^{72}Ge(p,γ) 1978Li23

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 158, 1 (2019)	16-May-2019

1978Li23: E=2.213 MeV. Measured Eγ, Iγ, $\gamma\gamma$-coin, low-energy γ in coin with Eγ>4 MeV. Target thickness not given; possibly several resonances excited.
1997Ra16: E=1800-3900. Measured Eγ, Iγ. Deduced partial radiative transition strengths, J, π.
1979Sz06, 1978WiZM: E=3000-3900. Average resonance spectroscopy yielding γ-ray strength functions; tentative J^π values from Hauser-Feshbach calculations.
1978Kl05: E=3300-5200. Measured σ(E(p)). Deduced levels from primary transitions.
2015Na14: E=1.8-3.6 MeV; measured Eγ, Iγ, σ(E) using γ-summing detector SuN at Notre Dame Tandem Van de Graaff accelerator facility. Natural Ge target. Deduced nuclear level densities (NLDs), and γ-ray strength functions.
All data are from 1978Li23, except as noted.

^{73}As Levels

E(level)[#]	J$^\pi$[a]	Cross section (μb) (1997Ra16)[†]	Comments
0.0	3/2$^-$	31 *7*	
66.5 *6*	5/2$^-$	11 *3*	Relative population=0.36 *9* (1997Ra16), 0.53 *4* (1979Sz06).
85.3 *6*	(1/2)$^-$	29 *7*	J$^\pi$: 3/2$^-$ (1979Sz06,1997Ra16). Relative population=0.93 *9* (1997Ra16), 0.96 *4* (1979Sz06).
255.2 *6*	(1/2)$^-$	20 *5*	Relative population=0.65 *6* (1997Ra16), 0.63 *3* (1979Sz06).
394.2 *7*	3/2$^-$	25 *6*	Relative population=0.80 *6* (1997Ra16), 0.82 *4* (1979Sz06).
429.0 *11*	9/2$^+$	2.1 *5*	Relative population=0.07 *4* (1997Ra16), 0.08 *2* (1979Sz06).
509.2 *8*	(5/2)$^+$	12 *3*	Relative population=0.38 *7* (1997Ra16), 0.40 *3* (1979Sz06).
575.6 *7*	(1/2)$^-$	19 *6*	Relative population=0.60 *8* (1997Ra16), 0.86 *4* for doublet (1979Sz06).
576.2 *8*	5/2$^-$	9 *3*	Relative population=0.27 *9* (1997Ra16).
655.9 *6*	3/2$^-$	15 *3*	J$^\pi$: 1/2$^-$ (1979Sz06). J^π=5/2$^-$ in figure 3 of 1997Ra16 seems a misprint. Relative population=0.47 *7* (1997Ra16), 0.50 *3* (1979Sz06).
674?[‡]		≤0.6	Relative population ≤0.02 (1997Ra16).
769.6 *7*	5/2$^-$	6.1 *14*	Relative population=0.20 *7* (1997Ra16), 0.46 *4* (1979Sz06).
851.6 *8*	(5/2)$^-$	≤7.9	J$^\pi$: 5/2$^+$ (1997Ra16). Relative population ≤0.25 (1997Ra16).
860?	7/2$^-$	≤6.9	J$^\pi$: 7/2$^-$ (1997Ra16). Relative population ≤0.22 (1997Ra16), 0.54 *4* for doublet (1979Sz06).
886[@] *3*	1/2$^+$		Relative population=0.49 *3* (1979Sz06).
994[@] *3*	(7/2)$^-$	5.5 *13*	J$^\pi$: 7/2$^-$ (1979Sz06,1997Ra16). Relative population=0.18 *7* (1997Ra16), 0.17 *4* (1979Sz06). E(level): quoted as 894 in 1979Sz06.
1037[‡]		3.6 *7*	J$^\pi$: 7/2$^-$ (1997Ra16). Relative population=0.11 *9* (1997Ra16).
1079.2 *7*	(3/2)$^-$	15 *5*	Relative population=0.50 *19* (1997Ra16), 0.73 *4* for doublet (1979Sz06).
1087 *3*	5/2$^-$	6 *4*	Decay mode not consistent with that observed in ^{73}Ge(p,nγ). Relative population<0.5 (1997Ra16).
1178?[‡]		≤1.6	J$^\pi$: 7/2 (1997Ra16). Relative population ≤0.03 (1997Ra16).
1190[@] *3*	(3/2$^-$)		E(level): 1178 (1997Ra16) is probably different from 1190 in 1979Sz06. J$^\pi$: 3/2$^-$ (1979Sz06). Relative population=0.40 *3* (1979Sz06).
1216.8 *7*	(3/2)$^-$	30 *7*	E(level),J$^\pi$: 1221, 5/2$^-$ in 1997Ra16.

