^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 113, 909 (2012)	1-Jan-2012

$J^\pi(^{27}Al)=5/2^+$, $J^\pi(^{26}Mg)=0^+$.

Others: 1987Pe09, 1987Pe04, 1975Wi05, 1974Be05, 1971Jo03, 1960Ja17, 1971Hi05, 1969Jo22, 1969Ke08.

1984Bl18: ^{27}Al(t,p), E=15 MeV; protons were momentum analyzed in a multi-angle spectrograph and detected in nuclear emulsion plates after passing through mylar absorbers; deduced level energies and L values.

1976Be16: ^{26}Mg(α,pγ) E=14.2 MeV; Compton polarimeter of 3 Ge(Li) detectors were used for γ-ray detection; Measured: Eγ, γ-ray branching, p-γ angular polarization and linear polarization; deduced level energies, δ.

1974Ek02: ^{26}Mg(α,pγ) E=14.2, 16.5, 18.0 MeV; 99.4% enriched ^{26}Mg target; protons were detected by surface-barrier Si detector and γ-rays by Ge(Li); Measured: Eγ, γ-ray branching, p-γ coin, γ-ray angular correlation, deduced level energies, J^π, lifetime by Doppler Shift Method, and δ.

1987Pe09, 1987Pe04: ^{30}Si(^{3}He,α), E=36 MeV; deduced spectroscopic factors.

1975Wi05: ^{26}Mg(α,pγ), E=11.26 MeV; Measured γ-ray polarization, deduced level energies, J^π.

1974Be05: ^{26}Mg(α,p), E=7-11 MeV; ^{27}Al(t,p) E=2.5=2.8 MeV; deduced level lifetime by Doppler Shift Method.

1971Jo03: ^{27}Al(t,p), E=2.54 MeV; deduced level mean lifetime by Doppler shift method, spectroscopic factor and L value.

1960Ja17: ^{27}Al(t,p), E=5.5 MeV; deduced level energies.

^{29}Al Levels

E(level)[†]	J$^\pi$[@]	T$_{1/2}$[&]	L[a]	Comments
0	5/2$^+$		0	J$^\pi$: From Adopted Levels.
1398.0 *2*	1/2$^+$	4.5 ps *3*	2	J$^\pi$: From Adopted Levels. T$_{1/2}$: From 1974Be05. Others: 3.5 ps +4.8-1.2 (1974Ek02), 2.3 ps +1.5-0.7 (1971Jo03).
1754.2 *2*	7/2$^+$	22 fs *7*	2	J$^\pi$: From p-γ polarization measurement (1976Be16). T$_{1/2}$: From weighted average of mean lifetimes: 25 fs *11* (1974Ek02), 80 fs *40* ((α,pγ)−1974Be05), and 60 fs *30* ((t,pγ)−1974Be05). Other: <35 fs (1971Jo03).
2224.1 *2*	3/2$^+$	75 fs *17*	2+4	T$_{1/2}$: From weighted average of mean lifetimes: 110 fs *30* (1974Ek02), 110 fs *50* ((α,pγ)−1974Be05), and 90 fs *70* ((t,pγ)−1974Be05). Other: <55 fs (1971Jo03).
2865.6 *2*	3/2$^+$	71 fs *17*	2+4	T$_{1/2}$: From weighted average of mean lifetimes: 120 fs *30* (1974Ek02), and 70 fs *40* (1974Be05). Other: <104 fs (1971Jo03).
3061.6 *4*	5/2$^+$	58 fs *21*	0+2+4	T$_{1/2}$: From weighted average of mean lifetimes: 90 fs *50* ((α,pγ)-1974Be05) and 80 fs *40* ((t,pγ)−1974Be05). Others: <35 fs (1971Jo03), <111 fs (1974Ek02).
3184.6 *4*	5/2$^+$	124 fs *23*	0+2+4	T$_{1/2}$: From weighted average of mean lifetimes: 120 fs *50* (1974Ek02), 280 fs *70* ((α,pγ)−1974Be05), 180 fs *70* ((t,pγ)−1974Be05), and 210 fs *100* (1971Jo03).
3432.9 *5*	1/2$^+$	<7 ns	2	
3577.6 *5*	9/2$^+$,(5/2$^+$)	25 fs *7*	2	J$^\pi$: From 1976Be16.
3641.5 *7*	(5/2)$^+$	<70 fs	0+2	
3671.7 *8*	(3/2,5/2)$^+$	<70 fs	2	
3935.2 *7*	(3/2,7/2)$^+$	90 fs *21*	2+4	
3986.2 *12*		<28 fs	(3,2+4)	
4057.0 *7*	(1/2,3/2$^+$)		2	
4219.6 *6*	5/2$^+$		0	
4403.1 *7*	(7/2,9/2)$^+$		2+6	L: In Fig 3: L=0+6, in Table 1: L=2+6 (1984Bl18).
4656 *10*	5/2$^+$		0+4	E(level): From 1984Bl18.
4715.5 *9*			(1+3,2+4)	
4827.9 *10*			2	
4940.8[‡] *10*				
5023[‡] *3*			3	

