

$^{148}\text{Nd}(\text{d,t}),(\text{pol d,t})$ 1977St23,1977St22

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh		NDS 181, 1 (2022)	9-Mar-2022

[1977St23](#): E(pol d,t)=17 MeV; polarized beam produced by Lamb-shift source (McMaster; average polarization 0.75); used 95.4% enriched target; reaction products analyzed with Enge split-pole magnetic spectrograph and detected with position-sensitive proportional counter at focal plane; Si surface barrier detector used to measure elastically scattered deuterons; measurements done at 18 angles (6° – 57.5°), with spin “up” and “down”; several angles were measured with unpolarized beam as well; DWBA calculations (code DWUCK).

[1977St22](#): E(d,t)=12 MeV; essentially same as [1977St23](#), but with nuclear emulsions used to detect reaction products; measurements done at 9 angles.

[1982Ja09](#): E=12.1 MeV, see $^{146}\text{Nd}(\text{d,p})$ dataset.

[1980Lo06](#): E=17 MeV, enrich target, multi-angle spectrograph (10 angles, 7.5° – 52.5°), Si detector (elastic yield), nuclear emulsions. Spectrograph resolution: FWHM $\approx$ 25 keV ([1977St23](#)); FWHM $\approx$ 8 keV ([1977St22](#)); $\approx$ 12-15 keV ([1982Ja09](#)); FWHM=12 MeV ([1980Lo06](#)).

 ^{147}Nd Levels

[1977St22](#) obtain cross sections for 2 angles with uncertainties: 15% relative, 25% absolute.

E(level) [†]	J π [‡]	L [#]	S [@]	Comments
0.0	5/2 ⁻	3	0.06	
50 2	7/2 ⁻	3	1.79	
128 2	5/2 ⁻	3	0.36	
191 2		5 ^{&}	1.3 ^a	
214 2	1/2 ⁻	1	0.04	
314 2	3/2 ⁻	1	0.25	
463 2	3/2 ⁻	1	0.16	
516 2	5/2 ⁻	3	0.19	
575 2	7/2 ⁻	3	0.23	
604 2	1/2 ⁻	1	0.07	
631 2	3/2 ⁻	1	0.21	
656 2		5 ^b	0.50 ^c	
749 5				
769 2	3/2 ⁺	2	0.11	
809 2				
859 2		1 ^b	0.01 ^c	
904 2				
934 2		6 ^{&}	0.76 ^a	L=6 assigned in ($^3\text{He},\alpha$) by 1976LoZP at 939 keV. 13/2 ⁺ follows from E(level) systematics of N=87 isotones.
957 2	3/2 ⁻	1	0.10	
983 5				
1029 2				
1042 2	1/2 ⁻	1	0.13	
1112 2	3/2 ⁺	2	0.55	
1153 2		3 ^b	0.03 ^c	
1205 2		3 ^{&}	0.11 ^a	
1215 2				
1235 6		(5) ^b	0.17 ^c	E(level): from 1982Ja09 .
1262 2	3/2 ⁺	2	0.21	
1312 2	3/2 ⁺	2	0.24	
1333 2		(5) ^b	0.17 ^c	Additional information 1.
1353 2	1/2 ⁺	0	0.57	Additional information 2.

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$^{148}\text{Nd}(\text{d,t}),(\text{pol d,t})$ [1977St23,1977St22](#) (continued) ^{147}Nd Levels (continued)

E(level) [†]	J ^π [‡]	L [#]	S [@]	Comments
1377				
1400	3/2 ⁺	2	0.96	Additional information 3.
1447	1/2 ⁺	0	0.39	
1464		4,5,6	2.02	Additional information 4.
1509 2		5 ^b	1.30 ^c	
1515 5		1+5 ^{&}	^a	
1553 2	3/2 ⁻	1 ^{&}	0.08 ^a	
1597 2	(5/2 ⁺)	2 ^{&}	0.27 ^a	
1624 5		2 ^{&}	0.10 ^a	
1647 5				
1673 2	1/2 ⁺	0	0.27	
1698 5		(5) ^b	0.12 ^c	
1733 5		3 ^{&}	0.09 ^a	
1759 5				
1770				
1824 5		3 ^{&}	0.09 ^a	L: 1982Ja09 report L=(5).
1846 5	(5/2 ⁺)	2 ^{&}	0.24 ^a	E(level): reported as 1854 25 in 1977St23 .
1943 5		3 ^{&}	0.09 ^a	
1981 5		^{&}	^a	
2018 5		0 ^{&}	0.03 ^a	
2038 5		2 ^{&}	0.07 ^a	
2068 5				
2086 5		1 ^{&}	0.03 ^a	
2146 5		2 ^{&}	0.07 ^a	
2177 5		2 ^{&}	0.11 ^a	
2204 5		3 ^{&}	0.07 ^a	
2230 5				
2250 5		2 ^{&}	0.13 ^a	
2297 5				
2334 5				
2350 5				
2373 5				
2398 5		2 ^{&}	0.38 ^a	
2420 5		0 ^{&}	0.08 ^a	
2436 5				
2443 5				
2468 5				
2484 5		2 ^{&}	0.15 ^a	
2513 5				
2536 5		2 ^{&}	0.08 ^a	
2564 5		2 ^{&}	0.25 ^a	
2593 5		0 ^{&}	0.04 ^a	
2622 5		2 ^{&}	0.09 ^a	
2653 5		2 ^{&}	0.13 ^a	
2689 5		2 ^{&}	0.59 ^a	
2722 5		2 ^{&}	0.16 ^a	
2787 5				
2866 5				

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 $^{148}\text{Nd}(\text{d,t}),(\text{pol d,t})$ [1977St23](#),[1977St22](#) (continued)

 ^{147}Nd Levels (continued)

[†] Energies quoted with uncertainties of 2 keV are from [1977St22](#). Those of 5 keV are from [1980Lo06](#).

[‡] From DWBA and vector-analyzing power analysis ([1977St23](#)).

[#] L values are deduced from angular distributions and DWBA calc by [1977St23](#), except where noted.

[@] Spectroscopic factors are extracted from cross sections. Comparison is made with (d,t) strengths for similar states populated in N=87 isotones ([1977St22](#)).

[&] From [1980Lo06](#).

^a From [1980Lo06](#). Estimated uncertainty in S is $\approx 30\%$.

^b From [1982Ja09](#).

^c From [1982Ja09](#) using computer code DWUCK. Uncertainties in absolute cross sections range from 20% to 60% for weak or poorly resolved levels.