<center>^{56}Fe(n,n'γ)   **1987Ko18,1984KoZP**</center>

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

1987Ko18,1984KoZP: E=reactor fast neutrons; measured Eγ, Iγ, $\gamma(\theta)$, T$_{1/2}$ by DSAM, Hauser-Feshbach analysis.

1983Be10: E=0.16– 21 MeV; measured Eγ, Iγ, TOF.

1979Fa07: ^{57}Fe(p,p'γ) reaction at E(p)=4.4 MeV; measured $\gamma(\theta$,H,t).

Others: 1980Di11, 1977Ki07, 1973To11. See these for discussion of the doorway-state resonances.

All data are from 1987Ko18, except as indicated otherwise.

<center>^{57}Fe Levels</center>

E(level)	J$^{\pi\dagger}$	T$_{1/2}$‡	Comments
0.0	1/2$^-$		
14.4	3/2$^-$		
136.4	5/2$^-$		μ=+0.935 _10_ (1979Fa07)
366.9	3/2$^-$		
706.4	5/2$^-$		J=5/2$^-$.
1007.1	7/2$^-$	>1.0 ps	J=7/2$^-$.
1197.9	9/2$^-$		J=9/2$^-$.
1265.1	1/2$^-$	0.10 ps +_6−3_	J=1/2$^-$.
1357.1	7/2$^-$		J=7/2$^-$.
1627.1	3/2$^-$	0.062 ps _14_	J=3/2$^-$.
1725.2	3/2$^-$	0.025 ps _8_	J=3/2$^-$.
1976.6	(1/2$^-$,3/2,5/2$^-$)		J=(1/2)$^-$.
1989.4	9/2$^-$	0.18 ps +_17−6_	J=9/2$^-$.
2117.9	5/2$^-$	0.046 ps _12_	J=5/2$^-$.
2207.0	5/2$^-$	0.010 ps _3_	J=5/2$^-$.
2220.2	(7/2$^-$)	>0.3 ps	J=7/2$^-$.
2355.5	(11/2)$^-$		J=11/2$^-$.
2455.3	9/2$^+$	<1.0 ps	J=(9/2)$^+$.
2505.2	5/2$^+$	0.06 ps _1_	J=5/2$^+$.
2573.7	(1/2,3/2,5/2$^-$)	0.022 ps _8_	J=1/2.
2593.5	(3/2$^-$,5/2$^-$)	0.037 ps _10_	J=3/2$^-$.
2696.9	1/2$^-$		J=(3/2,1/2)$^-$.
2817.2	(1/2,3/2,5/2$^+$)	0.06 ps +_2−1_	J=(3/2 to 11/2)$^-$.
2835.2	3/2,5/2		J=1/2$^-$.
2878.9	(13/2)$^-$		J=13/2$^-$.
2904			J=1/2$^-$,3/2$^-$.
3058.9	1/2$^+$		J=1/2$^+$.

$\dagger$ From Adopted Levels; J$^{\pi}$ determined from Hauser-Feshbach analysis by 1987Ko18 are given in comments.

$\ddagger$ From DSAM by 1987Ko18; uncertainties are from 1984KoZP.

<center>γ(^{57}Fe)</center>

E$_i$(level)	J$^{\pi}_i$	E$_{\gamma}$	I$_{\gamma}$‡	E$_f$	J$^{\pi}_f$
136.4	5/2$^-$	122.1[#] _17_	11.2[#] _7_	14.4	3/2$^-$
		136.5[#] _17_	88.8[#] _7_	0.0	1/2$^-$
366.9	3/2$^-$	230.2[#] _17_	7.0[#] _4_	136.4	5/2$^-$
		352.3[#] _18_	79.4[#] _6_	14.4	3/2$^-$
		366.7[#] _18_	13.6[#] _6_	0.0	1/2$^-$
706.4	5/2$^-$	339.5	3	366.9	3/2$^-$

<center>Continued on next page (footnotes at end of table)</center>

^{56}Fe(n,n′γ)   **1987Ko18,1984KoZP (continued)**

$γ(^{57}$Fe) (continued)

