^{56}Fe(n,γ) E=1151.5 eV res 1978We09,1970Ch10

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

1970Ch10: E=thermal to ≈ 2 keV. Measured γ's; Ge(Li). TOF.
Additional information 1.
1978We09: E=1 to 50 keV. Measured γ's; Ge(Li). ^{10}B filter; TOF.
Others: see 1977Au04. See also 1981Mc05 and resonance parameters in (n,γ) E=thermal.

^{57}Fe Levels

E(level)†	J$^{\pi}$‡	Comments
0.0	1/2$^-$	
14.41‡	3/2$^-$	
135.3 *11*	5/2$^-$	
367.1 *6*	3/2$^-$	
706.6 *8*	5/2$^-$	
1139.9?‡ *10*		
1265.5 *8*	1/2$^-$	
1629.3 *13*	3/2$^-$	
1725.6 *8*	3/2$^-$	
(2330.29‡ *15*)	(1/2,3/2,5/2$^+$)	
2697.5 *12*	1/2$^-$	
2837 *3*	3/2,5/2	
2970.7 *20*	(1/2,3/2,5/2$^+$)	
3183.9 *15*	1/2$^-$,3/2$^-$	
3239 *3*	1/2$^+$	
3372.0 *17*	3/2$^-$	
3429.8 *16*	3/2$^-$	
3791.5 *9*	3/2$^+$	
3925.9 *20*	(1/2,3/2,5/2$^-$)	
4380.2 *20*	(1/2,3/2,5/2$^-$)	
S(n)+1.1515 *7*	1/2$^-$	J$^{\pi}$: p-wave resonance from transmission and scattering (Cf. 1981MuZQ). J=1/2 from $\gamma(\theta)$ (1970Ch10). E(level): s(n)= 7646.20 *10*. Other: E(n)= 1.1474 *5* from 1981MuZQ. $\gamma\Gamma_n\Gamma_\gamma/\Gamma$=68.7 meV *15*; $\sigma_0\Gamma_\gamma$=161 b×eV 4. Note: not consistent with 1981MuZQ. Additional information 2.

† Calculated using least-squares adjustment procedures with E(level) of the 14.4 and 2330 states and of the p-wave resonance held fixed; in good agreement with 1978We09.
‡ From Adopted Levels.

γ(^{57}Fe)

Except as noted, all data are from 1978We09; there is good agreement between the two groups.
5193γ, 4589γ, and 4400γ, representing transitions to the 1/2$^+$ states at 2454, 3058, and 3247 keV, were looked for but not observed (Iγ<≈1) by 1978We09. The unplaced 4676γ observed by 1970Ch10 was not observed (Iγ<1.4) by 1978We09.
The primary transitions, 3439γ, 3508γ, 3745γ, and 3795γ, and the secondary transitions, 3490γ and 4014γ, expected from thermal capture were looked for but not observed (Γ_γ< 1 meV) by 1970Ch10. 4014γ was also not observed (Iγ<1) by 1978We09.

Continued on next page (footnotes at end of table)

^{56}Fe(n,γ) E=1151.5 eV res 1978We09,1970Ch10 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.
367.1	3/2$^-$	352.5 *10*	85	14.41	3/2$^-$	
		367.4 *10*	15	0.0	1/2$^-$	
706.6	5/2$^-$	572.0 *10*	7	135.3	5/2$^-$	
		692.2 *10*	93	14.41	3/2$^-$	
1265.5	1/2$^-$	898.7 *10*	95	367.1	3/2$^-$	
		1250.8 *10*	5	14.41	3/2$^-$	
1629.3	3/2$^-$	1263.7[‡] *20*	26	367.1	3/2$^-$	
		1613.4 *20*	74	14.41	3/2$^-$	
1725.6	3/2$^-$	1019.6 *10*	24	706.6	5/2$^-$	
		1357.7 *10*	10	367.1	3/2$^-$	
		1725.5 *20*	66	0.0	1/2$^-$	
2697.5	1/2$^-$	2683.5 *20*	67	14.41	3/2$^-$	
		2697.4 *20*	33	0.0	1/2$^-$	
3183.9	1/2$^-$,3/2$^-$	3169.6 *20*		14.41	3/2$^-$	
3372.0	3/2$^-$	3358.0[#e] *20*		14.41	3/2$^-$	
3429.8	3/2$^-$	3415.7[#e] *20*		14.41	3/2$^-$	
3791.5	3/2$^+$	1460.3[@] *10*		2330.29?	(1/2,3/2,5/2$^+$)	
		3780.0[#e] *20*		14.41	3/2$^-$	
S(n)+1.1515	1/2$^-$	3267.0[#] *20*	1.9[&] *10*			*c*
		3721.3[#] *20*	1.9[&] *12*			
		3854.3 *35*	1.9 *11*			
		4217.9 *25*	1.2 *8*			*c*
		4276.5 *30*	1.7 *8*			*c*
		4408.0 *30*	1.3 *8*			*c*
		4463.5 *20*	5.5 *10*			*c*
		4810.0[de] *30*	1.5 *10*			
		4950.1 *20*	5.0 *14*			*c*
		5920.8 *30*	5.6 *13*			*c*
		6017.8 *30*	1.1 *5*			*c*
		6381.8 *20*	35 *5*			*c*
		6507.0[#e] *10*	<1.0[a]			
		7279.6 *30*	1.9 *7*			*c*
		7508.8 *20*	5.2 *8*			E2[b]
		7631.7 *20*	100 *4*			*c*
		7645.5 *20*	41 *4*			*c*

[†] Photon branching ratios (in percent) from each bound level. Primary Iγ's are relative to Iγ(7631)=100. See 1970Ch10 for Γ_γ's.

