755.9	28	4117.1	3⁻
		7825.9	28	4047.0	3⁻
		7987.9	34	3885.0	1⁻
		8480.8	19	3392.01	2⁺
		9448.4	25	2424.15	2⁺
		10035.1	16	1837.31	0⁺
		10347.6	56	1524.71	2⁺
		11871.9	6	0.0	0⁺
11925.6	(1⁻,2⁺)	8270.7	42	3654.0	2⁺
		8477.7	53	3446.94	3⁻
		9500.3	40	2424.15	2⁺
		10399.5	63	1524.71	2⁺
		11923.8	100	0.0	0⁺
11959.2	(1⁻)	8511.3	25	3446.94	3⁻
		9533.9		2424.15	2⁺
		10433.1	50	1524.71	2⁺
		11957.4	100	0.0	0⁺
11980.3	1⁻	7530.8	23	4448.8	2⁺
		8325.4	18	3654.0	2⁺
		8532.4	5	3446.94	3⁻
		8587.4	8	3392.01	2⁺

$^{42}_{20}Ca_{22}$-29

Adopted Levels, Gammas (continued)

γ(^{42}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	E_i(level)	J_i^π	E_γ †	E_f	J_f^π
11980.3	1^-	8679.3	21	3300.0	0^+	12198.1		3350.0	8847.97	(10^+)
		9555.0	21	2424.15	2^+	12701.4		880.3 *2*	11821.1	
		10454.2	100	1524.71	2^+			2533 *1*	10168.69	$(10,12^+)$
		11978.5	62	0.0	0^+	12814.7		2646.0	10168.69	$(10,12^+)$
12172.0	$(1,2^+)$	8779.0	72	3392.01	2^+			4517.0	8297.46	11^-
		9746.6	83	2424.15	2^+	13712.8		5415.0	8297.46	11^-
		10645.8	60	1524.71	2^+	13762.8		2037.0	11725.7	$(8^-$ to 11)
		12170.1	100	0.0	0^+	15251.7		2436.9	12814.7	

† Primarily from (α,pγ), (p,γ), (p,p′γ) and (^{18}O,α2nγ). Weighted averages are taken of all available values with uncertainties. Values of γ-energies without uncertainties are deduced from level-energy difference.

‡ From $\gamma(\theta$,pol) in (α,pγ), (p,p′γ) and (^{19}F,$\alpha\gamma$). If $T_{1/2}$ is unknown and parity is determined not by polarization measurements, evaluators use D and Q, instead of M1 and E2, or, E1 and M2.

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

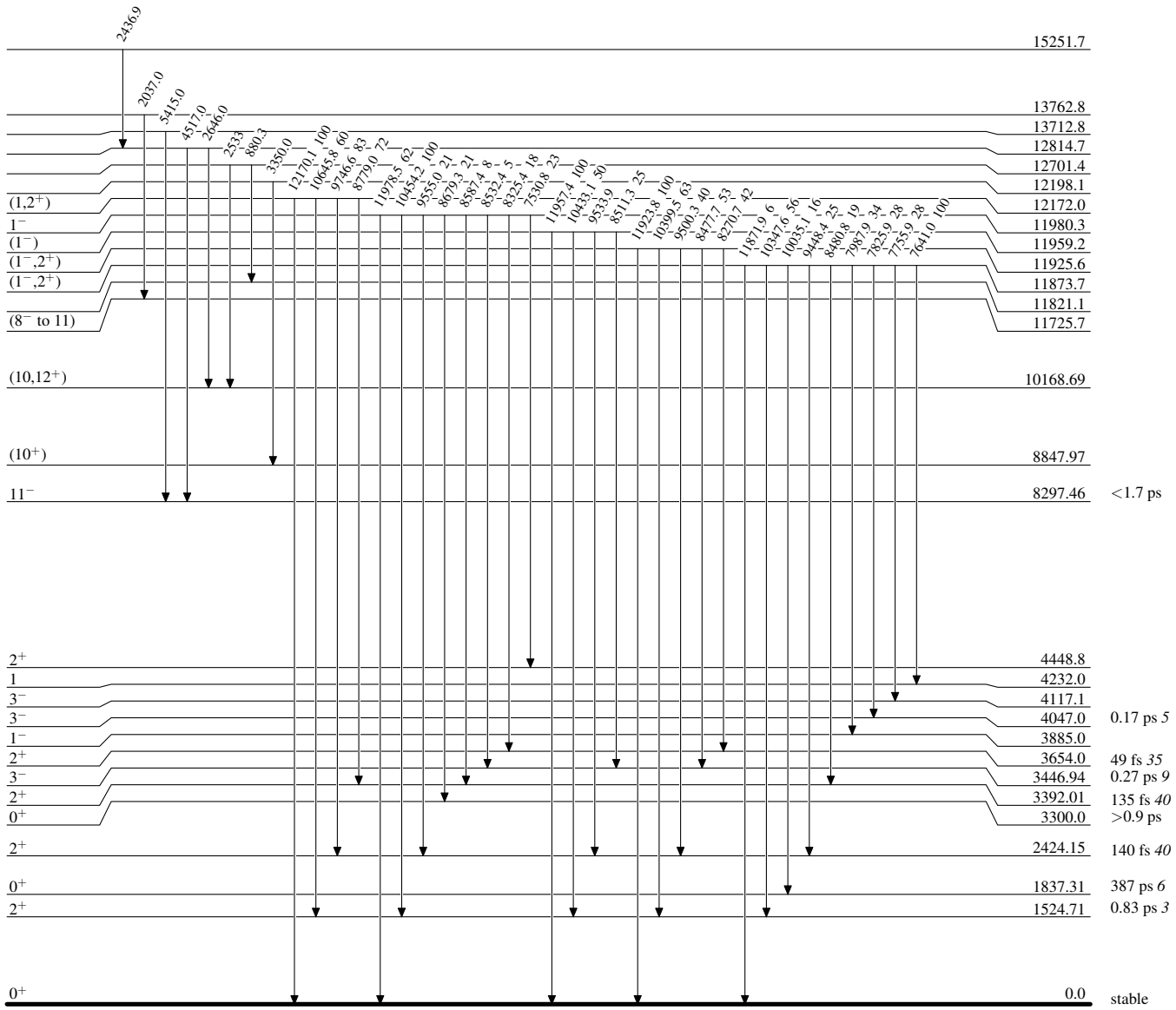
@ Placement of transition in the level scheme is uncertain.

