

$^{65}\text{Fe}$   $\beta^-$  decay: 0.81 s 2009Pa16

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 111, 2425 (2010)	1-Aug-2009

Parent:  $^{65}\text{Fe}$ :  $E=0$ ;  $J^\pi=(1/2^-)$ ;  $T_{1/2}=0.81$  s 5;  $Q(\beta^-)=8.29\times 10^3$  24;  $\% \beta^-$  decay=100.0

$^{65}\text{Fe}$ -E, $J^\pi$ , $T_{1/2}$ : from 2009Pa16.

$^{65}\text{Fe}$ - $Q(\beta^-)$ : from 2009AuZZ.

[Additional information 1.](#)

$^{65}\text{Fe}$  produced by 30-MeV proton-induced fission reaction on  $^{238}\text{U}$ .

Measured  $E_\gamma$ ,  $I_\gamma$ ,  $\beta\gamma\gamma$ -coin, half-lives with plastic scintillation  $\beta$  detectors and MINIBALL  $\gamma$  detectors. The experiments conducted at LISOL facility at CRC center in Belgium.

$^{65}\text{Fe}$  decay also studied in deep inelastic reaction:  $^{238}\text{U}(^{64}\text{Ni},\text{X})$   $E=430$  MeV. Measured delayed  $\gamma$  rays.

 $^{65}\text{Co}$  Levels

E(level) <sup>†</sup>	$J^\pi$
0.0	(7/2 <sup>-</sup> )
882.54 9	(3/2 <sup>-</sup> )
1094.99 18	(1/2 <sup>-</sup> )
1222.62 10	(3/2 <sup>-</sup> )
1958.8 3	(1/2 <sup>-</sup> , 3/2 <sup>-</sup> )
1996.28 24	(3/2 <sup>-</sup> )
2183.19 22	(1/2 <sup>-</sup> , 3/2 <sup>-</sup> )

<sup>†</sup> Deduced by evaluators from least-squares fit to  $E_\gamma$ 's.

 $\beta^-$  radiations

E(decay)	E(level)	$I\beta^-$ <sup>†‡</sup>	Log $ft$ <sup>†</sup>	Comments
( $6.11\times 10^3$ 24)	2183.19	8 2	5.38 14	av $E\beta=2.79\times 10^3$ 12 $I\beta^-$ : 10 2 (2009Pa16).
( $6.29\times 10^3$ 24)	1996.28	39 4	4.75 10	av $E\beta=2.88\times 10^3$ 12 $I\beta^-$ : 40 6 (2009Pa16).
( $6.33\times 10^3$ 24)	1958.8	19 2	5.08 10	av $E\beta=2.90\times 10^3$ 12 $I\beta^-$ : 20 3 (2009Pa16).
( $7.07\times 10^3$ 24)	1222.62	22 4	5.24 11	av $E\beta=3.26\times 10^3$ 12 $I\beta^-$ : 18 5 (2009Pa16).
( $7.20\times 10^3$ 24)	1094.99	<3	>6.1	av $E\beta=3.32\times 10^3$ 12
( $7.41\times 10^3$ 24)	882.54	11 2	5.63 11	av $E\beta=3.43\times 10^3$ 12 $I\beta^-$ : 12 3 (2009Pa16).

<sup>†</sup> All  $\beta$  feedings, which have been deduced by the evaluators, should be considered upper limits. Thus, associated log  $ft$  values are lower limits, due to possible missed  $\gamma$  rays.

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

$^{65}\text{Fe}$   $\beta^-$  decay: 0.81 s 2009Pa16 (continued) $\gamma(^{65}\text{Co})$ 

$I_\gamma$  normalization: from  $I_\gamma(882.5\gamma+1222.7\gamma+1996.6\gamma)=100$  (evaluators). 2009Pa16 give a normalization factor of 0.20 6, which the evaluators could not reproduce from the level scheme given by 2009Pa16.

$E_\gamma^\dagger$	$I_\gamma^{\ddagger}$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Comments
127.6 3	3.4 12	1222.62	(3/2 <sup>-</sup> )	1094.99	(1/2 <sup>-</sup> )	$I_\gamma$ : 3.2 11 in level scheme figure 4 of 2009Pa16. $E_\gamma=127.7$ 5, $I_\gamma=2$ 1.
212.5 2	11.1 13	1094.99	(1/2 <sup>-</sup> )	882.54	(3/2 <sup>-</sup> )	$I_\gamma$ : 11.3 13 in level scheme figure 4 of 2009Pa16. $E_\gamma=212.0$ 2, $I_\gamma=6$ 2.
340.07 6	47 2	1222.62	(3/2 <sup>-</sup> )	882.54	(3/2 <sup>-</sup> )	$E_\gamma=339.7$ 2, $I_\gamma=40$ 3.
736.1 10	22 2	1958.8	(1/2 <sup>-</sup> , 3/2 <sup>-</sup> )	1222.62	(3/2 <sup>-</sup> )	$E_\gamma=736.1$ 2, $I_\gamma=20$ 1.
774.0 10	6 4	1996.28	(3/2 <sup>-</sup> )	1222.62	(3/2 <sup>-</sup> )	$E_\gamma=773.8$ 5, $I_\gamma=4$ 2.
864.0 10	1.8 10	1958.8	(1/2 <sup>-</sup> , 3/2 <sup>-</sup> )	1094.99	(1/2 <sup>-</sup> )	$E_\gamma=863.8$ 5, $I_\gamma=3$ 1.
882.50 9	100	882.54	(3/2 <sup>-</sup> )	0.0	(7/2 <sup>-</sup> )	$E_\gamma=883.3$ 2, $I_\gamma=100$ .
960.5 2	9 3	2183.19	(1/2 <sup>-</sup> , 3/2 <sup>-</sup> )	1222.62	(3/2 <sup>-</sup> )	$E_\gamma=961.4$ 2, $I_\gamma=13$ 3.
1076.2 3	8.3 18	1958.8	(1/2 <sup>-</sup> , 3/2 <sup>-</sup> )	882.54	(3/2 <sup>-</sup> )	
1088.7 6	3.9 13	2183.19	(1/2 <sup>-</sup> , 3/2 <sup>-</sup> )	1094.99	(1/2 <sup>-</sup> )	$E_\gamma=1089.1$ 2, $I_\gamma=8$ 3.
1113.5 3	15 2	1996.28	(3/2 <sup>-</sup> )	882.54	(3/2 <sup>-</sup> )	
1222.7 2	23 3	1222.62	(3/2 <sup>-</sup> )	0.0	(7/2 <sup>-</sup> )	
1996.6 4	44 4	1996.28	(3/2 <sup>-</sup> )	0.0	(7/2 <sup>-</sup> )	$I_\gamma$ : 45 4 in level scheme figure 4 of 2009Pa16.

<sup>†</sup> Values obtained from  $^{65}\text{Fe}$  decay in delayed spectrum from deep inelastic reaction are given under comments. These values were communicated to the evaluators in an e-mail reply from D. Pauwels on May 12, 2009.

<sup>‡</sup> For absolute intensity per 100 decays, multiply by 0.599 18.

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Decay Scheme

Intensities: Relative  $I_\gamma$

Legend

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

