

$^{31}\text{P}(\text{d,p}),(\text{pol d,p})$ 1989Ec03,1986So01

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Christian Ouellet, Balraj Singh		NDS 112, 2199 (2011)	24-Aug-2011

$J^{\pi}(^{31}\text{P g.s.})=1/2^{+}$.

1989Ec03: (pol d,p) E=20 MeV deuterons from the Munich MP tandem accelerator laboratory. Pure vector polarization in the Sona mode. Q3D spectrograph with single wire proportional counters and plastic scintillators. 5-7 keV FWHM. Measured proton energies, angular distributions and vector analyzing powers. DWBA analysis.

1973Va13: (d,p) E=10 MeV deuterons from the Utrecht 6 mv tandem Van de Graaff generator. Protons analyzed in a split-pole magnetic spectrograph and detected using a focal plane position sensitive detector. FWHM=6-10 keV. Measured angular distributions, DWBA analysis.

1986So01: (d,p) E=3 MeV, measured proton spectra and cross sections.

1968Me05: (d,p) E=2.5 MeV deuterons from the University of Iowa type-CN Van de Graaff accelerator. GaP target. Silicon surface barrier detector. Lifetime of first excited state determined using the third moment about the centroid of the photopeak.

1962Ho09: (d,p) E=7.8 MeV deuterons from the University of Michigan cyclotron. High resolution magnetic spectrometer and nuclear emulsion plates. Measured angular distributions, used Butler curves analysis.

1960Pi05: (d,p) E=6 MeV deuterons. Silver phosphorus targets. Magnetic spectrograph and photographic emulsion. Measured proton groups.

 ^{32}P Levels

E(level) [†]	J^{π} [†]	$T_{1/2}$	L [#]	$d\sigma/d\Omega$ ($\mu\text{b/sr}$) [@]	Comments
0	1 ⁺		0+2	474	
78.1 12	2 ⁺	0.52 ns -5+9	2	664	Additional information 1.
511.6 12	0 ⁺		0	360	Additional information 2.
1151.2 17	1 ⁺		0	659	Additional information 3.
					L: 1973Va13 found pure l=0 versus 0+2 for 1989Ec03.
1327.6 15				8	Additional information 4.
1510?					E(level): from 1962Ho09.
1756 3	3 ⁺		2	22	Additional information 5.
					L: 1973Va13 found pure l=2 versus 2+4 for 1989Ec03.
2175.8 20	(3) ⁺		2+4	12	Additional information 6.
2221.9 13	2 ⁺		2	46	Additional information 7.
2230 3	(1) ⁺		0+2	241	
2658.0 6	2 ⁺		2	49	Additional information 8.
2738.3 12	(1,2) ⁺		2	13 ^{&}	Additional information 9.
3001.7 12	(3) ⁺		2(+4)	52	Additional information 10.
3144.4 11				2 ^{&}	Additional information 11.
3263.9 7	(1,2) ⁻		1	647	Additional information 12.
3319.1 6	(2,4) ⁻		3	1807	Additional information 13.
3443.5 7	4 ⁻		3(+5)	4044 ^{&}	Additional information 14.
					L: 1973Va13 found pure l=3 versus 3(+5) for 1989Ec03.
3795.0 12	(1) ⁺		0+2	7	Additional information 15.
					L: 1973Va13 found pure l=3 in disagreement with 0+2 for 1989Ec03.
3880.9 6	2 ⁺		2	86	Additional information 16.
3989.9 7	(1,3) ⁺		(0)+2	94 ^a	J^{π} : 1989Ec03 point out that 3 ⁺ gives a better agreement with theoretical spectroscopic factors.
					Additional information 17.
4010.0 20	(2) ⁻		1+3	1488 ^a	Additional information 18.
4035.1 12	(1,2) ⁻		1	6060 ^a	Additional information 19.

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$^{31}\text{P}(\text{d,p}),(\text{pol d,p})$ 1989Ec03,1986So01 (continued) ^{32}P Levels (continued)

