

**<sup>173</sup>Pt  $\alpha$  decay (381 ms)    [2014ThZZ](#),[1996Pa01](#),[1981De22](#)**

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

Parent: <sup>173</sup>Pt: E=0.0; J <sup>$\pi$</sup> =(7/2<sup>-</sup>); T<sub>1/2</sub>=381 ms 3; Q( $\alpha$ )=6360 60; % $\alpha$  decay=100 5

<sup>173</sup>Pt-J <sup>$\pi$</sup> : from [2014ThZZ](#), based on the 104 $\gamma$  (M1) multipolarity from (9/2<sup>-</sup>) state at 104. Consistent with the <sup>171</sup>Pt and <sup>175</sup>Pt g.s. assignments.

<sup>173</sup>Pt-T<sub>1/2</sub>: weighted average of 382 ms 2 ([2004GoZZ](#)). Others: 325 ms 20 ([1981De22](#)), 360 ms 20 ([1982En03](#)), 290 ms 60 ([1992ToZX](#)), 376 ms 11 ([1996Pa01](#)), 370 ms 13 ([2002Ro17](#)), 430 ms 40 ([2009An20](#)). Other: 382 ms 2 in the ENSDF (update).

<sup>173</sup>Pt-Q( $\alpha$ ): from [2021Wa16](#).

<sup>173</sup>Pt-% $\alpha$  decay: Measured in [2009An20](#). Others: 86 4 in ([1995Sh21](#)) and in ENSDF, based on 84 6 (from ratio of I $\alpha$  for  $\alpha$  group for <sup>173</sup>Pt daughter and for <sup>177</sup>Hg parent in the same spectrum) ([1979Ha10](#) – where %I $\alpha$ (6580)=85 of <sup>177</sup>Hg was an estimated value), 83 14 ([1996Pa01](#), 6225 $\alpha$ ) and 82 6 ([2004GoZZ](#), 6232 $\alpha$ ).

[2014ThZZ](#): Source was produced from <sup>92</sup>Mo(<sup>82</sup>Sr,x): E=392, 400 MeV; Experiment performed at Accelerator Laboratory, JYFL Finland. Measured reaction products, E $\alpha$ , I $\alpha$ , E $\gamma$ ,  $\alpha\gamma$  using planer and Double Sided Silicon Detectors; Deduced excited level energies.

[1996Pa01](#): source from 354 MeV <sup>70</sup>Ge bombardment of <sup>106</sup>Cd; recoil mass separator, double-sided Si strip detector (FWHM $\leq$ 20 keV); measured E $\alpha$ , parent and daughter T<sub>1/2</sub> and % $\alpha$ .

[1981De22](#): sources from <sup>112,116</sup>Sn, <sup>113</sup>In(<sup>63</sup>Cu,xnyp) (E(<sup>63</sup>Cu)=245-300 MeV, helium-jet transport); enriched targets; measured E $\alpha$ , I $\alpha$  (annular Si detector).

[1979Ha10](#): sources from decay of <sup>177</sup>Hg parent activity; measured E $\alpha$ , I $\alpha$  (Si surface-barrier detector).

[1982En03](#): sources from <sup>144</sup>Sm(<sup>32</sup>S,3n) (E(<sup>32</sup>S)=139.5-201 MeV, recoil-mass selection); Sm targets enriched to 96.33% in <sup>144</sup>Sm; measured E $\alpha$ , I $\alpha$  (thin gas  $\Delta$ E, surface-barrier E detectors).

[2009An20](#): <sup>173</sup>Pt obtained as granddaughter of <sup>181</sup>Pb  $\alpha$  decay produced in <sup>144</sup>Sm(<sup>40</sup>Ca,3n) at beam energy of 196 MeV at GSI SHIP facility. Measured: E $\alpha$ , (recoil) $\alpha$ ,  $\alpha\alpha$  correlations, half-lives,  $\alpha$  decay branching ratios. Evaporation residues were detected with position- sensitive silicon detector with  $\Delta$ E $\approx$ 25 keV FWHM.  $\alpha$ - energy calibration was performed using  $\alpha$ -lines from <sup>176-182</sup>Hg and their daughters. Distinction between the reaction and production channels was performed with three tof detectors.

Others: [1966Si08](#), [1973Ga08](#), [1982En03](#), [2002Ro17](#), [2004GoZZ](#).

<sup>169</sup>Os Levels

E(level) <sup>†</sup>	J <sup><math>\pi</math></sup>	T <sub>1/2</sub>	Comments
0.0	(7/2 <sup>-</sup> )	3.4 s 2	J <sup><math>\pi</math></sup> : from unhindered $\alpha$ decay from (7/2 <sup>-</sup> ) <sup>173</sup> Pt. T <sub>1/2</sub> : from Adopted Levels.
34.84 18	(5/2 <sup>-</sup> )		J <sup><math>\pi</math></sup> : 5/2 <sup>-</sup> in <a href="#">2014ThZZ</a> , authors assumed 34.84 $\gamma$ is of M1 character to 7/2 <sup>-</sup> g.s.. Relatively more hindered $\alpha$ transition from (7/2 <sup>-</sup> ) <sup>173</sup> Pt compared to that of the g.s.
112.3 3	(9/2 <sup>-</sup> )		J <sup><math>\pi</math></sup> : 9/2 <sup>-</sup> in <a href="#">2014ThZZ</a> , authors state that 112.3 $\gamma$ is more consistent M1 transition to (7/2 <sup>-</sup> ) g.s.
136.12 19			
170.97 20			

<sup>†</sup> From E $\gamma$ .

