^{101}Sn εp decay (2.20 s) 2019Pa16,2012Lo08,2007Ka15

History

Type	Author	Citation	Literature Cutoff Date
Update	Balraj Singh and Jun Chen	ENSDF	15-Sep-2021

Parent: ^{101}Sn: E=0; J^π=(5/2$^+$,7/2$^+$); $T_{1/2}$=2.20 s *5*; Q(εp)=666×10[1] *30*; %εp decay=23.0 *8*

^{101}Sn-J^π: As discussed by 2020Pa25 and 2012Lo08, and also proposed by 2007Ka15 based on the two lowest orbitals ($d_{5/2}$, $g_{7/2}$) above N=50 gap in shell-model configuration.

^{101}Sn-$T_{1/2}$: Weighted average of 2.22 s *5* (2019Pa16, 2020Pa25, weighted average of 2.18 s *9* from β-correlated decay curve and 2.24 s *6* from βp-correlated decay curve); 2.1 s *2* (2012Lo08, decay curves of time correlations between implantations and decay radiation); 2.20 s *10* (2011StZV); 1.9 s *3* (2007Ka15) and 1.3 s *5* (2007Se04, also 2009Se06). Others: 1.5 s *6* (Ph.D. thesis by A. Stolz, Munich Technical University, 2001; work at GSI); 3 s *1* (1995Ja16). Weighted average is the same if the values from 1995Ja16 and the thesis are also included.

^{101}Sn-Q(εp): From 2021Wa16.

^{101}Sn-%εp decay: %εp=23.0 *8* from weighted average of 23.6 *8* (2019Pa16,2020Pa25) and 22 *1* (2012Lo08) for ^{101}Sn decay. Other: 19.6 *1* (2011StZV, uncertainty of 0.1 seems unrealistically small, probably should be 1.0); 14 *+10−6* (2007Ka15); 26% for J^π(^{101}Sn g.s.)=5/2$^+$ and 14 for 7/2$^+$ choice.

Q value updated to 2021Wa16 value, B. Singh, Sept 15, 2021. No new references since Sept 15, 2021.

2019Pa16, 2020Pa25: E(^{124}Xe)=345 MeV/nucleon beam incident on a 740 mg/cm^2 thick ^{9}Be target at the RIKEN-RIBF facility. The identification of the nuclide of interest was made through the BigRIPS separator and the ZeroDegree spectrometer by determining the atomic number and the mass-to-charge ratio of the ion using the tof-Bρ-ΔE method. The secondary beam was stopped in the double-sided silicon strip detector of the WAS3ABi spectrometer. The γ rays were detected by EURICA array comprising of 84 HPGe detectors. Measured Eγ, βγ-coin, βp-coin, βpγ-coin, half-lives by βγ(t), βp(t). Comparisons with previous experimental data and shell-model calculations.

2012Lo08: ^{101}Sn produced from fragmentation of 120 MeV/nucleon ^{112}Sn beam on a 195 mg/cm^2 ^{9}Be target at the National Superconducting Cyclotron Laboratory (NSCL). Fragments separated by the A1900 Fragment Separator and the Radio Frequency Fragment Separator (RFFS). Ions were implanted in the double-sided silicon strip detector (DSSD). Detection system: NSCL Beta Counting System in conjunction with the SeGA Array of 16 HPGe detectors. Measured Eγ, Iγ, β spectra, E(p), I(p), βγ-coin, βp-coin, γβp-coin, half-life, β-delayed proton emission probability. Total of 458 βp coin events identified. No evidence was found for a 794γ from 4$^+$ to 2$^+$ in ^{100}Cd (2012Lo08).

2007Ka15: ^{101}Sn produced by the reaction ^{50}Cr(^{58}Ni,α3n) at 4.9 MeV/nucleon and 5.2 MeV/nucleon at GSI facility. Measured Eγ, γγ, βγ, β-delayed protons, isotopic half-life using three Si detectors, two GSI Sup-Clover detectors and one smaller Clover detector.

2007Se04: ^{101}Sn produced by the reaction ^{46}Ti(^{58}Ni,3n) at 192 MeV at Argonne Tandem-Linac facility. The recoiling fragments were separated using fragment mass analyzer (FMA) and implanted into double-sided Si strip (DSSD) detectors, recoil-decay tagging method employed to study γ rays in coin with delayed protons. Gamma rays detected with Gammasphere array of 99 Ge detectors. Measured half-life of ^{101}Sn from time distribution of delayed protons from ^{101}Sn decay associated with prompt γ ray at 172 keV in ^{101}Sn. 2009Se06 and 2008SeZZ are conference papers from the same group.

1995Ja16: ^{101}Sn produced by ^{50}Cr(^{58}Ni,2p5n) followed by mass separation. Measured delayed protons, $T_{1/2}$.

Others: fragmentation of ^{124}Xe in ^{9}Be(^{124}Xe,X) reaction (1994Sc22) and in Ni(^{112}Sn,X) reaction (1994Le27).

The delayed proton spectrum (2007Ka15) is peaked around 3 MeV.

Additional information 1.

^{100}Cd Levels

E(level)	J^π	Comments
0	0$^+$	
1004	2$^+$	J^π: from Adopted Levels.

^{101}Sn εp decay (2.20 s) 2019Pa16,2012Lo08,2007Ka15 (continued)

γ(^{100}Cd)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
1004	1004	2^+	0	0^+	Four counts were seen in coin with proton events (2012Lo08).

Delayed Protons (^{100}Cd)

E(^{100}Cd)	I(p)†	Comments
0	13 *5*	I(p): 23.0 *8* − %I(p) decay to the first 2^+ state.
1004	10 *5*	I(p): from 2020Pa25. Other: 11 *3* (2011StZV).

† Absolute intensity per 100 decays.

^{101}Sn εp decay (2.20 s) 2019Pa16,2012Lo08,2007Ka15

Decay Scheme