

⁵⁴Fe(α ,p), (α ,p γ)

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

1971Bu04: E=9, 10 MeV, $\gamma(\theta)$, DSA.
 1971Da22: E=9.86, 10.02, 10.40 MeV, $\gamma(\theta)$, DSA.
 1970Co16: E=10.71, 11.14 MeV, $\gamma(\theta)$.
 1969Da05: E=10.23, 10.30 MeV, $\gamma(\theta)$.
 1968Bo03: E=10.5, 11 MeV, $\sigma(\theta)$.
 Other: 1977Au04.
 See also ⁴⁸Ti(¹²C,p2n γ), ⁵⁴Fe(α ,p γ).

⁵⁷Co Levels

E(level) [†]	J π [‡]	T _{1/2}	Comments
0.0	7/2 ⁻		
1223.7 3	9/2 ⁻	54 fs 7	J π : 9/2 from $\gamma(\theta)$ (1969Da05); π =- from M1 to 7/2 ⁻ . T _{1/2} : weighted av of 52 fs 8 (1971Da22), and 58 fs 12 (1971Bu04).
1377.5 3	3/2 ⁻	>3 ps	J π : 3/2 from $\gamma(\theta)$ (1970Co16). T _{1/2} : from 1971Bu04.
1504.7 3	1/2 ⁻		J π : 1/2 from $\gamma(\theta)$ (1970Co16).
1689.4 3	11/2 ⁻	0.24 ps 2	J π : 11/2 from $\gamma(\theta)$ (1971Da22); π =- from E2 to 7/2 ⁻ . T _{1/2} : from 1971Da22. Other: 0.18 ps 8 (1971Bu04).
1757.2 3	3/2 ⁻	0.29 ps 3	J π : 3/2 from $\gamma(\theta)$ (1970Co16); π =- from E2 to 7/2 ⁻ . T _{1/2} : weighted av of 0.31 ps 4 (1971Da22) and 0.25 ps 5 (1971Bu04).
1896.9 3	7/2 ⁻	107 fs 10	J π : 7/2 from $\gamma(\theta)$ (1971Da22,1970Co16). T _{1/2} : from 1971Da22. Other: 83 fs 21 (1971Bu04).
1919.6 3	5/2 ⁻	22 fs 3	J π : 5/2 from $\gamma(\theta)$ (1970Co16). T _{1/2} : from 1971Da22. Other: 21 fs 14 (1971Bu04).
2133.6 3	5/2 ⁻	0.40 ps 5	J π : 5/2 from $\gamma(\theta)$ (1971Da22,1970Co16). T _{1/2} : from 1971Da22.
2311.3 4	7/2 ⁻	0.20 ps 4	J π : 7/2 from $\gamma(\theta)$ (1971Da22); π =- from M1 to 9/2 ⁻ . T _{1/2} : weighted av of 0.19 ps 5 (1971Da22) and 0.22 ps 6 (1971Bu04).
2485.8 4	9/2 ⁻	56 fs 9	T _{1/2} : from 1971Da22. Other: 25 fs 10 (1971Bu04).
2523.6 5	(13/2) ⁻	0.26 ps 5	T _{1/2} : from 1971Da22. Other: 0.11 ps 4 (1977Be16).
2559.6 4	(7/2 ⁻ ,9/2,11/2 ⁻)	0.51 ps 10	T _{1/2} : from 1971Da22.
2611.1 5	7/2 ⁻	85 fs 9	T _{1/2} : from 1971Da22. Other: 76 fs 21 (1971Bu04).
2723.0 6			
2730.3 5	3/2 ⁻ ,5/2	76 fs 21	T _{1/2} : from 1971Bu04. Other: 166 fs 21 (1971Da22).
2743.3 6	(9/2,11/2,13/2)		
2802.6 6	(3/2 ⁻ ,5/2)	28 fs 14	T _{1/2} : from 1971Bu04. Other: 69 fs 15 (1971Da22).
2879.4 6	3/2 ⁻	66 fs 31	J π : 3/2 from $\gamma(\theta)$ (1971Da22); π =- from E2 to 7/2 ⁻ . T _{1/2} : unweighted average of 97 fs 42 (1971Da22) and 35 fs 14 (1971Bu04).
2980.9 6	1/2 ⁺		J π : 1/2 from $\gamma(\theta)$ (1971Da22).
3108.7 7	(3/2) ⁻		
3175.6 7	5/2 ⁻ ,7/2 ⁻		
3262.4 7	(3/2 ⁻ ,5/2,7/2 ⁻)		
3343 10			
3389 10			
3436 10			
3533 10			
3613 10			
3662 10			
3696 10	(7/2 ⁻)		
3760 10			
3834 10			
3899 10			

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$^{54}\text{Fe}(\alpha, \text{p}), (\alpha, \text{p}\gamma)$ (continued) ^{57}Co Levels (continued)

<u>E(level)[†]</u>	<u>J^π[‡]</u>
3973 10	
4028 10	(15/2)

[†] From 1971Da22 up to 3262; other levels are from 1968Bo03.

[‡] From Adopted Levels; supporting arguments from this data set are indicated.

