

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 190,1 (2023)	20-Jun-2023

$Q(\beta^-) = -3652.7$ 18; $S(n) = 11131.18$ 23; $S(p) = 12182.3$ 5; $Q(\alpha) = -8853.7$ 3 [2021Wa16](#)

$S(2n) = 19064.07$ 29, $S(2p) = 21624$ 6 ([2021Wa16](#)).

^{44}Ca identification: [1923As04](#), [1925As02](#), [1935As01](#), [1938Ni04](#) using mass-spectrographic technique.

Other measurements and reactions:

Mesic atoms (pionic x rays): [1970Ku03](#), [1970Ma26](#), [1979Ba07](#), [1980Po01](#), [1983Ku10](#).

Mesic atoms (muonic x rays): [1966Co02](#), [1981Wo02](#).

Mesic atoms (kaonic x rays): [1971Ku08](#).

Isotope shifts: [2015Go24](#), [1976Ne08](#), [1978Br31](#), [1978Wo03](#), [1980Be13](#), [1982An15](#), [1982Ay02](#), [1983Lo13](#), [1984Pa12](#), [1986We08](#), [1991As06](#), [1992Ma20](#), [1998No10](#).

$^{26}\text{Mg}(^{18}\text{O}, X)$ $E = 130$ MeV: [1995Co22](#).

$^{40}\text{Ar}(\alpha, n)$: [1938Fu01](#): resonances.

Additional information 1.

$^{26}\text{Mg}(^{18}\text{O}, xn)$: [1995Co22](#).

$^{40}\text{Ar}(\alpha, \gamma)$: [1976Fo04](#), [1974Fo04](#).

$^{42}\text{Ca}(^{48}\text{Ti}, ^{46}\text{Ti})$: [1986Br06](#), [1988Br02](#); measured $\sigma(E, \theta)$.

[1977Mu02](#), [1993Mo10](#), [1966Go38](#), [1964Go13](#): $^{43}\text{Ca}(n, \gamma), (n, X)$ resonance. ≈ 50 $^{43}\text{Ca} + n$ resonances between 11133 and 11172 keV.

$^{45}\text{Sc}(\gamma, p)$: [1995Is07](#), [1993Is07](#), [1982Ry01](#), [1977Oi01](#), [1975We11](#).

$^{48}\text{Ti}(p, p\alpha)$: [1981Ca02](#), [1984Ca09](#).

$^{42}\text{Ca}(^{48}\text{Ti}, ^{46}\text{Ti})$ $E = 385$ MeV: [1986Br06](#).

$^{45}\text{Sc}(p, 2p)$: [1967Ru03 \(\$E = 156\$ MeV\); \[1969Ja12\]\(#\) \(\$E = 385\$ MeV\).](#)

Theoretical structure calculations:

[2023Ha06](#): calculated levels, J^π using shell model with OXBASH code.

[2022Wa13](#): calculated levels, J^π of the low-lying spectra in Bayesian neural network (BNN) approach.

[2021Fu11](#): calculated energy levels, J^π , $S(2n)$ using realistic shell model.

[2019Wa31](#), [2015Wa37](#): calculated binding energy, $S(2n)$, levels, J^π , yrast states, spectroscopic factors using shell model with CD-Bonn and Kuo-Brown (KB) interactions.

[2017Va30](#): calculated levels, J^π using IBM, p-IBM and shell-model with KB3G interaction.

[2016Im01](#): calculated low-lying levels, J^π using g.s. multiplets with seniority 2, 3 and 4 for pairing of nucleons in $1f_{7/2}$ shell.

[2014Ho12](#): calculated ground-state energy in pf and $pf_{9/2}$ shells, levels, J^π , $B(E2)$, $B(M1)$ using Chiral two- and three-nucleon interactions, and many-body perturbation theory (MBPT).

[2012Ca13](#): calculated levels, J^π , orbital occupations, quadrupole moments, $B(E2)$, magnetic moment using shell model with realistic interactions.

[2012Ca27](#): calculated levels, J^π , $B(E2)$, $B(E3)$, two-quasi particle components for the first 2^+ and 3^- states using QRPA with iterative non-Hermitian Arnoldi diagonalization procedures.

[2012Ut01](#): calculated energy levels, J^π , spectroscopic factors using large-scale shell-Model.

[2010Le16](#): calculated levels, J^π , $B(E2)$, wave function overlaps using shell Model with GXPF1A interaction.

[1981Co09](#): calculated levels, J^π , spectroscopic factors using shell model with modified Kuo-Brown interaction.

[1974Sk03](#): calculated levels, J^π , $B(E2)$, spectroscopic factors, γ -branching ratios using an extended model for the mixing between 4p spherical and 6p-2h deformed configurations.

[1973Ba23](#): calculated binding energy, levels, J^π , spectroscopic factors using shell model with a pairing-plus-surface-tensor interaction.

[1973Mc10](#): calculated levels, J^π , spectroscopic factors, $B(E2)$, $B(M1)$ using shell model.

[1972Fu02](#): calculated levels, J^π , $B(E2)$, spectroscopic factors using shell model with Hamada-Johnston, and Tabakin interactions.

[1970Fe06](#): calculated levels, J^π , binding energy, spectroscopic factors using shell model with effective interactions.

Theoretical calculations: about 343 primary references for structure calculations from 1970 to 2023, and six references for double- β decay can be retrieved from the NSR database at www.nndc.bnl.gov/nsr/.

Adopted Levels, Gammas (continued)

^{44}Ca Levels

Cross Reference (XREF) Flags

A	$^{44}\text{K} \beta^-$ decay (22.13 min)	M	$^{43}\text{Ca}(\text{n},\gamma)$ E=thermal	Y	$^{44}\text{Ca}(^6\text{Li}, ^6\text{Li}')$
B	$^{44}\text{Sc} \varepsilon$ decay (4.0420 h)	N	$^{43}\text{Ca}(\text{n},\gamma), (\text{n}, \text{n}): \text{resonances}$	Z	$^{44}\text{Ca}(^7\text{Li}, ^7\text{Li})$
C	$^{44}\text{Sc} \varepsilon$ decay (58.61 h)	O	$^{43}\text{Ca}(\text{d}, \text{p})$	Others:	
D	$^{27}\text{Al}(^{19}\text{F}, 2\text{p}\gamma)$	P	$^{44}\text{Ca}(\gamma, \gamma'), (\text{pol } \gamma, \gamma')$	AA	$^{44}\text{Ca}(^9\text{Be}, ^9\text{Be}')$
E	$^{30}\text{Si}(^{16}\text{O}, 2\text{p}\gamma)$	Q	$^{44}\text{Ca}(\text{e}, \text{e}')$	AB	$^{44}\text{Ca}(^{16}\text{O}, ^{16}\text{O}')$
F	$^{30}\text{Si}(^{18}\text{O}, 2\text{p}2\text{n}\gamma)$	R	$^{44}\text{Ca}(\pi^+, \pi^+'), (\pi^-, \pi^-')$	AC	$^{44}\text{Ca}(^{18}\text{O}, ^{18}\text{O}')$
G	$^{36}\text{S}(^{14}\text{C}, \alpha 2\text{n}\gamma)$	S	$^{44}\text{Ca}(\text{n}, \text{n}'\gamma)$	AD	$^{45}\text{Sc}(\mu^-, \text{n}\gamma)$
H	$^{40}\text{Ar}(^6\text{Li}, \text{d})$	T	$^{44}\text{Ca}(\text{p}, \text{p}'), (\text{pol } \text{p}, \text{p}')$	AE	$^{45}\text{Sc}(\text{d}, ^3\text{He}), (\text{pol } \text{d}, ^3\text{He})$
I	$^{41}\text{K}(\alpha, \text{p}\gamma), (\alpha, \text{p})$	U	$^{44}\text{Ca}(\text{p}, \text{p}'\gamma)$	AF	$^{45}\text{Sc}(\text{t}, \alpha)$
J	$^{42}\text{Ca}(\text{t}, \text{p})$	V	$^{44}\text{Ca}(\text{d}, \text{d}')$	AG	$^{46}\text{Ti}(^{14}\text{C}, ^{16}\text{O})$
K	$^{42}\text{Ca}(\alpha, ^2\text{He})$	W	$^{44}\text{Ca}(^3\text{He}, ^3\text{He}'), (\text{pol } ^3\text{He}, ^3\text{He}')$	AH	$^{48}\text{Ti}(\text{d}, ^6\text{Li})$
L	$^{42}\text{Ca}(^{48}\text{Ti}, ^{46}\text{Ti})$	X	$^{44}\text{Ca}(\alpha, \alpha')$	AI	Coulomb excitation

E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments
0.0 ^c	0 ⁺	stable	ABCDEFGHIJK M OPQRSTUVWXYZ	<p>XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI</p> <p>The rms charge radius $\langle r^2 \rangle^{1/2} = 3.5179$ fm 21 (2013An02 evaluation).</p> <p>Evaluated change in charge radius $\delta \langle r^2 \rangle (^{44}\text{Ca} - ^{40}\text{Ca}) = +0.283$ fm² 6 (2013An02).</p> <p>$\delta \langle r^2 \rangle (^{40}\text{Ca} - ^{44}\text{Ca}) = 0.288$ fm² 2 (stat) 6 (syst) (2016Ga34), 0.2904 fm² 10 (1998No10).</p> <p>$\delta \nu (^{40}\text{Ca} - ^{44}\text{Ca}) = 851.1$ MHz 6 (stat) 21 (syst) (2016Ga34).</p> <p>J^π: L(t,p)=L(α,²He)=L(⁶Li,d)=L(d,⁶Li)=0 from 0⁺.</p> <p>Adopted (1977En02) spectroscopic factors S: 3.1 3 (L=3) (neutron stripping); 0.50 13 (L=3) (proton pickup).</p>
1157.0208 ^c 30	2 ⁺	2.94 ps 12	ABCDEFGHIJ M OPQRSTUVWXYZ	<p>XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI</p> <p>μ=+0.34 6 (2003Sc21, 2020StZV)</p> <p>Q=-0.14 7 (1973To07, 2021StZZ)</p> <p>B(E2)↑=0.0475 20</p> <p>J^π: L(t,p)=L(⁶Li,d)=L(α,α')=L(d,d')=L(p,p')=L(e,e')=2 from 0⁺.</p> <p>T_{1/2}: weighted average of 3.5 ps 7 from DSAM in (α,py); 2.0 ps +8-5 from DSAM in (p,p'γ); 3.05 ps 28 from DSAM in Coul. ex. (2003Sc21); 3.19 ps 27 from DSAM in Coul. ex. (1973Fi15); and 2.88 ps 12 from adopted B(E2)↑=0.0475 20 in Coulomb excitation.</p> <p>μ: from transient field method in 2003Sc21.</p> <p>Q: from Coulomb excitation in 1973To07.</p> <p>B(E2)↑: weighted average of 0.0550 20 (1989It02) and 0.048 3 (1971He08) in (e,e'), 0.0475 36 (2016Ca17), 0.0473 20 (1973To07) and 0.049 5 (1972Bi17) in Coulomb excitation.</p> <p>Adopted (1977En02) spectroscopic factors S: 0.41 11 (L=3) and 0.08 2 (L=1) (neutron stripping); 0.18 3 (L=3) (proton pickup).</p>
1570?	2 ⁺		W	<p>E(level): from (pol ³He, ³He') only; this level is not seen in other studies.</p>

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Adopted Levels, Gammas (continued) ^{44}Ca Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF		Comments
1883.516 <i>13</i>	0 ⁺	13.9 ps <i>42</i>	A	HIJ M OPQR TUVWX	J ^π : from analyzing power in (pol $^3\text{He}, ^3\text{He}'$). XREF: Others: AB , AE , AF , AG , AH XREF: J(1903)X(1890?). J ^π : L($^6\text{Li}, d$)=L($d, ^6\text{Li}$)=0 from 0 ⁺ ; p-1883γ(θ) is isotropic in (p,p'γ). T _{1/2} : other: >1.4 ps from DSAM in (p,p'γ). Adopted (1977En02) spectroscopic factors S: 0.39 <i>10</i> (L=3) (neutron stripping); 0.12 <i>3</i> (L=3) (proton pickup).
2030?	2 ⁺			K	E(level): from ($\alpha, ^2\text{He}$) only; this level is not seen in other studies.
2283.119 ^C <i>10</i>	4 ⁺	1.9 ps <i>7</i>	A	CDEFGHIJ M O QR TUV X	J ^π : L($\alpha, ^2\text{He}$)=2 from 0 ⁺ . XREF: Others: AB , AD , AE , AF , AG , AH , AI J ^π : L($^6\text{Li}, d$)=L(e,e')=L(p,p')=L(α, α')=4 from 0 ⁺ . T _{1/2} : others: 2.6 ps from B(E2)↑(from 2 ⁺ , 1157)=0.021 in ($^{16}\text{O}, ^{16}\text{O}'$); 16 ps <i>5</i> from RDM in ($^{19}\text{F}, 2p\gamma$) is discrepant. Adopted (1977En02) spectroscopic factors S: 0.14 <i>4</i> (L=3) and 0.01 <i>1</i> (L=1) (neutron stripping); 0.09 <i>3</i> (L=3) (proton pickup). XREF: Others: AB , AD , AE , AF , AG , AH , AI B(E2)↑=0.0079 <i>7</i> (1989It02) XREF: AI(2657?). J ^π : L($^6\text{Li}, d$)=L(t,p)=L(p,p')=L(α, α')=2 from 0 ⁺ . T _{1/2} : from B(E2) in (e,e') in 1989It02 . B(E2)↑: from 1989It02 in (e,e'). Adopted (1977En02) spectroscopic factors S: 0.51 <i>13</i> (L=3) and <0.02 (L=1) (neutron stripping); 0.19 <i>3</i> (L=3) (proton pickup). XREF: Others: AB , AF , AG , AH J ^π : L(t,p)=L(α, α')=4 from 0 ⁺ . Adopted (1977En02) spectroscopic factors S: 0.91 <i>23</i> (L=3) (neutron stripping); <0.04 (L=3) (proton pickup).
2656.509 <i>11</i>	2 ⁺	30 fs <i>3</i>	AB	F HIJ M OPQR TUV X	XREF: Others: AB , AD , AE , AF , AG , AH , AI B(E2)↑=0.0079 <i>7</i> (1989It02) XREF: AI(2657?). J ^π : L($^6\text{Li}, d$)=L(t,p)=L(p,p')=L(α, α')=2 from 0 ⁺ . T _{1/2} : from B(E2) in (e,e') in 1989It02 . B(E2)↑: from 1989It02 in (e,e'). Adopted (1977En02) spectroscopic factors S: 0.51 <i>13</i> (L=3) and <0.02 (L=1) (neutron stripping); 0.19 <i>3</i> (L=3) (proton pickup). XREF: Others: AB , AF , AG , AH J ^π : L(t,p)=L(α, α')=4 from 0 ⁺ . Adopted (1977En02) spectroscopic factors S: 0.91 <i>23</i> (L=3) (neutron stripping); <0.04 (L=3) (proton pickup).
3044.292 <i>33</i>	4 ⁺	4.6 ps + <i>13-10</i>	A	FGHIJ M O TU X	XREF: Others: AB , AF , AG , AH J ^π : L(t,p)=L(α, α')=4 from 0 ⁺ . Adopted (1977En02) spectroscopic factors S: 0.91 <i>23</i> (L=3) (neutron stripping); <0.04 (L=3) (proton pickup).
3285.004 ^C <i>22</i>	6 ⁺	13.3 ps <i>12</i>		CDEFG IjK M T	XREF: Others: AH XREF: j(3298)K(3290)ah(3300). J ^π : L($\alpha, ^2\text{He}$)=6 from 0 ⁺ ; 1001.869γ, ΔJ=2 to 4 ⁺ . T _{1/2} : other: <17 ps from RDM in ($^{19}\text{F}, 2p\gamma$), <0.76 ns from γγ(t) in (n,γ) E=thermal.
3301.36 <i>4</i>	2 ⁺	35 fs <i>18</i>	AB	Ij M OP TU	XREF: Others: AH XREF: j(3298)ah(3300). J ^π : 3301.33γ E2 0 ⁺ .
3307.872 <i>10</i>	3 ⁻	0.15 ps <i>6</i>	AB	F j M OPQR TUV X	XREF: Others: AB , AF , AG , AH B(E3)↑=0.0072 <i>12</i> XREF: j(3298)ah(3300). J ^π : L(e,e')=L(p,p')=L(d,d')=L(α, α')=3 from 0 ⁺ . T _{1/2} : from adopted B(E3)↑=0.0072 <i>12</i> and γ-branching ratios. Other: <0.35 ns from γγ(t) in (n,γ) E=thermal. B(E3)↑: unweighted average 0.0095 <i>9</i> (1989It02) and 0.00559 <i>23</i> (1971He08) in (e,e'), 0.0065 <i>9</i> (1969BeYW) in (α, α').

