^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 111, 2331 (2010)	30-Jun-2010

Others: 1984Bh03, 1971Sy01.

1980Bi14: ^{27}Al(α,pγ) E=12,14.1, and 15 MeV; particle detector, γ-ray detectors at 0°, 20°, 30°, 45°, 55°, 70°, and 90° with respect to the beam direction, Ge(Li) and NaJ(Tl) for Compton polarimeter; Measured: Eγ, level lifetime τ, γ-ray correlation coefficients, γ-ray linear polarizations.

1971Sh11: ^{27}Al(α,p),(α,pγ) E=5.0, 6.3, 8.0 MeV; Ge(Li) and NaI(Tl) detectors; Eγ, γ-ray Branching, level lifetime τ, γ-ray linear polarization at 90°.

1972Ga05: ^{27}Al(α,pγ) E=9-10 MeV; Ge(Li); Measured Eγ, Iγ, level lifetime τ.

1984Bh03: ^{27}Al(α,p) E=6.3-7.3 MeV; Ge(Li) and NaI(Tl) detectors; Measured lifetime of 3788 keV level.

1971Sy01: ^{27}Al(α,pγ) E=8.80 MeV, ^{30}Si(α,$\alpha'\gamma$) E=13.52, 14.50, and 14.57 MeV, ^{30}Si(p,p$'\gamma$) E=8.06 and 9.41 MeV; 96% enriched ^{30}Si target; annular silicon surface barrier detector at 180°, 5 NaI(Tl) at 30°, 120°, 270°, 315°, and 352° with respect to the beam direction, Ge(Li); Measured particle-γ angular relation, deduced level E, J$^{\pi}$, δ. Reported level energies above 7256 keV are consistently lower than the level energies reported by 1980Bi14.

^{30}Si Levels

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[&]	Comments
0	0$^+$		
2235.5 *12*	2$^+$	220[a] fs *22*	
3498.7 *13*	2$^+$	62[a] fs *13*	
3769.6 *13*	1$^+$	36 fs *9*	
3788 *3*	0$^+$	8.3 ps *5*	T$_{1/2}$: From 1984Bh03.
4809.5 *14*	2$^+$	104 fs *15*	T$_{1/2}$: OTher: 139 fs *14* (1971Sh11).
4831.5 *15*	3$^+$	83 fs *24*	
5231.3 *14*	3$^+$	43 fs *21*	T$_{1/2}$: Other 69 fs *14* (1971Sh11).
5280.5 *15*	4$^+$	83 fs *22*	
5372.3 *13*	0$^+$	59[b] fs *21*	
5487.6[‡] *14*	3$^-$	43 fs *12*	
5614.2 *16*	2$^+$	<21 fs	
5951.0 *15*	4$^+$	15[b] fs *8*	T$_{1/2}$: Other:<24 fs (1980Bi14).
6504.3[‡] *16*	4$^-$	139 fs *35*	T$_{1/2}$: Other: 222 fs *35* (1971Sh11).
6537.6 *18*	2$^+$	<17 fs	T$_{1/2}$: Other: 33 fs *24* (1971Sh11).
6640.9 *22*	2$^-$	21 fs *9*	
6642 *5*	0$^+$		
6745 *3*	1$^-$	<14 fs	
6865.5 *17*	3$^+$	23 fs *16*	
6915.6 *18*	2$^+$	<24[b] fs	
7001.4 *16*	5$^+$	104 fs *35*	
7044.4 *16*	5$^-$	0.83 ps *20*	
7079.7 *18*	3$^+$	<14 fs	
7225.1 *16*	4$^+$[@]	<14 fs	
7255.9 *18*	2$^+$	<35 fs	T$_{1/2}$: Level energy of 7225 keV (would be 7255) mentioned at the footnotes of Table 1 in 1980Si14 related to this T$_{1/2}$ seems to be a typo, since the 7225 keV level is already quoted in Table 1.
7441 *5*	0$^+$		
7508.8 *20*	2$^-$	<24 fs	
7613.5 *19*	4$^-$	13 fs *6*	
7624.0 *25*	2$^+$	<17 fs	
7635 *4*	1,2$^+$		
7669.0 *25*	1$^+$,2$^+$	<14 fs	
7810.6 *18*	4	12 fs *8*	

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

^{30}Si Levels (continued)

E(level)[†]	J$^{\pi}$[#]	T$_{1/2}$[&]	Comments
7911.9 *23*	2$^+$	21 fs *15*	
8103.7 *18*	2$^+$,3$^-$	<24 fs	
8156 *3*	(1$^-$ to 4$^+$)		
8165 *3*	1$^-$		
8191 *3*	2$^+$	<24 fs	
8196.6[‡] *17*	5$^-$	35 fs *12*	
8290 *3*	(1 to 3)		
8333.5 *18*	2$^+$		E(level): Doublet? (1980Bi14).
8441 *3*	(1 to 3)		
8537.0 *20*	3$^+$,4$^+$	31 fs *16*	
8553 *3*	2$^-$,3$^-$	<14 fs	
8596.6 *21*	4$^-$	<24 fs	
8639.6 *24*	(1$^+$ to 4$^+$)	<24 fs	
8672.3 *20*	1$^-$,2$^+$		
8684.1 *19*	(2$^+$ to 4$^+$)	<24 fs	
8734 *3*	(0$^+$ to 3$^+$)		
8799 *3*	(1,2$^+$)		
8887 *5*	(0$^+$ to 4$^+$)		
8901 *5*	1$^-$		
8939 *3*	(0$^+$ to 3$^+$)		
8956 *4*	(1,2$^+$)		
8963.1 *18*	5$^-$	17 fs *10*	
8979 *3*	1,2$^+$		
9034.9 *25*	(0$^+$ to 3$^+$)		
9045.2 *22*	3,4	<24 fs	
9104 *5*	(0$^-$ to 2$^-$)	<24 fs	
9111.5 *21*	6$^-$[@]	24 fs *6*	
9131.2 *24*	4$^+$,5$^+$	<17 fs	
9166.5 *19*	(1$^+$ to 3$^+$)	<24 fs	
9255.1 *23*	3$^+$,2$^+$		
9310 *5*	(0 to 3$^+$)	<24 fs	
9349.8 *21*	4$^-$	<24 fs	
9362 *4*	1,2$^+$		
9371.2 *25*	6$^+$[@]	<17 fs	
9405.7 *24*	(1$^+$ to 4$^+$)	<24 fs	
9439 *3*	1$^-$		
9475 *3*	(2$^+$ to 4$^+$)		
9507.2 *22*	5$^-$	<17 fs	
9576 *3*	(1$^+$ to 3)		
9596 *3*	(0$^+$ to 4$^+$)		
9604.6 *23*	(2 to 4$^+$)		
9622 *4*	1$^-$		
9648.1 *24*	(3$^-$,4)	<35 fs	
9689 *5*	(0 to 3$^-$)		
9725 *3*	(0$^+$ to 4$^+$)		
9760.8 *23*	(2$^+$ to 4$^+$)	<35 fs	
9768 *3*	(1,2$^+$)		
9777.3[‡] *21*	6$^-$[@]	<24 fs	
9792 *4*	1$^-$		
9816 *5*	(0$^+$ to 4$^+$)		
9882.1 *24*	3,4		
9896.7 *23*	(0$^+$ to 4$^+$)		
9954.7 *20*	4,5	<14 fs	
9958 *3*	1,2$^+$		
10027 *3*	(2 to 4$^+$)		

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

^{30}Si Levels (continued)

E(level)[†]	J$^\pi$[#]	T$_{1/2}$[&]	E(level)[†]	J$^\pi$[#]	T$_{1/2}$[&]
10057.2 *24*	(3 to 5$^+$)		10835 *5*	(1$^+$ to 5$^+$)	
10079 *3*	(1$^+$ to 4$^+$)		10866.3 *23*	(3$^-$ to 5)	<35 fs
10116 *3*	(1$^-$ to 4$^+$)		10975 *5*	(0$^+$ to 4$^+$)	
10184 *3*	(0$^+$ to 3$^+$)		10991.0 *21*	(3 to 5)	
10188.2 *22*	5$^-$	19 fs *14*	11016 *4*	(2$^+$ to 4$^+$)	
10206.6 *25*	(1$^-$)		11038 *3*	(3$^-$ to 6$^+$)	<52 fs
10228 *5*	(0$^+$ to 4$^+$)		11074 *5*	(3 to 5)	<35 fs
10276 *3*	(0$^+$ to 4$^+$)		11084.1 *23*	(4$^-$ to 6$^-$)	24 fs *9*
10288 *3*	(4$^+$,5$^+$)	<28 fs	11091 *5*	(3 to 5)	<35 fs
10305.1 *22*	3$^-$		11205 *3*	(0$^+$ to 4$^+$)	
10348.9 *24*	(3$^+$,4)	<24 fs	11210.1 *25*	(4,5$^+$)	
10355 *3*	(0$^+$ to 4$^+$)		11250.3 *18*		<24 fs
10397 *4*	(3,5$^+$)	<24 fs	11269 *4*	(2$^+$ to 5$^+$)	
10420 *5*	(2$^+$ to 6$^+$)		11323 *3*	(2$^+$ to 5$^+$)	
10450 *3*	(0 to 3$^+$)		11349 *5*	(2$^+$ to 6$^+$)	
10465.0 *24*	(3$^+$,4)	<35 fs	11382 *5*	(0$^+$ to 4$^+$)	
10472 *3*	(1,2$^+$)		11417.7 *24*	(6$^+$,4$^+$)	<35 fs
10508 *3*	(0$^+$ to 3$^+$)		11477.3 *24*	(6$^-$,5$^-$)	
10560.9 *21*	6$^-$	<35 fs	11494 *3*	(3$^+$ to 6$^+$)	
10581 *5*	(0 to 3$^+$)		11513 *4*	(4 to 5$^+$)	
10623 *5*	(0 to 4$^+$)		11544.4[‡] *24*	7$^-$[@]	
10669.3 *25*	(3$^-$,4$^-$,5)	<17 fs	11565 *4*	(5,3$^+$)	<24 fs
10679 *3*	6$^+$,4	12 fs *8*	11661 *3*	(4 to 6)	
10725 *4*	7$^-$[@]	17 fs *9*	11740.4 *24*	(3 to 5)	
10732.2 *22*	(3$^-$,4$^-$,5$^-$)	<28 fs	11785 *3*	(4,5$^+$)	<35 fs
10795 *3*	(2 to 4)		11842 *5*	(0$^+$ to 4$^+$)	
10805 *5*	(0$^+$ to 4$^+$)		11880 *5*	(3$^-$ to 7$^-$)	
10823.3 *23*	(4,5$^+$,6$^+$)	<24 fs	12015 *3*	(4 to 6$^+$)	

[†] From a least squares fit to the γ-ray energies, ΔE=4 keV is assumed by the evaluator from the quoted 4 keV uncertainty of excited levels by 1980Bi14.

[‡] K$^\pi$=3$^-$ band; with an absolute value of intrinsic quadrupole moment Q$_o$=350 +250 −70 mb.

[#] From γ-rays linear polarization calculation, measured angular correlation coefficients and recommended upper limits of the calculated transition rates from the lifetime and mixing ratio ((α,p),(α,pγ)) − 1980Bi14).

[@] Consistent with γ-ray polarization data (1980Si14).

[&] From 1980Bi14, except otherwise noted. Level τ were measured using the Doppler-shift attenuation method and the T$_{1/2}$ is deduced from τ by the evaluator.

[a] Weighted average of data from 1980Bi14 and 1971Sh11.

[b] From 1971Sh11.

