

$^{58}\text{Fe}(\text{d,p})$, (pol d,p) 1964Sp03,1972Mc18,1980Ta05

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

Others: 1968Gr18, 1967KI03, 1964Bj01.

1980Ta05: E(pol d)=10 MeV, measured $\sigma(\theta)$ and analyzing power, 12 angles from 25° to 80° (lab), enriched targets (82.48%), 8 Si(Li)-detectors at 15° intervals, FWHM=30-50 keV for 15-MeV protons, $\sigma(\theta)$ and analyzing power compared with DWBA calculations.

1972Mc18: E(d)=10 MeV and 12 MeV, measured $\sigma(\theta)$, $\theta(\text{c.m.})$ from $\approx 5^\circ$ to $\approx 90^\circ$, enriched targets (85.4%), multigap spectrograph, FWHM=16 keV for 16-MeV protons.

1968Gr18: E(d)=6 MeV. DWBA analysis of $\sigma(\theta)$; levels at 730, 1020, 1230, 1910 and 3590; deduced $(2J_f+1)S$ for each level.

1967KI03: E(d)=10 MeV, measured $\sigma(\theta)$, 34 angles from 7.5° to 165°, surface-barrier detector for protons at 25° to 165° with FWHM (g.s.)=44 keV, magnetic spectrograph at 5 angles from 7.5° to 35°.

1964Sp03: E(d)=6.55 MeV, $\theta=30^\circ$ and 45° ; for E(d)=7.0 MeV, $\theta=10^\circ$. Measured E(p), enriched target (75.1%), single-gap spectrograph.

1964Bj01: E(d)=3-4.3 MeV, $\theta=145.5^\circ$, levels at 0, 290, 477, 614, 639, 732 keV, $\Delta E=8$ keV.

Spectroscopic factors from 1967KI03 are in very poor agreement with those from 1972Mc18 and 1980Ta05. The results of 1980Ta05 and 1968Gr18 are in fair agreement with 1972Mc18.

 ^{59}Fe Levels

E(level) [‡]	J ^π #	L [†]	S' [†]	E(level) [‡]
0.0	3/2 ⁻	1	1.45	3169 10
287 10	1/2 ⁻	1	0.09	3194 10
473 10	5/2 ⁻	3	2.10	3235 10
574 @	(3/2 ⁻ , 5/2 ⁻) ^c	(1,3) ^c	0.017 @	3280 10
614? ^b 8				3311 10
639? ^b 8				3388 10
728 10	3/2 ⁻	1	0.50	3452 10
1026 10	(7/2) ⁻	3	0.19	3565 10
1081		1	0.010	3600 10
1162 10		1	0.009	3639 10
1214 10	1/2 ⁻	1	1.19	3668 10
1517 10	(7/2, 9/2) ⁺	4	5.10	3734 10
1572 10		3	0.53	3824 10
1648 10	5/2 ⁺	2	0.77	3872 10
1749 10				3921 10
1921 ^a 10				3989 10
1962 10		1	0.05	4045 10
2158 10				4083 10
2273 10				4124 10
2321 10				4159 10
2345 10	(7/2) ⁻	3 &	1.26 &	4181 10
2390 10				4224 10
2442 10				4277 10
2735 10				4377 10
2768 10				4409 10
2812 10		1	0.07	4423 10
2856 10		1	0.04	4516 10
2947 10				4541 10
2990? 10				4580 10
3020? 10				4629 10
3076 10				4650 10
3110 10				4660 10
3155 10				4686 10

Continued on next page (footnotes at end of table)

 $^{58}\text{Fe}(\text{d,p})$, (pol d,p) [1964Sp03](#),[1972Mc18](#),[1980Ta05](#) (continued)

 ^{59}Fe Levels (continued)E(level)[‡]

4770? 10

4830? 10

4870? 10

[†] L values and spectroscopic factors are from [1972Mc18](#), based on comparison of 10 MeV data with DWBA calculations, except as noted.

[‡] From [1964Sp03](#), except as noted.

[#] From L value and measured analyzing power ([1980Ta05](#)).

[@] From [1972Mc18](#). Value of S' shown assumes L=1.

[&] From [1980Ta05](#).

^a Doublet.

^b From [1964Bj01](#).

^c Weakly excited state; $\sigma(\theta)$ corrected for $J^\pi=3/2^-$ ^{58}Fe contaminant nearby. Analyzing power compatible with $3/2^-$ or $5/2^-$. $\sigma(\theta)$ poorly fitted by L=1 or L=3 DWBA in [1980Ta05](#), and deviates significantly from $\sigma(\theta)$ for other levels at $\theta>60^\circ$. Probably a doublet. Good fit with L=1 in [1972Mc18](#), however, for five measured data points between $(\theta)(\text{c.m.})$ 0° to 35° .