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Adopted Levels, Gammas (continued)

⁴⁴ Ca Levels (continued)								
E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF					Comments
3357.29 11	(2 ⁺ ,3,4 ⁺)	<28 fs	A	IJ	M O	TU	X	XREF: Others: AE , AF XREF: AE(3370). J ^π : 1074γ to 4 ⁺ , 2200γ to 2 ⁺ . L(d, ² He)=2 from 0 ⁺ for a 3370 group suggest π=−, but L(t,α)=3 from 7/2 [−] for a 3360 group suggests π=+.
3581.3 10	0 ⁺		A	H J	O	TU		XREF: Others: AH XREF: J(3592). J ^π : L(d, ⁶ Li)=L(⁶ Li,d)=0 ⁺ from 0 ⁺ .
3661.527 10	1 [−] &		A	j	OP	TU	X	XREF: Others: AF XREF: j(3671)af(3670). J ^π : 3661γ D to 0 ⁺ ; 353.67γ to 3 [−] is not M2 since it would require a T _{1/2} >0.3 ns or width Γ<1.5×10 ₆ eV which is significantly smaller than observed Γ _γ =0.08 eV in (γ,γ'). T _{1/2} : 5.8 fs from Γ _γ =0.08 eV in (γ,γ'), but it would require a B(E2)(W.u.)(354γ)=3800 exceeding RUL=100, which constrains T _{1/2} >0.22 ps or a width Γ<0.0021 eV.
3676.092 14	(2 ⁺)		A	j	M O	TU		XREF: Others: AF XREF: j(3671)af(3670). J ^π : 3676.7γ to 0 ⁺ , 368.2γ to 3 [−] ; L(p,p')=(2) from 0 ⁺ .
3691.7 4	1&	46 [@] fs +30−13			P			
3711.96 ^d 9	4 [−]	<0.42 ns	A	F	M O	T		XREF: Others: AF XREF: O(3729). J ^π : L(t,α)=2 from 7/2 [−] ; 404.26γ D, ΔJ=1 to 3 [−] ; 1428.67γ ΔJ=0 to to 4 ⁺ .
3776.27 11	2 [−]	<0.69 ns	A		M O	TU		XREF: Others: AE , AF XREF: O(3792)AF(3770?). J ^π : spin=2 from pγ(θ) in (p,p'γ); L(d, ³ He)=2 from 7/2 [−] .
3880 10					O			
3913.80 ^e 8	5 [−]	>2 ps	FG	M	Q	T	X	XREF: Others: AB , AF , AH B(E5)↑=0.000083 15 XREF: af(3915)ah(3920). J ^π : L(e,e')=L(α,α')=5 from 0 ⁺ . T _{1/2} : from DSAM in (¹⁴ C,α2nγ). B(E5)↑: unweighted average of 0.000096 8 (1989It02) and 0.000053 5 (1971He08) in (e,e'), and 0.000101 16 (1969BeYW) in (α,α').
3922.71 10	5 [−]	<0.56 ns	F	M		T		XREF: Others: AF , AH XREF: F(?)af(3915)ah(3920). J ^π : L(p,p')=5 from 0 ⁺ ; and γ's to 4 ⁺ and 6 ⁺ .
3934? 10	(2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺)				O			J ^π : L(d,p)=(1) from 7/2 [−] .
4011.4 4					M O	T		XREF: Others: AF XREF: O(4026)AF(4022).
4092.04 13	(6 ⁺)		F	M o			x	XREF: Others: AF XREF: o(4104)x(4091)af(4099). J ^π : 1809γ (Q), ΔJ=(2) to 4 ⁺ .
4093.7 4	(2 ⁺ ,3,4 ⁺)		A		o		x	XREF: Others: AF

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Adopted Levels, Gammas (continued) ^{44}Ca Levels (continued)

<u>E(level)[†]</u>	<u>J^π</u>	<u>T_{1/2}[#]</u>	<u>XREF</u>	<u>Comments</u>
				XREF: o(4104)x(4091)af(4099). E(level): this level is probably different from 4092 level (see discussion in 1976Co06 in ^{44}K β^- decay). J ^π : 1810.4γ to 4 ⁺ , 2937.8γ to 2 ⁺ . XREF: Others: AH XREF: X(4169?)AH(4170). E(level): from (p,p'). J ^π : L(α,α')=(2) from 0 ⁺ . XREF: O(4207).
4170 5	(2 ⁺)		T X	J ^π : L(d,p)=1 from 7/2 ⁻ ; ΔJ=2 to 0 ⁺ from pγ(θ) in (p,p'γ). But J=1 is expected from population in (γ,γ'), although, a 2 ⁺ level could also be populated weakly either directly or from deexcitation of a higher J=1 level. T _{1/2} : from 30 fs ⁸⁻⁵ deduced from Γ _{γ0} for J=1 in (γ,γ') with a correcting factor of 5/3 due to the change of spin from 1 to 2, since (2J+1)Γ _{g0} is proportional to measured γ-ray yield (2011Is01). Other: <0.69 ns from γγ(t) in (n,γ) E=thermal.
4196.10 22	2 ⁺	50 fs +13-8	M OP TU	J ^π : (2 ⁺ ,3,4 ⁺) from γ's to 2 ⁺ and 4 ⁺ ; 4 ⁺ excluded by β-decay from 2 ⁻ . XREF: Others: AF XREF: AF(4310?). J ^π : from β-decay from 2 ⁻ , log ft=7.04.
4260.27 35	(2 ⁺ ,3)		A	XREF: Others: AF J ^π : L(α,α')=3 from 0 ⁺ . XREF: Others: AB , AF , AH XREF: j(4396)O(4410)q(4390)r(4400)ab(4399)af(4400)ah(4400).
4315.22 14	(1,2,3)		A	J ^π : L(p,p')=L(α,α')=3 from 0 ⁺ . XREF: Others: AB , AF , AH XREF: j(4396)q(4390)r(4400)ab(4399)af(4400)ah(4400).
4358.440 30	3 ⁻		A J M Q T X	J ^π : allowed β-decay from 2 ⁻ , log ft=5.63; 2268.5γ to 4 ⁺ . XREF: A(?). XREF: Others: AF , AH XREF: F(?)j(4562)K(4550)o(4569)af(4565)ah(4550). J ^π : L(t,p)=L(α,α')=2 from 0 ⁺ . But 3 ⁻ ,4 ⁻ from L(d, ³ He)=0 from 7/2 ⁻ for a group at 4480 is inconsistent.
4399.2 5	3 ⁻		A j M O qr T X	XREF: Others: AB , AF , AH XREF: j(4396)O(4410)q(4390)r(4400)ab(4399)af(4400)ah(4400).
4409.176 14	(1) ⁻		A j qr T	J ^π : L(p,p')=L(α,α')=3 from 0 ⁺ . XREF: Others: AB , AF , AH XREF: j(4396)q(4390)r(4400)ab(4399)af(4400)ah(4400).
4436.7 5	(1,2 ⁺)		A	J ^π : allowed β-decay from 2 ⁻ , log ft=5.63; 2268.5γ to 4 ⁺ . XREF: A(?). XREF: Others: AF , AH XREF: F(?)j(4562)K(4550)o(4569)af(4565)ah(4550). J ^π : L(t,p)=L(α,α')=2 from 0 ⁺ . But 3 ⁻ ,4 ⁻ from L(d, ³ He)=0 from 7/2 ⁻ for a group at 4480 is inconsistent.
4479.9 5	2 ⁺		A J M O T X	XREF: Others: AB , AF , AH XREF: j(4396)q(4390)r(4400)ab(4399)af(4400)ah(4400).
4552.644 23	(3) ⁻		A j T	J ^π : L(t,p)=L(α,α')=2 from 0 ⁺ . But 3 ⁻ ,4 ⁻ from L(d, ³ He)=0 from 7/2 ⁻ for a group at 4480 is inconsistent.
4561.8? 6			A	XREF: Others: AB , AF , AH XREF: j(4562)ah(4550).
4564.87 14	(5 ⁻)		A F jK M o Q T X	J ^π : allowed β-decay from 2 ⁻ , log ft=5.63; 2268.5γ to 4 ⁺ . XREF: A(?). XREF: Others: AF , AH XREF: F(?)j(4562)K(4550)o(4569)af(4565)ah(4550). J ^π : L(α,α')=L(p,p')=(5) from 0 ⁺ . L(α, ² He)=7 for a 4550 group.
4572.6 5	(1,2,3)		A j o	XREF: Others: AF , AH XREF: j(4562)o(4569)af(4565)ah(4550).
4584.08 18	(2 ⁺ ,3,4 ⁺)	<3.5 ns	M O T X	J ^π : β-decay from 2 ⁻ parent, log ft=7.0 3. XREF: O(4598). J ^π : 3427.5γ to 2 ⁺ and 1539.4γ to 4 ⁺ .

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Adopted Levels, Gammas (continued)

⁴⁴ Ca Levels (continued)										
E(level) [†]	J ^{π‡}	T _{1/2} [#]	XREF						Comments	
4616 10				O						
4649.46 10	1&	7.4 [@] fs +16-11		P						XREF: Others: AF XREF: af(4660).
4650.3 4	2 ⁺		A	J	M	O	T	X	XREF: Others: AB , AF XREF: O(4662)af(4660).	
4690.0 5	(1 ⁻ ,2,3,4 ⁺)			M O						J ^π : L(t,p)=L(α,α')=2 from 0 ⁺ . J ^π : 3332.9γ to 2 ⁺ ; primary γ from 3 ⁻ ,4 ⁻ rejects 0 ⁺ , 1 ⁺ .
4803.6 4	(1 ⁻ ,2,3,4 ⁺)			M T						J ^π : 3647.2γ to 2 ⁺ ; primary γ from 3 ⁻ ,4 ⁻ rejects 0 ⁺ , 1 ⁺ .
4824.4 6	(1,2,3)		A	O						J ^π : β-decay from 2 ⁻ parent, log ft=6.9 +3-2.
4848.39 20	1&	17 [@] fs +5-3		P						
4866.09 8	1&	4.3 [@] fs +14-9	A	P						
4884.02 8	(1,2,3)		A	j					t	XREF: j(4898)t(4889).
4892.6? 8			A							J ^π : β-decay from 2 ⁻ parent, log ft=5.86 8.
4904.58 35	3 ⁻		A	j	M	Q	t	X	XREF: A(?). XREF: Others: AB , AF XREF: A(?)j(4898)Q(4900)t(4889)AB(4905)A F(4912).	
										J ^π : L(α,α')=3 from 0 ⁺ ; L(t,α)=2 from 7/2 ⁻ . But 2 ⁺ from (¹⁶ O, ¹⁶ O') is in disagreement.
4914 10	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺			j	O					XREF: j(4898).
4930.74 ^d 16	(6 ⁻)		F							J ^π : L(d,p)=1 from 7/2 ⁻ . J ^π : 1016.9γ D, ΔJ=1 to 5 ⁻ and member of a 4 ⁻ band in (¹⁸ O,2p2nγ).
4992 10	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺			J	O					XREF: Others: AF XREF: J(4991). E(level): from (d,p). Other: 4991 15 from (t,p).
										J ^π : L(d,p)=1 from 7/2 ⁻ .
5005.69 22	4 ⁺			j	M	O	T	X	XREF: Others: AB XREF: j(5015)O(5016)T(5031)AB(5006?).	
5025.73 21	3 ⁻		A	j					R	J ^π : L(α,α')=4 from 0 ⁺ . XREF: Others: AF XREF: j(5015).
5087.62 ^c 8	8 ⁺	0.53 ps 14	EFG							J ^π : L(π,π')=3 from 0 ⁺ . J ^π : 1802.59γ E2, ΔJ=2 6 ⁺ and member of g.s. band in (¹⁸ O,2p2nγ).
5096.87 34	3 ⁻ ,4 ⁻			M T						T _{1/2} : from DSAM in (¹⁴ C,α2nγ). XREF: Others: AE , AF XREF: AE(5070).
5130.22 21	(2,3) ⁺		A	M O T						J ^π : L(t,α)=0 from 7/2 ⁻ . XREF: Others: AF XREF: O(5143)AF(5120?).
5161.8 5	1&	2.6 [@] fs 3	A	OP						J ^π : L(d,p)=1 from 7/2 ⁻ ; β-decay from 2 ⁻ parent, log ft=6.7 +4-2.
5201.13 30	(1,2,3) ⁻		A	j						XREF: O(5172). XREF: j(5222).
										J ^π : allowed β-decay from 2 ⁻ parent, log ft=5.9 +4-2.
5210.0 5	1 ⁺ &	2.0 fs +4-3		k	P	T			XREF: k(5210). T _{1/2} : deduced from Γ=0.228 eV 40 in (γ,γ').	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