$^{42}_{20}Ca_{22}$-30

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

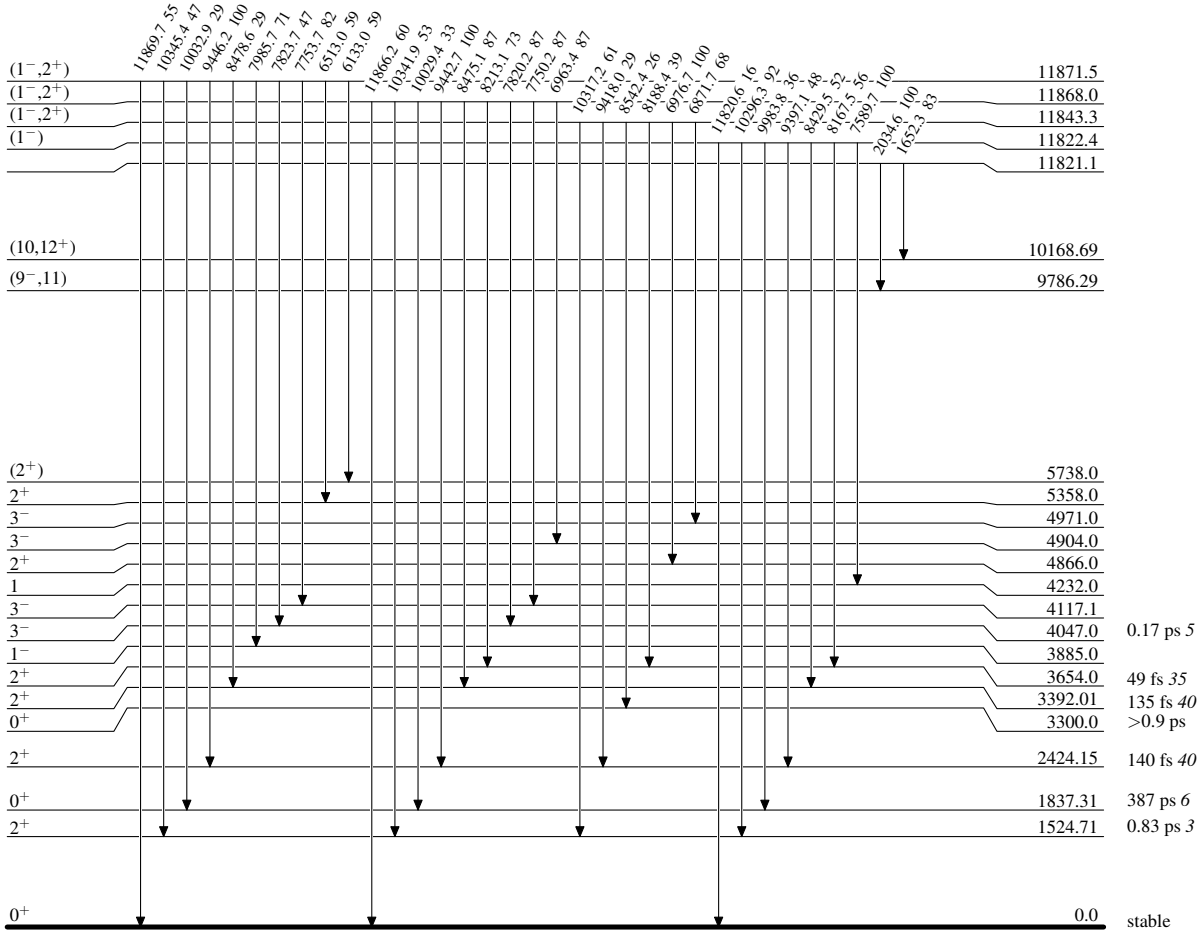


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

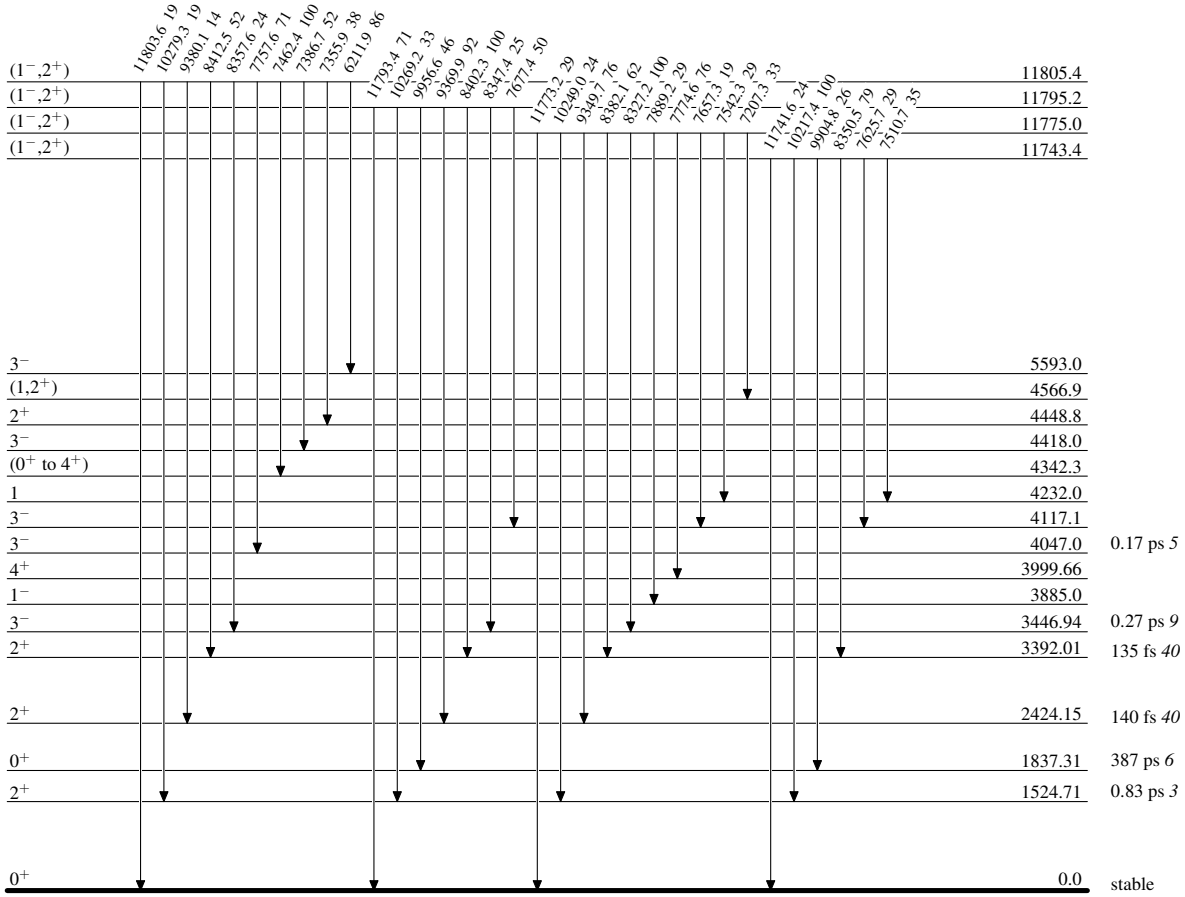