γ(^{30}Si)

E$_i$(level)	J$_i^\pi$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$_f^\pi$	Mult.[#]	δ[#]	Comments
2235.5	2$^+$	2235	100	0	0$^+$	E2		
3498.7	2$^+$	1263	100 *9*	2235.5	2$^+$	M1+E2	+0.18 *5*	
		3498	89 *9*	0	0$^+$	E2		
3769.6	1$^+$	1535	100 *9*	2235.5	2$^+$	M1+E2	−0.09 *3*	δ: Weighted average of −0.07 *4* (1964Sm04), −0.10 *4* (1967Br01) and −0.11 *5* (1971Sy01).
		3770	82 *9*	0	0$^+$	M1		
3788	0$^+$	1552	100	2235.5	2$^+$	E2		

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

$\gamma(^{30}Si)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
4809.5	2^+	1040	10 *3*	3769.6	1^+			
		1311	98 *10*	3498.7	2^+	M1+E2	−0.17 *6*	
		2574	43 *5*	2235.5	2^+	M1+E2	−0.52 *11*	
		4809	100 *10*	0	0^+	E2		
4831.5	3^+	1333	9 *2*	3498.7	2^+	D+Q[@]	+0.7[@] *5*	
		2596	100 *2*	2235.5	2^+	M1+E2	+0.73[&] *8*	
5231.3	3^+	1733	100 *9*	3498.7	2^+	M1+E2	+0.12 *6*	
		2996	13 *2*	2235.5	2^+			
5280.5	4^+	1782	1.0 *3*	3498.7	2^+			
		3045	100.0 *3*	2235.5	2^+	(E2)		
5372.3	0^+	1602.8 *9*	82 *11*	3769.6	1^+	M1		
		3136.6 *7*	100 *11*	2235.5	2^+	E2		
5487.6	3^-	1989	92 *8*	3498.7	2^+	(E1+M2)	−0.02 *7*	
		3252	100 *8*	2235.5	2^+	(E1+M2)	−0.04 *5*	
5614.2	2^+	783	6 *2*	4831.5	3^+	M1+E2[@]	+0.20[@] *11*	
		805	2 *1*	4809.5	2^+			
		1844	100 *8*	3769.6	1^+	M1+E2	+0.11 *5*	
		3379	81 *8*	2235.5	2^+			
5951.0	4^+	671	0.5 *2*	5280.5	4^+			
		720	0.3 *1*	5231.3	3^+			
		1120	1.7 *4*	4831.5	3^+			
		2453	6.7 *17*	3498.7	2^+	(E2)		
		3716	100 *2*	2235.5	2^+	(E2)		
6504.3	4^-	1018	9 *4*	5487.6	3^-	D+Q[@]	−0.23[@] *2*	δ: or −1.8 *+3−4*.
		1274	100 *7*	5231.3	3^+	(E1)		
		1674	62 *7*	4831.5	3^+	(E1)		
6537.6	2^+	923	13 *4*	5614.2	2^+			
		1306	16 *7*	5231.3	3^+			
		2768	35 *9*	3769.6	1^+			
		3039	100 *7*	3498.7	2^+			
		4302	27 *7*	2235.5	2^+			
		6537	31 *7*	0	0^+	E2		
6640.9	2^-	1153	88 *15*	5487.6	3^-			
		1809	100 *15*	4831.5	3^+			
		1831	47 *12*	4809.5	2^+			
		2871	59 *12*	3769.6	1^+			
6642	0^+	4406	100	2235.5	2^+			
6745	1^-	2956	100 *5*	3788	0^+			
		4509	3 *2*	2235.5	2^+	(E1)		
		6744	5 *2*	0	0^+	E1		
6865.5	3^+	914	6 *2*	5951.0	4^+	D+Q[@]	−0.03[@] *10*	
		1251	4 *2*	5614.2	2^+			
		1585	4 *2*	5280.5	4^+			
		1634	4 *2*	5231.3	3^+			
		2034	73 *12*	4831.5	3^+	D+Q[@]	+1.2[@] *5*	
		2056	12 *4*	4809.5	2^+			
		4630	100 *16*	2235.5	2^+	D+Q[@]	−0.15[@] *12*	
6915.6	2^+	1301	4.2 *22*	5614.2	2^+			
		3146	20 *7*	3769.6	1^+			
		3417	27 *7*	3498.7	2^+			
		4680	100 *20*	2235.5	2^+	M1+E2	−0.63 *14*	
		6914	71 *16*	0	0^+	E2		
7001.4	5^+	1050	18 *3*	5951.0	4^+	D+Q[@]	+0.12[@] *2*	

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

$\gamma(^{30}Si)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
7001.4	5^+	1721	100 *7*	5280.5	4^+	D+Q[@]	+0.25[@] *5*	
		2170	35 *5*	4831.5	3^+	Q		I_γ: 57 *7* (1971Sy01).
7044.4	5^-	540	96[‡] *9*	6504.3	4^-	M1+E2	+0.04 *3*	
		1094	100[‡] *8*	5951.0	4^+	D+Q[@]	−0.02[@] *1*	
		1556	32[‡] *4*	5487.6	3^-	Q		
		1765	62[‡] *6*	5280.5	4^+	D+Q[@]	+0.06[@] *3*	
7079.7	3^+	1848	<8	5231.3	3^+			
		2270	45 *8*	4809.5	2^+	D+Q[@]	+0.15[@] *1*	
		3581	22 *5*	3498.7	2^+			
		4844	100 *17*	2235.5	2^+	D+Q[@]	−0.00[@] *6*	
7225.1	4^+	720	<2	6504.3	4^-			
		1274	24 *7*	5951.0	4^+			I_γ: From 1971Sy01. Other: <9 (1980Bi14).
		1738	<9	5487.6	3^-			
		1945	100[‡] *7*	5280.5	4^+	M1+E2	+0.3 *4*	
		1994	30[‡] *7*	5231.3	3^+	M1+E2	+0.6[&] *1*	
		2394	23[‡] *4*	4831.5	3^+	D+Q[@]	+0.10[@] *3*	
		3727	25 *5*	3498.7	2^+			
7255.9	2^+	1768	31 *7*	5487.6	3^-			
		2024	24 *7*	5231.3	3^+			
		2424	17 *7*	4831.5	3^+			
		2446	45 *10*	4809.5	2^+	D+Q[@]	−1.5[@] *14*	
		3757	66 *14*	3498.7	2^+	D+Q[@]	−0.17[@] *15*	I_γ: Other: 18 *9* (1971Sy01).
		5020	100[‡] *10*	2235.5	2^+	M1+E2	+3.7 *15*	
		7256	63[‡] *8*	0	0^+	E2		
7441	0^+	3671	100	3769.6	1^+			
7508.8	2^-	2021	11 *3*	5487.6	3^-			
		2277	5 *3*	5231.3	3^+			
		2677	19 *5*	4831.5	3^+			
		3739	15 *5*	3769.6	1^+			
		4010	11 *3*	3498.7	2^+			
		5273	100 *13*	2235.5	2^+			
7613.5	4^-	1108	7 *2*	6504.3	4^-			
		2126	98 *12*	5487.6	3^-	D+Q	+0.25 *3*	
		2333	17 *5*	5280.5	4^+			
		2382	17 *5*	5231.3	3^+			
		2782	100 *10*	4831.5	3^+	D+Q	−0.00 *5*	
7624.0	2^+	4125	100 *16*	3498.7	2^+			I_γ: Other: 66 *11* (1971Sy01).
		5388	61 *11*	2235.5	2^+	D+Q	+0.38 *6*	I_γ: Other: 100 *16* (1971Sy01).
		7623	14 *5*	0	0^+	E2		I_γ: Other: 23 *8* (1971Sy01).
7635	$1,2^+$	3846	43 *14*	3788	0^+			
		3865	100 *14*	3769.6	1^+			
7669.0	$1^+,2^+$	4170	23 *5*	3498.7	2^+			
		5433	100 *10*	2235.5	2^+			
		7668	12 *4*	0	0^+			
7810.6	4	731	4 *2*	7079.7	3^+			
		945	12 *4*	6865.5	3^+			
		1859	46 *8*	5951.0	4^+			
		2530	100 *10*	5280.5	4^+			
		2579	18 *4*	5231.3	3^+			
		2979	20 *4*	4831.5	3^+			
7911.9	2^+	2424	11 *4*	5487.6	3^-			
		4142	40 *9*	3769.6	1^+			

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

$\gamma(^{30}Si)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]
7911.9	2^+	4413	25 *7*	3498.7	2^+		
		5676	100 *18*	2235.5	2^+	D+Q	+0.7 *3*
8103.7	$2^+,3^-$	1188	3 *2*	6915.6	2^+		
		2489	5 *3*	5614.2	2^+		
		2616	9 *3*	5487.6	3^-		
		2872	14 *5*	5231.3	3^+		
		3294	17 *5*	4809.5	2^+		
		4334	6 *3*	3769.6	1^+		
		5868	100 *15*	2235.5	2^+		
8156	(1^- to 4^+)	2668	29 *10*	5487.6	3^-		
		4657	43 *14*	3498.7	2^+		
		5920	100 *14*	2235.5	2^+		
8165	1^-	5929	100 *40*	2235.5	2^+		
		8164	100 *40*	0	0^+		
8191	2^+	2576	18 *6*	5614.2	2^+		
		4692	100 *6*	3498.7	2^+		
8196.6	5^-	971	34 *3*	7225.1	4^+	D+Q[@]	−0.00[@] *3*
		1151	6 *1*	7044.4	5^-	D+Q[@]	−0.15[@] *3*
		1195	6 *1*	7001.4	5^+		
		1691	100 *6*	6504.3	4^-		
		2245	77 *6*	5951.0	4^+		
		2709	43 *9*	5487.6	3^-		
		2916	20 *3*	5280.5	4^+	D+Q[@]	+0.06[@] *3*
8290	(1 to 3)	2802	9 *4*	5487.6	3^-		
		4790	16 *5*	3498.7	2^+		
		6054	100 *7*	2235.5	2^+		
8333.5	2^+	1109	13 *4*	7225.1	4^+		
		1254	30 *7*	7079.7	3^+		
		1332	7 *4*	7001.4	5^+		
		2720	27 *7*	5614.2	2^+		
		2845	20 *4*	5487.6	3^-		
		3053	37 *10*	5280.5	4^+		
		3502	100 *17*	4831.5	3^+		
		3523	13 *7*	4809.5	2^+		
		6097	87 *14*	2235.5	2^+		
8441	(1 to 3)	2954	16 *4*	5487.6	3^-		
		4942	100 *11*	3498.7	2^+		
		6205	63 *11*	2235.5	2^+		
8537.0	$3^+,4^+$	1535	39 *7*	7001.4	5^+		
		3306	23 *5*	5231.3	3^+		
		3727	100 *14*	4809.5	2^+		
		5037	16 *5*	3498.7	2^+		
		6300	50 *9*	2235.5	2^+		
8553	$2^-,3^-$	1911	6.3 *25*	6640.9	2^-		
		3066	100 *7*	5487.6	3^-		
		3744	19 *7*	4809.5	2^+		
8596.6	4^-	1372	16 *5*	7225.1	4^+	D+Q[@]	−0.13[@] *13*
		2645	24 *5*	5951.0	4^+		
		3108	82 *12*	5487.6	3^-	D+Q[@]	+0.08[@] *3*
		3365	100 *12*	5231.3	3^+	D+Q[@]	−0.01[@] *4*
8639.6	(1^+ to 4^+)	1774	25 *13*	6865.5	3^+		
		3026	25 *13*	5614.2	2^+		
		5140	100 *25*	3498.7	2^+		
		6403	100 *25*	2235.5	2^+		

