^{70}Zn(^{48}Ca,Xγ) 2017CaZP

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 207,1 (2026)	1-Apr-2023

Includes ^{197}Au(^{70}Zn,Xγ).

2017CaZP: Two experiments were conducted at Argonne National Laboratory.

^{70}Zn(^{48}Ca,Xγ): ^{69}Cu was populated via proton transfer with the ^{48}Ca beam at E=170 MeV impinging a ^{70}Zn target. The experimental setup consisted of the GRETINA spectrometer and the CHICO2 charged particle detector. Eγ, Iγ, $\gamma\gamma$ coin and $\gamma\gamma\gamma$ coincidence were measured. Experimental results were compared to Monte Carlo simulations. Angular distributions A_2 and A_4 were determined and mulitpolarities deduced.

^{197}Au(^{70}Zn,Xγ): In the deep inelastic reaction, ^{70}Zn beam at E=430 MeV impinged a ^{197}Au target. The experimental setup consisted of the GAMMASPHERE multidetector array. Eγ, Iγ, $\gamma\gamma$ coin and $\gamma\gamma\gamma$ coincidence were measured.

^{69}Cu Levels

E(level)†	J$^\pi$‡	E(level)†	J$^\pi$‡	E(level)†	J$^\pi$‡
0.0	3/2$^-$	2602.9 *6*	(9/2$^-$)	2973.3 *7*	(13/2$^+$)
1213.5 *4*	(5/2,7/2)$^-$	2668.2 *6*	11/2$^-$	3214.5 *6*	13/2$^-$
1711.4 *5*	7/2$^-$	2696.9 *6*	(7/2$^+$,9/2$^+$,11/2$^+$)	3483.2 *6*	15/2$^-$
1871.3 *4*	7/2$^-$	2742.0 *7*	(13/2$^+$)	3692.0 *8*	(19/2$^-$)
2182.1 *6*	9/2$^-$	2756.9 *6*	(7/2$^+$,9/2$^+$,11/2$^+$)	3798.8 *8*	(15/2$^-$)
2345.8 *5*	(5/2,7/2)	2800.9 *7*	(7/2$^+$,9/2$^+$,11/2$^+$)	3828.5 *12*	(17/2$^+$)
2551.8 *5*	(9/2$^+$)	2867.8 *5*	11/2$^-$		

† From least-squares fit to Eγ data by the evaluator. Δ(Eγ)=0.5 keV was assigned during the least-squares fit.

‡ From 2017CaZP.

γ(^{69}Cu)

E$_\gamma$†	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.‡	Comments
154.0	2756.9	(7/2$^+$,9/2$^+$,11/2$^+$)	2602.9	(9/2$^-$)		
172.4	2973.3	(13/2$^+$)	2800.9	(7/2$^+$,9/2$^+$,11/2$^+$)		
190.2	2742.0	(13/2$^+$)	2551.8	(9/2$^+$)		
205.1	2756.9	(7/2$^+$,9/2$^+$,11/2$^+$)	2551.8	(9/2$^+$)		
206.0	2551.8	(9/2$^+$)	2345.8	(5/2,7/2)		
208.8	3692.0	(19/2$^-$)	3483.2	15/2$^-$		
249.1	2800.9	(7/2$^+$,9/2$^+$,11/2$^+$)	2551.8	(9/2$^+$)		
268.7	3483.2	15/2$^-$	3214.5	13/2$^-$		
421.5	2973.3	(13/2$^+$)	2551.8	(9/2$^+$)		
470.7	2182.1	9/2$^-$	1711.4	7/2$^-$	D+Q	A_2=+0.05 *4*; A_4=+0.04 *6*
486.0	2668.2	11/2$^-$	2182.1	9/2$^-$		
546.2	3214.5	13/2$^-$	2668.2	11/2$^-$		
584.3	3798.8	(15/2$^-$)	3214.5	13/2$^-$		
614	3828.5	(17/2$^+$)	3214.5	13/2$^-$		
615.4	3483.2	15/2$^-$	2867.8	11/2$^-$		
657.8	1871.3	7/2$^-$	1213.5	(5/2,7/2)$^-$		
680.5	2551.8	(9/2$^+$)	1871.3	7/2$^-$	D	A_2=−0.35 *3*; A_4=−0.03 *5*
956.7	2668.2	11/2$^-$	1711.4	7/2$^-$		
996.5	2867.8	11/2$^-$	1871.3	7/2$^-$		
1032.4	3214.5	13/2$^-$	2182.1	9/2$^-$		
1132.3	2345.8	(5/2,7/2)	1213.5	(5/2,7/2)$^-$		
1213.5	1213.5	(5/2,7/2)$^-$	0.0	3/2$^-$		
1389.4	2602.9	(9/2$^-$)	1213.5	(5/2,7/2)$^-$		
1483.4	2696.9	(7/2$^+$,9/2$^+$,11/2$^+$)	1213.5	(5/2,7/2)$^-$		

