

$^{58}\text{Fe}(\text{p,d}), (\text{d,t}), (^3\text{He},\alpha)$  1965Sh06,1964Le10

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. R. Bhat	NDS 85, 415 (1998)	24-Sep-1998

See 1970Ra51 for a comparison of the results from these reactions. All groups cited below measured  $\sigma(\theta)$ .

1964Le10: E(p)=17.0, 18.5 MeV. Proportional counter telescope.  $\theta=15^\circ-40^\circ$ ,  $5^\circ$  steps, and  $50^\circ-70^\circ$ ,  $10^\circ$  steps. DWBA.

1965Sh06: E(p)= 28 MeV. Semiconductor telescope.  $\theta \approx 20^\circ-50^\circ$ . DWBA.

1962BI06 (E(d)=14 MeV, E( $^3\text{He}$ )=14.4 MeV. Semi) noted a great difference in the relative strengths of L=1 and L=3 transitions for ( $^3\text{He},\alpha$ ) and (d,t). In ( $^3\text{He},\alpha$ ) the g.s.+14+140 group  $\sigma(\theta)$  is dominated by L=3 to the 140,  $5/2^-$ , state; in (d,t), by L=1 to the g.s.,  $1/2^-$ , and 14,  $3/2^-$ , states. Other unresolved groups observed in both (d,t) and ( $^3\text{He},\alpha$ ) were at  $\approx 1.2$  and 2.2 MeV while the 0.36-MeV state and a group at  $\approx 1.7$  MeV were observed in (d,t).

1962Ma21 (E(d)= 21.6 MeV, scin telescope) observed unresolved groups at  $\approx 0$ , 1.3, 2.2, and 4.7 MeV.

 $^{57}\text{Fe}$  Levels

Energy,  $J^\pi$ , and L are from 1965Sh06 and  $C^2S$  are from 1964Le10, except as noted.  $\Delta E$  from estimates given by the authors for other reactions. J and L primarily from empirical shapes but with guidance from DWBA.

E(level)	$J^\pi$	L	$C^2S$	Comments
0				L, $C^2S$ : L=1 (1965Sh06,1964Le10); $C^2S=0.70$ for g.s.+14 doublet.
14				
$1.4 \times 10^2$	$2 \ 5/2^-$	3	0.80	
$3.7 \times 10^2$	$2 \ 3/2^-$	1	0.48	
$7.1 \times 10^2$	$2 \ (5/2^-)$	3		
$1.30 \times 10^3$		1	0.21	E(level),L: from 1964Le10.
$2.21 \times 10^3$	$2 \ 7/2^-$	3	4.4	$C^2S$ : $C^2S=2.03$ for composite of 2.21-, 3.19-, and 4.97-MeV states (1965Sh06).
$3.19 \times 10^3$	$2 \ 7/2^-$	3		
$4.97 \times 10^3$	$2 \ (7/2^-)$	(3)		
$5.27 \times 10^3$	$2 \ 3/2^+$	2		$J^\pi$ : adopted value is $1/2^+$ .
$10.45 \times 10^3$	$5 \ (7/2^-)$	(3)	0.36	$C^2S$ : from 1965Sh06. IAS?( $^{57}\text{Mn}$ ) (1965Sh06).