^{27}Al(^{18}O,2npγ) 1975Wa04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen[#] and Balraj Singh	NDS 135, 1 (2016)	31-May-2016

Includes ^{26}Mg(^{18}O,2nγ) E=40 MeV and ^{28}Si(^{19}F,αpγ) E=45 MeV from 1975Ol01, measured intensities.

1975Wa04 (also 1975Ol01), 1974Po10: E=40 MeV ^{18}O beam was produced from the Brookhaven National Laboratory MP tandem Van de Graaff facility. a target of 250 μg/cm^2 isotopically enriched ^{27}Al evaporated onto a thick W backing. γ-rays were detected with two true coaxial Ge(Li) detectors. Measured Eγ, Iγ, γγ, γ(θ), γ(lin pol), $T_{1/2}$ by recoil-distance method (RDM). Deduced levels, J^π, mixing ratios.

^{42}Ca Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	E(level)[†]	Jπ[‡]	$T_{1/2}$[#]
0	0^+		3446.5? *6*	3^-		6145.11 *25*	7^-	
1524.61 *8*	2^+		3571.59? *17*			6408.87 *24*	8^-	
2423.62 *21*	2^+		3953.5 *12*	4^-		6554.07 *25*	9^-	42 ps *3*
2752.29 *12*	4^+	3.5 ps *3*	4099.67 *17*	5^-		7368.8 *3*	10^-	2.6 ps *11*
3189.32 *14*	6^+		5491.00 *24*	6^-	<1.7 ps	8297.9 *4*	11^-	<1.7 ps
3254.3 *10*	4^+		5744.19 *22*	7^-				

[†] From least-squares fit to Eγ data.
[‡] From Adopted Levels.
[#] From recoil-distance method (1975Ol01).

γ(^{42}Ca)

A_2, A_4 and Pol values are from 1975OL01.

Eγ	Iγ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
145		6554.07	9^-	6408.87	8^-		Iγ(145)/Iγ(810)=24 *4*/76 *4*.
263.74 *15*	4.7	6408.87	8^-	6145.11	7^-	D+Q	A_2=−0.18 *2*; A_4=−0.14 *3*
382.24[‡] *10*	2.8	3571.59?		3189.32	6^+		A_2=−0.42 *12*; A_4=0 Placement considered uncertain (by the evaluators) since the level population is tentative. Pol=−0.52 *15*.
437.04 *8*	118.4	3189.32	6^+	2752.29	4^+	E2	A_2=+0.23 *2*; A_4=−0.15 *2* Pol=+0.32 *5*.
502		3254.3	4^+	2752.29	4^+		
507		3953.5	4^-	3446.5?	3^-		
694		3446.5?	3^-	2752.29	4^+		
809.88 *12*	32.3 *5*	6554.07	9^-	5744.19	7^-	E2	A_2=+0.30 *3*; A_4=−0.19 *3* Pol=+0.37 *8*.
814.75 *15*	19.5	7368.8	10^-	6554.07	9^-	M1	A_2=−0.30 *6*; A_4=−0.02 *4* Pol=−0.41 *9*.
898.99 *20*	4.99	2423.62	2^+	1524.61	2^+	D	A_2=+0.13 *10*; A_4=+0.11 *15*
910.45 *15*	19.2	4099.67	5^-	3189.32	6^+	E1	A_2=−0.20 *2*; A_4=−0.07 *3* Pol=+0.19 *9*.
917.87 *12*	24.1	6408.87	8^-	5491.00	6^-	E2	A_2=+0.31 *5*; A_4=−0.17 *5* Pol=+0.41 *12*.
929.10 *25*	6.9	8297.9	11^-	7368.8	10^-	M1	A_2=−0.25 *7*; A_4=0 Pol=−0.67 *27*.
1023		3446.5?	3^-	2423.62	2^+		

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^{27}Al(^{18}O,2npγ) 1975Wa04 (continued)

γ(^{42}Ca) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
1227.66 *8*		2752.29	4^+	1524.61	2^+	E2	A_2=+0.23 *1*; A_4=−0.11 *1* Pol=+0.29 *6*.
1347.24 *20*	10.2	4099.67	5^-	2752.29	4^+	(E1)	A_2=−0.23 *2*; A_4=0 Pol=+0.05 *25*. Iγ(910)/Iγ(1347)=61 *2*/33 *2*.
1524.58 *8*	222.5	1524.61	2^+	0	0^+	E2	A_2=+0.22 *1*; A_4=−0.10 *1* Pol=+0.37 *9*.
1644.54 *20*	22.2	5744.19	7^-	4099.67	5^-	(E2)	A_2=+0.26 *2*; A_4=−0.17 *3* Pol=+0.25 *29*.
1921.8 *8*	2.2	3446.5?	3^-	1524.61	2^+	D	A_2=−0.55 *14*; A_4=0
2301.68 *25*	32.3	5491.00	6^-	3189.32	6^+	E1	A_2=+0.32 *3*; A_4=−0.10 *4* Pol=−0.30 *25*.
2424		2423.62	2^+	0	0^+		
2554.70 *25*	17.4	5744.19	7^-	3189.32	6^+	(E1)	A_2=−0.26 *16*; A_4=0 Additional information 1. Pol=−0.17 *30*. Iγ(1644)/Iγ(2556)=51 *2*/49 *2*.
2955.6 *3*	4.8	6145.11	7^-	3189.32	6^+	D	A_2=−0.30 *8*; A_4=0
3219.3 *6*	4.5	6408.87	8^-	3189.32	6^+	[M2+E3]	A_2=+0.72 *5*; A_4=0 Iγ(264)/Iγ(918)/Iγ(3219)=17 *3*/70 *2*/13 *2*.

