

**Adopted Levels**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 196,342 (2024)	1-Sep-2023

Q( $\beta^-$ )=-5973 16; S(n)=8558 11; S(p)=80 12; Q( $\alpha$ )=7385 4 [2021Wa16](#)  
 S(2n)=19170 30, S(2p)=2489 25, Q( $\epsilon$ p)=6602 10 ([2021Wa16](#)).

<sup>202</sup>Fr Levels

Cross Reference (XREF) Flags

- A <sup>206</sup>Ac  $\alpha$  decay (22 ms)
- B <sup>206</sup>Ac  $\alpha$  decay (33 ms)

E(level)	J <sup><math>\pi</math></sup>	T <sub>1/2</sub>	XREF	Comments
0.0	(3 <sup>+</sup> )	372 ms 12	A	<p><math>\% \alpha \approx 100</math>; <math>\% \epsilon + \% \beta^+ = ?</math>  <math>\mu = +3.90</math> 5  <math>\% \epsilon + \% \beta^+</math>: The observation of <math>\beta</math>-delayed fissions in <a href="#">2014Gh09</a> (<math>N_\alpha/N_{\beta DF} = 1.4 \times 10^4</math> 2) would imply a small branch, but it is not clear if it is associated with the ground state or the isomer.  <math>\mu</math>: Using collinear resonance ionization spectroscopy in <a href="#">2013FI09</a>.  <math>\delta \langle r^2 \rangle \langle ^{202}\text{Fr}, ^{221}\text{Fr} \rangle = -1.596 \text{ fm}^2</math> 8(exp) 16(syst) (<a href="#">2013FI09</a>).  <math>J^\pi</math>: Hyperfine structure in <a href="#">2013FI09</a> and <a href="#">2014Ly01</a>; favored <math>\alpha</math> decay to the (3<sup>+</sup>) state in <sup>198</sup>At and subsequent favored <math>\alpha</math> decay to the (3<sup>+</sup>) state in <sup>194</sup>Bi.                      T<sub>1/2</sub>: from <a href="#">2014Ka23</a>. Others: 0.30 s 5 (<a href="#">2005Uu02</a>), 0.23 s +8-4 (<a href="#">1996En01</a>), 0.34 s 4 (<a href="#">1980Ew03</a>), 0.27 s +13-17 (<a href="#">1998Es02</a>).                      E<math>\alpha</math>=7238 keV 5 (<a href="#">2014Ka23</a>), 7241 keV 8 (<a href="#">2005Uu02</a>), 7243 keV 6 (<a href="#">1996En01</a>), 7237 keV 8 (<a href="#">1992Hu04</a>), 7236 keV 7 (<a href="#">1998Es02</a>). Other studies: <a href="#">2019Gh11</a>, <a href="#">2014Gh09</a>.                      configuration: Dominant <math>\pi(h_{9/2}^{+1}) \otimes \nu(f_{5/2}^{-1})</math>.</p>
257 6	(10 <sup>-</sup> )	286 ms 13	B	<p><math>\% \alpha \approx 100</math>; <math>\% \epsilon + \% \beta^+ = ?</math>  <math>\mu = +2.34</math> 4  <math>\% \epsilon + \% \beta^+</math>: The observation of <math>\beta</math>-delayed fissions in <a href="#">2014Gh09</a> (<math>N_\alpha/N_{\beta DF} = 1.4 \times 10^4</math> 2) would imply a small branch, but it is not clear if it is associated with the ground state or the isomer.  <math>\mu</math>: Using collinear resonance ionization spectroscopy in <a href="#">2013FI09</a>.  <math>\delta \langle r^2 \rangle \langle ^{202m}\text{Fr}, ^{221}\text{Fr} \rangle = -1.591 \text{ fm}^2</math> 9(exp) 16(syst) (<a href="#">2013FI09</a>).                      E(level): From <a href="#">2021Ko07</a>, based on masses of <sup>202</sup>Fr [<math>J^\pi = (3^+)</math>] and <sup>202</sup>Fr [<math>J^\pi = (10^-)</math>].  <math>J^\pi</math>: Hyperfine structure in <a href="#">2013FI09</a> and <a href="#">2014Ly01</a>; favored <math>\alpha</math> decay to the (10<sup>-</sup>) state in <sup>198</sup>At and subsequent favored <math>\alpha</math> decay to the (10<sup>-</sup>) state in <sup>194</sup>Bi.                      T<sub>1/2</sub>: from <a href="#">2014Ka23</a>. Others: 0.29 s 5 (<a href="#">2005Uu02</a>), 0.23 s +18-5 (<a href="#">1996En01</a>), 0.34 s 4 (<a href="#">1980Ew03</a>), 0.24 s +18-70 (<a href="#">1998Es02</a>).                      E<math>\alpha</math>=6747 keV 5 (<a href="#">2014Ka23</a>), 7235 keV 8 (<a href="#">2005Uu02</a>), 7242 keV 6 (<a href="#">1996En01</a>), 7237 keV 8 (<a href="#">1992Hu04</a>), 7248 keV 13 (<a href="#">1998Es02</a>). Other studies: <a href="#">2019Gh11</a>, <a href="#">2014Gh09</a>.                      configuration: Dominant <math>\pi(h_{9/2}^{+1}) \otimes \nu(i_{13/2}^{-1})</math>.</p>