

¹⁷³Au α decay (25.5 ms) 1999Po09,2004GoZZ,2012Th13

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 209,1 (2026)	1-Oct-2025

Parent: ¹⁷³Au: E=0.0; J ^{π} =(1/2⁺); T_{1/2}=25.5 ms 10; Q(α)=6836 5; % α decay \approx 94

¹⁷³Au-E,J ^{π} : from the Adopted Levels of ¹⁷³Au in ENSDF (update).

¹⁷³Au-T_{1/2}: weighted average of 26.3 ms 12 (2012Th13 α - γ (t)) and 25 ms 1 (2001Ko44, 2004GoZZ). Others: 20 ms +9-6 (1999Po09), 26.3 ms 12 in the Adopted Levels of ¹⁷³Au in ENSDF (update).

¹⁷³Au-Q(α): from 2021Wa16.

¹⁷³Au-% α decay: 94 19 in 1999Po09. Note that the reported % α branch in 1999Po09 exceeds 100 within the uncertainty.

1999Po09: Source was obtained from ¹⁷⁷Tl, produced from ¹⁰²Pd(⁷⁸Kr+1n2n) fusion-evaporation channel, E=370 MeV, at the Argonne ATLAS accelerator facility. 78% enriched target. After passing through the parallel grid avalanche counter (PGAC) and ions were implanted into a double-sided silicon strip detector (DSSD). Measured E α , ¹⁷³Au % α branching and half-life.

2004GoZZ: ¹⁷³Au was produced from ⁹²Mo(⁸⁴Sr,X), E=390, 395 MeV; The ⁸⁴Sr beam was delivered by the ATLAS superconducting linear accelerator at ANL. The targets were isotopically enriched (\approx 98%) and had a thickness \approx 0.7 mg/cm². Prompt γ rays were detected using 101 escape-suppressed Ge detectors of Gammasphere. The recoiling evaporation residues were separated by Fragment Mass Analyzer and implanted in a thick DSSD – Recoil Decay Tagging. Measured E α , $\alpha\alpha$ coin, ¹⁷³Au half-life.

2012Th13: ¹⁷³Au nuclei were produced via fusion-evaporation reactions by bombarding a 0.5 mg/cm² ⁹²Mo target of 97% isotopic enrichment with a beam of ⁸⁴Sr¹⁶⁺ ions provided by the K130 cyclotron of the Accelerator Laboratory of the University of Jyväskylä with E=392 MeV for about 140 hours and E=400 MeV for about 145 hours with an average beam intensity of 150 enA. Prompt γ rays were detected by 34 HPGe detectors at the target position; recoiling residues were separated using the RITU He-filled magnetic separator and implanted into a 300- μ m-thick DSSD in the GREAT spectrometer at the focal plane; delayed γ rays were detected by Ge detectors in the GREAT spectrometer. Measured E α , I α , E γ , I γ , recoil- α -correlation, $\alpha\gamma$ -delayed coin, α -tagged $\gamma\gamma$ -coin, α (t). Deduced isomers, Q α , α -decay branching ratios, T_{1/2}, reduced widths, hindrance factors and mass excesses.

Other: 2001Ko44.

¹⁶⁹Ir Levels

E(level)	J ^{π} [†]	T _{1/2} [†]
0.0	(1/2 ⁺)	0.570 s 30

[†] From Adopted Levels.

α radiations

E α	E(level)	I α [‡]	HF [†]	Comments
6683 6	0.0	100	\approx 1.9	E α : weighted average of 6688 14 (2012Th13), 6672 6 (1999Po09) and 6690 5 (2004GoZZ). Other E α : 6690 (2001Ko44; probably superseded by 2004GoZZ). Correlated with 6005 α from ¹⁶⁹ Ir (2004GoZZ).

[†] The nuclear radius parameter r₀(¹⁶⁹Ir)=1.5529 80 is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides: ¹⁶⁸Os=1.5578 40 ¹⁷⁰Pt=1.548 12 in 2020Si16.

[‡] For absolute intensity per 100 decays, multiply by \approx 0.94.