^{54}Cr(α,nγ), (pol α,nγ) 1972Sa38

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

Measured $\gamma\gamma$(90°,250°), γ(0°−90°) and linear polarization at 14.2 MeV and Iγ (Eα=10.2, 12.2, and 14.2 MeV); Ge(Li). DSAM.

^{57}Fe Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	1/2$^-$		
14.413[#]	3/2$^-$		
136.474[#]	5/2$^-$		
366.68 *20*	3/2$^-$		J=3/2.
706.35 *20*	5/2$^-$		J$^\pi$: 5/2$^-$.
1006.79 *15*	7/2$^-$		J$^\pi$: 7/2$^-$.
1197.86 *18*	9/2$^-$		J$^\pi$: 9/2$^-$.
1356.8 *4*	7/2$^-$		J$^\pi$: 3/2 or 7/2 from $\gamma(\theta)$. J=3/2 was preferred by 1972Sa38 on the basis of excitation function measurements. However, J=5/2 or 7/2 is required by (d,p) measurements.
1989.1 *4*	9/2$^-$		J$^\pi$: 9/2$^{(-)}$.
2355.37 *22*	(11/2)$^-$	≈0.42 ps	J$^\pi$: 11/2$^-$. $T_{1/2}$: disagrees with results from (α,pnγ) and (^{13}C,4nγ).
2455.1 *4*	9/2$^+$		J$^\pi$: (9/2$^-$); disagrees with adopted J^π.
2878.8 *4*	(13/2)$^-$	≤0.46 ps	J$^\pi$: 13/2$^-$.
3134.7 *4*	(15/2)$^-$		J$^\pi$: 15/2$^{(-)}$.
3268.5 *3*	(13/2)$^+$		J$^\pi$: 13/2$^{(-)}$.
4429.7 *21*			
4524.5 *11*	(17/2$^+$)		

[†] Calculated using least-squares adjustment procedures, except as noted. ΔE(γ) assumed to be 1 keV when not given; energies of first two excited states held fixed.

[‡] From Adopted Levels; supporting arguments from this data set based on $\gamma(\theta)$, linear polarization, and γ excitation functions are indicated. Note, however, comment by 1978Na06 in (^{13}C,4nγ) on the model dependency of the assumption of a Gaussian distribution of the magnetic substates. The J^π's of the first three levels were assumed by 1972Sa38 in their arguments.

[#] From Adopted Levels.

$\gamma(^{57}Fe)$

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	δ[‡]	Comments
122		136.474	5/2$^-$	14.413	3/2$^-$			
136		136.474	5/2$^-$	0.0	1/2$^-$			
255.9 *2*	16	3134.7	(15/2)$^-$	2878.8	(13/2)$^-$	D+Q	−0.07 *2*	
352.3 *2*	9.9	366.68	3/2$^-$	14.413	3/2$^-$	D+Q	−0.03 *9*	
641		1006.79	7/2$^-$	366.68	3/2$^-$			
650.4 *3*	8.6	1356.8	7/2$^-$	706.35	5/2$^-$	D+Q		δ: + 0.3 +*2*−*3* or + 1.6 *3* if J=7/2.
691.9 *2*	35	706.35	5/2$^-$	14.413	3/2$^-$	M1+E2	+1.1 *2*	
792		1989.1	9/2$^-$	1197.86	9/2$^-$			
[x]815								Coin with 989γ+992γ doublet. Possible coin with 692γ and 982γ.
870.4 *2*	35	1006.79	7/2$^-$	136.474	5/2$^-$	M1+E2	−0.6 +*2*−*5*	
913.1 *2*	11	3268.5	(13/2)$^+$	2355.37	(11/2)$^-$	D+Q	+0.00 *3*	
982.3 *4*	6.8	1989.1	9/2$^-$	1006.79	7/2$^-$	D+Q		δ>0.18<2.75
989.3[@&] *3*	6	1356.8	7/2$^-$	366.68	3/2$^-$	[#]	[#]	Placed by evaluators on basis of 989γ+992γ-352γ coin and adopted gammas.

Continued on next page (footnotes at end of table)

^{54}Cr(α,nγ), (pol α,nγ) 1972Sa38 (continued)

$\gamma(^{57}Fe)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
992.3[@] *3*	25	1006.79	$7/2^-$	14.413	$3/2^-$	#	#	
1061.3 *2*	100	1197.86	$9/2^-$	136.474	$5/2^-$	E2(+M3)	−0.03 *3*	
1157.4 *2*	10	2355.37	$(11/2)^-$	1197.86	$9/2^-$	D+Q	−0.45 *5*	I_γ: agrees with Iγ from (α,pnγ) but not from (^{13}C,4nγ).
1256.0		4524.5	$(17/2^+)$	3268.5	$(13/2)^+$			
1282		1989.1	$9/2^-$	706.35	$5/2^-$			
1295 *2*		4429.7		3134.7	$(15/2)^-$			
1348.8 *3*	23	2355.37	$(11/2)^-$	1006.79	$7/2^-$	E2(+M3)	−0.02 *2*	
1448.3 *3*	19	2455.1	$9/2^+$	1006.79	$7/2^-$	E1+M2	0.00 *4*	Mult.,δ: from adopted gammas.
1680.9 *3*	45	2878.8	$(13/2)^-$	1197.86	$9/2^-$	E2(+M3)	−0.01 *2*	
[x]2158								Possible coin with 122γ.

