^{64}Ni(d,p),(pol d,p) 1970An25,2013Sc06

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 202,59 (2025)	25-Feb-2025

Target J^π(^{64}Ni g.s.)=0^+.

(d,p) measurements:

1970An25: E=7.5 MeV deuteron beam was produced from the MIT-ONR Van de Graaff accelerator. Target was 60 μg/cm^2 95.90% enriched ^{62}Ni. Reaction products were momentum-analyzed with the MIT multi-gap spectrograph (FWHM≈13 keV). Measured σ(E$_p$,θ), θ_{lab}≈20°−170°. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis. Comparisons with shell-model calculations and available data. See also a preliminary report in 1961En07 and an updated report in 1962Ro19 (same authors for both) from the same lab. Note that there are some discrepancies between L assignments for some levels in 1970An25 and 1962Ro19 and that some levels reported in 1962Ro19 are not reported in 1970An25. Considering those measurements from the same lab, high resolution in 1970An25, and lack of details in 1962Ro19 (the whole report is only a table), the evaluator has used data only from 1970An25 which is considered to supersede 1961En07 and 1962Ro19.

1963Fu04: E=15 MeV deuteron beam was produced from University of Pittsburgh cyclotron. Target was about 2 mg/cm^2 thick foil of ^{62}Ni. Reaction products were momentum-analyzed with a magnetic spectrograph (FWHM=45 keV). Measured σ(E$_p$,θ), θ_{lab}=9°−50°. Deduced levels, J, π, L-transfers, spectroscopic factors from DWBA analysis. Uncertainty in cross-section is about 20%.

1967Te02: E=7.0-7.5 MeV deuteron beams were produced from the AWRE accelerator at Aldermaston. Target was 100 μg/cm^2 98.56% enriched ^{64}Ni. Reaction products were momentum-analyzed with the AWRE magnetic spectrograph (FHWM=15 KeV). Measured σ(E$_p$). Deduced levels. Comparisons with available data.

1970Tu02: E=11.5 MeV deuteron beam was produced from the Saclay Van de Graaff accelerator. Targets were 100-200 μg/cm^2 99.02% enriched ^{62}Ni on carbon backings. Reaction products were momentum-analyzed with a magnetic spectrograph (FWHM≈25-30 keV). Measured σ(E$_p$,θ), θ_{cm}=5°−60°. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis. Accuracy of cross-sections is estimated to be between 10%−20%. Note that the 1970Tu02 have adopted level energies from 1967Te02.

1972Li10,1971Li23: E=2.9 MeV deuteron beam was produced from a Van de Graaff accelerator at the Leningrad State University, St.Petersburg, Russia. Targets were 100-200 μg/cm^2 77.8% enriched ^{64}Ni. Reaction products were momentum-analyzed with a many-angle magnetic analyzer (FWHM≈15 keV). Measured σ(E$_p$,θ), θ_{cm}≈30°−160°. Deduced levels, spectroscopic factor ratios from DWBA analysis. Note that 1972Li10 have adopted level energies in 1967Te02 and L-transfers in 1963Fu04.

1977St07: E=2.8 MeV. FWHM≈30 keV. Measured σ(E(p),θ), θ=50°−160°. Deduced levels, spectroscopic factors from DWBA analysis.

1983ScZL (thesis): E=25.54 MeV at Rheinischen Freidrich-Wilhelms-Univ, Bonn. FWHM≈45 keV. Measured σ(E(p),θ), θ=4.6°−85.6°. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis.

2013Sc06,2013ScZZ: E=10 MeV deuteron beam was produced from Yale tandem accelerator of WNSL facility. Target was 160 μg/cm^2 ^{62}Ni (91.0% enriched). Reaction products were momentum-analyzed with a split-pole Enge spectrograph (FWHM≈50 keV). Measured σ(E$_d$,θ). Deduced levels, J, π, spectroscopic factors from DWBA analysis. Comparison with shell-model calculations. Cross section are from 2013ScZZ.

