Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 112,1875 (2011)	30-Nov-2010

Q(β^-)=−1.166×10^4 *3*; S(n)=13314.73 *18*; S(p)=7463.25 *16*; Q(α)=−9336.0 *7* 2012Wa38
Note: Current evaluation has used the following Q record −11669 2613314.69187463.20 *16*−9336.0 *7* 2011AuZZ,2003Au03.

2004Va22: Measured γ-ray transition cross-section from 1.1. GeV proton spallation on ^{28}Si; 5.0(9) and 2.5(8) mb for 782.7(3) and 960.3(7) keV γ-rays, respectively.

1999Ue03: Measured Gamow Teller (>) transition strengths B(>) of 0.32(3), 0.079(9), 0.28(7),0.09(1), 0.13(1) for excitation levels of 0.0, 2160, 2650+2870, 3800, 4290 keV, respectively, from ^{27}Al(^{6}Li,^{6}He) reaction, E=100 MeV/nucleon.

^{27}Si Levels

Cross Reference (XREF) Flags

A	^{27}P β^+ decay	E	^{25}Mg(^{3}He,n)	I	^{27}Al(^{3}He,t)
B	^{28}S β^+p decay	F	^{26}Al(p,γ)	J	^{28}Si(p,d)
C	^{12}C(^{16}O,nγ)	G	^{26}Al(^{3}He,d)	K	^{28}Si(^{3}He,α)
D	^{24}Mg(α,nγ)	H	^{27}Al(p,nγ)	L	^{29}Si(p,t)

E(level)[†]	J$^\pi$	T$_{1/2}$[c]	XREF	Comments
0.0	5/2$^+$	4.15 s *4*	AB DE H J L	%ε+%β^+=100 Q=+0.063 *14* μ=0.8654 *3* J$^\pi$: L=2 in (p,t) and from comparison of angular distribution measurement with DWBA calculations (1974Na14); L=0 in ^{25}Mg(^{3}He,n), J^π(^{25}Mg)=5/2$^+$. T$_{1/2}$: From the Limitation of Relative Statistical Weight Method (LWM) of 4.14 s 2 (1958Mi85), 4.19 s 2 (1968Bl16), 4.17 s 1 (1968Go10), 4.109 s 4 (1975Az01), and 4.206 s 8 (1976Ge06). LWM has used weighted average and expanded the uncertainty to include the most precise value of 4.109 s 4. An average value of 4.135 s *19* is reported in 2008Se10 from a compilation of half-lives. Q: From 2002Ma43 and 1999MaZK; other: 0.061(4) (1998MaZJ). 2005St24 lists data of 1999MaZK and 1998MaZJ (same research group). μ: From 1999MaZK; others: (−)0.8652(4) (1998MaZJ) and (−)0.8554 *4* (1984Hu11); reported in 1989Ra17 and 2005St24. 1998MaZJ and 1999MaZK (same research group) corrected for diamagnetism. All three values are measured using the β-NMR method.
780.9[‡] *2*	1/2$^+$	35 ps *4*	B D H JKL	J$^\pi$: L=0 (p,t).
957.4[‡] *2*	3/2$^+$	1.20 ps *8*	BCD H JKL	J$^\pi$: L=2 (p,t), 957.3γ (M1+E2) to 5/2$^+$.
2163.6[‡] *2*	7/2$^+$	44 fs *5*	CD H JKL	J$^\pi$: L=4 (p,t), 2163.5γ (M1+E2) to 5/2$^+$.
2647.6[‡] *3*	5/2$^+$	17 fs *2*	CDE H JKL	J$^\pi$: L=0 in ^{25}Mg(^{3}He,n), J^π(^{25}Mg)=5/2$^+$; L=2 (p,t).
2866.3[‡] *3*	(3/2,5/2)$^+$	<3 fs	CD H KL	J$^\pi$: L=2 (p,t).
2909.9[‡] *2*	9/2$^+$	52 fs *6*	CD H JKL	J$^\pi$: L=4 (p,t), 2909.7γ to 5/2$^+$ (E2+M3).
3540.2 *11*	1/2$^+$	<5 fs	C H KL	J$^\pi$: L=0 (p,t).
3803.6[‡] *11*	3/2$^+$	<7 fs	CD H KL	J$^\pi$: L=0 (p,t), 3803.3γ to (M1+E2) to 5/2$^+$.
4138.1 *14*	1/2$^-$,(3/2$^-$)	6 fs *3*	C H JK	J$^\pi$: L=1 (p,d).
4289.2 *9*	5/2$^+$	3.5 fs *14*	CD H JKL	J$^\pi$: L=2 (p,t), (p,d); 4289γ to 5/2$^+$, 3331γ to 3/2$^+$.
4447.3[‡] *5*	(11/2$^+$)	390 fs *40*	CD H K	J$^\pi$: 2283γ (E2) 7/2$^+$, 1537.3γ M1+E2 to 9/2$^+$.

