^{27}Al(^{14}N,n2pγ) 1976Ko10,1977Wa14

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 152, 1 (2018)	30-Sep-2017

Also includes some γ(anisotropy) and γ(pol) data from measurements with ^{27}Al(^{13}C,npγ) in 2014Bh03.

1976Ko10, 1977Wa14: E=40 MeV ^{14}N beam was produced from the BNL MP tandem. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$, γ(lin pol), recoil-distance. Deduced levels, J, π, $T_{1/2}$, γ-ray multipolarities. Also includes measurements with ^{26}Mg(^{14}N,pnγ), ^{27}Al(^{16}O,αpγ), ^{24}Mg(^{19}F,αpγ), ^{26}Mg(^{18}O,α2nγ), ^{27}Al(^{19}F,2$\alpha\gamma$), and ^{28}Si(^{19}F,2αpγ) reactions. The angular distribution and polarization data are from a weighted average of results obtained in several reactions. Results were reanalyzed and extended by 1977Wa14.

2014Bh03: ^{27}Al(^{13}C,npγ) E=30 MeV beam was produced by the BARC-TIFR Pelletron Linac facility at Mumbai. γ rays were detected with the INGA array of 15 Compton-suppressed Clover detectors. Measured Eγ, Iγ, γ(anisotropy), γ(pol). This reaction is attributed to the ^{13}C beam interacting with the ^{27}Al target holder. 2014Bh03 report data for ^{18}O(^{13}C,αnγ)^{26}Mg.

^{38}Ar Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	Comments
0.0	0^+		
2167.60 *5*	2^+		
3377.4 *4*	0^+		
3810.05 *12*	3^-		
3936.3 *7*	2^+		
4479.93 *14*	4^-		
4585.85 *15*	5^-	130 ps *4*	
5349.8 *7*	4^+		
5658.6 *4*	5^-	<0.7 ps	
6408.28 *15*	6^+	<1.4 ps	
7507.8 *3*	7^-	<1.4 ps	
8077.0 *3*	7^+		
8569.36 *22*	8^+		
8972.3 *3*	7^-		$T_{1/2}$: 4.2 ps *14* for 2564γ (1976Ko10), but <28 fs (1976Gl10) from DSAM for 4386γ in ^{35}Cl(α,pγ). The latter value is listed in Adopted Levels.
10173.6 *3*	9^-	4.6 ps *14*	$T_{1/2}$: weighted average of 6.2 ps *28* from 1201γ and 4.2 ps *14* from 1605γ in 1976Ko10.
11614.0 *4*	11^-	4.9 ps *21*	

[†] From a least-squares fit to γ-ray energies.
[‡] From Adopted Levels. Assignments in 1976Ko10 based on $\gamma(\theta)$ and γ(lin pol) data are the same.
[#] From 1976Ko10 using recoil distance method (RDM).

γ(^{38}Ar)

E_i(level)	J_i^π	Eγ[†]	Iγ[†]	E_f	J_f^π	Mult.[@]	Comments
2167.60	2^+	2167.53 *5*	100	0.0	0^+	E2	Mult.: A_2=+0.17 *2*, A_4=−0.05 *2*, POL=+0.17 *10* (1976Ko10). γ(anisotropy)≈2.2 gating on dipole (2014Bh03).
3377.4	0^+	1209.8 *4*	100	2167.60	2^+		
3810.05	3^-	1642.42 *10*	100	2167.60	2^+	E1+M2	Mult.: A_2=−0.22 *1*, A_4=0, POL=+0.32 *10* (1976Ko10). γ(anisotropy)≈1.1 gating on quadrupole (2014Bh03).
3936.3	2^+	3936.1 *7*	100	0.0	0^+		
4479.93	4^-	669.87 *8*	100	3810.05	3^-	M1+E2	Mult.: A_2=−0.20 *1*, A_4=0, POL=−0.25 *3* (1976Ko10). γ(anisotropy)≈1.0 gating on quadrupole (2014Bh03).
4585.85	5^-	105.92 *10*	100 *2*	4479.93	4^-		
		775.79 *13*	16 *2*	3810.05	3^-	E2	Mult.: A_2=+0.22 *3*, A_4=−0.08 *4*, POL=+0.13 *10* (1976Ko10).
5349.8	4^+	3182.1 *7*	100	2167.60	2^+		A_2=+0.22 *7*, A_4=−0.21 *10* (1976Ko10).

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^{27}Al(^{14}N,n2pγ) 1976Ko10,1977Wa14 (continued)

