

⁵⁸Ni(p,p),(p,p'γ) 1976FIZY,1976Ar01,1984Ge02

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

See also ⁵⁸Ni(p,γ).

Others: 1956Sc09, 1966Bo26, 1966Ha37, 1969Gu07, 1970Br33, 1972Ma51, 1977An28, 1978Be32, 1979Kr20, 1982Sz01.

1984Ge02: ⁵⁸Ni(p,p),(p,p'γ). E(p)=4400-5850 (98 resonances). Measured σ(E(p),θ), FWHM=3-4 keV, θ=90°, 125°, 150° for (p,p) and 90°, 140° for (p,p'γ); many-level one-channel R-matrix analysis. deduced d_{5/2} IAR, d_{5/2} and s_{1/2} strength functions.

1976FIZY: ⁵⁸Ni(p,p),(p,p'). E(p)=3110-4200 (86 resonances). Measured σ(E(p),θ), θ=90°, 105° [(p,p) only], 122°, 160°; semi (FWHM=15-20 keV), 99.89% ⁵⁸Ni target, energy reproducibility 0.6 keV, energy resolution 300-400 eV.

1976Ar01: ⁵⁸Ni(p,p). E(p)=2950-4000 (60 resonances). Measured σ(E(p),θ), 0.25 keV steps, θ(lab)=90°, 120°, 135°, 160°, 99.94% ⁵⁸Ni target≈100 eV thick at 3 MeV, FWHM≈400 eV, semi.

1970Br33: ⁵⁸Ni(p,p). E(p)=1800-3300 (20 resonances). Measured σ(E(p),θ), semi.

1956Sc09: ⁵⁸Ni(p,p'γ). E(p)=2-5 MeV. Measured excit, γ(θ), deduced J, Γ_pΓ_{p1}/(Γ_p+Γ_{p1}) for 37 resonances.

1978Be32: ⁵⁸Ni(p,p), (p,p'γ). E(p)=4700-5200. Deduced J, Γ, Γ_p from one channel R-matrix analysis.

1979Kr20: ⁵⁸Ni(p,p'γ). E(p)=2599-3900. Measured excit, γ(θ) for (2⁺ to g.s.) transition in ⁵⁸Ni.

Data for E(p)>4200 are not listed here; see 1984Ge02 for an additional 98 levels (or groups of levels with same L), E(level)=7764 to 9188. See also 1978Be32.

⁵⁹Cu Levels

E(level) [†]	J ^π @	Γ&	E(p)(lab) ^b	Γ _{p0} ^c	Comments
0.0 (3417.5 9)					
5228 3	1/2 ⁻		1841	0.040	Analogue of ⁵⁹ Ni(1301 level) (1970Br33).
5597 3	1/2 ⁺		2216	0.275 28	
5840 3	5/2 ⁺		2463	0.040	
5846 3	(1/2 ⁻)		2470	0.025	
6034 3	3/2 ⁺		2661	0.03	
6087 3	1/2 ⁺		2715	0.160 16	
6104 3	5/2 ⁺		2732	0.040	
6191 3	(3/2 ⁺ ,5/2 ⁺)		2821	0.020 10	
6230 3	1/2 ⁻		2860	0.080	
6297 3	1/2 ⁻		2928	0.050	
6326 3	5/2 ⁺	20 eV 10	2958.0	0.020 10	
6329 3	5/2 ⁺	20 eV 10	2961.0	0.020 10	
6365.3 30	3/2 ⁺	60 eV 12	2998.0	0.060 12	
6420.4 30	3/2 ⁻	90 eV 18	3054.0	0.090 18	
6502.2 30	5/2 ⁺		3137.2		Γ _{p0} : 70 eV 10 (1976FIZY), 40 eV 10 (1976Ar01).
6511.8 40	1/2 ⁻		3147.0		Γ _{p0} : 40 eV 10 (1976Ar01), 250 eV 25 (1976FIZY).
6511.8 30	3/2 ⁻	60 eV 12	3147.0		Absent in 1976FIZY.
6515.7 31	1/2 ⁺	5.5 keV 5	3151.0	5.50 50	
6515.9 31	3/2 ⁺	80 eV 16	3151.2	0.080 ^d 16	From 1976Ar01; absent in 1976FIZY.
6531.1 30	3/2 ⁻		3166.6		Γ _{p0} : 0.110 keV 11 (1970Br33), 0.160 keV 32 (1976Ar01), 0.30 eV 3 (1976FIZY).
6575.3 30	(3/2,1/2) ⁻	90 eV 9	3211.6	0.090 9	J ^π : 3/2 ⁻ (1976FIZY), 1/2 ⁻ (1976Ar01).
6604.1 30	(3/2,1/2) ⁻	100 eV 10	3240.9	0.10 1	J ^π : 3/2 ⁻ (1976FIZY), 1/2 ⁻ (1976Ar01).
6625.5 20	3/2 ⁺	45 eV 5	3262.7	0.045 5	
6642.6 20	1/2 ⁻		3280.1		Γ _{p0} : 60 eV 12 (1976Ar01), 250 eV 25 (1976FIZY).
6645.5 3	3/2 ⁻	60 eV 12	3283.0	0.060 ^d 12	From 1976Ar01; absent in 1976FIZY.
6707.8 20	1/2 ⁻	80 eV 8	3346.4	0.080 8	From 1976FIZY; not reported by 1976Ar01.
6712.3 20	1/2 ⁻		3351.0		Γ _{p0} : 162 eV 32 (1976Ar01), 350 eV 35 (1976FIZY).
6724.2 20	(3/2,1/2) ⁻	65 eV 7	3363.1	0.065 7	J ^π : 3/2 (1976FIZY), 1/2 (1976Ar01).
6727.5 20	5/2 ⁺		3366.5		Γ _{p0} : 150 eV 30 (1976Ar01), 290 eV 29 (1976FIZY).
6747.2 20	1/2 ⁺	2.2 keV 2	3386.5	2.2 2	

