Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan	NDS 133, 1 (2016)	30-Sep-2015

Q(β^-)=−6495.48 *16*; S(n)=8362.82 *14*; S(p)=8891.37 *15*; Q(α)=−6615.15 *25* 2012Wa38

^{41}Ca Levels

Cross Reference (XREF) Flags

A	^{41}Sc ε decay (596.3 ms)	O	^{40}Ca(pol d,p),(d,p)	AB	^{40}Ca(^{9}Be,^{8}Be)
B	(HI,xnγ)	P	^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ)	AC	^{40}Ca(^{11}B,^{10}B)
C	^{38}Ar(α,nγ)	Q	^{40}Ca(t,d)	AD	^{40}Ca(^{12}C,^{11}C)
D	^{39}K(^{7}Li,αnγ),^{40}Ca(^{3}He,2pγ)	R	^{40}Ca(α,^{3}He)	AE	^{40}Ca(^{13}C,^{12}C)
E	^{40}Ca(α,2pnγ)	S	^{40}Ca(p,π^+),(pol p,π^+)	AF	^{40}Ca(^{14}C,^{13}C)
F	^{40}Ca(n,γ),(pol n,γ) E=thermal	T	^{41}Ca(p,p′)	AG	^{40}Ca(^{14}N,^{13}N)
G	^{40}Ca(n,γ)	U	^{41}Ca(α,α′)	AH	^{40}Ca(^{17}O,^{16}O)
H	^{39}K(^{3}He,p)	V	^{42}Ca(p,d)	AI	^{40}Ca(^{18}O,^{17}O)
I	^{39}K(^{3}He,pγ)	W	^{42}Ca(d,t)	AJ	^{40}Ca(^{28}Si,^{27}Si)
J	^{39}K(α,d)	X	^{42}Ca(^{3}He,α)	AK	^{40}Ca(^{32}S,^{31}S)
K	^{40}K(d,n)	Y	^{42}Ca(^{3}He,$\alpha\gamma$)	AL	^{42}Ca(^{48}Ti,^{49}Ti)
L	^{40}K(^{3}He,d)	Z	^{43}Ca(p,t)	AM	^{41}Ca(e,e)
M	^{41}K(p,nγ)	Others:		AN	^{40}Ca(n,n):resonances
N	^{41}K(^{3}He,t)	AA	^{40}Ca(^{7}Li,^{6}Li)		

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	7/2$^-$	9.94×10^4 y *15*	ABCDEFGHIJKLMNOPQRSTUVWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN %ε=100 Q=−0.0665 *18* (2008Py01); μ=−1.594781 *9* (1962Br30) J$^\pi$: from L(d,p)=3 and (pol d,p); configuration=πf7/2. μ,Q: See compilation in 2014StZZ and recommended Q in 2013StZZ. T$_{1/2}$: From a combination of methods consisting of triple-to-double coincidence ratios method (TDCR) with the liquid scintillation counting and the thermal ionization mass spectrometry (TIMS) with isotope dilution for absolute isotopic composition (2012Jo04). Others: 1.03×10^5 y *7* (1991Kl06, 1990Fi13), 1.01×10^5 y *10* (1991Pa10), 1.03×10^5 y *4* (1989Ku33), 1.03×10^5 y *4* (1974Ma30) revised to 1.14×10^5 y *5* by 1991Kl06, 1.3×10^5 y *2* (1972Em01), 0.75×10^5 y *11* (1962Dr02) revised to 1.60×10^5 y *30* by 1991Kl06, 1.1×10^5 y *3* (1953Br71) revised to 1.90×10^5 y *60* by 1991Kl06.
1942.88 *17*	3/2$^-$[b]	0.42 ps *5*	CD FGHI M OPQRsTUVWXYZ	XREF: Others: AA, AE, AF, AG, AH, AI T$_{1/2}$: weighted average of 0.42 ps *10* from ^{38}Ar(α,nγ), 0.28 ps *9* from ^{41}K(p,nγ), and 0.47 ps *5* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ), all from DSAM.
2009.73 *21*	3/2$^+$[a]	0.505 ns *12*	BCD FGHIJ MNOPQRST VWXYZ	XREF: Others: AH T$_{1/2}$: weighted average of 0.46 ns *5* from

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Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				(HI,xnγ), 0.56 ns *14* from ^{41}K(p,nγ), and 0.506 ns *12* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Other: >3.1 ps from ^{38}Ar(α,nγ).
2462.38 *17*	3/2^{-}[b]	3.4 ps *10*	CD FGHI M OP R TUVWX Z	XREF: Others: AA, AB, AE, AF, AH, AI $T_{1/2}$: weighted average of 2.4 ps *6* from ^{38}Ar(α,nγ) and 4.4 ps *6* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Other: >0.5 ps from ^{41}K(p,nγ).
2576.0 *6*	5/2^{-}[&]	0.16 ps *4*	A C FGHI LM OP R TU X Z	XREF: Others: AB, AE Jπ: L(^{3}He,d)=1+3 for a 2587 group from 4^{-} target implying π=+ is discrepant. $T_{1/2}$: weighted average of 0.107 ps *28* from ^{38}Ar(α,nγ) and 0.180 ps *20* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Other: 66 ps *21* from ^{41}K(p,nγ).
2605.5 *3*	5/2^{+}[c]	0.35 ps *6*	C GHI MNOP R TU XYZ	Jπ: From L(p,t)=1+3 from 7/2^{-} target. L(^{3}He,α)=3 for a 2610 group implying π=− is discrepant. $T_{1/2}$: weighted average of 0.27 ps *7* from ^{38}Ar(α,nγ) and 0.39 ps *5* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Other: 0.111 ps *35* from ^{41}K(p,nγ).
2670.24 *25*	1/2^{+}	2.2 ps *5*	CD FGH MNOP R T VWXYZ	E(level): 2680 in (^{3}He,α). Jπ: L(d,p)=0. $T_{1/2}$: weighted average of 1.7 ps *5* from ^{38}Ar(α,nγ) and 2.8 ps *6* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Other: 0.28 ps *+29−18* from ^{41}K(p,nγ).
2884.5 *6*	7/2^{+}[c]	21 fs *17*	C HI LMNOP R TUV X Z	$T_{1/2}$: from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Others:< 14 fs from ^{38}Ar(α,nγ),≤ 14 fs from ^{41}K(p,nγ).
2959.3 *6*	7/2^{-}[c]	28 fs *7*	A C GHI M OP R TUVWXYZ	$T_{1/2}$: weighted average of 24 fs *7* from ^{38}Ar(α,nγ) and 41 fs *13* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Other: <28 fs from ^{41}K(p,nγ).
3049.86 *23*	3/2^{+}[c]	0.7 ps *3*	CD FGH NOP R T V Z	E(level): 3080 in (p,d). $T_{1/2}$: weighted average of 0.49 ps *14* from ^{38}Ar(α,nγ) and 1.12 ps *+19−15* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
3131? *5*			H O	
3201.39[d] *16*	9/2^{+}@[d]	31 fs *10*	BCDE HI M OP R TUV XYZ	Jπ: (5/2^{-},7/2^{-}) from L(^{3}He,α)=(3) for a 3210 group is in disagreement. $T_{1/2}$: weighted average of 35 fs *14* from ^{38}Ar(α,nγ), 40 fs *20* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ) and 19 fs *17* from ^{41}K(p,nγ).
3369.61 *13*	11/2^{+}[c]	20.6 ps *8*	BCDE H J L OP R TU Z	$T_{1/2}$: from (HI,xnγ). Others: >3.1 ps ^{38}Ar(α,nγ), < 2.8 ns ^{39}K(^{7}Li,αnγ),^{40}Ca(^{3}He,2pγ).
3399.9 *3*	1/2^{+}	82 fs *21*	C FGHI NOP R TUVWXYZ	XREF: Others: AA, AB XREF: H(3408). E(level): 3450 in (d,t). Jπ: L(d,p)=0. $T_{1/2}$: from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ). Other: <69 fs from ^{38}Ar(α,nγ).
3494.8 *4*	5/2^{+}[a]	0.28 ps *6*	C G L OP T v	E(level): 3510 in (p,d). $T_{1/2}$: weighted average of 0.24 ps *8* from ^{38}Ar(α,nγ) and 0.30 ps *6* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
3526.6[d] *6*	3/2^{+}[cd]	38 fs *17*	C F H NOP R TUvWXYZ	Jπ: 5/2^{-},7/2^{-} from L(^{3}He,α)=3 for a 3527 *12* group is in disagreement. $T_{1/2}$: weighted average of 69 fs *42* from ^{38}Ar(α,nγ) and 33 fs *17* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).

