^{54}Fe(p,p′γ)   1972Wa28,1972Mo31

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 121, 1 (2014)	20-Jun-2014

1972Wa28: E=7.0MeV. Magnetic spectrometer, measured angular correlations.

1972Mo31: E=10 MeV. Measured σ(E(p′),Eγ,θ(p′γ)), DSAM, Ge(Li), Si(Li).

1981Ke06: E=1.05-3.69 MeV. Measured 1408γ yield, deduced σ(E).

1980PaZM: E=6.9 MeV. Internal pair sum coincidence.

Others: 1971He21, 1970Kr02, 1978Ve02.

R(ω) by measuring the (baffle in/baffle out) ratio, is a measure of the angular correlation between the pairs (1972Wa28).

^{54}Fe Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	Comments
0.0	0$^+$		
1408.4 6	2$^+$	0.76 ps +35−22	
2538.4 8	4$^+$	≥2.1 ps	
2561.5 8	0$^+$	≥1.4 ps	J$^{\pi}$: strong pair-line in spectrum with no corresponding γ (1980PaZM). R(ω)=0.253 13 agree with the expected 0.26 for E0 transitions.
2948.8 11	6$^+$	1.22[@] ns 2	g=1.37 3 T$_{1/2}$: other:≥0.55 ps from 1972Mo31. From γ(θ,H), H=3 kG (1971He21).
2959.1 8	2$^+$	0.052 ps 8	J$^{\pi}$: R(ω)=0.17 2 agree with the expected value for E2, 0.156.
3166.2 8	2$^+$	0.16 ps +4−3	J$^{\pi}$: R(ω)=0.16 2 agree with the expected value for E2, 0.150.
3296.4 8	4$^+$	≥2.1 ps	
3344.7 8	3$^+$	≥2.1 ps	
3834.3 9	4$^+$	0.063 ps 14	
4032.9 11	4$^+$	≥0.7 ps	
4047.9 10	(4)	0.30 ps +23−10	
4072.9 10	3$^+$	0.058 ps 17	
4263.9 10	(4)$^+$	0.082 ps +23−17	
4286.4 12	0$^+$	0.055 ps +17−14	J$^{\pi}$: strong pair-line in spectrum with no corresponding γ (1980PaZM).
4578.8 8	2$^+$	≤0.007 ps	
4656.4 13			
4699.1 10			
4780.5 9	3$^-$	0.033 ps 11	
4948.6 9	4$^+$	0.029 ps 10	

† From least-squares fits to Eγ's.

‡ From pγ(θ), 1972Mo31; $\gamma\gamma$(θ), 1970Kr02; and multipolarity.

From DSAM in 1972Mo31, except as noted.

@ From γ(t) in 1971He21.

γ(^{54}Fe)

Eγ[†]	Iγ[‡]	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$	Mult.[#]	δ[#]	Comments
411.6	100	2948.8	6$^+$	2538.4	4$^+$	Q		
538.6	≤2	3834.3	4$^+$	3296.4	4$^+$			
703	50 3	4047.9	(4)	3344.7	3$^+$	D+Q	0.23 9	
733	95 3	4032.9	4$^+$	3296.4	4$^+$			
757.0	79 3	3296.4	4$^+$	2538.4	4$^+$			δ: −1.1≤δ≤−0.67 or −0.24≤δ≤0.18 if J=4 from 1972Mo31.
806.8	61 3	3344.7	3$^+$	2538.4	4$^+$			δ: δ≥3.5 or 0.00 14 from 1972Mo31.
1130.1	100	2538.4	4$^+$	1408.4	2$^+$	Q		

^{54}Fe(p,p′γ) **1972Wa28,1972Mo31 (continued)**

γ(^{54}Fe) (continued)

E$_\gamma$[†]	I$_\gamma$[‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[#]	δ[#]	I$_{(\gamma+ce)}$	Comments
1153.2	100	2561.5	0$^+$	1408.4	2$^+$	E2			
1295.6	9 3	3834.3	4$^+$	2538.4	4$^+$	E2			
1355	≥90	4699.1		3344.7	3$^+$				
1360	100	4656.4		3296.4	4$^+$				
1408.15	100	1408.4	2$^+$	0.0	0$^+$	Q			
1436	11 3	4780.5	3$^-$	3344.7	3$^+$	E1			
1485	18 4	4780.5	3$^-$	3296.4	4$^+$	E1			
1498	5 3	4032.9	4$^+$	2538.4	4$^+$				
1508[@]	≤2	4047.9	(4)	2538.4	4$^+$				
1534	8 3	4072.9	3$^+$	2538.4	4$^+$	Q			
1550.8	43 3	2959.1	2$^+$	1408.4	2$^+$	M1+E2	0.105 +40−42		δ: other: δ=+0.087 from 1970Kr02.
1725	79 14	4263.9	(4)$^+$	2538.4	4$^+$	M1+E2	−0.53 24		
1757.9	24 3	3166.2	2$^+$	1408.4	2$^+$	M1+E2	0.63 +57−25		δ: or δ≥2.4, or δ≤−10 from 1972Mo31 also.
1887.0	39 3	3296.4	4$^+$	1408.4	2$^+$				
1936.9	57 3	3344.7	3$^+$	1408.4	2$^+$	M1+E2	−0.7 +2−23		
2001	10 3	4948.6	4$^+$	2948.8	6$^+$	Q			
2160	≤10	4699.1		2538.4	4$^+$				
2241	17 4	4780.5	3$^-$	2538.4	4$^+$	E1			
2409	55 5	4948.6	4$^+$	2538.4	4$^+$	M1+E2	−0.36 +20−30		
2425.6	91 3	3834.3	4$^+$	1408.4	2$^+$	E2			
2561.3		2561.5	0$^+$	0.0	0$^+$	E0		0.17 3	B(E0)(2561γ):B(E2)(1153γ)=0.49 8 (1980PaZM). I$_{(\gamma+ce)}$: from electron-pair measurement (1972Wa28).
2639	50 3	4047.9	(4)	1408.4	2$^+$	Q			
2665	92 3	4072.9	3$^+$	1408.4	2$^+$	M1+E2	1.88 +50−44		
2856	21 6	4263.9	(4)$^+$	1408.4	2$^+$	Q			
2878	100	4286.4	0$^+$	1408.4	2$^+$	Q			δ: if J=2,δ=0.40 +7−4, or δ≤−14; if J=3 δ=−0.16 +5−1; if J=1, all values of δ.
2959.0	57 3	2959.1	2$^+$	0.0	0$^+$	E2			δ: δ=+0.087 if J=2 from 1970Kr02.
3166.1	76 3	3166.2	2$^+$	0.0	0$^+$	E2			
3170	70 10	4578.8	2$^+$	1408.4	2$^+$	M1+E2	−0.105 90		δ: or δ=−1.8 5.
3372	54 7	4780.5	3$^-$	1408.4	2$^+$	E1(+M2)	−0.018 26		
3540	35 8	4948.6	4$^+$	1408.4	2$^+$				
4286.4		4286.4	0$^+$	0.0	0$^+$	E0			B(E0)(4286γ):B(E2)(2878γ)=0.65 18 (1980PaZM).
4579	30 10	4578.8	2$^+$	0.0	0$^+$	E2			

[†] From difference in level energies in 1972Wa28 for E≤3833.8. Eγ from 1972Mo31 not consistent in all cases. For E>3833.8, Eγ of 1972Mo31 have been combined with lower level energies from 1972Wa28.

[‡] Branching from 1972Mo31.

[#] From 1972Mo31.

[@] Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

Intensities: Relative I$_\gamma$