

<sup>234</sup>Pa IT decay (1.159 min)

| Type            | Author                | History | Citation            | Literature Cutoff Date |
|-----------------|-----------------------|---------|---------------------|------------------------|
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Parent: <sup>234</sup>Pa: E=73.92+x; J<sup>π</sup>=(0<sup>-</sup>); T<sub>1/2</sub>=1.159 min 16; %IT decay=0.16 4

**Additional information 1.**

Isomeric decay branching of 0.16 4 has been obtained by the evaluators from the intensity of 131-keV  $\gamma$  following the 6.70-h <sup>234</sup>Pa  $\beta^-$  decay (I $\gamma$ =18.0% 18) and its intensity of 0.0286 4 per 100 <sup>234</sup>Th decays, measured on an absolute scale by 1990Sc09 in equilibrium with the grandparent nucleus <sup>238</sup>U; its uncertainty has been increased because of the diversity of values for the branching obtained by various methods.

Branching(IT)=0.13% 3 in 1963Bj02 was deduced by comparing Ice's, I $\gamma$ 's, and  $\beta^-$  disintegration rates from 6.70-h <sup>234</sup>Pa following 1.159-min <sup>234</sup>Pa decay with those following a pure 6.70-h <sup>234</sup>Pa source. The transition intensity of 73.92 $\gamma$  following <sup>234</sup>Th decay yields 0.19 5 when the photon intensities of 1978Ch06 are used, and 0.13 2 when the intensities measured by 1973Go40 are used. Other deduced branching ratios are: %IT=0.150 25 (1938Fe02), 0.12 (1945Br05), 0.63 (1954Zi02), 0.18 2 (1960Fo15).

<sup>234</sup>Pa Levels

| E(level) | J <sup>π</sup>    | T <sub>1/2</sub> |
|----------|-------------------|------------------|
| 0.0      | 4 <sup>+</sup>    | 6.70 h 5         |
| 73.92 2  | (3 <sup>+</sup> ) |                  |
| 73.92+x  | (0 <sup>-</sup> ) | 1.159 min 16     |

$\gamma$ (<sup>234</sup>Pa)

| E $\gamma$ | E <sub>i</sub> (level) | J <sub>i</sub> <sup>π</sup> | E <sub>f</sub> | J <sub>f</sub> <sup>π</sup> | Mult.   | $\delta$ | $\alpha^{\ddagger}$ | I <sub>(<math>\gamma</math>+ce)</sub> <sup>†</sup> | Comments   |
|------------|------------------------|-----------------------------|----------------|-----------------------------|---------|----------|---------------------|--|--|
| (<10)      | 73.92+x                | (0 <sup>-</sup> )           | 73.92          | (3 <sup>+</sup> )           |         |          |                     |  | Transition was not observed. Its energy was deduced from the limit on experimental detection (1973Go40). See <sup>234</sup> Th $\beta^-$ decay.  |
| 73.92 2    | 73.92                  | (3 <sup>+</sup> )           | 0.0            | 4 <sup>+</sup>              | (M1+E2) | 0.11 3   | 11.2 3              | 100  | ce(L)/( $\gamma$ +ce)=0.692; ce(M)/( $\gamma$ +ce)=0.168; ce(N+)/( $\gamma$ +ce)=0.066<br>$\alpha$ (L)=8.44 22; $\alpha$ (M)=2.05 7; $\alpha$ (N+..)=0.753 23<br>E $\gamma$ : given in 1973Go40 (s ce). Other measurements: 1963Bj02, 1962Fo11.<br>Mult.: from <sup>234</sup> Th $\beta^-$ decay.<br>Ice(L)/I(2290 $\beta$ of 1.159-min <sup>234</sup> Pa)=0.10/98 (1963Bj02). |

<sup>†</sup> For absolute intensity per 100 decays, multiply by 0.0016 4.

<sup>‡</sup> Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on  $\gamma$ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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Legend

Decay Scheme

%IT=0.16 4

