^{146}Nd(^{3}He,d) 1979St01

History

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

Additional information 1.

1979St01: E(^{3}He)=24 MeV. Measured deuteron spectrum and $\sigma(\theta)$ at 8-9 angles with FWHM≈14 keV using Enge-type split pole magnetic spectrograph and nuclear emulsions. Deduced levels, L-transfer from DWBA calculations using DWUCK code, spectroscopic factors, summed strengths. Interpretation of level structure by spherical configurations consisting mainly of $s_{1/2}$, $d_{3/2}$, $d_{5/2}$ and $h_{11/2}$ proton orbitals.

1979St01 also report data from ^{146}Nd(α,t) and ^{148}Sm(t,α) reactions. See separate datasets for these reactions.

^{147}Pm Levels

Relative cross sections are accurate to 10% while the absolute cross sections have uncertainties of ≈25%.

E(level)[†]	L[b]	(2J+1)S[d]	Comments
0[&]	4	1.67	dσ/dΩ (μb/sr)=36 (25°), 36 (50°).
91[@] *4*	2	2.33	dσ/dΩ (μb/sr)=302 (25°), 263 (50°).
409[#] *4*	(2,3,4)[c]	0.03	dσ/dΩ (μb/sr)=7 (25°), 4 (50°).
639[‡a] *4*	0+5	1.22,8.39	E(level),L: for 633+647 doublet. dσ/dΩ (μb/sr)=449 (25°), 493 (50°).
682[@] *4*	(2,3)[c]	0.08	L=2 consistent with $J^{\pi}=5/2^{+}$ assignment. dσ/dΩ (μb/sr)=14 (25°), 14 (50°).
730[#] *4*	(2,0)[c]	0.06	L=(2) adopted in 1979St01. dσ/dΩ (μb/sr)=4 (25°), 9 (50°).
808[#] *4*	2	0.17	dσ/dΩ (μb/sr)=29 (25°), 25 (50°).
880[#] *4*	2	0.17	dσ/dΩ (μb/sr)=30 (25°), 26 (50°).
931[‡] *4*	0	0.26	dσ/dΩ (μb/sr)=75 (25°), 68 (50°).
973 *4*	(3)[c]		dσ/dΩ (μb/sr)=14 (25°), 6 (50°).
1038[#] *4*	2	0.23	dσ/dΩ (μb/sr)=42 (25°), 44 (50°).
1100[‡] *4*	0	0.03	dσ/dΩ (μb/sr)=19 (25°), 12 (50°).
1145[#] *4*	(2)	0.07	dσ/dΩ (μb/sr)=16 (25°), 11 (50°).
1212 *4*			dσ/dΩ (μb/sr)=10 (25°), 6 (50°).
1310 *4*			dσ/dΩ (μb/sr)=27 (25°), 15 (50°).
1344[#] *4*	2	0.21	dσ/dΩ (μb/sr)=36 (25°), 41 (50°).
1378[‡] *4*	0	0.18	dσ/dΩ (μb/sr)=75 (25°), 57 (50°).
1422 *4*			dσ/dΩ (μb/sr)=11 (25°), 4 (50°).
1440 *4*			dσ/dΩ (μb/sr)=9 (25°), 11 (50°).
1476[&] *4*	4,(5)	(0.57)	L=4 from σ(θ) in (^{3}He,d) is adopted by 1979St01. dσ/dΩ (μb/sr)=14 (25°), 18 (50°).
1543 *4*			dσ/dΩ (μb/sr)=18 (25°), 11 (50°).
1587[#] *4*	2	0.27	dσ/dΩ (μb/sr)=47 (25°), 47 (50°).
1629[#] *4*	2	0.11	dσ/dΩ (μb/sr)=32 (25°), 21 (50°).
1656[#] *4*	(2)	0.14	dσ/dΩ (μb/sr)=31 (25°), 27 (50°).
1702[a] *4*	5,(4)	1.31	L=4 from σ(θ) in (^{3}He,d), but L=5 consistent with $(11/2^{-})$ assignment. dσ/dΩ (μb/sr)=25 (25°), 21 (50°).
1788[#] *4*	2	0.18	dσ/dΩ (μb/sr)=36 (25°), 36 (50°).
1832 *4*			dσ/dΩ (μb/sr)=8 (25°), 8 (50°).
1872 *4*			dσ/dΩ (μb/sr)=15 (25°), 12 (50°).
1892[‡] *4*	(0)[c]	0.03	dσ/dΩ (μb/sr)=14 (25°), 20 (50°).

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^{146}Nd(^{3}He,d) 1979St01 (continued)

^{147}Pm Levels (continued)

E(level)[†]	L[b]	(2J+1)S[d]	Comments
1930[‡] *4*	0	0.28	dσ/dΩ (μb/sr)=146 (25°), 119 (50°).
2013[#] *4*	2+4,5	0.34	L=(2) from σ(θ) in (^{3}He,d) is adopted by 1979St01. dσ/dΩ (μb/sr)=75 (25°), 67 (50°).
2035 *4*			dσ/dΩ (μb/sr)=21 (25°), 10 (50°).
2068[&] *4*	(4)[c]	(0.56)	dσ/dΩ (μb/sr)=12 (25°), 13 (50°).
2106 *4*	(2)[c]		dσ/dΩ (μb/sr)=42 (25°), 42 (50°).
2160 *4*			dσ/dΩ (μb/sr)=39 (25°), 25 (50°).
2180 *4*			dσ/dΩ (μb/sr)=27 (25°), 26 (50°).
2220 *4*			dσ/dΩ (μb/sr)=25 (25°), 21 (50°).

[†] Uncertainties are stated by 1979St01 as less than 4 keV.
[‡] Assigned as fragment of $s_{1/2}$ orbital (1979St01).
[#] Assigned as fragment of $d_{3/2}$ and/or $d_{5/2}$ orbital (1979st01).
[@] Assigned as fragment of $d_{5/2}$ orbital (1979St01).
[&] Assigned as fragment of $g_{7/2}$ orbital (1979St01).
[a] Assigned as fragment of $h_{11/2}$ orbital (1979St01).
[b] From DWBA analysis of σ(θ) data in ^{146}Nd(^{3}He,d), unless otherwise stated. Most of these are also consistent with the values from σ(^{3}He,d)/σ(α,t) ratios.
[c] From ratio of (α,t) cross sections at θ=60° and (^{3}He,d) cross sections at θ=50°, compared with theoretical values from DWBA calculations. Angular distribution data not available for this level.
[d] Spectroscopic factors deduced from ratio of experimental to DWBA theoretical cross sections with a normalization factor N=6.0. Experimental summed spectroscopic strengths for different orbitals were deduced by 1979St01 as: 2.00 for $s_{1/2}$, 2.41 for $d_{5/2}$, 1.98 for $d_{3/2}$ and/or $d_{5/2}$, (2.70) for $g_{7/2}$ and 9.70 for $h_{11/2}$.