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$^{58}\text{Ni}(\text{p,p}),(\text{p,p}'\gamma)$ **1976FIZY,1976Ar01,1984Ge02 (continued)** ^{59}Cu Levels (continued)

E(level) [†]	J^π [@]	Γ &	E(p)(lab) ^b	Γ_{p0} ^c	Comments
6748.9 30	1/2 ⁺	30 eV 10	3388.2	0.03 ^d 1	$J^\pi, E(p)$ (lab): From 1976Ar01; $E_p=3386.5$ in 1976FIZY may represent the same resonance level.
6749.2 20	(5/2 ⁺)	140 eV 41	3388.5	0.012 4	J^π : 5/2 from $\gamma(\theta)$ in (p,p' γ) (1979Kr20). $\Gamma_{p1}=20$ eV 10 (1976FIZY).
6760.8 20	3/2 ⁻	50 eV 5	3400.3	0.050 5	J^π : 3/2 from $\gamma(\theta)$ in (p,p' γ) (1979Kr20). $\Gamma_{p0}=50$ eV 10 (1976Ar01).
6810.9 20	3/2 ⁻	110 eV 11	3451.3	0.0110 11	
6834.2 [‡] 20	9/2 ⁺	11.2 eV 4	3475.0	0.0097 ^d 4	$\Gamma_{p1}=1.41$ eV 20 (1976Ar01); others: 1 eV 1 (1976FIZY), 3.7 eV (1982Sz01) (cf. 2.0 in ($^3\text{He},\text{dp}$)). $\Gamma_{p0}/\Gamma=0.86$ 5 (1976Ar01). Other Γ_{p0} : 15 eV 5 (1976FIZY). J^π : confirmed by (p,p' γ) angular correlation data (1982Sz01). Other E(p): 3489 (1980Ho31), 3473.3 30 in (p,p) (1976Ar01). (2J+1) $\Gamma_{p0}\Gamma_\gamma/\Gamma=1.1$ eV 1 (1976Ar01). Γ from Γ_{p0} (9.7 eV 4) + Γ_{p1} (1.41 eV 20) + Γ_γ (0.13 eV 2) from 1976Ar01. E(level): Possible fragment of analogue of Ni(3054 level).
6836.5 20	(3/2,1/2) ⁻	48 eV 4	3477.4	0.0476 ^d 43	J^π : 3/2 (1976FIZY), 1/2 (1976Ar01). Γ_{p0} : 114 eV 3 (1976Ar01), 185 eV 19 (1976FIZY). Absent in 1976Ar01. $\Gamma_{p1}=5$ eV 2, $J=3/2$ (1976FIZY); $J=1/2$ (1976Ar01). J^π : (1/2,3/2) ⁻ from $\sigma(E(p),\theta)$; 3/2 from $\gamma(\theta)$ (1979Kr20). Γ_{p0} : weighted average of 69 eV 3 (1976Ar01), 80 eV 8 (1976FIZY).
6840.8 20	5/2 ⁺		3481.7		
6842.1 20	(1/2 ⁻)	120 eV 12	3483.1	0.0120 12	
6865.2 20	3/2 ⁻	85 eV 8	3506.6	0.080 8	
6877.4 20	5/2 ⁺	70 eV 4	3519.0	0.070 4	$\Gamma_{p0}/\Gamma=0.70$ 4 (1976Ar01). Γ from Γ_{p0} (24.4 eV 8) + Γ_{p1} (9.6 eV 12) + Γ_γ (1.1 eV 2) (1976Ar01). Other Γ : 65 eV 10 (1972Ma51); 50 eV 11 from $\Gamma_{p0}=35$ eV 5 (1976FIZY) if $\Gamma_{p0}/\Gamma=0.70$ (as in 1976Ar01). Possible fragment of analogue of Ni(3054 level).
6879.9 20	1/2 ⁺	1.40 keV 14	3521.5	1.40 14	
6904.4 [‡] 20	9/2 ⁺	35.1 eV 15	3546.4	0.0244 8	
6906.0 20	(1/2 ⁻)	50 eV 10	3548.1	0.05 1	E(level), J^π,Γ,Γ_{p0} : from 1972Ma51. Absent in 1976Ar01 and 1976FIZY.
6908.9? 50	1/2 ⁺	1.7 keV	3551		
6922.1 20	5/2 ⁺	230 eV 23	3564.4	0.0230 23	Γ_{p0} : 212 eV 15 (1976Ar01), 600 eV 60 (1976FIZY). $\Gamma_{p1}=10$ eV 4 (1976FIZY). $\Gamma_{p0}=80$ eV 16 in 1976Ar01. $\Gamma_{p1}=10$ eV 4 (1976FIZY). Γ_{p0} : 90 eV 18 (1976Ar01), 190 eV 19 (1976FIZY). $\Gamma_{p1}=78$ eV 10 (1976FIZY). $J=3/2,5/2$, $\Gamma_{p0}=180$ eV 18, 75.6 eV 25, from 1976FIZY, 1976Ar01, respectively. $J=3/2,1/2$, $\Gamma_{p0}=35.5$ eV 39, 130 eV 13 from 1976Ar01, 1976FIZY, respectively. $\Gamma_{p1}=100$ eV 30 (1976FIZY).
6938.5 [‡] 20	1/2 ⁻		3581.1		
6943.4 20	1/2 ⁻		3586.1	0.0140 15	
6946.1 20	3/2 ⁺	310 eV 30	3588.9	0.030 3	$\Gamma_{p1}=9$ eV 2 (1976FIZY). J^π : 5/2 from $\gamma(\theta)$ in (p,p' γ) (1979Kr20). $\Gamma_{p1}=11$ eV 3 (1976FIZY). $\Gamma_{p1}=3$ eV 2 (1976FIZY).
6957.0 20	3/2 ⁻		3600.0		
6965.5 20	(3/2,5/2) ⁺		3608.6		
6968.9 20	(1/2,3/2) ⁻		3612.1		
6991.4 20	5/2 ⁺	140 eV 32	3635.0	0.04 1	
7013.9 20	1/2 ⁺	6.3 keV 6	3657.8	6.30 63	
7028.4 20	3/2 ⁻	82 eV 8	3672.6	0.073 8	
7043.1 20	5/2 ⁺	29 eV 6	3687.5	0.018 5	
7075.3 20	3/2 ⁻	103 eV 15	3720.3	0.0100 15	