E_i(level)	J_i^π	E_γ	$I_\gamma^\ddagger$	E_f	J_f^π	Mult.[†]	δ	Comments
706.4	5/2⁻	570.0	9	136.4	5/2⁻	D+Q	0.10 3	
		692.0	86	14.4	3/2⁻			
		706.4	2	0.0	1/2⁻			
1007.1	7/2⁻	870.7	74	136.4	5/2⁻			
		992.7	26	14.4	3/2⁻			
1197.9	9/2⁻	1061.5	100	136.4	5/2⁻			
1265.1	1/2⁻	898.2	93.0# 9	366.9	3/2⁻			
		1250.7	4.5# 6	14.4	3/2⁻			
		1265.0# 22	2.5# 6	0.0	1/2⁻			
1357.1	7/2⁻	650.7	54.8# 25	706.4	5/2⁻	D+Q	−4.0 5	
		990.1# 21	23.6# 22	366.9	3/2⁻			
		1342.7	21.6# 19	14.4	3/2⁻	Q		
1627.1	3/2⁻	920.7	10	706.4	5/2⁻			
		1260.2	29	366.9	3/2⁻			
		1612.7	58	14.4	3/2⁻	D+Q	0.15 4	
		1627.1	3	0.0	1/2⁻			
1725.2	3/2⁻	460.1	2	1265.1	1/2⁻			
		1018.8	21	706.4	5/2⁻			
		1358.3	6	366.9	3/2⁻			
		1710.2# 3		14.4	3/2⁻			
		1725.2	71	0.0	1/2⁻			
1976.6	(1/2⁻,3/2,5/2⁻)	251.4	17	1725.2	3/2⁻			
		1840.2	67	136.4	5/2⁻			
		1976.6	16	0.0	1/2⁻			
1989.4	9/2⁻	791.5	27	1197.9	9/2⁻			
		982.3	32	1007.1	7/2⁻	D+Q	−4.5 5	
		1283.0	41	706.4	5/2⁻	Q(+O)	0.00 2	
2117.9	5/2⁻	1110.8	19	1007.1	7/2⁻			
		1411.5	65	706.4	5/2⁻	D+Q	−0.08 5	
		2103.5	16	14.4	3/2⁻			
2207.0	5/2⁻	941.9	12	1265.1	1/2⁻			
		1199.9	22	1007.1	7/2⁻			
		2192.6	53	14.4	3/2⁻			
		2207.0	13	0.0	1/2⁻			
2220.2	(7/2⁻)	1853.3	5	366.9	3/2⁻			
		2083.8	46	136.4	5/2⁻	D+Q		δ: - 0.04 1 or - 5.2 3.
		2205.8	49	14.4	3/2⁻			
2355.5	(11/2)⁻	1157.6	40	1197.9	9/2⁻			
		1348.4	60	1007.1	7/2⁻			
2455.3	9/2⁺	1448.2	100	1007.1	7/2⁻			
2505.2	5/2⁺	780.0	5	1725.2	3/2⁻			
		2138.3	95	366.9	3/2⁻			
2573.7	(1/2,3/2,5/2⁻)	2573.7	100	0.0	1/2⁻			
2593.5	(3/2⁻,5/2⁻)	1586.4	41	1007.1	7/2⁻			
		1887.1	50	706.4	5/2⁻			
		2593.5	9	0.0	1/2⁻			
2696.9	1/2⁻	2682.5	61	14.4	3/2⁻			
		2696.9	39	0.0	1/2⁻			
2817.2	(1/2,3/2,5/2⁺)	597.0		2220.2	(7/2⁻)			
		1810.1		1007.1	7/2⁻			
2835.2	3/2,5/2	2128.8	38	706.4	5/2⁻			
		2820.8	62	14.4	3/2⁻			
		2834.0# 37		0.0	1/2⁻			
2878.9	(13/2)⁻	1681.0	100	1197.9	9/2⁻			

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^{56}Fe(n,n'γ)   **1987Ko18,1984KoZP (continued)**

