^{64}Ni(^{3}He,α) 2013Sc06,1968Ru02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 196,17 (2024)	30-Sep-2023

The XUNDL dataset compiled by E. Thiagalingam and B. Singh (McMaster) on May 10, 2013 has been used for updating this dataset.

2013Sc06,2013ScZZ: E=25 MeV ^{3}He beam was produced from Yale tandem accelerator of WNSL facility. Target was 160 μg/cm^2 ^{64}Ni (91.0% enriched). Reaction products were momentum-analyzed with a split-pole Enge spectrograph (FWHM≈75 keV). Measured σ(E$_\alpha$,θ). Deduced levels, J, π, spectroscopic factors from DWBA analysis. Comparison with shell-model calculations.

1968Ru02: E=25 MeV ^{3}He beam was produced from the University of Illinois isochronous cyclotron. Reaction product were detected with surface-barrier detectors (FWHM≈140 keV). Measured σ(E$_\alpha$,θ). Deduced levels, J, L-transfers, spectroscopic factors from DWBA analysis.

1969Ar20: E=36 MeV ^{3}He beam from 1.5-m cyclotron of I. V. Kurchatov Atomic Energy Institute. Target was 1 mg/cm^2 metallic foil of ^{64}Ni. Reaction products were detected with a counter telescope. Measured $\sigma(\theta)$. Deduced spectroscopic factor from DWBA analysis.

The uncertainties are estimated to be ≈4% for σ>1 mb/sr, ≈7% for 0.1<σ< 1.0 mb/sr, and ≈18% for σ<0.1 mb/sr at their respective maxima. The uncertainties arising from possible contaminants or previously unidentified states for very weak transitions could be ≈0.02 mb/sr (2013ScZZ).

dσ/dΩ in mb/sr (2013ScZZ)

Level	10° (p,d)	25° (p,d)	5° (^{3}He,α)
0	3.48	0.35	0.36
87	1.79	2.20	3.54
156	15.4	1.27	0.41
518	4.90	0.51	0.30
1001	2.91	0.31	0.25
1292	0.045	0.14	0.62
2149	2.53	0.20	0.38
2297	0.059	0.052	0.26
2519	0.027	0.064	0.42
2953	0.065	0.045	0.036

^{63}Ni Levels

E(level)[†]	J$^\pi$[‡]	L[#]	C^{2}S[#]	Comments
0	1/2$^-$		0.43	
87	5/2$^-$		3.42	C^{2}S: others: 3.23 for an unresolved group around E≈100 (1968Ru02); 6.0 for a triplet of g.s.+90+160 (1969Ar20). L: 3 for an unresolved group (1968Ru02).
156	3/2$^-$		1.91	
518	3/2$^-$	1	0.64	E(level): other: 520 *40* (1968Ru02). C^{2}S: other: 0.64 (1968Ru02).
1001	1/2$^-$	1	0.41	E(level): other: 1010 *40* (1968Ru02). C^{2}S: other: 0.30 (1968Ru02).
1292	(9/2)$^+$	4	0.39	E(level): other: 1290 *40* (1968Ru02). C^{2}S: other: 0.32 (1968Ru02).
2149	3/2$^-$	1	0.43	E(level): other: 2140 *40* (1968Ru02). C^{2}S: other: 0.55 (1968Ru02).
2297	5/2$^+$			
2519	(9/2)$^+$	4	0.26	E(level): other: 2530 *40* (1968Ru02).

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^{64}Ni(^{3}He,α) 2013Sc06,1968Ru02 (continued)

^{63}Ni Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	L[#]	C^{2}S[#]	Comments
				C^{2}S: other: 0.19 (1968Ru02).
2953	1/2$^+$			
3550 *40*	7/2$^-$	3	1.31	E(level),C^{2}S: from 1968Ru02.
4370 *40*	7/2$^-$	3	0.69	E(level),C^{2}S: from 1968Ru02.

[†] Rounded values from Adopted Levels, unless otherwise noted.
[‡] Assumed for extracting C^{2}S.
[#] From DWBA analysis of measured $\sigma(\theta)$ with L-transfer from 1968Ru02 and C^{2}S from 2013Sc06, unless otherwise noted.