

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. C. Batchelder and A. M. Hurst, M. S. Basunia		NDS 183, 1 (2022)	1-Mar-2022

$Q(\beta^-)=3900$  60;  $S(n)=5280$  60;  $S(p)=7580$  90;  $Q(\alpha)=850$  210 [2021Wa16](#)

 $^{186}\text{Ta}$  LevelsCross Reference (XREF) Flags

- A  $^{186}\text{Ta}$  IT decay
- B  $^{186}\text{Hf}$   $\beta^-$  decay
- C  $^9\text{Be}(^{197}\text{Au},\text{X})$
- D  $^{186}\text{W}(n,p)$

E(level)	$J^\pi$	$T_{1/2}$	XREF	Comments
0.0	(3 <sup>-</sup> )	10.39 min 3	ABCD	<p><math>\% \beta^- = 100</math></p> <p><math>J^\pi</math>: In <a href="#">2021Wa39</a> (<math>^{186}\text{Ta}</math> IT Decay), g.s. was assumed as (5<sup>-</sup>) and proposed <math>J^\pi=(9^+)</math> for the isomeric state at 347.9. In <a href="#">2021Ko07</a> (NUBASE), <math>J^\pi=(9^+)</math> is proposed for the isomeric state at 336 keV (<math>T_{1/2}=1.54</math> m) from systematics. The assumption of a <math>J^\pi(\text{g.s.})=(5^-)</math> conflicts with the data in <math>^{186}\text{Ta}</math> <math>\beta^-</math> decay. For simplicity (3<sup>-</sup>) is assumed by the evaluators, (2<sup>-</sup>) is possible but less likely. Possible configuration: ((<math>\pi</math> 7/2[404]) (<math>\nu</math> 3/2[512] or 1/2[510])) (<a href="#">1970Pa16,1973Gu02</a>); <math>\log ft=7.5</math> (<math>\log f^{1u}t=8.8</math>) to 3<sup>-</sup>, <math>\log ft=7.5</math> (<math>\log f^{1u}t=8.6</math>) to (2<sup>+</sup>), <math>\log ft=8.2</math> (<math>\log f^{1u}t=9.5</math>) to (2<sup>+</sup>), no decay to 5<sup>-</sup>, 6<sup>-</sup>, 6<sup>+</sup>.</p> <p><math>T_{1/2}</math>: Weighted average of 10.5 min 5 (<a href="#">1955Po43</a>), 10.6 min 5 (<a href="#">1960Po01</a>), 10.5 min 5 (<a href="#">1970Pa16</a>), 10.0 min 10 (<a href="#">1999Ya10</a>); presumably supersedes 10.3 min 10 reported in <a href="#">1998Yu02</a>, 10.4 min 5 (<a href="#">2004Xu08</a>), 10.8 5 (<a href="#">2021Wa39</a>) and 10.390 min 27 (<a href="#">1995ItZY</a>).</p>
186.8 1 336 20	(4 <sup>-</sup> )	1.54 min 5	A CD	<p><math>J^\pi</math>: (E3) 161.1<math>\gamma</math> from (7<sup>+</sup>).</p> <p><math>\%IT&gt;0</math>; <math>\% \beta^-=?</math></p> <p>XREF: D(0+X).</p> <p>E(level): From measured mass difference between the isomer and g.s. (<math>^{197}\text{Au},\text{X}</math>).</p> <p><math>T_{1/2}</math>: From <a href="#">2004Xu08</a> – based on (g.s.+isomer) decay curves for 197.5-, 307.5-, 417.7-, 615.3-, 737.5+739.2-keV <math>\gamma</math> rays. And analyzing and fitting a two-component radioactive decay by computer code. Other: 3.0 min +15-8 for ionized atoms (<math>^{186}\text{Ta}^{\text{m},72+}</math>) (<a href="#">2012Re19</a>).</p>
347.9 3	(7 <sup>+</sup> )	17 s 2	A	<p><math>J^\pi</math>: Based on cascade of (E3) 161.1<math>\gamma</math> and (M1+E2) 186.8<math>\gamma</math> to (3<sup>-</sup>) g.s.. In <a href="#">2021Wa39</a> (<math>^{186}\text{Ta}</math> IT decay), authors assumed g.s. to be (5<sup>-</sup>) and proposed <math>J^\pi=(9^+)</math> for this isomeric level. See <math>J^\pi</math> notes for g.s.</p> <p><math>T_{1/2}</math>: From IT decay.</p>

 $\gamma(^{186}\text{Ta})$ 

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma$	$E_f$	$J_f^\pi$	Mult.
186.8	(4 <sup>-</sup> )	186.8 1	0.0	(3 <sup>-</sup> )	(M1+E2)
347.9	(7 <sup>+</sup> )	161.1 2	186.8	(4 <sup>-</sup> )	(E3)

**Adopted Levels, Gammas**Level Scheme