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

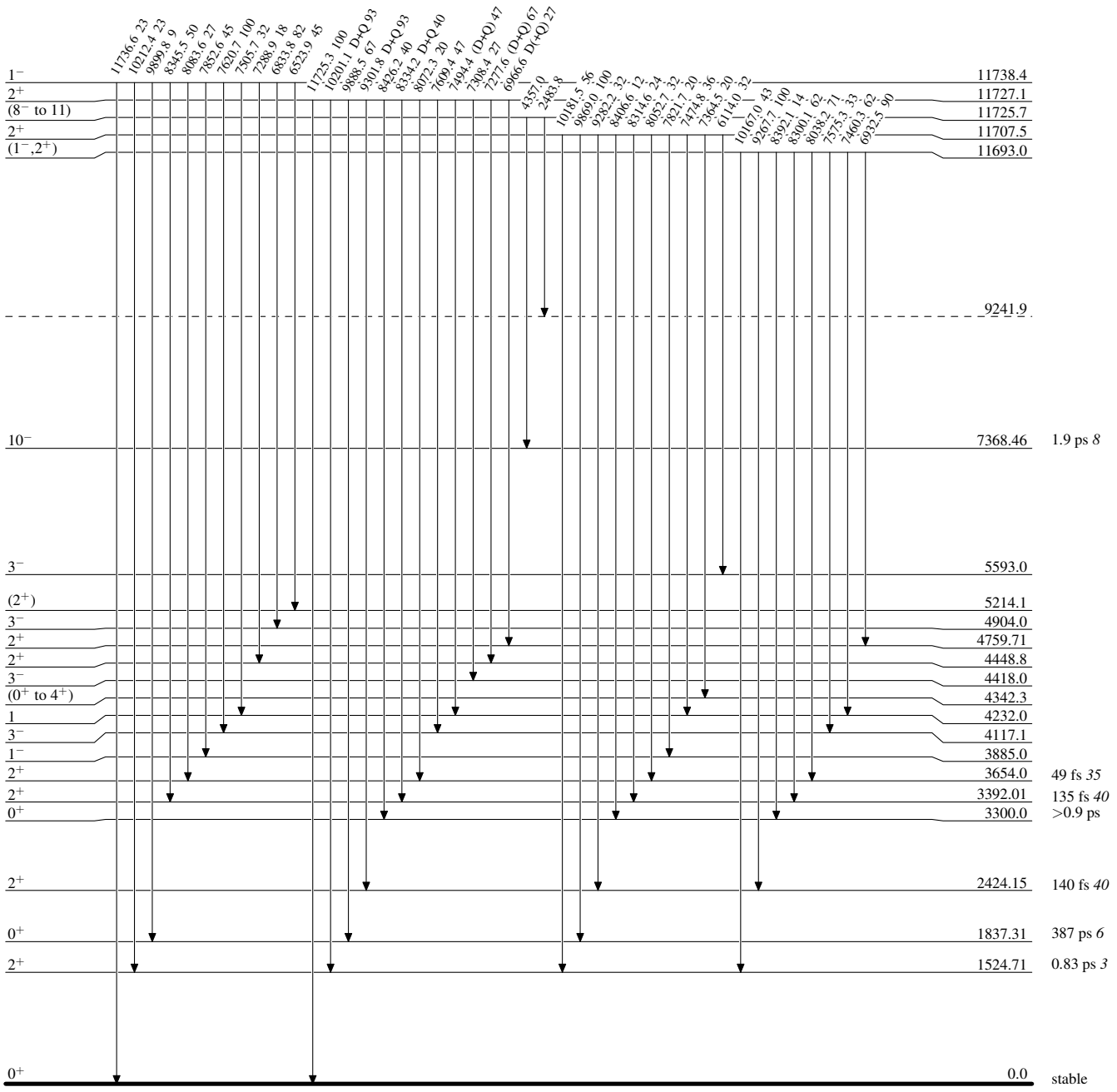


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

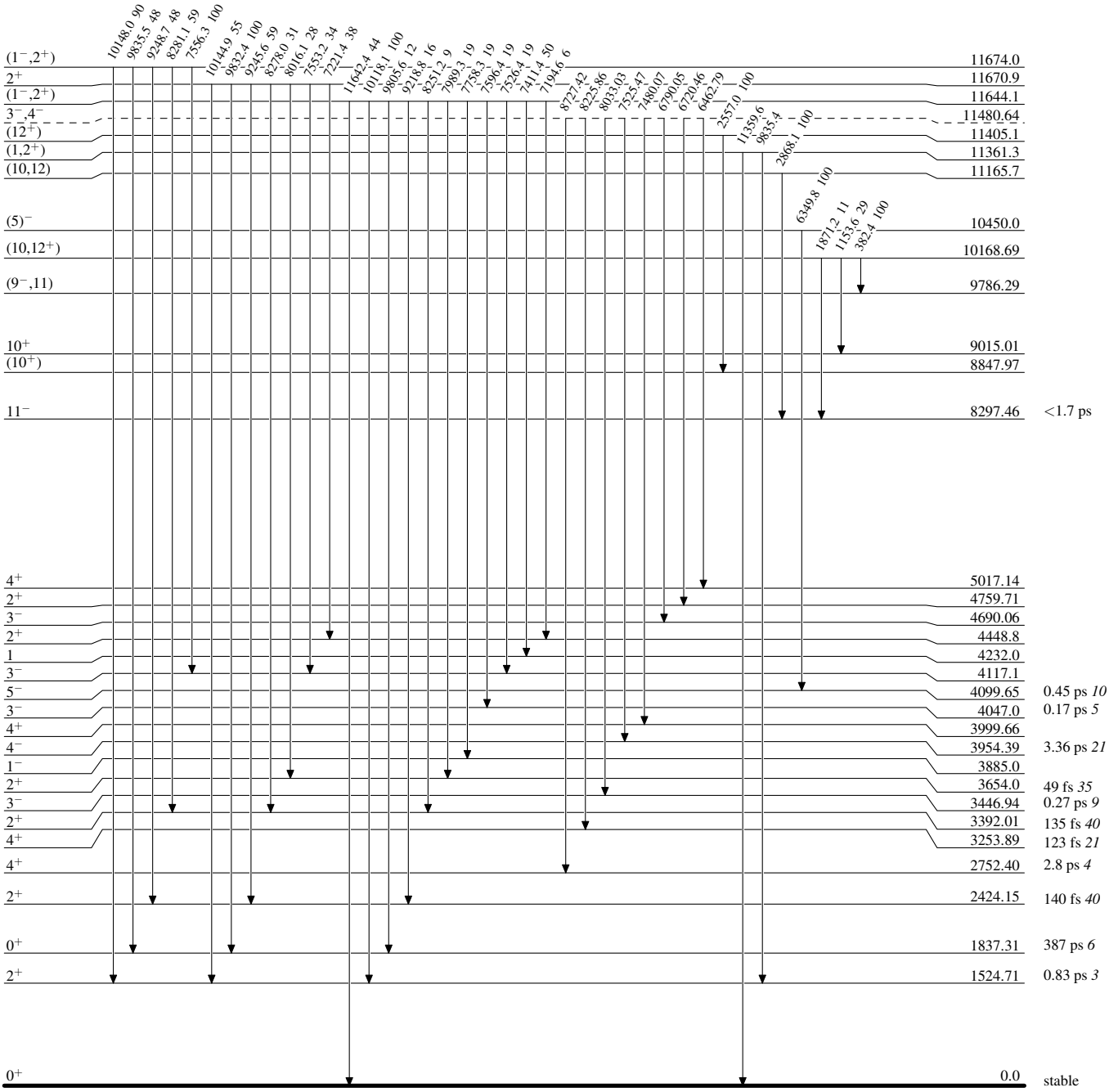