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^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02 (continued)

^{29}Al Levels (continued)

E(level)[†]	J$^\pi$[@]	L[a]	Comments
5145 *8*		1+3	E(level): From 1984Bl18.
5181.6 *14*	(3/2 to 7/2)$^+$	2+4	
5248.3 *17*		3	J$^\pi$: Indicated negative parity from L=3 (1984Bl18).
5263.7 *11*			
5392[‡] *3*			
5433[‡] *4*			
5549[#] *7*			
5580[#] *8*			
5660[#] *9*			
5733[‡] *4*			
5855.2 *8*	11/2$^+$,(7/2,9/2$^+$)		J$^\pi$: From measured polarization and polarization calculations from the measured angular correlations (1976Be16).
5922[#] *10*			
5993.6[‡] *10*	(1/2$^+$ to 7/2$^+$)		J$^\pi$: In 1974Ek02 from level mean lifetime.
6068[#] *9*			
6154[#] *10*			
6359[#] *11*			
6410[#] *12*			
6450[#] *9*			
6472[#] *10*			
6516[#] *11*			
6582[#] *11*			
6670[#] *12*			
6689[#] *11*			
6762[#] *13*			
6840[#] *12*			
6984[#] *14*			
7065[#] *15*			
7093[#] *12*			
7179[#] *15*			

[†] Weighted average of data from 1976Be16 and 1974Ek02, except otherwise noted.
[‡] From 1974Ek02.
[#] From 1984Bl18.
[@] Assignments are from 1984Bl18, except otherwise noted.
[&] From 1974Ek02, except otherwise noted.
[a] From 1984Bl18, except otherwise noted.

γ(^{29}Al)

E$_i$(level)	J$_i^\pi$	E$_\gamma$[†]	I$_\gamma$[‡]	E$_f$	J$_f^\pi$	Mult.[#]	Comments
1398.0	1/2$^+$	1397.9	100	0	5/2$^+$	Q	
1754.2	7/2$^+$	356.2[&]	<1	1398.0	1/2$^+$		E$_\gamma$: Placement marked as questionable as it is an unlikely transition, 7/2$^+$ to 1/2$^+$ implied [M3], from a level of half-life 22 fs. Not adopted by the evaluator.

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^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02 (continued)

