^{54}Fe(d,α) 1973De03,1973Ga07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 128, 185 (2015)	10-Jul-2015

1973Ga07: E=15 MeV, <20 keV (FWHM), measured $\sigma(\theta)$, Buechner-type magnet and α sensitive plates, DWBA analysis.
1973De03: E=17 MeV, ≈15 keV (FWHM), measured $\sigma(\theta)$, α sensitive plates placed in the focal plane of the Enge split-pole spectrograph, DWBA analysis.
1972Ke04: E=15 MeV, measured $\sigma(E\alpha,\theta)$, Si detector, ≈25 keV (FWHM), DWBA analysis. .
1971Gu03: E=28 MeV, ≈80 keV (FWHM), measured $\sigma(E\alpha,\theta)$, DWBA analysis.
Others: 1964Bj01, 1968Ra05.
Low-lying states are expected to have strong configuration=$(^1f_{7/2})^{-4}$ components in their wavefunctions, and predominantly seniority=2. The direct (d,α) reaction should excite strongly odd-J states, but excitation of even-J, seniority=2 states is forbidden. Configuration assignments have been made by most authors on this basis.

^{52}Mn Levels

E(level)[†]	J$^\pi$[a]	L[@]	dσ/dΩ[#]	Comments
0	(6$^+$)	(6)	3.0	
378 *1*	(2$^+$)	(2)	1.6	
546 *1*	(1$^+$)	0+2	10	L: From 1972Ke04. 1973De03 reported L=(2).
732 *1*	4$^+$	4	2.3	
826 *1*	3$^+$	2+4	27	L: From 1973Ga07 and 1972Ke04. 1973De03 reported L=2.
870 *1*	7$^+$	6	250	
1252 *1*	5$^+$	4+6	82	L: from 1973De03 and 1972Ke04. 1973Ga07 and 1971Gu03 reported L=4.
1646 *2*			≈1.3	
1683 *1*	3$^+$,4$^+$,5$^+$	4	8.5	L: from 1973De03, 1973Ga07 and 1971Gu03. 1972Ke04 reported L=2+4.
1954 *2*	5$^+$,6$^+$,7$^+$	6	3.4	
2046 *4*			≈2.5	
2130 *5*			11	L: 1973De03 assigned L=4. 1973Ga07 assigned L=0+2, 1971Gu03 assigned L=(2).
2252 *2*	3$^+$,4$^+$,5$^+$	4	9.8	
2285 *5*			≈2.5	
2338 *2*			5.0	L: 1973De03 assigned L=2,3. 1973Ga07 assigned L=0+2.
2475 *2*			22	L: 1973De03 assigned L=0+2 or L=1. 1973Ga07 assigned L=3. 1971Gu03 assigned L=0, 1972Ke04 assigned L=1+3.
2629 *3*	1$^+$	0+2	40	
2711 *3*		(5)	56	L: 1973Ga07 and 1972Ke04 assigned L=5, 1971Gu03 assigned L=(3).
2796 *3*	1$^+$,2$^+$,3$^+$	2	21	
2848 *3*				
2858 *5*				dσ/dΩ: 1973De03 reported combined dσ/dΩ=97 (μb/sr) for unresolved 2848+2858 pair.
2903 *5*			21	1973Ga07 assigned L=5. 1972Ke04 assigned L=(2).
2955 *5*			2.5	
2973 *4*				
2982 *3*				dσ/dΩ: 1973De03 reported dσ/dΩ=4.4 for unresolved 2973+2982 pair.
3106 *4*			5.0	1973De03 reported L=(2) and 1973Ga07 report L=(5) for E=3080.
3199 *3*			11	L: 1973De03 assigned L=4. 1972Ke04 assigned L=0.
3226 *4*		4(+6)	12	
3297 *5*		(2)	≈3.0	L: from 1972Ke04.
3333 *3*			26	L: 1973De03 assigned L=(2+4). 1973Ga07 assigned L=3.
3386 *3*		(2+4)	11	
3423 *3*		3	110	L: from 1973Ga07.
3506 *3*		4,5[‡]	46	L: 1973De07 assigned L=4.
3573 *5*	1$^+$	0	17	L: from 1973De03, 1972Ke04. 1973Ga07 assigned L=0+2. 1971Gu03 assigned L=(3).
3620 *6*			3.9	
3640 *6*		&	15	
3655 *6*		&	15	

Continued on next page (footnotes at end of table)

^{54}Fe(d,α) 1973De03,1973Ga07 (continued)

^{52}Mn Levels (continued)

E(level)[†]	J$^{\pi}$[a]	L[@]	dσ/dΩ[#]	Comments
3706 *6*			5.6	
3738 *4*		4	16	L: from 1973De03, 1971Gu03. 1973Ga07 assigned L=2.
3898 *4*			12	L: 1973De03 assigned L=(2). 1973Ga07 assigned L=5.
3936 *4*			3.7	
3973 *6*				
3987 *6*				dσ/dΩ: 1973De03 reported dσ/dΩ=10 (μb/sr) for unresolved pair and L=(4). L: 1973Ga07 assigned L=0+2 to level at 3984 *10*.
4061 *4*				
4129 *8*	$3^+,4^+,5^+$	4		
4235 *8*		6,5[‡]	19	
4281 *8*			18	1973De03 assigned L=(2). 1973Ga07 assigned L=5.
4377 *8*	1^+	0+2	20	
4450[‡] *10*		4[‡]		
4500[‡] *10*		3[‡]		
4540[‡] *10*		3,4[‡]		
4620[‡] *10*		3[‡]		
4690[‡] *10*				

[†] From 1973De03, except as noted. The energies of 1973De03 are averages of values from (d,α) and (^{3}He,t).
[‡] From 1973Ga07.
[#] Cross section (30°) in μb/sr, from 1973De03. Δ(dσ/dΩ)≈25%.
[@] From 1973De03, except as noted. L-value assignments are from DWBA analysis.
[&] 1973Ga07 report L=5,6 for E=3647.
[a] Empirical consideration of spin-dependent effects applied. Also see comments above on even-odd effects in configuration=($^1f_{7/2}$)$^{-4}$, seniority=2 states (1973De03,1973Ga07).