

## <sup>4</sup>He

Rutherford's 1908 publication of "The Charge and Nature of the  $\alpha$ -Particle" can be considered as the first identification of the <sup>4</sup>He isotope (1908Ru03). At the University of Manchester, England, an  $\alpha$ -particle source of "radium C" (<sup>214</sup>Bi) was placed inside an electromagnetic field to measure its charge. From the known E/M ratio the mass was deduced. "We have already seen that the evidence is strongly in favour of the view that  $E = 2e$ . Consequently  $M = 3.84 m$ , i.e., the atomic weight of an  $\alpha$ -particle is 3.84. The atomic weight of the helium atom is 3.96. Taking into account probable experimental errors in the estimates of the value of E/M for the  $\alpha$ -particle, we may conclude that an  $\alpha$ -particle is a helium atom, or, to be more precise, the  $\alpha$ -particle, after it has lost its positive charge, is a helium atom."

Adapted from reference (2012Th01)

1908Ru03 E. Rutherford and H. Geiger, Proc. Roy. Soc. (London) **81**, 162 (1908).  
2012Th01 M. Thoennessen, At. Data Nucl. Data Tables **98**, 43 (2012).

Please cite this abstract as: "FRIB Nuclear Data Group, *Discovery of Nuclides Project*, Isotope Database, doi:[10.11578/frib/2279152](https://doi.org/10.11578/frib/2279152)"