

¹⁸¹Hg α decay ¹⁹⁷⁹Ha10

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

Parent: ¹⁸¹Hg: E=0.0; J ^{π} =1/2⁻; T_{1/2}=3.4 s 3; Q(α)=6284 4; % α decay=24.3 21

¹⁸¹Hg-T_{1/2}: From [1979Ha10](#) (supersedes 3.6 s 3 in [1969Ha03](#) and [1970Ha18](#)). Others: 3.2 s 7 ([1982HeZM](#)) and 3.4 s 6 ([1992BoZO](#)).

¹⁸¹Hg-Q α from [2017Wa10](#).

1979Ha10: ¹⁸¹Hg source produced using spallation reaction reactions with 600 MeV protons on lead target. Detectors: 200 mm² silicon surface barrier detector with a typical energy resolution of 25 keV (FWHM), 100 mm² surface barrier silicon detector, 43 cm³ Ge(Li) γ -detector with a typical energy resolution of 2.1 keV (FWHM) at 1.33 MeV. Measured: E α , I α , % α , T_{1/2}, $\alpha\gamma$ coin, $\alpha\gamma$ (t). Other (from the same group): [1978Ha30](#).

Others: [1970Ha18](#), [1975Ho02](#), [1982HeZM](#), [1986Ke03](#), [1992BoZO](#), [1996Pa01](#).

¹⁷⁷Pt Levels

E(level) [†]	J ^{π} [‡]	T _{1/2} [‡]	Comments
0.0	5/2 ⁻	10.0 s 4	E α =5527 keV 6, I α =88 7, E α =5435 keV 10, I α =12 1 (1979Ha10). Others: E α =5535 keV 20 (1982HeZM); E α =5525 keV 20, I α =66 6 and 5485 keV 20, I α =34 3 (1970Ha18); E α =5510 keV 10 (1966Si08); E α =5530 keV 25 (1968De01); E α =5510 keV 3 (1982Bo04).
81.0 4	7/2 ⁻		
147.4 4	1/2 ⁻	2.2 μ s 3	T _{1/2} : From $\alpha\gamma$ (t) by gating on E α = 6006 keV and E γ = 147.4 keV (1979Ha10).
214.2 5	(3/2 ⁻)		
239.8 4	5/2 ⁻		

[†] From least-squares fit to E γ .

[‡] From Adopted Levels.

α radiations

E α [†]	E(level)	I α ^{†#}	HF [‡]	Comments
5916 10	239.8	4.6 19	7 3	E α ,I α : Others: E α =5920 keV 20,I α =5.36 (1986Ke03) and E α =5920 keV 30 (1970Ha18).
5938 10	214.2	6.1 17	6.5 20	E α ,I α : Others: E α =5928 keV 30 (not resolved from 5916 α), I α (5938 α + 5916 α)=13 (1982HeZM).
6006 5	147.4	88 3	0.86 12	E α ,I α : Others: E α =6003 keV, I α =80.95 (1986Ke03); E α =6007 keV 20, I α =87 (1982HeZM); E α =6003 keV 15 (1970Ha18); E α =6180 keV (1992BoZO); E α =5986 keV 13 (1996Pa01).
6071 10	81.0	1.5 3	94 23	E α ,I α : Others: E α =6071 keV, I α =6.72 (1986Ke03).
6148 10	0.0	0.5 11	6. \times 10 ² 14	E α ,I α : Others: E α =6134 keV, I α =6.96 (1986Ke03).

[†] From [1979Ha10](#).

[‡] Calculated using r₀(¹⁷⁷Pt)= 1.525 4, weighted average of r₀=1.533 4 (¹⁷⁶Pt) and 1.523 8 (¹⁷⁸Pt) deduced from HF=1.0.

For absolute intensity per 100 decays, multiply by 0.243 21.

^{181}Hg α decay **1979Ha10** (continued) $\gamma(^{177}\text{Pt})$

E_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π
80.9 5	81.0	$7/2^-$	0.0	$5/2^-$
92.4 5	239.8	$5/2^-$	147.4	$1/2^-$
147.4 5	147.4	$1/2^-$	0.0	$5/2^-$
158.7 5	239.8	$5/2^-$	81.0	$7/2^-$
214.2 5	214.2	$(3/2^-)$	0.0	$5/2^-$
239.8 5	239.8	$5/2^-$	0.0	$5/2^-$

† From **1979Ha10**. Note, that the 66.3 keV γ -ray is shown in the level scheme given in Fig. 6 (**1979Ha10**), but no evidence for such a transition is seen in the spectrum shown in Fig. 5 (**1979Ha10**). Given the adopted level scheme for ^{177}Pt , the multipolarity of such a transition would be M3. Hence, by using the Weisskopf estimates for the reduced transition probabilities, one may expect $I_\gamma(66.3)/I_\gamma(147.7) \approx 10^{-11}$. It is worth noting, that 66.3 γ overlaps with the Pt $K\alpha_1$ x ray energy.

 ^{181}Hg α decay **1979Ha10**

Decay Scheme