⁴⁴ Ca Levels (continued)						
E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF			Comments
						J ^π : parity from 4053γ M1+E2 to 2 ⁺ . L(α, ² He)=4+5 from 0 ⁺ for a 5210 group is inconsistent.
5222 5	(3 ⁻)		Jk	T	X	XREF: Others: AF XREF: k(5210)af(5235). E(level): from (α,α'). J ^π : L(α,α')=(3) from 0 ⁺ . L(α, ² He)=4+5 for a 5210 group.
5230.33 20	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺	<4.2 ns	Jk M O	T		XREF: Others: AF XREF: J(5245)k(5210)O(5243)T(5235)af(5235)
						.
						J ^π : L(d,p)=1 from 7/2 ⁻ for a group at 5343 10. Other: 3 ⁻ for a group at 5235 5 in (p,p') is inconsistent.
5245.19 ^e 12	7 ⁻		F			J ^π : 1331.3γ ΔJ=2 to 5 ⁻ , 1960.2γ ΔJ=1 to 6 ⁺ ; band assignment.
5289.25 32			M o	T		XREF: o(5296). J ^π : L(d,p)=1 for a group at 5296 10, probably a doublet of 5289+5301.
5300.5 4			M o	T		XREF: Others: AF XREF: o(5296)AF(5306). J ^π : see comment for 5289 level.
5325.0 6	(1,2,3)		A	j		XREF: j(5333). J ^π : β-decay from 2 ⁻ parent, log ft=6.5 +4-2.
5342.2 5	(2) ⁺		j M O		X	XREF: Others: AF XREF: j(5333)O(5351). J ^π : L(α,α')=(2) from 0 ⁺ ; L(d,p)=1 from 7/2 ⁻ .
5367.5 7	(1,2,3)		A	j		XREF: j(5361). J ^π : β-decay from 2 ⁻ parent, log ft=5.9 +8-3.
5375.0 5	(2,3,4) ⁺		j M O			XREF: j(5361)O(5385). J ^π : L(d,p)=1 from 7/2 ⁻ ; 4217.9γ to 2 ⁺ .
5406 5	3 ⁻ ,4 ⁻			O	X	XREF: Others: AE, AF XREF: AE(5430). E(level): weighted average of 5405 10 from (d,p), 5407 5 from (α,α'), and 5404 12 from (t,α).
5458.9 4	(2,3,4) ⁺			M O		J ^π : L(t,α)=L(d, ³ He)=0 from 7/2 ⁻ . J ^π : L(d,p)=1 from 7/2 ⁻ ; 4301.7γ to 2 ⁺ .
5512.3 10			A		X	XREF: Others: AF XREF: A(5512?)AF(5518).
5548.68 22	(2,3,4) ⁺			M O		J ^π : L(d,p)=1 from 7/2 ⁻ ; 4391.5γ to 2 ⁺ .
5561.0 5	3 ⁻		A			XREF: Others: AF XREF: AF(5579). J ^π : L(t,α)=0 from 7/2 ⁻ ; allowed β feeding from spin=2 parent; 4403.6γ to 2 ⁺ .
5611.56 28	1&	1.4 [@] fs +7-4		P		
5646.79 14	8 ⁽⁺⁾		F			J ^π : ΔJ=0 (M1) to 8 ⁺ in (¹⁸ O,2p2nγ). XREF: Others: AF
5656 5	(1 to 6) ⁻		J	O	X	XREF: J(5646)O(5666). E(level): weighted average of 5646 20 in (t,p), 5666 10 in (d,p), 5654 5 from (α,α'), and 5660 12 from (t,α).
						J ^π : L(t,α)=2 from 7/2 ⁻ .
5733.30 22	(4,5) ⁺	<3.5 ns	J M O		X	XREF: Others: AF J ^π : L(d,p)=1 from 7/2 ⁻ ; 1640.7γ to (6 ⁺).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{44}Ca Levels (continued)					
E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF		Comments
5775.76 22	(2,3,4) ⁺		M	O	J ^π : L(d,p)=1 and γ to 2 ⁺ .
5800.61 20	1&	11 @ fs +5-3		P	XREF: Others: AF
					XREF: af(5810).
5806.31 10	1-&	2.3 @ fs 3		P	XREF: Others: AF
					XREF: af(5810).
5832 10				O	J ^π : from γ(pol) in (γ,γ') (2016De05).
5864 20	0 ⁺		H JK	X	XREF: X(5830).
					XREF: H(5850)J(5864)K(5860).
					E(level): from (t,p).
5866.82 30	(4 ⁺ ,5 ⁺)		M	O	J ^π : L(t,p)=L(⁶ Li,d)=L(α, ² He)=0 from 0 ⁺ .
					XREF: O(5873?).
5875.82 20	1-&	4.2 @ fs +8-5		P	J ^π : L(d,p)=(1) from 7/2 ⁻ ; 1773.3γ to 6 ⁺ .
				X	XREF: Others: AF
					XREF: X(5880)AF(5891).
5911.13 20	1&	1.9 @ fs +6-4		P	J ^π : from γ(pol) in (γ,γ') (2016De05).
5971.30 ^d 14	8 ⁽⁻⁾		F	X	XREF: X(5940?).
5975 10				O	J ^π : 1040.5γ Q, ΔJ=2 to 6 ⁻ , 726.1γ (M1),
6014 20			J	X	ΔJ=1 to 7 ⁻ .
6040.0 5	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺		M	O	XREF: X(5970).
					XREF: X(6020).
6082.9 4	1+&	2.1 @ fs +4-3		P	XREF: O(6050).
6136.59 26	1-&	1.27 @ fs +20-15		P	J ^π : L(d,p)=1 from 7/2 ⁻ .
6146.14 31	(4,5) ⁺		M	O	XREF: Others: AE
6211.4 5			K M		XREF: AE(6100).
					J ^π : L(d,p)=1 from 7/2 ⁻ ; 2053.9γ to (6 ⁺).
					XREF: K(6210).
					J ^π : L(α, ² He)=2 for a 6210 group suggests
					π=+.
6245.48 30	1&	9 @ fs +3-2	k	P	XREF: k(6210).
6422.12 10	1-&	0.21 @ fs 2	J	P	XREF: J(6438).
6446.5 7	1+&	5.9 @ fs +16-11		P	
6507.1 5	1&	3.3 @ fs +9-6		P	
6578 20			J		
6657.65 ^e 17	9 ⁽⁻⁾		F		J ^π : 1412.4γ (E2), ΔJ=2 to 7 ⁻ , 1570γ
					(E1), ΔJ=1 to 8 ⁺ .
6672.92 31			M		
6675.44 20	1&	4.5 @ fs +9-6		P	
6744 20			J		
6778 20			J		
6913 20			J		
6960.7 6	1&	5.6 @ fs +13-9		P	
6972.14 19	1&	0.47 @ fs +14-9	j	P	XREF: j(6996).
6996 20			J		
7065.9 9	1&	2.7 @ fs +6-4		P	
7092.76 15	(9 ⁻)		F		J ^π : 2005.1γ (E1), ΔJ=1 to 8 ⁺ , (E1) to 8 ⁺ .
7226.04 30	1&	2.8 @ fs +6-4		P	
7275.2 9	1&	1.9 @ fs +4-3		P	
7403.0 8	1&	3.7 @ fs +9-6		P	
7470.92 20	(10 ⁺)		F		J ^π : 1824.1γ Q, ΔJ=2 to (8 ⁺).
7556.58 22	(9)		F		J ^π : 2468.9γ D, ΔJ=(1) to 8 ⁺ .

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Adopted Levels, Gammas (continued)

^{44}Ca Levels (continued)				
E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments
7572.0 5	1 ^{(+)&}	2.6@ fs +8-5	P	
7578.90 30	1 ^{-&}	0.51@ fs +7-6	P	
7662.1 6	1 ^{-&}	4.7@ fs +21-11	P	
7783.3 10	1 ^{-&}	4.2@ fs +19-11	P	
7808.9 16	1 ^{-&}	8@ fs +4-2	P	
7828.9 12	1&	6@ fs +3-2	P	
7834.8 8	1 ^{-&}	3.0@ fs +9-6	P	
7844 20			J	
7879.97 ^d 19	(10 ⁻)		F	J ^π : 1908.6γ Q, ΔJ=2 to 8 ⁻ , 787.2γ (M1), ΔJ=1 to (9 ⁻).
7953.1 5	1&	1.7@ fs +7-4	P	
8050			K	J ^π : L(α, ² He)=3 from 0 ⁺ suggests π=-.
8070.2 7	1&	2.2@ fs +5-3	P	
8086.0 7	1&	2.1@ fs +5-3	P	
8286.28 ^e 26	(11 ⁻)		F	J ^π : 1628.6γ (E2), ΔJ=2 to 9 ⁻ ; band assignment.
8290			K	J ^π : L(α, ² He)=5 from 0 ⁺ suggests π=-.
8321.5 16	1&	9.5@ fs +7-3	P	
8395.3 4	1&	1.6@ fs +5-3	P	
8405.4 17	1&	0.42@ fs +7-5	P	
8556.7 8	1 ^{-&}	2.4@ fs +16-7	P	
8615.2 12	1 ^{-&}	2.3@ fs +10-5	P	
8801.9 29	1 ^{-&}	11@ fs +13-4	P	
8828.0 11	1 ^{-&}	0.8@ fs +3-2	P	
8851.5 7	1 ^{-&}	0.70@ fs +17-12	P	
8860			K	J ^π : L(α, ² He)=(5,6,7) from 0 ⁺ .
8908.8 7	1 ^{-&}	0.33@ fs +7-5	P	
9024.1 20	1 ^{-&}		P	
9148.4 24	1 ^{-&}		P	
9273.6 8	1 ^{-&}	1.1@ fs +3-2	P	
9317.2 10	1 ^{-&}		P	
9460			K	J ^π : L(α, ² He)=3 from 0 ⁺ suggests π=-.
9664.9 7	1 ^{-&}		P	
9750			K	J ^π : L(α, ² He)=(7,8) from 0 ⁺ .
9788.6 6			F	J ^π : 2317.6γ to (10 ⁺).
9814.1 11	1 ^{-&}		P	
9859.5 ^d 4	(12 ⁻)		F	J ^π : 1979.5γ (E2), ΔJ=2 to (10 ⁻); band assignment.
9898.2 10	1 ^{-&}		P	
10567.8 ^e 5	(13 ⁻)		F	J ^π : 2281.5γ Q, ΔJ=2 to (11 ⁻); band assignment.
(11131.60 12)	3 ⁻ ,4 ⁻		M	J ^π : s-wave capture in 7/2 ⁻ g.s. of ⁴³ Ca. E(level): S(n)=11131.16 23 (2021Wa16).
11132.73 30	4 ^{-a}	1.13 eV	N	
11134.44 23	+ ^a		N	
11134.52 23	(4) ^{-a}	0.67 eV	N	
11135.49 23	4 ^{-a}	0.522 eV 7	N	

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Adopted Levels, Gammas (continued) ^{44}Ca Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments
11135.72 23	+ <i>a</i>		N	
11136.33 23	3- <i>a</i>	1.23 eV 10	N	
11136.35 23	4- <i>a</i>		N	
11138.07 23	3- <i>a</i>	0.69 eV 7	N	
11139.93 23	4- <i>a</i>	0.68 eV 7	N	
11141.00 23	+ <i>a</i>		N	
11141.22 23	+ <i>a</i>		N	
11141.52 23	(4)- <i>a</i>	0.76 eV 10	N	
11143.08 23			N	
11143.31 23			N	
11143.77 23	+ <i>a</i>		N	
11144.39 23			N	
11144.9 5	4- <i>a</i>	1.0 eV 1	N	
11145.29 23	(3)- <i>a</i>	0.8 eV 9	N	
11145.65 23	+ <i>a</i>		N	
11146.04 23	+ <i>a</i>		N	
11146.19 23	+ <i>a</i>		N	
11147.53 23	3-,4- <i>a</i>		N	
11149.99 24	4- <i>a</i>	0.66 eV 7	N	
11150.62 23	+ <i>a</i>		N	
11151.10 23	(3)- <i>a</i>	0.80 eV 12	N	
11152.19 23	(3)- <i>a</i>	0.79 eV 10	N	
11152.71 23	(3) <i>a</i>	0.5 eV	N	
11153.68 23	(4)- <i>a</i>	0.57 eV 9	N	
11154.10 23	+ <i>a</i>		N	
11154.90 23	(2)+ <i>a</i>	0.92 eV 12	N	
11155.07 23	(3)- <i>a</i>	0.81 eV 12	N	
11155.29 23	+ <i>a</i>		N	
11155.41 23	(2)+ <i>a</i>	0.74 eV 11	N	
11157.59 23			N	
11157.71 23	(4)- <i>a</i>	0.60 eV 8	N	
11157.99 23	3-,4- <i>a</i>		N	
11158.69 23	+ <i>a</i>		N	
11158.84 23	+ <i>a</i>		N	
11160.27 23	(4)- <i>a</i>	0.66 eV 8	N	
11160.40 23	(4)- <i>a</i>	0.75 eV 10	N	
11161.47 23	+ <i>a</i>		N	
11161.65 23	(4)- <i>a</i>	0.66 eV 7	N	
11161.86 23	+ <i>a</i>		N	
11162.06 23	(4)- <i>a</i>	0.75 eV 9	N	
11162.89 23			N	
11164.00 23			N	
11165.39 23			N	
11165.91 23			N	
11166.61 23			N	
11166.74 23			N	
11167.34 23			N	
11167.58 23	(4)- <i>a</i>	1.4 eV 2	N	
11170.05 23			N	
11850 10			Q	T=3
12188.1 10			F	Additional information 2.
16.5×10 ³ <i>b</i> 15		4.9 ^b MeV +21-24	X	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{44}Ca Levels (continued)

E(level) [†]	T _{1/2} [#]	XREF
17.13×10 ³ ^b 11	9.40 ^b MeV 14	X
19.5×10 ³ ^b 4	5.8 ^b MeV +9-7	X
34.9×10 ³ ^b 15	16.3 ^b MeV 23	X

[†] From a least-squares fit to γ -ray energies for levels populated in γ -ray studies, and from different reactions as noted for others, unless otherwise noted.

[‡] 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 $E_\gamma < 4$ MeV, transitions are only considered to be E1, M1 or E2; if $E_\gamma > 4$ MeV, M2 and E3 are considered to be possible.

[#] From DSAM in $(\alpha, p\gamma)$, unless otherwise stated. Values quoted in nanoseconds are from $\gamma\gamma(t)$ in (n, γ) .

[@] Deduced by the evaluators from Γ_γ in (γ, γ') . Actual T_{1/2} could be smaller for levels from which only the g.s. transitions are reported, with the possibility that competing transitions to the low-lying 2⁺ and 0⁺ excited states in ^{44}Ca might have missed observation, making Γ_γ underestimated, thus T_{1/2} overestimated.

[&] From $\Delta J=1$ excitation and γ (linear polarization) in (γ, γ') and (polarized γ, γ').

^a From analysis of neutron resonance.

^b From (α, α') for giant resonance.

^c Band(A): Yrast g.s. band.

^d Band(B): Band based on 4⁻, $\alpha=0$.

^e Band(b): Band based on 5⁻, $\alpha=1$.