(pol d,p) measurements:

1973TyZZ (thesis): E=10 MeV at University of Winsconsin. Measured σ(E(p),θ) and analyzing powers, θ≈20°−130°. Deduced levels, J, π from DWBA analysis.

1991We07: E=2.7, 3.0, 3.3 MeV at Warsaw University. Reaction products were detected with three surface-barrier detectors (FWHM≈22 keV). Measured σ(θ). Deduced rms radii for single-particle neutron states using the single-particle potential method.

Others: 1962Pa11, 1965Bo36, 1967Le01, 1968Gr18, 1968Gr23, 2009Le14.

For measurement of spectroscopic factors in continuum-bound states see 1983ScZL.

^{65}Ni Levels

Spectroscopic factor is obtained from dσ/dΩ(exp)=N×(2J+1)C^{2}S×dσ/dΩ(DWBA), where J is the spin of the final level and N is the normalization factor.

Level	dσ/dΩ in (2013ScZZ) 15°	35°	7°

	(d,p)	(d,p)	(α,^{3}He)
0	0.50	0.64	0.46
63	5.23	0.91	0.13
310	0.65	0.19	
693	2.50	0.75	
1017	0.53	1.23	2.79
1418	0.75	0.21	
1594	0.14	0.22	<0.013
1920	3.34	1.96	
2147	0.45	0.18	
2336	0.27	0.36	0.36
2793	2.18	1.37	
2829	1.95	2.00	0.201

Note: 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 (2013ScZZ).

E(level)[†]	J$^\pi$[‡]	L[#]	(2J+1)C^{2}S[#]	Comments
0	5/2$^-$	3	2.03	(2J+1)C^{2}S: others: 2.07 (2013Sc06), 2.52 (1970Tu02), 1.49 (1963Fu04), 1.32 (1977St07). dσ/dΩ(max)[mb/sr]=1.02 (1970Tu02), 0.53 (1970An25), 1.01 (1963Fu04).
64 *5*	1/2$^-$	1	1.24	E(level): others: 62 *10* (1967Te02), 65 (1963Fu04). (2J+1)C^{2}S: others: 1.38 (2013Sc06), 1.00 (1972Li10), 1.41 (1970Tu02), 1.23 (1963Fu04), 0.55 (1977St07). dσ/dΩ(max)[mb/sr]=7.28 (1970Tu02), >4.5 (1970An25), 8.74 (1963Fu04).
310 *5*	3/2$^-$	1	0.14	E(level): others: 309 *10* (1967Te02), 315 (1963Fu04). (2J+1)C^{2}S: others: 0.16 (2013Sc06), 0.17 (1970Tu02), 0.173 (1963Fu04), 0.072 (1977St07). dσ/dΩ(max)[mb/sr]=0.98 (1970Tu02), 0.48 (1970An25), 1.27 (1963Fu04).
