^{136}Sb β^- decay 1997Ho15,2008MaZL

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 152,331 (2018)	1-Apr-2018

Parent: ^{136}Sb: E=0; J$^\pi$=(1$^-$); $T_{1/2}$=0.923 s *14*; Q(β^-)=9918 *6*; %β^- decay=100

1997Ho15: ^{136}Sb activity from ^{235}U(n,F) followed by separation with the OSIRIS mass separator. Measured Eγ, Iγ, $\gamma\gamma$, $\beta\gamma$ using two Ge detectors; γ identification based on characteristic $T_{1/2}$ or $\gamma\gamma$ coincidence results.

2008MaZL: ^{136}Sb activity from ^{136}Sn β decay; the ^{136}Sn was produced in spallation of a UC_x target and extracted with the ISOLDE separator. Measured Eγ, γ(t) using a BaF_2 scintillator, a $LaBr_3$(Ce) detector and two HPGe detectors; deduced $T_{1/2}$ using the centroid shift technique.

The decay scheme should be considered incomplete, as evidenced by the total energy release of 8050 keV *30* as calculated by the code RADLST, compared with the decay Q value of 9918 keV *6*. Beta feedings and log *ft* values should be taken as upper and lower limits, respectively.

^{136}Te Levels

E(level)[‡]	J$^\pi$[†]	$T_{1/2}$	Comments
0.0	0$^+$		
606.64 *5*	2$^+$	42 ps *8*	$T_{1/2}$: from centroid shift technique in 2008MaZL; authors state that result is preliminary.
1031.1 *4*	4$^+$		
1568.36 *7*	(2$^+$)		
1904.62 *20*	(1,2$^+$)		
2033.27 *10*	(1,2$^+$)		
2044.01 *12*	(0$^+$,1,2)		
2060.82 *20*	(1,2$^+$)		
2211.57 *12*	(0$^+$,1,2)		
2573.15 *9*	(0$^+$,1,2)		
2633.05 *21*	(0$^+$,1,2)		
2801.1 *3*	(0$^+$,1,2)		
2821.0 *10*	(0,1,2)		
3583.3 *4*	(0$^+$,1,2)		
3714.5 *4*	(0$^+$,1,2)		
4768+x			E(level): S(n)(^{136}Te)=4768 *3* (2017Wa10), with x < 5150 from Q(β^-)(^{136}Sb decay)=9918 *6* and S(n)(^{136}Te).

† From the Adopted Levels.
‡ From a least-squares fit to Eγ's, by evaluator.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(2.6×10^3[#] *26*)	4768+x	18.5		Iβ^-: from %β^-n=18.5 *18* for ^{136}Sb.
(6204 *6*)	3714.5	0.3	7.2	av Eβ=2750.3 *29*
(6335 *6*)	3583.3	0.3	7.3	av Eβ=2812.3 *29*
(7097 *6*)	2821.0	0.3	7.5	av Eβ=3172.2 *29*
(7117 *6*)	2801.1	0.8	7.1	av Eβ=3181.6 *29*
(7285 *6*)	2633.05	0.7	7.2	av Eβ=3260.9 *29*
(7345 *6*)	2573.15	1.3	6.9	av Eβ=3289.1 *29*
(7706 *6*)	2211.57	1.5	7.0	av Eβ=3459.5 *29*
(7857 *6*)	2060.82	1.2	7.1	av Eβ=3530.6 *29*
(7874 *6*)	2044.01	1.6	7.0	av Eβ=3538.5 *29*
(7885 *6*)	2033.27	3.2	6.7	av Eβ=3543.5 *29*
(8013 *6*)	1904.62	1.3	7.1	av Eβ=3604.1 *29*
(8350 *6*)	1568.36	1.5	7.1	av Eβ=3762.3 *29*
(8887 *6*)	1031.1	<0.5	>7.7	av Eβ=4014.8 *29*

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^{136}Sb β^- decay 1997Ho15,2008MaZL (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^- †‡	Log ft	Comments
(9311 6)	606.64	7.4	6.6	av Eβ=4213.9 29
(9918 6)	0.0	59.7	5.8	av Eβ=4497.9 28 Iβ^-: from ΣI(γ+ce)(to g.s.) + Iβ^- (to g.s.)=100−%β^-n, with %β^-n=18.5 18 for ^{136}Sb.

