

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong		NDS 144,1 (2017)	1-Mar-2016

$Q(\beta^-)=-1.286\times 10^4$ 5; $S(n)=1.380\times 10^4$ 1; $S(p)=4864$ 9; $Q(\alpha)=-8065$ 11 [2017Wa10](#)

^{51}Fe Levels

Cross Reference (XREF) Flags

A	$^{54}\text{Fe}(^3\text{He},^6\text{He}), ^{50}\text{Cr}(^3\text{He},2n)$	D	^{52}Ni $\epsilon\beta$ decay (40.8 ms)
B	$^{24}\text{Mg}(^{32}\text{S},\alpha n\gamma)$	E	$\text{Ni}(^{58}\text{Ni},\text{X})$
C	$^{28}\text{Si}(^{32}\text{S},2\alpha n\gamma)$	F	$^9\text{Be}(^{58}\text{Ni},\text{X})$

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	$5/2^-$	305 ms 2	ABCDEF	$\%e+\%b^+=100$ J^π : $\log ft=4.86$ to $7/2^-$ and $\log ft=5.5$ to $3/2^-$. $T_{1/2}$: from av of 308 ms 5 (β (t), 2015Sh16), 301 ms 4 (β (t), 2013Su07), 305 ms 5 (1988HaZD), 310 ms 5 (1984Ay01), 298 ms 14 (237γ (t), 1989Ho13), Others: 360 ms 100 (1825γ (t), 1989Ho13), 245 ms 7 (1977Ho25).
253.5 [†] 5	$(7/2^-)$		ABC	XREF: A(262). J^π : $\Delta J=1$ d γ to $5/2^-,0$.
1146.5 [†] 11	$(9/2^-)$		BC	J^π : $\Delta J=1$ d γ to $(7/2^-),254$.
1218 [‡] 10			A	
1516.5 [†] 10	$(11/2^-)$		ABC	XREF: A(1525). J^π : $\Delta J=1$ d γ to $(9/2^-),1147$ and $\Delta J=2$ Q γ to $(7/2^-),254$.
1866 [‡] 13			A	
2063 [‡] 7	$(3/2^+)$ @		A	
2489 [‡] 8	$(1/2^+)$ @		A	
2953.4 [†] 24	$(13/2^-)$		BC	J^π : $\Delta J=1$ d γ to $(11/2^-),1517$ and $\Delta J=2$ Q γ to $(9/2^-),1147$.
3013 [‡] 9			A	
3127 [‡] 9			A	
3275.7 [†] 24	$(15/2^-)$		BC	J^π : $\Delta J=1$ d γ to $(13/2^-),2953$ and $\Delta J=2$ Q γ to $(11/2^-),1517$.
3310 [‡] 10			A	
3589.7 [†] 24	$(17/2^-)$	1.99 ns +6-8	BC	$T_{1/2}$: from 2000Ek02 . 15% systematic uncertainty not added. J^π : $\Delta J=1$ d γ to $(15/2^-),3276$ and $\Delta J=2$ Q γ to $(13/2^-),2953$.
3964 [‡] 12			A	E(level): doublet.
4097.9 [†] 25	$(19/2^-)$		BC	J^π : $\Delta J=1$ d γ to $(17/2^-),3590$.
4456 [‡] 13			A	
5608 [†] 3	$(21/2^-)$		BC	J^π : $\Delta J=1$ d γ to $(19/2^-),4098$.
6492 [†] 3	$(23/2^-)$		BC	J^π : $\Delta J=1$ d γ to $(21/2^-),5608$.
7269 [†] 3	$(27/2^-)$	48.3 ps 24	BC	J^π : $\Delta J=2$ Q γ to $(23/2^-),6492$. $T_{1/2}$: from 2004Du25 . The uncertainty was deduced by adding the systematic and statistical uncertainties in quadrature (by evaluators). The half-life was obtained by applying the recoil distance Doppler shift (RDDS) method to the 777 and 704 transitions in spectra taken in coincidence with low-lying γ -rays.
7933 [†] 3	$(25/2^-)$		C	J^π : From the proposed rotational structure based on $5/2^-$ in 2004Ek03 .
11468 [†] 7	$(29/2^-)$ #		C	J^π : (M1+E2) γ to $27/2^-,7269$.

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Adopted Levels, Gammas (continued) ^{51}Fe Levels (continued)

E(level)	J^π	XREF
11712?† 14	(29/2 ⁻)#	C
12650† 11	(31/2 ⁻)#	C

† From $^{28}\text{Si}(^{32}\text{S}, 2\alpha n\gamma)$.‡ From $^{54}\text{Fe}(^3\text{He}, ^6\text{He}), ^{50}\text{Cr}(^3\text{He}, 2n)$.# From comparison of the $T_z=-1/2$ nucleus ^{51}Fe with $T_z=1/2$ nucleus ^{51}Mn levels.@ From comparison of the $T_z=-1/2$ with $T_z=1/2$ levels, and comparison of the angular distribution of the states of interest with those from the $^{42}\text{Ca}(^3\text{He}, ^6\text{He})^{39}\text{Ca}$.