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

$\gamma(^{30}Si)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]
8672.3	$1^-,2^+$	3185	100 *20*	5487.6	3^-		
		4902	53 *14*	3769.6	1^+		
		5173	87 *17*	3498.7	2^+		
		6436	77 *17*	2235.5	2^+		
		8671	20 *10*	0	0^+		
8684.1	(2^+ to 4^+)	1460	11 *4*	7225.1	4^+		
		1604	21 *8*	7079.7	3^+		
		2733	54 *15*	5951.0	4^+		
		3070	21 *8*	5614.2	2^+		
		3403	100 *18*	5280.5	4^+		
		3453	50 *11*	5231.3	3^+		
		3852	43 *11*	4831.5	3^+		
		3874	57 *15*	4809.5	2^+		
8734	(0^+ to 3^+)	5235	100 *12*	3498.7	2^+		
		6498	47 *12*	2235.5	2^+		
8799	($1,2^+$)	5029	100 *30*	3769.6	1^+		
		8797	100 *30*	0	0^+		
8887	(0^+ to 4^+)	6651	100	2235.5	2^+		
8901	1^-	5131	100	3769.6	1^+		
8939	(0^+ to 3^+)	5169	100 *40*	3769.6	1^+		
		6703	100 *40*	2235.5	2^+		
8956	($1,2^+$)	8955	100	0	0^+		
8963.1	5^-	766	11 *4*	8196.6	5^-	D+Q[@]	−0.04[@] *3*
		1152	5.6 *19*	7810.6	4		
		1349	30 *4*	7613.5	4^-	D+Q[@]	+0.22[@] *5*
		1919	93 *12*	7044.4	5^-	D+Q[@]	−0.03[@] *13*
		1961	19 *4*	7001.4	5^+		
		2459	52 *8*	6504.3	4^-	D+Q[@]	−0.13[@] *3*
		3012	15 *4*	5951.0	4^+		
		3475	48 *8*	5487.6	3^-		
		3682	100 *12*	5280.5	4^+	D+Q[@]	−0.02[@] *3*
8979	$1,2^+$	6743	100 *40*	2235.5	2^+		
		8978	100 *40*	0	0^+		
9034.9	(0^+ to 3^+)	5265	100 *20*	3769.6	1^+		
		5536	60 *16*	3498.7	2^+		
		9033	40 *12*	0	0^+		
9045.2	3,4	2541	48 *17*	6504.3	4^-		
		3094	65 *13*	5951.0	4^+		
		3557	100 *17*	5487.6	3^-		
		3814	29 *10*	5231.3	3^+		
		4213	81 *17*	4831.5	3^+		
9104	(0^- to 2^-)	2359	100	6745	1^-		
9111.5	6^-	914	2.6 *6*	8196.6	5^-		
		2067	100.0 *6*	7044.4	5^-	D+Q[@]	+0.35[@] *4*
9131.2	$4^+,5^+$	1907	43 *9*	7225.1	4^+		
		2129	100 *11*	7001.4	5^+		
		3180	62 *11*	5951.0	4^+		
		4299	65 *9*	4831.5	3^+		
9166.5	(1^+ to 3^+)	2301	40 *12*	6865.5	3^+		
		2629	40 *12*	6537.6	2^+		
		4335	100 *20*	4831.5	3^+		
		4357	40 *20*	4809.5	2^+		
		5396	80 *20*	3769.6	1^+		
		5667	20 *12*	3498.7	2^+		

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

γ(^{30}Si) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]
9166.5	(1$^+$ to 3$^+$)	6930	80 *24*	2235.5	2$^+$		
9255.1	3$^+$,2$^+$	3641	24 *6*	5614.2	2$^+$		
		4024	48 *6*	5231.3	3$^+$		
		4445	13 *4*	4809.5	2$^+$		
		7018	100 *10*	2235.5	2$^+$		
9310	(0 to 3$^+$)	5540	100	3769.6	1$^+$		
9349.8	4$^-$	753	13 *5*	8596.6	4$^-$		
		1736	63 *25*	7613.5	4$^-$		
		2270	10 *5*	7079.7	3$^+$		
		2846	40 *15*	6504.3	4$^-$		
		3862	25 *8*	5487.6	3$^-$		
		4118	100 *25*	5231.3	3$^+$		
9362	1,2$^+$	9360		0	0$^+$		
9371.2	6$^+$	2370	83 *10*	7001.4	5$^+$	D+Q[@]	+0.24[@] *3*
		3420	55 *8*	5951.0	4$^+$	Q	
		4090	100 *12*	5280.5	4$^+$	Q	
9405.7	(1$^+$ to 4$^+$)	4174	66 *11*	5231.3	3$^+$		
		4574	100 *15*	4831.5	3$^+$		
		4596	21 *9*	4809.5	2$^+$		
		5906	26 *7*	3498.7	2$^+$		
9439	1$^-$	5669	100 *40*	3769.6	1$^+$		
		9438	100 *40*	0	0$^+$		
9475	(2$^+$ to 4$^+$)	2395	50 *20*	7079.7	3$^+$		
		4194	100 *20*	5280.5	4$^+$		
		7238	50 *10*	2235.5	2$^+$		
9507.2	5$^-$	2463	6 *3*	7044.4	5$^-$		
		2505	17 *3*	7001.4	5$^+$	D+Q[@]	−0.00[@] *3*
		3003	6 *3*	6504.3	4$^-$		
		4019	14 *5*	5487.6	3$^-$		
		4226	100 *8*	5280.5	4$^+$	D+Q[@]	−0.00[@] *7*
9576	(1$^+$ to 3)	4744	54 *16*	4831.5	3$^+$		
		6076	100 *16*	3498.7	2$^+$		
9596	(0$^+$ to 4$^+$)	6097	100 *11*	3498.7	2$^+$		
		7360	43 *11*	2235.5	2$^+$		
9604.6	(2 to 4$^+$)	4117	43 *12*	5487.6	3$^-$		
		4373	100 *18*	5231.3	3$^+$		
		6105	71 *15*	3498.7	2$^+$		
		7368	71 *15*	2235.5	2$^+$		
9622	1$^-$	9620		0	0$^+$		
9648.1	(3$^-$,4)	2604	38 *8*	7044.4	5$^-$		
		4160	29 *6*	5487.6	3$^-$		
		4367	25 *8*	5280.5	4$^+$		
		4816	100 *12*	4831.5	3$^+$		
9689	(0 to 3$^-$)	2944	100	6745	1$^-$		
9725	(0$^+$ to 4$^+$)	6226	100 *13*	3498.7	2$^+$		
		7489	54 *13*	2235.5	2$^+$		
9760.8	(2$^+$ to 4$^+$)	3810	100 *14*	5951.0	4$^+$		
		4929	78 *12*	4831.5	3$^+$		
		6261	22 *7*	3498.7	2$^+$		
		7524	22 *7*	2235.5	2$^+$		
9768	(1,2$^+$)	7532	67 *17*	2235.5	2$^+$		
		9766	100 *17*	0	0$^+$		
9777.3	6$^-$	1580	79 *6*	8196.6	5$^-$	D+Q[@]	+0.26[@] *5*
		2733	100 *9*	7044.4	5$^-$	D+Q[@]	+0.10[@] *3*

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

$\gamma(^{30}Si)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]
9777.3	6^-	2775	30 *6*	7001.4	5^+	D+Q[@]	−0.00[@] *5*
		3273	94 *9*	6504.3	4^-	Q	
9792	1^-	9790	100	0	0^+		
9816	(0^+ to 4^+)	6317	100	3498.7	2^+		
9882.1	3,4	3378	51 *9*	6504.3	4^-		
		3931	89 *11*	5951.0	4^+		
		4394	30 *6*	5487.6	3^-		
		4650	100 *11*	5231.3	3^+		
9896.7	(0^+ to 4^+)	2981	83 *24*	6915.6	2^+		
		5087	67 *17*	4809.5	2^+		
		6397	100 *20*	3498.7	2^+		
		7660	83 *17*	2235.5	2^+		
9954.7	4,5	1417	13 *4*	8537.0	3^+,4^+		
		2144	100 *8*	7810.6	4		
		2953	25 *4*	7001.4	5^+		
		3089	21 *4*	6865.5	3^+		
		4004	11.5 *20*	5951.0	4^+		
		4674	13 *4*	5280.5	4^+		
		4723	7.7 *20*	5231.3	3^+		
9958	$1,2^+$	7721	100 *11*	2235.5	2^+		
		9956	54 *11*	0	0^+		
10027	(2 to 4^+)	4539	30 *6*	5487.6	3^-		
		4795	70 *12*	5231.3	3^+		
		6527	100 *14*	3498.7	2^+		
10057.2	(3 to 5^+)	3553	50 *10*	6504.3	4^-		
		4106	100 *20*	5951.0	4^+		
		4776	100 *20*	5280.5	4^+		
		5225	83 *17*	4831.5	3^+		
10079	(1^+ to 4^+)	3163	60 *10*	6915.6	2^+		
		5247	40 *8*	4831.5	3^+		
		5269	100 *12*	4809.5	2^+		
10116	(1^- to 4^+)	4165	75 *13*	5951.0	4^+		
		4628	100 *15*	5487.6	3^-		
		7879	75 *13*	2235.5	2^+		
10184	(0^+ to 3^+)	5374	56 *12*	4809.5	2^+		
		6413	100 *18*	3769.6	1^+		
		7947	67 *14*	2235.5	2^+		
10188.2	5^-	1991	15 *8*	8196.6	5^-		
		2377	50 *10*	7810.6	4	D+Q[@]	−0.02[@] *8*
		3144	100 *15*	7044.4	5^-	D+Q[@]	−0.26[@] *6*
		3186	23 *5*	7001.4	5^+		
		3684	63 *10*	6504.3	4^-	D+Q[@]	−0.10[@] *5*
10206.6	(1^-)	6436	60 *14*	3769.6	1^+		
		7970	40 *10*	2235.5	2^+		
		10205	100 *20*	0	0^+		
10228	(0^+ to 4^+)	5396	100	4831.5	3^+		
10276	(0^+ to 4^+)	5465	20 *4*	4809.5	2^+		
		6776	13 *4*	3498.7	2^+		
		8040	100 *5*	2235.5	2^+		
10288	(4^+,5^+)	3286	100 *8*	7001.4	5^+		
		4337	30 *4*	5951.0	4^+		
		5007	70 *8*	5280.5	4^+		
10305.1	3^-	2691	100 *18*	7613.5	4^-		
		3801	83 *14*	6504.3	4^-		
		4691	52 *11*	5614.2	2^+		

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

$\gamma(^{30}Si)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	δ[#]
10305.1	3^-	5024	59 *11*	5280.5	4^+		
		6805	52 *11*	3498.7	2^+		
10348.9	$(3^+,4)$	3347	100 *14*	7001.4	5^+		
		4861	30 *6*	5487.6	3^-		
		5068	40 *10*	5280.5	4^+		
		5517	30 *6*	4831.5	3^+		
10355	$(0^+$ to $4^+)$	5545	100 *20*	4809.5	2^+		
		6855	75 *15*	3498.7	2^+		
		8118	75 *15*	2235.5	2^+		
10397	$(3,5^+)$	5116	100 *8*	5280.5	4^+		
		5165	25 *8*	5231.3	3^+		
10420	$(2^+$ to $6^+)$	4469	100	5951.0	4^+		
10450	$(0$ to $3^+)$	6679	67 *17*	3769.6	1^+		
		8213	100 *17*	2235.5	2^+		
10465.0	$(3^+,4)$	3463	29 *15*	7001.4	5^+		
		4514	100 *15*	5951.0	4^+		
		5233	71 *15*	5231.3	3^+		
		5633	86 *18*	4831.5	3^+		
10472	$(1,2^+)$	6972	100 *30*	3498.7	2^+		
		10470	100 *30*	0	0^+		
10508	$(0^+$ to $3^+)$	5698	36 *9*	4809.5	2^+		
		6737	45 *11*	3769.6	1^+		
		8271	100 *15*	2235.5	2^+		
10560.9	6^-	1053	30.2 *24*	9507.2	5^-		
		1449	44 *5*	9111.5	6^-	D+Q[@]	−0.10[@] *5*
		1597	7.0 *24*	8963.1	5^-		
		3517	100 *10*	7044.4	5^-	D+Q[@]	+0.27[@] *2*
		3559	42 *5*	7001.4	5^+	D+Q[@]	−0.04[@] *8*
		4057	9.3 *24*	6504.3	4^-		
10581	$(0$ to $3^+)$	6811	100	3769.6	1^+		
10623	$(0$ to $4^+)$	7123	100	3498.7	2^+		
10669.3	$(3^-,4^-,5)$	2858	7 *3*	7810.6	4		
		3625	14 *5*	7044.4	5^-		
		4165	100 *8*	6504.3	4^-		
		5388	21 *5*	5280.5	4^+		
10679	$6^+,4$	3635	100 *4*	7044.4	5^-		
		4175	12.5 *25*	6504.3	4^-		
		5398	12.5 *25*	5280.5	4^+		
10725	7^-	1613	100 *6*	9111.5	6^-	D+Q[@]	+0.27[@] *3*
		3681	92 *6*	7044.4	5^-		
10732.2	$(3^-,4^-,5^-)$	2535	20 *10*	8196.6	5^-		
		2628	20 *6*	8103.7	$2^+,3^-$		
		4228	100 *10*	6504.3	4^-		
		4781	30 *6*	5951.0	4^+		
		5451	30 *6*	5280.5	4^+		
10795	(2 to 4)	3929	100 *25*	6865.5	3^+		
		5306	50 *13*	5487.6	3^-		
		5563	100 *25*	5231.3	3^+		
10805	$(0^+$ to $4^+)$	8568	100	2235.5	2^+		
10823.3	$(4,5^+,6^+)$	2626	22 *7*	8196.6	5^-		
		3599	11 *5*	7225.1	4^+		
		3821	11 *5*	7001.4	5^+		
		4872	78 *18*	5951.0	4^+		
		5542	100 *20*	5280.5	4^+		
10835	$(1^+$ to $5^+)$	5603	100	5231.3	3^+		