692 *5*	3/2$^-$	1	0.94	E(level): others: 686 *10* (1967Te02), 699 (1963Fu04). (2J+1)C^{2}S: others: 0.58 (2013Sc06), 0.416 (1972Li10), 0.75 (1970Tu02), 0.615 (1963Fu04), 0.29 (1977St07). dσ/dΩ(max)[mb/sr]=4.15 (1970Tu02), 3.5 (1970An25), 4.62 (1963Fu04).
1013 *5*		4	10.3	E(level): others: 1013 *10* (1967Te02), 1021 (1963Fu04). L: from 1963Fu04, 1970An25, 1970Tu02, 1972Li10, 1973TyZZ. Other: L=3 reported in 1977St07 is inconsistent. (2J+1)C^{2}S: others: 4.27 (2013Sc06), 8.23 (1972Li10), 7.38 (1970Tu02), 8.31 (1963Fu04), 1.80 (1977St07). dσ/dΩ(max)[mb/sr]=2.58 (1970Tu02), 1.38 (1970An25), 2.88 (1963Fu04).
1143?[@a] *10*				dσ/dΩ(max)[mb/sr]=0.006 (1970An25).
1273[a] *10*		1	0.017	L,(2J+1)C^{2}S: from 1963Fu04 for a level at 1330. dσ/dΩ(max)[mb/sr]=0.016 (1970An25), 0.130 (1963Fu04).
1417 *10*	1/2$^-$	1	0.17	E(level): others: 1415 *10* (1967Te02), 1417 (1963Fu04). (2J+1)C^{2}S: others: 0.15 (2013Sc06), 0.14 (1972Li10), 0.15 (1970Tu02), 0.140 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.95 (1970Tu02), 0.70 (1970An25), 1.11 (1963Fu04).
1594			0.14	E(level),(2J+1)C^{2}S: from 2013Sc06, for L=3. 1963Fu04 report a level at E=1603 with L=2 and (2J+1)C^{2}S=0.089, which was not observed in other studies and is probably an impurity. It may correspond to ^{63}Ni or ^{59}Ni peaks labelled by 1970An25. dσ/dΩ(max)[mb/sr]=0.390 for a 1603 level (1963Fu04).
1779?		1	0.015	E(level),L,(2J+1)C^{2}S: from 1963Fu04. Level was not observed in other studies and is probably an impurity. It may correspond to ^{63}Ni or ^{59}Ni peaks labelled by 1970An25. dσ/dΩ(max)[mb/sr]=0.122 (1963Fu04).
1920 *10*	5/2$^+$	2	1.54	E(level): others: 1915 *10* (1967Te02), 1919 (1963Fu04). L: 2 from 1970Tu02, (2) from 1970An25 and 1964Fu04.

