

$^{60}\text{Ni}(n,n'\gamma)$ 2002KoZT,2008Or02

Type	Author	History	Literature Cutoff Date
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2002KoZT: E=fast reactor neutrons. Measured γ , $\theta=90^\circ-124^\circ$.

2008Or02: E=1.6,1.8 MeV beam provided by electrostatic accelerator at the University of Kentucky. Measured E_γ , I_γ , $\gamma(\theta)$, lifetimes by Doppler-shift attenuation method using an HPGe detector with Compton-suppression.

1989Ge09,1983El03: E(n)=fast neutron from reactor. Measured E_γ , DSA with double target technique.

1989Ko54: Measured $\gamma(t)$, $\gamma(\theta)$, $T_{1/2}$ (DSA).

1982Sh28: E(n)=14.2 MeV. Measured E_γ . Ge(Li) and surface barrier detectors. Associated particle technique.

1979Tr09: E(n)=1.3-4.0 MeV. Measured E_γ , I_γ , $\sigma(E(n),E_\gamma)$. Ge(Li) detector, time-of-flight, long counter, proton recoil telescope.

 ^{60}Ni Levels

E(level)	J^π [‡]	$T_{1/2}$ [†]	Comments
0.0	0 ⁺		
1332.55 12	2 ⁺	0.90 ps +21-14	$T_{1/2}$: from DSAM (2008Or02). The authors give 0.735 ps 21 as the averaged recommended value from all the measurements, including the current value.
2158.84 13	2 ⁺	>1.04 ps	$T_{1/2}$: 64 fs 12 (1989Ge08,1983El03).
2284.47 18	0 ⁺	>0.69 ps	$T_{1/2}$: 8 fs 8 (1989Ge08,1983El03).
2505.97 20	4 ⁺	0.4 ps +4-2	$T_{1/2}$: >42 fs (1989Ge08,1983El03).
2626.10 16	3 ⁺	0.6 ps +5-3	$T_{1/2}$: 24 fs 4 (1989Ge08,1983El03).
3119.89 25	4 ⁺	0.04 ps 1	
3124.50 17	2 ⁺		
3186.30 17	2 ⁺	0.12 ps +5-2	J^π : $J^\pi=3^+$ in $^{28}\text{Si}(^{35}\text{Cl},3p\gamma)$, (p, γ).
3194.20 18	1 ⁺		
3269.14 14	2 ⁺	0.10 ps +3-2	
3317.88 24	1 ⁺	0.10 ps 3	J^π : adopted 0 ⁺ .
3393.56 18	2 ⁺	0.08 ps 6	
3587.82 19	0 ⁺		
3619.49 25	3 ⁺		
3671.6 3	4 ⁺	0.11 ps +7-3	
3702.9 11	6 ⁺		J^π : adopted 4 ⁺ .
3730.9 3	2 ⁺ ,3 ⁺		
3732.98 23	2 ⁺	0.10 ps 2	
3870.35 18	2 ⁺	0.04 ps 1	
3887.91 24	2 ⁺		
4007 [#]		0.028 ps 5	
4040 [#]		0.038 ps 11	
4079 [#]		0.014 ps 7	
4165.0 [#] 11	5 ⁺	0.09 ps +9-3	
4265 [#]	6 ⁺		

[†] From 1989Ko54.

[‡] Deduced J^π from comparison of level population probability with theory, using Hauser-Feshbach-Moldauer calculations (2002KoZT).

[#] From 1989Ko54.

${}^{60}\text{Ni}(n,n'\gamma)$ 2002KoZT,2008Or02 (continued) $\gamma({}^{60}\text{Ni})$ All data, except δ , from 2002KoZT, unless given otherwise. δ from 1989Ko54.