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Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
3613.63 *22*	1/2$^-$[b]	0.11 ps *5*	C Fg LM OP r x	$T_{1/2}$: from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
3614.4 *8*	7/2$^+$[c]	15 fs *9*	C g M P r TU x Z	$T_{1/2}$: from ^{41}K(p,nγ). Other: <17 fs from ^{38}Ar(α,nγ).
3677.0 *6*	9/2$^-$[c]	45 fs *12*	C H OP R TU Z	XREF: H(3686). E(level): 3686 in (pol d,p),(d,p). $T_{1/2}$: weighted average of 44 fs *12* from ^{38}Ar(α,nγ) and 53 fs *28* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
3730.8 *3*	3/2$^-$[b]	45 fs *14*	C G M OP	$T_{1/2}$: weighted average of 52 fs *14* from ^{38}Ar(α,nγ) and 38 fs *14* from ^{41}K(p,nγ). Other: 0.26 ps *5* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
3736.7 *15*			F	
3740.3 *4*	(3/2,5/2)$^+$[c]	<35[e] fs	C F HI L NOP R TUVWXYZ	XREF: N(3754). Jπ: π=+ is also supported by L(^{3}He,d)=1 from 4$^-$ target and L(^{3}He,p)=0+2 from 3/2$^+$ target. 5/2$^+$ was proposed in an earlier (pol d,p) study (1972Ko41), but this level was not reported in recent (pol d,p) work (1994Uo01,1990Ec01).
3829.87 *17*	15/2$^+$[c]	3.02 ns *13*	BCDE G JKL OP R TU Z	μ=+2.18 *15* (1975Yo05) $T_{1/2}$: weighted average of 3.00 ns *10* from (HI,xnγ) and 3.8 ns *6* from ^{39}K(^{7}Li,αnγ),^{40}Ca(^{3}He,2pγ). Other: >3.12 ps from ^{38}Ar(α,nγ).
3845.9 *7*	1/2$^+$	111[f] fs *31*	FGH K NOP VWXY	E(level): 3862 in (^{3}He,α). Jπ: L(d,p)=L(d,t)=0.
3914.79 *21*	13/2$^+$[c]	1.5 ps *3*	BCDE G JKL OP R TU Z	$T_{1/2}$: weighted average of 1.9 ps *4* from (HI,xnγ) and 1.21 ps *31* from ^{38}Ar(α,nγ).
3920	1/2$^+$		W	Jπ: L(d,t)=0.
3944.5 *3*	1/2$^-$[b]	<20[f] fs	FGH OP RSTU X	XREF: Others: AA, AB
3974.3 *5*	7/2$^+$[c]	24[e] fs *10*	C jkl OP r tu	$T_{1/2}$: other: 88 fs *35* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
3976.02 *22*	11/2$^+$[c]	23[e] fs *7*	C jkl N r tu	XREF: N(3992).
4015.1[d] *8*	11/2$^-$[cd]	10[e] fs *4*	C NO R TU X Z	XREF: N(3992). Jπ: (5/2$^-$,7/2$^-$) from L(^{3}He,α)=(3) for a 4018 *15* group is in disagreement.
4096.8[d] *6*	5/2$^+$[d]	<21[f] fs	C HI KL NOP R TUV XYZ	E(level): 4120 in (p,d). Jπ: L(d,p)=2; γ to 7/2$^-$; RUL. π=− from L(^{3}He,α)=3 for a 4108 *15* group is in disagreement. $T_{1/2}$: other: < 28 fs from ^{38}Ar(α,nγ).
4184.2[d] *6*	(3/2,5/2)[d]	39[f] fs *12*	G I NOP TU W Y	E(level): 4198 in (pol d,p),(d,p); 4150 in (d,t). Jπ: γ's to 3/2$^+$ and 5/2$^+$; π=+ from L(d,t)=2 for a 4150 group, but π=− from L(d,p)=1 for a tentative group at 4198.
4277.3[d] *10*	(5/2,7/2,9/2)$^-$[d]	<26[f] fs	C OP R TU X Z	Jπ: (3/2 to 11/2)$^-$ from L(p,t)=L(p,p′)=2 from 7/2$^-$ target; 5/2,7/2,9/2 from γ(θ) in (α,nγ); (9/2)$^+$ from L(d,p)=4 and (pol d,p), is in disagreement. $T_{1/2}$: other: < 49 fs from ^{38}Ar(α,nγ).
4328.4 *11*		<110[f] fs	NOP R TU	
4343.1[d] *10*	9/2$^-$[cd]	0.13 ps *3*	C H OP TU Z	E(level): 4367 in (pol d,p),(d,p).

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Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				Jπ: π=(+) from L(α,α′)=(3) from 7/2⁻ target for a 4343 *5* group is in disagreement. $T_{1/2}$: weighted average of 125 fs *35* from ^{38}Ar(α,nγ) and 132 fs *35* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
4416.5 *7*	3/2+[a]	40 fs *10*	C h NOP TU Y	$T_{1/2}$: weighted average of 28 fs *24* from ^{38}Ar(α,nγ) and 42 fs *10* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
4451.0 *10*	9/2+@[c]	83[e] fs *31*	C h KL OP R TU	$T_{1/2}$: other: <101 fs from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
4519.64 *22*	13/2+[c]	<49[e] fs	C JK O R TU Z	
4550.1 *10*		93 fs *21*	C noP	$T_{1/2}$: weighted average of 97 fs *28* from ^{38}Ar(α,nγ) and 87 fs *31* from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
4569 *5*			no T	
4603.3 *20*	3/2−[b]	<37[f] fs	FG OPQR T X	E(level): 4618 in (^{3}He,α).
4648 *15*			X	
4728.1 *7*	(3/2)+	<30[f] fs	I n P r t Yz	Jπ: see comment for 4730 level.
4731.2[d] *6*	(5/2)+[d]	21[e] fs *10*	C HI KL nOP r tU z	Jπ: L(^{3}He,p)=0+2 from 3/2+ target; L(^{3}He,d)=L(d,n)=1+3 from 4− target; L(α,α′)=3 from 7/2− target; L(p,t)=3 for a doublet from 7/2− target. Based on all the L-transfers both levels of the doublet at 4728 and 4730 are of positive parity; with most likely spin of 5/2 for 4730 and 3/2 for 4728. But (9/2)+ from L(d,p)=4 and (pol d,p) is in disagreement.
4752.8 *3*	1/2−[b]	30[f] fs *10*	FG OP T X	XREF: Others: AA, AB
4778.6 *21*	(3/2)+[a]	<15[f] fs	F I OP T	
4797 *5*			U	
4814.9 *8*	5/2+[a]	<37[f] fs	I nOP R T v x	
4830.7 *9*	(3/2)+[a]		H nO T v x	
4882.9 *11*	5/2−&	<87[e] fs	C I OP RSTU X	$T_{1/2}$: other: < 34 fs in ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
4928 *5*			O T	E(level): From (p,p′), 4944 in (pol d,p),(d,p).
4966 *5*			N	
4972.6 *8*	9/2+@	49[e] fs *45*	C IjKL nOP R TU x z	XREF: I(4961). $T_{1/2}$: other: <25 fs from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
4995.1 *18*			j nO TU x z	
5010.3 *20*	1/2+		FGH OP TU X	XREF: P(?). Jπ: L(d,p)=0.
5046.9 *10*	(9/2)+@		H l O R Tu	E(level): 5050 in (α,α′).
5057.1 *14*	(5/2,7/2,9/2)+	0.14[e] ps *7*	C Kl tu	Jπ: L(d,n)=1 from 4− target; γ to 7/2−.
5072.3 *9*	1/2−[b]		F OP t Z	XREF: F(?)P(?).
5078.4 *25*	1/2−[b]		G nO	
5095.3 *10*	3/2+[a]		nO T	
5120.1 *9*	3/2−[b]	0.8[e] ps *7*	C OP TUv Z	E(level): 5110 in (α,α′). $T_{1/2}$: <46 fs from ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).
5148.1 *16*	7/2−&		O Tuv X	XREF: X(5129). E(level): 5129 in (^{3}He,α).
5154.4 *16*		<125[e] fs	C OP Tuv x	Jπ: γ to 7/2−.
5194.9 *8*	9/2+@		HIjKL nO R TU x	XREF: I(?).