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^{64}Ni(d,p),(pol d,p) 1970An25,2013Sc06 (continued)

^{65}Ni Levels (continued)

E(level)†	Jπ‡	L#	(2J+1)C^{2}S#	Comments
				(2J+1)C^{2}S: others: 1.23 (1972Li10), 1.46 (1970Tu02), ≈1.3 (1963Fu04), 0.77 (1977St07). dσ/dΩ(max)[mb/sr]=6.80 (1970Tu02), >2.5 (1970An25), ≈6.3 (1963Fu04).
2096?& *10*				
2144 *10*	3/2$^-$	1	0.07	E(level): others: 2139 *10* (1967Te02), 2153 (1963Fu04). (2J+1)C^{2}S: others: 0.08 (2013Sc06), 0.11 (1970Tu02), 0.099 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.86 (1970Tu02), 0.35 (1970An25), 0.837 (1963Fu04).
2163?@a *10*				dσ/dΩ(max)[mb/sr]=0.012 (1970An25).
2302a *10*				E(level): a level is reported at 2293 *10* in 1967Te02. dσ/dΩ(max)[mb/sr]=0.09 (1970An25).
2320a *10*		(3)	0.52	E(level): others: 2312 *10* in 1967Te02; 2330 (1970Tu02, doublet). L,(2J+1)C^{2}S: 0.52 for L=3 component of 2330 double (1970Tu02). dσ/dΩ(max)[mb/sr]=0.32 for L=3 component (1970Tu02), 0.1 (1970An25).
2336 *10*	(9/2$^+$)	(4)	1.02	E(level): others: 2330 *10* (1967Te02), 2338 (1963Fu04), 2330 (1970Tu02, doublet). Level reported in 1970An25 with L=3 could be an unresolved of L=3+4, indicated by reported L-values. L,(2J+1)C^{2}S: for L=4 component of 2330 doublet (1970Tu02); L=4 also from 1973TyZZ; high L-transfer suggested from ratio of cross sections (2013ScZZ). Others: (2J+1)C^{2}S=1.5 (1973TyZZ) for L=4; 0.86 for L=3 (1970An25); 0.56 for L=4 (2013Sc06). dσ/dΩ(max)[mb/sr]=0.41 for L=4 component (1970Tu02), 0.38 (1970An25), 0.765 (1963Fu04).
2520 *10*		2	0.02	E(level): others: 2505 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.068 (1970An25).
2574?@a *10*				dσ/dΩ(max)[mb/sr]=0.016 (1970An25).
2698?@a *10*				dσ/dΩ(max)[mb/sr]=0.015 (1970An25).
2714?@ *10*		2	0.01	dσ/dΩ(max)[mb/sr]=0.034 (1970An25).
2793 *10*	5/2$^+$	2	0.59	E(level): others: 2785 *10* (1967Te02), 2794 (1963Fu04). (2J+1)C^{2}S: others: 0.85 (1972Li10), 0.64 (1970Tu02), 0.742 (1963Fu04). dσ/dΩ(max)[mb/sr]=3.36 (1970Tu02), 1.95 (1970An25), 4.01 (1963Fu04).
2829 *10*		0	0.28	E(level): others: 2823 *10* (1967Te02). (2J+1)C^{2}S: others: 0.203 (1972Li10), 0.19 (1970Tu02). dσ/dΩ(max)[mb/sr]=2.50 (1970Tu02), >2.75 (1970An25).
2902 *10*		2	0.02	E(level): others: 2899 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.057 (1970An25).
3014 *10*	3/2$^+$	2	0.05	E(level): others: 3008 *10* (1967Te02), 3032 with L=2 (1963Fu04, possible doublet). dσ/dΩ(max)[mb/sr]=0.19 (1970An25).
3044 *10*	(5/2$^+$)	(2)	0.096	E(level): others: 3036 *10* (1967Te02), 3032 with L=2 (1963Fu04, possible doublet). Jπ,L,(2J+1)C^{2}S: from 1973TyZZ with L=2 and J^π=5/2$^+$; L=2, (2J+1)C^{2}S=0.156 from 1963Fu04 for a level at 3032, possible doublet. But L=1 with (2J+1)C^{2}S=0.06 from 1970An25. dσ/dΩ(max)[mb/sr]=0.34 (1970An25), 0.874 (1963Fu04).
3108 *10*		(1)	0.02	E(level): others: 3103 *10* (1967Te02), 3130 (1963Fu04). (2J+1)C^{2}S: other: 0.041 for L=(2) (1963Fu04). dσ/dΩ(max)[mb/sr]>0.128 (1970An25), 0.234 (1963Fu04).
3197 *10*				E(level): from 1967Te02. Other: 3187 *10* reported in an early report by 1962Ro19 from the same lab as 1970An25, but is not confirmed in 1970An25.
3261a *10*				E(level): others: 3262 *10* (1967Te02), 3276 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.019 (1970An25).
3279a *10*		2	0.024	L,(2J+1)C^{2}S: from 1963Fu04 for a level at 3276 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.078 (1970An25), 0.141 (1963Fu04).
3354 *10*	5/2$^+$	2	0.20	E(level): others: 3346 *10* (1967Te02), 3350 (1963Fu04). (2J+1)C^{2}S: others: 0.25 (1972Li10), 0.27 (1970Tu02), 0.266 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.58 (1970Tu02), 0.77 (1970An25), 1.57 (1963Fu04).

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^{64}Ni(d,p),(pol d,p) 1970An25,2013Sc06 (continued)

^{65}Ni Levels (continued)

