

Adopted Levels

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Sukhjeet Singh		ENSDF	08-Mar-2022

$Q(\beta^-)=5266$ 24; $S(n)=3788$ 26; $S(p)=6660$ SY; $Q(\alpha)=4330$ SY [2021Wa16](#)

Estimated uncertainties: 200 for S(p), 300 for Q(α) ([2021Wa16](#)).

$S(2n)=9385$ 27, $S(2p)=15820$ 300 (syst) ([2021Wa16](#)).

[2010Ch19](#): ^{224}At nuclide was discovered in the $^9\text{Be}(^{238}\text{U},\text{X})$ reaction; beam energy 670 MeV/nucleon with target=4 g/cm² using Fragment Recoil Separator facility at GSI. The fragments were then injected into the cooler electron storage ring ESR. Measured mass and half-life by time-resolved Schottky Mass Spectrometry technique.

[2010Al24](#) measured σ . Figure 2 of this reference plots σ versus A. Statistical uncertainty <10%, and systematic uncertainty \approx 20% Comparisons of measured σ with model predictions using the computer codes COFRA and EPAX; COFRA provides an overall good description of the measured σ .

Measured mass excess=27711 keV 22 ([2012Ch19](#); also [2010Ch19](#)).

Theoretical calculations: two references extracted from the NSR database are listed in document records.

[Additional information 1](#).

 ^{224}At Levels

E(level)	$T_{1/2}$	Comments
0	1.3 min +23-4	$^{\pi}\beta^-=?$ $T_{1/2}$: for ionized (hydrogen-like) ^{224}At (2010Ch19), value quoted in 2010Ch19 is 76 s +138-23. Half-life is measured from number of stored $^{224}\text{At}^{84+}$ ions. J^{π} : 1 or 2 from coupling of 1/2 for proton and 3/2 for neutron orbitals predicted in 2019Mo01 calculations. $J^{\pi}=2^+$ from systematics (2021Ko07).