$\gamma(^{29}Al)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[@]
1754.2	7/2$^+$	1754.2	100	0	5/2$^+$	D+Q	+0.18 *3*
2224.1	3/2$^+$	469.9	<2	1754.2	7/2$^+$		
		826.1	<2	1398.0	1/2$^+$		
		2223.9 *3*	100	0	5/2$^+$		
2865.6	3/2$^+$	641.5	<7.7	2224.1	3/2$^+$		
		1111.4	<9.6	1754.2	7/2$^+$		
		1467.5 *5*	92 *8*	1398.0	1/2$^+$	D+Q	−0.00 *10*
		2865.3 *4*	100 *8*	0	5/2$^+$		
3061.6	5/2$^+$	837.5	<4.1	2224.1	3/2$^+$		
		1307.3 *5*	100 *4*	1754.2	7/2$^+$		
		1663.5	<5.5	1398.0	1/2$^+$		
		3061.3 *4*	37 *4*	0	5/2$^+$		
3184.6	5/2$^+$	319.0	<3.6	2865.6	3/2$^+$		
		960.5 *4*	100 *4*	2224.1	3/2$^+$	D+Q	+0.03 *2*
		1430.3 *4*	44 *3*	1754.2	7/2$^+$	D+Q	+0.25 *6*
		1786.5 *4*	25.3 *22*	1398.0	1/2$^+$		
		3184.2 *3*	12.0 *13*	0	5/2$^+$		
3432.9	1/2$^+$	371.3	<4.8	3061.6	5/2$^+$		
		567.3	<4.8	2865.6	3/2$^+$		
		1208.8	20 *4*	2224.1	3/2$^+$		
		1678.6	<8.4	1754.2	7/2$^+$		
		2034.7 *6*	100 *4*	1398.0	1/2$^+$	D	
		3432.5	<9.6	0	5/2$^+$		
3577.6	9/2$^+$,(5/2$^+$)	393.0	<1	3184.6	5/2$^+$		
		516.0	<1	3061.6	5/2$^+$		
		712.0	<1	2865.6	3/2$^+$		
		1353.4	<2.1	2224.1	3/2$^+$		
		1823.3	100.0 *11*	1754.2	7/2$^+$		
		2179.4	<1	1398.0	1/2$^+$		
		3577.1	10.0 *11*	0	5/2$^+$		
3641.5	(5/2)$^+$	456.9	<3.3	3184.6	5/2$^+$		
		579.9	<3.3	3061.6	5/2$^+$		
		775.9	<3.3	2865.6	3/2$^+$		
		1417.3	<5.5	2224.1	3/2$^+$		
		1887.2	9.9 *22*	1754.2	7/2$^+$		
		2243.3	<4.4	1398.0	1/2$^+$		
		3641.0	100.0 *22*	0	5/2$^+$		
3671.7	(3/2,5/2)$^+$	487.1	<8	3184.6	5/2$^+$		
		610.1	<7	3061.6	5/2$^+$		
		806.1	<8	2865.6	3/2$^+$		
		1447.5	<15	2224.1	3/2$^+$		
		1917.4	<9	1754.2	7/2$^+$		
		2273.5	<12	1398.0	1/2$^+$		
		3671.2	100	0	5/2$^+$		
3935.2	(3/2,7/2)$^+$	750.6	<5.7	3184.6	5/2$^+$		
		873.6	<4.6	3061.6	5/2$^+$		
		1069.6	<7	2865.6	3/2$^+$		
		1711.0	15 *3*	2224.1	3/2$^+$		
		2180.8	<10.3	1754.2	7/2$^+$		
		2537.0	<10.3	1398.0	1/2$^+$		
		3934.6	100 *3*	0	5/2$^+$		
3986.2		801.6	<4	3184.6	5/2$^+$		
		924.6	<4	3061.6	5/2$^+$		
		1120.6	<6	2865.6	3/2$^+$		
		1762.0	<8	2224.1	3/2$^+$		
		2231.8	<9	1754.2	7/2$^+$		

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^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02 (continued)