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Adopted Levels, Gammas (continued)

^{27}Si Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[c]	XREF	Comments
4474.8[‡] *7*	7/2+,(9/2+)	<7 fs	CD H JK	Jπ: L=4 (p,d), 4474γ to 5/2+.
4703.8 *11*	5/2+	<5 fs	C E H KL	Jπ: L=0 in ^{25}Mg(^{3}He,n), Jπ(^{25}Mg)=5/2+.
5062 *2*	5/2+	21 fs *6*	C H JKL	Jπ: L=2 (p,d), 4104γ M1+E2 to 3/2+.
5208 *2*		<35 fs	H L	
5227 *5*	1/2−,3/2−		JK	Jπ: L=1 in (p,d).
5262.0 *5*	(3/2+ to 9/2+)		F	Jπ: γ-ray feeding from resonance state (p,γ).
5282.8[‡] *4*	(7/2,11/2)+	17 fs *4*	CD H K	Jπ: From γ-ray angular correlation and meanlife measurements (1977St32 − (α,nγ).
5316.7[‡] *5*		<31 fs	D H K	
5391.7 *16*	(3/2,5/2)+	<31 fs	H JK	XREF: K(5402). Jπ: L=2 (p,d).
5497 *2*		<10 fs	E H KL	XREF: E(5510)K(5505).
5547 *4*			JK	
5580 *4*			K	
5613 *4*			K	
5783 *6*			K	
5897 *3*			K	
6028 *4*			K	
6059 *4*			K	
6323 *4*			jK	
6346 *4*			jK	
6457 *3*			K	
6513 *4*			K	
6572 *3*			K	
6587 *6*			K	
6626 *3*	1/2+		A K	T=3/2 E(level),Jπ: level energy from (^{3}He,α). Jπ from L=0 (1977Be13 − (p,t)).
6715 *3*			K	
6743 *3*			K	
6780 *4*			K	
7005 *8*			K	
7059 *5*			K	
7080 *3*			K	
7134 *5*			K	
7223 *4*			K	
7239 *4*			K	
7260 *4*			K	
7276 *3*			K	
7324 *4*			K	
7341 *4*			K	
7383[#] *4*			I K	
7428 *4*			I	
7436[#] *3*			I K	
7469.3[@] *6*	(5/2+)[a]		C I K	
7531.6[@] *5*	5/2+[a]	<4.2[d] fs	C I K	Jπ: L(p)=2 resonance (^{16}O,nγ).
7590.1[@] *1*	9/2+[a]	13.9[d] fs *21*	BC I K	Jπ: L(p)=0 resonance (^{16}O,nγ).
7651.6[@] *1*	(11/2+)[a]	8.3[d] fs *21*	C FG I K	
7694.3[@] *9*	(5/2+)[a]	<3.5[d] fs	C	
7704.8[@] *1*	(7/2−)[a]	<0.7[d] fs	C I K	
7738.8[@] *1*	(9/2+)[a]	15[d] fs *3*	C FG I K	Γ<0.3 keV (p,γ).
7795.2[@] *19*	(7/2+)[a]		C I K	

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Adopted Levels, Gammas (continued)

