^{60}Ni(p,d), (pol p,d) 1995Ma06,1983Na09,1978Ik02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 151, 1 (2018)	1-Apr-2018

Others: 1964Le10, 1964Sh12, 1965Sh06, 1966Ej01, 1966Wh02, 1983Na01. 2013Sc06, 2013ScZZ. Also (^{3}He,α), ^{58}Ni(α,^{3}He),(d,p) were studied by 2013Sc06, 2013ScZZ.

1995Ma06: E(pol p)=65 MeV; 99.8% ^{60}Ni target, magnetic spectrograph, θ(lab)=5°−38°, FWHM≈40 keV; measured $\sigma(\theta)$, A(θ); DWBA analysis. Supersedes 1989OhZX. Data analyzed by 1997Ah08 also.

1983Na09: E(pol p)=94 MeV. Measured $\sigma(\theta)$, A(θ); magnetic spectrometer, particle identification, 99.8% ^{60}Ni target, θ(lab)=6°−45°, FWHM≈55 keV. See also 1983Na01.

1978Ik02: E(p)=50 MeV. Measured $\sigma(\theta)$ with magnetic spectrograph, particle identification, FWHM=9 keV, θ(lab)=8° to 24° or 40°.

For J dependence of $\sigma(\theta)$ at $\theta\geq$90°, see 1966Wh02.

^{59}Ni Levels

E(level)[†]	J$^\pi$[&]	L[d]	C^{2}S[c]	Comments
0.0[@]	3/2$^-$	1	1.64	C^{2}S=1.33, 1.33, 1.82, 2.97 for different optical model parameter sets (1983Na09).
340[@] *10*	5/2$^-$	3	1.93	C^{2}S=1.19, 1.23, 2.02, 2.67 for different optical model parameter sets (1983Na09).
460[@] *10*	1/2$^-$	1	0.33	
880[@] *10*	3/2$^-$	1	0.19	
1190[@] *10*	5/2$^-$	3	0.06	
1313	1/2$^-$[b]	1	0.13	
1346	7/2$^-$[b]	3	0.11	
1680[@] *10*	5/2$^-$	3	0.17	
1950[@] *10*	7/2$^-$	3	0.45	
2630[@] *10*	7/2$^-$	3	1.60	C^{2}S=1.51, 1.56, 1.84, 2.93 for different optical model parameter sets (1983Na09).
3040[@] *10*	7/2$^-$	3	0.66	
3105	7/2$^-$	3	0.05	
3164	7/2$^-$	3	0.03	
3391	(7/2$^-$)	(3)	0.02	
3537	7/2$^-$	3	0.03	
3730[@] *20*	7/2$^-$	3	0.16	E(level): 3697 in 1995Ma06.
4160[@] *20*	7/2$^-$	3	0.33	E(level): 4104 in 1995Ma06.
4230[@] *20*	7/2$^-$	3	0.27	E=4176 in 1995Ma06.
4253	7/2$^-$	3	0.07	
4356	7/2$^-$	3	0.06	
4419	(1/2$^+$)	(0)	0.06	
4479	7/2$^-$	3	0.13	E=4560 *20*, C^{2}S=0.17 in 1983Na09.
4615	7/2$^-$	3	0.17	E=4690 *20*, C^{2}S=0.29 in 1983Na09.
4648	(1/2$^+$)	(0)	0.09	
4977	7/2$^-$	3	0.05	
5110	(1/2$^+$)	(0)	0.09	
5201	7/2$^-$	3	0.05	
5249				
5349				
5410	7/2$^-$	3	0.05	
5451	7/2$^-$	3	0.05	
5529	1/2$^+$	0	0.48	
5587	(1/2$^+$)	(0)	0.09	
5646	1/2$^+$	0	0.30	E=5650 in 1966Ej01.
5758		2,3		
5830	3/2$^+$	2	0.38	

Continued on next page (footnotes at end of table)

^{60}Ni(p,d), (pol p,d) 1995Ma06,1983Na09,1978Ik02 (continued)

^{59}Ni Levels (continued)

E(level)[†]	Jπ[&]	L[d]	C²S[c]	Comments
5892	(3/2⁺)	(2)	0.19	
5941	(7/2⁻)	(3)	0.05	
6025	(7/2⁻)	(3)	0.05	
6082		2,3		E=6050 in 1966Ej01.
6164	(3/2⁺)	(2)	0.11	
6942	7/2⁻	3	0.06	
7287[#] *50*				L ≠ 3 (1978Ik02).
7305[#] *50*	(7/2)⁻[a]	3		Probable fragment of ^{59}Co g.s. IAS; 36.2 keV *2* below strongest component of IAS, relative intensity 11.0% 7 (1978Ik02).
7330[#] *50*				L ≠ 3 (1978Ik02).
7341[#] *50*	7/2⁻	3	0.87	Jπ,C²S: from 1995Ma06. Analogue of 7/2⁻ ^{59}Co g.s. (1995Ma06,1978Ik02,1965Sh06). Other E: 7280 *50* (1965Sh06), 7304 (1995Ma06).
7359[#] *50*	(7/2)⁻[a]	3		Probable fragment of ^{59}Co g.s. IAS; 17.7 keV *3* above strongest component of IAS, relative intensity 12.2% 5 (1978Ik02).
7381[#] *50*	(7/2)⁻[a]	3		E(level): No nearby energy levels from (d,p) or other reactions is comparable considering the fact of centroid energy shift (see footnote). Earlier evaluation (1993Ba85 and 2002Ba42) listed in Adopted Level with a 7342 *10* level from (d,p) − but this the level is absent in (d,p) data set. Not listed in Adopted Levels. Probable fragment of ^{59}Co g.s. IAS; 40.1 keV *3* above strongest component of IAS, relative intensity 14.0% 9 (1978Ik02).
7414[#] *50*				L ≠ 3 (1978Ik02).
10600[‡]		0[‡]	0.44[‡]	

[†] From 1995Ma06 for E<7000 (uncertainties unstated by authors), unless noted to the contrary. In 1995Ma06, data for E<3500 are between 4 keV low and 18 keV high, so ΔE≈20 appears to be a reasonable assumption.
[‡] From 1966Ej01.
[#] From 1978Ik02. The energy scale of 1978Ik02 appears to be 35-40 keV higher than that for adopted (d,p) data.
[@] From 1983Na09.
[&] From L (based on σ(θ)) and analyzing power; from 1995Ma06, unless indicated otherwise.
[a] L=3; probably a fragment of ^{59}Co(g.s.) IAS (1978Ik02).
[b] Analyzing power for E=1320 *20* doublet observed in 1983Na09 is consistent with combination of 1/2⁻ and 7/2⁻ states with C²S=0.08 and 0.06, respectively.
[c] C²S from 1995Ma06, except as noted. Data from 1983Na09, parameter set D3, are in fair agreement, but other parameter sets in 1983Na09 lead to different values of C²S. Quoted values serve as a guide to relative strengths within a given orbital. See 1983Na09, 1964Le10.
[d] Values are based on shape of σ(θ). Data for low-energy levels are from 1983Na09, and data for levels above 7 MeV from 1978Ik02, except as noted.