^{37}Cl(p,nγ) 1972Lu02,1972Wo17

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	John Cameron, Jun Chen and Balraj Singh, Ninel Nica	NDS 113, 365 (2012)	15-Jan-2012

$J^\pi(^{37}Cl)=3/2^+$.

1973Kr04: E=3.61-5.80 MeV, 99.28%-enriched ^{37}Cl target. Used Ge(Li) detector and measured $T_{1/2}$ by DSAM.

1972Lu02: E=3.45-6.0 MeV, enriched target. Measured E(γ), I(γ), $T_{1/2}$ by DSAM.

1972Wo17: E=3.25-5.90 MeV, 87%-enriched ^{37}Cl target. Used Ge(Li) and N-tof technique and measured I(γ), γ(θ), and $T_{1/2}$ by DSAM.

1971Ta08: E=3.98, 4.17, 4.38, and 4.81 MeV, 99.3%-enriched ^{37}Cl target. Used Ge(Li) and five NaI(Tl) detectors As Compton polarimeter and measured γ(θ) and linear polarization.

1971Ca40: E=4.15, 5.15, 5.60, 6.15 MeV, natural ^{37}Cl target. Measured γ and γ-N coin with Ge(Li) detector for γ′s and liquid scintillator for N′s, and $T_{1/2}$ by DSAM (temporal resolution≈6 ns).

1971Ra22: E not specified, enriched target. Measured $T_{1/2}$ and magnetic moment.

^{37}Ar Levels

E(level)	J^π[†]	$T_{1/2}$	Comments
0	$3/2^+$		
1409.82 *10*	$1/2^+$	476 fs *106*	E(level): weighted average of: 1409.82 *10* (1972Lu02), 1409.0 *6* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 620 *185* (1973Kr04), 1220 *500* (1972Lu02), 940 *+170−100* (1972Wo17), 370 *+190−110* (1971Ca40). Weighted average: 687 *153*.
1611.25 *10*	$7/2^-$	4.5 ns *2*	E(level): weighted average of: 1611.26 *10* (1972Lu02), 1610.7 *10* (1971Ca40). $T_{1/2}$: from 1971Ra22 (which reported $T_{1/2}$); other measured mean lifetimes τ In ps:>10 (1972Lu02),>3 (1972Wo17). μ=−1.33 *5* (1971Ra22).
2217.1 *4*	$7/2^+$	387 fs *60*	E(level): weighted average of: 2217.1 *4* (1972Lu02), 2216.4 *15* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 540 *145* (1973Kr04), 910 *180* (1972Lu02), 510 *70* (1972Wo17). Weighted average: 559 *87*.
2489.9 *4*	$3/2^-$	568 fs *76*	E(level): weighted average of: 2490.0 *4* (1972Lu02), 2489.0 *10* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 755 *170* (1973Kr04), 1040 *190* (1972Lu02), 660 *+250−160* (1972Wo17), 88 *24* (1971Ca40). Weighted average (excluding 88 *24*): 820 *110*.
2795.4 *5*	$5/2^+$	16 fs *5*	E(level): weighted average of: 2795.5 *6* (1972Lu02), 2795.1 *13* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 23 *8* (1973Kr04), 22 *14* (1972Wo17). Weighted average: 23 *7*. Others:<40 (1972Lu02),<8 (1971Ca40).
3169.8 *8*	$5/2^+$	61 fs *8*	E(level): weighted average of: 3169.7 *8* (1972Lu02), 3171 *3* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 81 *15* (1973Kr04), 100 *20* (1972Lu02). Weighted average: 88 *12*.
3184.8 *10*	$9/2^-$	206 fs *26*	E(level): weighted average of: 3184.9 *10* (1972Lu02), 3184 *3* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 310 *80* (1973Kr04), 300 *60* (1972Lu02), 285 *60* (1972Wo17). Weighted average: 296 *37*.
3271.8 *9*	$5/2^-$	33 fs *7*	E(level): weighted average of: 3271.6 *10* (1972Lu02), 3272 *3* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 38 *15* (1973Kr04), 60 *20* (1972Lu02), 50 *20* (1972Wo17). Weighted average: 47 *10*.
3516.0 *10*	$3/2^-$	64 fs *24*	E(level): weighted average of: 3515.9 *10* (1972Lu02), 3519 *6* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 93 *35* (1973Kr04),<50 (1972Lu02).
3527 *3*	$7/2^-$	416 fs *208*	E(level): weighted average of: 3525.7 *20* (1972Lu02), 3535 *6* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs:>1120 (1973Kr04), 600 *300* (1972Lu02).
3602.9 *20*	$3/2^+$	55 fs *17*	E(level): weighted average of: 3603.0 *20* (1972Lu02), 3599 *10* (1971Ca40). $T_{1/2}$: mean lifetime τ In fs: 82 *25* (1973Kr04),<80 (1972Lu02).