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Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
5219.0 *3*	(13/2,17/2)+[c]	<28[e] fs	BCDE G jK nOP R TU Z	$T_{1/2}$: other: <0.35 ps from (HI,xnγ).
5283.2 *11*	5/2+[a]	<37[f] fs	hI L NOP r tU X	XREF: Others: AB XREF: N(?). E(level): From (d,pγ), ^{2}H(^{40}Ca,pγ), 5300 in (^{3}He,α). Jπ: also L(^{3}He,α)=2.
5290.3 *13*		<104[e] fs	C h n r t	
5305 *4*			h nO T v	
5339.7 *16*	(7/2,9/2,11/2)+		JKLM O TUv	XREF: K(5336). Jπ: L(α,d)=6 from 3/2+ target; L(^{3}He,d)=1 from 4− target.
5349.7 *13*	7/2−		K O v Z	XREF: K(5336). Jπ: L(p,t)=0 from 7/2− target.
5369.0 *15*	3/2−[b]		F O T	
5411.4[d] *8*	5/2+[ad]	<30[f] fs	HI KL NOP R T X	Jπ: π=(−) from L(^{3}He,α)=(3) for a 5425 *15* group is in disagreement.
5451.7 *11*	1/2−[b]		F O	XREF: F(?).
5468.4 *9*	3/2−[b]		F I OP T	XREF: P(?).
5482.2 *13*	(3/2)+[a]		H nOP T v	XREF: P(?).
5506.5 *16*		62[e] fs *21*	C nO T v x	
5519.9 *13*	(5/2)−[&]		O T x	
5539 *3*	(5/2 to 11/2)+[#]		JKL O TU	
5588 *2*	(9/2)+[@]		O T	
5616 *4*	(5/2)−[&]		O	
5635 *5*	+		N TU	Jπ: L(^{3}He,t)=2 at 5631 level from 3/2+ target.
5648.8 *13*	(5/2)−[&]		NOPQR TU X	XREF: Others: AA XREF: P(?).
5669.4 *15*	3/2−[b]		F O U	
5685[d] *3*	(5/2,7/2)−[d]		O R T	Jπ: L(α,^{3}He)=3. π=(+) from L(p,p′)=(3,5) from 7/2− target for a 5682 *5* group is in disagreement.
5704.0 *9*	1/2−[b]		O	
5719.0 *6*	(5/2)−[&]		I L NO T	XREF: I(5716).
5728.3 *18*	5/2+[a]		H K NO	XREF: K(5714).
5750.9 *15*	9/2+[@]		h Kl OP R T x	XREF: K(5759)P(?). E(level): 5740 in (α,^{3}He).
5759.6 *11*	(5/2)+[a]		h Kl O T x	XREF: K(5759).
5801.2 *15*	(5/2)−[&]		OP R TU	Jπ: also L(α,^{3}He)=3.
5817.1 *5*	3/2+	<28 fs	HI L NO T V XYZ	T=3/2 E(level): L=2 *5852* group in (p,d) and (^{3}He,α) is associated with 5819, T=3/2 analog state, based on large (L=2) C^2S factors. Jπ: γ(θ) in (^{3}He,αγ). $T_{1/2}$: from ^{42}Ca(^{3}He,αγ).
5849 *5*			TU	
5866 *3*			O T	
5891.6 *14*	1/2−[b]		NO T	
5910 *3*			O R	
5933.2[d] *10*	(5/2)−[&d]		O TU	Jπ: π=(+) from L(p,p′)=(3,5) from 7/2− target for a 5927 *5* group is in disagreement.

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Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
5975.9 *12*	(3/2,5/2)$^+$		hI KL NO T z	XREF: I(?)N(5963). Jπ: L(d,p)=2. (pol d,p) favors 3/2$^+$, but L(d,n)=1+3 from 4$^-$ target does not permit 3/2.
5984 *5*	1/2$^+$		h T V X z	Jπ: L(^{3}He,α)=L(p,d)=0. E(level): 6000 in (p,d); 5997 in (^{3}He,α).
6004.6 *13*	1/2$^-$[b]		O tU	
6013 *3*			NO t v x	
6036.0 *17*	(9/2)$^+$[@]		kL O T z	
6066[d] *2*	(5/2 to 11/2)$^+$[#d]		JkL N R TU z	Jπ: (5/2$^-$,7/2$^-$) from L(α,^{3}He)=(3) for a 6067 group is in disagreement. E(level): 6057 in (p,p′).
6083 *2*	(3/2)$^+$[a]		H k O Tu	E(level): 6071 in (p,p′).
6098.7 *14*	5/2$^+$		H L O Tuv X	Jπ: L(d,n)=1 from 4$^-$ target; L(^{3}He,α)=2. E(level): 6117 in (^{3}He,α).
6140.6 *16*	(5/2,7/2)$^-$		O v	Jπ: L(d,p)=3.
6148 *3*			O v	
6164 *2*			O T	
6179.8 *13*	1/2$^-$[b]		O T	
6192.9 *11*			O t	E(level): 6197 in (p,p′).
6208.2 *13*	3/2$^-$[b]		O t	
6238.8 *8*	5/2$^-$[&]		O T	E(level): 6232 in (p,p′).
6245 *5*			T	
6272.9 *12*	5/2$^-$[&]		O	
6284.0 *17*	(5/2)$^+$[a]		O	
6295.9 *21*	7/2$^-$[&]		L O T	
6325.1 *11*	(5/2)$^+$		HI KL NO T	Jπ: L(d,n)=1 from 4$^-$ target; γ to 3/2$^-$.
6354.1 *24*	5/2$^+$[a]		h O T	
6376.7 *10*	1/2$^-$[b]		O	
6400.7 *13*	(9/2)$^+$[@]		H l O u	E(level): 6410 in (α,α′).
6410.9 *4*	(1/2,3/2,5/2$^+$)		l O u	Jπ: L(d,p)<3.
6437.9 *7*	5/2$^-$[&]		O	
6450.7 *14*	5/2$^-$[&]		O	
6462 *10*	(5/2 to 11/2)$^+$		L NO r x	Jπ: L(^{3}He,d)=1+3 from 4$^-$ target.
6483.4 *22*	$^+$		H J O Qr U x	Jπ: L(α,d)=4+6 from 3/2$^+$ target. E(level): 6500 in (α,α′).
6520.6 *11*	5/2$^-$[&]		O uv x	
6527 *7*	(5/2 to 11/2)$^+$[#]		KL uv x	
6553 *10*			NO uv x	XREF: O(?).
6567.4 *13*	7/2$^-$[&]		O u	
6602.6 *15*	(≥5/2)		O	Jπ: L(d,p)>2.
6614.2 *16*	(≥5/2)		O	Jπ: L(d,p)>2.
6628.6 *24*			O	
6647.0 *20*	5/2$^-$[&]		NO	
6674.3 *13*	5/2$^+$[a]		O	
6686.2 *8*	7/2$^-$[&]		O X	
6729.2 *10*	7/2$^-$[&]		O	
6738 *7*	(5/2 to 11/2)$^+$[#]		KL n	
6748.1 *9*	7/2$^-$[&]		nO	
6792.9 *19*	(5/2)$^+$[a]		O	
6806.7 *15*	(3/2)$^+$[a]		O	
6822.4 *5*	1/2$^+$	<28 fs	NO V XYZ	T=3/2

