^{174}Au α decay (139 ms) 2004GoZZ,2002Ro17,1983Sc24

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}Au: E=0.0; J^π=(3$^-$); $T_{1/2}$=139 ms *3*; Q(α)=6699 *7*; %α decay=90 *6*

^{174}Au-$T_{1/2}$: from 2002Ro17 based on 6540α(t). Other: 120 ms *20* (1983Sc24, 6530α and 1984ScZQ, 6546α).

^{174}Au-J^π: is unmeasured. A weak argument can be made for 3$^-$ for the low spin isomer of ^{174}Au, based on HF<4 for α feeding to possibly (3$^-$) ^{170}Ir, assuming the 6547α is a g.s. to g.s. transition. However, please see comment on 'J^π(^{174}Au) parent' In ^{174}Au α decay (162.9 ms). Note that the α branch with lowest HF In (2$^-$) ^{178}Tl α decay does not feed this level In ^{174}Au, so it is reasonable to suppose its structure differs from that of ^{178}Tl(g.s.).

^{174}Au-%α decay: from 2002Ro17, based on observation of 1131 ^{178}Tl-to-^{174}Au correlated decays and 82 ^{178}Tl-to-^{174}Pt decays, and assuming %α(^{174}Pt)=67 *6* (%α(^{174}Pt)=76 *8*, adopted In the evaluation by 2002Ba93, does not significantly affect this conclusion).

2004GoZZ: ^{174}Au source from ^{92}Mo(^{84}Sr,pn), E=390, 395 MeV; 98.27% ^{92}Mo target; fragment mass analyzer and double-sided Si strip detector (for recoils and decay α particles) surrounded by 4 Ge detectors and a low-energy photon spectrometer; recoil decay tagging technique; measured Eα, Iα, Eγ, Iγ, I(K x ray), recoil-α-γ coin, α(t), parent-daughter α correlations. Supersedes 2001KoZY.

2002Ro17: ^{174}Au produced by α decay of ^{178}Tl; Si strip detector; measured Eα, parent-daughter α correlations, $T_{1/2}$ for parent and daughter, %α for ^{174}Au.

1983Sc24: ^{174}Au was identified from spectroscopy of α emitters produced in ^{92}Mo bombardments of Rb through Mo targets; measured Eα with semiconductor detectors. Other: 1984ScZQ.

See comments and tabulation of data for both ^{174}Au isomer decays In ^{174}Au α decay (162.9 ms).

^{170}Ir Levels

E(level)	J^π	Comments
0	(3$^-$)	J^π: from Adopted Levels. E(level): the possibility that this is not the ^{170}Ir g.s. but, instead, a low-spin excited state, cannot be entirely ruled out.

α radiations

Eα	E(level)	Iα[‡]	HF[†]	Comments
6547 *5*	0	100	3.8 *3*	Eα: from 2004GoZZ; uncertainty from text, p. 119. Others: 6540 *35* (2002Ro17), 6546 *10* (1984ScZQ). 6530 *20* (1983Sc24) could be attributed to either isomer of ^{174}Au based on Eα, but absence In 1983Sc24 of known stronger lines from high-spin ^{174}Au decay favors attribution to low-spin ^{174}Au. The adopted Eα would imply Q(α)=6701 *5* were this a g.s. to g.s. transition. Eα: correlated with 6704α from ^{178}Tl (2002Ro17) and with 5815α from ^{170}Ir(g.s.) (2002Ro17, 2004GoZZ, 2007Ha45).

[†] Tentative value assuming r_0=1.5530 *24* (unweighted average of r_0(^{170}Os)=1.556 *6* and r_0(^{170}Pt)=1.548 *12* from the evaluation by 2002Ba93, r_0(^{168}Os)=1.558 *8* and r_0(^{172}Pt)=1.55 *3* from 1998Ak04), %α(^{174}Au)=90 *6* (2002Ro17) and Q(α)(^{174}Au)=6699 *7* from 2017Wa10 (which assumes g.s. to g.s. transition for the 6547α).

[‡] For absolute intensity per 100 decays, multiply by 0.90 *6*.