E(level) [†]	J ^π [†]	L [#]	dσ/dΩ (μb/sr) [@]	Comments
4149.8 14	4 ⁻	3	121 ^{&}	Additional information 20. L: 1973Va13 found pure l=3 versus 3(+5) for 1989Ec03.
4204.3 6	1 ⁺	0+2	113	Additional information 21.
4275 3			22	Additional information 22.
4316.6 14	(3) ⁺	2(+4)	13	Additional information 23.
4409.8 12	(0,1) ⁻	1	36	Additional information 24.
4554.7 6	2 ⁺	2	29	Additional information 25.
4613.1 18	(3) ⁺	2+4	20	Additional information 26.
4661.4 14	(1,2) ⁻	1	2533 ^a	Additional information 27.
4697.0 17	(3) ⁺	(2)+4	14	
4710.2 19	(1) ⁺	0+2	40	Additional information 28.
4743 4	(3 ⁺)	(2)+4	5 ^b	
4847.5 11			3 ^b	Additional information 29.
4874 3	(1,2) ⁻	1	267	Additional information 30.
4940.7 25			3 ^b	Additional information 31.
5012 3			23 ^{&}	Additional information 32.
5080.5 13	(4 ⁻)	3(+5)	715 ^{&}	Additional information 33.
5129.4 15			10 ^{&}	Additional information 34.
5233.5 14	(2 ⁻)	1(+3)	16	Additional information 35.
5350.3 6	(1,2) ⁻	1	558	Additional information 36.
5396.4 12			2 ^b	Additional information 37.
5498 3		>2	219 ^{&}	Additional information 38.
5510.0 9	(0,1) ⁻	1	448 ^{&}	Additional information 39.
5554.4 12			10 ^{&}	Additional information 40.
5588 [‡] 2				
5663.4 15			30 ^{&}	Additional information 41.
5673.5 15	(1,2) ⁺	2	8 ^b	Additional information 42.
5704.3 20	(1,2) ⁻	1	13 ^b	Additional information 43.
5724.8 9	(4 ⁻)	3(+5)	12 ^b	Additional information 44.
5778.2 10	1 ⁻	1	65 ^b	Additional information 45.
5815.2 16	(3,4) ⁻	3	170 ^a	Additional information 46.
5830.1 [‡] 9				Additional information 47.
5860.2 11	(2 ⁻)	1(+3)	252 ^a	Additional information 48.
5968.7 22			25	Additional information 49.
5971.8 21			68	
5989? 8				E(level): from 1960Pi05, also seen in 1962Ho09.
6026.2 10	(2,3,4) ⁻	3	43	Additional information 50.
6062.7 9	1 ⁻	1	244	Additional information 51.
6104.8 8	(3) ⁺	2+4	22	Additional information 52.
6147.2 22	(1,2,3) ⁺	2	19 ^{&}	Additional information 53.
6160? 8				E(level): from 1960Pi05 also seen in 1962Ho09.
6197.2 10	(0,1) ⁻	1	168	Additional information 54.
6278.7 23			9 ^b	Additional information 55.
6298.1 [‡] 14				
6310.7 19		>1	22 ^b	Additional information 56.
6332.9 15			11 ^b	Additional information 57.
6378.0 [‡] 15				
6396 3			8	Additional information 58.
6413.0 6			4	
6434 3			15	

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$^{31}\text{P}(\text{d,p}),(\text{pol d,p})$ 1989Ec03,1986So01 (continued) ^{32}P Levels (continued)

E(level) [†]	J ^π [†]	L [#]	dσ/dΩ (μb/sr) [@]	Comments
6477 3	(4 ⁻)	3(+5)	24	
6530.7 22		<3	357 ^a	Additional information 59.
6553 3		<3	255 ^{&}	
6581.9 5		<3	984 ^a	Additional information 60.
6682 3		(2+3)	83 ^{&}	
6685.0 20			40 ^{&}	
6705.3 12			153 ^{&}	
6707.8 15			138 ^{&}	Additional information 61.
6733.8 10			18 ^{&}	
6738.1 11			9 ^{&}	
6781 [‡] 2				
6858.0 12			399 ^{&}	Additional information 62.
6997 3			37	
7067 3			52	
7339.8 20			70 ^{&}	
7343.1 18			122 ^{&}	
7392.7 23		>1	247 ^{&}	
7655 3			11	
7679.0 14			23	
7767.2 25			75	
7807 3	(2,3,4) ⁻	3	63	
7810 3	(4 ⁻)	3(+5)	77	
7852 2	(2,3,4) ⁻	3	36	
7875 4	(3,4,5) ⁻	4	131	
7925.5 20			17	
7939.6 20			17	
7958 3		>2	65	
7963 3			44	
7991 3		>2	35	
8018 3	(2,3,4) ⁻	3	109	
8037 3	(1,2) ⁺	2	29	
8042 3			32	
8077 4			22	
8082.6 18			21	
8098.7 21		>3	95	
8158 3	(2,3,4) ⁻	3	74	
8166 3			33	
8203 3	(2,3,4) ⁻	3	68	
8247 3			15	
8337 3	(1,2) ⁺	2	37	
8363 3			30 ^{&}	

[†] From 1989Ec03, unless otherwise noted.

[‡] From 1986So01.

[#] From 1989Ec03, in good agreement with 1973Va13.

[@] At 30°, unless otherwise stated.

[&] At 20°.

^a At 10°.

^b At 50°.