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				E(level): 6851 *15* in (p,d) and (^{3}He,α) differs significantly, but most likely these correspond to the 6822 level seen in (^{3}He,αγ). Jπ: L(^{3}He,α)=L(p,d)=0. $T_{1/2}$: from ^{42}Ca(^{3}He,αγ).
6826.3 *5*	(15/2,19/2)	<1.7 ps	B E	Jπ: ΔJ=1 γ to (13/2,17/2)$^+$. $T_{1/2}$: from (HI,xnγ).
6851.8 *15*	5/2$^+$[a]		O	
6869.5 *10*	(5/2)$^-$[&]		O	
6901.2[d] *24*	5/2$^+$[ad]		nO R x	Jπ: (5/2$^-$,7/2$^-$) from L(α,^{3}He)=(3) for a 6900 group is in disagreement.
6917.3 *25*	(9/2)$^+$[@]		nO x	
6931.8 *19*			O	E(level): probable doublet.
6966[d] *15*	3/2$^+$,5/2$^+$[d]		N R X	Jπ: L(^{3}He,α)=2. (7/2$^+$,9/2$^+$) from L(α,^{3}He)=(4) for a 6980 group is in disagreement. E(level): 6980 in (α,^{3}He).
6990.6 *10*	5/2$^-$[&]		NO	E(level): 6984 *5* (^{3}He,t).
7014.8 *7*	(9/2)$^+$[@]		KL O x	
7026.5 *15*			O x	
7041.0 *5*	3/2$^-$[b]		O x	
7073.1 *25*	1/2$^-$[b]		O	
7092.7 *18*	(9/2)$^+$[@]		l O	
7107.8 *25*	(5/2 to 11/2)$^-$		kl nO r	Jπ: L(^{3}He,t)=3+5 at 7120 level from 3/2$^+$ target.
7115.8 *23*			kl nO r	
7137.5 *27*	5/2$^+$[a]		O	
7145.6 *8*	7/2$^-$		YZ	T=3/2 Jπ: L(p,t)=0 from 7/2$^-$ target.
7164.2 *21*	(9/2)$^+$[@]		O	
7176.1 *10*	(5/2,7/2)$^-$		O V X	Jπ: L(p,d)=L(^{3}He,α)=3.
7191 *3*	1/2$^-$[b]		NO	
7225 *5*			N	
7237.8 *23*	5/2$^-$[&]		O	
7268 *3*	(5/2)$^+$		K O	Jπ: L(d,n)=1 from 4$^-$ target; L(d,p)<4.
7295.8 *10*	5/2$^-$[&]		NO	
7308.4 *9*	7/2$^-$[&]		O X	
7332 *5*			N	
7340.6 *24*	3/2$^+$[a]		O	
7365.3 *14*	(5/2)$^-$[&]		O	
7367 *15*	1/2$^+$		N X	Jπ: L(^{3}He,α)=0.
7377.1 *9*	(5/2)$^-$[&]		O	
7392.9 *19*	(5/2 to 11/2)$^+$[#]		KL O	
7417.1 *15*	(7/2,9/2)$^-$		K O	Jπ: L(d,n)=0 from 4$^-$ target.
7437.3 *11*	5/2$^-$[&]		O	
7440 *20*	1/2$^+$&(3/2,5/2)$^+$		V	Jπ: L(p,d)=0+2.
7459 *3*	5/2$^-$[&]		O	
7487.5 *6*	$^+$		NO	Jπ: L(^{3}He,t)=2 at 7499 level from 3/2$^+$ target.
7508.8 *17*	7/2$^-$[&]		O	
7524.7 *14*	7/2$^-$[&]		O x	
7533 *10*	(5/2 to 11/2)$^+$[#]		K x	
7537.9 *14*	(5/2)$^-$[&]		O x	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
7553 *8*		N x	
7576.4 *21*	+	K O X	Jπ: L(d,n)=3 from 4⁻ target. E(level): 7587 in (^{3}He,α).
7587 *15*	(5/2,7/2)⁻	N X	Jπ: L(^{3}He,α)=3.
7607.6 *22*	(9/2)+[@]	NO	
7614 *8*		N	
7631.3 *16*	(9/2)+[@]	O	
7639 *5*		N	
7657.0 *13*	(1/2,3/2,5/2+)	O X	Jπ: L(d,p)<3; L(^{3}He,α)=(0) favors 1/2+. E(level): 7639 in (^{3}He,α).
7678.6 *20*		O	
7706.7 *10*	(≥5/2)	O	Jπ: L(d,p)>2.
7720 *20*		N	
7731.7 *12*	(≥5/2)	O	Jπ: L(d,p)>2.
7751.0 *9*	1/2+	O X	Jπ: L(^{3}He,α)=0.
7770.3 *14*	1/2+	K O V	Jπ: L(p,d)=0.
7792 *5*		N	
7817.1 *11*	5/2−[&]	O	
7854 *5*		N	
7887.8 *11*	5/2−[&]	O	
7901 *5*		N	
7919.1 *24*	(5/2)−[&]	O	
7957 *3*	5/2−[&]	O	
7974 *3*	7/2−[&]	O	
7990 *20*	1/2+&3/2+,5/2+	N V	Jπ: L(p,d)=0+2.
7995 *3*	(9/2)+[@]	KL O	
8040 *10*	(5/2 to 11/2)+[#]	KL n	
8047.5 *17*	(5/2)−[&]	nO	
8063.4 *23*	7/2−[&]	O	
8101.8 *14*	7/2−[&]	O	
8120 *3*	5/2+[a]	O X	
8136.1 *16*	(5/2)−[&]	NO	
8150.8 *9*	(5/2)−[&]	O	
8179.0 *19*	5/2+[a]	K O v x	E(level): 8172 in (^{3}He,α).
8199.7 *19*	7/2−[&]	O v x	
8229.4 *19*	5/2+[a]	O X	E(level): 8212 in (^{3}He,α).
8242 *3*	(1/2,3/2,5/2+)	O	Jπ: L(d,p)<3.
8259 *3*		O	
8272 *7*		N	
8311 *15*	(3/2,5/2)+	k V X	Jπ: L(p,d)=L(^{3}He,α)=2.
8312.7 *21*	(9/2)+[@]	k O	
8335.7 *23*	(5/2)−[&]	O	
8347 *7*		N	
8373.5 *18*	5/2+[a]	kl O	Jπ: see comment for 8402 level also.
8402.2 *21*	(5/2 to 11/2)+	kl NO	Jπ: Jπ=(5/2:11/2)+ from L(d,n)=L(^{3}He,d)=1+3 from 4⁻ target for 8388 *10* group.
8447.4[d] *38*	(9/2)+[@d]	KL O X	Jπ: (1/2⁻,3/2⁻) from L(^{3}He,α)=(1) for a 8444 group is in disagreement.
8467.4 *12*	7/2−[&]	NO	
8504 *10*	(5/2 to 11/2)+[#]	KL N	
8522.4 *20*	7/2−[&]	O	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
8549 *3*	5/2$^-$[&]	O	
8551 *15*	1/2$^+$	V XY	Jπ: L(^{3}He,α)=0. E(level): average of 8560 in (p,d) and 8543 in (^{3}He,α).
8585 *3*	7/2$^-$[&]	K NO	
8620 *4*	5/2$^-$[&]	O	
8630 *10*	(5/2 to 11/2)$^+$[#]	KL v x	
8638 *4*	5/2$^-$[&]	O v x	
8656 *10*	(5/2 to 11/2)$^+$[#]	K N v x	
8674 *3*		O v	
8700 *4*	5/2$^+$[a]	K NO X	
8741 *15*		X	
8783 *10*	5/2$^-$[&]	O	
8855 *10*	(9/2$^+$)[@]	NO	
8916 *10*	(3/2$^-$,9/2$^+$)	NO	Jπ: L(d,p)=(1,4) and (pol d,p).
8980 *10*	(5/2)$^+$	K X	Jπ: L(d,n)=1 from 4$^-$ target; L(p,d)=(2).
8997 *10*	(9/2$^+$)[@]	NO	
9047 *15*	(3/2,5/2)$^+$	X	Jπ: L(^{3}He,α)=2.
9084[d] *10*	5/2$^-$[&d]	NO V	Jπ: (3/2$^+$,5/2$^+$) from L(p,d)=(2) is in disagreement. E(level): 9110 in (p,d).
9140 *15*		X	
9177 *10*	(5/2 to 11/2)$^+$[#]	K NO	
9216 *15*		N X	
9273 *10*	(5/2 to 11/2)$^+$[#]	K O	Jπ: (5/2$^-$,9/2$^+$) from L(d,p) and (pol d,p).
9315 *10*		NO	
9375 *10*	5/2$^+$	K O V X	Jπ: L(d,n)=1 from 4$^-$ target; L(^{3}He,α)=2.
9420 *10*	(5/2 to 11/2)$^+$[#]	K NO	
9475 *10*		O	
9555 *15*	(5/2 to 11/2)$^+$[#]	K O	
9590 *7*		N	
9616 *7*		N	
9650 *20*	(5/2 to 11/2)$^+$[#]	K N	
9720 *20*	(5/2 to 11/2)$^+$[#]	K	
9880 *20*	(5/2 to 11/2)$^+$[#]	K N	
9910 *20*	(5/2 to 11/2)$^+$[#]	K	
9920 *20*	(5/2 to 11/2)$^+$[#]	K	
10030 *20*		N	
10113 *7*		N	
10177 *15*		N X	
10194 *7*		N	
10238 *7*		N	
10300 *20*	(5/2 to 11/2)$^+$[#]	K N	
10339 *7*		N	
10421 *7*		N	
10752 *15*		X	
10859 *15*	(3/2,5/2)$^+$	X	Jπ: L(^{3}He,α)=2.
10950 *20*	(3/2,5/2)$^+$	V	Jπ: L(p,d)=2.
11817 *15*		X	

[†] From least-squares fit to Eγ′s, when explicit Eγ′s are available in literature. In other cases levels are taken from (^{3}He,α), (d,n),

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{41}Ca Levels (continued)

(3He,t),(pol d,p),(d,p), or (p,d).

‡ When L-transfer arguments are used, target $J^{\pi}=0^{+}$ if not specified otherwise.

L(d,n)=1 from 4^{-} (^{40}K) target.

@ L(d,p)=4 and (pol d,p).

& L(d,p)=3 and (pol d,p).

a L(d,p)=2 and (pol d,p).

b L(d,p)=1 and (pol d,p).

c $\gamma(\theta)$ and γ(lin pol) in (α,nγ).

d Assigned J^{π} is in disagreement with L-transfer in one of the reactions as mentioned under comments. It is possible that there are two levels near this energy.

e From DSAM in ^{38}Ar(α,nγ).

f From DSAM in ^{40}Ca(d,pγ),^{2}H(^{40}Ca,pγ).

Adopted Levels, Gammas (continued)