$\gamma(^{38}Ar)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[@]	Comments
5658.6	5^-	1072.7 *3*	100	4585.85	5^-		Additional information 1.
6408.28	6^+	1822.39 *3*	100	4585.85	5^-	E1+M2	Mult.: A_2=−0.29 *2*, A_4=0, POL=+0.44 *22* (1976Ko10).
7507.8	7^-	2921.5 *3*	100	4585.85	5^-		E_γ: 2921.5 *3* (1976Ko10). A_2=+0.20 *9*, A_4=0 (1976Ko10).
8077.0	7^+	1668.3 *4*	100	6408.28	6^+		
8569.36	8^+	492.25 *25*	14[#] *4*	8077.0	7^+		A_2=−0.30 *5*, A_4=0 (1976Ko10).
		1061.2 *3*	14[#] *4*	7507.8	7^-		A_2=−0.14 *6*, A_4=0 (1976Ko10).
		2161.30 *20*	100[#] *4*	6408.28	6^+		A_2=+0.25 *4*, A_4=−0.07 *5* (1976Ko10).
8972.3	7^-	2564.0[‡] *5*	100[#] *13*	6408.28	6^+		A_2=−0.18 *6*, A_4=0 (1976Ko10).
		3313.1[#] *7*	29[#] *9*	5658.6	5^-		
		4386.1[#] *5*	93[#] *18*	4585.85	5^-	E2	
10173.6	9^-	1201.24[‡] *20*	92[#] *8*	8972.3	7^-		I_γ: other: 49 *8* (1976Ko10). A_2=+0.17 *3*, A_4=0.08 *4* (1976Ko10).
		1604.32 *25*	100[#] *8*	8569.36	8^+		I_γ: also from 1976Ko10. A_2=−0.36 *5*, A_4=0 (1976Ko10).
11614.0	11^-	1440.31 *25*	100	10173.6	9^-		A_2=+0.29 *3*, A_4=−0.09 *3* (1976Ko10).

[†] From 1976Ko10, unless otherwise noted.
[‡] Ordering of the 1201-2564 cascade is from 1977Wa14 who adopted it from 1976Gl10. It was shown reversed in 1976Ko10.
[#] From 1977Wa14.
[@] From $\gamma(\theta)$ and γ(lin pol) data in 1976Ko10.

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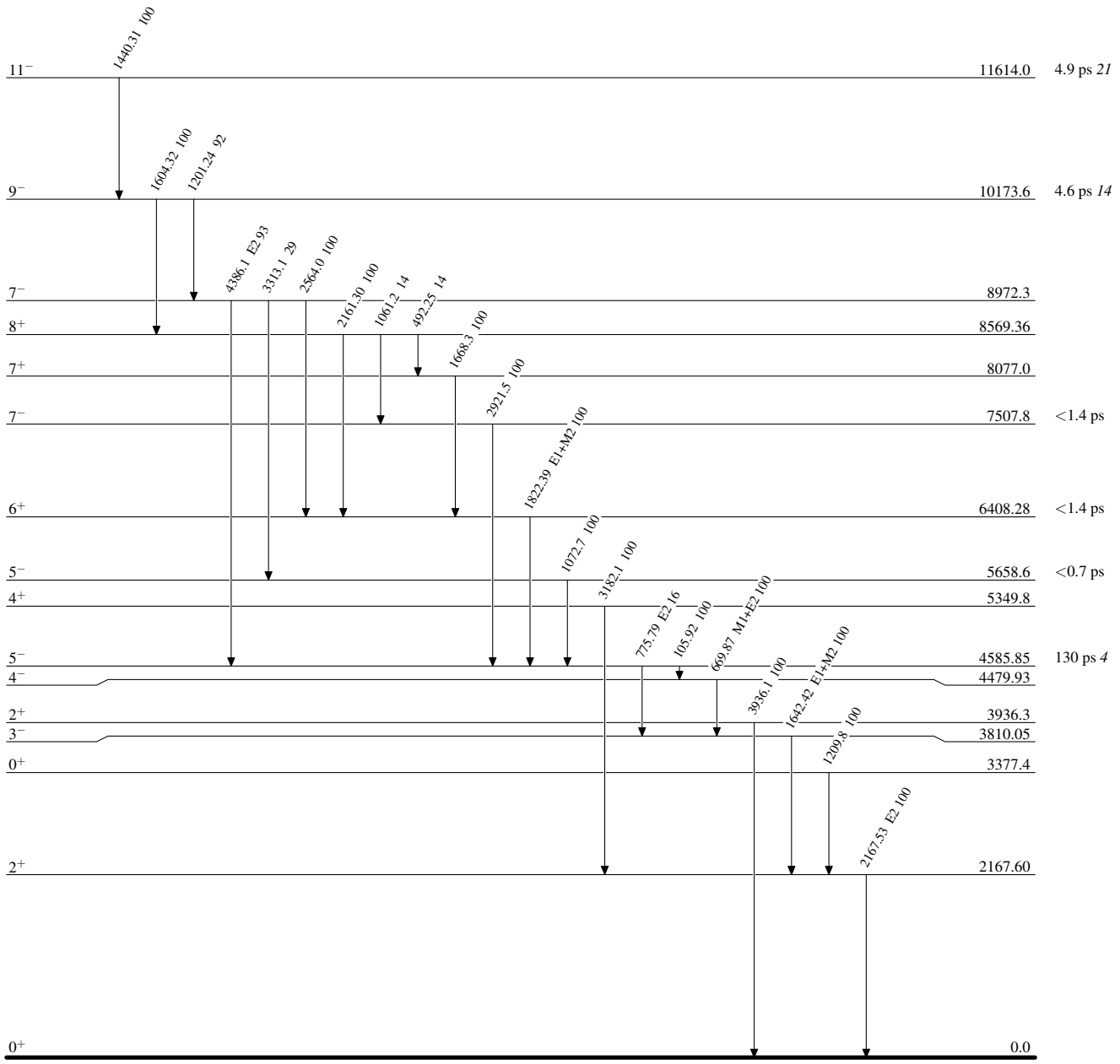
Level Scheme

Intensities: Relative photon branching from each level



$^{38}_{18}Ar_{20}$