^{27}Si Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[c]	XREF	Comments
7831.5[@] *2*	$(9/2^-)$[a]	6[d] fs *4*	C F I K	Jπ: Assigned in 2009Lo01 (^{16}O,nγ). Other: $(7/2^+$ to $11/2^+)$ in 1984Bu09 (p,γ). Γ<1.0 keV (p,γ).
7837.9 *2*	$(1/2^+)$[a]	<0.7 fs	C	
7899.7[@] *6*	$(5/2^+)$[a]	10 fs *7*	C I	
7909.0[@] *7*	$(3/2^+)$[a]		C I K	
7966.6[@] *8*	$(5/2^+)$	8 fs *6*	C I K	
8031.9[@] *9*	$(5/2^+)$[a]		C I K	
8070[@] *3*	$(3/2^-)$[a]		C I K	
8139.3[@] *6*	$(1/2)$[a]	<0.7 fs	C I K	
8156[&] *2*		<0.5 keV	F I K	
8167.3[@] *12*	$(11/2^+)$[a]	<0.5 keV	C F I K	
8175 *3*	$(1/2,3/2)^+$[b]		A	
8183.7[@] *4*	$(3/2^-)$[a]	2.8 fs *21*	C F	
8200.1 *7*	$(1/2,5/2)$[a]	9 fs *5*	C	
8208.1[@] *22*	$(7/2^-)$[a]		C I K	
8224[&] *2*	$(7/2^+)$[a]	<0.5 keV	F I K	
8287[&] *3*	$(7/2^+$ to $13/2^+)$[a]	<1.0 keV	F K	
8299 *5*			I	
8327 *2*	$(1/2,3/2)^+$[b]		A I K	XREF: K(8310). E(level): From ^{27}P β$^+$ decay.
8344.8 *7*	$(7/2)$[a]		C	
8356[&] *2*	$(3/2^+$ to $9/2^+)$	<0.5 keV	F I K	Jπ: Assigned in 1984Bu09 based on γ-ray feeding to $5/2^+$ (g.s.) and $7/2^+$ (2163.6 keV) states.
8375.8[@] *9*	$(5/2^+)$[a]	2.1 fs *14*	C I K	
8450 *2*	$(1/2,3/2)^+$[b]		A I K	XREF: K(8440). E(level): From ^{27}P β$^+$ decay.
8486[#] *3*			I K	
8523[#] *3*			I K	
8544 *3*		4.8 keV *7*	F	
8557[#] *3*			I K	
8586[#] *3*			I K	
8669[&] *3*		5.4 keV *6*	F I K	XREF: K(8660).
8724 *4*			I	
8776[&] *5*		16 keV *4*	F I K	XREF: I(8782).
8822 *5*			K	
8864[#] *3*			I K	
8872 *5*			K	
8931[#] *4*			I K	
8984[#] *3*			I K	
9026[#] *3*			I K	
9066 *4*	$(1/2,3/2)^+$[b]		A K	E(level): From ^{27}P β$^+$ decay.
9074[#] *3*			I K	
9140[#] *2*			I K	
9164 *12*			K	
9184 *3*			I	
9215 *4*			K	

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Adopted Levels, Gammas (continued)

^{27}Si Levels (continued)

E(level)[†]	XREF	E(level)[†]	XREF	E(level)[†]	XREF
9227 *4*	I	9409 *3*	I	9715[#] *2*	I K
9237[#] *2*	I K	9428 *3*	K	9764[#] *2*	I K
9256 *4*	K	9438 *18*	K	9791 *2*	K
9274[#] *2*	I K	9477 *3*	I	9834 *2*	I
9308[#] *3*	I K	9547[#] *4*	I K	9856 *3*	I
9339[#] *6*	I K	9576[#] *4*	I K	9895 *2*	K
9363[#] *4*	I K	9615[#] *6*	I K	9916[#] *2*	I K
9386 *13*	I	9655[#] *4*	I K	9934 *5*	I

[†] From (p,nγ), except otherwise noted.
[‡] Weighted average of data from (p,nγ)−1971We12, 1972Mo02, 1985Ti09 and (α,nγ)−1977St32.
[#] Weighted average of data from (^{3}He,α) and (^{3}He,t).
[@] From (^{16}O,nγ).
[&] From (p,γ).
[a] From (^{16}O,nγ)−2009Lo05 based on γ(θ), meanlife, and analogy with mirror states in ^{27}Al.
[b] Assigned in 1996Og01 (^{27}P β$^+$ decay) based on Gamow-Teller strength function and logft values.
[c] Weighted average of data from 1986Ti02, 1985Ti09, 1972Ha22, 1971Ma49, 1971We12, and 1971Bi24, except otherwise noted. Γ (keV) widths from (p,γ) (1984Bu09).
[d] From (^{16}O,nγ).