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^{72}Ge(p,γ) 1978Li23 (continued)

^{73}As Levels (continued)

E(level)[#]	J$^{\pi}$[a]	Cross section (μb) (1997Ra16)[†]	Comments
			Relative population=0.98 *3* (1997Ra16), 0.98 *4* (1979Sz06).
1276.1 *11*	(7/2)$^+$	≤2.7	Relative population ≤0.09 (1997Ra16).
1301.4 *8*	(1/2$^-$,3/2)	19 *4*	J$^{\pi}$: 3/2$^-$ (1997Ra16). Relative population=0.61 *25* (1997Ra16), 0.72 *4* (1979Sz06).
1324[@] *3*	(5/2$^+$)	4.6 *10*	Relative population=0.15 *4* (1997Ra16), 0.35 *3* (1979Sz06).
1344[@] *3*	(7/2)$^-$	3.1 *10*	Relative population=0.10 *8* (1997Ra16), 0.18 *4* (1979Sz06).
1399? *5*			E(level): primary γ to this level not seen by 1978WiZM.
1489?[‡]		≤2.8	J$^{\pi}$: 5/2 (1997Ra16). Relative population ≤0.09 (1997Ra16).
1540[@] *3*		4.6 *15*	E(level),J$^{\pi}$: 1556, 5/2$^+$ (1997Ra16). Relative population=0.15 *8* (1997Ra16), 0.25 *2* (1979Sz06).
1592.1 *9*	(3/2)$^-$	10 *3*	Relative population=0.33 *9* (1997Ra16).
1612[‡]		6.1 *14*	J$^{\pi}$: 1/2 (1997Ra16). Relative population=0.20 *8* (1997Ra16).
1715.7[&] *20*			
1852.7[&]	(9/2)$^+$		
1861.3 *11*			
1974.3 *11*			
2125[&] *3*			
2231.5[&]			
7861.6 *5*	(3/2,5/2)		

[†] Values are for E(p)=2800. Population relative to g.s. are given under comments.
[‡] From 1997Ra16 only.
[#] From energy differences of primary γ's, except where noted.
[@] From 1979Sz06 and/or 1997Ra16.
[&] From 1978Kl05.
[a] From Adopted Levels. Assignments from studies in this dataset are given under comments.

γ(^{73}As)

E$_i$(level)	J$_i^{\pi}$	E$_{\gamma}$	E$_f$	J$_f^{\pi}$
255.2	(1/2)$^-$	255	0.0	3/2$^-$
394.2	3/2$^-$	308	85.3	(1/2)$^-$
		393	0.0	3/2$^-$
509.2	(5/2)$^+$	443	66.5	5/2$^-$
		(510)	0.0	3/2$^-$
575.6	(1/2)$^-$	321	255.2	(1/2)$^-$
576.2	5/2$^-$	489	85.3	(1/2)$^-$
		578[‡]	0.0	3/2$^-$
655.9	3/2$^-$	402	255.2	(1/2)$^-$
		571	85.3	(1/2)$^-$
		588	66.5	5/2$^-$
		655	0.0	3/2$^-$
769.6	5/2$^-$	704	66.5	5/2$^-$
		768[&#]	0.0	3/2$^-$
851.6	(5/2)$^-$	852	0.0	3/2$^-$
1079.2	(3/2)$^-$	822	255.2	(1/2)$^-$

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^{72}Ge(p,γ) 1978Li23 (continued)

$\gamma(^{73}As)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Comments
1079.2	$(3/2)^-$	995		85.3	$(1/2)^-$	
		1080		0.0	$3/2^-$	
1087	$5/2^-$	1088[b]		0.0	$3/2^-$	
1216.8	$(3/2)^-$	356[b]		860?	$7/2^-$	
		642		575.6	$(1/2)^-$	
		789[b]		429.0	$9/2^+$	This γ from $(3/2)^-$ to $9/2^+$, implying mult=E3, is unlikely.
		1151		66.5	$5/2^-$	
1276.1	$(7/2)^+$	768[&]		509.2	$(5/2)^+$	
		846		429.0	$9/2^+$	
1301.4	$(1/2^-,3/2)$	726		575.6	$(1/2)^-$	
		1217		85.3	$(1/2)^-$	
1399?		973[b]		429.0	$9/2^+$	
1592.1	$(3/2)^-$	936		655.9	$3/2^-$	
7861.6	(3/2,5/2)	5887	7.2	1974.3		
		6000	<1	1861.3		
		6269	9.7	1592.1	$(3/2)^-$	
		6462[b]	<12.5[@]	1399?		
		6561	9.2	1301.4	$(1/2^-,3/2)$	
		6647	2.3	1216.8	$(3/2)^-$	
		7010	2.7	851.6	$(5/2)^-$	
		7091	5.3	769.6	$5/2^-$	
		7205	8.4	655.9	$3/2^-$	
		7285[ab]	7.1[a]	575.6	$(1/2)^-$	
		7285[ab]	7.1[a]	576.2	$5/2^-$	
		7465	7.9	394.2	$3/2^-$	
		7606	4.2	255.2	$(1/2)^-$	
		7776	8.0	85.3	$(1/2)^-$	
		7794	6.6	66.5	$5/2^-$	
		7861	8.9	0.0	$3/2^-$	

[†] Relative branchings are given.
[‡] Placed by evaluator; see ^{73}Ge(p,nγ).
[#] Placed by evaluator from comparison with ^{73}Ge(p,nγ).
[@] Probably overestimated by 1978Li23.
[&] Multiply placed.
[a] Multiply placed with undivided intensity.
[b] Placement of transition in the level scheme is uncertain.