Adopted Levels, Gammas (continued)

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	δ	$I_{(\gamma+ce)}$	Comments
1157.0208	2 ⁺	1157.004 3	100	0.0	0 ⁺	E2			B(E2)(W.u.)=10.06 +42-40 E _γ : weighted average of 1157.002 3 from ⁴⁴ K β ⁻ decay, 1157.022 15 from ⁴⁴ Sc ε decay (4.0420 h), 1157.002 15 from ⁴⁴ Sc ε decay (58.61 h), 1157 1 from (¹⁶ O,2pγ), 1157.0 2 from (¹⁸ O,2p2nγ), 1157.031 15 from (¹⁴ C,α2nγ), 1156.89 15 from (n,γ) E=thermal, 1158 1 from (p,p'γ), and 1155.9 5 from (μ ⁻ ,nγ). Mult.: ΔJ=2, Q γ from DCO in (¹⁸ O,2p2nγ); M2 rejected by RUL.
1883.516	0 ⁺	726.490 16 (1883.47)	100	1157.0208 0.0	2 ⁺ 0 ⁺	E2 E0		≈0.012	B(E2)(W.u.)=22 +9-5 Mult.: Q from pγ(θ) in (p,p'γ); M2 ruled out by RUL. I _(γ+ce) : branching deduced by the evaluators from q _K ² (E0/E2)=I _K (E0)/I _K (E2)=0.54 9 and assuming 80% K-shell conversion of E0 transition. q _K ² (E0/E2)=0.54 9, X(E0/E2)=0.23 4, ρ ² (E0)=0.14 5 (2005Ki02 evaluation). Γ(pair formation)/T=8.8×10 ⁻⁴ 14 from (p,p') (1976U101); Γ(pair formation)=2.1×10 ⁻⁸ eV 3 from (e,e') (1978Gr02).
2283.119	4 ⁺	1126.078 10	100	1157.0208	2 ⁺	E2			B(E2)(W.u.)=18 +10-5 E _γ : weighted average of 1126.076 10 from ⁴⁴ K β ⁻ decay, 1126.084 20 from ⁴⁴ Sc ε decay (58.61 h), and 1126.092 40 from (¹⁴ C,α2nγ). Others: 1126 1 from (¹⁶ O,2pγ), 1126.1 2 from (¹⁸ O,2p2nγ), 1126.03 15 from (n,γ) E=thermal, 1127 1 from (p,p'γ), and 1124.1 7 from (μ ⁻ ,nγ). Mult.,δ: δ(O/Q)=-0.05 +4-3 from pγ(θ) in (p,p'γ); M2, M3 ruled out by RUL.
2656.509	2 ⁺	1499.449 15	100.0 17	1157.0208	2 ⁺	M1+E2	-0.123 17		B(M1)(W.u.)=0.191 +22-17; B(E2)(W.u.)=3.6 +12-9 E _γ : from ⁴⁴ Sc ε decay (4.0420 h). Others: 1499.45 4 from ⁴⁴ K β ⁻ decay, 1499.4 3 from (¹⁸ O,2p2nγ), 1499.30 18 from (n,γ) E=thermal, 1501 2 from (p,p'γ), and 1510 10 from (μ ⁻ ,nγ). I _γ : from ⁴⁴ Sc ε decay (4.0420 h). Others: 100.0 37 from ⁴⁴ K β ⁻ decay and 100.0 25 from (p,p'γ). Mult.,δ: δ(Q/D) is weighted average of -0.15 +4-9 (1970La09) and -0.14 7 (1966Ma31) in (p,p'γ), -0.137 17 (1968Wa21), and -0.07 3 (1971Ok03) in ⁴⁴ Sc ε decay (4.0420 h); E1+M2 ruled out by RUL.
		2656.44 3	12.39 33	0.0	0 ⁺	E2			B(E2)(W.u.)=1.70 +20-16 E _γ : weighted average of 2656.41 3 from ⁴⁴ K β ⁻ decay, 2656.48 4

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}^{\dagger}</u>	<u>I_{γ}^{\dagger}</u>	<u>E_f</u>	<u>J_f^{π}</u>	<u>Mult.</u>	<u>δ</u>	<u>$\alpha^{\textcircled{a}}$</u>	<u>Comments</u>
3044.292	4 ⁺	761.12 4	100 5	2283.119	4 ⁺	M1+E2	-0.18 8		from ⁴⁴ Sc ε decay (4.0420 h), 2656.2 5 from (n, γ) E=thermal, and 2656 3 from (p,p' γ). I _{γ} : weighted average of 12.52 59 from ⁴⁴ K β^- decay, 12.31 33 from ⁴⁴ Sc ε decay (4.0420 h), and 17.0 38 from (p,p' γ). Mult.: Q from $\text{py}(\theta)$ in (p,p' γ); M2 ruled out by RUL. B(M1)(W.u.)=0.0055 +15-13; B(E2)(W.u.)=0.9 +10-6 E _{γ} : weighted average of 761.10 3 from ⁴⁴ K β^- decay, 761.3 1 from (¹⁸ O,2p2n γ), and 761.19 10 from (n, γ) E=thermal. Others: 761.19 20 from (¹⁴ C, α 2n γ) and 764 1 from (p,p' γ). I _{γ} : from (¹⁴ C, α 2n γ). Others: 100 50 from ⁴⁴ K β^- decay, 100.0 52 from (¹⁸ O,2p2n γ), and 100.0 79 from (p,p' γ). Mult., δ : δ (Q/D) from weighted average of -0.18 8 from (¹⁴ C, α 2n γ) and -0.25 +9-31 from (p,p' γ); E1+M2 ruled out by RUL. B(E2)(W.u.)=0.27 +7-6 E _{γ} : weighted average of 1887.21 28 from ⁴⁴ K β^- decay, 1887.3 2 from (¹⁸ O,2p2n γ), 1887.45 20 from (¹⁴ C, α 2n γ), and 1887.3 3 from (n, γ) E=thermal. Other: 1890 2 from (p,p' γ). I _{γ} : weighted average of 100 50 from ⁴⁴ K β^- decay, 93.1 69 from (¹⁸ O,2p2n γ), 85.4 42 from (¹⁴ C, α 2n γ), and 95.9 30 from (p,p' γ). Mult., δ : δ (O/Q)=-0.08 +3-6 from (p,p' γ); M2,M3 ruled out by RUL. B(E2)(W.u.)=4.57 +46-37 E _{γ} : weighted average of 1001.876 20 from ⁴⁴ Sc ε decay (58.61 h), 1001.9 1 from (¹⁸ O,2p2n γ), and 1001.850 31 from (¹⁴ C, α 2n γ). Others: 1001 1 from (¹⁶ O,2p γ) and 1001.85 15 from (n, γ) E=thermal. Mult.: Q, Δ J=2 from DCO in (¹⁸ O,2p2n γ); M2 ruled out by RUL. E _{γ} : weighted average of 2144.23 8 from ⁴⁴ K β^- decay, 2144.33 10 from ⁴⁴ Sc ε decay (4.0420 h), 2144.5 5 from (n, γ) E=thermal, and 2144 2 from (p,p' γ). I _{γ} : others: 100 19 from ⁴⁴ Sc ε decay (4.0420 h) and 100.0 90 from (p,p' γ). B(M1)(W.u.)=0.044 +40-16 if M1, B(E2)(W.u.)=27 +24-10 if E2. B(E2)(W.u.)=1.4 +12-5 E _{γ} : weighted average of 3301.21 14 from ⁴⁴ K β^- decay, 3301.35 6 from ⁴⁴ Sc ε decay (4.0420 h), 3301.5 6 from (n, γ) E=thermal, and 3304 4 from (p,p' γ). I _{γ} : weighted average of 42.6 70 from ⁴⁴ K β^- decay, 38 11 from ⁴⁴ Sc ε decay (4.0420 h), and 49.3 75 from (p,p' γ). Mult.: Q from $\text{py}(\theta)$ in (p,p' γ); M2 ruled out by RUL.
		1887.34 20	92.5 30	1157.0208	2 ⁺	E2			
3285.004	6 ⁺	1001.869 20	100	2283.119	4 ⁺	E2			
3301.36	2 ⁺	2144.27 8	100 6	1157.0208	2 ⁺	[M1,E2]			
		3301.33 6	44 7	0.0	0 ⁺	E2			

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	$\alpha^@$	Comments
14	3 ⁻	263.53 6	0.49 13	3044.292	4 ⁺	[E1]	1.13×10 ⁻³ 2	B(E1)(W.u.)=0.00068 +49-25
		651.353 16	13.2 8	2656.509	2 ⁺	[E1]		B(E1)(W.u.)=0.0012 +8-4
								E _γ : weighted average of 651.355 9 from ⁴⁴ K β ⁻ decay, 651.07 12 from (n,γ) E=thermal, and 652 1 from (p,p'γ).
								I _γ : weighted average of 13.30 51 from ⁴⁴ K β ⁻ decay and 6.8 41 from (p,p'γ).
		1024.738 17	29.4 5	2283.119	4 ⁺	[E1]		B(E1)(W.u.)=0.00069 +44-20
								E _γ : others: 1024.4 3 from (¹⁸ O,2p2nγ), 1024.66 20 from (n,γ) E=thermal, and 1026 1 from (p,p'γ).
								I _γ : other: 28.4 68 from (p,p'γ).
		2150.805 17	100.0 21	1157.0208	2 ⁺	[E1]		B(E1)(W.u.)=0.00025 +16-7
								E _γ : weighted average of 2150.786 17 from ⁴⁴ K β ⁻ decay, 2150.840 22 from ⁴⁴ Sc ε decay (4.0420 h), 2150.5 2 from (¹⁸ O,2p2nγ), 2150.9 3 from (n,γ) E=thermal, and 2150 2 from (p,p'γ).
								I _γ : others: 100.0 74 from (¹⁸ O,2p2nγ) and 100.0 81 from (p,p'γ).
		3307.7 5	0.077 26	0.0	0 ⁺	(E3)		B(E3)(W.u.)=9 +7-4
								Mult.: E3 excitation in (e,e').
								E _γ : others: 1074.1 4 from ⁴⁴ K β ⁻ decay and 1074 1 from (p,p'γ).
	3357.29	1074.13 [‡] 15	100 60	2283.119	4 ⁺			
		2200.1 3	13 13	1157.0208	2 ⁺			
	3581.3	2426.2 29	100	1157.0208	2 ⁺	(E2)		E _γ : unweighted average of 2423.3 6 from ⁴⁴ K β ⁻ decay and 2429 2 from (p,p'γ).
14	1 ⁻						2.18×10 ⁻³ 3	Mult.: (Q) from pγ(θ) in (p,p'γ); Δπ=no from level scheme.
		353.67 25	0.29 19	3307.872	3 ⁻	[E2]		E _γ : from (pol γ,γ').
		1005.0 9	0.48	2656.509	2 ⁺	[E1]		E _γ : from (pol γ,γ').
		1777.973 20	34.8 8	1883.516	0 ⁺	(E1)		E _γ : from (pol γ,γ'). Other: 1780 2 from (p,p'γ).
		2504.39 6	10.7 9	1157.0208	2 ⁺	[E1]	1.55×10 ⁻³ 2	Mult.: D from pγ(θ) in (p,p'γ); Δπ=yes from level scheme.
		3661.363 11	100.0 19	0.0	0 ⁺	(E1)		E _γ : from (pol γ,γ'). Other: 2508 3 from (p,p'γ).
								E _γ : others: 3661.3 2 from (pol γ,γ') and 3659 4 from (p,p'γ).
	3676.092							Mult.: D from pγ(θ) in (p,p'γ); Δπ=yes from level scheme.
		368.208 23	23.2 4	3307.872	3 ⁻			E _γ : weighted average of 368.207 14 from ⁴⁴ K β ⁻ decay, 368.8 3 from (n,γ) E=thermal, and 367 1 from (p,p'γ).
		374.82 11	2.0 5	3301.36	2 ⁺			E _γ : weighted average of 374.85 10 from ⁴⁴ K β ⁻ decay and 374.4 4 from (n,γ) E=thermal.
		1017.5 13	8.7 4	2656.509	2 ⁺			E _γ : unweighted average of 1019.55 7 from ⁴⁴ K β ⁻ decay, 1017.8 7 from (n,γ) E=thermal, and 1015 1 from (p,p'γ).
		2518.991 18	100.0 18	1157.0208	2 ⁺			E _γ : others: 2518.9 5 from (n,γ) E=thermal and 2520 3 from (p,p'γ).
		3676.7 6	0.15 7	0.0	0 ⁺			
	3691.7	3691.5 4	100	0.0	0 ⁺			E _γ : from (γ,γ').
	3711.96	404.26 13	100 8	3307.872	3 ⁻	(M1)		B(M1)(W.u.)>5.2×10 ⁻⁴
								E _γ : weighted average of 403.86 20 from ⁴⁴ K β ⁻ decay, 404.4 3 from

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	δ	$\alpha^@$
								Comments
								($^{18}\text{O}, 2\text{p}2\text{n}\gamma$), and 404.34 10 from (n, γ) E=thermal. I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). Other: 100 27 from ^{44}K β^- decay. Mult.: D, $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$); $\Delta\pi$ =no from level scheme. B(E1)(W.u.) $>1.2\times 10^{-7}$ E_γ : weighted average of 1428.7 4 from ^{44}K β^- decay, 1428.8 3 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$), and 1428.56 25 from (n, γ) E=thermal. I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). Other: 36 18 from ^{44}K β^- decay. B(E1)(W.u.) $>2.1\times 10^{-8}$ I_γ : weighted average of 8.3 56 from ^{44}K β^- decay and 7.7 38 from (p,p' γ). B(E1)(W.u.) $>2.6\times 10^{-8}$; B(M2)(W.u.) >0.0061 E_γ : others: 2619.1 5 from (n, γ) E=thermal and 2617 4 from (p,p' γ). I_γ : from (p,p' γ). Other: 100 20 from ^{44}K β^- decay. Mult.: D+Q from (p,p' γ); $\Delta\pi$ =yes from level scheme. E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$) require a $T_{1/2}>44$ ps. B(M1)(W.u.) <0.041 if M1. B(E2)(W.u.) <2767 upper limit exceeds RUL=100 if E2. B(E1)(W.u.) $<5.3\times 10^{-4}$ B(M2)(W.u.) <1013 upper limit exceeds RUL=3 14, RUL=3 would require a $T_{1/2}>0.11$ ns. E_γ : unweighted average of 628.9 1 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$), 628.53 9 from ($^{14}\text{C}, \alpha 2\text{n}\gamma$), and 628.69 10 from (n, γ) E=thermal. I_γ : weighted average of 92.1 32 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$) and 100 11 from ($^{14}\text{C}, \alpha 2\text{n}\gamma$). Mult., δ : D+Q from $\gamma(\theta)$ in ($^{14}\text{C}, \alpha 2\text{n}\gamma$); $\Delta\pi$ =yes from level scheme. $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). B(E1)(W.u.) $<2.2\times 10^{-4}$ E_γ : weighted average of 869.5 2 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$) and 869.45 15 from (n, γ) E=thermal. I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). Mult.: D, $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$); $\Delta\pi$ =yes from level scheme. B(E1)(W.u.) $>1.5\times 10^{-6}$ E_γ : weighted average of 637.8 2 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$) and 637.63 12 from (n, γ) E=thermal. B(E1)(W.u.) $>4.8\times 10^{-7}$ E_γ : weighted average of 878.4 2 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$) and 878.10 20 from (n, γ) E=thermal.
3711.96	4 ⁻	1428.67 25	44 4	2283.119	4 ⁺	[E1]		
3776.27	2 ⁻	1119.7 4	7.9 38	2656.509	2 ⁺	[E1]		
		2619.16 12	100 4	1157.0208	2 ⁺	(E1+M2)	-0.62 +7-8	
3913.80	5 ⁻	202.1 2	4.8	3711.96	4 ⁻	[M1,E2]		0.010 8
		628.71 11	92.7 32	3285.004	6 ⁺	(E1+M2)	-0.30 14	
		869.47 15	100 5	3044.292	4 ⁺	(E1)		
3922.71	5 ⁻	637.68 12	100 [‡]	3285.004	6 ⁺	[E1]		
		878.25 20	91 [‡]	3044.292	4 ⁺	[E1]		