Adopted Levels, Gammas (continued)

γ(^{27}Si)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	δ[a]	Comments
780.9	1/2$^+$	780.8	100	0.0	5/2$^+$	E2		Mult.: From experimental B(E2) value (1971We12 − (p,nγ)).
957.4	3/2$^+$	176.4	6.42 *29*	780.9	1/2$^+$	(M1)		B(M1)(W.u.)=0.17 *6*
		957.3	100.0 *22*	0.0	5/2$^+$	(M1+E2)	+0.50 *4*	B(M1)(W.u.)=0.0157 *8*; B(E2)(W.u.)=23 *3*
2163.6	7/2$^+$	1206.1	<0.5	957.4	3/2$^+$			
		1382.6	<0.5	780.9	1/2$^+$			
		2163.5	100.0	0.0	5/2$^+$	(M1+E2)	−0.43 *4*	B(M1)(W.u.)=0.041 *12*; B(E2)(W.u.)=8.5 *16*
2647.6	5/2$^+$	1690.1	100 *4*	957.4	3/2$^+$	(M1+E2)	−0.083 *14*	B(M1)(W.u.)=0.21 *3*; B(E2)(W.u.)=2.6 *10*
		1866.6	3.9 *13*	780.9	1/2$^+$	(E2)		B(E2)(W.u.)=9 *3*
		2647.4	26 *4*	0.0	5/2$^+$	(M1+E2)	−0.40 *6*	B(M1)(W.u.)=0.0120 *24*; B(E2)(W.u.)=1.5 *5*
2866.3	(3/2,5/2)$^+$	702.6	<0.52	2163.6	7/2$^+$			
		1908.8	<1	957.4	3/2$^+$			
		2085.3	4.2 *11*	780.9	1/2$^+$	(M1)		
		2866.1	100.0 *21*	0.0	5/2$^+$	(M1+E2)		
2909.9	9/2$^+$	262.2	<0.5	2647.6	5/2$^+$			
		746.2	6.4 *22*	2163.6	7/2$^+$	(M1)		B(M1)(W.u.)=0.061 *23*
		1952.4	<0.5	957.4	3/2$^+$			
		2128.9	<0.5	780.9	1/2$^+$			
		2909.7	100.0 *22*	0.0	5/2$^+$	(E2+(M3))	−0.03 *6*	B(E2)(W.u.)=10.1 *13* Mult.,δ: From 1972Ba06 (^{3}He,α). Other: +0.05 *7* (1977St32 -(α,nγ)).
3540.2	1/2$^+$	2582.6	61 *7*	957.4	3/2$^+$			
		2759.1	100 *7*	780.9	1/2$^+$			
3803.6	3/2$^+$	1155.9	15 *8*	2647.6	5/2$^+$	(M1)		
		3022.5	10 *8*	780.9	1/2$^+$			
		3803.3	100 *5*	0.0	5/2$^+$	(M1)		Mult.,δ: From 1974Pr03 (^{3}He,α).
4138.1	1/2$^-$,(3/2$^-$)	3180.4	11 *5*	957.4	3/2$^+$			
		3356.9	100 *5*	780.9	1/2$^+$	(E1)		
4289.2	5/2$^+$	2125.5	13 *8*	2163.6	7/2$^+$	M1+(E2)	+0.09 *16*	
		3331.5	79 *10*	957.4	3/2$^+$	M1+E2	+0.21 *3*	B(M1)(W.u.)=0.07 *3*; B(E2)(W.u.)=1.4 *8*
		4288.8	100 *8*	0.0	5/2$^+$	M1		B(M1)(W.u.)=0.041 *18*
4447.3	(11/2$^+$)	1537.3	12.4 *23*	2909.9	9/2$^+$	M1+E2	+0.9 *7*	
		1799.6	<2.2	2647.6	5/2$^+$			
		2283.5	100.0 *23*	2163.6	7/2$^+$	(E2)		B(E2)(W.u.)=4.2 *5*
		3489.6	<2.2	957.4	3/2$^+$			
		3666.1	<2.2	780.9	1/2$^+$			
		4446.9	<2.2	0.0	5/2$^+$			
4474.8	7/2$^+$,(9/2$^+$)	4474.4	100	0.0	5/2$^+$			
4703.8	5/2$^+$	2540.0	<17.9	2163.6	7/2$^+$			
		3746.1	79 *15*	957.4	3/2$^+$	M1+(E2)	<+1.8	
		4703.3	100 *15*	0.0	5/2$^+$	M1+E2	+0.4 *3*	
5062	5/2$^+$	2414	28 *11*	2647.6	5/2$^+$			
		4104	100 *11*	957.4	3/2$^+$	M1+E2	+0.07 *4*	B(M1)(W.u.)=0.012 *4*

