^{92}Mo(p,p′γ) 1975Pa19,1973DoZB

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 2187 (2012)	15-Sep-2012

Others: 1966Di01, 1968Li10, 1969Li11, 1971Co08, 1972Mo36, 1974Cu04.
1968Li10: E(p)=7.96 MeV; θ=30°−140°; via ^{93}Tc IAR. γ(θ).
1972Mo36: E(p)=8,11 MeV; FWHM=4 keV; measured E(ce); ΔE, I(ce) unstated.
1973DoZB: E(p)=7 MeV; Eγ, branching, p′-γ coin.
1975Pa19: E(p)=7.0, 7.6, 8.5 MeV; Eγ, branching, γ(θ), γ(t) (DSA).

^{92}Mo Levels

The level scheme is from 1975Pa19 and agrees closely with that from 1973DoZB. The 480γ, at one time assigned to a level at 3572 keV, actually deexcites the 3007-keV level (1975Pa19).

E(level)†	Jπ‡	$T_{1/2}$#	Comments
0.0	0+		
1509.48 *3*	2+	0.36 ps *+8−5*	
2282.64 *8*	4+	>3.4 ps	Jπ: from 773γ(θ), J=4, J≠2,3,5.
2519.71 *8*	0+	>3.4 ps	
2527.10 *10*	5−	1.55@ ns *4*	
2613.5 *4*	6+		
2849.74 *5*	3−	0.34 ps *+18−9*	Jπ: from 1340γ(θ), J=2,3, J≠4; however, J=2 would imply large δ.
3007.11 *16*			
3064.19 *11*	(4−)		Jπ: J=3,4,5 from 537γ(θ), but δ unreasonably large if Jπ=5+ or 3. Absence of level in (α,α′) may suggest unnatural π, favoring a 4− assignment. adopted Jπ=(5−).
3091.33 *22*	2+	35 fs *3*	$T_{1/2}$: 1975Pa19 obtain 21 fs *6*. Jπ: from 3091γ(θ), J=2, J≠3,4.
3369.16 *14*	4	>3.4 ps	Jπ: 1086γ(θ) allows J=4,5, not 3. Magnitude of δ rules out 5−. Possible branch to 2+.
3542.00 *11*	2+	0.090 ps *+42−28*	$T_{1/2}$: 1975Pa19 obtain 0.061 ps *+24−17*. Jπ: 2033γ(θ) allows J=2,3, not 1. Mult(3541γ)=E1,M1,E2, from $T_{1/2}$. γ rays to 2+, 0+ levels.
3580.38 *17*		>0.21 ps	Jπ: 1053γ(θ) allows J=3,4,5.
3621.2 *4*		>0.21 ps	
3688.00 *13*		>0.69 ps	
3813.9 *3*		>0.48 ps	
3841.2 *4*	0+	>0.21 ps	
3876.1 *5*			
3925.0 *4*	2+	17 fs *+16−10*	$T_{1/2}$: 1975Pa19 obtain 20 fs *+20−12*.
3942.5 *4*	1,2+	10 fs *+10−3*	$T_{1/2}$: 1975Pa19 obtain 21 fs *+20−12*.
3962.38 *20*		>0.21 ps	

† From least-squares fit to Eγ.
‡ Jπ values shown for levels above 2 MeV were proposed by 1975Pa19 based on γ(θ), assuming adopted values for g.s. and 1509 level.
# Evaluator adopts values from DSA measurements of 1973DoZB using Winterbon attenuation factors, because they are in better agreement with other half-life measurements than are the DSA values obtained by 1975Pa19 using Blaugrund attenuation factors (see also comment in 1977Me01).
@ From p′−244γ delayed measurements (1971Co08).

^{92}Mo(p,p′γ) 1975Pa19,1973DoZB (continued)

