

⁵⁸Ni(³He,n γ) 1989Sc28,1974Ka24

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 114, 1849 (2013)	31-Dec-2012

E(³He)=8, 12 MeV. Neutron singles, γ singles, n γ , $\gamma\gamma$, and n $\gamma\gamma$, n γ (θ) (1989Sc28).

E(³He)=10 MeV. γ singles and n γ spectra (1974Ka24).

The heavy-ion reaction ⁴⁰Ca(²³Na,p2n γ) with E(²³Na)=70 MeV showed appreciable strength but no spectroscopic information (1989Sc28).

⁶⁰Zn Levels

No measurable half-life observed, 1 ps<T_{1/2}<1 ns (1989Sc28).

E(level)	J π [†]	Comments
0.0	0 ⁺ [‡]	
1004.1 5	2 ⁺ [‡]	
2193.3 7	4 ⁺ [‡]	
3035.1 12		
3510.6 8	(3 ⁺) [‡]	J π : 2 ⁽⁺⁾ ,4 ⁽⁺⁾ from n γ angular correlation.
3627.2 12		
3812.2 12		
3972.7 10	2	
4200.2 11	5 ⁽⁺⁾	
4351.3 12	5 ⁽⁺⁾	
4776.3 12	5 ⁽⁺⁾	
4913.5 11		
5337.5 12	3 ⁽⁺⁾ ,4 ⁽⁺⁾	
5503.8 14		
6639.4 11		
7372.8 23	4	
8702.4 14		

[†] Spin from n γ angular correlation, π from multipolarity of decay γ , except as noted.

[‡] From Adopted Levels.

γ (⁶⁰Zn)

E _i (level)	J π _i	E γ [‡]	I γ [@]	E _f	J π _f	Mult.&	δ &	α [†]	Comments
1004.1	2 ⁺	1004.2 [#] 5	100	0.0	0 ⁺				
2193.3	4 ⁺	1189.4 [#] 5	100	1004.1	2 ⁺				
3035.1		2031 1	100	1004.1	2 ⁺				
3510.6	(3 ⁺)	1318 1	12	2193.3	4 ⁺				
		2506 1	88	1004.1	2 ⁺	(M1+E2)	-3 1	0.000596 12	$\alpha=0.000596$ 12; $\alpha(K)=4.17\times 10^{-5}$ 6; $\alpha(L)=4.13\times 10^{-6}$ 6; $\alpha(M)=5.91\times 10^{-7}$ 9; $\alpha(N+..)=0.000549$ 11 $\alpha(N)=2.40\times 10^{-8}$ 4; $\alpha(IPF)=0.000549$ 11
3627.2		2623 1	100	1004.1	2 ⁺				
3812.2		2808 1	100	1004.1	2 ⁺				
3972.7	2	462 ^d 1	6	3510.6	(3 ⁺)				
		1780 1	14	2193.3	4 ⁺				
		2968 2	10	1004.1	2 ⁺				

Continued on next page (footnotes at end of table)

$^{58}\text{Ni}(\text{}^3\text{He},\text{n}\gamma)$ **1989Sc28,1974Ka24** (continued) $\gamma(^{60}\text{Zn})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\ddagger	I_γ^\oplus	E_f	J_f^π	Mult. &	$\delta^\&$	α^\dagger	Comments
3972.7	2	3971 2	70	0.0	0 ⁺				
4200.2	5 ⁽⁺⁾	690 ^a 1 2006.8 [#] 10	33 67	3510.6	(3 ⁺) 4 ⁺	(M1+E2)	+4 2	0.000380 10	$\alpha=0.000380$ 10; $\alpha(\text{K})=6.18\times 10^{-5}$ 10; $\alpha(\text{L})=6.13\times 10^{-6}$ 10; $\alpha(\text{M})=8.78\times 10^{-7}$ 14; $\alpha(\text{N}+.)=0.000311$ 9 $\alpha(\text{N})=3.56\times 10^{-8}$ 6; $\alpha(\text{IPF})=0.000311$ 9
4351.3	5 ⁽⁺⁾	2158 1	100	2193.3	4 ⁺	(M1+E2)	+3.5 5	0.000444 7	$\alpha=0.000444$ 7; $\alpha(\text{K})=5.42\times 10^{-5}$ 8; $\alpha(\text{L})=5.37\times 10^{-6}$ 8; $\alpha(\text{M})=7.69\times 10^{-7}$ 11; $\alpha(\text{N}+.)=0.000384$ 6 $\alpha(\text{N})=3.12\times 10^{-8}$ 5; $\alpha(\text{IPF})=0.000384$ 6
4776.3	5 ⁽⁺⁾	2583 1	100	2193.3	4 ⁺	(M1+E2)	<+4.5	0.00060 4	$\alpha=0.00060$ 4; $\alpha(\text{K})=3.91\times 10^{-5}$ 8; $\alpha(\text{L})=3.87\times 10^{-6}$ 8; $\alpha(\text{M})=5.55\times 10^{-7}$ 11; $\alpha(\text{N}+.)=0.00055$ 4 $\alpha(\text{N})=2.25\times 10^{-8}$ 5; $\alpha(\text{IPF})=0.00055$ 4
4913.5		1403 1 3909 2	28 72	3510.6	(3 ⁺) 2 ⁺				
5337.5	3 ⁽⁺⁾ ,4 ⁽⁺⁾	1827 1	65	3510.6	(3 ⁺)	(M1+E2)		0.000287 24	$\alpha=0.000287$ 24; $\alpha(\text{K})=7.21\times 10^{-5}$ 19; $\alpha(\text{L})=7.16\times 10^{-6}$ 20; $\alpha(\text{M})=1.03\times 10^{-6}$ 3; $\alpha(\text{N}+.)=0.000207$ 22 $\alpha(\text{N})=4.16\times 10^{-8}$ 11; $\alpha(\text{IPF})=0.000207$ 22 δ : if $J_f=4$, then $J_i=3$ (or 4) with $\delta=-1.0$ 5 (or 0.0 2); if $J_f=2$, then $J_i=3$ and $\delta=-0.5$ 1.
5503.8		4333 2	35	1004.1	2 ⁺				
6639.4		1531 1 1726 1 2439 1 3129 2	100 19 47 34	3972.7 4913.5 4200.2 3510.6	2 2 5 ⁽⁺⁾ (3 ⁺)				
7372.8	4	3400 2	100	3972.7	2				
8702.4		2063 1 4502 2	70 30	6639.4 4200.2	2 5 ⁽⁺⁾				

