^{191}Bi $\varepsilon+\beta^+$ decay (12.4 s)   2010Co13

	History		
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 195,368 (2024)	1-Dec-2023

Parent: ^{191}Bi: E=0.0; J^π=(9/2$^-$); T$_{1/2}$=12.4 s *3*; Q(ε)=7052 *10*; %ε+%β^+ decay=49 *10*

Source (^{191}Bi) production is not clear in 2010Co13. The description "the radioactive nuclei were produced in fusion evaporation reactions using ^{14}N, ^{16}O and ^{20}Ne beams on natural Ir (37.3% ^{191}Ir, 62.7% ^{193}Ir), natural Re (37.4% ^{185}Re, 62.6% ^{187}Re) and ^{181}Ta targets, respectively" appears to be from 1985Co06. Authors of 2010Co13 then describe, the radioactive recoils were subsequently ionized in a plasma ion source, mass separated and implanted in an aluminized mylar tape. Single γ-ray energy spectra were recorded with two coaxial HPGe detectors. Measured Eγ, Iγ. Also studied ^{195}Po α decay.

Other reference: 1985Co06 (mention about the ^{191}Bi ε decay for the ^{191}Bi half-life in Table II − no data reported),

^{191}Pb Levels

E(level)	J^π	T$_{1/2}$	Comments
0.0	3/2$^{(-)}$	1.33 min *8*	J^π,T$_{1/2}$: from Adopted Levels.
55 *12*	(13/2$^+$)		E(level): from Adopted Levels.
			J^π: from systematics and HF of the 6699 keV α ray from the (13/2$^+$) parent state in ^{195}Po (2002Va13).
214.7 *5*	(5/2$^-$)		J^π: from Adopted Levels.
724.6 *5*	(13/2$^+$)		E(level): from 2002Va13, based on the γ-ray energy difference to the (13/2$^+$) isomeric level. For total uncertainty propagate 12 keV in quadrature.
			J^π: based on the E0 component in 669.6γ transition to the (13/2$^+$) isomeric level (2002Va13).

γ(^{191}Pb)

E$_\gamma$[†]	I$_\gamma$	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.	α[‡]	Comments
[x]143 *1*								
214.8 *5*		214.7	(5/2$^-$)	0.0	3/2$^{(-)}$			
669.6 *5*	100	724.6	(13/2$^+$)	55	(13/2$^+$)	E0+M1+E2	0.8 *3*	Mult.: from Adopted Gammas.
								α: measured value from Adopted Gammas.
[x]708.26								
[x]820.2								
[x]954.7								
[x]1082.3								
[x]1117.71								E$_\gamma$: A comparable 1117.3 keV *8* γ transition was placed from 1172.5 level (J^π=(15/2$^+$,17/2$^+$)) in the adopted dataset, unlikely to populate from the (9/2$^-$) g.s. in ^{191}Bi ε Decay, if J^π=(15/2$^+$,17/2$^+$).

[†] γ-ray placements are not reported in 2010Co13. The evaluator has placed two γ rays in the level scheme based on the placement in the Adopted Levels,Gammas dataset.

[‡] 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.

[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I$_\gamma$

Legend

•   Coincidence

(9/2$^-$)   0.0   12.4 s *3*

%ε + %β^+=49   Q$_\varepsilon$=7052 *10*

$^{191}_{83}$Bi$_{108}$

669.6 E0+M1+E2 100

(13/2$^+$)   724.6

214.8

(5/2$^-$)   214.7

(13/2$^+$)   55

3/2$^{(-)}$ 0.0   1.33 min *8*

$^{191}_{82}$Pb$_{109}$