

$^{40}\text{Ar}(n,\gamma),(\text{pol } n,\gamma) \text{ E=thermal } 1970\text{Ha56},1972\text{St04},1967\text{Ly05}$

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan		NDS 133, 1 (2016)	30-Sep-2015

[1972St04](#): (pol n, γ). Circular polarization measured for states up to 3.4 MeV. Determined J^π .

[1970Ha56](#) (also [1967Ar14](#)): Neutrons produced from heavy water reactor at Stockholm. Measured E_γ , I_γ for secondary and primary transitions using a Ge(Li) detector.

[1968Sk02](#): Neutrons produced from heavy water reactor at Stockholm. Measured E_γ from thermal neutron capture of natural argon target with Ge(Li) detector and an anticoincidence spectrometers.

[1967Ly05](#): (n, γ). Measured 25 transitions; E_γ , I_γ , $\gamma\gamma$ using Ge(Li) detectors.

[1962Ba22](#): Pair-spectrometer measurements at Chalk River Laboratories. Measured, two γ energies and their intensities and $\gamma\gamma$ -coin. using NaI detectors.

 ^{41}Ar Levels

E(level) [#]	J^π [†]	Comments
0	$7/2^-$	
167.3 17	$5/2^-$	
516.1 21	$3/2^-$ [‡]	
1034.7 6	$3/2^+$	
1353.9 22	$3/2^-$ [‡]	
2398.1 4	$1/2^-$ [‡]	
2693? 3		
2733.4 7	$3/2^-$ [‡]	
2948.7 7	$3/2^-$ [‡]	
3009.6 8	$3/2^-$	
3111.4? 22		
3278.7? 22		
3326.8 6	$1/2^-$ [‡]	
3430.7? 21		
3564.9? 25		
3573? 3		
3702.9? 21		
3732? 3		
3968.2 6	$1/2^-$	
4270.0 10	$3/2^-$	
(6098.9 4)	$1/2^+$	E(level): 6098.9 3 from 2012Wa38 . J^π : s-wave capture in ^{40}Ar g.s.

[†] From Adopted Levels, unless otherwise stated.

[‡] From circular polarization measurement for primary γ ([1972St04](#)).

[#] From least-squares fit to E_γ 's.

 $\gamma(^{41}\text{Ar})$

I_γ normalization: Normalized assuming $\Sigma I_\gamma(\text{g.s.})=100$.

Polarization functions (ratio R) for circular polarization are from [1972St04](#).

Continued on next page (footnotes at end of table)

$^{40}\text{Ar}(n,\gamma),(\text{pol } n,\gamma) \text{ E=thermal}$ [1970Ha56,1972St04,1967Ly05](#) (continued) $\gamma(^{41}\text{Ar})$ (continued)