γ(^{41}Ca)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[&]	δ[ae]	α[d]	Comments
1942.88	3/2$^-$	1942.70 *20*	100	0.0	7/2$^-$	E2		3.08×10^{-4}	α(K)=2.04×10^{-5} *3*; α(L)=1.751×10^{-6} *25*; α(M)=2.08×10^{-7} *3* α(N)=1.183×10^{-8} *17*; α(IPF)=0.000286 *4* B(E2)(W.u.)=5.8 *7*
2009.73	3/2$^+$	2009.8 *3*	100	0.0	7/2$^-$	M2+E3	+0.16 *2*	1.70×10^{-4}	α(K)=2.93×10^{-5} *5*; α(L)=2.51×10^{-6} *4*; α(M)=2.99×10^{-7} *5* α(N)=1.700×10^{-8} *24*; α(IPF)=0.0001377 *20* B(M2)(W.u.)=0.154 *4*; B(E3)(W.u.)=4.5 *12* Iγ<5 for γ to 1943 level ((p,nγ),1970Ho26). δ: Other: +0.095 *22* in (^{3}He,$\alpha\gamma$).
2462.38	3/2$^-$	519.57 *15*	100	1942.88	3/2$^-$	M1+E2	+0.03 *12*	2.59×10^{-4} *8*	α(K)=0.000236 *8*; α(L)=2.04×10^{-5} *7*; α(M)=2.42×10^{-6} *8* α(N)=1.37×10^{-7} *5* B(M1)(W.u.)=0.046 *14*; B(E2)(W.u.)=0.5 *4* Iγ<0.5 for γ to 2010 level and <0.3 to g.s. (see (p,nγ)).
2576.0	5/2$^-$	2576.3 *6*	100	0.0	7/2$^-$	M1+E2		0.00056 *5*	α(K)=1.21×10^{-5} *4*; α(L)=1.04×10^{-6} *4*; α(M)=1.23×10^{-7} *4* α(N)=7.01×10^{-9} *22*; α(IPF)=0.00054 *5* δ: −0.36 *8* or −1.48 *11* in (α,nγ). Iγ<1 for γ's to 1943 and 2010 levels (see (p,nγ)).
2605.5	5/2$^+$	2605.7[‡] *6*	100	0.0	7/2$^-$	E1+M2	−0.03 *1*	1.03×10^{-3}	α(K)=7.94×10^{-6} *12*; α(L)=6.78×10^{-7} *10*; α(M)=8.06×10^{-8} *12* α(N)=4.59×10^{-9} *7*; α(IPF)=0.001023 *15* B(E1)(W.u.)=9.2×10^{-5} *16*; B(M2)(W.u.)=0.06 *4* Iγ<5 for γ to 1943 and <8 to 2010 level (see (p,nγ)).
2670.24	1/2$^+$	660.4 *2*	52 *2*	2009.73	3/2$^+$	M1		1.56×10^{-4}	α(K)=0.0001421 *20*; α(L)=1.222×10^{-5} *18*; α(M)=1.452×10^{-6} *21* α(N)=8.24×10^{-8} *12* B(M1)(W.u.)=0.012 *3*
		727.6 *5*	100 *2*	1942.88	3/2$^-$	E1(+M2)		8.0×10^{-5} *3*	α=8.0×10^{-5} *3*; α(K)=7.30×10^{-5} *25*; α(L)=6.27×10^{-6} *22*; α(M)=7.4×10^{-7} *3* α(N)=4.21×10^{-8} *15* Iγ<6 for γ to g.s. (see (p,nγ)). δ: <0.03 from RUL for M2.
2884.5	7/2$^+$	2883.8[‡] *6*	100	0.0	7/2$^-$	E1+M2	−0.08 *6*	1.19×10^{-3} *2*	α(K)=6.98×10^{-6} *14*; α(L)=5.97×10^{-7} *12*; α(M)=7.09×10^{-8} *15* α(N)=4.03×10^{-9} *8*; α(IPF)=0.001179 *20* B(E1)(W.u.)=0.0011 *9*; B(M2)(W.u.)=4 *+7−4* Iγ<1 for γ's to 1943 and 2010 levels (see (p,nγ)).
2959.3	7/2$^-$	2959.2[‡] *7*	100	0.0	7/2$^-$	M1+E2	−0.29 *1*	6.71×10^{-4}	α(K)=9.53×10^{-6} *14*; α(L)=8.15×10^{-7} *12*; α(M)=9.68×10^{-8} *14* α(N)=5.52×10^{-9} *8*; α(IPF)=0.000661 *10* B(M1)(W.u.)=0.028 *7*; B(E2)(W.u.)=0.82 *22* δ: Other: −0.31 *3* in (^{3}He,$\alpha\gamma$).

$^{41}_{20}Ca_{21}$-11

Adopted Levels, Gammas (continued)

γ(^{41}Ca) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [b]	E_f	J_f^π	Mult.[&]	δ [ae]	α [d]	Comments
3049.86	3/2+	379.3 [@]	7 [c] 2	2670.24	1/2+				E_γ: From (d,pγ).
		444.4 [‡] 2	73 [c] 5	2605.5	5/2+				
		1040.6 3	100 [c] 5	2009.73	3/2+	M1		6.28×10^{-5} 9	α=6.28×10^{-5} 9; α(K)=5.73×10^{-5} 8; α(L)=4.92×10^{-6} 7; α(M)=5.84×10^{-7} 9 α(N)=3.32×10^{-8} 5 B(M1)(W.u.)=0.011 5
		1106.4 [‡] 3	63 [c] 5	1942.88	3/2−	E1		4.59×10^{-5} 7	α=4.59×10^{-5} 7; α(K)=3.02×10^{-5} 5; α(L)=2.59×10^{-6} 4; α(M)=3.08×10^{-7} 5 α(N)=1.746×10^{-8} 25; α(IPF)=1.279×10^{-5} 20 B(E1)(W.u.)=0.00016 7 Iγ<8 for γ to g.s. (see (d,pγ)).
3201.39	9/2+	3201.1 2	100	0.0	7/2−	E1+M2	−0.02 1	1.35×10^{-3}	α(K)=6.06×10^{-6} 9; α(L)=5.18×10^{-7} 8; α(M)=6.15×10^{-8} 9 α(N)=3.50×10^{-9} 5; α(IPF)=0.001340 19 B(E1)(W.u.)=0.00056 18; B(M2)(W.u.)≤0.21 Iγ<5 for γ to 2606 (see (d,pγ)). δ: Other: +0.09 7 in (^{3}He,αγ).
3369.61	11/2+	168.04 24	100 2	3201.39	9/2+	M1(+E2)	−0.02 2	0.00358 7	α(K)=0.00326 6; α(L)=0.000285 6; α(M)=3.38×10^{-5} 7 α(N)=1.90×10^{-6} 4 B(M1)(W.u.)=0.129 6; B(E2)(W.u.)≤18
		3369.54 14	74 2	0.0	7/2−	M2+E3	+0.94 +10−5	6.39×10^{-4} 10	α(K)=1.119×10^{-5} 16; α(L)=9.57×10^{-7} 14; α(M)=1.137×10^{-7} 16 α(N)=6.48×10^{-9} 9; α(IPF)=0.000626 10 B(M2)(W.u.)=0.066 8; B(E3)(W.u.)=24 3
3399.9	1/2+	1390.11 20	100	2009.73	3/2+	M1+E2		8.5×10^{-5} 11	α=8.5×10^{-5} 11; α(K)=3.7×10^{-5} 4; α(L)=3.1×10^{-6} 3; α(M)=3.7×10^{-7} 4 α(N)=2.11×10^{-8} 18; α(IPF)=4.4×10^{-5} 8
3494.8	5/2+	444.8 [‡] 4	15 [c] 4	3049.86	3/2+				
		1485.2 [‡] 4	100 [c] 4	2009.73	3/2+	M1+E2	−0.14 4	9.34×10^{-5} 14	α=9.34×10^{-5} 14; α(K)=2.98×10^{-5} 5; α(L)=2.55×10^{-6} 4; α(M)=3.03×10^{-7} 5 α(N)=1.725×10^{-8} 25; α(IPF)=6.07×10^{-5} 9 B(M1)(W.u.)=0.019 5; B(E2)(W.u.)=0.5 4
		3494	6 [c] 2	0.0	7/2−	[E1]		1.48×10^{-3}	α(K)=5.42×10^{-6} 8; α(L)=4.63×10^{-7} 7; α(M)=5.50×10^{-8} 8 α(N)=3.13×10^{-9} 5; α(IPF)=0.001473 21 B(E1)(W.u.)=2.4×10^{-6} 10
3526.6	3/2+	856	18 [c] 4	2670.24	1/2+	M1+E2	+0.22 7	9.40×10^{-5} 20	E_γ: From (d,pγ). α=9.40×10^{-5} 20; α(K)=8.58×10^{-5} 18; α(L)=7.37×10^{-6} 16; α(M)=8.75×10^{-7} 18 α(N)=4.97×10^{-8} 11

$^{41}_{20}Ca_{21}$-12

Adopted Levels, Gammas (continued)

γ(^{41}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[&]	δ[ae]	α[d]	Comments
									B(M1)(W.u.)=0.09 *5*; B(E2)(W.u.)=18 *14* E_γ: From (d,pγ). δ: or −3.1 *+6−9* from (^{3}He,α).
3526.6	3/2$^+$	1516	64[c] *6*	2009.73	3/2$^+$				E_γ: From (d,pγ).
		1584.5[‡] *8*	100[c] *5*	1942.88	3/2$^-$	[E1+M2]		3.46×10^{-4} *6*	α(K)=1.67×10^{-5} *4*; α(L)=1.43×10^{-6} *4*; α(M)=1.69×10^{-7} *4* α(N)=9.63×10^{-9} *23*; α(IPF)=0.000328 *6*
3613.63	1/2$^-$	943.0[#] *10*	31 *4*	2670.24	1/2$^+$	[E1]		4.50×10^{-5} *7*	α=4.50×10^{-5} *7*; α(K)=4.10×10^{-5} *6*; α(L)=3.52×10^{-6} *5*; α(M)=4.18×10^{-7} *6* α(N)=2.37×10^{-8} *4* B(E1)(W.u.)=0.0010 *5*
		1151.24[#] *20*	65 *8*	2462.38	3/2$^-$				
		1670.71[#] *20*	100 *8*	1942.88	3/2$^-$				
3614.4	7/2$^+$	3614.2[‡] *8*	100	0.0	7/2$^-$	E1+M2	+0.06 *5*	1.53×10^{-3} *2*	α(K)=5.22×10^{-6} *9*; α(L)=4.46×10^{-7} *7*; α(M)=5.29×10^{-8} *9* α(N)=3.01×10^{-9} *5*; α(IPF)=0.001523 *23* B(E1)(W.u.)=0.0008 *5*; B(M2)(W.u.)≤2.8 E_γ: 3612.8 in (d,pγ).
3677.0	9/2$^-$	717.7[‡] *4*	6.0 *6*	2959.3	7/2$^-$	M1+E2	−0.19 *+5−9*	1.34×10^{-4} *4*	α(K)=0.000123 *4*; α(L)=1.05×10^{-5} *3*; α(M)=1.25×10^{-6} *4* α(N)=7.10×10^{-8} *21* B(M1)(W.u.)=0.072 *21*; B(E2)(W.u.)=15 *9*
		3676.8[‡] *8*	100.0 *6*	0.0	7/2$^-$	M1+E2	−1.28 *2*	1.01×10^{-3}	α(K)=7.01×10^{-6} *10*; α(L)=6.00×10^{-7} *9*; α(M)=7.12×10^{-8} *10* α(N)=4.06×10^{-9} *6*; α(IPF)=0.001007 *15* B(M1)(W.u.)=0.0035 *10*; B(E2)(W.u.)=1.3 *4*
3730.8	3/2$^-$	1156	69[c] *20*	2576.0	5/2$^-$				E_γ: From (d,pγ).
		1268.4[‡] *3*	100[c] *17*	2462.38	3/2$^-$	M1+E2		6.7×10^{-5} *9*	α=6.7×10^{-5} *9*; α(K)=4.4×10^{-5} *5*; α(L)=3.8×10^{-6} *4*; α(M)=4.5×10^{-7} *5* α(N)=2.5×10^{-8} *3*; α(IPF)=1.9×10^{-5} *4*
		1787.6[‡] *5*	49 *12*	1942.88	3/2$^-$	M1+E2		0.00021 *3*	α(K)=2.27×10^{-5} *13*; α(L)=1.94×10^{-6} *11*; α(M)=2.31×10^{-7} *13* α(N)=1.31×10^{-8} *8*; α(IPF)=0.000188 *25*
		3730.4[‡] *8*	69[c] *12*	0.0	7/2$^-$	(E2)		1.08×10^{-3}	α(K)=6.95×10^{-6} *10*; α(L)=5.94×10^{-7} *9*; α(M)=7.06×10^{-8} *10* α(N)=4.02×10^{-9} *6*; α(IPF)=0.001076 *15* B(E2)(W.u.)=0.50 *19*
3736.7		3736.5[#] *15*	100	0.0	7/2$^-$				
3740.3	(3/2,5/2)$^+$	1135	52[c] *5*	2605.5	5/2$^+$				E_γ: From (d,pγ).

