

¹³⁷Cs β⁻ decay 1983Be18,1996Bi23,1997WaZZ

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli		NDS 108,2173 (2007)	1-Oct-2006

Parent: ¹³⁷Cs: E=0.0; J^π=7/2⁺; T_{1/2}=30.08 y 9; Q(β⁻)=1175.63 17; %β⁻ decay=100.0

Measured: E(β⁻) (1983Be18,1978Ch22,1968Wo02,1966Hs02,1958Yo01), shape of the β spectra

(1983Be18,1978Ch22,1978Gr09,1969Sc23,1966Hs02), longitudinal polarization of β (1975Do14), internal bremsstrahlung (1977We04,1975Ba20).

1996Bi23, 1997WaZZ: measured 283y, HPGe.

¹³⁷Ba Levels

E(level)	J ^π †	T _{1/2}	Comments
0.0	3/2 ⁺		
283.50 10	1/2 ⁺		
661.659 3	11/2 ⁻	2.552 min 1	T _{1/2} : from Adopted Levels.

† Adopted values.

β⁻ radiations

E(decay)	E(level)	Iβ ⁻ †	Log ft	Comments
514.03 23	661.659	94.7 2	9.625 ^{1u} 2	av Eβ=174.32 6 E(decay): from 1983Be18. Others: 513.89 26 (1978Ch22), 511.63 84 (1968Wo02), 514 1 (1966Hs02), 514 3 (1958Yo01). Iβ ⁻ : from Iγ. Others: 94.6 3 (1968Wo02), 94.0 5 (1966Hs02), 92.4 8 (1958Yo01). Iβ=94.6, log f ^{1u} t=8.5 (2006SeZY).
(892.13 20)	283.50	0.00058 8	16.61 ^{2u} 6	Shape: ΔJ=2(yes)-1U (1983Be18,1978Gr09,1969Sc23,1966Hs02). av Eβ=334.65 8 Iβ ⁻ : from Iγ. 2007Se05 have recomputed logf2UT=16.45 12, Iβ=8.7×10 ⁻⁴ 20, superseding their earlier value of 13.5 (2006SeZY).
1176 1	0.0	5.3 2	12.079 17	av Eβ=416.26 8 E(decay): from 1966Hs02, 1176 3 (1958Yo01), 1176 15 (1983Be18). Iβ ⁻ : from 100-Iβ(661 level). Others: 5.45 1 (1983Be18), 5.3 4 (1968Wo02), 5.4 3 (1969Ha05), 6.0 5 (1966Hs02), 7.6 8 (1958Yo01). Shape: ΔJ=2(no) (1966Hs02,1969Sc23,1978Gr09).

† Absolute intensity per 100 decays.

γ(¹³⁷Ba)

1997WaZZ, 1996Bi23 looked for but did not find a transition from the 661 level to the 283.5 level.

2007Ni04: Measured α(K)exp(127.5 keV E3 in ¹³⁴Cs)/α(K)exp(661.7 keV M4 in ¹³⁷Cs)=30.01 15.

2007Ya02: Measured K x-ray ratios obtained in decay vs photo-ionization. Values agreed with previous measurements and theory.

Other: 2006Ha36.

E _γ	I _γ †	E _i (level)	J _i ^π	E _f	J _f ^π	Comments
283.5 1	5.8×10 ⁻⁴ 8	283.50	1/2 ⁺	0.0	3/2 ⁺	E _γ ,I _γ : E _γ from 1997Wa37, %I _γ average of 5.3×10 ⁻⁴ 14 (1996Bi23), 6.1×10 ⁻⁴ 10 (1997Wa37).

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^{137}Cs β^- decay [1983Be18](#),[1996Bi23](#),[1997WaZZ](#) (continued) $\gamma(^{137}\text{Ba})$ (continued)

<u>E_γ</u>	<u>I_γ^\dagger</u>	<u>$E_i(\text{level})$</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>α^\ddagger</u>	<u>Comments</u>
661.657 3	85.1 2	661.659	11/2 ⁻	0.0	3/2 ⁺	M4	0.1124	$\alpha(\text{K})=0.0915$ 13; $\alpha(\text{L})=0.01648$ 23; $\alpha(\text{M})=0.00352$ 5; $\alpha(\text{N+..})=0.000879$ 13 $\alpha(\text{N})=0.000759$ 11; $\alpha(\text{O})=0.0001134$ 16; $\alpha(\text{P})=7.21 \times 10^{-6}$ 11 E_γ : from 1995HeZZ . I_γ : recommended by 1991BaZS on the basis of following values: 85.21 7 (1983Be18), 84.3 5 (1978Gr09), 84.7 7 (1978MeZM), 85.1 4 (1975Go28), 84.56 8 (1973LeZJ), 85.1 4 (1969Ha05). Mult., α : see ^{137}Ba IT decay.

[†] Absolute intensity per 100 decays.

[‡] Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^{137}Cs β^- decay 1983Be18,1996Bi23,1997WaZZ

Decay Scheme

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

Legend