† From intensity balance at each level, except where noted. As the decay scheme is incomplete (see the general comments), these should be taken as upper limits.
‡ Absolute intensity per 100 decays.
\# Estimated for a range of levels.

γ(^{136}Te)

Iγ normalization: From absolute intensity of 607γ = 18% 6, determined through simultaneous β and γ counting (1997Ho15).

E$_\gamma$	I$_\gamma$ ‡	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult. †	α #	Comments
424.5 4	2.7 10	1031.1	4$^+$	606.64	2$^+$	E2	0.01310	α(K)=0.01109 16; α(L)=0.001614 24; α(M)=0.000325 5; α(N)=6.33×10^{-5} 9; α(O)=6.48×10^{-6} 10 E$_\gamma$,I$_\gamma$: Unresolved doublet; overlaps with the 424.7γ from ^{135}Te which is populated in β^-n decay. Iγ from coincidence data.
465.0 10	2.0 5	2033.27	(1,2$^+$)	1568.36	(2$^+$)			
606.62 5	100	606.64	2$^+$	0.0	0$^+$	E2	0.00482	α(K)=0.00413 6; α(L)=0.000556 8; α(M)=0.0001112 16; α(N)=2.18×10^{-5} 3; α(O)=2.29×10^{-6} 4 %Iγ=18 6. %Iγ: Absolute intensity per decay measured by simultaneous β and γ counting (1997Ho15).
777.0 10	1.6 4	2821.0	(0,1,2)	2044.01	(0$^+$,1,2)			
961.72 5	17.1 8	1568.36	(2$^+$)	606.64	2$^+$			
1004.79 5	7.0 4	2573.15	(0$^+$,1,2)	1568.36	(2$^+$)			
1298.0 10	4.0 10	1904.62	(1,2$^+$)	606.64	2$^+$			
1426.56 10	5.0 7	2033.27	(1,2$^+$)	606.64	2$^+$			
1437.37 10	10.3 8	2044.01	(0$^+$,1,2)	606.64	2$^+$			
1604.92 10	8.6 6	2211.57	(0$^+$,1,2)	606.64	2$^+$			
^{x}1775.6 2	2.6 3							
1904.6 2	2.9 3	1904.62	(1,2$^+$)	0.0	0$^+$			
2026.4 2	3.9 4	2633.05	(0$^+$,1,2)	606.64	2$^+$			
2033.5 2	11.3 8	2033.27	(1,2$^+$)	0.0	0$^+$			
2060.8 2	6.6 5	2060.82	(1,2$^+$)	0.0	0$^+$			
2194.4 3	4.6 3	2801.1	(0$^+$,1,2)	606.64	2$^+$			
^{x}2595.5 3	3.7 3							
^{x}2721.9 3	2.5 3							
^{x}2727.0 3	1.9 2							
^{x}2739.9 4	3.3 3							
^{x}2915.3 4	1.2 4							
2976.6 4	1.6 3	3583.3	(0$^+$,1,2)	606.64	2$^+$			
3107.8 4	1.6 3	3714.5	(0$^+$,1,2)	606.64	2$^+$			
^{x}3203.5 4	1.6 3							

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^{136}Sb β^- decay 1997Ho15,2008MaZL (continued)

γ(^{136}Te) (continued)

† From the Adopted Gammas.
‡ For absolute intensity per 100 decays, multiply by 0.18 *6*.
# 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: $I_{(\gamma+ce)}$ per 100 parent decays