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^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05 (continued)

γ(^{30}Si) (continued)

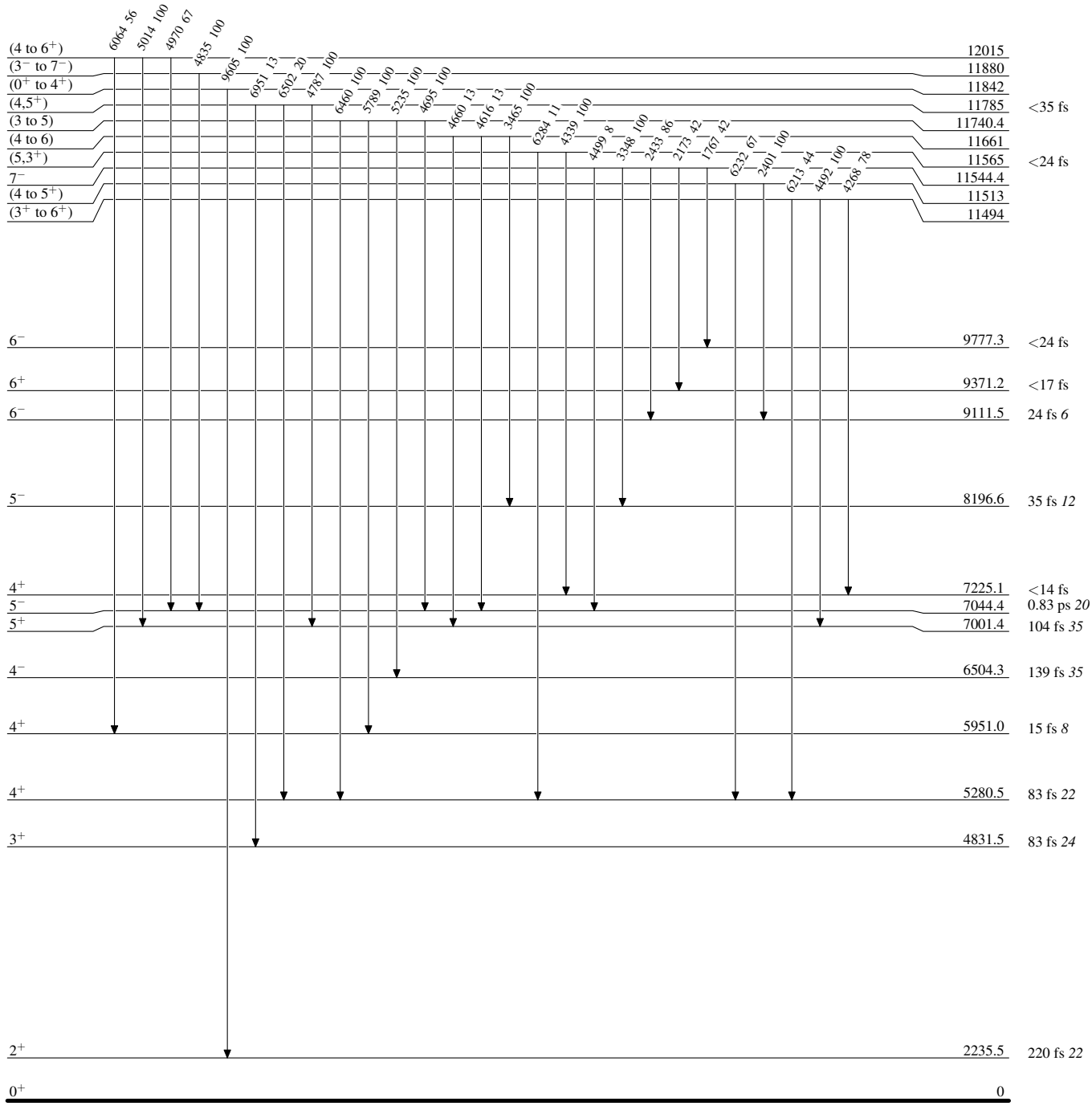
E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
10866.3	(3$^-$ to 5)	2669	18 *6*	8196.6	5$^-$
		3822	18 *4*	7044.4	5$^-$
		4362	27 *6*	6504.3	4$^-$
		4915	18 *4*	5951.0	4$^+$
		5585	100 *9*	5280.5	4$^+$
10975	(0$^+$ to 4$^+$)	8738	100	2235.5	2$^+$
10991.0	(3 to 5)	2453	100 *25*	8537.0	3$^+$,4$^+$
		3989	100 *50*	7001.4	5$^+$
		4487	75 *15*	6504.3	4$^-$
		5040	100 *25*	5951.0	4$^+$
		5710	75 *15*	5280.5	4$^+$
		6159	50 *10*	4831.5	3$^+$
11016	(2$^+$ to 4$^+$)	5064	100 *34*	5951.0	4$^+$
		5401	67 *34*	5614.2	2$^+$
11038	(3$^-$ to 6$^+$)	3994	100 *35*	7044.4	5$^-$
		5087	75 *25*	5951.0	4$^+$
		5757	75 *25*	5280.5	4$^+$
11074	(3 to 5)	5122	100	5951.0	4$^+$
11084.1	(4$^-$ to 6$^-$)	1972	17 *5*	9111.5	6$^-$
		2487	25 *5*	8596.6	4$^-$
		3470	17 *9*	7613.5	4$^-$
		4040	100 *10*	7044.4	5$^-$
		4580	8 *4*	6504.3	4$^-$
11091	(3 to 5)	5810	100	5280.5	4$^+$
11205	(0$^+$ to 4$^+$)	7705	54 *16*	3498.7	2$^+$
		8968	100 *16*	2235.5	2$^+$
11210.1	(4,5$^+$)	1021	43 *15*	10188.2	5$^-$
		3400	43 *15*	7810.6	4
		5259	100 *29*	5951.0	4$^+$
		5978	100 *29*	5231.3	3$^+$
11250.3		1472	17 *7*	9777.3	6$^-$
		2139	10 *7*	9111.5	6$^-$
		2286	23 *7*	8963.1	5$^-$
		2917	13 *7*	8333.5	2$^+$
		3053	10 *7*	8196.6	5$^-$
		3637	67 *7*	7613.5	4$^-$
		4206	17 *7*	7044.4	5$^-$
		4249	100 *17*	7001.4	5$^+$
		4746	17 *7*	6504.3	4$^-$
		5762	33 *10*	5487.6	3$^-$
		5969	27 *7*	5280.5	4$^+$
11269	(2$^+$ to 5$^+$)	5988	54 *12*	5280.5	4$^+$
11269	(2$^+$ to 5$^+$)	6437	100 *12*	4831.5	3$^+$
11323	(2$^+$ to 5$^+$)	3512	88 *15*	7810.6	4
		4097	100 *20*	7225.1	4$^+$
		6091	63 *10*	5231.3	3$^+$
11349	(2$^+$ to 6$^+$)	6068	100	5280.5	4$^+$
11382	(0$^+$ to 4$^+$)	9145	100	2235.5	2$^+$
11417.7	(6$^+$,4$^+$)	4192	21 *4*	7225.1	4$^+$
		4416	28 *4*	7001.4	5$^+$
		5466	100 *9*	5951.0	4$^+$
		6137	26 *4*	5280.5	4$^+$
11477.3	(6$^-$,5$^-$)	916	36 *6*	10560.9	6$^-$
		1700	39 *9*	9777.3	6$^-$
		2366	67 *15*	9111.5	6$^-$
		4432	100 *12*	7044.4	5$^-$
		4476	61 *9*	7001.4	5$^+$
11494	(3$^+$ to 6$^+$)	4268	78 *11*	7225.1	4$^+$
		4492	100 *22*	7001.4	5$^+$
		6213	44 *9*	5280.5	4$^+$
11513	(4 to 5$^+$)	2401	100 *17*	9111.5	6$^-$
		6232	67 *17*	5280.5	4$^+$
11544.4	7$^-$	1767	42 *6*	9777.3	6$^-$
		2173	42 *6*	9371.2	6$^+$
		2433	86 *6*	9111.5	6$^-$
		3348	100 *8*	8196.6	5$^-$
		4499	8 *3*	7044.4	5$^-$
11565	(5,3$^+$)	4339	100 *3*	7225.1	4$^+$
		6284	11 *3*	5280.5	4$^+$
11661	(4 to 6)	3465	100 *6*	8196.6	5$^-$
		4616	13 *4*	7044.4	5$^-$
		4660	13 *4*	7001.4	5$^+$
11740.4	(3 to 5)	4695	100 *20*	7044.4	5$^-$
		5235	100 *20*	6504.3	4$^-$
		5789	100 *20*	5951.0	4$^+$
		6460	100 *20*	5280.5	4$^+$
11785	(4,5$^+$)	4787	100 *7*	7001.4	5$^+$
		6502	20 *4*	5280.5	4$^+$
		6951	13 *4*	4831.5	3$^+$
11842	(0$^+$ to 4$^+$)	9605	100	2235.5	2$^+$
11880	(3$^-$ to 7$^-$)	4835	100	7044.4	5$^-$
12015	(4 to 6$^+$)	4970	67 *11*	7044.4	5$^-$
		5014	100 *18*	7001.4	5$^+$
		6064	56 *11*	5951.0	4$^+$

† From 1980Bi14 – deduced by the evaluator from level energy difference of the decay scheme, except otherwise noted.
‡ Weighted average of data from 1980Bi14 and 1971Sy01.
# From 1971Sy01, except otherwise noted. Multipolarities are based on γ-ray linear polarization and correlation measurements.
@ From 1980Bi14, based on γ-ray correlation measurements.
& Weighted average of data from 1980Bi14 and 1971Sy01.