$^{27}_{14}Si_{13}$-5

Adopted Levels, Gammas (continued)

γ(^{27}Si) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]
5208		2297	100 *38*	2909.9	9/2$^+$	
		3044	35 *19*	2163.6	7/2$^+$	
		5207	73 *40*	0.0	5/2$^+$	
5282.8	(7/2,11/2)$^+$	2372.7	100 *3*	2909.9	9/2$^+$	
		2635.0	<5.1	2647.6	5/2$^+$	
		3119.0	28 *3*	2163.6	7/2$^+$	
		4325.0	<2.6	957.4	3/2$^+$	
		4501.4	<2.6	780.9	1/2$^+$	
		5282.2	<2.6	0.0	5/2$^+$	
5316.7		3152.9	100	2163.6	7/2$^+$	
7469.3	(5/2$^+$)	6511.1[‡] *6*	100	957.4	3/2$^+$	D+Q[&]
7531.6	5/2$^+$	4883.5[‡] *5*		2647.6	5/2$^+$	
		6573.5[‡] *9*		957.4	3/2$^+$	D+Q[&]
7590.1	9/2$^+$	3115.6[‡] *14*		4474.8	7/2$^+$,(9/2$^+$)	
		3143[‡] *3*		4447.3	(11/2$^+$)	
		5425.9[‡] *1*		2163.6	7/2$^+$	
7651.6	(11/2$^+$)	2371[‡] *4*		5282.8	(7/2,11/2)$^+$	
		3204.1[‡] *1*		4447.3	(11/2$^+$)	D+Q[&]
7694.3	(5/2$^+$)	5530.1[‡] *9*	100	2163.6	7/2$^+$	D+Q[&]
7704.8	(7/2$^-$)	5056.7[‡] *1*	100	2647.6	5/2$^+$	D[&]
7738.8	(9/2$^+$)	2421.6[‡] *4*		5316.7		
		2455.9[‡] *4*		5282.8	(7/2,11/2)$^+$	
		3291.3[‡] *1*		4447.3	(11/2$^+$)	
		4828.7[‡] *5*		2909.9	9/2$^+$	D+Q[&]
		5575.7[‡] *2*		2163.6	7/2$^+$	
7795.2	(7/2$^+$)	5631.0[‡] *19*	100	2163.6	7/2$^+$	D+Q[&]
7831.5	(9/2$^-$)	2329.8[‡] *8*		5497		
		3383.8[‡] *2*		4447.3	(11/2$^+$)	
		4921.0[‡] *4*		2909.9	9/2$^+$	
		5668.0[‡] *3*		2163.6	7/2$^+$	
7837.9	(1/2$^+$)	6879.6[‡] *2*	100	957.4	3/2$^+$	D+Q[&]
7899.7	(5/2$^+$)	3424.9[‡] *8*		4474.8	7/2$^+$,(9/2$^+$)	
		6941.1[‡] *8*		957.4	3/2$^+$	D+Q[&]
7909.0	(3/2$^+$)	7127.1[‡] *7*	100	780.9	1/2$^+$	D+Q[&]
7966.6	(5/2$^+$)	7008.2[‡] *8*	100	957.4	3/2$^+$	

$^{27}_{14}Si_{13}$-6

Adopted Levels, Gammas (continued)

γ(^{27}Si) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]
8031.9	(5/2$^+$)	5384.2[‡] *9*		2647.6	5/2$^+$	
		7071.6[‡] *19*		957.4	3/2$^+$	D+Q[&]
8070	(3/2$^-$)	7112[‡] *3*	100	957.4	3/2$^+$	D+Q[&]
8139.3	(1/2)	7180.9[‡] *6*	100	957.4	3/2$^+$	D+Q[&]
8167.3	(11/2$^+$)	3719.4[‡] *12*		4447.3	(11/2$^+$)	D+Q[&]
		5261[‡] *4*		2909.9	9/2$^+$	
8183.7	(3/2$^-$)	7401.7[‡] *4*	100	780.9	1/2$^+$	D[&]
8200.1	(1/2,5/2)	7241.7[‡] *7*	100	957.4	3/2$^+$	
8208.1	(7/2$^-$)	5298.3[‡] *22*	100	2909.9	9/2$^+$	
8344.8	(7/2)	5434.0[‡] *19*		2909.9	9/2$^+$	
		6180.6[‡] *7*		2163.6	7/2$^+$	
8375.8	(5/2$^+$)	7417.3[‡] *9*	100	957.4	3/2$^+$	D+Q[&]