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)							
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	Comments
3922.71	5 ⁻	1640.7 ^{&‡} 5	<46 ^{&‡}	2283.119	4 ⁺	[E1]	
4011.4		299.5 [‡] 4	100	3711.96	4 ⁻		
4092.04	(6 ⁺)	806.95 [‡] 15	100 11	3285.004	6 ⁺	(E2)	E_γ : other: 807.0 3 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). Mult.: from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
		1809.0 4	53 7	2283.119	4 ⁺	(E2)	E_γ : weighted average of 1809.1 4 from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$) and 1808.9 5 from (n, γ) E=thermal. I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). Other: 48 from (n, γ) E=thermal. Mult.: from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
4093.7	(2 ⁺ , 3, 4 ⁺)	1810.4 7	100 67	2283.119	4 ⁺		
		2937.8 10	67 25	1157.0208	2 ⁺		
4196.10	2 ⁺	3038.7 [‡] 4	30 7	1157.0208	2 ⁺	[M1, E2]	E_γ : other: 3040 from (p,p' γ); not seen in (γ, γ'). I_γ : from (p,p' γ). B(M1)(W.u.)=0.0036 +9-11 if M1, B(E2)(W.u.)=1.09 +28-31 if E2.
		4196.1 3	100 4	0.0	0 ⁺	(E2)	B(E2)(W.u.)=0.73 15 E_γ : from (γ, γ'), also seen in (p,p' γ). but this γ is not seen in (n, γ) E=thermal. It is likely a different level is populated in (n, γ) E=thermal. I_γ : from (p,p' γ). Mult.: Q from $\text{py}(\theta)$ in (p,p' γ); $\Delta\pi$ =no from level scheme.
4260.27	(2 ⁺ , 3)	1976.9 7	82 64	2283.119	4 ⁺		
		3103.2 4	100 36	1157.0208	2 ⁺		
4315.22	(1, 2, 3)	1658.69 18	100 24	2656.509	2 ⁺		
		3158.07 20	70 11	1157.0208	2 ⁺		
4358.440	3 ⁻	646.5 3	12 4	3711.96	4 ⁻		
		682.34 3	11 6	3676.092	(2 ⁺)		
		696.9 ^a	≤ 0.8	3661.527	1 ⁻		
		1050.60 10	79 12	3307.872	3 ⁻		E_γ : other: 1050.54 20 from (n, γ) E=thermal.
		1701.9 3	14 6	2656.509	2 ⁺		
		3201.26 12	100 8	1157.0208	2 ⁺		E_γ : weighted average of 3201.27 7 from ^{44}K β^- decay and 3200.1 7 from (n, γ) E=thermal.
4399.2	3 ⁻	3242.0 6	100	1157.0208	2 ⁺		E_γ : other: 3242.1 7 from (n, γ) E=thermal.
4409.176	(1) ⁻	733.0 4	4.0 17	3676.092	(2 ⁺)		
		747.63 3	51.4 29	3661.527	1 ⁻		
		1101.3 5	0.29 29	3307.872	3 ⁻		
		1107.98 10	16.4 12	3301.36	2 ⁺		
		1752.629 10	100.0 14	2656.509	2 ⁺		
		3252.07 13	3.9 6	1157.0208	2 ⁺		
		4408.91 19	1.31 22	0.0	0 ⁺		
4436.7	(1, 2 ⁺)	3279.0 7	100 67	1157.0208	2 ⁺		
		4437.0 7	40 27	0.0	0 ⁺		

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Comments
4479.9	2 ⁺	3322.8 [†] 6	100	1157.0208	2 ⁺	
4552.644	(3) ⁻	876.53 3	100 2	3676.092	(2 ⁺)	
		891.10 12	5.4 20	3661.527	1 ⁻	
		1195.4	2.7 24	3357.29	(2 ⁺ ,3,4 ⁺)	
		1244.75 5	48.0 17	3307.872	3 ⁻	
		1896.0 9	6.4 47	2656.509	2 ⁺	
		2268.5 10	1.7 14	2283.119	4 ⁺	
		3395.51 4	96.3 27	1157.0208	2 ⁺	
4561.8?		3404.6 ^a 6	100	1157.0208	2 ⁺	
4564.87	(5) ⁻	651.07 12	<420	3913.80	5 ⁻	E_γ : other: 651.0 3 from (¹⁸ O,2p2n γ). I_γ : from (n, γ) E=thermal, where the 651.07 γ is a doubly placed with intensity not divided.
		2281.7 [†] 5	100 [†]	2283.119	4 ⁺	
		4565.1 ^a 8	98	0.0	0 ⁺	Placement of this transition in (n, γ) E=thermal is considered unlikely by evaluators from the implied high mult=E5.
4572.6	(1,2,3)	1916.0 8	100 52	2656.509	2 ⁺	
		3415.5 7	44 18	1157.0208	2 ⁺	
4584.08	(2 ⁺ ,3,4 ⁺)	1276.0 [†] 8	9.2 [†]	3307.872	3 ⁻	
		1539.40 [†] 25	39 [†]	3044.292	4 ⁺	
		2300.6 [†] 5	40 [†]	2283.119	4 ⁺	
		3427.5 [†] 4	100 [†]	1157.0208	2 ⁺	
4649.46	1	4649.2 1	100	0.0	0 ⁺	E_γ : from (γ,γ').
4650.3	2 ⁺	1992.8 7	100 67	2656.509	2 ⁺	E_γ : weighted average of 1992.4 5 from ⁴⁴ K β^- decay and 1994.2 10 from (n, γ) E=thermal.
		4650.1 [†] 9	12 7	0.0	0 ⁺	I_γ : from ⁴⁴ K β^- decay. In (n, γ), $I_\gamma(4651)/I_\gamma(1993)=1.43$.
4690.0	(1 ⁻ ,2,3,4 ⁺)	3532.9 [†] 6	100	1157.0208	2 ⁺	
4803.6	(1 ⁻ ,2,3,4 ⁺)	3647.2 [†] 6	100	1157.0208	2 ⁺	
4824.4	(1,2,3)	2167.8 6	100	2656.509	2 ⁺	
4848.39	1	4848.1 2	100	0.0	0 ⁺	E_γ : from (γ,γ').
4866.09	1	1285.0 ^a 10	≤ 10.7	3581.3	0 ⁺	
		2982.44 15	79 11	1883.516	0 ⁺	E_γ : weighted average of 2982.47 15 from ⁴⁴ K β^- decay and 2982.3 3 from (pol γ,γ'). I_γ : other: 79 27 from (pol γ,γ').
		3708.90 ^a 13	≤ 29	1157.0208	2 ⁺	
		4865.81 15	100 4	0.0	0 ⁺	E_γ : other: 4865.7 4 from (pol γ,γ'). I_γ : other: 100 27 from (pol γ,γ').
4884.02	(1,2,3)	1222.50 8	100 10	3661.527	1 ⁻	
		1575.9 3	36 11	3307.872	3 ⁻	
		3726.6 4	6.0 12	1157.0208	2 ⁺	

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)									
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	δ	$\alpha^@$	Comments
4892.6?		4892.3 ^a 8	100	0.0	0 ⁺				
4904.58	3 ⁻	2248.2 [‡] 5	63 [‡]	2656.509	2 ⁺				
		3747.2 [‡] 6	100 [‡]	1157.0208	2 ⁺				
4930.74	(6 ⁻)	1016.9 2	100 7	3913.80	5 ⁻	D			
		1218.8 3	48 7	3711.96	4 ⁻				
5005.69	4 ⁺	1092.2 [‡] 7	6.7 [‡]	3913.80	5 ⁻				
		1648.1 [‡] 5	69 [‡]	3357.29	(2 ⁺ ,3,4 ⁺)				
		2722.4 [‡] 3	100 [‡]	2283.119	4 ⁺				
		3848.9 [‡] 7	12.2 [‡]	1157.0208	2 ⁺				
5025.73	3 ⁻	1363.7 8	18 18	3661.527	1 ⁻				
		3868.56 22	100 27	1157.0208	2 ⁺				
		5025.4 8	2.7 18	0.0	0 ⁺				
5087.62	8 ⁺	1802.59 8	100	3285.004	6 ⁺	E2			B(E2)(W.u.)=6.1 +22-13 E _γ : from (¹⁴ C,α2nγ). Others: 1802 1 from (¹⁶ O,2pγ) and 1802.6 2 from (¹⁸ O,2p2nγ). Mult.: Q, ΔJ=2 from DCO in (¹⁸ O,2p2nγ); M2 ruled out by RUL.
5096.87	3 ⁻ ,4 ⁻	1183.1 [‡] 4	100	3913.80	5 ⁻				
5130.22	(2,3) ⁺	1773.3 [‡] 5	34 [‡]	3357.29	(2 ⁺ ,3,4 ⁺)				
		2846.9 3	100 [‡]	2283.119	4 ⁺				E _γ : weighted average of 2847.6 7 from ⁴⁴ K β ⁻ decay and 2846.8 3 from (n,γ) E=thermal.
		3973.1 [‡] 4	83 [‡]	1157.0208	2 ⁺				
5161.8	1	4005	1.8 18	1157.0208	2 ⁺				
		5161.33 63	100 6	0.0	0 ⁺				E _γ : unweighted average of 5161.96 10 from ⁴⁴ K β ⁻ decay and 5160.7 3 from (pol γ,γ').
5201.13	(1,2,3) ⁻	1525.0 ^a		3676.092	(2 ⁺)				
		1893.2 4	100 47	3307.872	3 ⁻				
		4044 ^a	≤2.6	1157.0208	2 ⁺				
5210.0	1 ⁺	1909	33 15	3301.36	2 ⁺	[M1,E2]			E _γ ,I _γ : from (γ,γ'). B(M1)(W.u.)=0.19 8 if M1, B(E2)(W.u.)=1.4×10 ² 6 if E2.
		2553	4 4	2656.509	2 ⁺	[M1,E2]			E _γ ,I _γ : from (γ,γ'). B(M1)(W.u.)<0.023 if M1, B(E2)(W.u.)<10 if E2.
		3326	80 2	1883.516	0 ⁺	M1			B(M1)(W.u.)=0.085 +16-15
		4053	65 2	1157.0208	2 ⁺	M1+E2	+0.27 8	1.07×10 ⁻³ 2	E _γ ,I _γ ,Mult.: from (γ,γ'). B(M1)(W.u.)=0.036 7; B(E2)(W.u.)=0.44 +27-23 E _γ ,I _γ ,Mult.,δ: from (γ,γ').

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	$\alpha^@$	Comments
5210.0	1 ⁺	5210	100 1	0.0	0 ⁺	M1 [#]	1.41×10 ⁻³ 2	B(M1)(W.u.)=0.028 5 E $_\gamma$,I $_\gamma$: from (γ , γ').
5230.33	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺	1872.7 ^{&‡} 3 2186.2 [‡] 10 2947.4 [‡] 3	<74 ^{&‡} 6.9 [‡] 100 [‡]	3357.29 3044.292 2283.119	(2 ⁺ ,3,4 ⁺) 4 ⁺ 4 ⁺			
5245.19	7 ⁻	1331.3 2	100 5	3913.80	5 ⁻	(E2)		E $_\gamma$,I $_\gamma$: from (¹⁸ O,2p2n γ).
		1960.2 2	97 7	3285.004	6 ⁺	(E1)		Mult.: $\Delta J=2$ from DCO in (¹⁸ O,2p2n γ). E $_\gamma$,I $_\gamma$: from (¹⁸ O,2p2n γ). Mult.: $\Delta J=1$ from DCO in (¹⁸ O,2p2n γ).
5289.25		3006.0 [‡] 4	100	2283.119	4 ⁺			
5300.5		1588.7 [‡] 4	100	3711.96	4 ⁻			
5325.0	(1,2,3)	4167.8 6	100 50	1157.0208	2 ⁺			
5342.2	(2) ⁺	4185.6 [‡] 8	100	1157.0208	2 ⁺			
5367.5	(1,2,3)	2711	1.0×10 ² 10	2656.509	2 ⁺			
		4210.1 10	30 27	1157.0208	2 ⁺			
5375.0	(2,3,4) ⁺	4217.9 [‡] 8	100	1157.0208	2 ⁺			
5458.9	(2,3,4) ⁺	3176.2 [‡] 7	100 [‡]	2283.119	4 ⁺			
		4301.7 [‡] 7	50 [‡]	1157.0208	2 ⁺			
5512.3		4355 ^a	100	1157.0208	2 ⁺			
5548.68	(2,3,4) ⁺	1872.7 ^{&‡} 3 2891.2 ^{‡a} 6 3265.4 [‡] 7 4391.5 [‡] 7	<540 ^{&‡} 63 [‡] 100 [‡] 72 [‡]	3676.092 2656.509 2283.119 1157.0208	(2 ⁺) 2 ⁺ 4 ⁺ 2 ⁺			
5561.0	3 ⁻	1884.5 10 4403.6 6 5561.3 ^a 10	100 75 15 10 13 10	3676.092 1157.0208 0.0	(2 ⁺) 2 ⁺ 0 ⁺			
5611.56	1	4454.1 8 5611.2 3	100 21 47 21	1157.0208 0.0	2 ⁺ 0 ⁺			
5646.79	8 ⁽⁺⁾	559.2 2	100 11	5087.62	8 ⁺	(M1)		E $_\gamma$,I $_\gamma$: from (¹⁸ O,2p2n γ). $\Delta J=0$ from DCO in (¹⁸ O,2p2n γ).
		1554.7 3	70 7	4092.04	(6 ⁺)	(E2)		E $_\gamma$,I $_\gamma$: from (¹⁸ O,2p2n γ).
		2361.6 4	75 7	3285.004	6 ⁺	(E2)		E $_\gamma$,I $_\gamma$: from (¹⁸ O,2p2n γ).
5733.30	(4,5) ⁺	1640.7 ^{&‡} 5 2376.1 [‡] 5 2688.7 [‡] 5	<42 ^{&‡} 16.7 [‡] 21.3 [‡]	4092.04 3357.29 3044.292	(6 ⁺) (2 ⁺ ,3,4 ⁺) 4 ⁺			

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)							
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
5733.30	(4,5) ⁺	3450.3 ^{±4}	100 [±]	2283.119	4 ⁺		
5775.76	(2,3,4) ⁺	2099.3 ^{±5}	49 [±]	3676.092	(2 ⁺)		
		2474.9 ^{±6}	24.8 [±]	3301.36	2 ⁺		
		2730.7 ^{±6}	33 [±]	3044.292	4 ⁺		
		3120.5 ^{±15}	12.8 [±]	2656.509	2 ⁺		
		3492.9 ^{±4}	100 [±]	2283.119	4 ⁺		
		4618.0 ^{±8}	37 [±]	1157.0208	2 ⁺		
5800.61	1	5800.2	100	0.0	0 ⁺		
5806.31	1 ⁻	5805.9	100	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=1.2×10 ⁻³ 2
5866.82	(4 ⁺ ,5 ⁺)	1773.3 ^{±5}	100 [±]	4093.7	(2 ⁺ ,3,4 ⁺)		
		2509.2 ^{±6}	23.1 [±]	3357.29	(2 ⁺ ,3,4 ⁺)		
		3583.4 ^{±6}	100 [±]	2283.119	4 ⁺		
5875.82	1 ⁻	5875.4	100	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=6.4×10 ⁻⁴ 10
5911.13	1	5910.7	100	0.0	0 ⁺		
5971.30	8 ⁽⁻⁾	726.1	100 6	5245.19	7 ⁻	(M1)	E _γ , I _γ : from (¹⁸ O,2p2nγ). ΔJ=1 from DCO in (¹⁸ O,2p2nγ).
		883.7	71 6	5087.62	8 ⁺		E _γ , I _γ : from (¹⁸ O,2p2nγ).
		1040.5	42.9 29	4930.74	(6 ⁻)	Q	E _γ , I _γ : from (¹⁸ O,2p2nγ). ΔJ=2 from DCO in (¹⁸ O,2p2nγ).
6040.0	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺	2682.8 ^{±6}	100	3357.29	(2 ⁺ ,3,4 ⁺)		
6082.9	1 ⁺	4199.5	62 12	1883.516	0 ⁺	M1 [#]	B(M1)(W.u.)=0.043 10
		4925.3	41 7	1157.0208	2 ⁺	[M1,E2]	B(M1)(W.u.)=0.018 4 if M1, B(E2)(W.u.)=2.0 5 if E2.
		6080.1	100 7	0.0	0 ⁺	M1 [#]	B(M1)(W.u.)=0.023 4
6136.59	1 ⁻	4978.5	46 7	1157.0208	2 ⁺	[E1]	B(E1)(W.u.)=0.00109 19
		6136.4	100 5	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=0.00127 18
6146.14	(4,5) ⁺	2053.9 ^{±5}	86 [±]	4092.04	(6 ⁺)		
		2223.3 ^{±20}		3922.71	5 ⁻		
		3861.7 ^{±7}	100 [±]	2283.119	4 ⁺		
6211.4		2297.5 ^{±6}	100	3913.80	5 ⁻		
6245.48	1	6245.0	100	0.0	0 ⁺		
6422.12	1 ⁻	4539.9	5.2 7	1883.516	0 ⁺	E1 [#]	B(E1)(W.u.)=0.0013 2
		5263.8	5.5 7	1157.0208	2 ⁺	E1 [#]	B(E1)(W.u.)=8.8×10 ⁻⁴ 14
		6421.6	100 1	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=0.0088 +9-8
6446.5	1 ⁺	5288.0	50 14	1157.0208	2 ⁺	[M1,E2]	B(M1)(W.u.)=0.0084 +24-26 if M1, B(E2)(W.u.)=0.84 +24-26 if E2.
		6446.3	100 10	0.0	0 ⁺	M1 [#]	B(M1)(W.u.)=0.0093 +24-22

