^{174}Hg α decay 1999Se14,1997Uu01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

Parent: ^{174}Hg: E=0.0; $J^\pi=0^+$; $T_{1/2}$=1.9 ms *+4−3*; Q(α)=7233 *6*; %α decay=99.7 *3*

^{174}Hg-$T_{1/2}$: 1.9 ms *+4−3* (1999Se14), 2.1 ms *+18−7* (1997Uu01).

^{174}Hg-%α decay: Gross β decay theory calculations predict partial β half-life to be≈1 s (1973Ta30) and 1997Mo25 predict 0.35 s, implying %ε+%β^+≈0.2 or 0.5, respectively; based on this, the evaluator suggests %α=99.7 *3*. α decay of ^{174}Hg has been observed (1997Uu01,1999Se14), but %α has not been measured.

1999Se14: produced ^{174}Hg parent using ^{96}Ru(^{80}Kr,2n), E=375 MeV, isotopically enriched target; fragment mass analyzer, double-sided Si strip detector, observed spatial and time correlations between fragment implantation and its decays; measured Eα, parent $T_{1/2}$.

1997Uu01: produced ^{174}Hg using ^{144}Sm(^{36}Ar,6n) reaction at E(^{36}Ar)=180-230 MeV; 88.6% ^{144}Sm target; gas-filled recoil separator with PIPS detector in focal plane (FWHM=27 keV at 6 MeV); observed correlated recoil-α-α chains; measured Eα, parent and daughter $T_{1/2}$.

Deformation β(^{170}Pt)=0.249 extracted by 2012Qi15 from experimental α decay data using modified two-potential approach.

^{170}Pt Levels

E(level)	J^π
0.0	0^+

α radiations

Eα	E(level)	Iα[‡]	HF[†]	Comments
7067 *6*	0.0	100	1.0	Eα: weighted average of 7069 *11* (1997Uu01) and 7066 *8* (1999Se14). This Eα implies Q(α)(^{174}Hg)=7233 *6*; the Q(α) initially published in 1999Se14 differs because it erroneously included a +29.7 keV screening correction (see erratum for 1999Se14).

[†] r_0=1.548 *12*, assuming HF=1.0 for 7067α, $T_{1/2}$(^{174}Hg)=1.9 ms *+4−3* (1999Se14), Q(α)(^{174}Hg)=7233 *6* (based on adopted Eα) and %α(^{174}Hg)=99.7 *3*.

[‡] For absolute intensity per 100 decays, multiply by 0.997 *3*.