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

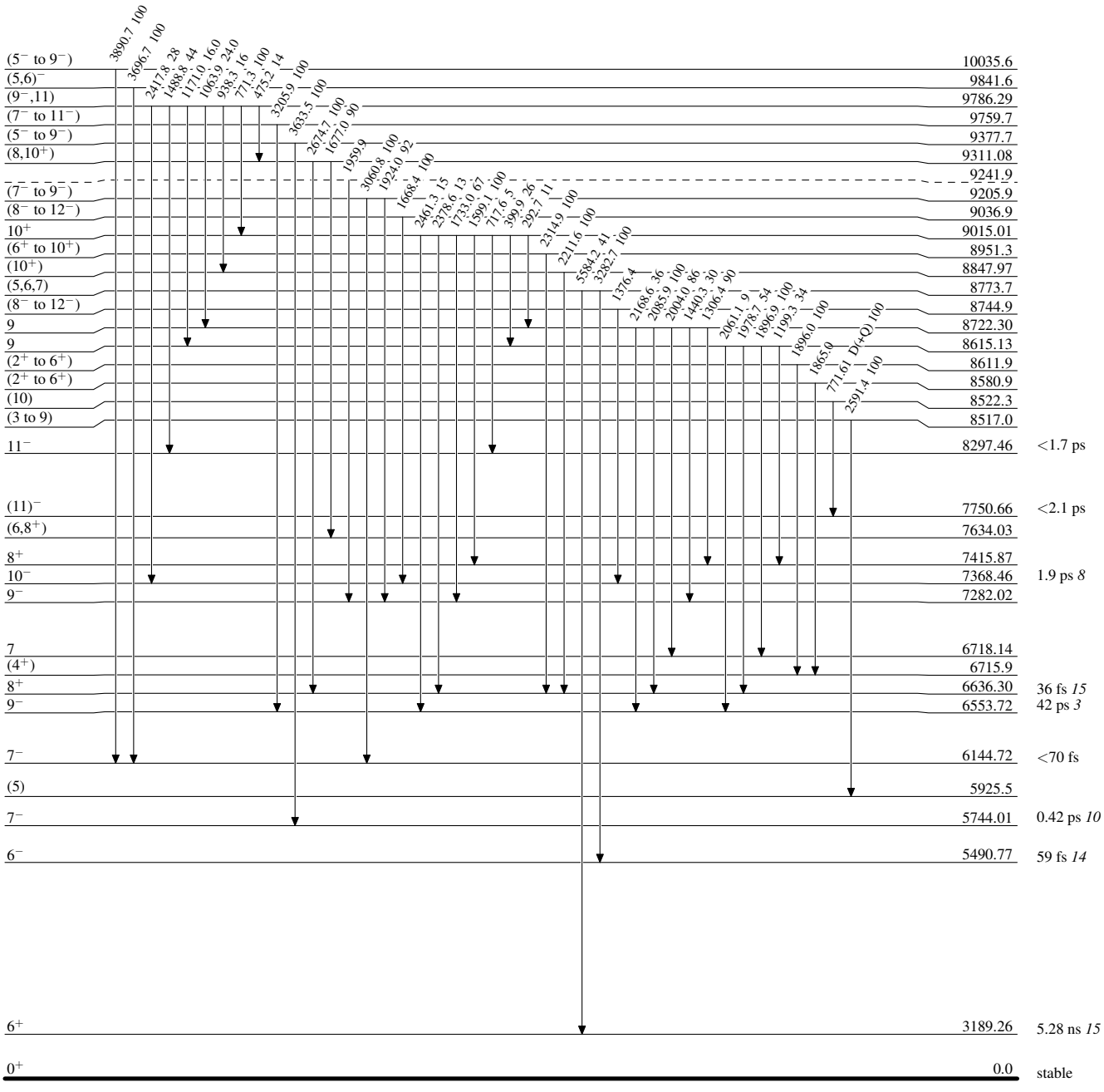


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

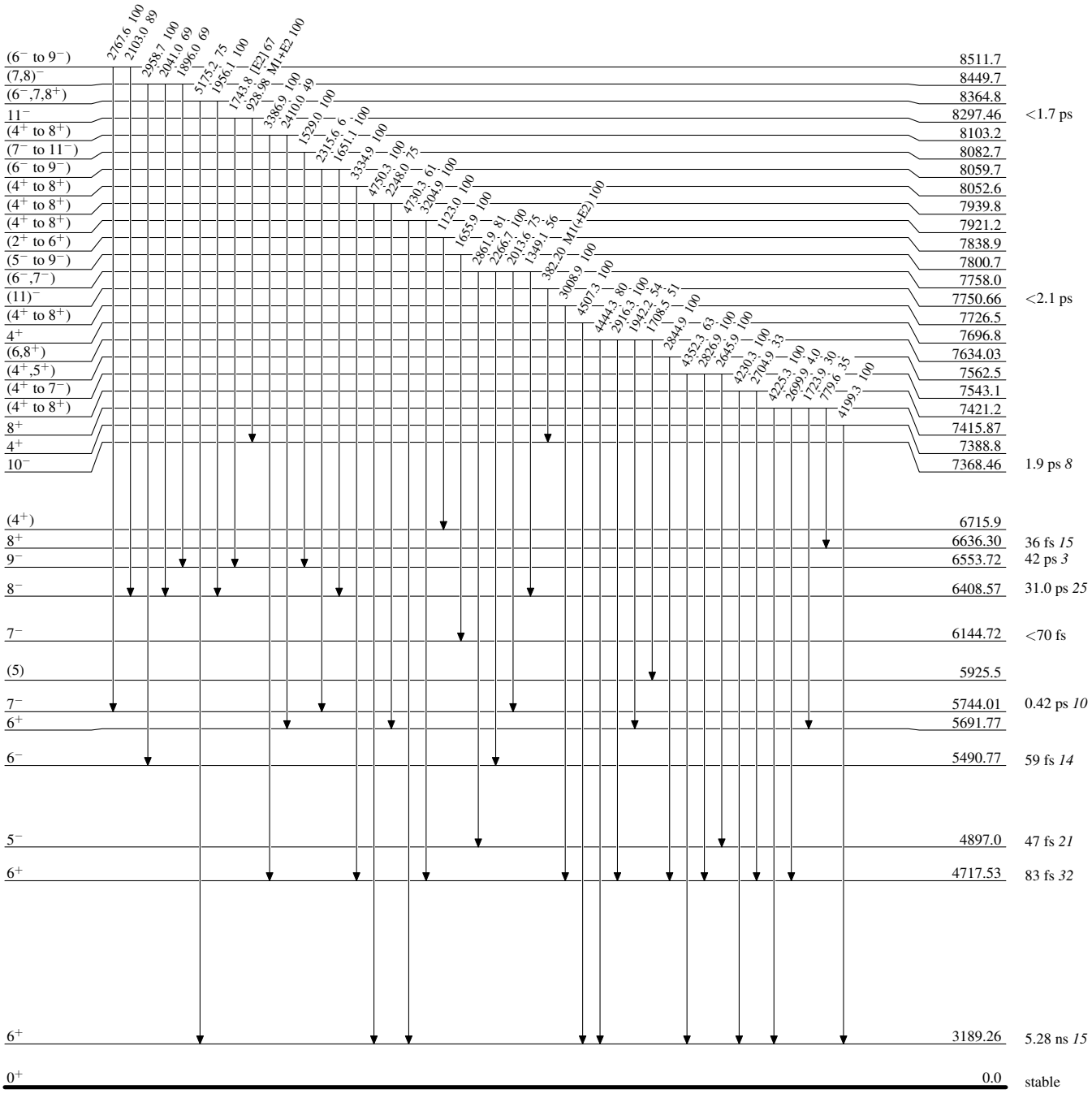


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

