

⁷He

In 1967, Stokes and Young reported the discovery of ⁷He in “New Isotope of Helium: ⁷He” (1967St04). Tritons, accelerated to 22 MeV by the Los Alamos three-stage tandem accelerator bombarded an isotopically pure ⁷Li target. ⁷He was produced in the transfer reaction ⁷Li(t,³He)⁷He and identified by measuring the reaction product ³He in a ΔE gas proportional counter and a surface-barrier E detector. “The average value of Q obtained by this procedure was −11.16 MeV. This Q value corresponds to a mass excess of 26.09±0.06 MeV (¹²C scale) which has the consequence that ⁷He is unbound to neutron decay by 0.42±0.06 MeV.”

In 1965, Detraz, Cerny, and Pehl had deduced ⁷He to be unbound from the measurement of the T = 3/2 level in ⁷Li refuting earlier reports that ⁷He might be bound (1965De08). Two years later, Cosper, Cerny, and Gatti confirmed the instability of ⁷He in a direct search (1967Co36).

Adapted from reference (2012Th01)

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