^{53}Fe ε decay   **1975Bl01**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Huo Junde	NDS 110,2689 (2009)	31-Mar-2007

Parent: ^{53}Fe: E=0.0; J$^{\pi}$=7/2$^-$; T$_{1/2}$=8.51 min *2*; Q(ε)=3742.6 *17*; %ε+%β^+ decay=100.0

Measured: γ, $\gamma\gamma$ (1975Bl01), β^+, $\beta\gamma$ (1975Bl01,1959Ju40).

Others: 1974Ca15, 1968De27, 1967Es06, 1950Ne02.

β^+: 2800 *100* (57% *8*), 2400 *100* (42% *8*), 1710 *350* ($\approx$1%), (1975Bl01); 2840 *100* (50%), 2380 *100* (38%), 1570 *150* (12%), (1959Ju40).

I(378γ)/Iβ^+=0.43 *3* (1968De27), 0.36 *3* (1967Es06).

^{53}Mn Levels

E(level)	J$^{\pi\dagger}$
0.0	7/2$^-$
377.90 *10*	5/2$^-$
1288.02 *10*	3/2$^-$
1619.93 *10*	9/2$^-$
2273.6 *3*	5/2$^-$
2685.7 *3*	7/2$^-$
2946.7 *4*	(9/2)$^-$
3126.8 *5*	(5/2)$^-$
3248.9 *8*	(9/2)$^-$

† Adopted values.

ε,β^+ radiations

E(decay)	E(level)	I$\beta^{+\dagger}$	I$\varepsilon^\dagger$	Log ft	I($\varepsilon+\beta^+$)†	Comments
(493.7 *19*)	3248.9		0.04	4.8	0.04	εK=0.8882; εL=0.09518; εM+=0.01663
(615.8 *18*)	3126.8		0.14	4.5	0.14	εK=0.8887; εL=0.09479; εM+=0.01655
(795.9 *18*)	2946.7		0.05	5.1	0.05	εK=0.8891; εL=0.09443; εM+=0.01648
(1056.9 *17*)	2685.7		0.10	5.1	0.10	εK=0.8894; εL=0.09413; εM+=0.01642
(1469.0 *17*)	2273.6	0.0557	0.331	4.9	0.387	av Eβ=188.70 *72*; εK=0.7616 *16*; εL=0.08034 *16*; εM+=0.01401 *3*
2.73×10^3 *35*	1619.93	$\approx$0.80	$\approx$0.22	$\approx$5.3	$\approx$1.02	av Eβ=469.81 *76*; εK=0.1950 *8*; εL=0.02052 *8*; εM+=0.003578 *14*
3.42×10^3 *10*	377.90	41 *8*	1.09 *22*	5.06 *9*	42 *8*	av Eβ=1038.06 *80*; εK=0.02305 *5*; εL=0.002421 *6*; εM+=0.0004221 *1*
3.82×10^3 *10*	0.0	55 *8*	0.93 *13*	5.22 *6*	56 *8*	av Eβ=1216.10 *81*; εK=0.01480 *3*; εL=0.001554 *3*; εM+=0.0002709 *5*

† Absolute intensity per 100 decays.

γ(^{53}Mn)

Iγ normalization: from I(378γ/ΣIβ^+)=0.43 *3* and ΣIβ^+=98.0% *5*. From I(β^+) (1975Bl01) and ε/β^+ (theory).

^{53}Fe ε decay   **1975Bl01** (continued)

$\gamma(^{53}$Mn) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π
377.9 *1*	100	377.90	5/2⁻	0.0	7/2⁻
1288.0 *1*	<0.20	1288.02	3/2⁻	0.0	7/2⁻
1397.6 *8*	0.02 *1*	2685.7	7/2⁻	1288.02	3/2⁻
1619.9 *1*	1.20 *20*	1619.93	9/2⁻	0.0	7/2⁻
2273.5 *3*	0.90 *10*	2273.6	5/2⁻	0.0	7/2⁻
2307.7 *6*	0.03 *1*	2685.7	7/2⁻	377.90	5/2⁻
2685.6 *4*	0.19 *5*	2685.7	7/2⁻	0.0	7/2⁻
2748.8 *4*	0.33 *8*	3126.8	(5/2)⁻	377.90	5/2⁻
2946.6 *4*	0.12 *4*	2946.7	(9/2)⁻	0.0	7/2⁻
3248.8 *8*	0.09 *5*	3248.9	(9/2)⁻	0.0	7/2⁻

[†] For absolute intensity per 100 decays, multiply by 0.42 *3*.

<u>^{53}Fe ε decay</u>   1975Bl01

<u>Decay Scheme</u>

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend

$I_\gamma <\ \ 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

$7/2^-$ 0.0   8.51 min _2_

$\%\varepsilon + \%\beta^+ = 100$ $Q_\varepsilon = 3742.6$ _17_

$^{53}_{26}$Fe$_{27}$

	<u>$I\beta^+$</u>	<u>$I\varepsilon$</u>	<u>Log ft</u>
$(9/2)^-$ 3248.9		0.04	4.8
$(5/2)^-$ 3126.8		0.14	4.5
$(9/2)^-$ 2946.7		0.05	5.1
$7/2^-$ 2685.7		0.10	5.1
$5/2^-$ 2273.6	0.0557	0.331	4.9
$9/2^-$ 1619.93	≈0.80	≈0.22	≈5.3
$3/2^-$ 1288.02			
$5/2^-$ 377.90	41	1.09	5.06
$7/2^-$ 0.0	55	0.93	5.22

$^{53}_{25}$Mn$_{28}$