γ(^{29}Al) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π
3986.2		2588.0	<10	1398.0	1/2$^+$
		3985.6	100	0	5/2$^+$
4057.0	(1/2,3/2$^+$)	872.4	<5.5	3184.6	5/2$^+$
		995.4	<5.5	3061.6	5/2$^+$
		1191.4	<7.4	2865.6	3/2$^+$
		1832.8	85 *7*	2224.1	3/2$^+$
		2302.6	<9.2	1754.2	7/2$^+$
		2658.7	100 *7*	1398.0	1/2$^+$
		4056.4	<7.4	0	5/2$^+$
4219.6	5/2$^+$	1035.0	<2	3184.6	5/2$^+$
		1157.9	<3	3061.6	5/2$^+$
		1353.9	<4	2865.6	3/2$^+$
		1995.4	<5	2224.1	3/2$^+$
		2465.2	100	1754.2	7/2$^+$
		2821.3	<2	1398.0	1/2$^+$
		4218.9	<3	0	5/2$^+$
4403.1	(7/2,9/2)$^+$	1218.5	<7.2	3184.6	5/2$^+$
		1341.4	<9	3061.6	5/2$^+$
		1537.4	<9	2865.6	3/2$^+$
		2178.8	<11	2224.1	3/2$^+$
		2648.6	100 *11*	1754.2	7/2$^+$
		3004.8	<11	1398.0	1/2$^+$
		4402.4	82 *11*	0	5/2$^+$
4715.5		1530.8	<8	3184.6	5/2$^+$
		1653.8	<8	3061.6	5/2$^+$
		1849.8	<7	2865.6	3/2$^+$
		2491.2	<10	2224.1	3/2$^+$
		2961.0	<7	1754.2	7/2$^+$
		3317.1	<11	1398.0	1/2$^+$
		4714.7	100	0	5/2$^+$
4827.9		1643.2	33 *13*	3184.6	5/2$^+$
		4827.0	100 *13*	0	5/2$^+$
4940.8		1756.1	<15	3184.6	5/2$^+$
		1879.1	<4	3061.6	5/2$^+$
		2075.0	<4	2865.6	3/2$^+$
		2716.4	<6	2224.1	3/2$^+$
		3186.2	<7	1754.2	7/2$^+$
		3542.3	<10	1398.0	1/2$^+$
		4939.9	100	0	5/2$^+$
5023		5022	100	0	5/2$^+$
5181.6	(3/2 to 7/2)$^+$	5180.6	100	0	5/2$^+$
5248.3		3849.8	100	1398.0	1/2$^+$
5263.7		3509.0	100	1754.2	7/2$^+$
5392		5391	100	0	5/2$^+$
5433		5432	100	0	5/2$^+$
5733		3978	100	1754.2	7/2$^+$
5855.2	11/2$^+$,(7/2,9/2$^+$)	2277.4	100 *5*	3577.6	9/2$^+$,(5/2$^+$)
		2670.3	<5	3184.6	5/2$^+$
		2793.3	<5	3061.6	5/2$^+$
		2989.3	<5	2865.6	3/2$^+$
		3630.6	<6	2224.1	3/2$^+$
		4100.4	54 *5*	1754.2	7/2$^+$
		4456.5	<5	1398.0	1/2$^+$
		5853.9	<3	0	5/2$^+$
5993.6	(1/2$^+$ to 7/2$^+$)	1773.9	100 *10*	4219.6	5/2$^+$

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^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02 (continued)

$\gamma(^{29}Al)$ (continued)