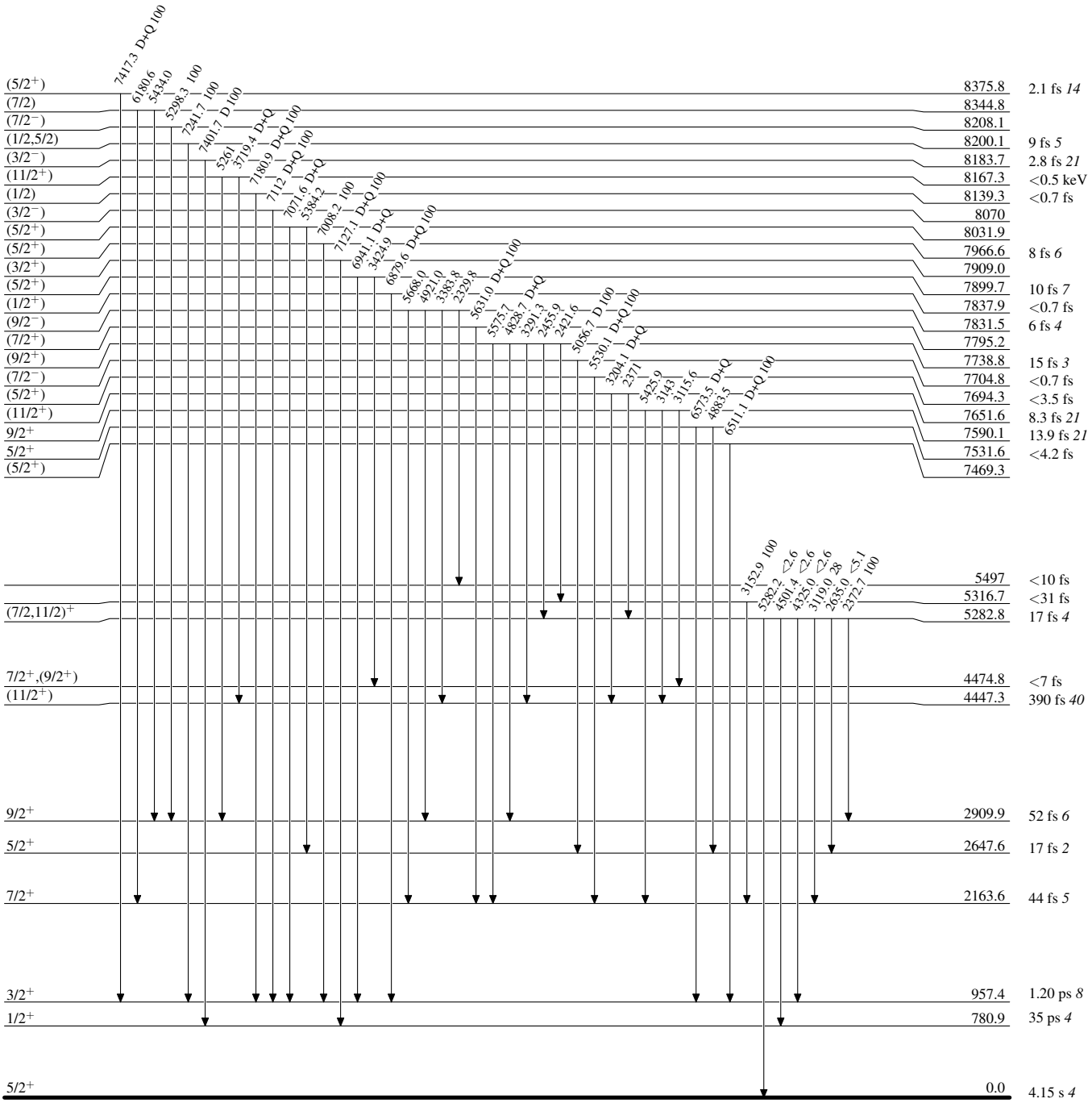
[†] Deduced by the evaluator from level energy differences.
[‡] From (^{16}O,nγ).
[#] Weighted averages of values from different reactions.
[@] Quoted from 1985Ti09 (p,nγ) or measured δ values, except otherwise noted.
[&] From (^{16}O,nγ).
[a] Weighted averages of values from 1967Da13, 1967Le15, 1971Ma26, 1974Ri04, 1974Pr03, and 1977St32, except otherwise noted. Sign convention as of the ENSDF policy.