γ(^{92}Mo)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡d]	E_f	J^π_f	Mult.[#]	δ[@]	Comments
1509.48	2^+	1509.47 *3*	100	0.0	0^+			
2282.64	4^+	773.10 *8*	100	1509.48	2^+	Q(+O)	−0.12 *+22−14*	A_2=+0.22 *4*, A_4=−0.20 *4* (1975Pa19).
2519.71	0^+	1010.22 *7*	100	1509.48	2^+			
2527.10	5^-	244.47 *7*	100	2282.64	4^+			A_2=−0.22 *5* (1968Li10); implies ΔJ=0,1.
2613.5	6^+	330.9[a] *4*	100	2282.64	4^+			
2849.74	3^-	567.05 *12*	16 *2*	2282.64	4^+			
		1340.26 *4*	84 *2*	1509.48	2^+	D+Q	−0.09 *+5−21*	δ: from table 4 (summary of observed electromagnetic transition rates) of 1975Pa19; δ misprinted in table 3 (summary of γ(θ) analyses). A_2=−0.35 *2*, A_4=−0.03 *3* (1975Pa19); A_2=−0.28 *5* (1968Li10).
3007.11		480.12 *14*	100	2527.10	5^-			
3064.19	(4^-)	537.07 *4*	100	2527.10	5^-			A_2=−0.44 *10*, A_4=−0.08 *11* (1975Pa19). δ is ≥1.2 if J=5; +0.5 to +2.8 if J=3; +0.25 *+25−11* or +5 *+14−3* if J=4.
3091.33	2^+	1581.9 *3*	19 *2*	1509.48	2^+	D+Q	+0.63[c] *11*	A_2=+0.50 *12*, A_4=−0.05 *13* (1975Pa19).
		3091.2 *3*	81 *2*	0.0	0^+	E2		Mult.: Q from γ(θ); RUL disallows M2. A_2=+0.32 *4*, A_4=−0.09 *5* (1975Pa19).
3369.16	4	304.8 *2*	35 *3*	3064.19	(4^-)			
		362.3 *2*	17 *2*	3007.11				
		842.1 *2*	37 *2*	2527.10	5^-			
		1086.4 *2*	11 *2*	2282.64	4^+	D+Q	+0.27 *+51−24*	A_2=+0.47 *5*, A_4=+0.12 *6* (1975Pa19).
		1859.5[&e]		1509.48	2^+			
3542.00	2^+	2032.5 *1*	86 *5*	1509.48	2^+	E2+M1	−1.7 *+9−26*	A_2=−0.30 *8*, A_4=−0.04 *8* (1975Pa19). Mult=D+Q, but δ too large for E1+M2 transition.
		3541.4 *9*	14 *5*	0.0	0^+			
3580.38		1053.4 *2*	57 *4*	2527.10	5^-	Q(+O)	−0.12 *+19−32*	A_2=+0.18 *7*, A_4=−0.10 *8* (1975Pa19).
		1297.6 *2*	43 *4*	2282.64	4^+			
3621.2		2111.7 *4*	100	1509.48	2^+			
3688.00		838.3 *3*	48 *3*	2849.74	3^-			
		2178.48 *13*	52 *3*	1509.48	2^+			
3813.9		750.8[&e]		3064.19	(4^-)			
		807.7[&e]		3007.11				
		964.5 *5*	45 *3*	2849.74	3^-			
		2304.3 *3*	55 *3*	1509.48	2^+			
3841.2	0^+	2331.7 *4*	100	1509.48	2^+			
3876.1		1593.3 *5*	38 *7*	2282.64	4^+			
		2367.0 *7*	62 *7*	1509.48	2^+			
3925.0	2^+	2415.5 *5*	35 *5*	1509.48	2^+			
		3924.9 *5*	65 *5*	0.0	0^+			
3942.5	$1,2^+$	3942.4 *4*	100	0.0	0^+			
3962.38		594.9[&e]		3369.16	4			
		898.0 *2*	49 *4*	3064.19	(4^-)			
		1113.2 *4*	27 *3*	2849.74	3^-			
		2453.4 *7*	24 *3*	1509.48	2^+			

† From 1975Pa19, unless noted otherwise.

‡ Branching, from 55° data of 1975Pa19. 1973DoZB report different branching for 3369, 3814 and 3962 levels to accommodate γ rays which they alone observe, as follows: 3369 level: I(304γ):I(362γ):I(842γ):I(1086γ):I(1860γ)=70:15:5:10:5; 3814 level: I(751γ):I(808γ):I(965γ):I(2304γ)=5:5:45:45; 3962 level: I(595γ):I(898γ):I(1113γ):I(2453γ)=25:15:30:10.

Based on γ(θ) from 1975Pa19.

Continued on next page (footnotes at end of table)

^{92}Mo(p,p′γ) 1975Pa19,1973DoZB (continued)

γ(^{92}Mo) (continued)

[@] From γ(θ), 1975Pa19, assuming J(parent level)=adopted J. See 1975Pa19 for additional δ values corresponding to other plausible J values.

[&] Reported by 1973DoZB only. For branching, see comment on Iγ.

[a] Given as 333.9 keV in 1975Pa19, but level energy difference is 330.9 and Eγ=329.76 *12* is associated with this level in (α,2nγ); Eγ=333.9 is assumed to be a misprint.

[b] From ce data of 1972Mo36. ΔE not stated by authors.

[c] From table 4 (summary of observed electromagnetic transition rates) of 1975Pa19; table 3 (summary of γ(θ) analyses) quotes 0.7 *+5−4*. Reason for discrepancy not evident.

[d] Absolute intensity per 100 decays.

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

[x] γ ray not placed in level scheme.

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Legend

Level Scheme

Intensities: % photon branching from each level