^{211}Bi

Rutherford from McGill University reported two activities later identified as ^{211}Bi 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 (^{219}Rn) and thorium emanation (^{220}Rn) 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 $\lambda_1 = 1.75\times10^{-5}$, 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 $\lambda_2 = 2.08\times10^{-4}$, i.e., in which half the matter is transformed in 55 minutes." The measured half-lives for the second decay of the actinium emanation was 1.5 min, named actinium B (^{211}Bi). Rutherford and Soddy had reported the observation of a "Thorium-excited activity II" from the decay of thorium emanation earlier (1903Ru06). ThB and AcB were later reclassified as ThC and AcC, respectively.

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).

Please cite this abstract as: "FRIB Nuclear Data Group, *Discovery of Nuclides Project*, Isotope Database, doi:10.11578/frib/2279152"