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)							Comments
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	
6507.1	1	6506.6 5	100	0.0	0 ⁺		
6657.65	9 ⁽⁻⁾	1412.4 3	59 4	5245.19	7 ⁻	(E2)	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=2$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
		1570.0 2	100 6	5087.62	8 ⁺	(E1)	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
6672.92		2088.2 [‡] 5	100 [‡]	4584.08	(2 ⁺ , 3, 4 ⁺)		
		2896.7 ^{‡a} 6	18.4 [‡]	3776.27	2 ⁻		
		3628.9 [‡] 7	34.5 [‡]	3044.292	4 ⁺		
6675.44	1	6674.9 2	100	0.0	0 ⁺		
6960.7	1	6960.1 6	100	0.0	0 ⁺		
6972.14	1	5815.0 5	100 15	1157.0208	2 ⁺		
		6971.5 2	52 15	0.0	0 ⁺		
7065.9	1	7065.3 9	100	0.0	0 ⁺		
7092.76	(9 ⁻)	435.1 3	39	6657.65	9 ⁽⁻⁾		E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
		1121.5 4	78	5971.30	8 ⁽⁻⁾		E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
		1445.9 3	100 11	5646.79	8 ⁽⁺⁾	D	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
		2005.1 2	67 6	5087.62	8 ⁺	(E1)	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
7226.04	1	7225.4 3	100	0.0	0 ⁺		
7275.2	1	7274.5 9	100	0.0	0 ⁺		
7403.0	1	7402.3 8	100	0.0	0 ⁺		
7470.92	(10 ⁺)	1824.1 2	100 8	5646.79	8 ⁽⁺⁾	Q	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=2$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
		2383.2 3	55 6	5087.62	8 ⁺	Q	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=2$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
7556.58	(9)	2468.9 3	100	5087.62	8 ⁺	(D)	E_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=(1)$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
7572.0	1 ⁽⁺⁾	7571.3 5	100	0.0	0 ⁺	(M1) [#]	B(M1)(W.u.)=0.020 5
7578.90	1 ⁻	7578.2 3	100	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=0.0025 3
7662.1	1 ⁻	7661.4 6	100	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=2.6×10 ⁻⁴ 8
7783.3	1 ⁻	7782.6 10	100	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=2.7×10 ⁻⁴ +10-8
7808.9	1 ⁻	7808.2 16	100	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=1.4×10 ⁻⁴ 5
7828.9	1	7828.1 12	100	0.0	0 ⁺		
7834.8	1 ⁻	7834.0 8	100	0.0	0 ⁺	E1 [#]	B(E1)(W.u.)=3.8×10 ⁻⁴ +10-9
7879.97	(10 ⁻)	323.4 2	33.3	7556.58	(9)	D	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)							Comments
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	
7879.97	(10 ⁻)	787.2 2	100 8	7092.76	(9 ⁻)	(M1)	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=1$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
		1908.6 3	74 8	5971.30	8 ⁽⁻⁾	Q	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=2$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
7953.1	1	5293.8 14	100	2656.509	2 ⁺		
		7952.6 5	100	0.0	0 ⁺		
8070.2	1	8069.4 7	100	0.0	0 ⁺		
8086.0	1	8085.2 7	100	0.0	0 ⁺		
8286.28	(11 ⁻)	1628.6 2	100.0 63	6657.65	9 ⁽⁻⁾	(E2)	E_γ, I_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=2$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
8321.5	1	8320.7 16	100	0.0	0 ⁺		
8395.3	1	8394.4 4	100	0.0	0 ⁺		
8405.4	1	8404.5 17	100	0.0	0 ⁺		
8556.7	1 ⁻	8555.8 8	100	0.0	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=3.6\times 10^{-4} +15-13$
8615.2	1 ⁻	8614.3 12	100	0.0	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=3.7\times 10^{-4} 11$
8801.9	1 ⁻	8800.9 29	100	0.0	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=7.2\times 10^{-5} +4-3$
8828.0	1 ⁻	6944.6 18	100 14	1883.516	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=0.0011 +4-3$
		8826.6 14	89 23	0.0	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=4.7\times 10^{-4} +17-15$
8851.5	1 ⁻	7692.9 18	19 8	1157.0208	2 ⁺	E1 [#]	$B(E1)(\text{W.u.})=2.7\times 10^{-4} 11$
		8850.7 7	100 6	0.0	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=9.4\times 10^{-4} +21-19$
8908.8	1 ⁻	8907.8 7	100	0.0	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=0.0023 4$
9024.1	1 ⁻	9023.1 20	100	0.0	0 ⁺	E1 [#]	
9148.4	1 ⁻	9147.4 24	100	0.0	0 ⁺	E1 [#]	
9273.6	1 ⁻	9272.5 8	100	0.0	0 ⁺	E1 [#]	$B(E1)(\text{W.u.})=6.2\times 10^{-4} 14$
9317.2	1 ⁻	9316.1 10	100	0.0	0 ⁺	E1 [#]	
9664.9	1 ⁻	8508.5 33	17 8	1157.0208	2 ⁺		
		9663.7 7	100 6	0.0	0 ⁺	E1 [#]	
9788.6		2317.6 6	100	7470.92	(10 ⁺)		E_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
9814.1	1 ⁻	9812.9 11	100	0.0	0 ⁺	E1 [#]	
9859.5	(12 ⁻)	1979.5 3	100	7879.97	(10 ⁻)	(E2)	E_γ : from ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$). $\Delta J=2$ from DCO in ($^{18}\text{O}, 2\text{p}2\text{n}\gamma$).
9898.2	1 ⁻	9897.0 10	100	0.0	0 ⁺	E1 [#]	
10567.8	(13 ⁻)	2281.5 4	100	8286.28	(11 ⁻)	Q	
(11131.60)	3 ⁻ , 4 ⁻	4457.9 [‡] 7	27.3 [‡]	6672.92			
		4919.9 [‡] 7	12.9 [‡]	6211.4			
		4984.4 [‡] 5	16.1 [‡]	6146.14	(4,5) ⁺		

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}^{\dagger}</u>	<u>I_{γ}^{\dagger}</u>	<u>E_f</u>	<u>J_f^{π}</u>
(11131.60)	3 ⁻ ,4 ⁻	5091.6 ^{\dagger} 8	5.7 ^{\dagger}	6040.0	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺
		5264.4 ^{\dagger} 5	17.1 ^{\dagger}	5866.82	(4 ⁺ ,5 ⁺)
		5355.7 ^{\dagger} 5	41 ^{\dagger}	5775.76	(2,3,4) ⁺
		5397.8 ^{\dagger} 5	54 ^{\dagger}	5733.30	(4,5) ⁺
		5582.4 ^{\dagger} 5	14.2 ^{\dagger}	5548.68	(2,3,4) ⁺
		5673.0 ^{\dagger} 7	7.2 ^{\dagger}	5458.9	(2,3,4) ⁺
		5756.3 ^{\dagger} 7	12.2 ^{\dagger}	5375.0	(2,3,4) ⁺
		5789.5 ^{\dagger} 7	5 ^{\dagger}	5342.2	(2) ⁺
		5831.4 ^{\dagger} 7	14.4 ^{\dagger}	5300.5	
		5841.9 ^{\dagger} 5	16.8 ^{\dagger}	5289.25	
		5900.9 ^{\dagger} 5	100 ^{\dagger}	5230.33	2 ⁺ ,3 ⁺ ,4 ⁺ ,5 ⁺
		6001.3 ^{\dagger} 6	49 ^{\dagger}	5130.22	(2,3) ⁺
		6034.4 ^{\dagger} 6	16.9 ^{\dagger}	5096.87	3 ⁻ ,4 ⁻
		6125.3 ^{\dagger} 6	53 ^{\dagger}	5005.69	4 ⁺
		6226.7 ^{\dagger} 8	12.1 ^{\dagger}	4904.58	3 ⁻
		6328.3 ^{\dagger} 6	8.5 ^{\dagger}	4803.6	(1 ⁻ ,2,3,4 ⁺)
		6441.1 ^{\dagger} 8	5.6 ^{\dagger}	4690.0	(1 ⁻ ,2,3,4 ⁺)
		6480.2 ^{\dagger} 6	33 ^{\dagger}	4650.3	2 ⁺
		6546.6 ^{\dagger} 6	33.9 ^{\dagger}	4584.08	(2 ⁺ ,3,4 ⁺)
		6566.4 ^{\dagger} 6	8 ^{\dagger}	4564.87	(5 ⁻)
		6651.3 ^{\dagger} 8	6 ^{\dagger}	4479.9	2 ⁺
		6731.9 ^{\dagger} 10	2.01 ^{\dagger}	4399.2	3 ⁻
		6772.3 ^{\dagger} 6	10.8 ^{\dagger}	4358.440	3 ⁻
		6935.2 ^{\dagger} 6	12.6 ^{\dagger}	4196.10	2 ⁺
		7119.7 ^{\dagger} 10	1.15 ^{\dagger}	4011.4	
		7208.1 ^{\dagger} 6	22.2 ^{\dagger}	3922.71	5 ⁻
		7354.2 ^{\dagger} 8	7 ^{\dagger}	3776.27	2 ⁻
		7418.8 ^{\dagger} 6	10.6 ^{\dagger}	3711.96	4 ⁻
		7454.4 ^{\dagger} 10	1.15 ^{\dagger}	3676.092	(2 ⁺)
		7773.4 ^{\dagger} 6	44 ^{\dagger}	3357.29	(2 ⁺ ,3,4 ⁺)
		7822.3 ^{\dagger} 10	2.44 ^{\dagger}	3307.872	3 ⁻
		7829.3 ^{\dagger} 8	8.6 ^{\dagger}	3301.36	2 ⁺

Adopted Levels, Gammas (continued)

$\gamma(^{44}\text{Ca})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Comments
(11131.60)	$3^-, 4^-$	8086.4 [‡] 7	9.6 [‡]	3044.292	4 ⁺	
		8474.3 [‡] 10	1 [‡]	2656.509	2 ⁺	
		8848.0 [‡] 7	5.3 [‡]	2283.119	4 ⁺	
		9974.3 [‡] 8	1.58 [‡]	1157.0208	2 ⁺	
12188.1		2399.5 7	100	9788.6		E_γ : from ($^{18}\text{O}, 2p2n\gamma$).

[†] From ^{44}K β^- decay up to 5561 level, and from (γ, γ') , (pol γ, γ') above that, unless otherwise noted.

[‡] From (n, γ) E=thermal.

From γ (linear polarization) in (polarized γ, γ').

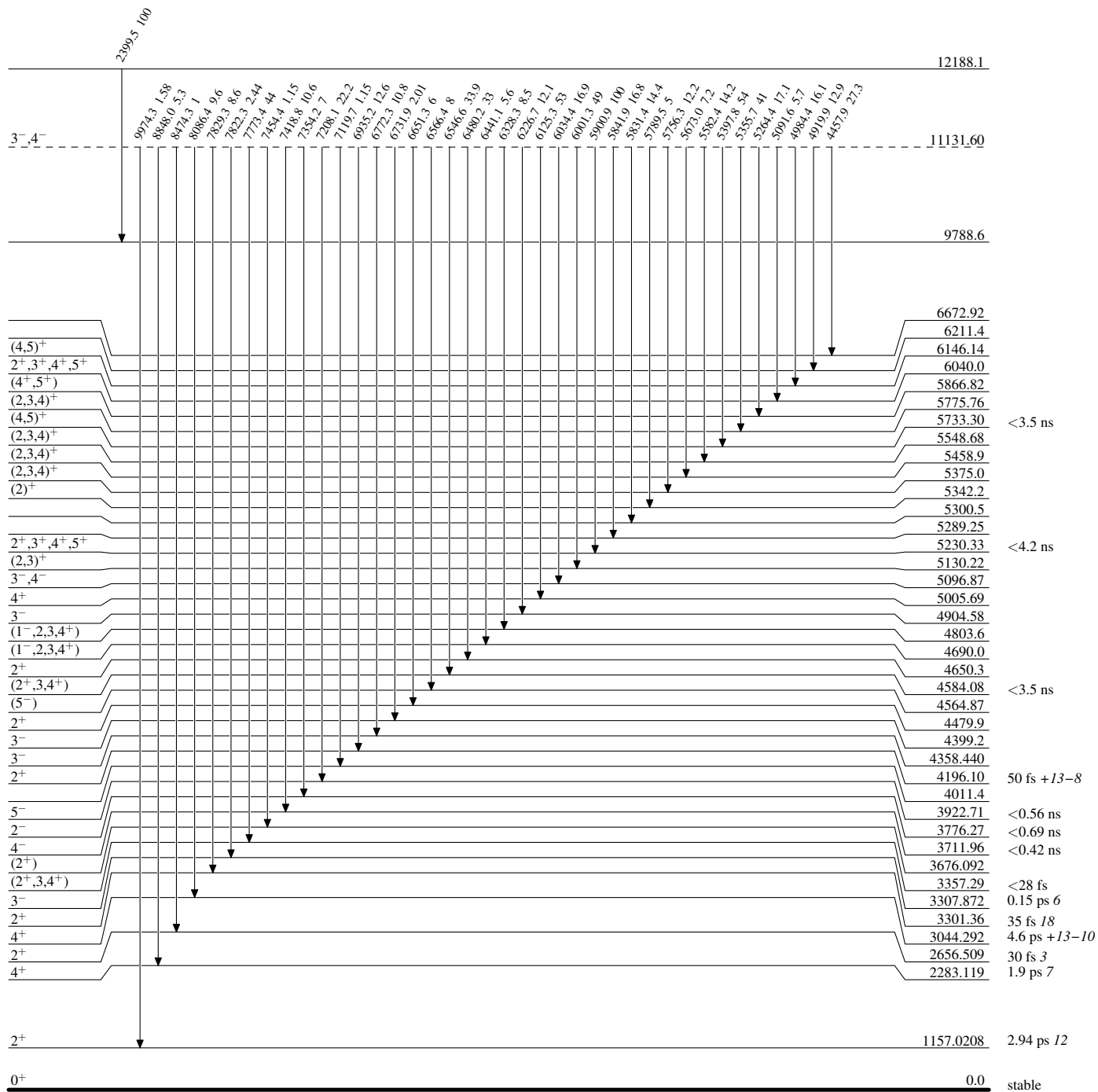
@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

& Multiply placed with undivided intensity.