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme

Intensities: Relative photon branching from each level

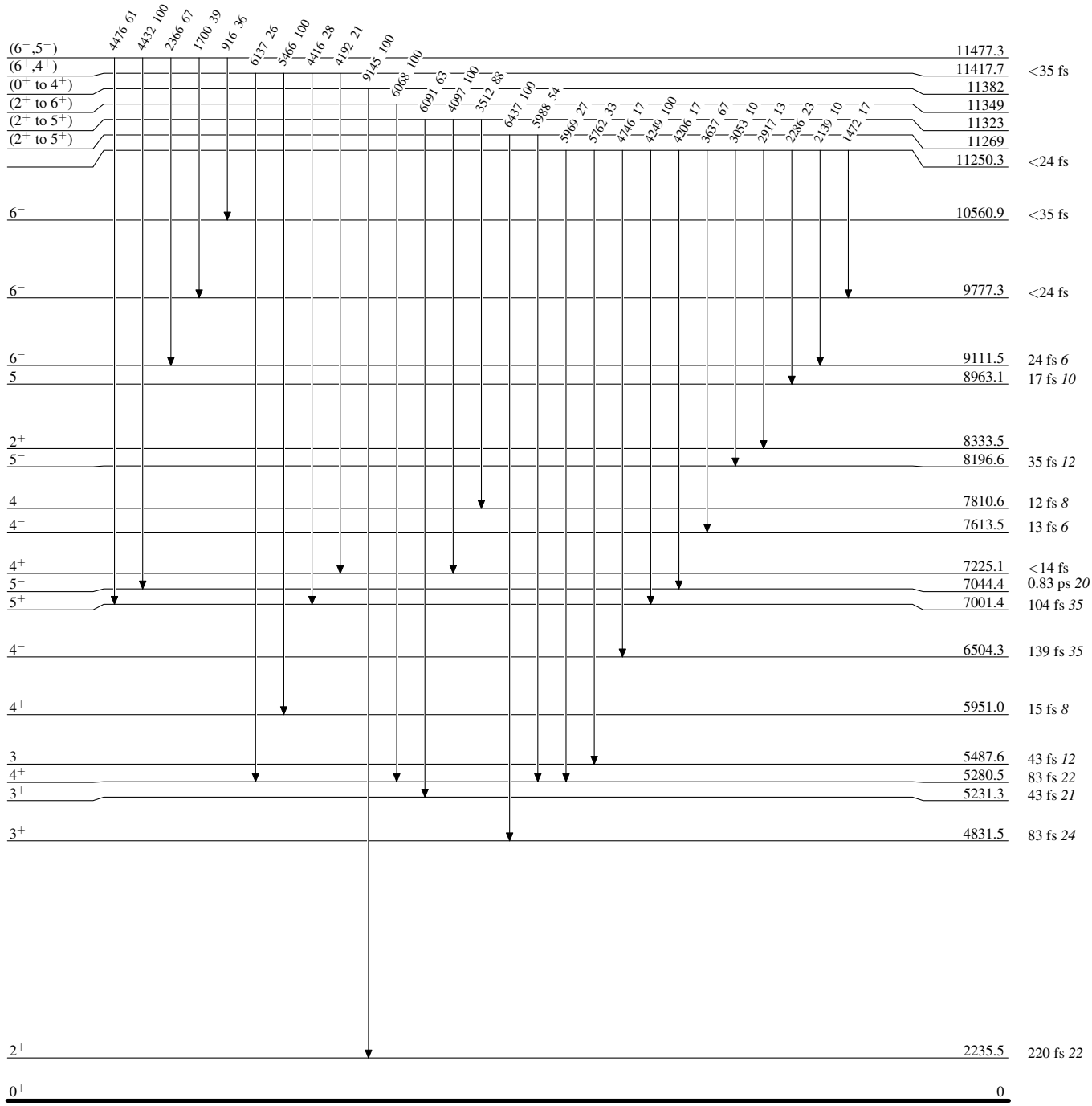


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

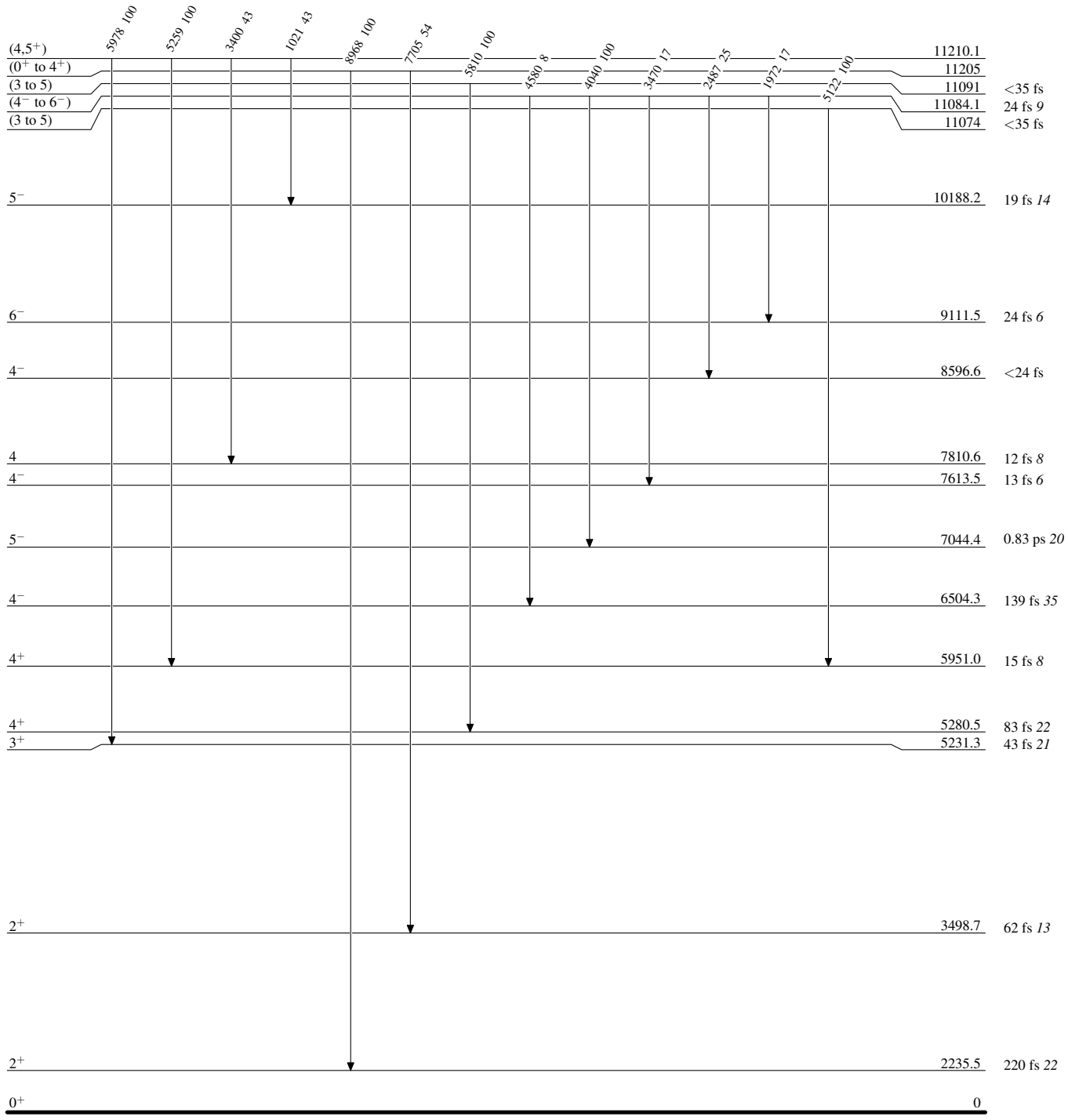


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) **1980Bi14,1971Sh11,1972Ga05**

Level Scheme (continued)

Intensities: Relative photon branching from each level

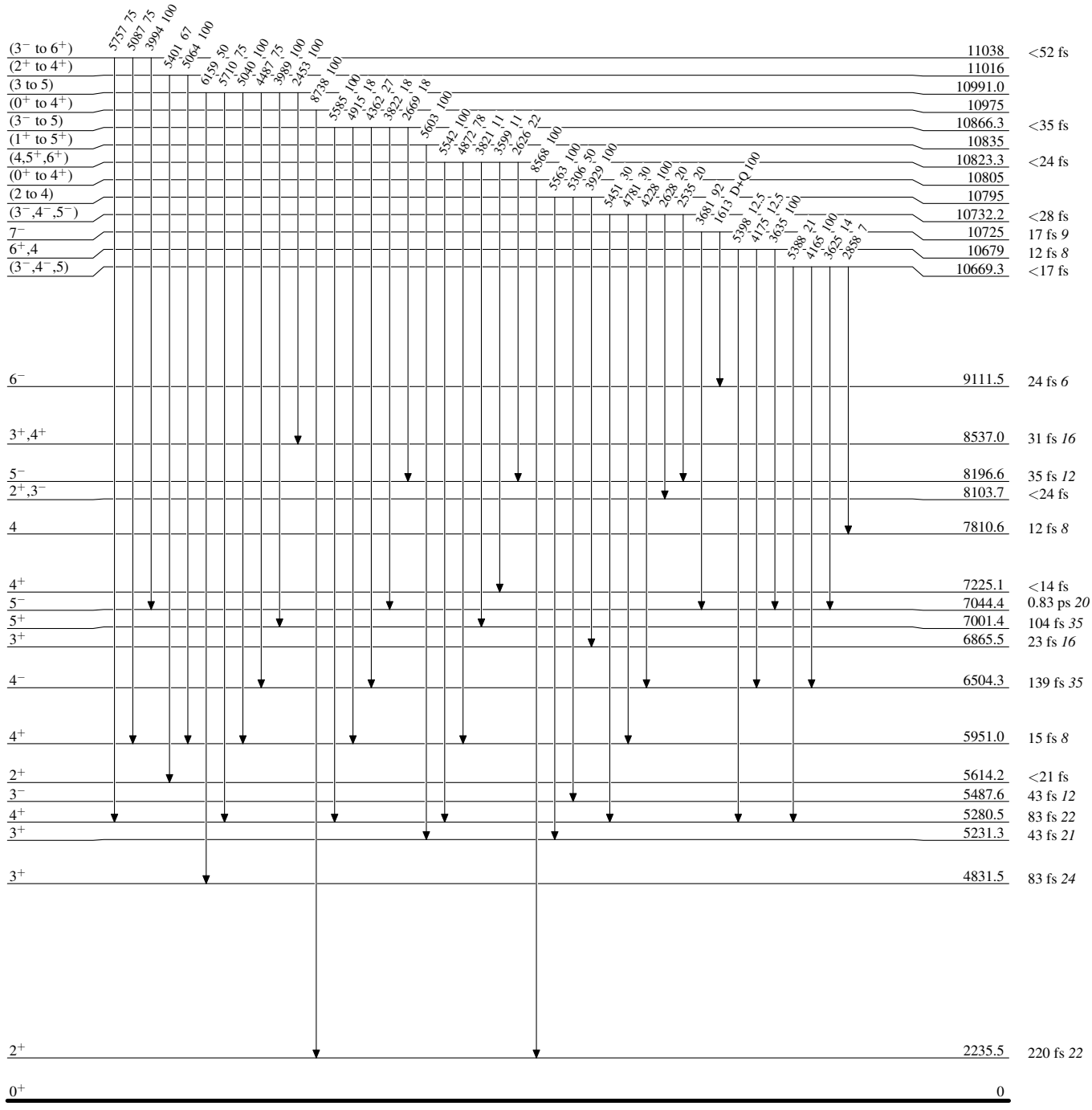


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

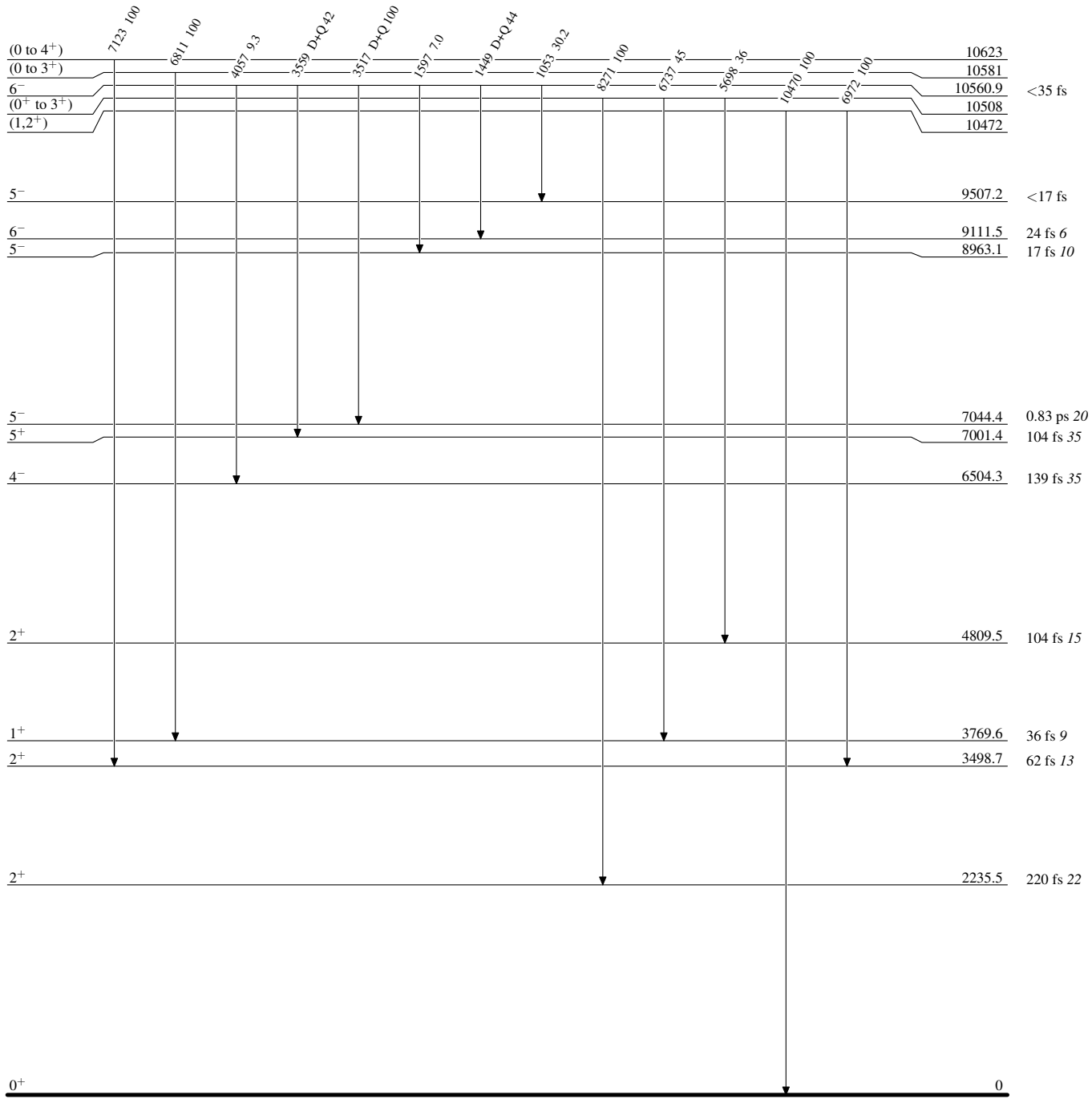
Intensities: Relative photon branching from each level



