

⁴²K

In 1935, Hevesy identified ⁴²K at the Institute for Theoretical Physics in Copenhagen as described in “Natural and artificial radioactivity of potassium” (1935He04). Scandium oxide was irradiated with neutrons from a beryllium-radium source and ⁴²K was formed in the reaction ⁴⁵Sc(n,α). Beta-rays were measured following chemical separation. “The scandium oxide was dissolved in hydrochloric acid and, after the addition of 0.15 gm. of sodium chloride and the same amount of calcium chloride, precipitated with ammonia. The calcium present in the filtrate was removed as oxalate and found to be inactive. The remaining sodium chloride, however, was found to be active and to contain the potassium isotopes looked for. This decayed with a period of about 16 hours, emitting very hard β-rays of approximately 1.2 million e.v.” Previously, Amaldi et al. had observed the 16 h half-life without a mass assignment (1935Am01). Hurst and Walker reported a more accurate half-life of 12.4(2) h questioning the half-life measurement by Hevesy (1937Hu01). However, Hurst and Walker acknowledge the population of ⁴²K in the ⁴⁵Sc(n,α) and thus we credit Hevesy for the discovery of ⁴²K.

Adapted from reference (2012Th10)

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