$^{27}_{14}Si_{13}$-7

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

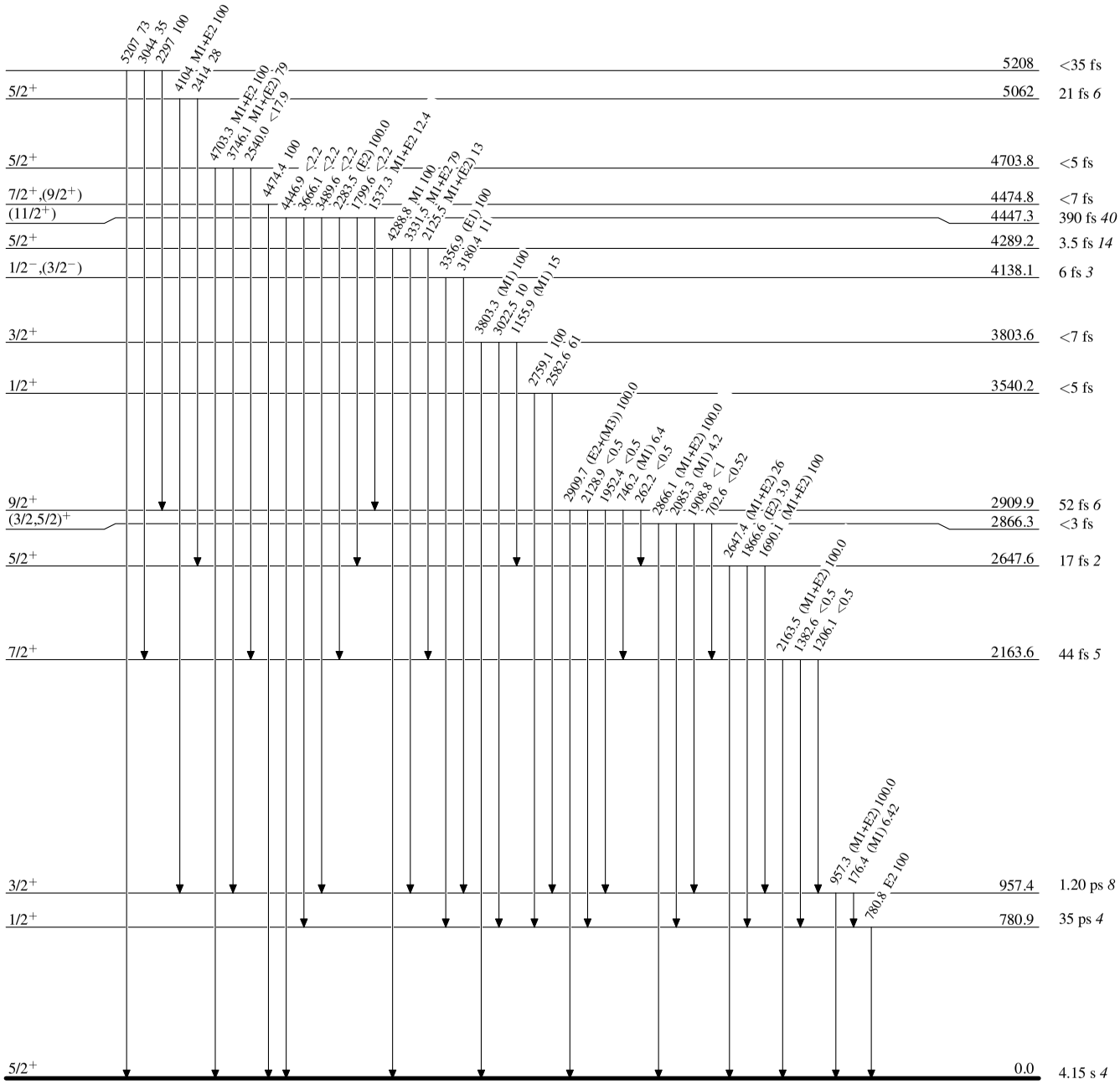


$^{27}_{14}Si_{13}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{27}_{14}Si_{13}$