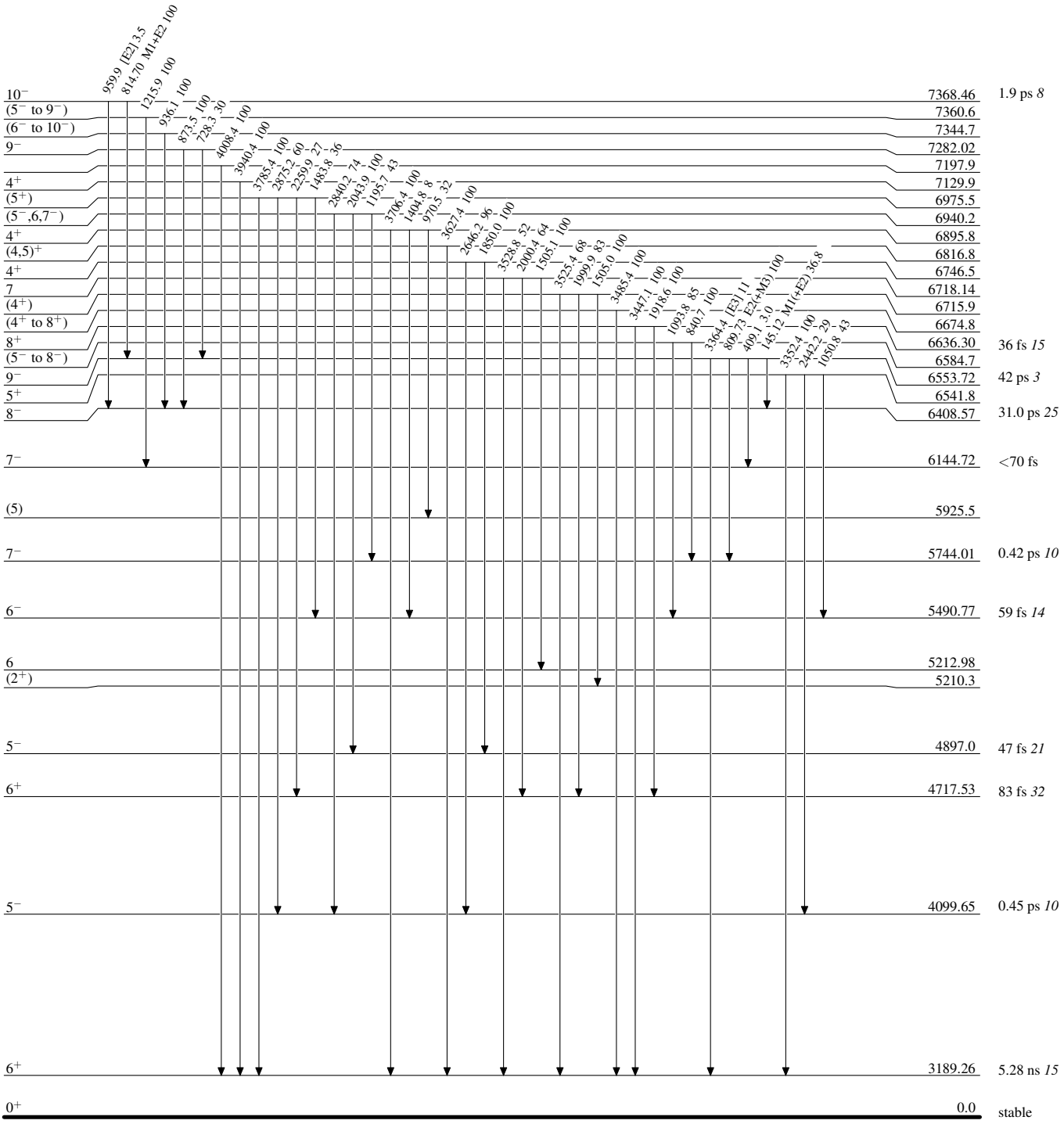
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{42}_{20}Ca_{22}$

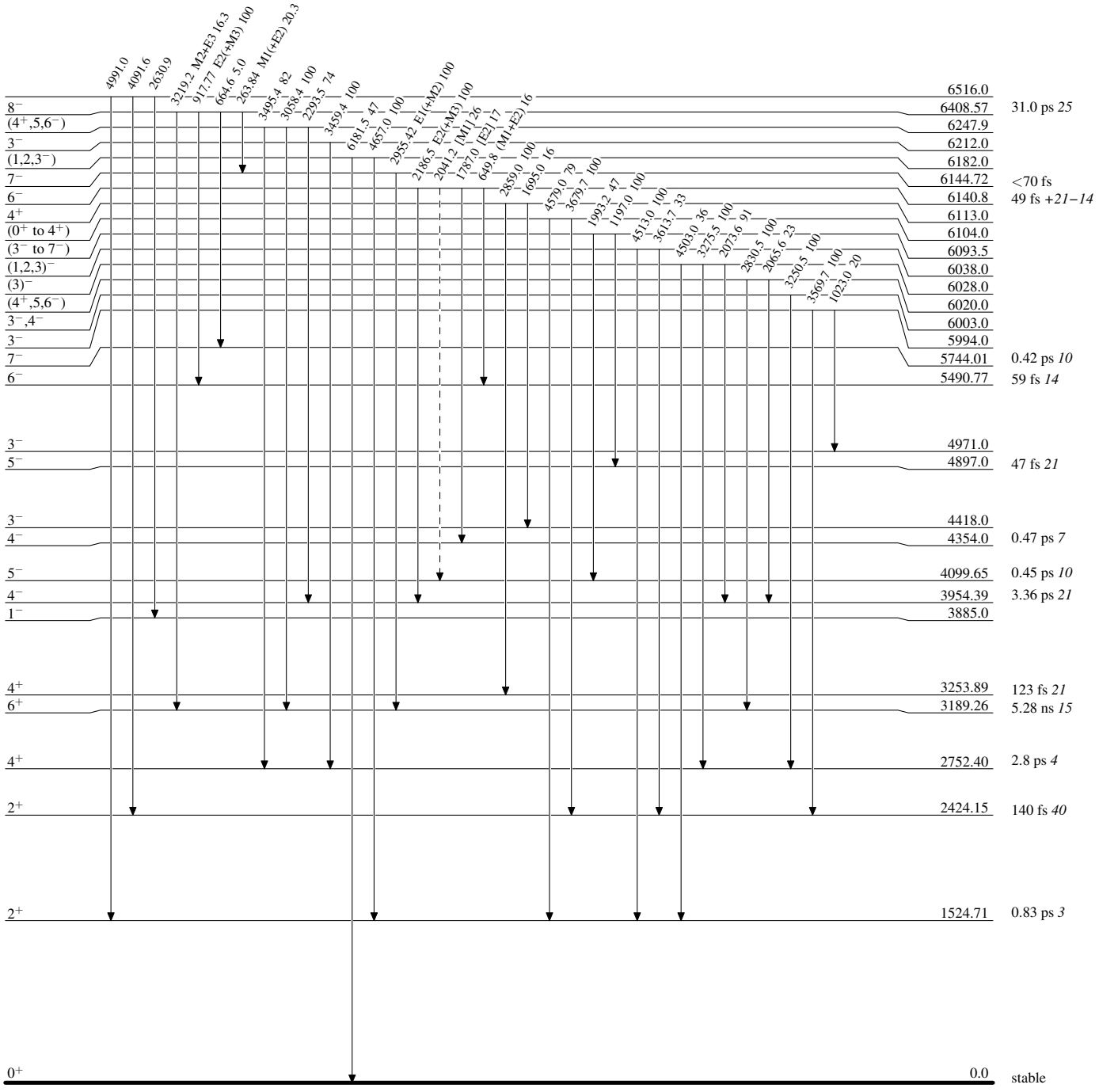
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