^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

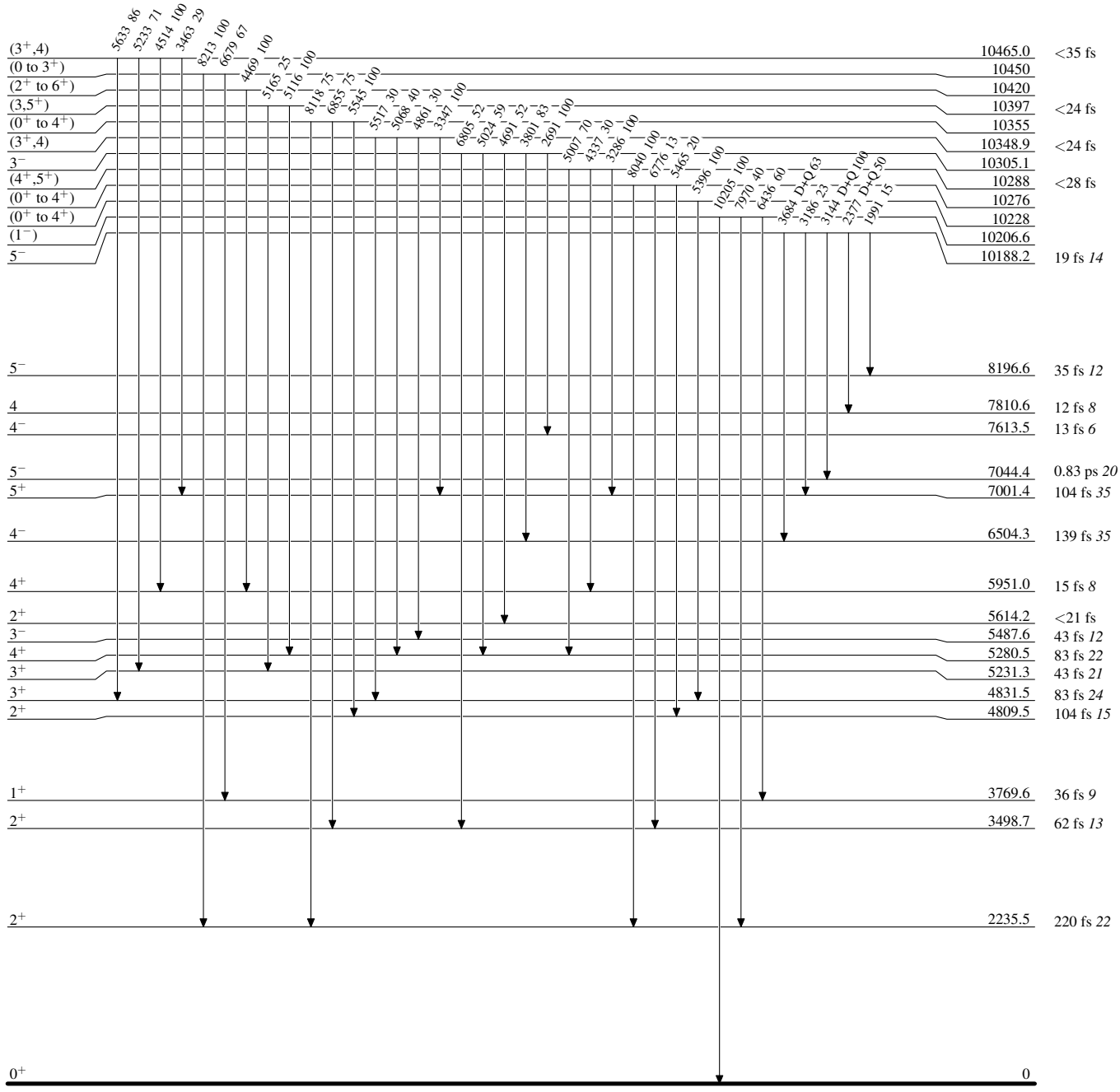


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

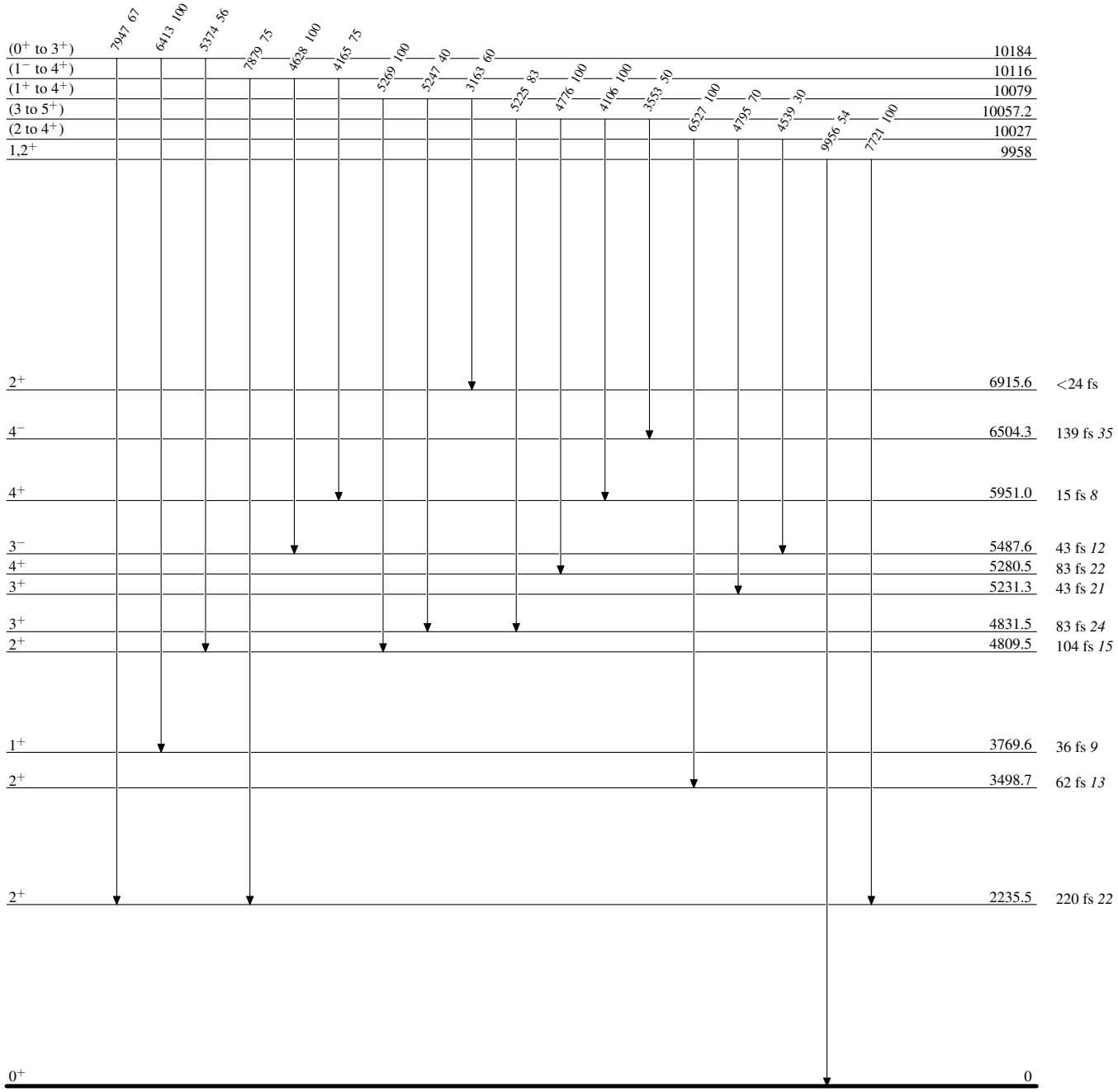


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

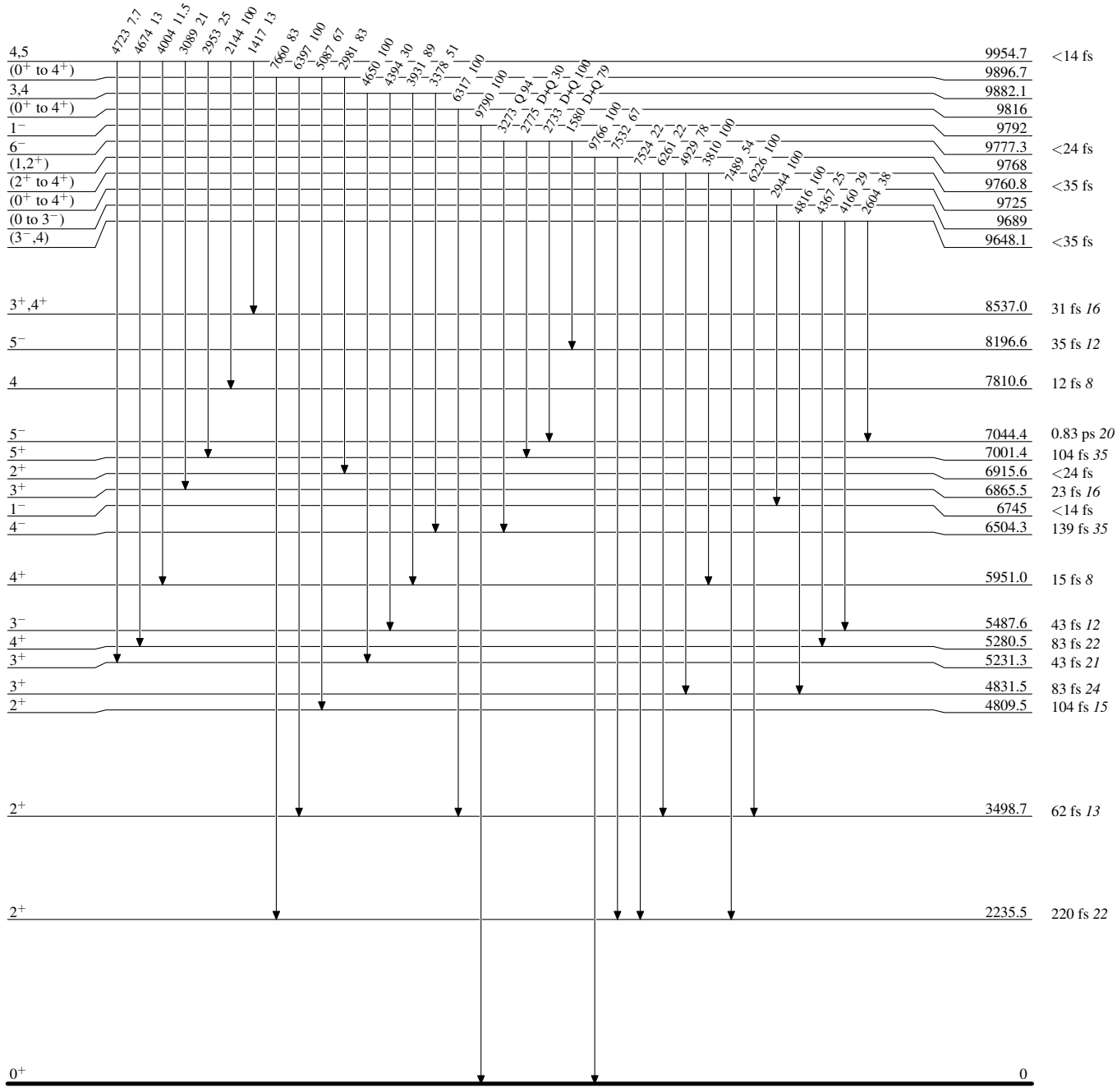


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

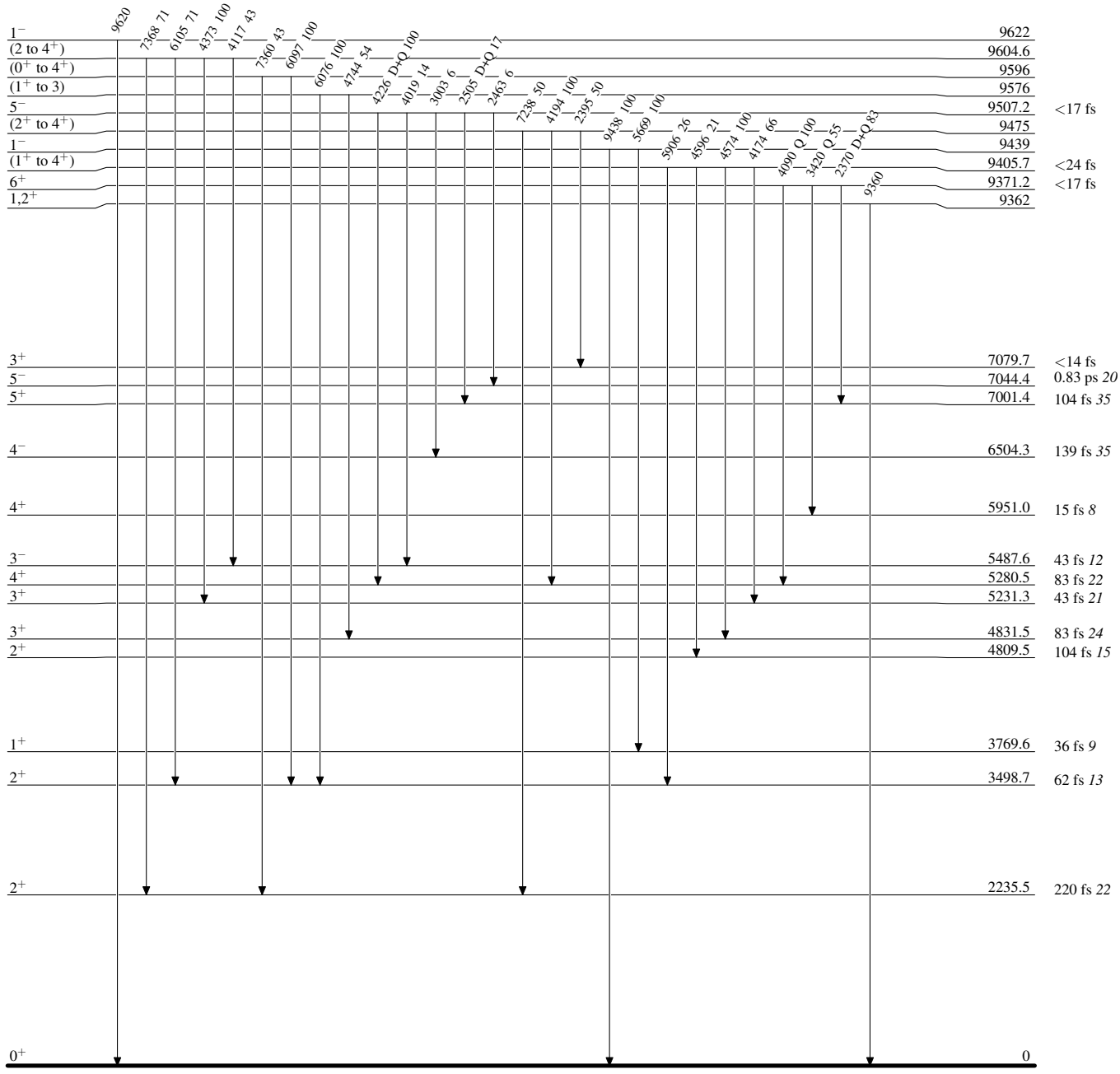