$^{41}_{20}Ca_{21}$-13

Adopted Levels, Gammas (continued)

γ(^{41}Ca) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [b]	E_f	J_f^π	Mult.[&]	δ [ae]	α [d]	Comments
3740.3	(3/2,5/2)$^+$	1730.5[‡] *4*	100[c] *5*	2009.73	3/2$^+$	M1(+E2)	<0.4	1.70×10^{-4} *4*	α(K)=2.29×10^{-5} *4*; α(L)=1.96×10^{-6} *4*; α(M)=2.33×10^{-7} *4* α(N)=1.327×10^{-8} *22*; α(IPF)=0.000145 *4* B(M1)(W.u.)>0.069 δ: −0.3 *1* for J(3740)=5/2; 0.0 *2* for J(3740)=3/2.
3829.87	15/2$^+$	460.25 *11*	100	3369.61	11/2$^+$	E2		8.77×10^{-4}	α(K)=0.000799 *12*; α(L)=6.91×10^{-5} *10*; α(M)=8.19×10^{-6} *12* α(N)=4.59×10^{-7} *7* B(E2)(W.u.)=1.08 *5*
3845.9	1/2$^+$	444.5[f] *4*		3399.9	1/2$^+$				E_γ: from (n,γ) E=th seen only by 1967Gr14. Evaluators consider this gamma questionable as it was not confirmed in any other studies.
		1836	100[c] *6*	2009.73	3/2$^+$				E_γ: From (d,pγ).
		1903	25[c] *6*	1942.88	3/2$^-$				E_γ: From (d,pγ).
3914.79	13/2$^+$	545.31 *18*	100	3369.61	11/2$^+$	M1(+E2)	−0.01 *3*	2.33×10^{-4}	α(K)=0.000213 *3*; α(L)=1.83×10^{-5} *3*; α(M)=2.18×10^{-6} *3* α(N)=1.234×10^{-7} *18* B(M1)(W.u.)=0.091 *19*; B(E2)(W.u.)≤0.65
3944.5	1/2$^-$	1482.0[#] *3*	7.5 *21*	2462.38	3/2$^-$				
		2001.6[#] *4*	100.0 *21*	1942.88	3/2$^-$				
3974.3	7/2$^+$	1368.5[‡] *4*	100 *2*	2605.5	5/2$^+$	M1+E2	+0.06 *3*	7.05×10^{-5} *10*	α=7.05×10^{-5} *10*; α(K)=3.44×10^{-5} *5*; α(L)=2.95×10^{-6} *5*; α(M)=3.51×10^{-7} *5* α(N)=1.99×10^{-8} *3*; α(IPF)=3.28×10^{-5} *5* B(M1)(W.u.)=0.20 *9*; B(E2)(W.u.)≤2.5
		3975.1[‡] *8*	75 *2*	0.0	7/2$^-$	[E1]		1.68×10^{-3}	α(K)=4.62×10^{-6} *7*; α(L)=3.95×10^{-7} *6*; α(M)=4.69×10^{-8} *7* α(N)=2.67×10^{-9} *4*; α(IPF)=0.001671 *24* B(E1)(W.u.)=0.00016 *7*
3976.02	11/2$^+$	606.5[‡] *5*	22 *10*	3369.61	11/2$^+$				
		774.6[‡] *2*	100 *10*	3201.39	9/2$^+$	M1+E2	−0.09 *2*	1.13×10^{-4}	α(K)=0.0001030 *15*; α(L)=8.85×10^{-6} *13*; α(M)=1.051×10^{-6} *15* α(N)=5.97×10^{-8} *9* B(M1)(W.u.)=1.7 *6*; B(E2)(W.u.)=7.E+1 *4*
4015.1	11/2$^-$	4014.9[‡] *8*	100	0.0	7/2$^-$	E2		1.18×10^{-3}	α(K)=6.24×10^{-6} *9*; α(L)=5.33×10^{-7} *8*; α(M)=6.33×10^{-8} *9* α(N)=3.61×10^{-9} *5*; α(IPF)=0.001175 *17* B(E2)(W.u.)=6 *3*
4096.8	5/2$^+$	2086.6[‡] *8*	100 *9*	2009.73	3/2$^+$	M1(+E2)	+0.06 *5*	3.04×10^{-4}	α(K)=1.657×10^{-5} *24*; α(L)=1.418×10^{-6} *20*; α(M)=1.685×10^{-7} *24* α(N)=9.59×10^{-9} *14*; α(IPF)=0.000286 *4* B(M1)(W.u.)>0.073 δ: From (^{3}He,α).

$^{41}_{20}Ca_{21}$-14

Adopted Levels, Gammas (continued)

γ(^{41}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[&]	δ[ae]	α[d]	Comments
4096.8	5/2$^+$	4097.3[‡] *10*	56 *9*	0.0	7/2$^-$	E1(+M2)	+0.01 *4*	1.72×10^{-3} *3*	α(K)=4.46×10^{-6} *7*; α(L)=3.81×10^{-7} *6*; α(M)=4.52×10^{-8} *7* α(N)=2.58×10^{-9} *4*; α(IPF)=0.001713 *24* B(E1)(W.u.)>0.00014 δ: From (^{3}He,α).
4184.2	(3/2,5/2)	1579	45[c] *4*	2605.5	5/2$^+$				E_γ: From (d,pγ).
		2174	100[c] *4*	2009.73	3/2$^+$				E_γ: From (d,pγ).
4277.3	(5/2,7/2,9/2)$^-$	4277.1[‡] *10*	100	0.0	7/2$^-$	D+Q			γ to 2605 level with Iγ=22 *12* (1971Fo09) in (d,pγ) has not been confirmed in other studies.
4328.4		1127	100[c]	3201.39	9/2$^+$				E_γ: From (d,pγ).
4343.1	9/2$^-$	4342.9[‡] *10*	100	0.0	7/2$^-$	M1+E2	+7.3 *+12−9*	1.29×10^{-3}	α(K)=5.56×10^{-6} *8*; α(L)=4.75×10^{-7} *7*; α(M)=5.65×10^{-8} *8* α(N)=3.22×10^{-9} *5*; α(IPF)=0.001288 *18* B(M1)(W.u.)=3.8×10^{-5} *15*; B(E2)(W.u.)=0.33 *8*
4416.5	3/2$^+$	1812	43[c] *3*	2605.5	5/2$^+$				E_γ: From (d,pγ).
		2407	100[c] *3*	2009.73	3/2$^+$				E_γ: From (d,pγ).
4451.0	9/2$^+$	4450.7[‡] *10*	100	0.0	7/2$^-$				
4519.64	13/2$^+$	543.6[‡] *4*	23 *6*	3976.02	11/2$^+$				
		605.5[‡] *4*	100 *11*	3914.79	13/2$^+$				
		689.7[‡] *3*	82 *9*	3829.87	15/2$^+$				
		1149.7 *3*	80 *9*	3369.61	11/2$^+$	M1+E2	−0.04 *2*	5.44×10^{-5} *8*	α=5.44×10^{-5} *8*; α(K)=4.75×10^{-5} *7*; α(L)=4.07×10^{-6} *6*; α(M)=4.84×10^{-7} *7* α(N)=2.75×10^{-8} *4*; α(IPF)=2.35×10^{-6} *4* B(M1)(W.u.)>0.083; B(E2)(W.u.)>0.00049
4550.1		4549.8[‡] *10*	100	0.0	7/2$^-$				
4603.3	3/2$^-$	2660.3[#] *20*	100	1942.88	3/2$^-$				
4728.1	(3/2)$^+$	2718	100	2009.73	3/2$^+$				
4731.2	(5/2)$^+$	2268	100[c] *14*	2462.38	3/2$^-$				E_γ: From (d,pγ).
		2790	91[c] *12*	1942.88	3/2$^-$				E_γ: From (d,pγ).
		4730	42[c] *9*	0.0	7/2$^-$				E_γ: From (d,pγ).
4752.8	1/2$^-$	2290.3[#] *3*	49 *3*	2462.38	3/2$^-$				
		2809.8[#] *5*	100 *3*	1942.88	3/2$^-$				
4778.6	(3/2)$^+$	2768.8[#] *20*	100	2009.73	3/2$^+$				
4814.9	5/2$^+$	1931	100[c] *12*	2884.5	7/2$^+$				E_γ: From (d,pγ).
		4814	69[c] *12*	0.0	7/2$^-$				E_γ: From (d,pγ).
4882.9	5/2$^-$	4882.6[‡] *11*	100	0.0	7/2$^-$				
4972.6	9/2$^+$	2086	90[c] *45*	2884.5	7/2$^+$				E_γ: From (d,pγ).
		4974.9[‡] *11*	100[c] *45*	0.0	7/2$^-$				