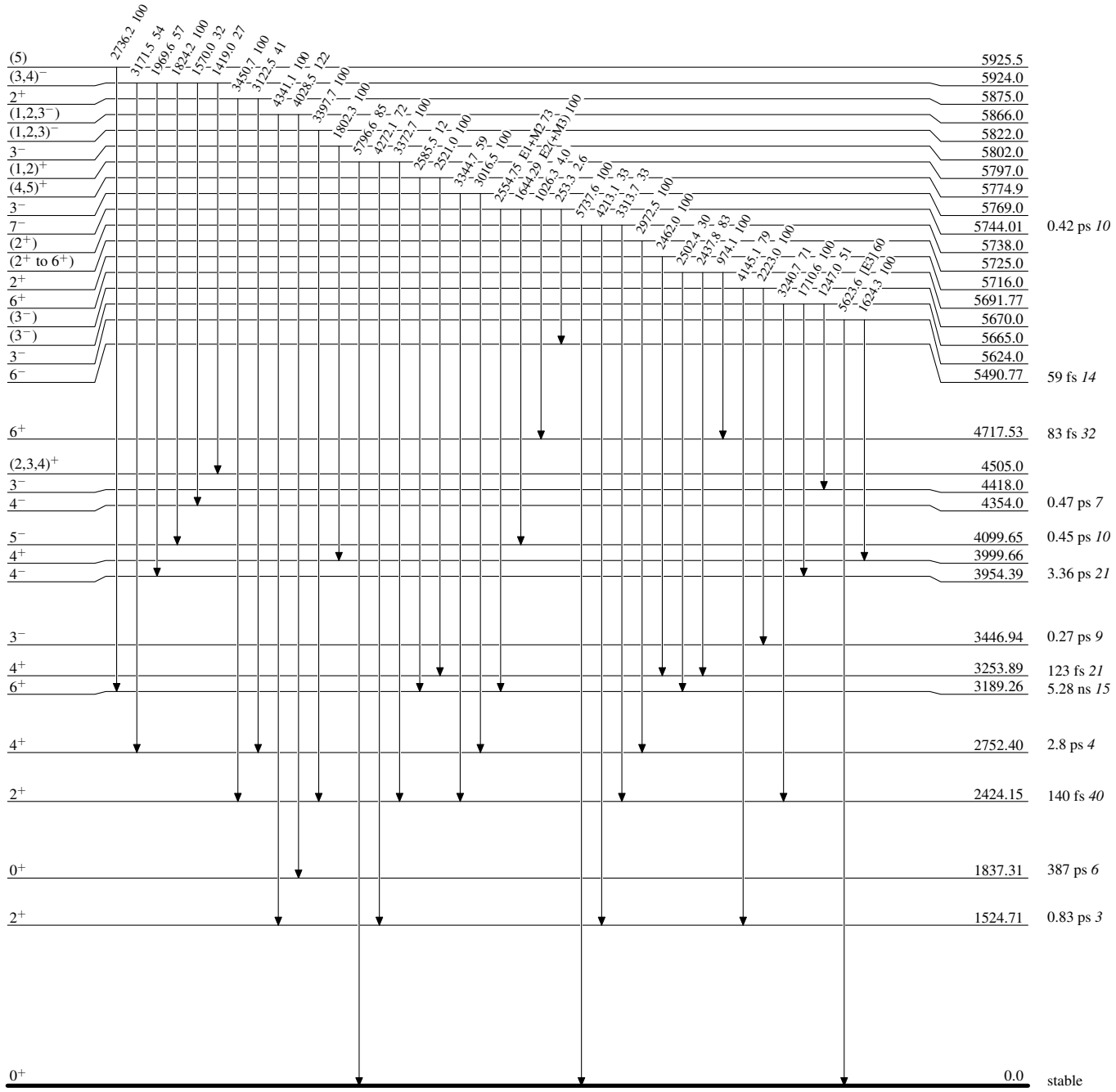


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{42}_{20}Ca_{22}$

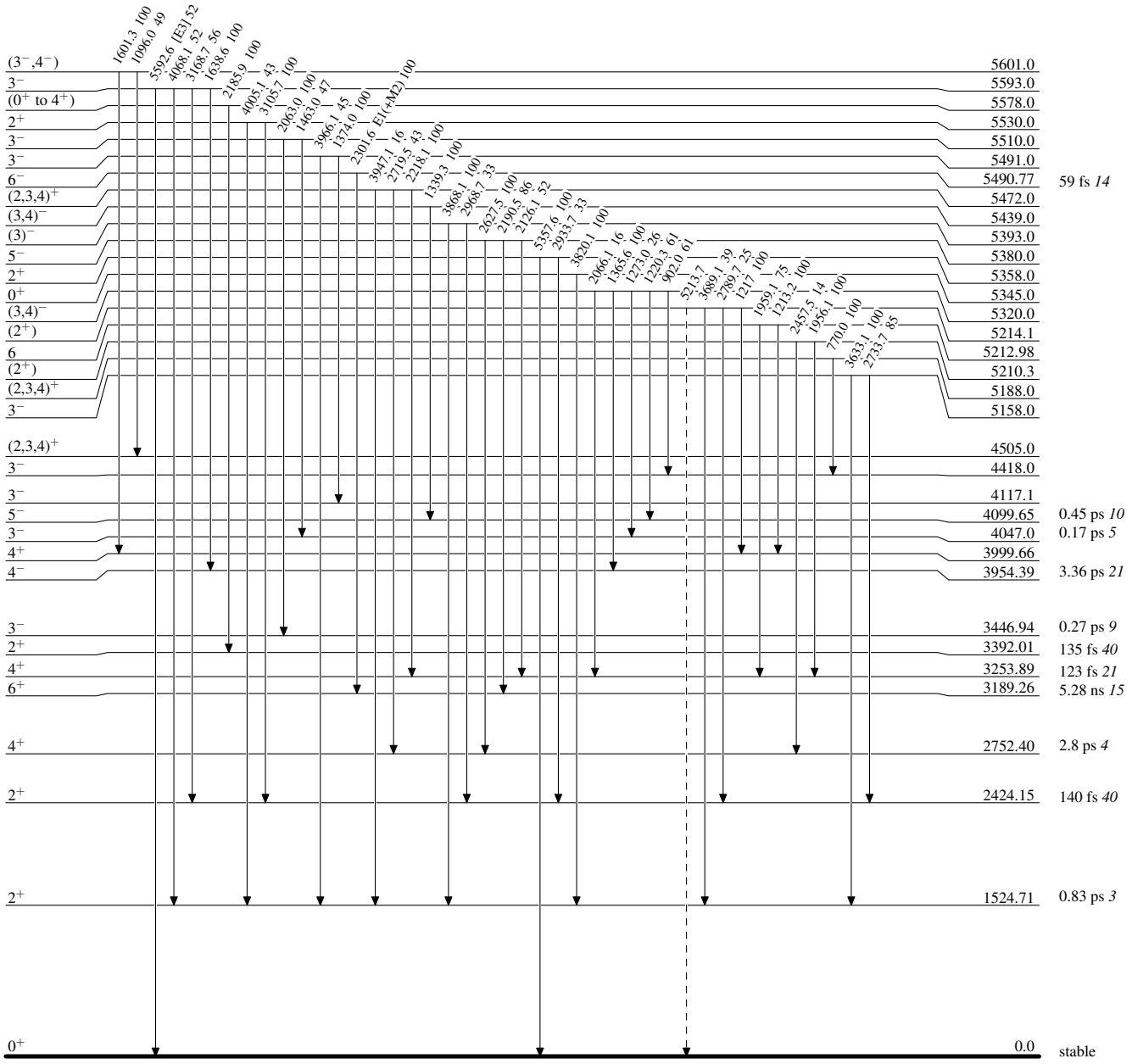
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