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$^{58}\text{Ni}(\text{p,p}),(\text{p,p}'\gamma)$ **1976FIZY,1976Ar01,1984Ge02 (continued)** ^{59}Cu Levels (continued)

E(level) [†]	J ^π @	Γ&	E(p)(lab) ^b	Γ _{p0} ^c	Comments
7097.8 [‡] 20	3/2 ⁻	335 eV 9	3743.2	0.0315 ^d 7	Γ _{p1} =20 eV 5 (1976FIZY). Data of 1976FIZY imply Γ _{p0} /Γ=0.94 3 (cf. 1.00 from 1976Ar01). Possible analogue of Ni(3182 level).
7106.7 20	5/2 ⁺	1.96 keV 20	3752.3	1.7 2	Γ _{p1} =264 eV 30 (1976FIZY). Γ from Γ _{p0} +Γ _{p1} implies Γ _p /Γ=0.87 10 (cf. 0.8 in 1976Ar01).
7129.9 20	3/2 ⁻	45 eV 5	3775.9	0.045 5	Γ _{p0} : 20 eV 10 in 1976Ar01.
7137.9 20	1/2 ⁻	0.67 keV 3	3784.0	0.0673 ^d 32	Γ _{p0} : other: 800 eV 80 (1976FIZY).
7139.6 20	5/2 ⁺	0.90 keV 5	3785.7	0.809 ^d 42	Γ _{p0} /Γ=0.9 (1976Ar01). Γ _{p0} : other: 600 eV 60 (1976FIZY).
7152.0 20	3/2 ⁻	84 eV 20	3798.3	0.084 20	Γ _{p0} : weighted average of 100 eV 20 (1976Ar01), 60 eV 25 (1976FIZY).
7174.4 20	1/2 ⁺	5.1 keV 5	3821.1	5.1 5	
7180.9 20	1/2 ⁻	700 eV 70	3827.7	0.70 7	
7188.7 20	3/2 ⁺	1.80 keV 17	3835.7	1.70 17	Γ _{p1} =100 eV 30 (1976FIZY).
7209.0 30	7/2 ⁻	5 eV	3856.3	0.005 ^d	From 1976Ar01; absent in 1976FIZY.
7231.5 20	1/2 ⁻	626 eV 36	3879.2	0.626 ^d 36	Γ _{p0} : 900 eV 90 in 1976FIZY.
7243.1 20	5/2 ⁺	65 eV 10	3891.0	0.065 10	
7243.5 20	3/2 ⁻	63 eV 10	3891.4	0.055 10	Γ _{p1} =8 eV 2 (1976FIZY). Absent in 1976Ar01.
7248.2 20	1/2 ⁻	70 eV 15	3896.2	0.070 15	From 1976FIZY; absent in 1976Ar01.
7266.4 20	3/2 ⁺	1.95 keV 22	3914.7	1.4 2	Γ _{p1} =555 eV 103 (1976FIZY). Γ from Γ _{p0} +Γ _{p1} implies Γ _{p0} /Γ=0.72 13 (cf. 0.68 from 1976Ar01).
7287.5 20	3/2 ⁻		3936.2		Γ _{p1} =28 eV 8 (1976FIZY); Γ _{p0} =40 eV 4 (1976Ar01), 130 eV 20 (1976FIZY).
7288.4 20	5/2 ⁺	422 eV 40	3938.1	0.40 4	Γ _{p1} =22 eV 4 (1976FIZY).
7291.1 20	3/2 ⁻		3939.9		Γ _{p1} =11 eV 2 (1976FIZY). Γ _{p0} =151 eV 7 (1976Ar01), 450 eV 45 (1976FIZY).
7321.5 20	1/2 ⁺	2.22 keV 22	3970.8	2.0 2	Γ _{p0} /Γ=0.90 (1976Ar01).
7332.1 30	3/2 ⁺	100 eV 20	3981.6	0.10 ^d 2	E(level),J ^π ,E(p)(lab): from 1976Ar01; not reported by 1976FIZY.
7337.4 20	1/2 ⁺	11.8 keV 12	3987.0	11.8 12	
7338.1 20	5/2 ⁺	218 eV 40	3987.7	0.20 4	Absent in 1976Ar01. Γ _{p1} =18 eV 5 (1976FIZY).
7350.0 [‡] 20	5/2 ⁻	22 eV 5	3999.8	0.015 4	Absent in 1976Ar01. Γ _{p1} =7 eV 3 (1976FIZY).
7350.4 30	1/2 ⁻	81 eV 10	4000.2	0.081 ^d 10	E(level),J ^π ,E(p)(lab): from 1976Ar01; not reported by 1976FIZY. E scale of 1976Ar01 is ≈5 keV lower than that of 1976FIZY so this level differs from the 7356 level of 1976FIZY only if authors' J assignments are correct. Not adopted.
7356.5 20	3/2 ⁻	154 eV 20	4006.4	0.145 20	Γ _{p1} =9 eV 3 (1976FIZY).
7365.6 [‡] 20	(5/2 ⁻)	32 eV 10	4015.7	0.031 10	Γ _{p1} =2 eV 1 (1976FIZY).
7372.2 [‡] 20	3/2 ⁻	2.5 keV 2	4022.4	2.5 2	Analogue of Ni(3452 level).
7384.0 20	5/2 ⁺	2.17 keV 30	4034.4	2.0 3	Γ _{p1} =165 eV 27 (1976FIZY).
7392.6 20	3/2 ⁻	105 eV 10	4043.1	0.075 8	Γ _{p1} =30 eV 6 (1976FIZY).
7398.6 20	3/2 ⁺	1.28 keV 16	4049.2	1.00 15	Γ _{p1} =280 eV 51 (1976FIZY).
7401.4 20	1/2 ⁺	235 eV 25	4052.1	0.235 25	
7413.4 20	(1/2 ⁻)	215 eV 36	4064.3	0.14 3	Γ _{p1} =75 eV 20 (1976FIZY).
7434.4 20	5/2 ⁺	0.60 keV 5	4085.7	0.50 5	Γ _{p1} =104 eV 18 (1976FIZY).
7438.9 20	3/2 ⁺	1.84 keV 18	4090.2	1.80 18	Γ _{p1} =40 eV 10 (1976FIZY).
7456.7 20	(5/2 ⁻)	10 eV 2	4108.3	0.009 2	Γ _{p1} =1 eV 1 (1976FIZY).
7461.4 20	3/2 ⁺	60 eV 17	4113.1	0.040 15	Γ _{p1} =20 eV 7 (1976FIZY).
7470.1 20	3/2 ⁺	260 eV 25	4122.0	0.0100 15	Γ _{p1} =160 eV 20 (1976FIZY).
7473.4 20	3/2 ⁻	40 eV 11	4125.3	0.03 1	Γ _{p1} =10 eV 4 (1976FIZY).
7474.6 [‡] 20	1/2 ⁻	3.8 keV 4	4126.6	3.80 38	Possible analogue of Ni(3563 level).
7488.3 20	5/2 ⁻	14 eV 4	4140.5	0.008 4	Γ _{p1} =6 eV 2 (1976FIZY).