E_γ^\dagger	$I_\gamma^{\ddagger\#}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
167.3 2	79.6	167.3	5/2 ⁻	0	7/2 ⁻	
348.7 3	6.6	516.1	3/2 ⁻	167.3	5/2 ⁻	
516.0 3	25.3	516.1	3/2 ⁻	0	7/2 ⁻	
837.7 3	9.6	1353.9	3/2 ⁻	516.1	3/2 ⁻	
867.3 6	1.1	1034.7	3/2 ⁺	167.3	5/2 ⁻	
1044.3 4	6.0	2398.1	1/2 ⁻	1353.9	3/2 ⁻	
1186.8 3	52.2	1353.9	3/2 ⁻	167.3	5/2 ⁻	
1354.0 4	2.3	1353.9	3/2 ⁻	0	7/2 ⁻	
1828.8 12	1.0	(6098.9)	1/2 ⁺	4270.0	3/2 ⁻	
1881.5 10	1.4	2398.1	1/2 ⁻	516.1	3/2 ⁻	
1972.6 12	0.54	3326.8	1/2 ⁻	1353.9	3/2 ⁻	
2130.7 8	4.4	(6098.9)	1/2 ⁺	3968.2	1/2 ⁻	
2229.5 20	0.29	2398.1	1/2 ⁻	167.3	5/2 ⁻	
2291.6 20	0.20	3326.8	1/2 ⁻	1034.7	3/2 ⁺	
2432.5 8	0.84	2948.7	3/2 ⁻	516.1	3/2 ⁻	
2566.1 8	2.8	2733.4	3/2 ⁻	167.3	5/2 ⁻	
2614.3 8	2.9	3968.2	1/2 ⁻	1353.9	3/2 ⁻	
2668.1 [#] 20	0.51 [#]	3702.9?		1034.7	3/2 ⁺	
2668.1 [#] 20	0.51 [#]	(6098.9)	1/2 ⁺	3430.7?		
2771.8 8	8.6	(6098.9)	1/2 ⁺	3326.8	1/2 ⁻	R=+0.45 18. 2772 γ is unresolved from 2782 γ (from 2948 level) in 1972St04 .
2781.8 15	1.7	2948.7	3/2 ⁻	167.3	5/2 ⁻	
2810.5 8	5.9	3326.8	1/2 ⁻	516.1	3/2 ⁻	
2842.5 10	0.88	3009.6	3/2 ⁻	167.3	5/2 ⁻	
3089.4 10	1.1	(6098.9)	1/2 ⁺	3009.6	3/2 ⁻	
3111.3 [#] 22	0.40 [#]	3111.4?		0	7/2 ⁻	
3111.3 [#] 22	0.40 [#]	3278.7?		167.3	5/2 ⁻	
3150.2 10	4.0	(6098.9)	1/2 ⁺	2948.7	3/2 ⁻	R=-0.4 4.
3365.5 10	4.2	(6098.9)	1/2 ⁺	2733.4	3/2 ⁻	R=-0.8 4.
3405.3 [#] 25	0.08 [#]	(6098.9)	1/2 ⁺	2693?		
3405.5 [#] 25	0.08 [#]	3573?		167.3	5/2 ⁻	
3451.8 10	2.0	3968.2	1/2 ⁻	516.1	3/2 ⁻	
3564.5 [#] 25	0.13 [#]	3732?		167.3	5/2 ⁻	
3564.7 [#] 25	0.13 [#]	3564.9?		0	7/2 ⁻	
^x 3658.5 18	0.25					
3700.4 8	9.8	(6098.9)	1/2 ⁺	2398.1	1/2 ⁻	R=+1.27 17.
4102.5 15	0.3	4270.0	3/2 ⁻	167.3	5/2 ⁻	
4745.0 8	55.0	(6098.9)	1/2 ⁺	1353.9	3/2 ⁻	R=-0.46 2.
^x 4916.8 20	0.07					
5063.7 10	0.26	(6098.9)	1/2 ⁺	1034.7	3/2 ⁺	
^x 5448.6 25	0.05					
5582.0 8	11.6	(6098.9)	1/2 ⁺	516.1	3/2 ⁻	R=-0.44 6.
^x 5960.2 25	0.01					
^x 6062.6 25	0.04					
^x 6082.3 25	0.02					
^x 6092.8 25	0.03					
^x 6142.0 25	0.02					

[†] From [1970Ha56](#). Values given by [1967Ly05](#) agree with those from [1970Ha56](#), but are less precise. E_γ reported by [1970Ha56](#) and [1967Ly05](#) were recoil corrected. Recoil energies have been subtracted by evaluators.

[‡] For intensity per 100 neutron captures, multiply by 0.93.

[#] Multiply placed with undivided intensity.

^x γ ray not placed in level scheme.

⁴⁰Ar(n, γ),(pol n, γ) E=thermal 1970Ha56,1972Si04,1967Ly05

Level Scheme

Legend

Intensities: Per 100 N-captures
& Multiply placed: undivided intensity given

- ▶ I _{γ} < 2% × I _{γ} ^{max}
- ▶ I _{γ} < 10% × I _{γ} ^{max}
- ▶ I _{γ} > 10% × I _{γ} ^{max}

