

Adopted Levels

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Ashok Jain, Sukhjeet Singh, Suresh Kumar, Jagdish Tuli		NDS 108,883 (2007)	15-Jan-2007

Q( $\beta^-$ )=1194 8; S(n)=4212 6; S(p)=7192 16; Q( $\alpha$ )=6162.5 22 [2012Wa38](#)

Note: Current evaluation has used the following Q record \$ 1194 7 4212 6 7170 50 6147 3 [2003Au03](#).

Assignment: thorium(110-MeV p); chem; parent of <sup>221</sup>Fr, <sup>217</sup>At, <sup>213</sup>Po ([1956Mo15](#)).

Theory, calculations:

[1991Cw01](#): Level energy calculations.

[1986Po06](#),[1986Pi11](#),[1986De32](#): Rates for the most probable heavy-ion decays were calculated by [1986Po06](#) (<sup>14</sup>C, <sup>8</sup>Be, <sup>13</sup>C, <sup>12</sup>C, <sup>15</sup>C, <sup>10</sup>Be, <sup>15</sup>N and <sup>18</sup>O emission), by [1986Pi11](#) (<sup>14</sup>C emission), and by [1986De32](#) (<sup>14</sup>C emission).

<sup>221</sup>Rn Levels

E(level)	J $\pi$	T <sub>1/2</sub>	Comments
0.0	7/2 <sup>+</sup>	25 min 2	<p><math>\% \alpha = 22</math> 1; <math>\% \beta^- = 78</math> 1  <math>\mu = -0.020</math> 1 (<a href="#">1988Ki03</a>,<a href="#">2005St24</a>); Q=-0.38 4(<a href="#">1988NeZZ</a>,<a href="#">2005St24</a>)                      J<math>\pi</math>: spin measured (<a href="#">1987Bo29</a>; LASER spectroscopy). <math>\pi</math> from log ft value of 5.7 3 for the <math>\beta^-</math> transition to the 294.76-keV, <math>\pi = +</math> level in <sup>221</sup>Fr.  <math>\mu</math>: See <a href="#">1988Le13</a> for calculations of magnetic dipole and electric quadrupole moments, and for discussion on complex structure of this transitional nucleus.                      Q: other: -0.47 5 (quoted in <a href="#">2005St24</a>).  <math>\% \alpha, \% \beta^-</math>: <math>\alpha</math> and <math>\beta^-</math> branchings deduced by <a href="#">1977Vy02</a> by comparing intensities of <sup>221</sup>Rn, <sup>221</sup>Fr, <sup>217</sup>Po, and <sup>217</sup>At <math>\alpha</math> groups present in a mass-separated source of <sup>221</sup>Rn in equilibrium with its daughters.                      T<sub>1/2</sub>: measured by <a href="#">1956Mo15</a>.                      J<math>\pi</math>: Spin parity assignment is model dependent and highly tentative.</p>
30 10	(3/2 <sup>+</sup> )		