$E_i(\text{level})$	J_i^π	$\gamma(^{51}\text{Fe})$		E_f	J_f^π	Mult.†	δ	Comments
		E_γ^\ddagger	I_γ^\ddagger					
253.5	(7/2 ⁻)	253.5 5	100	0.0	5/2 ⁻	D		
1146.5	(9/2 ⁻)	893 2	100 5	253.5	(7/2 ⁻)	D		
		1146 3	11.9 24	0.0	5/2 ⁻			
1516.5	(11/2 ⁻)	370.0 5	44 3	1146.5	(9/2 ⁻)	D		
		1263 1	100 5	253.5	(7/2 ⁻)	Q		
2953.4	(13/2 ⁻)	1437 4	100 5	1516.5	(11/2 ⁻)	D		
		1807 5	65 5	1146.5	(9/2 ⁻)	Q		
3275.7	(15/2 ⁻)	322.3 9	11.1 19	2953.4	(13/2 ⁻)	D		
		1759 3	100 6	1516.5	(11/2 ⁻)	Q		
3589.7	(17/2 ⁻)	314.0 5	91 5	3275.7	(15/2 ⁻)	D		
		636.3 7	100 5	2953.4	(13/2 ⁻)	Q		
4097.9	(19/2 ⁻)	508.2 3	100	3589.7	(17/2 ⁻)	D		
5608	(21/2 ⁻)	1510.0 8	100	4097.9	(19/2 ⁻)	D		
6492	(23/2 ⁻)	883.9 5	100 4	5608	(21/2 ⁻)	D		
		2394 1	24 3	4097.9	(19/2 ⁻)			
7269	(27/2 ⁻)	777.2 4	100	6492	(23/2 ⁻)	E2		B(E2)(W.u.)=3.68 19 Mult.: Q from DCO, M2 ruled out by RUL.
7933	(25/2 ⁻)	664 2	44 22	7269	(27/2 ⁻)			
		1441 3	100 56	6492	(23/2 ⁻)			
11468	(29/2 ⁻)	4199 6	100	7269	(27/2 ⁻)	(M1+E2)	>0.2	δ : From 2004Ek03.
11712?	(29/2 ⁻)	4443‡ 13	100	7269	(27/2 ⁻)			
12650	(31/2 ⁻)	5381 10	100	7269	(27/2 ⁻)			

† From $^{28}\text{Si}(^{32}\text{S}, 2\alpha n\gamma)$.

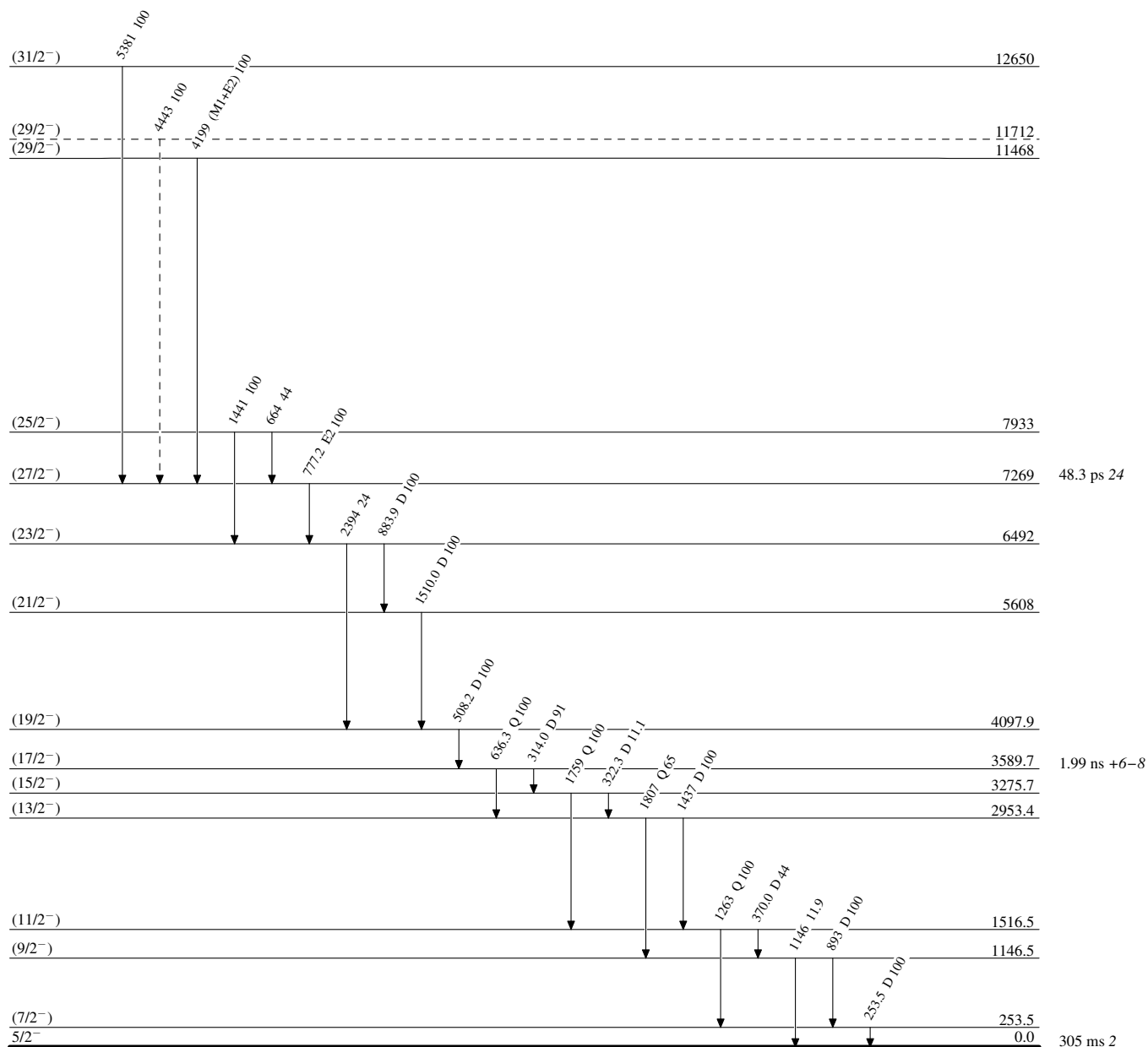
‡ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{51}_{26}\text{Fe}_{25}$