[‡] Probable doublet (1978We09). Evaluators' note: this doublet may consist of the 1260.6γ, E(level)=1627, and 1263.3γ, E(level)=3240 observed in (n,γ) E=thermal.

[#] Not observed by 1978We09. From 1970Ch10.

[@] Not placed by 1978We09. Placed by evaluators on basis of (n,γ) E=thermal data.

[&] From Γ_γ's in 1970Ch10 (evaluators).

[a] Not observed by 1978We09. Γ_γ= 5.5 meV *10* (1970Ch10).

[b] From J^π considerations (1978We09,1970Ch10). Note that this is one of the very rare primary E2 transitions.

[c] From J^π considerations these transitions appear to be magnetic dipoles.

[d] Not observed (Γ_γ< 1 meV) by 1970Ch10. From 1978We09.

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

[x] γ ray not placed in level scheme.

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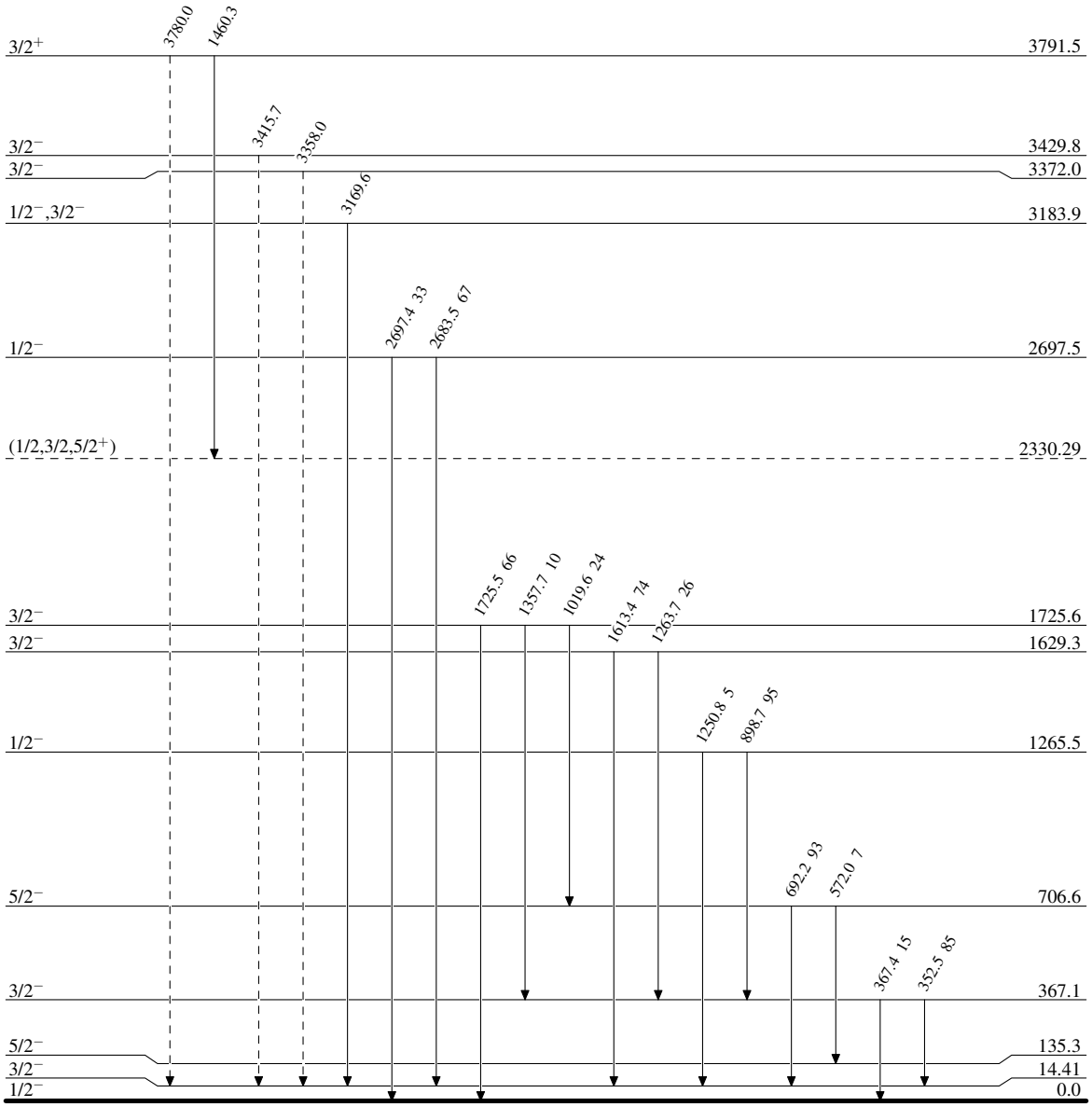
Level Scheme

Intensities: % photon branching from each level

γ Decay (Uncertain)



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