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

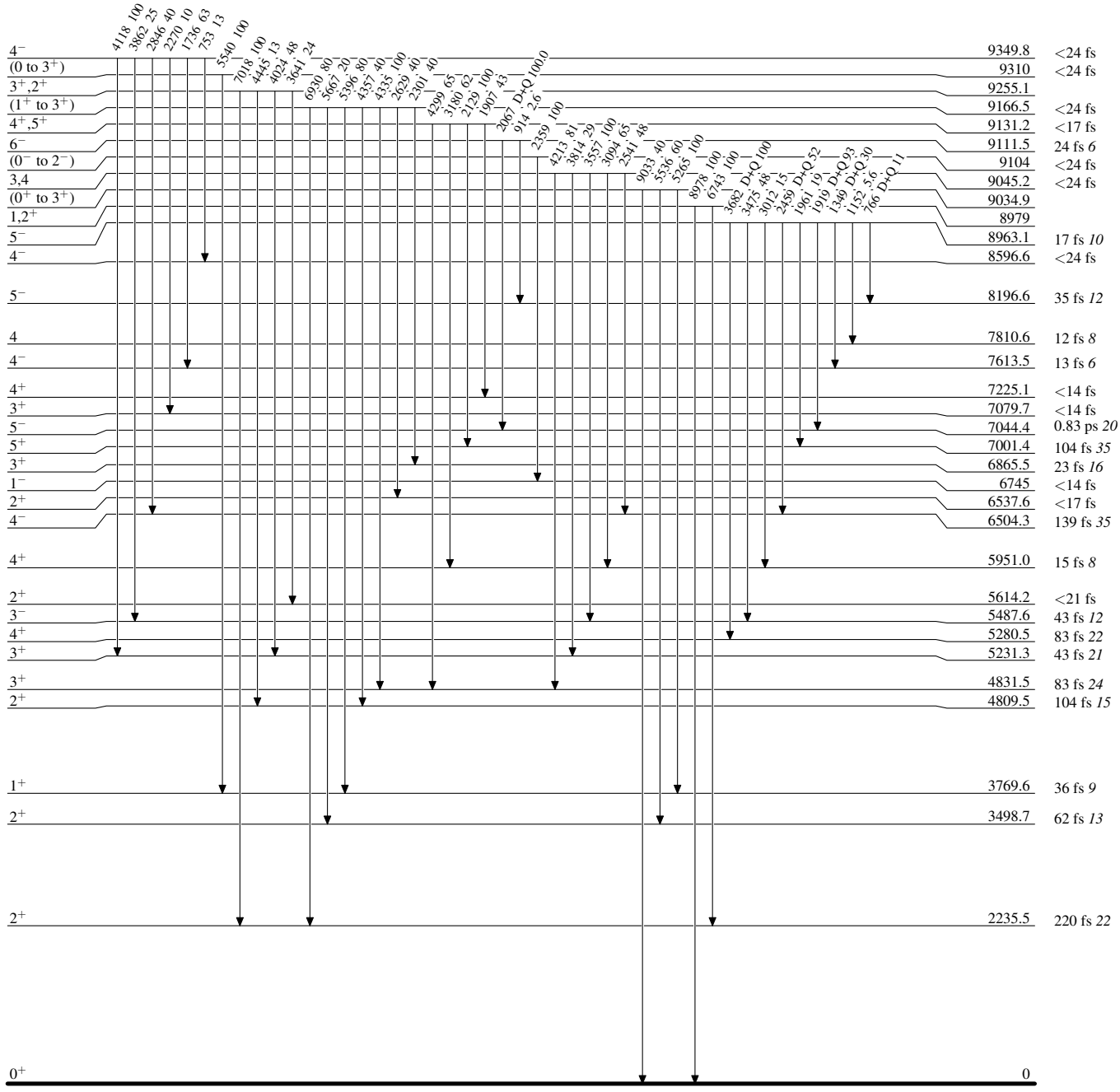


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

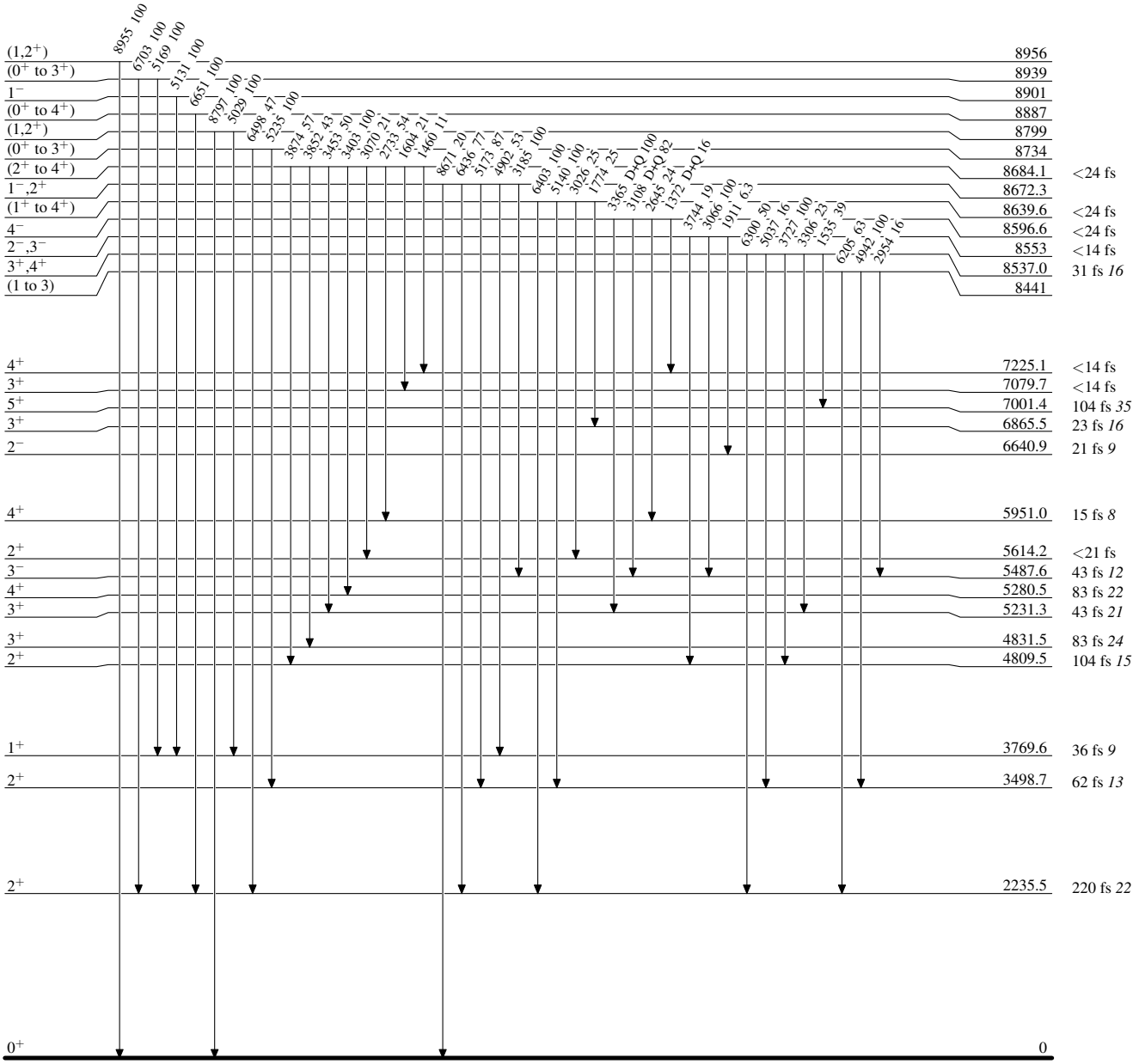


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

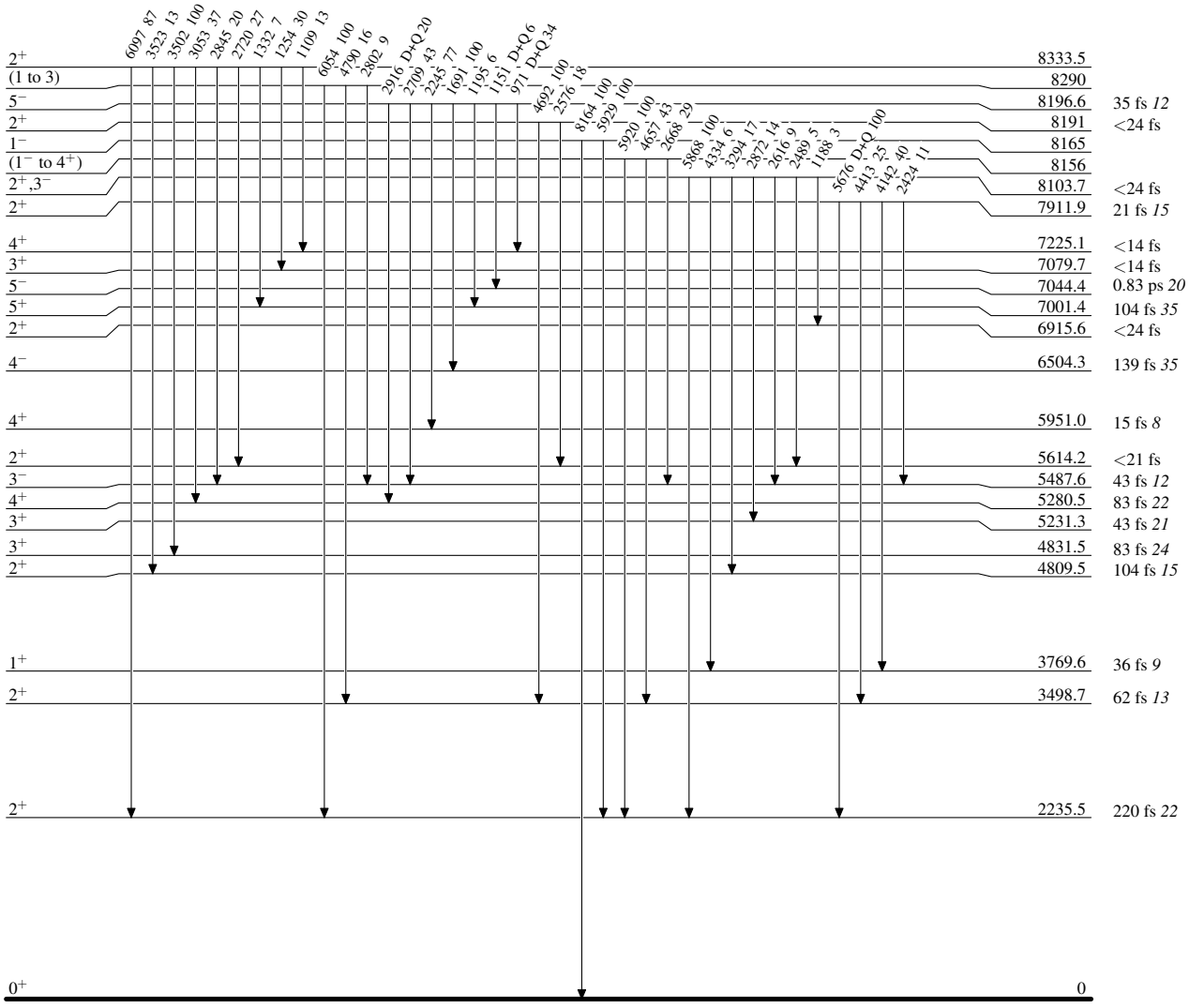


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