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	δ	α^\dagger	Comments
467.2 2		2626.10	3 ⁺	2158.84	2 ⁺				
493.8 2	0.19 4	3119.89	4 ⁺	2626.10	3 ⁺				
583 1	0.12 3	3702.9	6 ⁺	3119.89	4 ⁺				
642.8 2	0.32 4	3269.14	2 ⁺	2626.10	3 ⁺				
680.2 2	0.63 5	3186.30	2 ⁺	2505.97	4 ⁺				
745.9 2	0.40 4	3870.35	2 ⁺	3124.50	2 ⁺				
826.1 2	17.8 8	2158.84	2 ⁺	1332.55	2 ⁺	D+Q	+1.0 2		
909 1	0.30 6	3194.20	1 ⁺	2284.47	0 ⁺				
952.2 2	4.1 3	2284.47	0 ⁺	1332.55	2 ⁺				
985.0 2	0.05 1	3269.14	2 ⁺	2284.47	0 ⁺				
993.4 2	0.90 5	3619.49	3 ⁺	2626.10	3 ⁺				
1027.4 2	0.86 9	3186.30	2 ⁺	2158.84	2 ⁺	D+Q	-6.1 +9-10		
1035.5 2	0.40 4	3194.20	1 ⁺	2158.84	2 ⁺				
1110 1	0.4 1	3269.14	2 ⁺	2158.84	2 ⁺				
1165.6 2	0.7 1	3671.6	4 ⁺	2505.97	4 ⁺				
1173.3 2	7.1 4	2505.97	4 ⁺	1332.55	2 ⁺				
1224.9 2	0.22 2	3730.9	2 ⁺ ,3 ⁺	2505.97	4 ⁺				
1234.9 2	0.15 3	3393.56	2 ⁺	2158.84	2 ⁺				
1244 1	≈0.02	3870.35	2 ⁺	2626.10	3 ⁺				
1293.4 2		2626.10	3 ⁺	1332.55	2 ⁺	D+Q	-3.1 +4-6		
1332.5 2	100	1332.55	2 ⁺	0.0	0 ⁺	(E2)		0.0001625 23	B(E2) _↓ =10.7 +17-25 (2008Or02) α=0.0001625 23; α(K)=0.0001137 16; α(L)=1.108×10 ⁻⁵ 16; α(M)=1.560×10 ⁻⁶ 22 α(N)=6.73×10 ⁻⁸ 10; α(IPF)=3.61×10 ⁻⁵ 5 Mult.: From Adopted Levels, Gammas. From average half-life=0.735 ps 21, B(E2)(W.u.)=13.1 4.
1428.6 2	0.22 3	3587.82	0 ⁺	2158.84	2 ⁺				
1448 1	0.10 3	3732.98	2 ⁺	2284.47	0 ⁺				
1460 1	0.10 3	3619.49	3 ⁺	2158.84	2 ⁺				
1659		4165.0	5 ⁺	2505.97	4 ⁺				
1787 1	1.7 3	3119.89	4 ⁺	1332.55	2 ⁺				
1791 1	2.6 3	3124.50	2 ⁺	1332.55	2 ⁺				
1853.9 2	0.84 8	3186.30	2 ⁺	1332.55	2 ⁺				
1861.5 2	0.60 6	3194.20	1 ⁺	1332.55	2 ⁺				
1936.5 2	0.70 5	3269.14	2 ⁺	1332.55	2 ⁺				
1985.3 2	1.1 1	3317.88	1 ⁺	1332.55	2 ⁺				
2060.8 2	1.3 1	3393.56	2 ⁺	1332.55	2 ⁺				
2158.8 2	3.3 2	2158.84	2 ⁺	0.0	0 ⁺				
2255.6 2	0.10 2	3587.82	0 ⁺	1332.55	2 ⁺				
2398 1	0.5 1	3730.9	2 ⁺ ,3 ⁺	1332.55	2 ⁺				
2400.4 2	0.7 1	3732.98	2 ⁺	1332.55	2 ⁺				
2537.7 2	0.18 2	3870.35	2 ⁺	1332.55	2 ⁺				
2555.3 2	0.15 2	3887.91	2 ⁺	1332.55	2 ⁺				
3124.5 2	0.26 4	3124.50	2 ⁺	0.0	0 ⁺				
3194 1	0.25 3	3194.20	1 ⁺	0.0	0 ⁺				
3269.0 2	0.35 3	3269.14	2 ⁺	0.0	0 ⁺				
3393 1	0.70 2	3393.56	2 ⁺	0.0	0 ⁺				

† Additional information 1.