<u>E_i(level)</u>	<u>J_i^π</u>	<u>γ(⁵⁷Co)</u>						<u>δ</u>	<u>Comments</u>
		<u>E_γ[@]</u>	<u>I_γ^{†@}</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>			
1223.7	9/2 ⁻	1223.7	100	0.0	7/2 ⁻	M1+E2 [‡]	+0.24 2	δ: average of +0.27 1 (1971Bu04), +0.23 3 (1970Co16), +0.22 3 (1969Da05).	
1377.5	3/2 ⁻	1377.5	100	0.0	7/2 ⁻				
1504.7	1/2 ⁻	127.2	100	1377.5	3/2 ⁻				
1689.4	11/2 ⁻	465.7	54 2	1223.7	9/2 ⁻	(M1(+E2)) [#]	-0.0 9	δ: from 1969Da05.	
		1689.4	46 2	0.0	7/2 ⁻	E2 [‡]			
1757.2	3/2 ⁻	252.5	0.5	1504.7	1/2 ⁻				
		379.7	1	1377.5	3/2 ⁻				
		1757.2	98.5	0.0	7/2 ⁻	E2 [‡]			
1896.9	7/2 ⁻	673.2	59 4	1223.7	9/2 ⁻	(M1(+E2)) [#]	+0.04 9	δ: from 1971Da22.	
		1896.9	41 4	0.0	7/2 ⁻	(M1(+E2)) [#]	-0.04 22	δ: from 1970Co16.	
1919.6	5/2 ⁻	162.4	0.1	1757.2	3/2 ⁻				
		1919.6	99.9	0.0	7/2 ⁻				
2133.6	5/2 ⁻	628.9	3 1	1504.7	1/2 ⁻	E2 [‡]			
		756.1	14 2	1377.5	3/2 ⁻	M1+E2 [‡]	-0.34 20	δ: from 1970Co16. Other: -0.38 +14-37 (1971Da22).	
		2133.6	83 2	0.0	7/2 ⁻	(M1(+E2)) [#]	+0.08 8	δ: from 1971Da22.	
2311.3	7/2 ⁻	933.8	10 2	1377.5	3/2 ⁻	E2 [‡]			
		1087.6	70 2	1223.7	9/2 ⁻	M1+E2 [‡]	+0.13 2	δ: from 1971Bu04. Other: +0.09 +14-9 (1971Da22).	
		2311.3	20 3	0.0	7/2 ⁻	(M1(+E2)) [#]	-0.4 6	δ: from 1970Co16.	
2485.8	9/2 ⁻	588.9	11 3	1896.9	7/2 ⁻				
		796.4	12 4	1689.4	11/2 ⁻				
		1262.1	12 4	1223.7	9/2 ⁻				
		2485.8	65 6	0.0	7/2 ⁻				
2523.6	(13/2) ⁻	834.2	100	1689.4	11/2 ⁻				
2559.6	(7/2 ⁻ , 9/2, 11/2 ⁻)	870.2	16 5	1689.4	11/2 ⁻				
		1335.9	42 7	1223.7	9/2 ⁻				
		2559.6	42 7	0.0	7/2 ⁻				
2611.1	7/2 ⁻	2611.1	100	0.0	7/2 ⁻				
2723.0		1499.3	100	1223.7	9/2 ⁻				
2730.3	3/2 ⁻ , 5/2	2730.3	100	0.0	7/2 ⁻				
2743.3	(9/2, 11/2, 13/2)	1053.9	100	1689.4	11/2 ⁻				
2802.6	(3/2 ⁻ , 5/2)	905.7	19 6	1896.9	7/2 ⁻				
		1045.4	35 5	1757.2	3/2 ⁻				
		2802.6	46 5	0.0	7/2 ⁻				
2879.4	3/2 ⁻	959.8	40 7	1919.6	5/2 ⁻				
		1122.2	20 6	1757.2	3/2 ⁻				
		2879.4	40 7	0.0	7/2 ⁻	E2 [‡]			

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$^{54}\text{Fe}(\alpha, \mathbf{p}), (\alpha, \mathbf{p}\gamma)$ (continued) $\gamma(^{57}\text{Co})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ [@]	I_γ ^{†@}	E_f	J_f^π
2980.9	$1/2^+$	1223.7	100	1757.2	$3/2^-$
3108.7	$(3/2)^-$	1731.2	100	1377.5	$3/2^-$
3175.6	$5/2^-, 7/2^-$	1278.7	27 6	1896.9	$7/2^-$
		3175.6	73 6	0.0	$7/2^-$
3262.4	$(3/2^-, 5/2, 7/2^-)$	1505.2	52 5	1757.2	$3/2^-$
		3262.4	48 5	0.0	$7/2^-$

[†] Percent photon branching from each level.

[‡] From $\gamma(\theta)$ and RUL.

[#] From $\gamma(\theta)$ and ΔJ^π .

[@] From [1971Da22](#).

$^{54}\text{Fe}(\alpha, p), (\alpha, p\gamma)$

Level Scheme

Intensities: % photon branching from each level

