

²¹²Bi

Rutherford from McGill University reported two activities later identified as ²¹²Bi in the 1905 paper “Bakerian lecture: The succession of changes in radioactive bodies” (1905Ru03). The decay curves of “excited activities” following the decay of actinium emanation (²¹⁹Rn) and thorium emanation (²²⁰Rn) were measured. “We may thus conclude that the active deposit from actinium undergoes two distinct successive transformations: (1) A rayless change, in which half the matter is transformed in 41 minutes; (2) A change giving rise to α rays, in which half the matter is transformed in 1.5 minutes.” For the thorium activities Rutherford states: “The evidence, as a whole, thus supports the conclusion that the active deposit from thorium undergoes two successive transformations as follows: (1) A ‘rayless’ change for which $\lambda_1 = 1.75 \times 10^{-5}$, i.e., in which half the matter is transformed in 11 hours; (2) A second change giving rise to α , β and γ rays, for which $\lambda_2 = 2.08 \times 10^{-4}$, i.e., in which half the matter is transformed in 55 minutes.” The measured half-lives for the second decay of the thorium emanation was 55 min, named thorium B (²¹²Bi). Rutherford and Soddy had reported the observation of a “Thorium-excited activity II” from the decay of thorium emanation earlier (1903Ru06). ThB was later reclassified as ThC.

Adapted from reference (2013Fr04)

- 1903Ru06 E. Rutherford and F. Soddy, *Phil. Mag.* **5**, 576 (1903).
1905Ru03 E. Rutherford, *Philos. Trans. R. Soc.* **204**, 169 (1905).
2013Fr04 C. Fry and M. Thoennessen, *At. Data Nucl. Data Tables* **99**, 365 (2013).

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