[†] Additional information 1.

[‡] From 1989Sc28, except as noted. ΔE not given, estimated by the evaluator.

[#] From 1974Ka24.

[@] Relative branching from each level.

[&] From $n\gamma$ angular correlation analysis. $\Delta\pi$ =no assumed from large δ values (1989Sc28).

^a Placement of transition in the level scheme is uncertain.

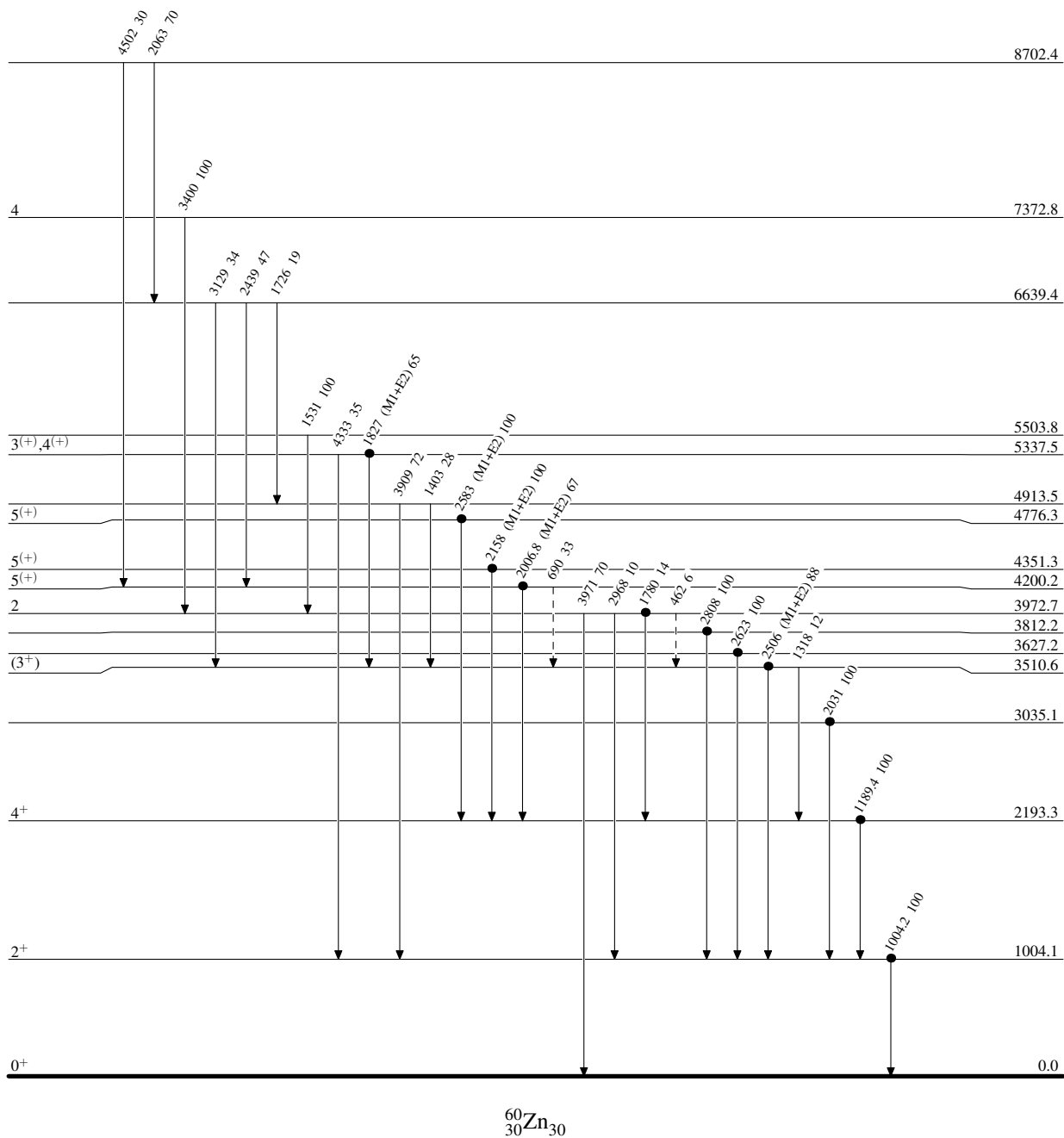
$^{58}\text{Ni}(\text{}^3\text{He},\text{n}\gamma)$ 1989Sc28,1974Ka24

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----▶ γ Decay (Uncertain)
 ● Coincidence



$^{60}_{30}\text{Zn}_{30}$