

¹⁴⁰Sb β⁻ 2n decay 2017Mo12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 146, 1 (2017)	30-Sep-2017

Parent: ¹⁴⁰Sb: E=0.0; J^π=(3⁻); T_{1/2}=173 ms 12; Q(β⁻2n)=5620 SY; %β⁻2n decay=?

¹⁴⁰Sb-J^π: Proposed by 2017Mo12 based on observed feeding pattern, but 4⁻ cannot be completely ruled out.

¹⁴⁰Sb-T_{1/2}: From γ(t) in 2017Mo12.

¹⁴⁰Sb-Q(β⁻2n): Estimated by evaluator based on Q(β⁻)=12640 600 (syst) for ¹⁴⁰Sb, S(2n)=7020 60 (syst) for ¹⁴⁰Te (2017Wa10).

¹⁴⁰Sb-%β⁻2n decay: ≈0.08 is estimated by 2017Mo12 based on measured γ-ray intensities. ¹⁴⁰Sb also decays to ¹³⁹Te by β-delayed single- neutron emission with P_n=23% 4 (2017Mo12).

2017Mo12: Source of ¹⁴⁰Sb was produced by in-flight fission of ²³⁸U on a ⁹Be target at E=345 MeV/nucleon at the Radioactive Isotope Beam Factory (RIBF) at the RIKEN Nishina Center. Fragments were separated by the BigRIPS separator and identified through a zero-degree spectrometer (ZDS) based on the Bρ-ΔE-tof method. Separated and selected ions were implanted into a wide-range active-silicon-strip stopper array for beta and ion detector (WAS3ABi), consisting of five layers of 1-mm-thick double-sided silicon-strip detectors (DSSSDs); γ rays were detected by the EUROBALL-RIKEN HPGe cluster array (EURICA). Measured E_γ, I_γ, βγ-coin, βγγ-coin, γ(t). Deduced levels, J, π, parent T_{1/2}, β-decay branchings.

¹³⁸Te Levels

E(level) [†]	J ^π [‡]	Comments
0	0 ⁺	
460.8 5	(2 ⁺)	%β ⁻ 2n=2.0 8 from ¹⁴⁰ Sb decay (2017Mo12).
903.6 7	(4 ⁺)	%β ⁻ 2n=5.6 23 from ¹⁴⁰ Sb decay (2017Mo12).

[†] From E_γ.

[‡] From Adopted Levels.

γ(¹³⁸Te)

E _γ [†]	I _γ	E _i (level)	J _i ^π	E _f	J _f ^π
442.8 5	17 12	903.6	(4 ⁺)	460.8	(2 ⁺)
460.8 5	24 11	460.8	(2 ⁺)	0	0 ⁺

[†] Energies and placements are from 2015Le14 of the same group as 2017Mo12.

^{140}Sb $\beta^{-}2n$ decay 2017Mo12

Decay Scheme

Intensities: Relative I_{γ}

Legend

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