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$^{58}\text{Ni}(\text{p,p}),(\text{p,p}'\gamma)$ **1976FIZY,1976Ar01,1984Ge02** (continued) ^{59}Cu Levels (continued)

E(level) [†]	J ^π @	Γ&	E(p)(lab) ^b	Γ _{p0} ^c	Comments
7491.9 20	1/2 ⁻	1.30 keV 12	4144.2	0.90 9	Γ _{p1} =400 eV 80 (1976FIZY).
7496.2 20	1/2 ⁺	25 eV 15	4148.5	0.025 15	
7502.6 20	3/2 ⁻	87 eV 11	4155.0	0.06 1	Γ _{p1} =27 eV 5 (1976FIZY).
7506.4 20	5/2 ⁺	1.03 keV 9	4158.9	0.075 8	Γ _{p1} =280 eV 46 (1976FIZY).
7511.7 20	3/2 ⁺	1.52 keV 15	4164.3	0.90 10	Γ _{p1} =620 eV 108 (1976FIZY).
7512.3 20	(5/2 ⁻)	55 eV 10	4164.9	0.045 10	Γ _{p1} =10 eV 3 (1976FIZY).
7519.6 20	(5/2 ⁻)	51 eV 11	4172.3	0.040 10	Γ _{p1} =17 eV 5 (1976FIZY).
7525.2 20	(5/2 ⁻)	49 eV 11	4178.0	0.032 10	Γ _{p1} =17 eV 5 (1976FIZY).
7525.9 20	1/2 ⁺	2.3 keV 5	4178.8	2.3 5	
7527.7 20	3/2 ⁺	1.85 keV 28	4180.6	1.10 20	Γ _{p1} =750 eV 200 (1976FIZY).
7528.7 20	3/2 ⁻	28 eV 10	4181.6	0.028 10	
7536.4 20	3/2 ⁻	0.37 keV 4	4189.4	0.35 4	Γ _{p1} =20 eV 6 (1976FIZY).
7765.0 ^a		≈3.0 ^a keV	4422.0 ^a	0.80 ^a 4	L=0 (1984Ge02).
7770.9 ^a		≈2.5 ^a keV	4428.0 ^a	0.70 ^a 4	L=2 (1984Ge02).
7786.4 ^a		≈3.8 ^a keV	4443.8 ^a	2.10 ^a 11	L=0 (1984Ge02).
7798.4 ^a		≈4.3 ^a keV	4456.0 ^a	1.60 ^a 8	L=0 (1984Ge02).
7802.5 ^a		≈2.5 ^a keV	4460.2 ^a	1.20 ^a 6	L=0 (1984Ge02).
7857.1 ^a		≈4.8 ^a keV	4515.7 ^a	2.80 ^a 14	L=0 (1984Ge02).
7895.2 ^a		≈11.1 ^a keV	4554.5 ^a	8.7 ^a 4	L=0 (1984Ge02).
7901.0 ^a		≈6.5 ^a keV	4560.4 ^a	3.20 ^a 16	L=0 (1984Ge02).
7906.1 ^a		≈8.2 ^a keV	4565.6 ^a	2.0 ^a 1	L=2 (1984Ge02).
7943.2 ^a		≈7.8 ^a keV	4603.3 ^a	4.10 ^a 21	L=0 (1984Ge02).
7946.3 ^a		≈1.2 ^a keV	4606.5 ^a	0.40 ^a 2	L=0 (1984Ge02).
7950.1 ^a		≈10.4 ^a keV	4610.3 ^a	1.30 ^a 7	L=2 (1984Ge02).
