^{171}Pt α decay 1981De22,1981Ho10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	8-Sept-2009

Parent: ^{171}Pt: E=0.0; $T_{1/2}$=44 ms *7*; Q(α)=6610 *50*; %α decay≈98.0

^{171}Pt-J$^{\pi}$: 3/2$^-$ (or possibly 5/2$^-$) suggested in ^{171}Pt Adopted Levels in ENSDF database.

^{171}Pt-$T_{1/2}$: From ^{171}Pt Adopted Levels in ENSDF database. Weighted average (using limitation of statistical weights method) of 40 ms *10* (1981De22), 20 ms *6* (1982En03), 43 ms *3* (1996Pa01), 25 ms *+11−6* (1997Uu01), 51 ms *2* (2002Ro17). Other value: >20 ms (1981Ho10).

^{171}Pt-Q(α): From 2003Au03, 2009AuZZ. Measure Eα gives an uncertainty of 3 keV. Uncertainty of 50 keV is assigned by 2003Au03 since ground state to ground state α transition is not firmly established.

^{171}Pt-%α decay: Gross β decay theory calculations predict partial β half-life to be 0.79 s (1997Mo25) or ≈2 s (1973Ta30), implying %ε+%β^+=3.1 or ≈1.3, respectively; based on this, the evaluator suggests %α=98 *2*. α decay of ^{171}Pt has been observed (1981De22,1981Ho10,1982En03,1997Uu01,2002Ro17), but %α has not been measured. 2004GoZZ thesis mentions %α=96 *5*, but no details are provided.

Additional information 1.

Others: 1982En03, 1997Uu01.

1981De22: sources from ^{112}Sn(^{63}Cu,p3n), E=240-300 MeV; measured Eα (annular silicon detector), parent $T_{1/2}$.

1981Ho10: sources from ^{58}Ni bombardments of tin; measured Eα (silicon detector system correlating time, energy, position), parent and daughter $T_{1/2}$, %α(^{167}Os).

1982En03: sources from ^{144}Sm(^{32}S,5n), E≈186 MeV; recoil-mass selection; measured Eα (thin gas ΔE, surface-barrier E detectors), parent and daughter $T_{1/2}$, %α(^{167}Os).

1996Pa01: sources from heavy-ion fusion-evaporation reactions; recoil mass separator, double-sided Si strip detector (FWHM≤20 keV); measured Eα, parent and daughter $T_{1/2}$, %α(^{167}Os).

1997Uu01: observed (evaporation residue)-α(mother)-α(daughter) correlated chains following the ^{144}Sm(^{36}Ar,5n) reaction at E=180-230 MeV; gas-filled recoil separator with PIPS detector in focal plane. Measured Eα (FWHM≈27 keV), parent $T_{1/2}$.

2002Ro17: ^{102}Pd(^{78}Kr,X) E=340 MeV, Berkeley gas-filled separator, measured half-life of ^{171}Pt α decay.

Other: 2004GoZZ: source from ^{84}Sr bombardment of Mo targets. measured Eα, %α.

^{167}Os Levels

E(level)	J$^{\pi}$	Comments
0.0	(7/2$^-$)	J$^{\pi}$: from Adopted Levels.

α radiations

Eα	E(level)	Iα[‡]	HF[†]	Comments
6453 *3*	0.0	100	1.4 *4*	Eα: value recommended by 1991Ry01, based on 6453 keV *4* (1981De22), 6452 keV *5* (revision of 6448 *5*, 1981Ho10), 6455 keV *10* (revision of 6450 *10*, 1982En03); this gives Q(α)=6607 *3*, assuming a g.s. to g.s. transition. Other Eα: 6450 *11* (1997Uu01).

[†] If r_0=1.560 *5* (from r_0(^{166}Os)=1.561 *6* and r_0(^{168}Os)=1.558 *8* in 1998Ak04), $T_{1/2}$(^{171}Pt)=44 ms *7*, %α(^{171}Pt)=98 *2*.

[‡] For absolute intensity per 100 decays, multiply by ≈0.98.