[†] From Adopted Levels.

^{37}Cl(p,nγ) 1972Lu02,1972Wo17 (continued)

γ(^{37}Ar)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.	δ	Comments
1409.82	1/2$^+$	1409.79 *10*	100	0	3/2$^+$	D(+Q)		Mult.,δ: ΔJ=1, D(+Q) γ (1972Wo17). A_2=−0.01 *3*, A_4=0.00 *3* (1972Wo17).
1611.25	7/2$^-$	1611.21 *10*	100	0	3/2$^+$	M2+E3	−0.22 *11*	Mult.: ΔJ=2, Q+O (1971Ta08, 1972Wo17, γ(θ)), M2+E3 γ (1971Ta08, lin. POLARIZ.). δ: −0.22 *11* (1971Ta08); −0.16 *5* (1972Wo17). A_2=+0.18 *1*, A_4=−0.04 *1* (1972Wo17, W. AV.); A_2=+0.13 *1*, A_4=−0.03 *2* (1971Ta08, W. AV.), P=+0.87 *2* (1971Ta08, W. AV.).
2217.1	7/2$^+$	2217.0 *4*	100	0	3/2$^+$	Q		Mult.,δ: ΔJ=2, Q γ (1972Wo17, δ=−0.03 *4*). A_2=+0.25 *5*, A_4=−0.02 *2* (1972Wo17, W. AV.).
2489.9	3/2$^-$	878.3[#] *10*	9 *2*	1611.25	7/2$^-$			E_γ: As deduced As explained In Eγ footnote: 878.6. I_γ: others: 5 *3* (1972Wo17), 12 *3* (1971Ca40).
		2489.8 *4*	91 *2*	0	3/2$^+$	(D+Q)		I_γ: other: 95 *3* (1972Wo17), 88 *3* (1971Ca40). Mult.,δ: (D+Q) γ (1972Wo17). A_2=+0.05 *1*, A_4=+0.01 *1* (1972Wo17, W. AV.).
2795.4	5/2$^+$	2795.3 *5*	100	0	3/2$^+$	D+Q	+0.21 *13*	Mult.,δ: ΔJ=1, D+Q γ, δ=+0.21 *13* (1972Wo17). A_2=+0.01 *1*, A_4=+0.03 *2* (1972Wo17, W. AV.).
3169.8	5/2$^+$	3169.7 *8*	100	0	3/2$^+$	D(+Q)	−0.7 *+6−15*	Mult.,δ: ΔJ=1, D(+Q) γ, δ=−0.7 *+6−15* (1972Wo17). A_2=−0.36 *8*, A_4=+0.04 *8* (1972Wo17).
3184.8	9/2$^-$	1573[#] *3*	100	1611.25	7/2$^-$	D+Q	+0.58 *9*	E_γ: As deduced As explained In Eγ footnote: 1573.5. Mult.,δ: ΔJ=1, D+Q γ, δ=+0.58 *9* (1972Wo17). A_2=+0.47 *1*, A_4=+0.02 *2* (1972Wo17).
3271.8	5/2$^-$	476.4	6 *3*	2795.4	5/2$^+$			
		1661[#] *3*	38 *5*	1611.25	7/2$^-$			E_γ: As deduced As explained In Eγ footnote: 1660.5. I_γ: other: 57 *2* (1972Wo17), 55 *6* (1971Ca40).
		3271.6 *9*	56 *5*	0	3/2$^+$	D(+Q)	+0.03 *13*	I_γ: other: 43 *2* (1972Wo17), 45 *6* (1971Ca40). Mult.,δ: ΔJ=1, D(+Q) γ, δ=+0.03 *13* or −4.0 *+15−55* (1972Wo17). A_2=−0.08 *1*, A_4=−0.01 *1* (1972Wo17).
3516.0	3/2$^-$	346.2	7 *4*	3169.8	5/2$^+$			
		1026.1	24 *3*	2489.9	3/2$^-$			
		2110[#] *6*	69 *4*	1409.82	1/2$^+$			E_γ: As deduced As explained In Eγ footnote: 2106.1.
3527	7/2$^-$	1924[#] *6*	100	1611.25	7/2$^-$			E_γ: As deduced As explained In Eγ footnote: 1916.
3602.9	3/2$^+$	3602.7 *20*	100	0	3/2$^+$			

[†] Except when noted otherwise, the Eγ′s are deduced by evaluators from differences of initial and final levels (including recoil correction) based on measured Eγ′s from 1972Lu02 and 1971Ca40. 1971Ca40 report both Eγ′s and E(level)′s and 1972Lu02 report only E(level)′s based on more precise measured Eγ′s (unreported). Eγ′s were deduced using the here adopted E(level)′s (weighted average values of E(level)′s from both references). Eγ′s to g.s. are given the uncertainties of the initial levels, while those to final levels other than g.s. are reported without uncertainty, with the exception of γ′s In this category measured by 1971Ca40 for which both Eγ and ΔE_γ are from this ref. (noted separately).

