

<sup>68</sup>Fe β<sup>-</sup> decay 2012Li02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 113, 1735 (2012)	1-Mar-2012

Parent: <sup>68</sup>Fe: E=0.0; J<sup>π</sup>=0<sup>+</sup>; T<sub>1/2</sub>=188 ms 4; Q(β<sup>-</sup>)=8.78×10<sup>3</sup> 71; %β<sup>-</sup> decay=100.0

<sup>68</sup>Fe activity produced in the fragmentation of a <sup>86</sup>Kr beam on a <sup>9</sup>Be target with E(<sup>86</sup>Kr)=130 MeV/nucleon. Fragments were separated in the A1900 at NSCL and identified based on energy loss and time of flight. Measured Eβ, β(t) using double-sided silicon strip detector and Eγ, Iγ using the SeGA array consisting of 16 HPGe detectors.

Other: 1999So20.

<sup>68</sup>Co Levels

E(level) <sup>†</sup>	J <sup>π</sup>	T <sub>1/2</sub>	Comments
0.0+x	1 <sup>+</sup>	1.6 s 3	From the β-decay curve, the <sup>68</sup> Fe decay populates the long-lived isomer of <sup>68</sup> Co. J <sup>π</sup> : log ft=4.9 from <sup>68</sup> Fe β <sup>-</sup> decay (J <sup>π</sup> =0 <sup>+</sup> ).
44.9+x 3	1 <sup>+</sup>		J <sup>π</sup> : log ft=4.9 from <sup>68</sup> Fe β <sup>-</sup> decay (J <sup>π</sup> =0 <sup>+</sup> ).
206.6+x 3			
390.6+x 3			
417.5+x 5			
564.8+x 3			
694.2+x 2			
973.0+x 3	1 <sup>+</sup>		J <sup>π</sup> : log ft=5.1 from <sup>68</sup> Fe β <sup>-</sup> decay (J <sup>π</sup> =0 <sup>+</sup> ).
1021.0+x 2	1 <sup>+</sup>		J <sup>π</sup> : log ft=5.1 from <sup>68</sup> Fe β <sup>-</sup> decay (J <sup>π</sup> =0 <sup>+</sup> ).
1273.9+x 5			
1412.6+x 5			
1591.0+x 4			
1816.4+x 4			

<sup>†</sup> From a least-squares fit to Eγ, by evaluator.

β<sup>-</sup> radiations

E(decay)	E(level)	Iβ <sup>-</sup> <sup>‡</sup> #	Log ft <sup>†</sup>	Comments
(3×10 <sup>3</sup> @ 4)	1816.4+x	1.8 5	5.65 25	av Eβ=3.21×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	1591.0+x	1.4 4	5.83 25	av Eβ=3.32×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	1412.6+x	0.4 3	6.4 4	av Eβ=3.41×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	1273.9+x	4 1	5.46 23	av Eβ=3.48×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	1021.0+x	10 1	5.13 20	av Eβ=3.60×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	973.0+x	11 1	5.10 20	av Eβ=3.62×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	694.2+x	2 1	5.9 3	av Eβ=3.76×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	564.8+x	3 2	5.8 4	av Eβ=3.82×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	417.5+x	1.5 4	6.10 22	av Eβ=3.89×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	390.6+x	4 1	5.68 21	av Eβ=3.91×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	206.6+x	<1	>6.3	av Eβ=4.00×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	44.9+x	32 9	4.86 21	av Eβ=4.08×10 <sup>3</sup> 35
(4×10 <sup>3</sup> @ 4)	0.0+x	31 10	4.88 23	av Eβ=4.10×10 <sup>3</sup> 35

<sup>†</sup> Calculated assuming x=0.

<sup>‡</sup> From absolute γ-ray intensities and total measured β decays.

# Absolute intensity per 100 decays.

@ Estimated for a range of levels.

${}^{68}\text{Fe} \beta^-$  decay 2012Li02 (continued) $\gamma({}^{68}\text{Co})$ 

$E_\gamma$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult.	Comments
44.8 3	24 2	44.9+x	1 <sup>+</sup>	0.0+x	1 <sup>+</sup>	D	$\alpha(\text{exp})=1.0(4)$ . $\alpha(\text{exp})$ : from $\gamma$ -ray intensity balance. Mult.: from $\alpha(\text{exp})$ .
161.5 3	10 1	206.6+x		44.9+x	1 <sup>+</sup>		
183.8 3	6.9 5	390.6+x		206.6+x			
210.9 4	1.5 4	417.5+x		206.6+x			
326.7 3	1.8 3	1021.0+x	1 <sup>+</sup>	694.2+x			
345.7 3	0.9 2	390.6+x		44.9+x	1 <sup>+</sup>		
358.3 4	4 2	564.8+x		206.6+x			
519.9 3	2.7 3	564.8+x		44.9+x	1 <sup>+</sup>		
630.1 3	1.9 4	1021.0+x	1 <sup>+</sup>	390.6+x			
649.4 3	1.8 4	694.2+x		44.9+x	1 <sup>+</sup>		
694.1 3	2.5 4	694.2+x		0.0+x	1 <sup>+</sup>		
883.3 4	1.8 1	1273.9+x		390.6+x			
973.0 3	11 2	973.0+x	1 <sup>+</sup>	0.0+x	1 <sup>+</sup>		
<sup>x</sup> 979.6 3	1.1 4						
1021.2 3	6.7 6	1021.0+x	1 <sup>+</sup>	0.0+x	1 <sup>+</sup>		
1027		1591.0+x		564.8+x			
<sup>x</sup> 1039.3 4	0.5 2						
1206.0 4	0.4 3	1412.6+x		206.6+x			
1251.6 3	1.8 4	1816.4+x		564.8+x			
<sup>x</sup> 1367.8 5	1.2 5						
<sup>x</sup> 1423.5 5	1.5 4						
<sup>x</sup> 1460.6 4	1.4 3						
1545.9 4	1.4 4	1591.0+x		44.9+x	1 <sup>+</sup>		
<sup>x</sup> 2615.3 5	1.1 4						