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

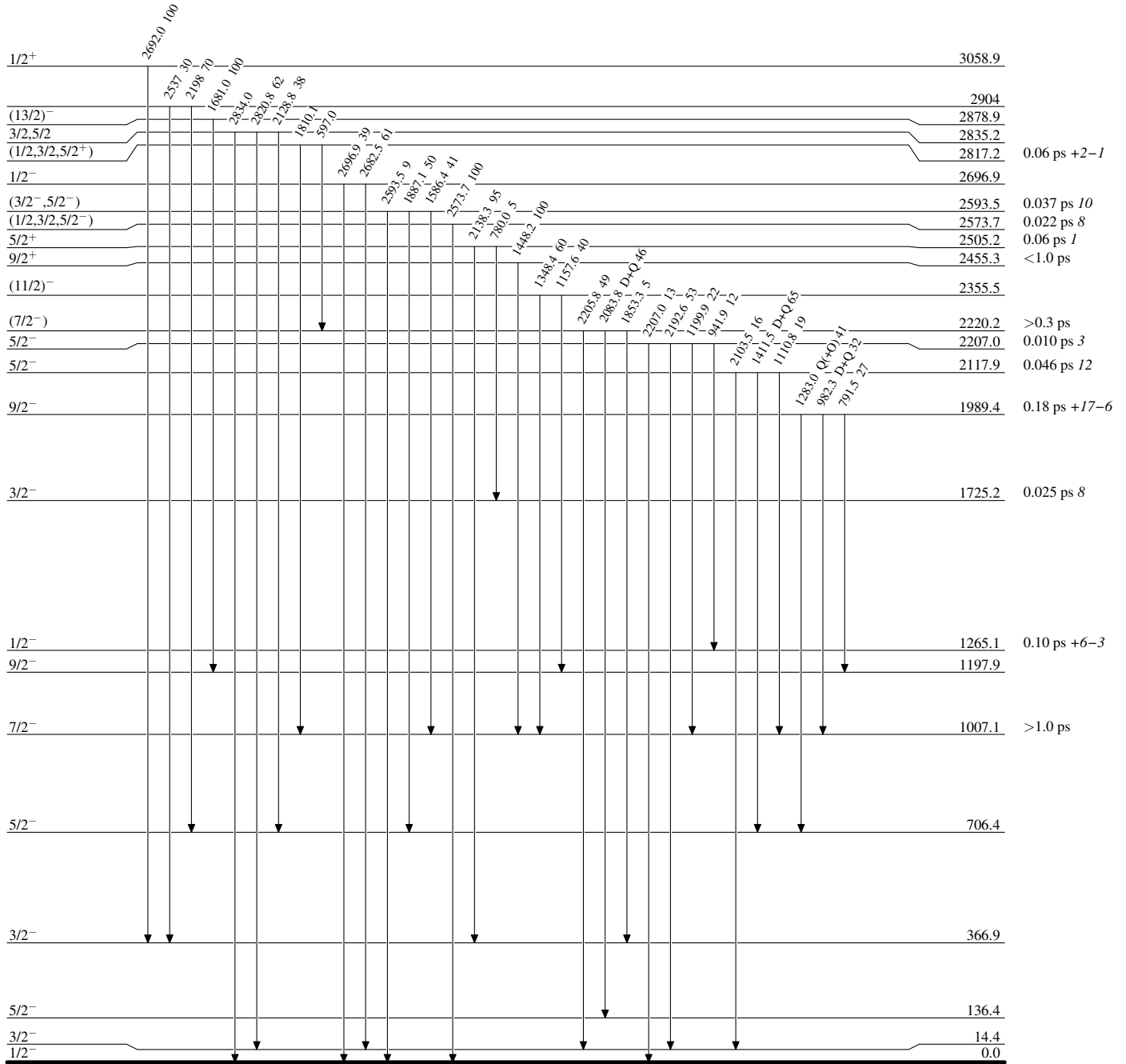| E_i(level)	J^π_i	E_γ	$I_\gamma^\ddagger$	E_f	J^π_f
2904		2198	70	706.4	5/2$^-$
		2537	30	366.9	3/2$^-$
3058.9	1/2$^+$	2692.0	100	366.9	3/2$^-$

† From $\gamma(\theta)$ by 1987Ko18.

‡ Percent photon branching from each level from 1987Ko18 except as indicated otherwise.

From 1983Be10.

^{56}Fe(n,n'γ)   **1987Ko18,1984KoZP (continued)**

^{56}**Fe(n,n′γ)**   **1987Ko18,1984KoZP**

Level Scheme

Intensities: % photon branching from each level

Gamma transition labels:
2692.0 100
2537 30
2198 70
1681.0 100
2834.0
2820.8 62
2128.8 38
1810.1
597.0
2696.9 39
2682.5 61
2593.5 9
1887.1 50
1586.4 41
2573.7 100
2138.3 95
780.0 5
1448.2 100
1348.4 60
1157.6 40
2205.8 49
2083.8 D+Q 46
1853.3 5
2207.0 13
2192.6 53
1199.9 22
941.9 12
2103.5 16
1411.5 D+Q 65
1110.8 19
1283.0 Q+Q(41)
982.3 D+Q 32
791.5 27

Levels (energy, spin-parity, lifetime):

J^π	Energy	Lifetime
$1/2^+$	3058.9	
	2904	
$(13/2)^-$	2878.9	
$3/2,5/2$	2835.2	
$(1/2,3/2,5/2^+)$	2817.2	0.06 ps +2−1
$1/2^-$	2696.9	
$(3/2^-,5/2^-)$	2593.5	0.037 ps 10
$(1/2,3/2,5/2^-)$	2573.7	0.022 ps 8
$5/2^+$	2505.2	0.06 ps 1
$9/2^+$	2455.3	<1.0 ps
$(11/2)^-$	2355.5	
$(7/2^-)$	2220.2	>0.3 ps
$5/2^-$	2207.0	0.010 ps 3
$5/2^-$	2117.9	0.046 ps 12
$9/2^-$	1989.4	0.18 ps +17−6
$3/2^-$	1725.2	0.025 ps 8
$1/2^-$	1265.1	0.10 ps +6−3
$9/2^-$	1197.9	
$7/2^-$	1007.1	>1.0 ps
$5/2^-$	706.4	
$3/2^-$	366.9	
$5/2^-$	136.4	
$3/2^-$	14.4	
$1/2^-$	0.0	

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

^{56}Fe(n,n′γ)　　1987Ko18,1984KoZP

Level Scheme (continued)

Intensities: % photon branching from each level

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