7976.3 ^a		≈9.0 ^a keV	4637.0 ^a	1.50 ^a 8	L=0 (1984Ge02).
7993.1 ^a		≈8.0 ^a keV	4654.1 ^a	1.50 ^a 8	L=2 (1984Ge02).
8013.5 ^a		≈3.9 ^a keV	4674.8 ^a	1.10 ^a 6	L=1 (1984Ge02).
8016.9 ^a		≈6.4 ^a keV	4678.3 ^a	1.70 ^a 9	L=0 (1984Ge02).
8028.0 ^{#a}		≈0.4 ^a keV	4689.6 ^a	0.20 ^a 1	L=2 (1984Ge02).
8041.2 ^a		≈2.0 ^a keV	4703.0 ^a	0.20 ^a 1	L=2 (1984Ge02).
8044.1 ^a		≈3.0 ^a keV	4706.0 ^a	0.40 ^a 2	L=1 (1984Ge02).
8054.0 ^a		≈3.0 ^a keV	4716.0 ^a	0.40 ^a 2	L=1 (1984Ge02).
8081.5 ^a		≈7.5 ^a keV	4744.0 ^a	2.20 ^a 11	L=2 (1984Ge02).
8110.0 ^a		≈3.0 ^a keV	4773.0 ^a	0.500 ^a 25	L=2 (1984Ge02).
8112.0 ^a		≈9.0 ^a keV	4775.0 ^a	5.00 ^a 25	L=1 (1984Ge02).
8126.7 ^a		≈13.0 ^a keV	4790.0 ^a	8.5 ^a 4	L=0 (1984Ge02).
8131.6 ^a		≈2.0 ^a keV	4795.0 ^a	0.40 ^a 2	L=2 (1984Ge02).
8143.4 ^a		≈1.5 ^a keV	4807.0 ^a	0.20 ^a 1	L=2 (1984Ge02).
8148.3 ^a		≈8.0 ^a keV	4812.0 ^a	0.500 ^a 25	L=1 (1984Ge02).
8182.8 ^a		≈37.5 ^a keV	4847.1 ^a	2.0 ^a 1	L=2 (1984Ge02).
8189.1 ^a		≈6.6 ^a keV	4853.5 ^a	0.90 ^a 5	L=2 (1984Ge02).
8202.5 ^a		≈4.8 ^a keV	4867.1 ^a	3.00 ^a 15	L=2 (1984Ge02).
8208.4 ^a		≈3.4 ^a keV	4873.1 ^a	1.60 ^a 8	L=2 (1984Ge02).
8227.0 ^a		≈3.0 ^a keV	4892.0 ^a	0.500 ^a 25	L=2 (1984Ge02).
8236.8 ^a		≈4.5 ^a keV	4902.0 ^a	1.00 ^a 5	L=0 (1984Ge02).
8242.7 ^a		≈2.5 ^a keV	4908.0 ^a	1.50 ^a 8	L=2 (1984Ge02).
8256.4 ^a		≈19.5 ^a keV	4922.0 ^a	15.1 ^a 8	L=0 (1984Ge02).
8266.3 ^a		≈18.1 ^a keV	4932.0 ^a	7.3 ^a 4	L=2 (1984Ge02).
8276.1 ^a		≈7.2 ^a keV	4942.0 ^a	1.10 ^a 6	L=2 (1984Ge02).
8281.0 ^a		≈2.8 ^a keV	4947.0 ^a	0.60 ^a 3	L=0 (1984Ge02).
8285.5 ^a		≈1.6 ^a keV	4951.6 ^a	0.300 ^a 15	L=0 (1984Ge02).
8290.8 ^a		≈4.9 ^a keV	4957.0 ^a	0.500 ^a 25	L=2 (1984Ge02).

