

^3H

In 1934, Oliphant et al. reported the discovery of ^3H “Transmutation Effects observed with Heavy Hydrogen” (1934OI02). Deuterated ammonium chloride, ammonium sulphate, and orthophosphoric acid samples were bombarded with deuterons accelerated by 20 kV at the Cavendish Laboratory in Cambridge, UK, and the range of observed protons were measured. “It seems more probable that the diplons unite to form a new helium nucleus of mass 4.0272 and 2 charges. This nucleus apparently finds it difficult to get rid of its large surplus energy above that of an ordinary He nucleus of mass 4.0022, but breaks up into two components. One possibility is that it breaks up according to the reaction $\text{D}_1^2 + \text{D}_1^2 \rightarrow \text{H}_1^3 + \text{H}_1^1$. The proton in this case has the range of 14 cm while the range of 1.6 cm observed agrees well with that to be expected from momentum relations for an H^3 particle. The mass of this new hydrogen isotope calculated from mass and energy changes is 3.0151.”

Adapted from reference (2012Th01)

1934OI02 M. L. Oliphant, P. Harteck, and E. Rutherford, *Nature* **133**, 413 (1934).
2012Th01 M. Thoennessen, *At. Data Nucl. Data Tables* **98**, 43 (2012).

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