$^{41}_{20}Ca_{21}$-15

Adopted Levels, Gammas (continued)

γ(^{41}Ca) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[&]	δ[ae]	α[d]	Comments
5010.3	1/2$^+$	1611[f]	82 *22*	3399.9	1/2$^+$				E_γ: From (d,pγ).
		3000.2[f]	100 *22*	2009.73	3/2$^+$				E_γ: From (d,pγ).
		3067.3[#] *20*		1942.88	3/2$^-$				E_γ: from (n,γ) E=th.
5057.1	(5/2,7/2,9/2)$^+$	5056.8[‡] *14*	100	0.0	7/2$^-$				
5120.1	3/2$^-$	2450	100[c] *17*	2670.24	1/2$^+$				E_γ: From (d,pγ).
		5119.3[‡] *15*	69[c] *17*	0.0	7/2$^-$				
5154.4		5154.1[‡] *16*	100	0.0	7/2$^-$				
5194.9	9/2$^+$	2589[f]		2605.5	5/2$^+$				
		3252[f]		1942.88	3/2$^-$				
5219.0	(13/2,17/2)$^+$	1389.14 *25*	100	3829.87	15/2$^+$	M1(+E2)	<0.04	7.36×10^{-5} *11*	α=7.36×10^{-5} *11*; α(K)=3.35×10^{-5} *5*; α(L)=2.87×10^{-6} *4*; α(M)=3.41×10^{-7} *5* α(N)=1.94×10^{-8} *3*; α(IPF)=3.69×10^{-5} *6* B(M1)(W.u.)>0.29
5283.2	5/2$^+$	3273.3	100	2009.73	3/2$^+$				E_γ: From (d,pγ), ^{2}H(^{40}Ca,pγ).
5290.3		5289.9[‡] *13*	100	0.0	7/2$^-$				
5369.0	3/2$^-$	5368.6[#] *15*	100	0.0	7/2$^-$				
5411.4	5/2$^+$	2805.7	59	2605.5	5/2$^+$				E_γ: from (^{3}He,pγ) only.
		3468.5	100	1942.88	3/2$^-$				
5468.4	3/2$^-$	2418.8		3049.86	3/2$^+$				
		5467.4[#] *15*		0.0	7/2$^-$				
5506.5		5506.1 *16*	100	0.0	7/2$^-$				
5669.4	3/2$^-$	5669.0[#] *15*	100	0.0	7/2$^-$				
5719.0	(5/2)$^-$	1534.8	36	4184.2	(3/2,5/2)				
		3709.0	100	2009.73	3/2$^+$				
		3776.1	100	1942.88	3/2$^-$				
		5718.6	45	0.0	7/2$^-$				
5817.1	3/2$^+$	1089.0	21 *4*	4728.1	(3/2)$^+$				
		1720.3	100 *8*	4096.8	5/2$^+$				
		2076.7	15 *9*	3740.3	(3/2,5/2)$^+$				
		2417.1	30 *4*	3399.9	1/2$^+$	D(+Q)			δ: −0.03 *14* or −1.7 *5* in (^{3}He,$\alpha\gamma$).
		3211.5	23 *4*	2605.5	5/2$^+$	D(+Q)			δ: −0.25 *+30−65* or −1.8 *+9−40* in (^{3}He,$\alpha\gamma$).
		3807.2	<6	2009.73	3/2$^+$				
5975.9	(3/2,5/2)$^+$	2576[f]		3399.9	1/2$^+$				
		3370[f]		2605.5	5/2$^+$				
		3400[f]		2576.0	5/2$^-$				
		3966[f]		2009.73	3/2$^+$				
6325.1	(5/2)$^+$	4382		1942.88	3/2$^-$				
6822.4	1/2$^+$	2094.1	63 *5*	4728.1	(3/2)$^+$				
		2407.2	16 *11*	4416.5	3/2$^+$				

$^{41}_{20}Ca_{21}$-16

Adopted Levels, Gammas (continued)

γ(^{41}Ca) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [b]	E_f	J_f^π	E_i(level)	J_i^π	E_γ †	I_γ [b]	E_f	J_f^π
6822.4	$1/2^+$	2638.0	18 *5*	4184.2	(3/2,5/2)	6822.4	$1/2^+$	4812.1	<5	2009.73	$3/2^+$
		2976.3	42 *5*	3845.9	$1/2^+$	6826.3	(15/2,19/2)	1607.2 *4*	100	5219.0	$(13/2,17/2)^+$
		3081.8	24 *5*	3740.3	$(3/2,5/2)^+$	7145.6	$7/2^-$	4186	54 *11*	2959.3	$7/2^-$
		4151.6	100 *5*	2670.24	$1/2^+$			7145	100 *11*	0.0	$7/2^-$

† From weighted averages of available values in (α, nγ), (n,γ) E=th,(α,2pnγ), and/or (HI,Xnγ) except as noted.
‡ From (α,nγ).
# From (n,γ) E=th.
@ From level energy difference and rounded off to the nearest keV.
& From (α,nγ) and (^{3}He,$\alpha\gamma$). See also (HI,xnγ) and (α,2pnγ).
[a] From (α,nγ) except as noted.
[b] Weighted averages of all available data except as noted.
[c] From (d,pγ).
[d] Additional information 1.
[e] If No value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
[f] Placement of transition in the level scheme is uncertain.

$^{41}_{20}Ca_{21}$-17

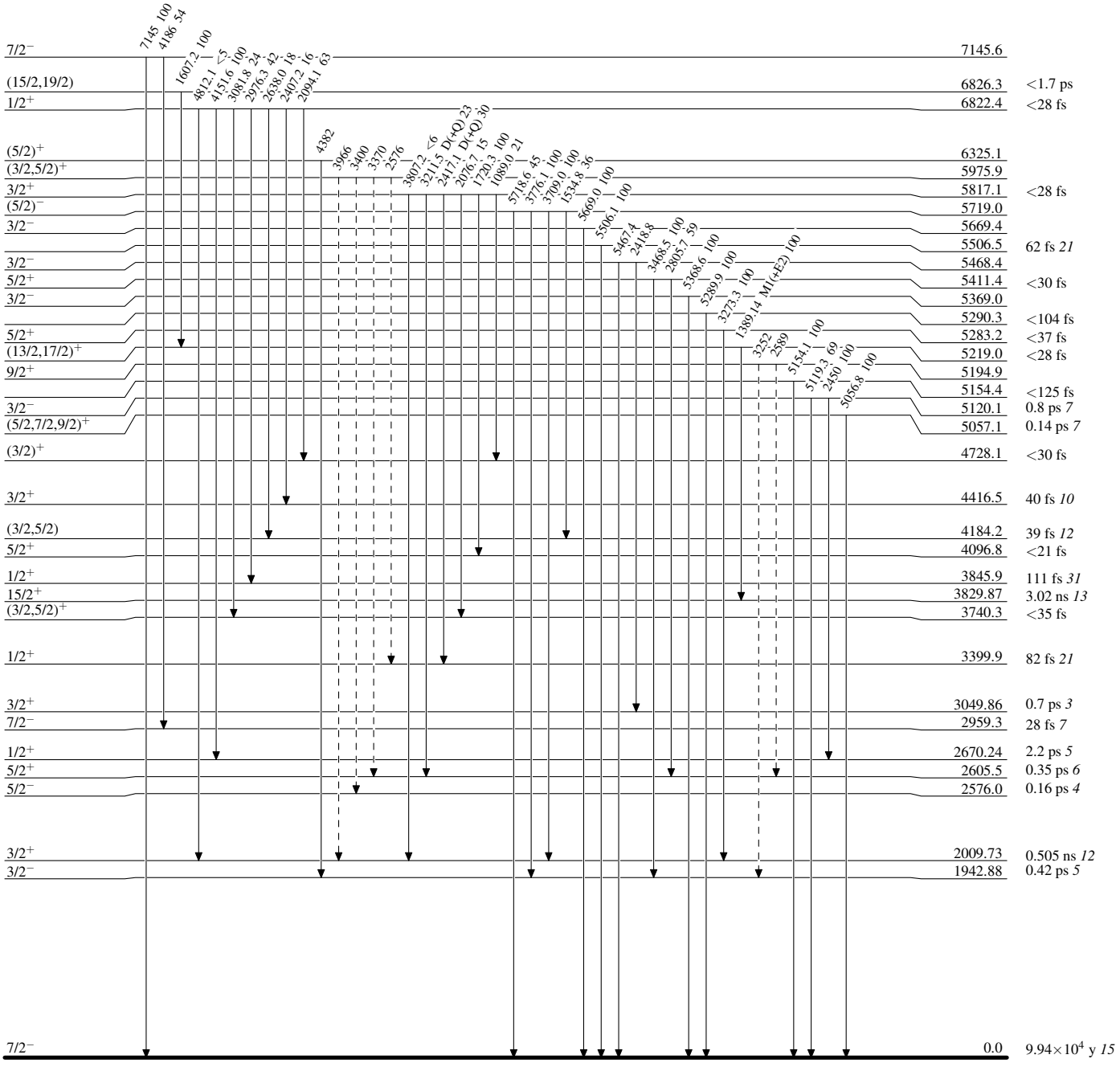
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{41}_{20}Ca_{21}$