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$^{58}\text{Ni}(\text{p,p}),(\text{p,p}'\gamma)$ **1976FIZY,1976Ar01,1984Ge02** (continued) ^{59}Cu Levels (continued)

E(level) [†]	$\Gamma\&$	E(p)(lab) ^b	Γ_{p0} ^c	Comments
8315.4 ^a	$\approx 7.7^a$ keV	4982.0 ^a	0.300 ^a 15	L=1 (1984Ge02).
8333.1 ^a	$\approx 22.6^a$ keV	5000.0 ^a	3.20 ^a 16	L=2 (1984Ge02).
8351.8 ^a	$\approx 5.7^a$ keV	5019.0 ^a	2.30 ^a 12	L=1 (1984Ge02).
8367.4 ^a	$\approx 0.5^a$ keV	5034.9 ^a	0.20 ^a 1	L=0 (1984Ge02).
8376.5 ^a	$\approx 5.4^a$ keV	5044.1 ^a	1.80 ^a 9	L=2 (1984Ge02).
8397.9 ^a	$\approx 5.9^a$ keV	5065.9 ^a	1.60 ^a 8	L=1 (1984Ge02).
8400.5 ^a	$\approx 1.8^a$ keV	5068.6 ^a	0.500 ^a 25	L=0 (1984Ge02).
8435.3 ^a	$\approx 4.0^a$ keV	5104.0 ^a	0.300 ^a 15	L=0 (1984Ge02).
8447.1 ^a	$\approx 1.4^a$ keV	5116.0 ^a	0.20 ^a 1	L=0 (1984Ge02).
8452.5 ^a	$\approx 3.1^a$ keV	5121.5 ^a	0.80 ^a 4	L=1 (1984Ge02).
8459.9 ^a	$\approx 9.6^a$ keV	5129.0 ^a	2.80 ^a 14	L=2 (1984Ge02).
8505.1 ^a	$\approx 4.0^a$ keV	5175.0 ^a	0.70 ^a 4	L=2 (1984Ge02).
8515.9 ^a	$\approx 12.0^a$ keV	5186.0 ^a	1.80 ^a 9	L=2 (1984Ge02).
8525.8 ^a	$\approx 3.6^a$ keV	5196.0 ^a	0.60 ^a 3	L=0 (1984Ge02).
8540.5 ^a	$\approx 9.0^a$ keV	5211.0 ^a	1.80 ^a 9	L=1 (1984Ge02).
8564.1 ^a	$\approx 5.9^a$ keV	5235.0 ^a	1.70 ^a 9	L=2 (1984Ge02).
8595.3 ^a	$\approx 14.7^a$ keV	5266.8 ^a	10.3 ^a 5	L=0 (1984Ge02).
8614.7 ^a	$\approx 0.9^a$ keV	5286.5 ^a	0.300 ^a 15	L=0 (1984Ge02).
8648.6 ^a	$\approx 9.8^a$ keV	5321.0 ^a	2.10 ^a 11	L=0 (1984Ge02).
8656.9 ^a	$\approx 3.7^a$ keV	5329.4 ^a	0.80 ^a 4	L=0 (1984Ge02).
8667.3 ^a	$\approx 5.2^a$ keV	5340.0 ^a	1.10 ^a 6	L=2 (1984Ge02).
8679.1 ^a	$\approx 8.8^a$ keV	5352.0 ^a	4.30 ^a 22	L=i (1984Ge02).
8691.4 ^a	$\approx 5.9^a$ keV	5364.5 ^a	4.90 ^a 25	L=0 (1984Ge02).
8702.7 ^a	$\approx 10.0^a$ keV	5376.0 ^a	2.50 ^a 13	L=2 (1984Ge02).