<sup>†</sup> Absolute intensity per 100 decays.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

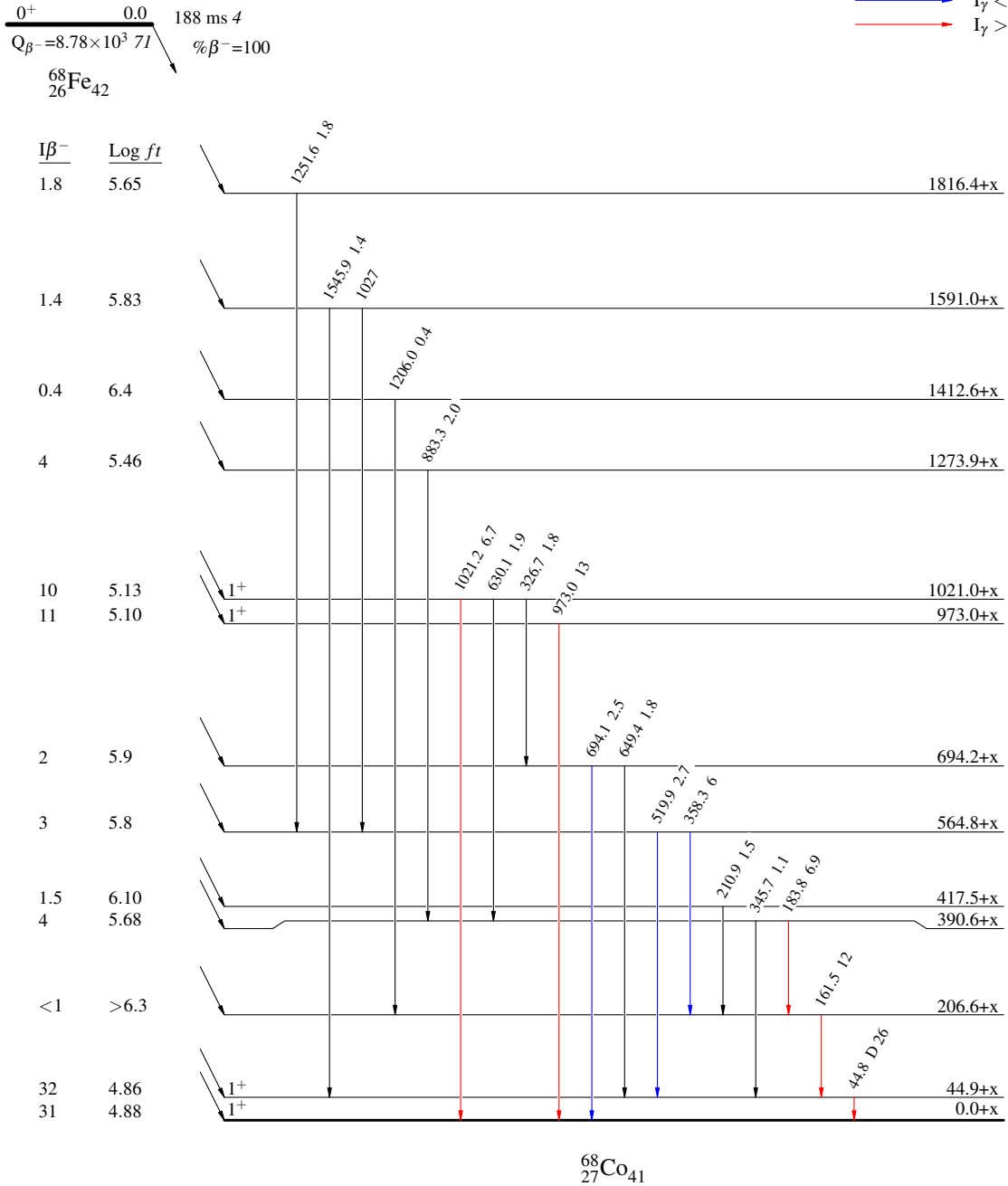
$^{68}\text{Fe} \beta^-$  decay 2012Li02

Decay Scheme

Intensities:  $I_\gamma$  per 100 parent decays

Legend

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



1.6 s 3