E(level)[†]	Jπ[‡]	L[#]	(2J+1)C^{2}S[#]	Comments
3401 *10*		0	0.17	E(level): from 1967Te02. Others: 3416 *10* with L=0 reported in an early report by 1962Ro19 from the same lab as 1970An25, but is not confirmed in 1970An25, which instead report a level at 3411 *10* with L=2; 3401 (1963Fu04, 1970Tu02). L: from 1963Fu04, 1970Tu02, 1972Li10. Others: L=2 for a 3411 level which could be a different level; L=0 or 3, $J^\pi=1/2^+$ or $7/2^-$ reported for a level at 3411 in 1973TyZZ, indicating it may be a doublet. (2J+1)C^{2}S: from 1970Tu02. (2J+1)C^{2}S: others: 0.292 (1972Li10), 0.17 (1970Tu02), 0.267 (1963Fu04). dσ/dΩ(max)[mb/sr]=2.33 (1970Tu02), 4.02 (1963Fu04).
3411? *10*		(2)	0.61	E(level),L: from 1970An25. See comments for 3401 level. dσ/dΩ(max)[mb/sr]=2.3 (1970An25).
3451 *10*		(2)	0.06	E(level): other: 3442 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.213 (1970An25).
3463?[&] *10*				
3483?[&] *10*				
3509 *10*		(2)	0.04	E(level): others: 3502 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.138 (1970An25).
3563 *10*	5/2$^+$	2	0.49	E(level): others: 3555 *10* (1967Te02), 3558 (1963Fu04, possible doublet). (2J+1)C^{2}S: others: 0.37 (1972Li10), 0.58 (1970Tu02), 0.523 (1963Fu04). dσ/dΩ(max)[mb/sr]=3.44 (1970Tu02), 1.931 (1970An25), 3.21 (1963Fu04).
3569?[&] *10*				
3743 *10*		2	0.25	E(level): others: 3736 *10* (1967Te02), 3740 (1963Fu04). (2J+1)C^{2}S: others: 0.20 (1972Li10), 0.31 (1970Tu02), 0.263 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.86 (1970Tu02), 0.995 (1970An25), 1.67 (1963Fu04).
3907 *10*		2	0.41	E(level): others: 3902 *10* (1967Te02), 3892 (1963Fu04). (2J+1)C^{2}S: others: 0.33 (1972Li10), 0.58 (1970Tu02), 0.422 (1963Fu04). dσ/dΩ(max)[mb/sr]=3.44 (1970Tu02), 1.71 (1970An25), 2.74 (1963Fu04).
3937[a] *10*				E(level): other: 3928 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.03 (1970An25).
3963 *10*		(2)	0.02	E(level): other: 3950 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.105 (1970An25).
3984?[&] *10*				
4012 *10*		2	0.10	E(level): others: 4008 *10* (1967Te02), 4006 (1963Fu04). (2J+1)C^{2}S: other: 0.101 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.448 (1970An25), 0.669 (1963Fu04).
4061?[@a] *10*				dσ/dΩ(max)[mb/sr]=0.03 (1970An25).
4084 *10*		2	0.02	E(level): other: 4080 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.105 (1970An25).
4108 *10*		2	0.02	E(level): others: 4105 *10* (1967Te02), 4113 (1963Fu04, possible doublet). (2J+1)C^{2}S: other: 0.054 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.070 (1970An25), 0.360 (1963Fu04).
4134 *10*		2	0.02	E(level): others: 4127 *10* (1967Te02), 4113 (1963Fu04, possible doublet). dσ/dΩ(max)[mb/sr]=0.068 (1970An25).
4165[a] *10*				E(level): other: 4145 *10* (1967Te02). dσ/dΩ(max)[mb/sr]=0.016 (1970An25).
4199 *10*		0	0.38	E(level): others: 4194 *10* (1967Te02), 4196 (1963Fu04). L: from L=0 for a level at 4196 (1963Fu04), at 4194 (1970Tu02). L=(0) in 1970An25. (2J+1)C^{2}S: others: 0.211 (1972Li10), 0.26 (1970Tu02), 0.273 (1963Fu04). dσ/dΩ(max)[mb/sr]=3.60 (1970Tu02), >4.0 (1970An25), 4.11 (1963Fu04).
4252 *10*		0	0.04	E(level): others: 4245 *10* (1967Te02), 4230 (1963Fu04). (2J+1)C^{2}S: other: 0.054 for L=(2) (1963Fu04). dσ/dΩ(max)[mb/sr]>0.413 (1970An25), 0.362 (1963Fu04).
4299?[@a] *10*				dσ/dΩ(max)[mb/sr]=0.012 (1970An25).
4343 *10*		0	0.03	E(level): other: 4340 *10* (1967Te02).

