

¹⁹⁷At α decay (2.0 s) [1999Sm07](#),[1986Co12](#),[2014Ka23](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 143, 1 (2017)	31-Mar-2017

Parent: ¹⁹⁷At: E=52 10; J ^{π} =(1/2⁺); T_{1/2}=2.0 s 2; Q(α)=7104 3; % α decay \leq 100.0

¹⁹⁷At-Q(α): From [2017Wa10](#). E_{ex}(¹⁹⁷At) from α -ray energy differences ([1986Co12](#)).

¹⁹⁷At-T_{1/2}: From [1999Sm07](#). Other values: 3.7 s 25 ([1986Co12](#)), 1.1 s +11-4 ([2005Uu02](#)), and 2.8 s +38-10 ([2014Ka23](#)).

¹⁹⁷At-% α decay: From ¹⁹⁷At Adopted Levels.

Other: [2005Uu02](#).

[1999Sm07](#): ¹⁹⁷At produced from ¹⁶⁵Ho(³⁶Ar,4n), E=178 MeV; Recoiling fusion-evaporation products were magnetically separated in-flight from the primary beam and fission products using the RITU gas-filled recoil separator. The recoils were implanted into a 16-strip Si detector, three Clover-type Ge detectors for prompt γ -ray and another four Ge detectors for delayed γ ray detection. Measured E γ , E α , and half life using recoil-decay-tagging technique.

[1986Co12](#): Sources from ^{185,187}Re(²⁰Ne,xn), E(²⁰Ne) \leq 240 MeV; helium-jet transport; measured E α , I α (silicon surface-barrier detectors).

[2014Ka23](#): ¹⁹⁷At obtained from ²⁰¹Fr decay. ²⁰¹Fr produced in ¹⁴⁹Sm(⁵⁶Fe,p3n), E=275 MeV; Target=370 μ g/cm² thick enriched to 96.9% in ¹⁴⁹Sm. Evaporation residues were separated using SHIP facility at GSI, and implanted into the detection system consisting of 16-strip position sensitive Si detectors (PSSD), a pack of six Si strip detectors (BOX) at the back to detect escaping α particles, and three time-of-flight detectors in front of PSSDs. Measured position and time correlations between evaporation residues (Er) and α events, E α , half-lives of ground states and isomers of ²⁰¹Fr and ¹⁹⁷At, Er- α correlations.

¹⁹³Bi Levels

E(level)	J ^{π}	T _{1/2}	Comments
308 7	(1/2 ⁺)	3.12 s 26	E(level),J ^{π} ,T _{1/2} : From Adopted Levels.

α radiations

E α	E(level)	I α [†]	HF	Comments
6707 4	308	100	\geq 0.84	HF: Using r ₀ (¹⁹³ Bi)=1.529, average of r ₀ (¹⁹² Pb)=1.506 6 and r ₀ (¹⁹⁴ Po)=1.551 10 (1998Ak04). 1999Sm07 obtained a HF=1.2 8, assuming I(α)=100%. E α : Weighted average of 6707 5 (1999Sm07 , 2014Ka23) and 6706 9 (2005Uu02). Other: 6707 (1986Co12). Reduced α width δ^2_{α} =70 keV +90-30 (2014Ka23).

[†] For absolute intensity per 100 decays, multiply by \leq 1.0.