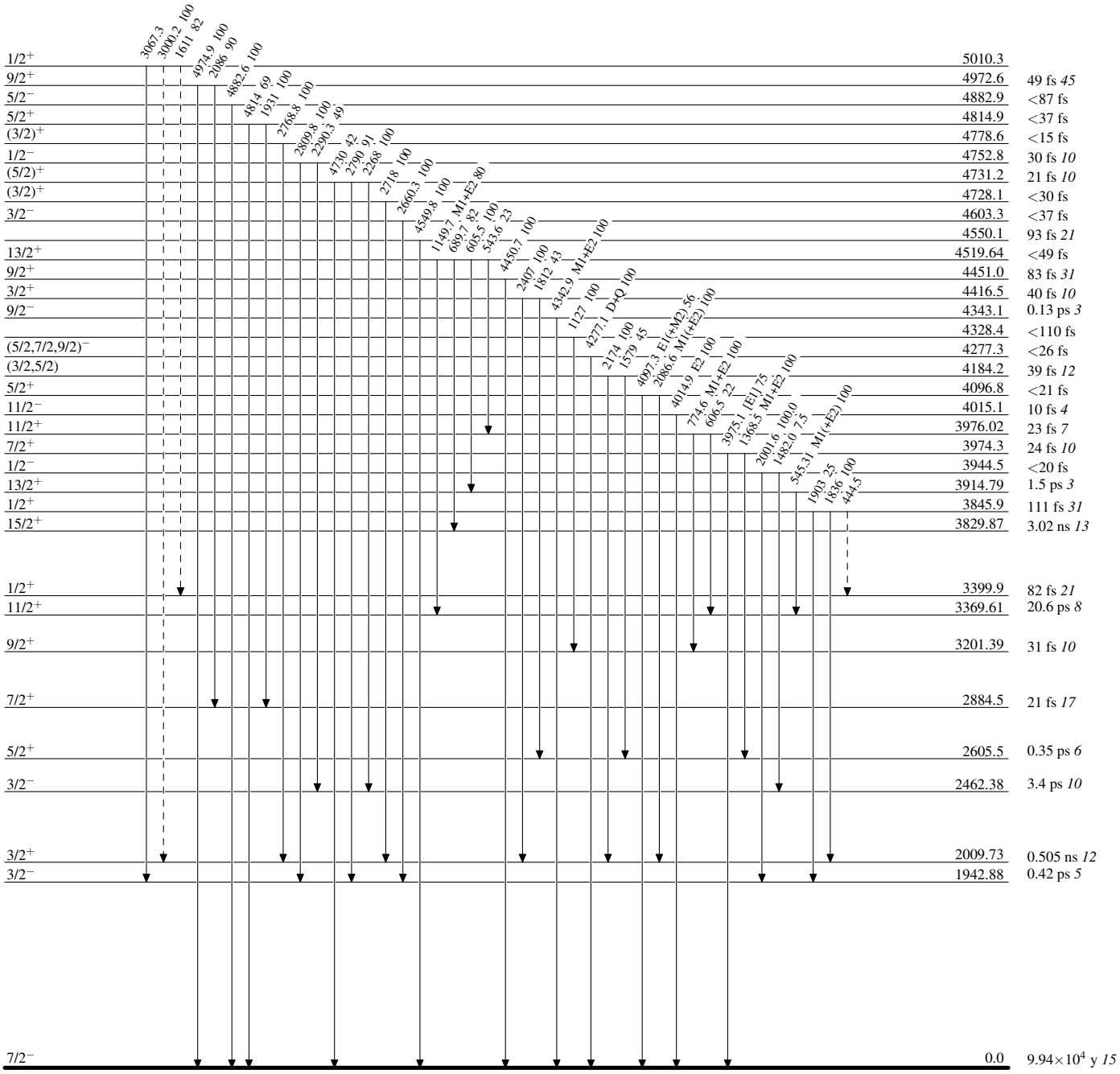
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

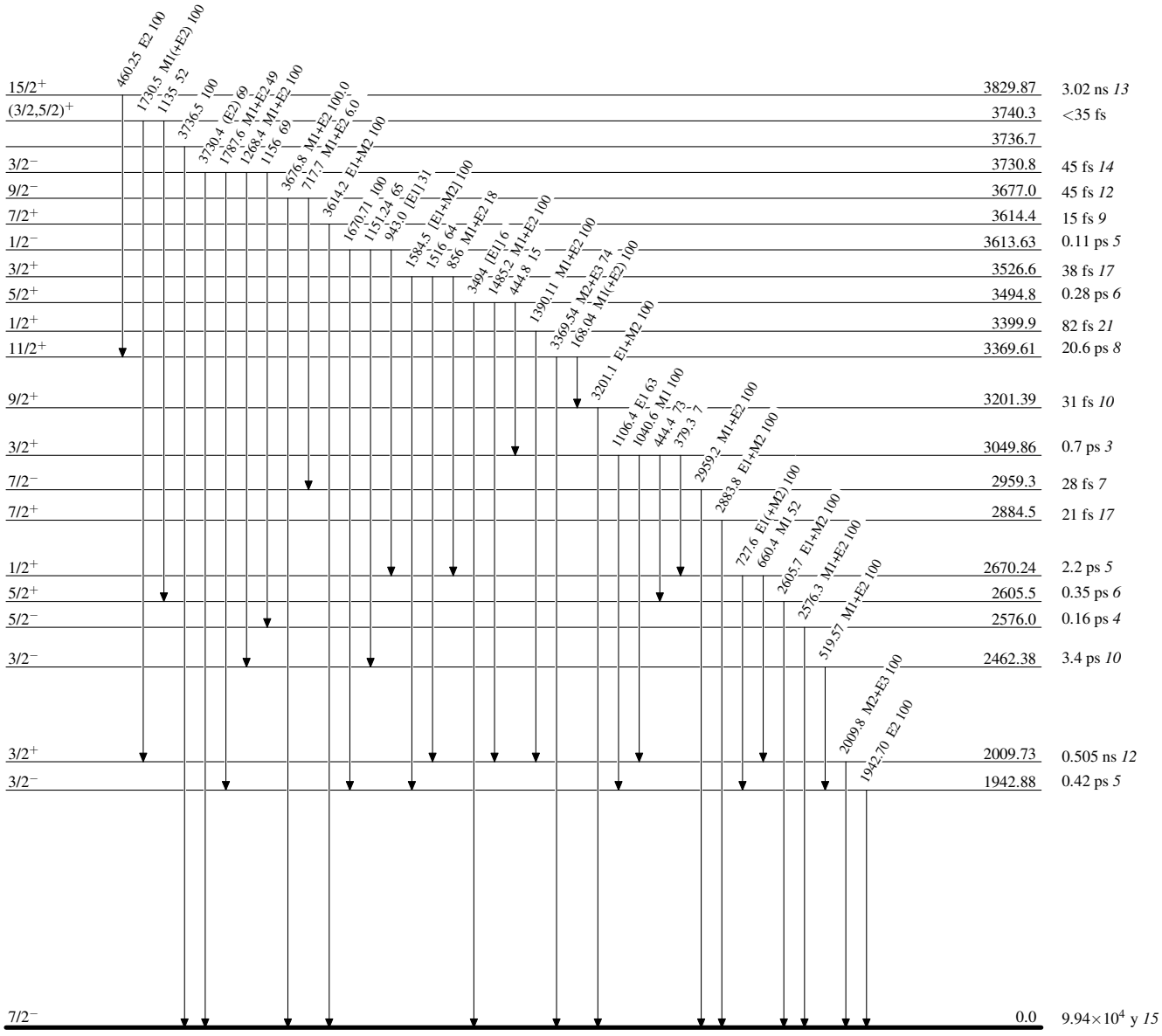


$^{41}_{20}Ca_{21}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{41}_{20}Ca_{21}$