^a Placement of transition in the level scheme is uncertain.

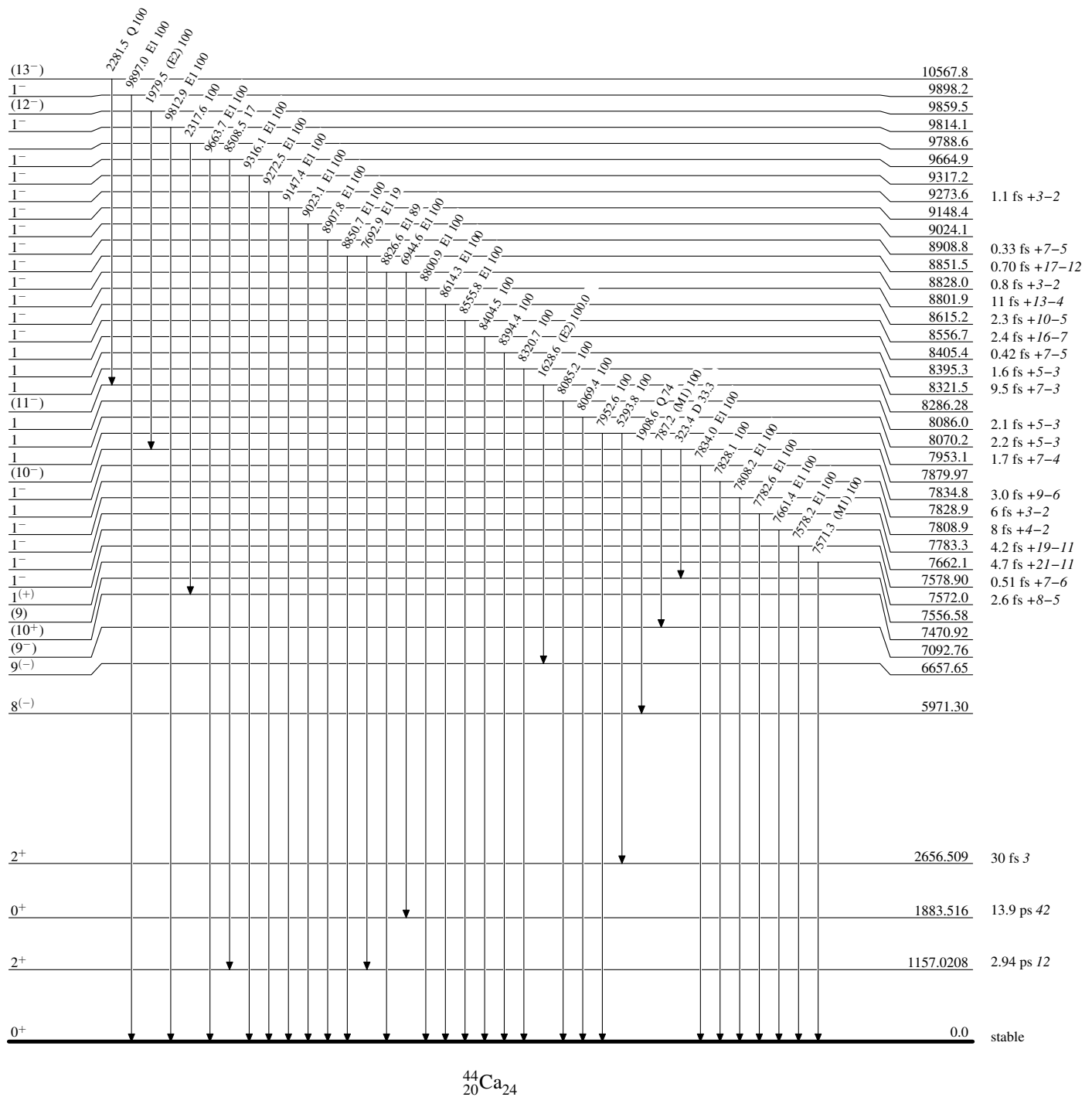
Adopted Levels, Gammas**Level Scheme**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level

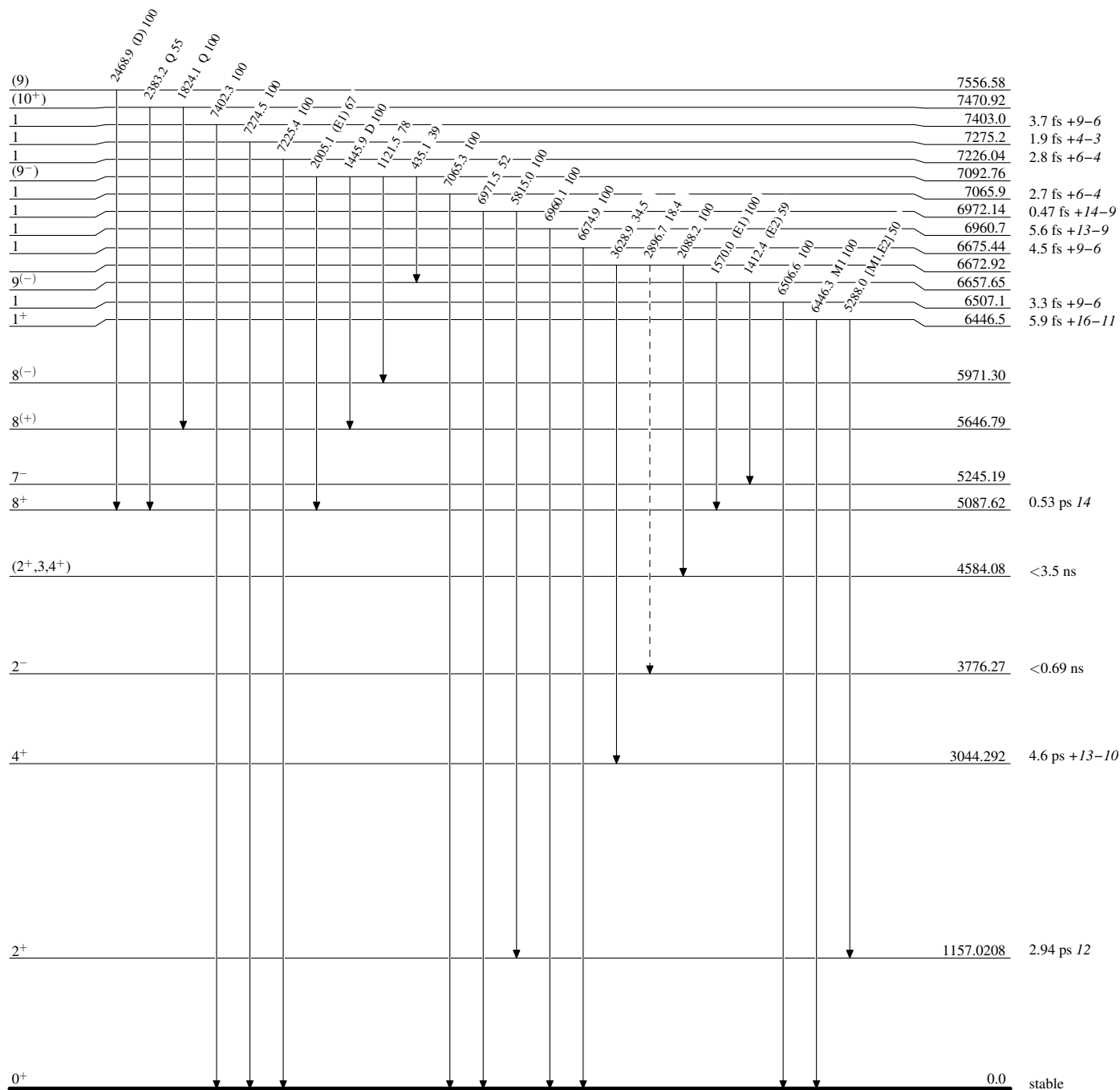


Adopted Levels, Gammas

Legend

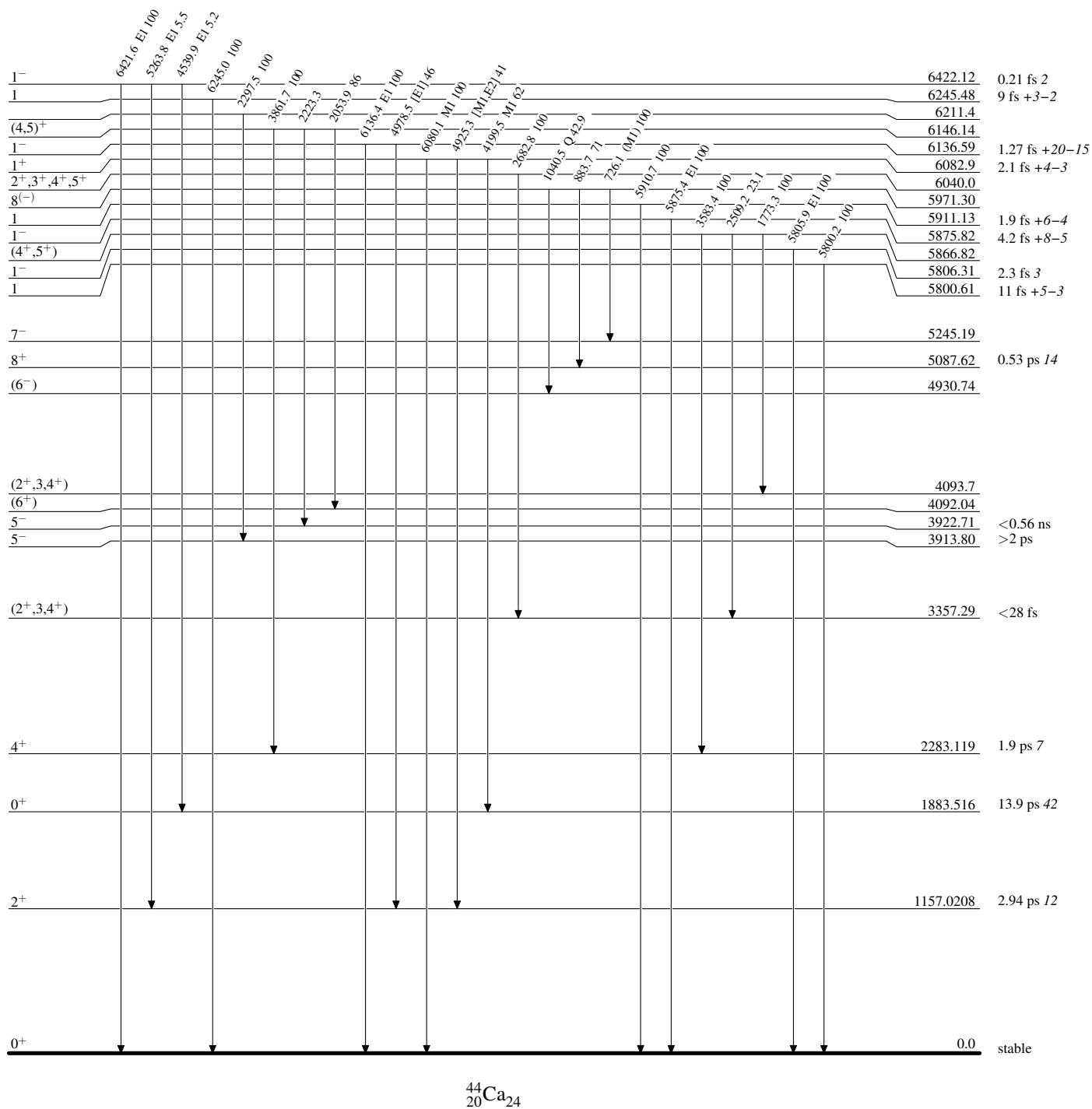
Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)


Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



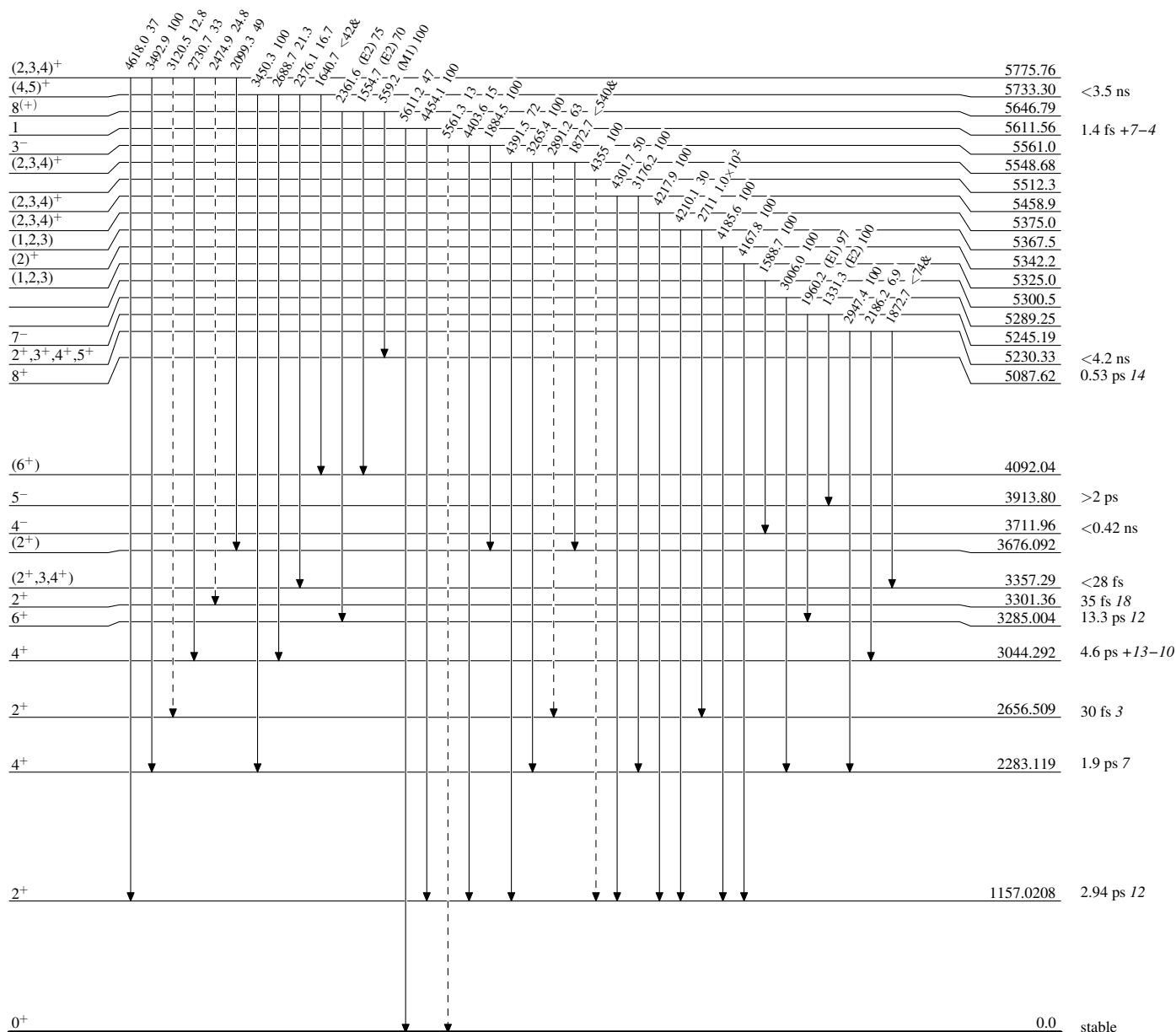
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