8722.8 ^a	$\approx 6.8^a$ keV	5396.5 ^a	4.20 ^a 21	L=0 (1984Ge02).
8732.7 ^a	$\approx 6.8^a$ keV	5406.5 ^a	2.0 ^a 1	L=2 (1984Ge02).
8745.9 ^a	$\approx 2.9^a$ keV	5420.0 ^a	0.40 ^a 2	L=2 (1984Ge02).
8764.6 ^a	$\approx 13.9^a$ keV	5439.0 ^a	2.60 ^a 13	L=0 (1984Ge02).
8771.7 ^a	$\approx 4.7^a$ keV	5446.2 ^a	1.30 ^a 7	L=0 (1984Ge02).
8831.6 ^a	$\approx 17.3^a$ keV	5507.2 ^a	12.5 ^a 6	L=0 (1984Ge02).
8842.4 ^a	$\approx 5.8^a$ keV	5518.1 ^a	4.30 ^a 22	L=1 (1984Ge02).
8862.2 ^a	$\approx 7.1^a$ keV	5538.3 ^a	7.1 ^a 4	L=0 (1984Ge02).
8883.4 ^a	$\approx 4.1^a$ keV	5559.9 ^a	1.40 ^a 7	L=2 (1984Ge02).
8888.3 ^a	$\approx 5.7^a$ keV	5564.9 ^a	1.10 ^a 6	L=2 (1984Ge02).
8899.3 ^a	$\approx 25.0^a$ keV	5576.0 ^a	15.5 ^a 8	L=0 (1984Ge02).
8918.9 ^a	$\approx 6.0^a$ keV	5596.0 ^a	1.50 ^a 8	L=0 (1984Ge02).
8932.7 ^a	$\approx 6.0^a$ keV	5610.0 ^a	2.0 ^a 1	L=1 (1984Ge02).
8940.5 ^a	$\approx 13.7^a$ keV	5618.0 ^a	0.40 ^a 2	L=2 (1984Ge02).
8948.4 ^a	$\approx 6.1^a$ keV	5626.0 ^a	0.40 ^a 2	L=0 (1984Ge02).
8954.3 ^a	$\approx 4.0^a$ keV	5632.0 ^a	0.40 ^a 2	L=2 (1984Ge02).
8960.2 ^a	$\approx 2.8^a$ keV	5638.0 ^a	0.70 ^a 4	L=1 (1984Ge02).
8977.9 ^a	$\approx 1.1^a$ keV	5656.0 ^a	1.00 ^a 5	L=1 (1984Ge02).
8989.4 ^a	$\approx 2.5^a$ keV	5667.7 ^a	0.70 ^a 4	L=0 (1984Ge02).
8992.2 ^a	$\approx 7.6^a$ keV	5670.6 ^a	2.50 ^a 13	L=2 (1984Ge02).
9001.8 ^a	$\approx 10.4^a$ keV	5680.3 ^a	5.6 ^a 3	L=2 (1984Ge02).
9014.3 ^a	$\approx 4.0^a$ keV	5693.0 ^a	1.00 ^a 5	L=2 (1984Ge02).
9020.2 ^a	$\approx 0.9^a$ keV	5699.0 ^a	0.20 ^a 1	L=0 (1984Ge02).
9029.0 ^a	$\approx 6.8^a$ keV	5708.0 ^a	4.70 ^a 24	L=2 (1984Ge02).
9042.8 ^a	$\approx 7.7^a$ keV	5722.0 ^a	6.1 ^a 3	L=0 (1984Ge02).
9059.0 ^a	$\approx 6.0^a$ keV	5738.5 ^a	1.9 ^a 1	L=0 (1984Ge02).
9077.2 ^a	$\approx 4.8^a$ keV	5757.0 ^a	3.20 ^a 16	L=0 (1984Ge02).