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^{70}Zn(^{48}Ca,Xγ) 2017CaZP (continued)

$\gamma(^{69}Cu)$ (continued)

E_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
1711.4	1711.4	7/2$^-$	0.0	3/2$^-$	Q	A_2=+0.41 *4*; A_4=−0.09 *7*
1871.3	1871.3	7/2$^-$	0.0	3/2$^-$		

[†] From Fig. 3.15 in 2017CaZP. No uncertainties were provided.
[‡] From A_2 and A_4 values taken from Tabella 3.1 in 2017CaZP.

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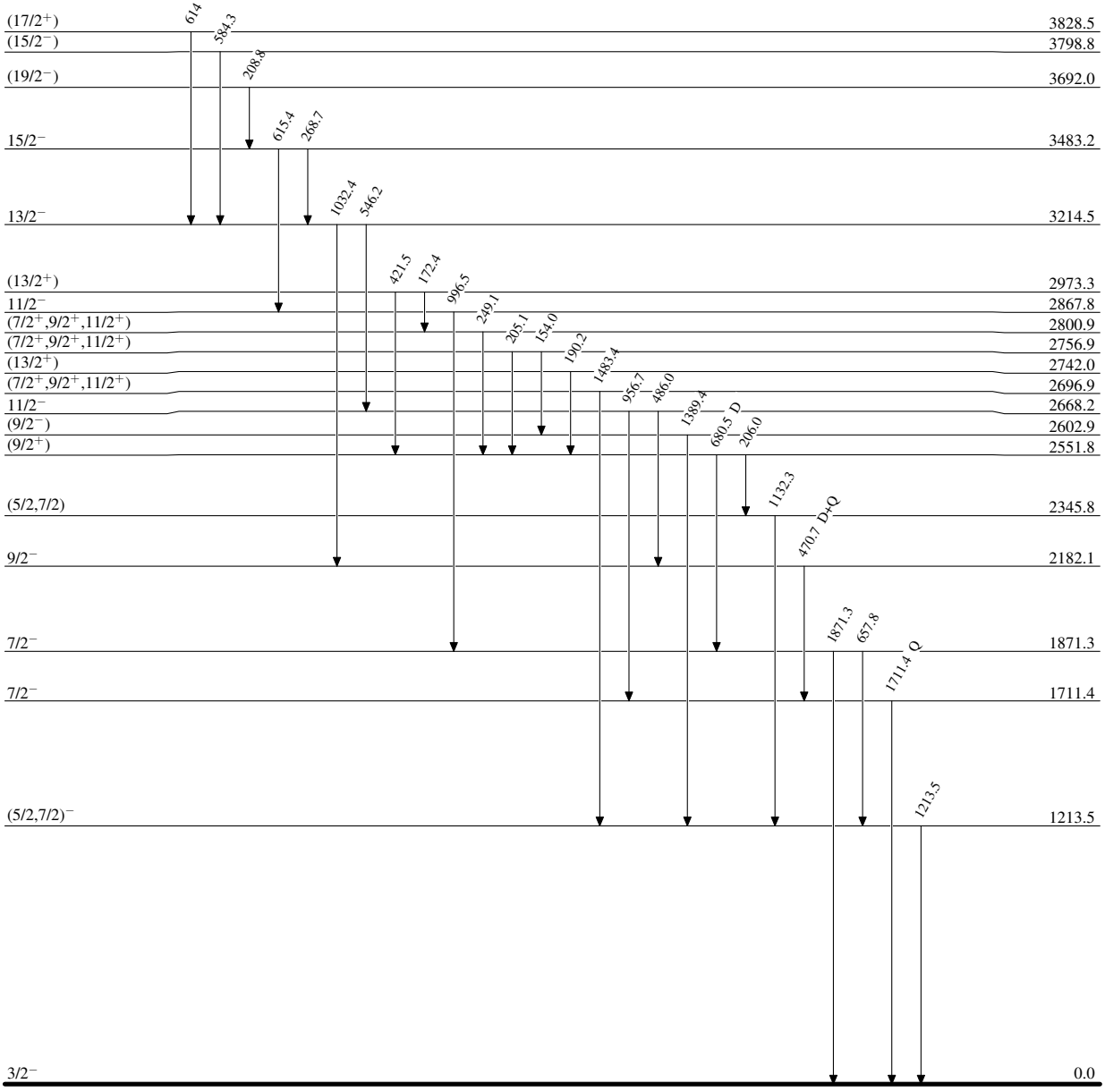
Level Scheme



$^{69}_{29}Cu_{40}$