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^{64}Ni(d,p),(pol d,p) 1970An25,2013Sc06 (continued)

^{65}Ni Levels (continued)

E(level)[†]	L[#]	(2J+1)C^{2}S[#]	Comments
			dσ/dΩ(max)[mb/sr]>0.262 (1970An25).
4373?[&] *10*			
4391 *10*	2	0.32	E(level): others: 4388 *10* (1967Te02), 4392 (1963Fu04). L: from 1963Fu04. (2) in 1970An25. (2J+1)C^{2}S: others: 0.217 (1972Li10), 0.369 (1963Fu04); 0.43 for a 4408 level, which may correspond to this level. dσ/dΩ(max)[mb/sr]=1.46 (1970An25), 2.54 (1963Fu04); 2.76 (1970Tu02) for a 4408 level.
4408?[&] *10*			E(level): from 1967Te02. 4408 also from 1970Tu02. But, since this is the only level seen by 1970Tu02 around this energy, it may correspond to the 4391 level with L=2 in other work.
4443 *10*	2	0.11	E(level): others: 4440 *10* (1967Te02), 4430 (1963Fu04). L: from 1972Li10. Others: (2) (1970An25); L=0 for a level at 4430 (1963Fu04) is inconsistent. Additional information 1. (2J+1)C^{2}S: others: 0.023 for L=2 (1972Li10); 0.1 for L=0 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.492 (1970An25), 1.6 (1963Fu04).
4482[a] *10*	(2)	0.013	E(level): others: 4479 *10* (1967Te02), 4480 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.01 (1970An25), 0.093 (1963Fu04).
4507[a] *10*			E(level): other: 4495 *10* (1967Te02).
4536 *10*			E(level): other: 4531 *10* (1967Te02).
4568 *10*	2	0.224	E(level): others: 4565 *10* (1967Te02), 4567 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.57 (1963Fu04).
4590 *10*			E(level): other: 4588 *10* (1967Te02).
4632 *10*			E(level): others: 4631 *10* (1967Te02), 4640 (1963Fu04, possible doublet).
4650 *10*	2	0.489	E(level): others: 4648 *10* (1967Te02), 4640 (1963Fu04, possible doublet). dσ/dΩ(max)[mb/sr]=3.46 (1963Fu04).
4677 *10*			E(level): other: 4678 *10* (1967Te02).
4712 *10*			E(level): from 1967Te02. Other: 4718 *10* with L=0 reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25.
4750 *10*			E(level): from 1967Te02. Other: 4761 *10* with L=0 reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25.
4781 *10*			E(level): from 1967Te02. Other: 4788 *10* reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25.
4808 *10*			E(level): from 1967Te02. Other: 4814 *10* with L=0 reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25.
4834 *10*	2	0.190	E(level): from 1967Te02. Other: 4828 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.37 (1963Fu04).
4860?[&] *10*			
4879 *10*	0	0.088	E(level): from 1967Te02. Other: 4878 (1963Fu04); 4887 *10* reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25. dσ/dΩ(max)[mb/sr]=1.33 (1963Fu04).
4902?[&] *10*			
4916?[&] *10*			
4934 *10*			E(level): from 1967Te02. Other: 4930 *10* with L=3 reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25.
4949?[&] *10*			
4972 *10*	2	0.358	E(level): from 1967Te02. Others: 4975 (1963Fu04); 4980 *10* reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25. dσ/dΩ(max)[mb/sr]=2.65 (1963Fu04).
5009?[&] *10*			
5029 *10*			E(level): from 1967Te02. Other: 5037 *10* with L=1 reported in an early report by 1962Ro19 from the same lab as 1970An25, but not confirmed in 1970An25.
5066 *10*	2	0.216	E(level): from 1967Te02. Other: 5061 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.60 (1963Fu04).
5090?[&] *10*			
5123 *10*	2	0.131	E(level): from 1967Te02. Other: 5118 (1963Fu04).