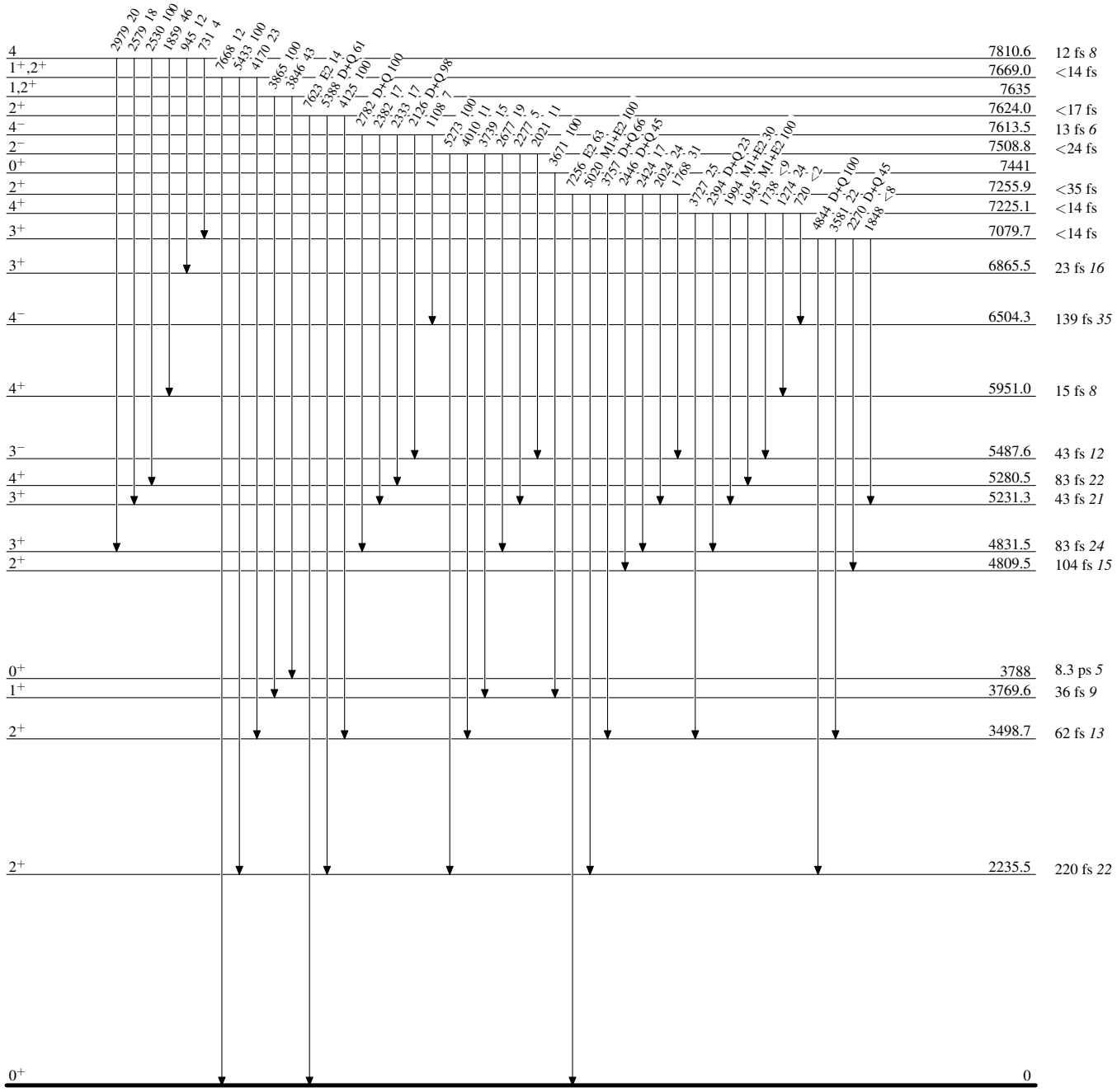


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

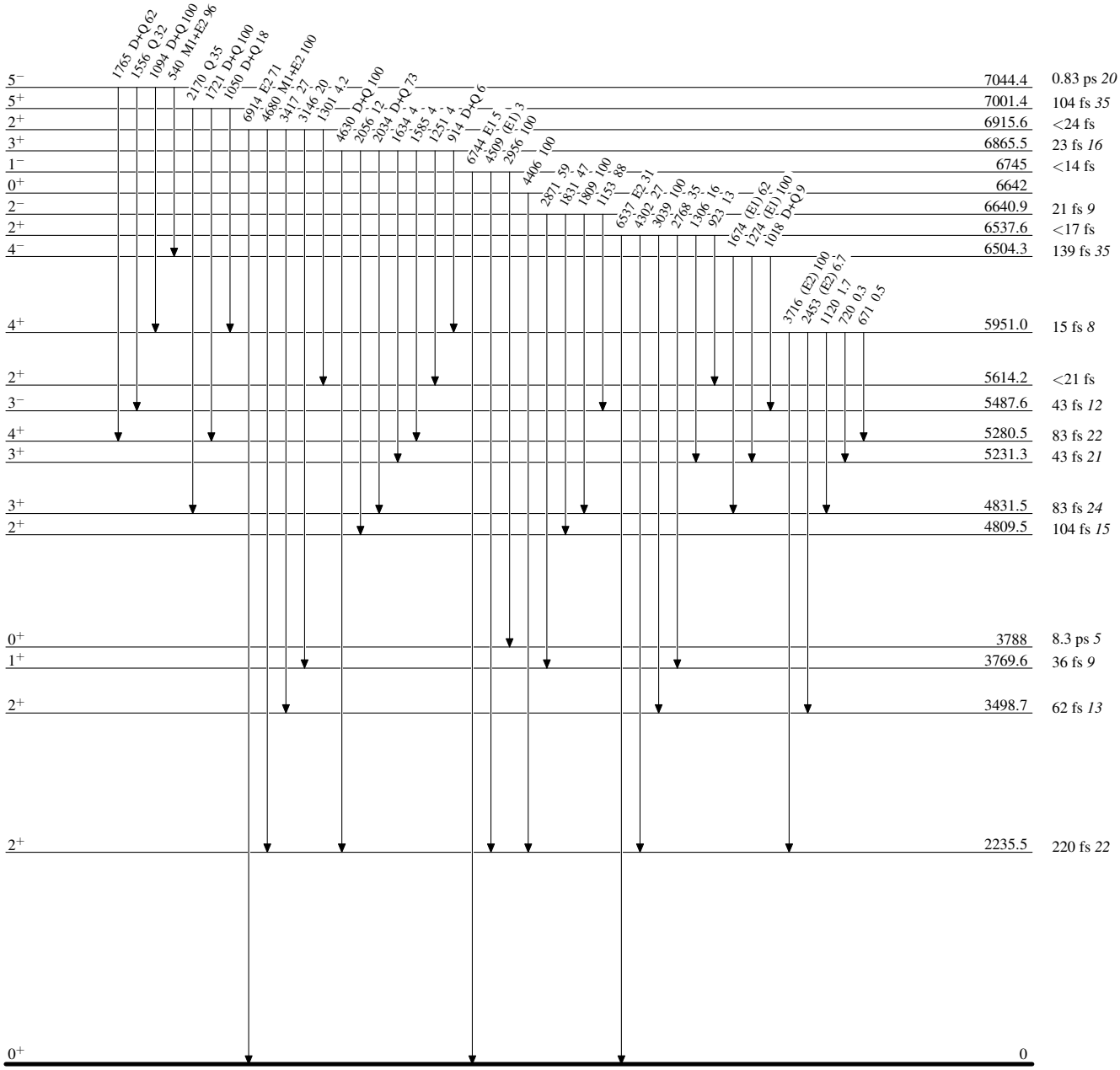


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level

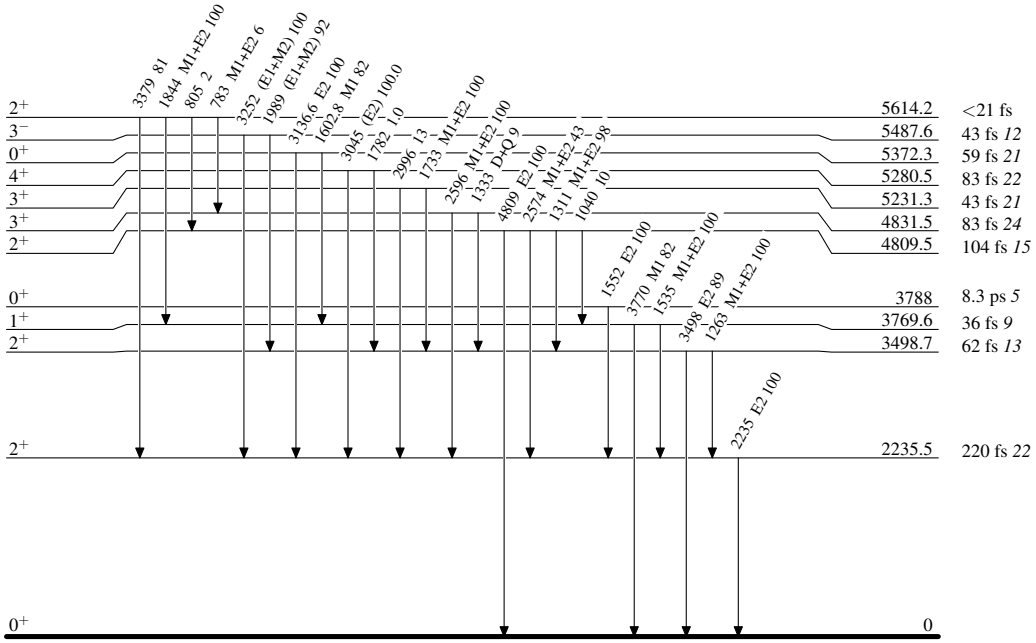


$^{30}_{14}Si_{16}$

^{27}Al(α,p),(α,pγ) 1980Bi14,1971Sh11,1972Ga05

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{30}_{14}Si_{16}$