[‡] From 1972Lu02.

[#] From 1971Ca40.

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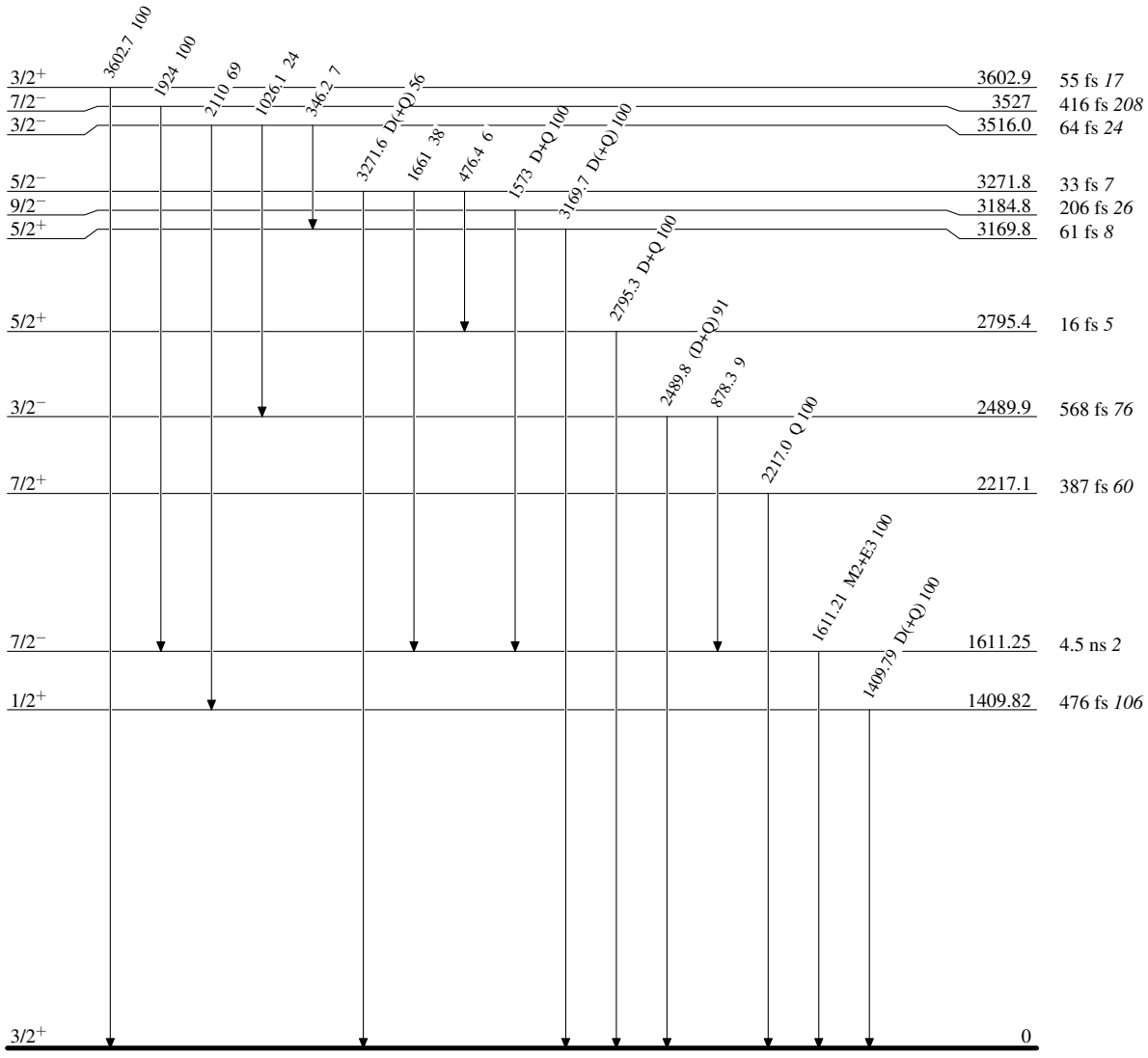
Level Scheme

Intensities: % photon branching from each level



$^{37}_{18}Ar_{19}$