Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

S(n)=14780 *SY*; S(p)=730 *SY*; Q(α)=−3910 *SY* 2017Wa10
Estimated uncertainties (2017Wa10): 500 for S(n) and Q(α), 420 for S(p).
Q(εp)=9640 *320*, S(2n)=32150 *580*, S(2p)=3960 *310* (syst,2017Wa10).
Measurements:
1995Ry03 (also 1995Le14): few events of ^{98}In were identified by analyzing fragments by tof method in Ni(^{112}Sn,X) reaction at E=58 MeV/nucleon.
2001Ki13, 2002Fa13, 2002StZZ, 2007WeZX: ^{98}In produced and identified in ^{9}Be(^{112}Sn,X) at 1 GeV/nucleon followed by isotopic fragment separation.
2012Lo08, 2008Ba53: ^{98}In produced from fragmentation of a ^{112}Sn beam at E=120 MeV/nucleon 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), $\beta\gamma$-coin, βp-coin, $\gamma\beta$p-coin, half-life, β-delayed proton emission probability. Production σ=3.8 pb *12* (2008Ba53) from 216±21 events assigned to ^{98}In. Total of 20 and 40 βp coin events identified for the ground state and isomer, respectively. Decay curves were fitted with Poisson distribution using log-likelihood function by consideration of decay of parent, daughter and grand-daughter.
2011StZV: ^{98}In produced in ^{9}Be(^{124}Xe,X), E=1 GeV/nucleon at GSI. Measured half-life from implants-β-correlated decay curve.
2019Pa16: 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, $\beta\gamma$-coin, βp-coin, βpγ-coin, half-lives by $\beta\gamma$(t), βp(t). Deduced β^+ end-point energies, Q(ε) value, excitation energy of the (9$^+$) isomer. Comparisons with previous experimental data and shell-model calculations.
Additional information 1.
Theory references: consult the NSR database (www.nndc.bnl.gov/nsr/) for 9 primary references, 8 dealing with nuclear structure calculations, and one with decay modes and half-life.

^{98}In Levels

E(level)	J$^\pi$	T$_{1/2}$	Comments
0	(0$^+$)	30 ms *1*	%ε+%β^+=100; %εp<0.13 (2019Pa16) T=1 %εp: measured by 2019Pa16. Other: 5.5 *+30−20* (2012Lo08, based on observation of 20 βp coincidence events. Uncertainty from e-mail reply of August 1, 2012 from G. Lorusso). 2019Pa16 suggest that large %εp reported in 2012Lo08 probably contributed by the (9$^+$) isomeric activity. J$^\pi$: β^+ decay proceeds mostly to the ground state of ^{98}Cd with T=1 through a superallowed β transition as log *ft*=3.57 *8*. Also J^π=0$^+$ and T=1 from shell-model predictions in 1997He24. See also shell-model calculations by 2012Co07 for energies of proton hole-neutron hole multiplet in ^{98}In. T$_{1/2}$: weighted average of 30 ms *1* (2019Pa16, $\beta\gamma$-correlated decay curve); 47 ms *13* (2012Lo08 and 2008Ba53, decay curves of time correlations between implantations and decay radiation); 32 ms *6* (2011StZV, implants-β-correlated decay curve); 32 ms *+32−11* (2001Ki13,2002StZZ,2002Fa13,2007WeZX).
0.82×10^3 *73*	(9$^+$)	0.89 s *2*	%ε+%β^+=100; %εp=44 *2* (2019Pa16) %εp: measured by 2019Pa16. Other measurement: 19 *2* (2012Lo08, from observation of 40 βp-coin events). E(level): from $\beta^+\gamma$-coin data (2019Pa16). Other: <500 keV from systematics (2017Au03). T$_{1/2}$: weighted average of 0.89 s *2* (2019Pa16, weighted average of 0.99 s *7* from $\beta\gamma$-decay curve and 0.88 s *2* from βp-decay); 1.27 s *30* (2012Lo08, decay curves of time correlations

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Adopted Levels (continued)

^{98}In Levels (continued)

E(level)	J^{π}	$T_{1/2}$	Comments
			between implantations and decay radiation), 0.86 s *21* (2011StZV, implants-β-correlated decay curve), and 1.2 s *+12−4* (2001Ki13,2002StZZ,2002Fa13). Other: 0.66 s *40* reported in 2008Ba53 (earlier publication of 2012Lo08). J^{π}: proposed by 2019Pa16 from β feeding to (8^+) state in ^{98}Cd with log *ft*≈5.0, and strong population of $(15/2^+)$, $(17/2^+)$ and $(21/2^+)$ levels in ^{97}Ag from β^+p decay through minimum angular momentum for the proton, which for 9^+ assignment would be L=1.