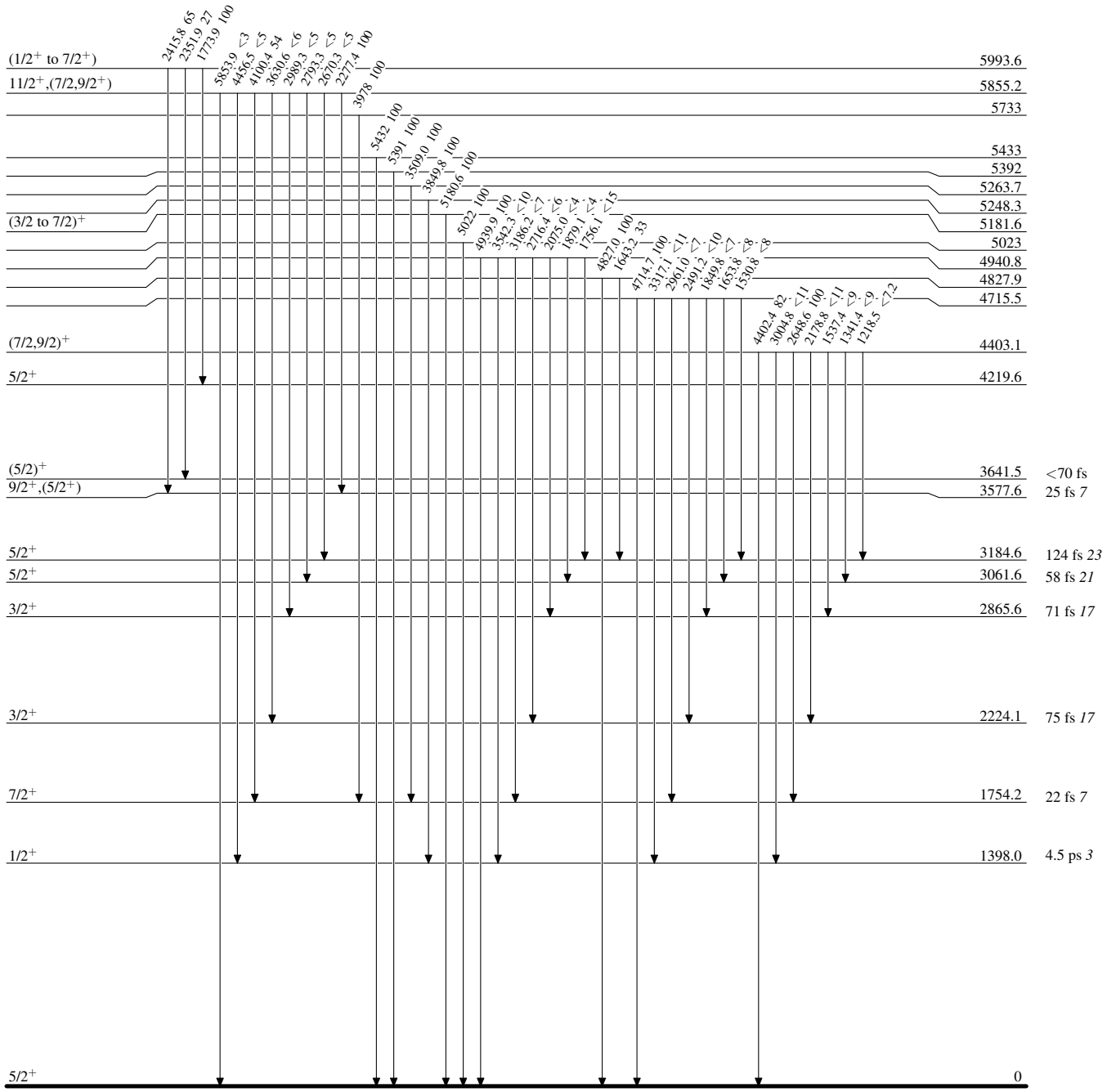
E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π
5993.6	$(1/2^+$ to $7/2^+)$	2351.9	27 *6*	3641.5	$(5/2)^+$
		2415.8	65 *10*	3577.6	$9/2^+,(5/2^+)$

[†] Calculated from level energy differences, E_i-E_f and recoil energy subtracted, by the evaluator.
[‡] From 1974Ek02.
[#] From γ-ray angular distribution (1974Ek02) and γ-ray polarization (1976Be16) measurements.
[@] Average value (of 1976Be16, 1974Ek02, 1974Ek02, 1969Ke08 and 1971Hi05) reported in 1976Be16, except otherwise noted.
[&] Placement of transition in the level scheme is uncertain.

