

Adopted Levels

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

$Q(\beta^-)=11.5\times 10^3$ *11*; $S(n)=2.2\times 10^3$ *11*; $S(p)=11720$ *SY*; $Q(\alpha)=-4990$ *SY* [2017Wa10](#)

$\Delta S(p)=1140$, $\Delta Q(\alpha)=1110$ ([2017Wa10](#)).

$S(2n)=5860$ *1060*, $S(2p)=28290$ *1140* (syst), $Q(\beta^-n)=7010$ *1060*, $Q(2\beta^+)=17760$ *1060* ([2017Wa10](#)).

First identification of ^{138}Sb nuclide by [1994Be24](#) via $^{208}\text{Pb}(\text{U},f)$ (See [2013Ka01](#)).

[2015Le14](#): Source of ^{138}Sb was produced by in-flight fission of ^{238}U 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 $B\rho$ - 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), surrounded by two 2-mm-thick plastic scintillators. γ rays were detected by the EUROBALL-RIKEN HPGe cluster array (EURICA). Measured $\beta\gamma(t)$, β -decay feedings. Deduced ground state half-life, J , π . Comparisons with shell-model calculations. Energy systematics of Te isotopes.

[2011Ar18](#): ^{138}Sb ions was prepared by bombardment of UC_x target with 1 GeV protons followed by selective ionization with the Resonance Ionization Laser Ion Source (RILIS) and high-resolution mass separator at ISOLDE-CERN facility. Measured delayed neutrons to deduce half-life and P_n (delayed neutron emission probability). Comparison with calculations for spherical and nonspherical shapes. The new data incorporated in nucleosynthesis calculations of the r process.

[1998Do08](#), [1994Be24](#): identified in $^{208}\text{Pb}(^{238}\text{U},f)$, $E=750$ MeV/nucleon, using the FRS fragment mass separator.

Mass measurement: [2016Kn03](#).

Theoretical nuclear structure calculations:

[2011Iz02](#): calculated β -delayed fission, β -transition strength functions.

[2008Ga15](#): calculated change in decay-rate for decays to bound states and continuum.

[2007Ot03](#): calculated proton single-particle level energies.

[2017Ko24](#), [2007Ma09](#), [2005Ni02](#), [2003Bo06](#): calculated β -decay half-life.

 ^{138}Sb Levels

E(level)	J^π	$T_{1/2}$	Comments
0	(3 ⁻)	348 ms <i>15</i>	$\% \beta^- = ?$; $\% \beta^- n = 72.8$ (2011Ar18); $\% \beta^- 2n = ?$ Theoretical $\% \beta^- n = 37.3$, $\% \beta^- 2n = 30.5$ (2003Mo09). J^π : (3 ⁻) tentatively proposed by 2015Le14 based on strong feedings to (2 ⁺) and (4 ⁺) states in ^{138}Te . $T_{1/2}$: weighted average of 346 ms <i>19</i> from $\beta\gamma(t)$ in 2015Le14 , and 350 ms <i>15</i> measured by 2011Ar18 from decay curve for delayed neutrons. Other 296 ms <i>35</i> from a preliminary analysis of decay curve in 2006KeZZ . Theoretical value: 597 ms (2003Mo09).