$\alpha$  radiations

E $\alpha$	E(level)	I $\alpha$ <sup>†@</sup>	HF <sup>#</sup>	Comments
6067 <sup>‡</sup>	170.97	0.5 4	67 56	E $\alpha$ : same value in <a href="#">2014ThZZ</a> and <a href="#">2004GoZZ</a> . I $\alpha$ : same in <a href="#">2014ThZZ</a> . Other: $\approx$ 1 ( <a href="#">2004GoZZ</a> ).
6099 5	136.12	0.5 4	92 77	E $\alpha$ : weighted average of 6097 5 ( <a href="#">2014ThZZ</a> ) and 6100 5 ( <a href="#">2004GoZZ</a> ). I $\alpha$ : same in <a href="#">2014ThZZ</a> . Other: $\approx$ 1 ( <a href="#">2004GoZZ</a> ).
6132 <sup>‡</sup> 6	112.3	0.15 3	3.8 $\times$ 10 <sup>2</sup> 12	E $\alpha$ : weighted average of 6130 6 ( <a href="#">2014ThZZ</a> ) and 6133 5 ( <a href="#">2004GoZZ</a> ). I $\alpha$ : same in <a href="#">2014ThZZ</a> . Other: $\approx$ 2 ( <a href="#">2004GoZZ</a> ).
6203 4	34.84	15.2 10	7.4 17	E $\alpha$ : weighted average of 6201 4 ( <a href="#">2014ThZZ</a> ), 6190 20 ( <a href="#">1966Si08</a> ), 6190 10

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**$^{173}\text{Pt}$   $\alpha$  decay (381 ms) [2014ThZZ,1996Pa01,1981De22](#) (continued)**

$\alpha$  radiations (continued)

<u><math>E_\alpha</math></u>	<u>E(level)</u>	<u><math>I_\alpha^\dagger</math>@</u>	<u>HF#</u>	<u>Comments</u>
				( <a href="#">1973Ga08</a> ), 6212 8 (6213 8 of <a href="#">1979Ha10</a> after adjustment by <a href="#">1991Ry01</a> ), and 6205 3 ( <a href="#">1981De22</a> ). Assumed g.s. transition assumed – correlated with 5575 $\alpha$ from $^{169}\text{Os}$ (g.s.) ( <a href="#">2002Ro17</a> ).
6232 4	0.0	83.6 11	1.8 4	$I_\alpha$ : 15.2 11 ( <a href="#">2014ThZZ</a> ). $E_\alpha$ : weighted average of 6235 4 ( <a href="#">2014ThZZ</a> ), 6240 15 ( <a href="#">2009An20</a> ), 6232 5 ( <a href="#">2004GoZZ</a> ), 6225 9 ( <a href="#">1996Pa01</a> ), and 6222 10 ( <a href="#">1982En03</a> ). $I_\alpha$ : 83.6 17 ( <a href="#">2014ThZZ</a> ). Other: 96 1 ( <a href="#">2004GoZZ</a> ).

$^\dagger$  Relative intensity of [2004GoZZ](#) (except where otherwise noted) normalized to yield  $\Sigma I_\alpha=100$ .  $I_\alpha$  values from the articles are listed in the comments.

$^\ddagger$  Correlated with 5581 $\alpha$  and 5537 $\alpha$  from  $^{169}\text{Os}$  ([2004GoZZ](#)).

$\#$  The nuclear radius parameter  $r_0(^{169}\text{Os})=1.5564\ 36$  is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides:  $^{170}\text{Os}=1.5551\ 32$  and  $^{168}\text{Os}=1.5578\ 40$  in [2020Si16](#).

@ For absolute intensity per 100 decays, multiply by 1.00 5.

$\gamma(^{169}\text{Os})$

<u><math>E_\gamma^\dagger</math></u>	<u><math>E_i</math>(level)</u>	<u><math>J_i^\pi</math></u>	<u><math>E_f</math></u>	<u><math>J_f^\pi</math></u>	<u>Mult.</u>	<u>Comments</u>
34.84 18	34.84	(5/2 $^-$ )	0.0	(7/2 $^-$ )	[M1]	
112.3 3	112.3	(9/2 $^-$ )	0.0	(7/2 $^-$ )	[M1]	Mult.: M1 assumed in <a href="#">2014ThZZ</a> .
136.12 19	136.12		0.0	(7/2 $^-$ )		$E_\gamma$ : from <a href="#">2014ThZZ</a> . Other: 136.2 5 ( <a href="#">2004GoZZ</a> ).
170.97 20	170.97		0.0	(7/2 $^-$ )		$E_\gamma$ : from <a href="#">2014ThZZ</a> . Other: 171.2 5 ( <a href="#">2004GoZZ</a> ).

$^\dagger$  From [2014ThZZ](#).

**$^{173}\text{Pt}$   $\alpha$  decay (381 ms) 2014ThZZ,1996Pa01,1981De22**Decay Scheme