Continued on next page (footnotes at end of table)

$^{58}\text{Ni}(\text{p,p}),(\text{p,p}'\gamma)$ 1976FIZY,1976Ar01,1984Ge02 (continued) ^{59}Cu Levels (continued)

<u>E(level)[†]</u>	<u>Γ&</u>	<u>E(p)(lab)^b</u>	<u>Γ_{p0}^c</u>	<u>Comments</u>
9086.0 ^a	$\approx 20.3^a$ keV	5766.0 ^a	11.4 ^a 6	L=2 (1984Ge02).
9112.1 ^{#a}	$\approx 11.5^a$ keV	5792.5 ^a	10.7 ^a 5	L=0 (1984Ge02).
9121.7 ^a	$\approx 1.1^a$ keV	5802.3 ^a	0.300 ^a 15	L=1 (1984Ge02).
9129.8 ^{#a}	$\approx 0.8^a$ keV	5810.6 ^a	0.100 ^a 5	L=2 (1984Ge02).
9156.3 ^a	$\approx 11.9^a$ keV	5837.5 ^a	5.1 ^a 3	L=0 (1984Ge02).
9170.5 ^a	$\approx 6.0^a$ keV	5852.0 ^a	1.00 ^a 5	L=0 (1984Ge02).
9188.2 ^{#a}	$\approx 35.0^a$ keV	5870.0 ^a	25.0 ^a 13	L=0 (1984Ge02).

[†] From E(p)(c.m.)+S(p), where S(p)=3418.6 4 (2017Wa10).

[‡] Possible IAR or fragment of IAR (1976FIZY).

[#] Comparable Γ_{p0} and Γ .

[@] From R-matrix resonance parameters for $\sigma(E(p),\theta)$.

[&] From Γ_{p0} assuming $\Gamma=\Gamma_{p0}$ for all resonances reported by 1976Ar01 or 1976FIZY for which neither Γ_{p1} nor Γ_{p0}/Γ values were reported; from Γ_{p0}/Γ and Γ_{p0} if Γ/Γ_{p0} reported; from $\Gamma_{p0}+\Gamma_{p1}$ if Γ_{p1} reported; exceptions are noted.

^a From 1984Ge02. Most have large deviations between Γ_{p0} and Γ – indicating several unresolved resonances, noted in 1984Ge02. Not adopted by evaluator. For comparable Γ_{p0} and Γ – resonance levels are adopted, marked by footnote.

^b E(p)(lab) for resonance. From 1970Br33 for E(p)<2939 ($\Delta E=3$ keV, but E(p) is 7-9 keV low cf. data from 1976Ar01 and 1976FIZY), from 1976Ar01 for E(p)=2939-3215 ($\Delta E=3$ keV (absolute), 0.1 keV (relative)) and from 1976FIZY for E(p)>3215 ($\Delta E=2$ keV), except as noted. There is, in general, good agreement between E and J^π from 1976Ar01 and 1976FIZY where data overlap; however, for E(p)>3900, E(p) from 1976FIZY is 3-6 keV higher than in 1976Ar01.

^c Γ_{p0} in keV; from 1970Br33 for E(p)<2939 [uncertainty 10% if $\Gamma_{p0}>100$ eV, up to 50% for $\Gamma_{p0}\leq 20$ eV], from 1976Ar01 for E(p)=2939-3060 and from 1976FIZY for E(p)>3060. The evaluator assumes that data labelled “ Γ ” in table 1 of 1976Ar01 are in fact Γ_{p0} values and that “ Γ_p/Γ ” is actually Γ_{p0}/Γ . Some significant inconsistencies exist between 1976Ar01 and 1976FIZY, but overall agreement is fair.

^d From 1976Ar01.