-----► γ Decay (Uncertain)



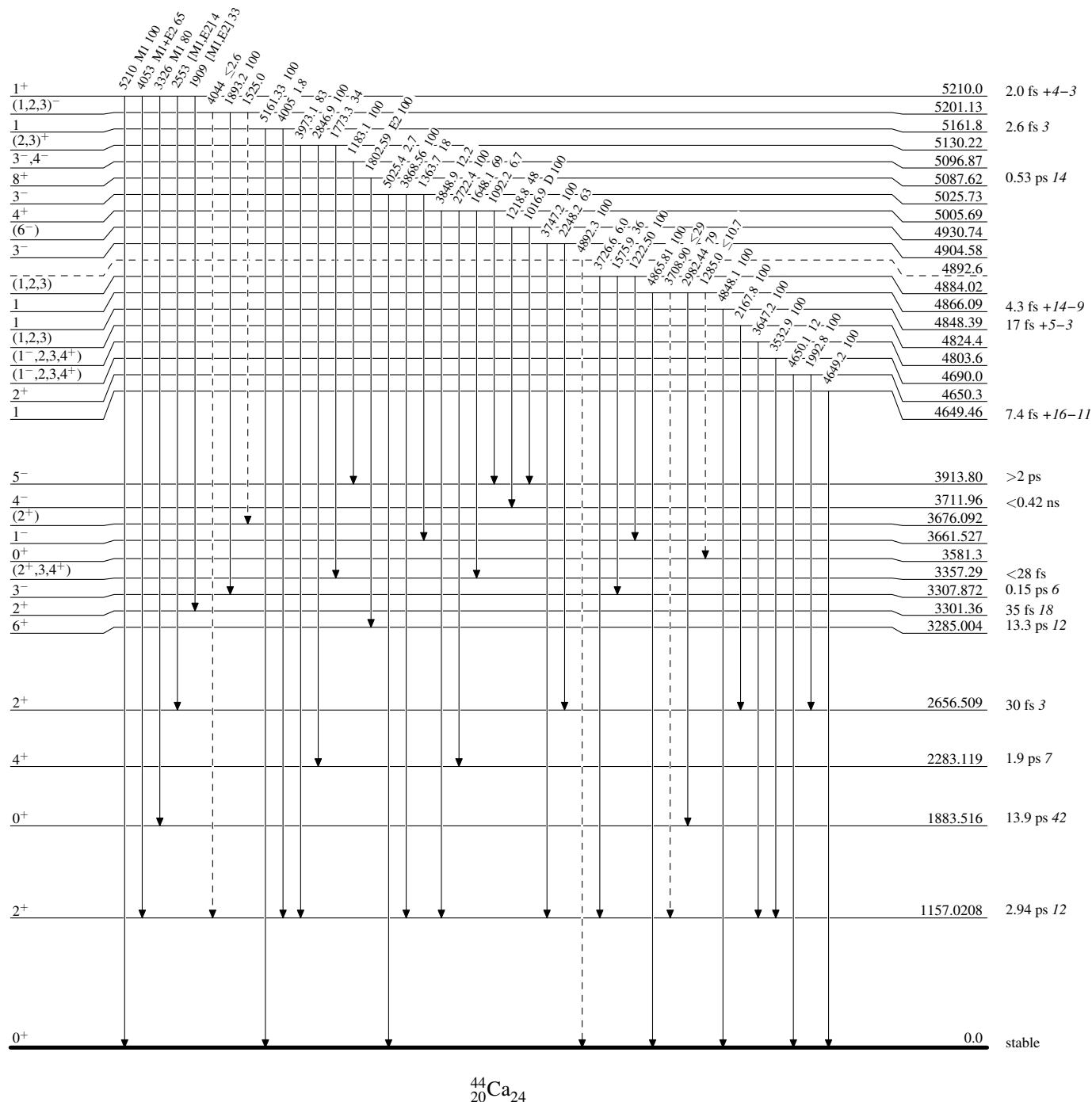
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

-----> γ Decay (Uncertain)

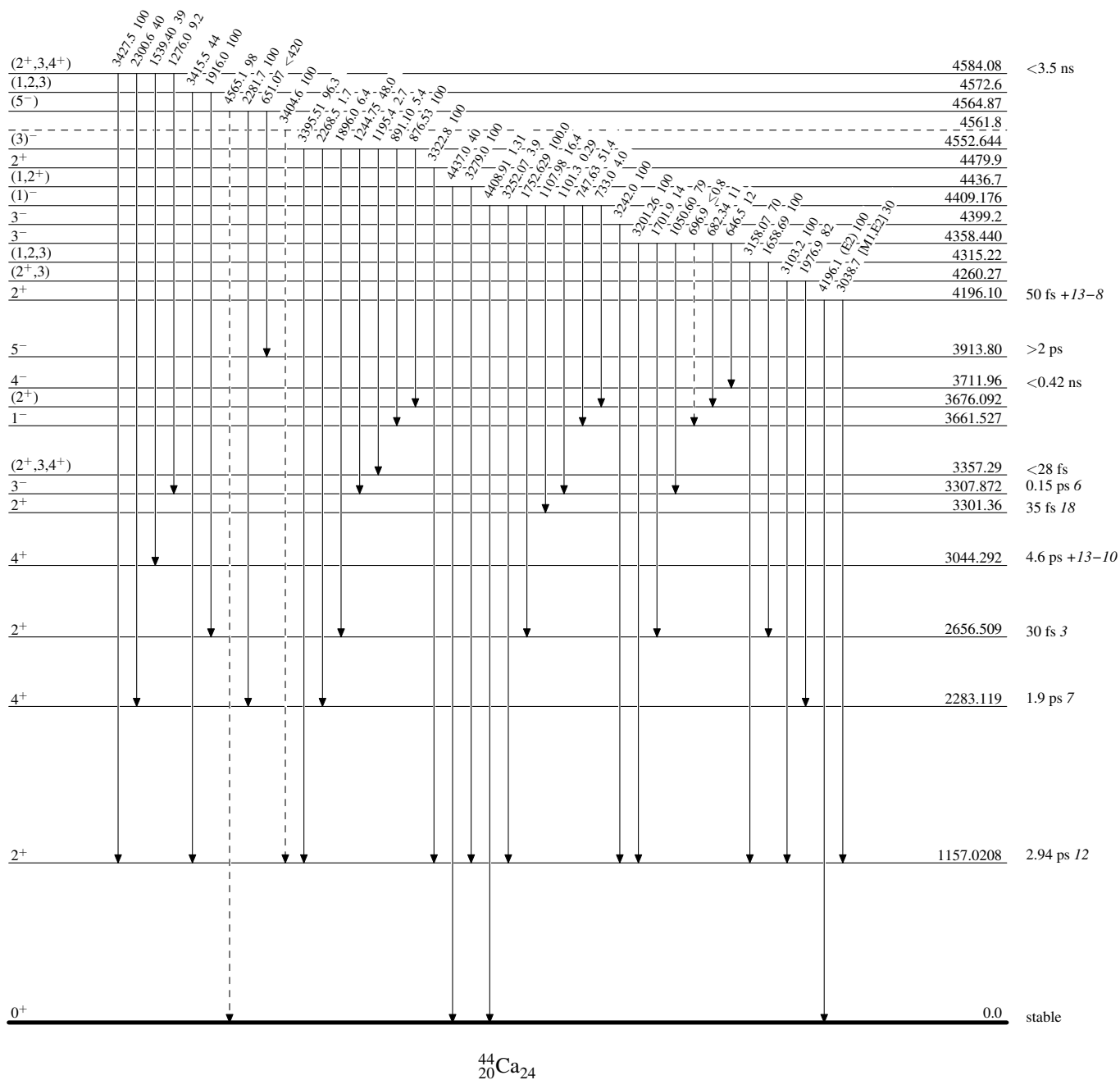

 $^{44}_{20}\text{Ca}_{24}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

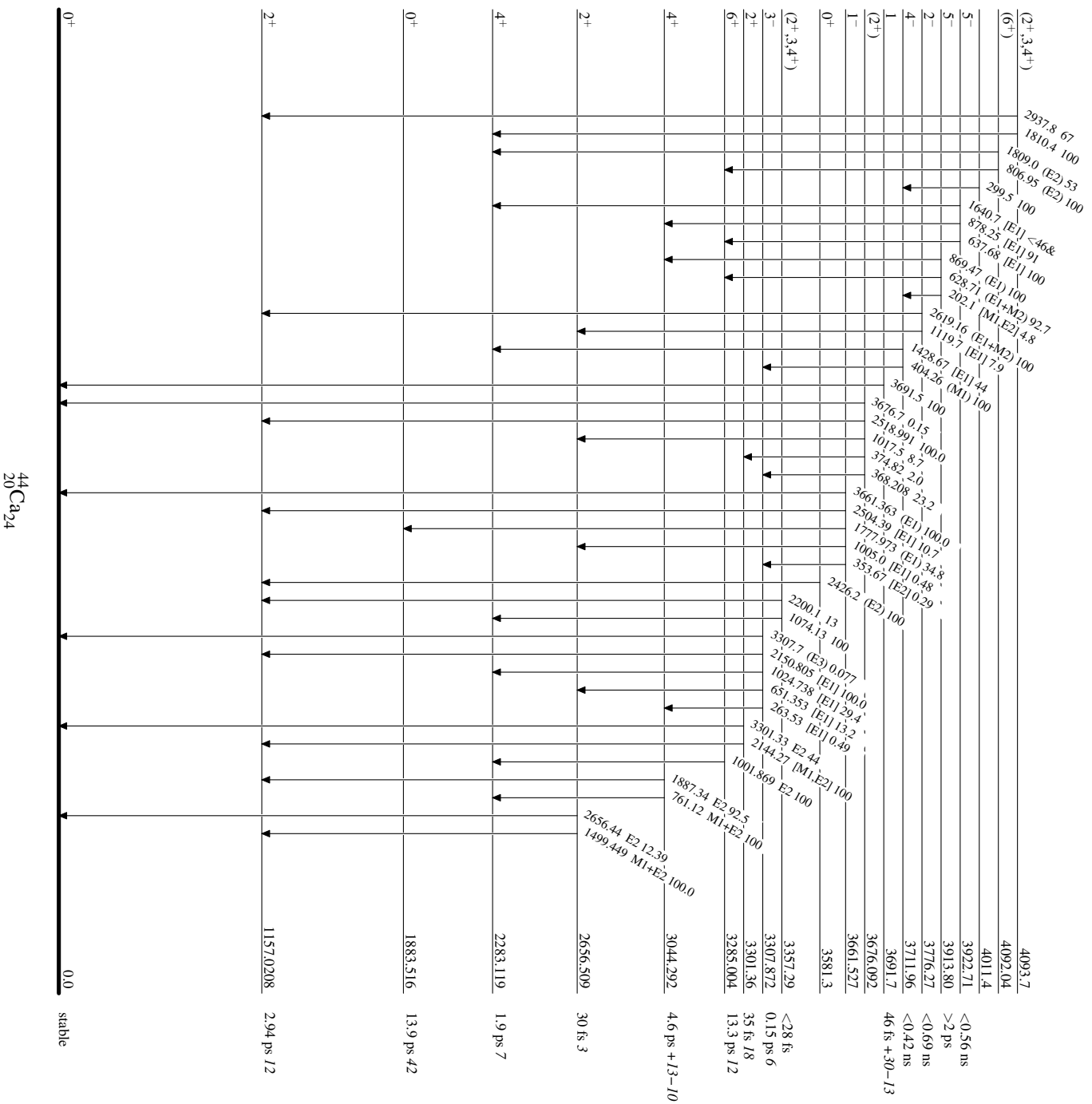
Intensities: Relative photon branching from each level
& Multiplied: undivided intensity given

-----► γ Decay (Uncertain)

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



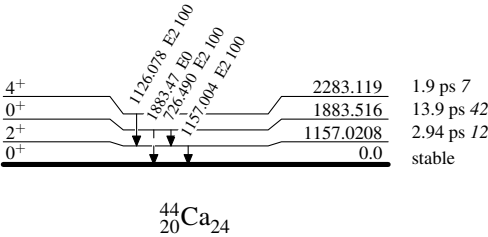
Adopted Levels, Gammas

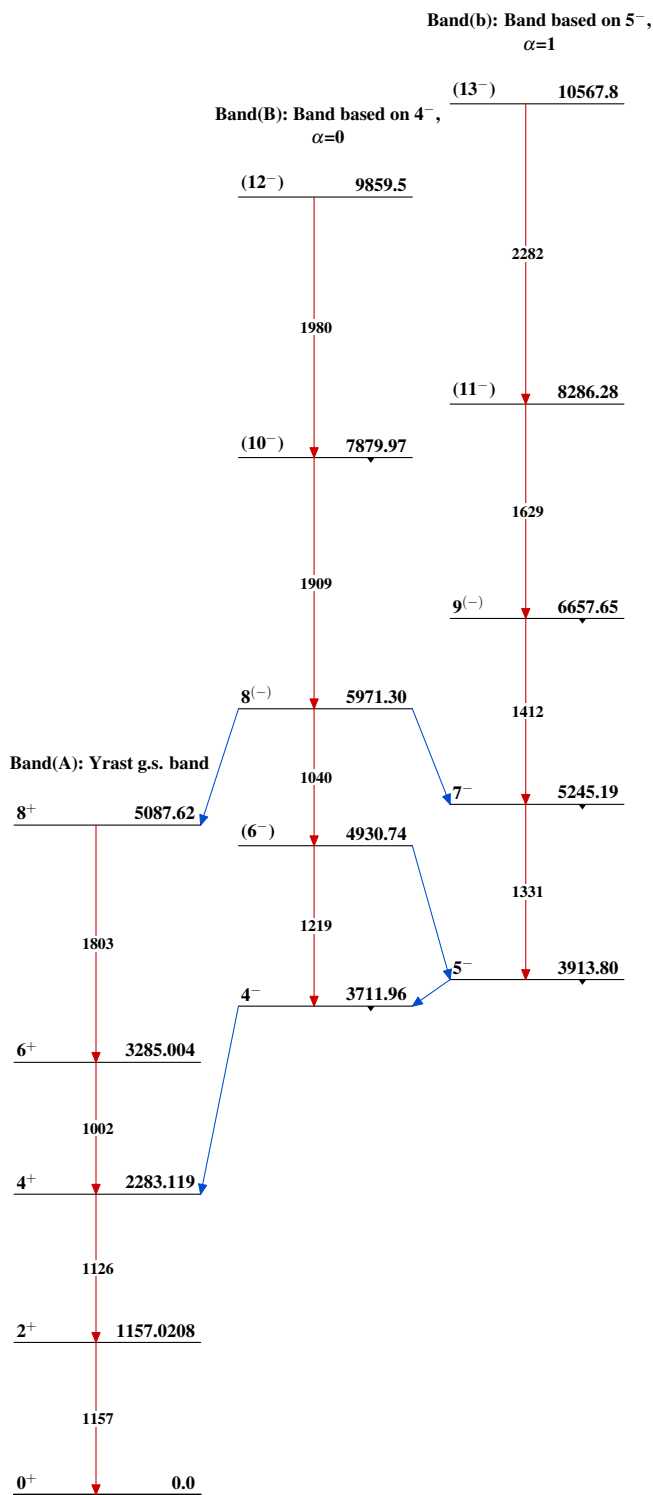
Level Scheme (continued)

Legend

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

-----► γ Decay (Uncertain)



Adopted Levels, Gammas $^{44}_{20}\text{Ca}_{24}$