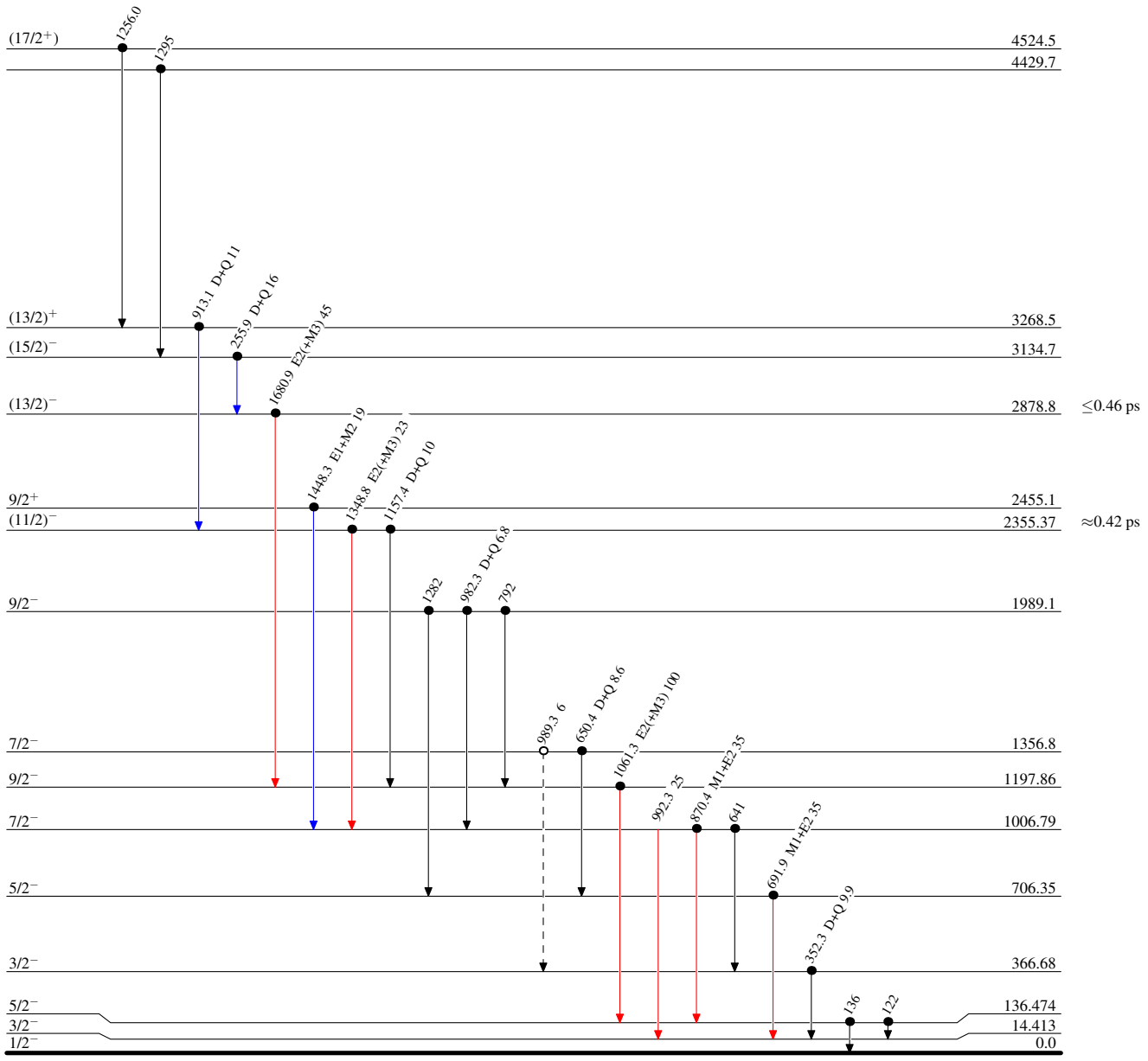
[†] Relative photon intensity at E= 14.2 MeV.
[‡] From $\gamma(\theta)$ and linear polarization. Other δ's excluded by comparison to RUL or adopted J^π.
[#] Q + O. δ=− 0.02 *2* for doublet.
[@] Multiply placed.
[&] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{54}Cr(α,nγ), (pol α,nγ) 1972Sa38

Level Scheme

Intensities: Relative photon intensity At E=14.2 MeV

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence
- Coincidence (Uncertain)



$^{57}_{26}Fe_{31}$