^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02

Level Scheme

Intensities: Relative photon branching from each level

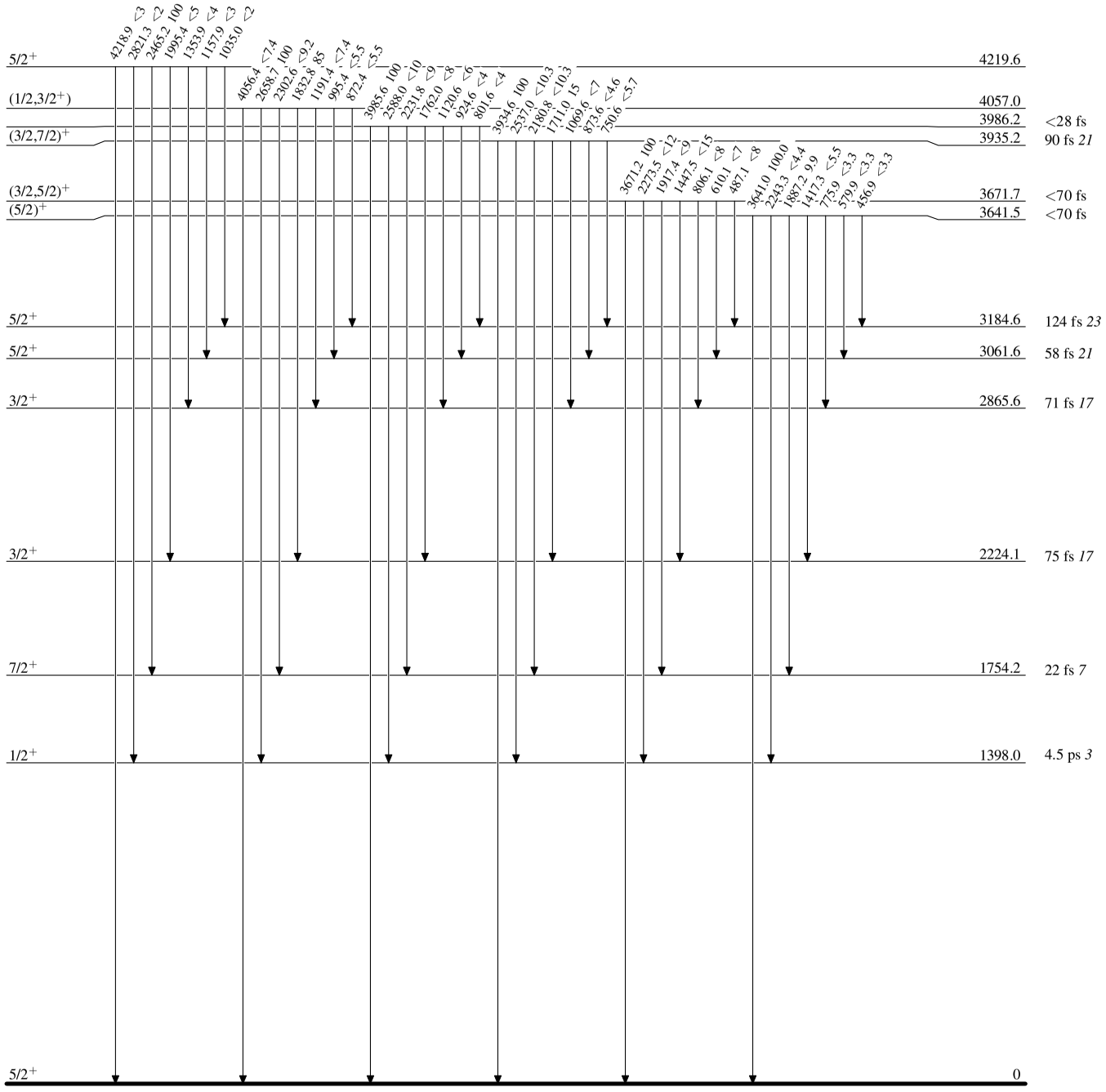


$^{29}_{13}Al_{16}$

^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02

Level Scheme (continued)