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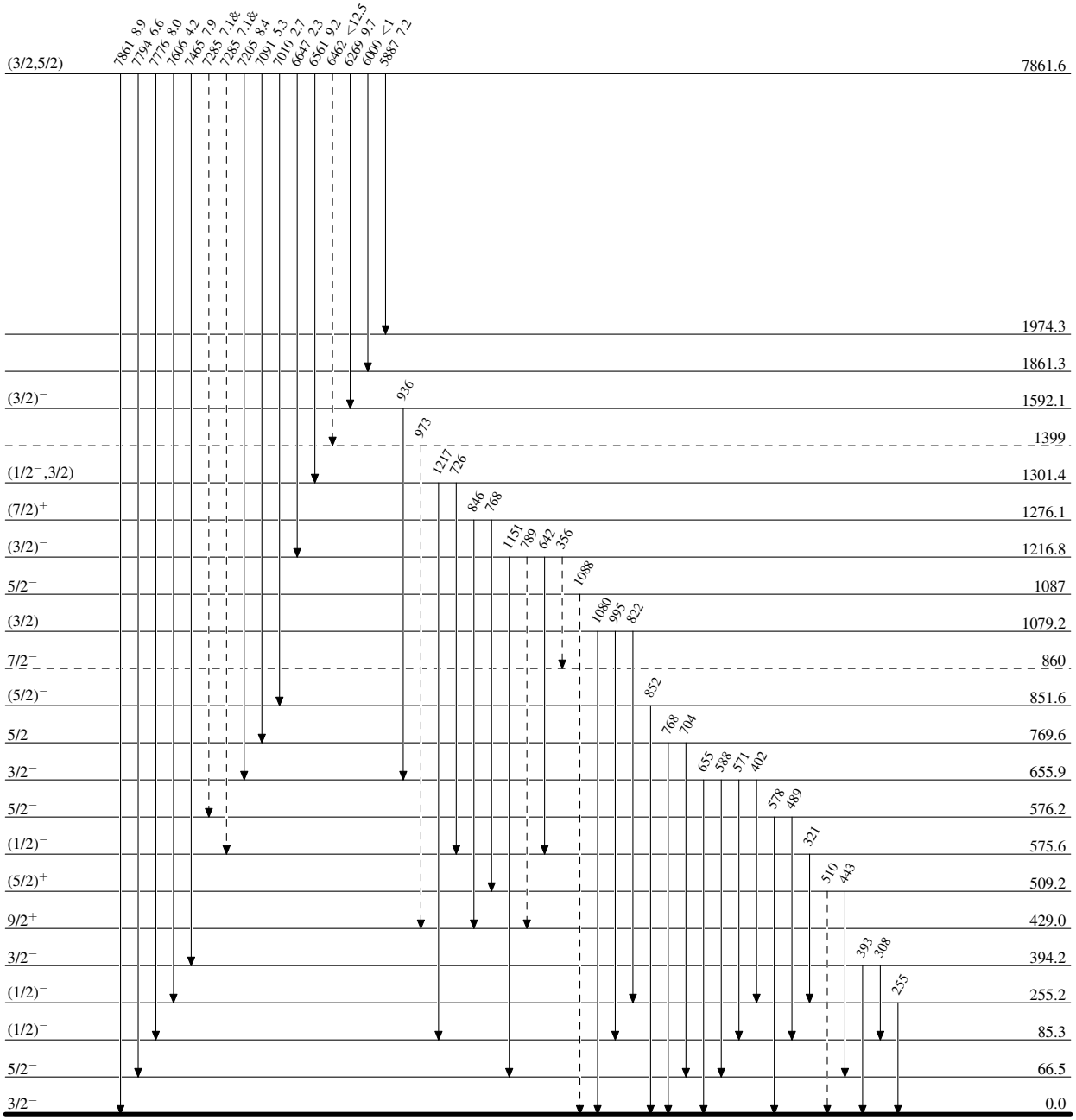
Legend

Level Scheme

Intensities: % photon branching from each level
& Multiply placed: undivided intensity given

- - - - - - ► γ Decay (Uncertain)



$^{73}_{33}As_{40}$