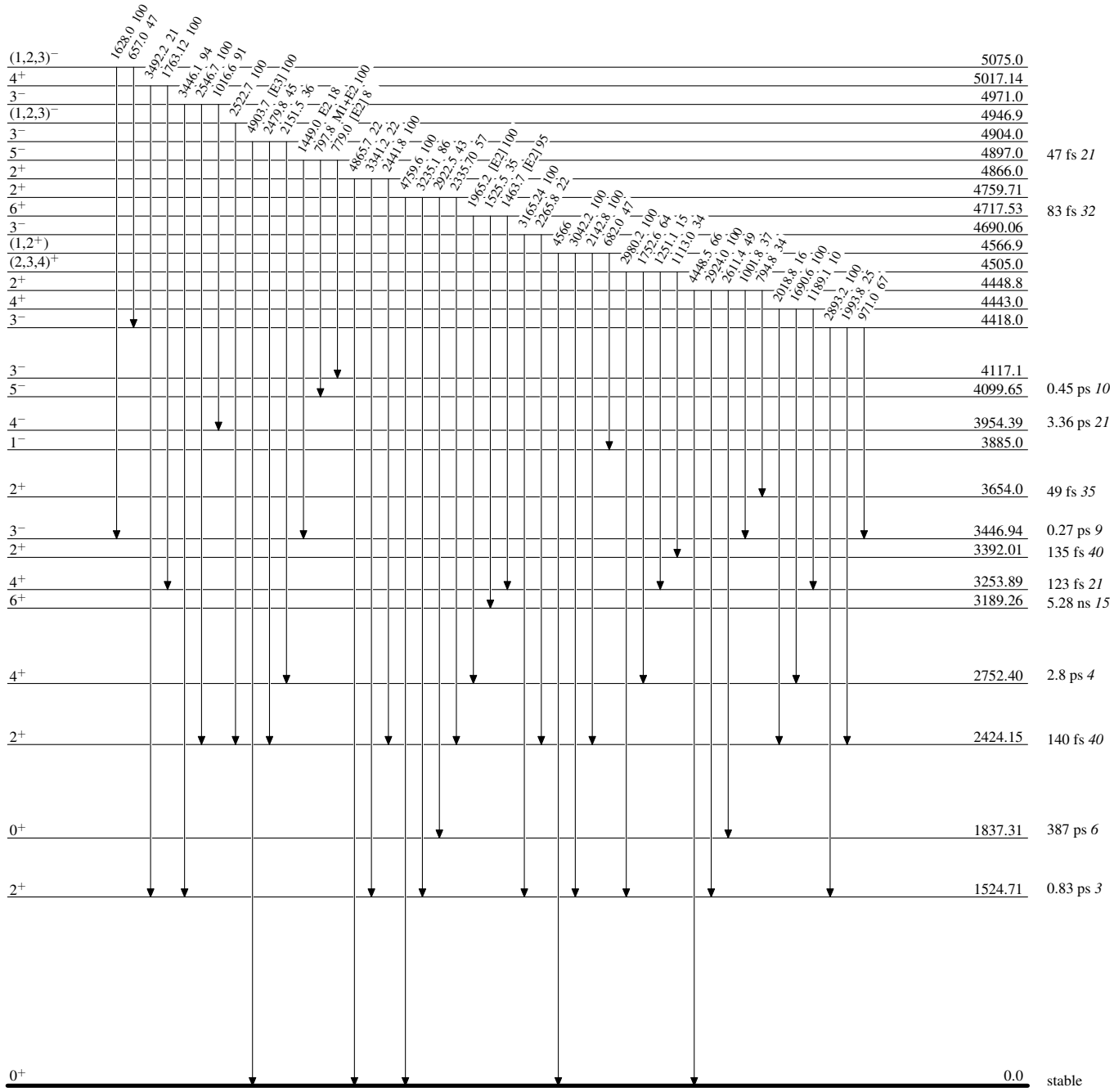


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

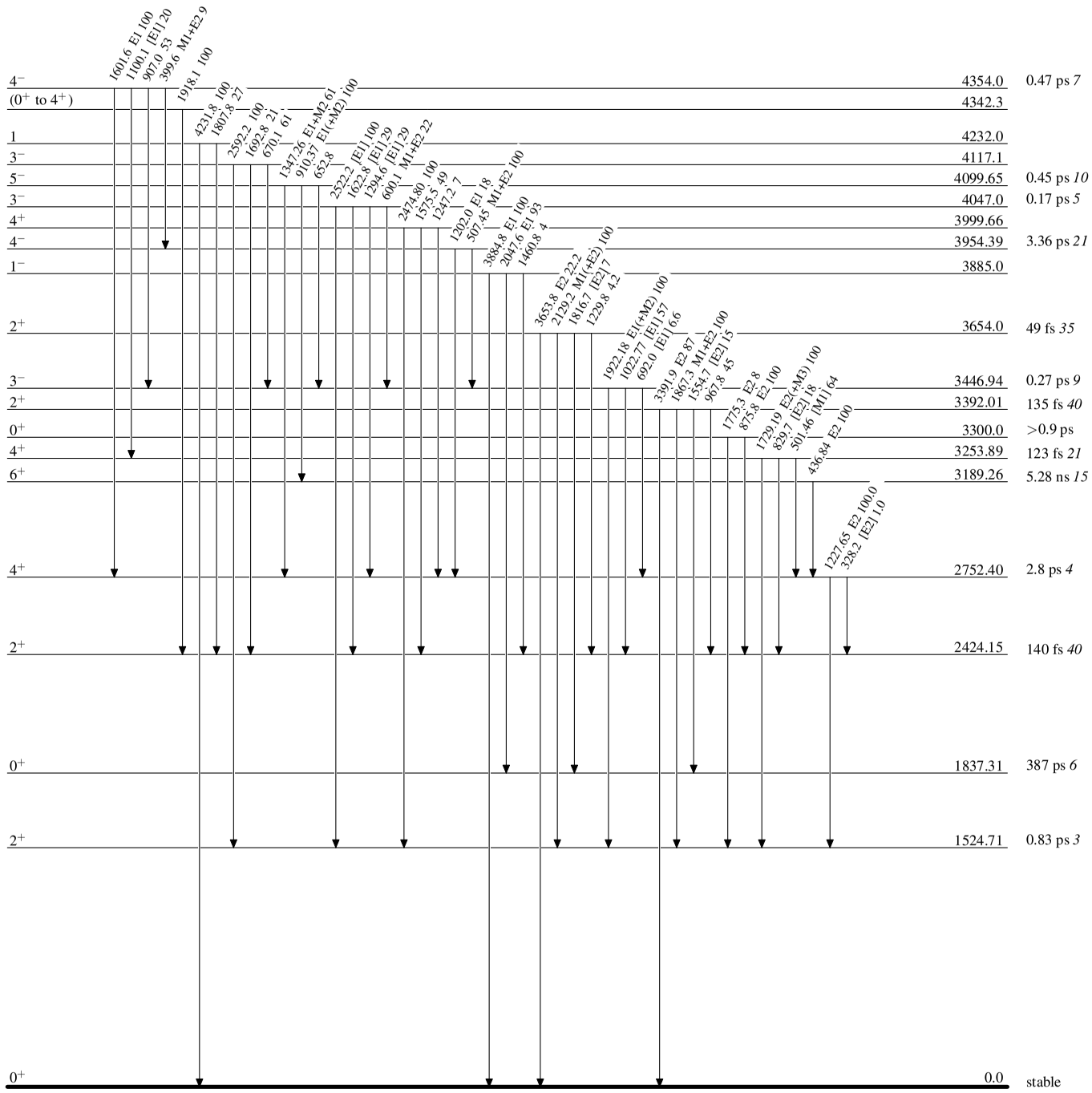


$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{42}_{20}Ca_{22}$

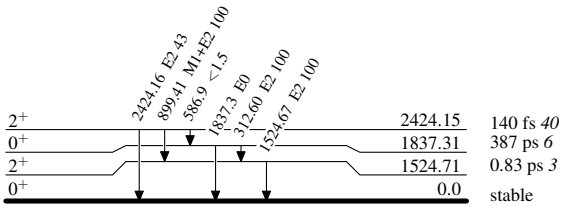