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^{64}Ni(d,p),(pol d,p) 1970An25,2013Sc06 (continued)

^{65}Ni Levels (continued)

E(level)[†]	L[#]	(2J+1)C^{2}S[#]	Comments
			dσ/dΩ(max)[mb/sr]=0.99 (1963Fu04).
5133?[&] *10*			
5193 *10*	2	0.285	E(level): from 1967Te02. Other: 5191 (1963Fu04). dσ/dΩ(max)[mb/sr]=2.15 (1963Fu04).
5212?[&] *10*			
5340 *15*	2	0.541	E(level): other: 5346 (1963Fu04). dσ/dΩ(max)[mb/sr]=4.11 (1963Fu04).
5530 *15*			E(level): other: 5500 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.58 (1963Fu04).
5600 *15*			E(level): other: 5580 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.03 (1963Fu04).
5650 *15*			E(level): other: 5620 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.86 (1963Fu04).
5710 *15*			E(level): other: 5700 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.71 (1963Fu04).
5810			E(level): from 1963Fu04. Other: 5840 *15* in 1983ScZL possibly a doublet. dσ/dΩ(max)[mb/sr]=1.23 (1963Fu04).
5860			E(level): from 1963Fu04. Other: 5840 *15* in 1983ScZL possibly a doublet. dσ/dΩ(max)[mb/sr]=0.89 (1963Fu04).
5900 *15*			E(level): 5940 (1963Fu04). dσ/dΩ(max)[mb/sr]=0.88 (1963Fu04).
6000			E(level): from 1963Fu04. Other: 6040 *15* in 1983ScZL possibly a doublet. dσ/dΩ(max)[mb/sr]=2.89 (1963Fu04).
6090			E(level): from 1963Fu04. Other: 6040 *15* in 1983ScZL possibly a doublet. dσ/dΩ(max)[mb/sr]=1.58 (1963Fu04).
6120 *15*			E(level): other: 6130 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.41 (1963Fu04).
6180 *15*			E(level): other: 6210 (1963Fu04). dσ/dΩ(max)[mb/sr]=2.24 (1963Fu04).
6250 *15*	2		L: from 1983ScZL.
6330 *15*			E(level): other: 6340 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.27 (1963Fu04).
6380?[b] *15*			
6470 *15*	(2)		L: L=2 reported for a 6470+6510 doublet in 1983ScZL. E(level): other: 6440 (1963Fu04). dσ/dΩ(max)[mb/sr]=3.29 (1963Fu04).
6510?[b] *15*	(2)		L: L=2 reported for a 6470+6510 doublet in 1983ScZL.
6620 *15*			E(level): other: 6590 (1963Fu04). dσ/dΩ(max)[mb/sr]=.941 (1963Fu04).
6690?			E(level): from 1963Fu04. dσ/dΩ(max)[mb/sr]=1.08 (1963Fu04).
6740 *15*			E(level): other: 6750 (1963Fu04). dσ/dΩ(max)[mb/sr]=1.81 (1963Fu04).
6870?[b] *15*			

[†] From 1970An25 up to 4677 level, from 1967Te02 above that up to 5212 level and from 1983ScZL above 5212 level, unless otherwise noted.
[‡] From analyzing powers in 1973TyZZ.
[#] From DWBA analysis of measured σ(θ) in 1970An25 up to 4443 level and from 1963Fu04 for levels above that, unless otherwise noted. The C^{2}S values from 1970Tu02, 1972Li10 and 2013Sc06 are in a reasonable agreement but less complete and are given under comments where available.
[@] Only observed in 1970An25.
[&] Only observed in 1967Te02.

Continued on next page (footnotes at end of table)

^{64}Ni(d,p),(pol d,p) 1970An25,2013Sc06 (continued)

^{65}Ni Levels (continued)

[a] Weakly populated in 1970An25. The authors suggest this level is probably not populated via the stripping mechanism.
[b] Only observed in 1983ScZL.