Intensities: Relative photon branching from each level



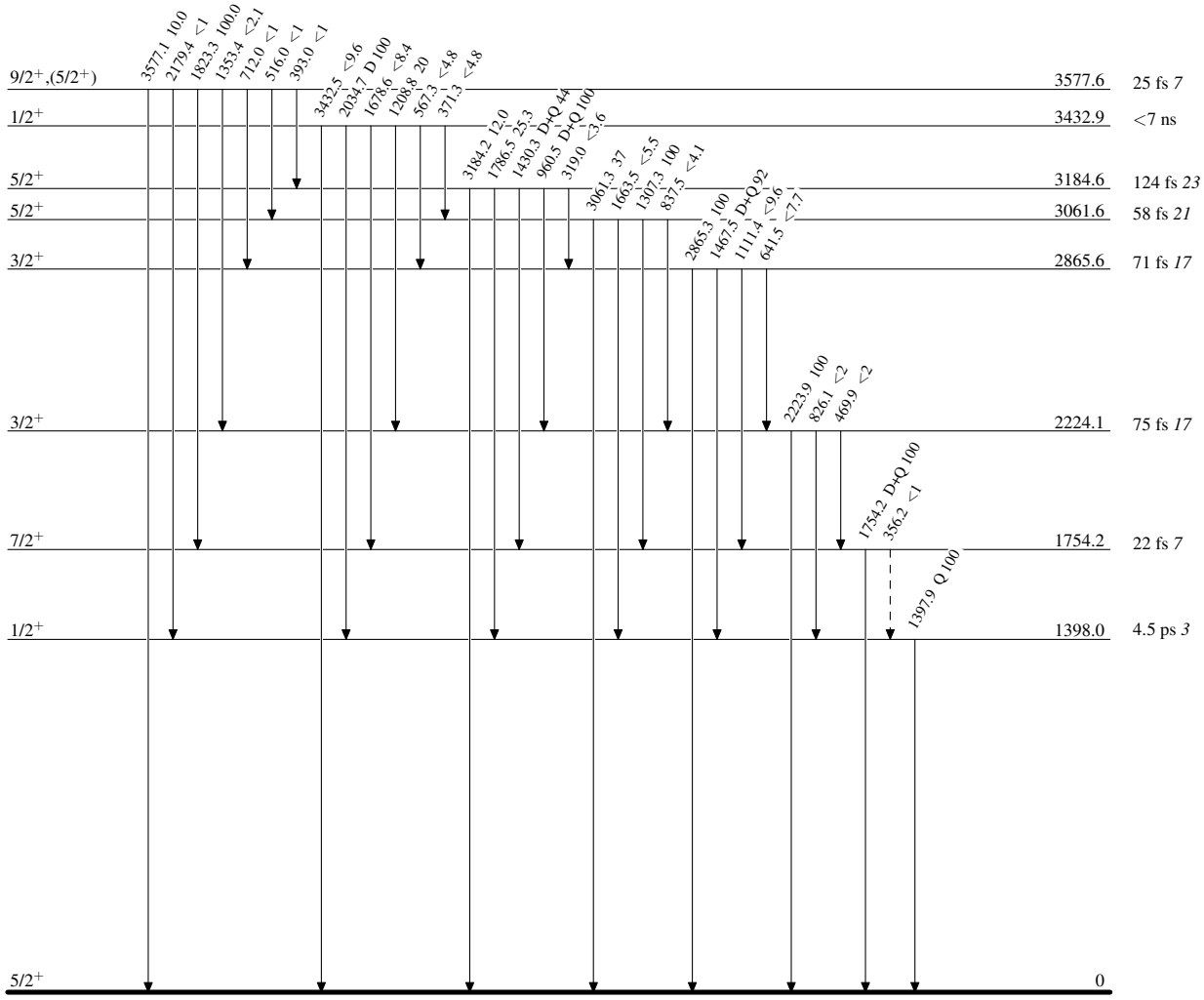
$^{29}_{13}Al_{16}$

^{27}Al(t,p),^{26}Mg(α,pγ) 1984Bl18,1976Be16,1974Ek02 Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{29}_{13}Al_{16}$