

$^{58}\text{Ni}(\text{n},\text{n}'),(\text{n},\text{n}'\gamma)$  1978AhZX,1983EI03

Type	Author	History	Citation	Literature Cutoff Date
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Fast reactor neutrons.

1989Ge09: measured  $T_{1/2}$  with DSAM; the values are the same as those in 1983EI03, except for a larger uncertainty on the  $T_{1/2}$  of the 2459 level.

1988Pe20: E=10,14, and 17 MeV; measured  $\sigma(E,\theta)$ ,  $\sigma(E',\theta)$ , and angular distributions for analyzing power, coupled-channels analysis.

Measured:  $\gamma$  (1978AhZX,1983EI03,1983Ba66),  $\gamma(t)$  (1983EI03),  $\gamma(\theta)$  (1983Ba66).

Additional information 1.

2008Or02: E(n)=1.6, 1.8 MeV. Measured  $\gamma(\theta)$  and lifetime of the first  $2^+$  state by Doppler-shift attenuation method.

 $^{58}\text{Ni}$  Levels

E(level)	$J^\pi$ ‡	$T_{1/2}$ †	Comments
0.0	$0^+$		
1454.3 1	$2^+$	0.69 ps +10-7	$T_{1/2}$ : from DSA (2008Or02). Other: 29 fs 8 from 1989Ge09 is highly suspect. $\beta_2=0.19$ (1988Pe20).
2459.1 2	$4^+$	13 fs 3	$T_{1/2}$ : from 1989Ge09; 13.2 fs 14 (1983EI03).
2775.7 3	$2^+$	26 fs 3	
2903.5 11	$1^+$	26 fs 15	
2942.4	$0^+$		
3037.9 4	$2^+$		
3263.8 4	$2^+$	44 fs 21	
3420.4 4	$3^+$	19 fs 7	
3531.4 6	$0^+$		
3593.6 7	$(1,2^+)$		
3620.9 5	$4^+$	<14 fs	
3776.0 5	$3^+$	40 fs 10	
3898.4 7	$2^+$		
4107.6 7	$2^+$		
4295.5 11	$4^{(+)}$		
4348.0 13			
4406.0 9	$4^+$		
4474.8 7	$3^-$	24 fs 8	
4538.1 16	$0^+$		

† From DSAM (1989Ge09 and 1983EI03). These values are discrepant with those from measurements in other reactions and are not included in Adopted Levels.

‡ Adopted values.

 $\gamma(^{58}\text{Ni})$ 

$E_\gamma$	$I_\gamma$ †	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$
354.4 8	0.45 10	3776.0	$3^+$	3420.4	$3^+$
383.5 8	0.25 10	3420.4	$3^+$	3037.9	$2^+$
738.1 8	0.25 10	3776.0	$3^+$	3037.9	$2^+$
817.8 6	0.6 2	3593.6	$(1,2^+)$	2775.7	$2^+$
961.3 2	3.7 5	3420.4	$3^+$	2459.1	$4^+$
1004.80 15	12.3 10	2459.1	$4^+$	1454.3	$2^+$
1161.7 3	3.3 8	3620.9	$4^+$	2459.1	$4^+$
1316.9 4	2.3 10	3776.0	$3^+$	2459.1	$4^+$
1321.4 2	8.7 12	2775.7	$2^+$	1454.3	$2^+$
1448.6 10	9.9 20	2903.5	$1^+$	1454.3	$2^+$

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$^{58}\text{Ni}(\text{n,n}')(\text{n,n}'\gamma)$  **1978AhZX,1983El03** (continued) $\gamma(^{58}\text{Ni})$  (continued)

$E_\gamma$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$
1454.28 10	100	1454.3	2 <sup>+</sup>	0.0	0 <sup>+</sup>
1490.1 9	0.55 <sup>‡</sup> 15	2942.4	0 <sup>+</sup>	1454.3	2 <sup>+</sup>
1583.7 3	2.6 3	3037.9	2 <sup>+</sup>	1454.3	2 <sup>+</sup>
1697.5 9	0.30 10	4474.8	3 <sup>-</sup>	2775.7	2 <sup>+</sup>
1809.5 3	1.4 2	3263.8	2 <sup>+</sup>	1454.3	2 <sup>+</sup>
2077.0 5	0.9 2	3531.4	0 <sup>+</sup>	1454.3	2 <sup>+</sup>
2139.4 6	0.30 10	3593.6	(1,2 <sup>+</sup> )	1454.3	2 <sup>+</sup>
2167.1 8	0.45 15	3620.9	4 <sup>+</sup>	1454.3	2 <sup>+</sup>
2322.8 10	0.30 10	3776.0	3 <sup>+</sup>	1454.3	2 <sup>+</sup>
2444.4 6	1.1 2	3898.4	2 <sup>+</sup>	1454.3	2 <sup>+</sup>
2652.9 6	1.0 2	4107.6	2 <sup>+</sup>	1454.3	2 <sup>+</sup>
2776.1 13	0.50 15	2775.7	2 <sup>+</sup>	0.0	0 <sup>+</sup>
2841.1 10	0.35 10	4295.5	4 <sup>(+)</sup>	1454.3	2 <sup>+</sup>
2893.6 12	0.5 2	4348.0		1454.3	2 <sup>+</sup>
2904.1 12	0.45 15	2903.5	1 <sup>+</sup>	0.0	0 <sup>+</sup>
2951.6 8	0.45 10	4406.0	4 <sup>+</sup>	1454.3	2 <sup>+</sup>
3021.1 6	1.2 2	4474.8	3 <sup>-</sup>	1454.3	2 <sup>+</sup>
3037.5 8	1.6 4	3037.9	2 <sup>+</sup>	0.0	0 <sup>+</sup>
3083.7 15	0.60 15	4538.1	0 <sup>+</sup>	1454.3	2 <sup>+</sup>
3263.6 6	1.7 3	3263.8	2 <sup>+</sup>	0.0	0 <sup>+</sup>
3593.6 10	1.3 3	3593.6	(1,2 <sup>+</sup> )	0.0	0 <sup>+</sup>
3896.1 20	0.35 15	3898.4	2 <sup>+</sup>	0.0	0 <sup>+</sup>
4109.3 15	0.8 3	4107.6	2 <sup>+</sup>	0.0	0 <sup>+</sup>

<sup>†</sup> From 1978AhZX.

<sup>‡</sup> Complex line.

$^{58}\text{Ni}(n,n'),(n,n'\gamma)$  1978AhZX,1983E103

Level Scheme

Intensities: Relative  $I_\gamma$

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$