Adopted Levels, Gammas

Legend

Level Scheme (continued)

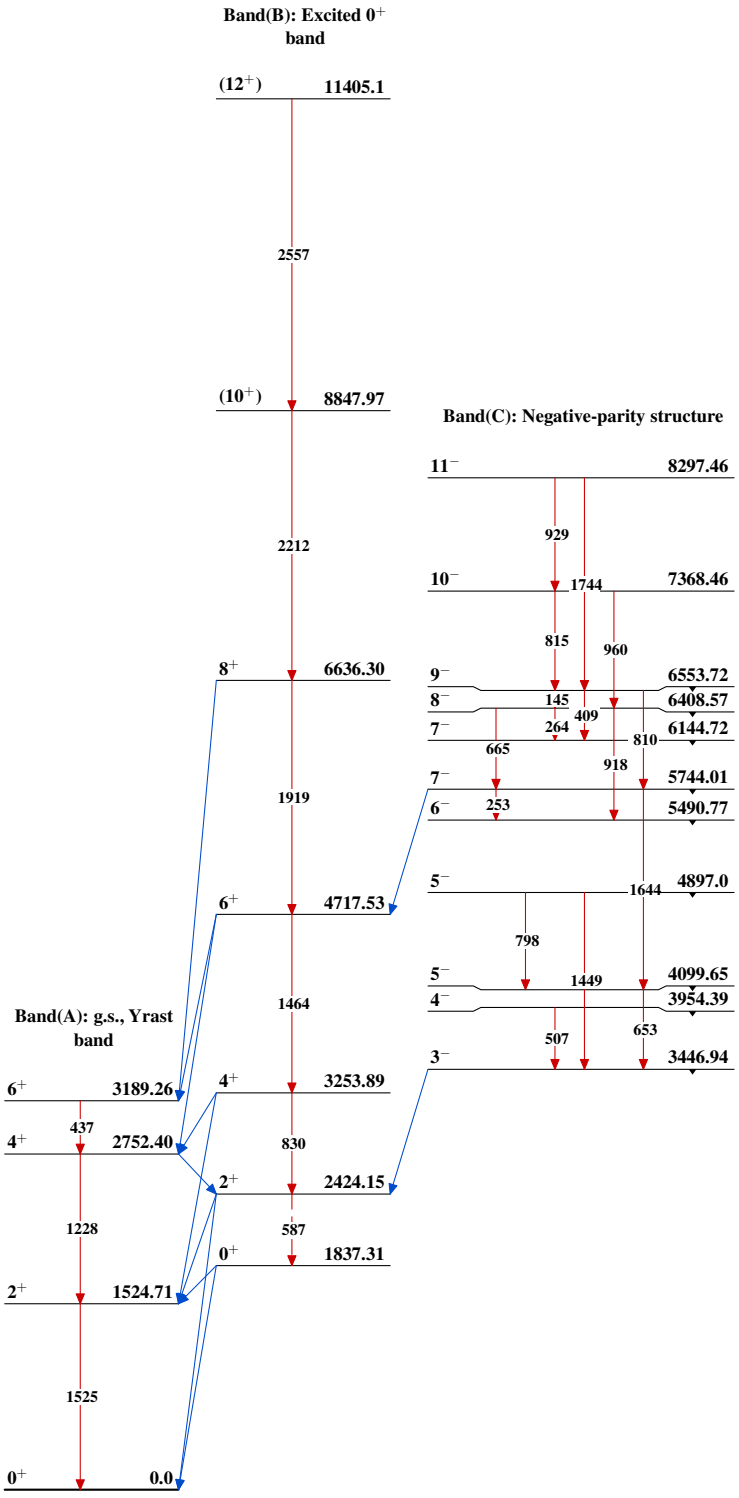
Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



$^{42}_{20}Ca_{22}$

Adopted Levels, Gammas



$^{42}_{20}Ca_{22}$