[†] From γ(lin pol) and $T_{1/2}$ in 1975Ol01.

[‡] Placement of transition in the level scheme is uncertain.

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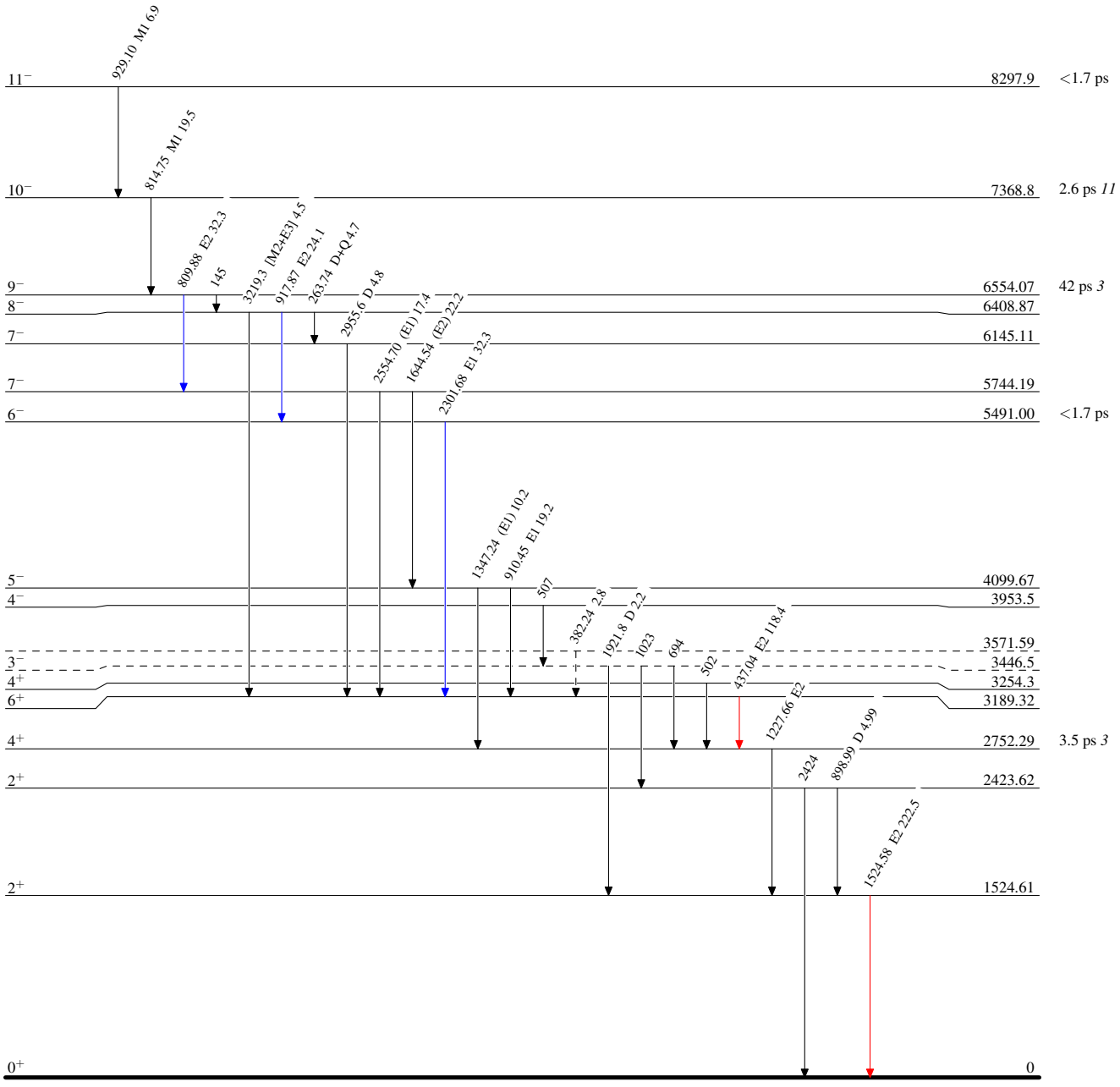
Level Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{42}_{20}Ca_{22}$