^{33}Cl

Hoag reported the discovery of ^{33}Cl in 1940 in "The production and half-life of chlorine 33" (1940Ho01). High purity sulphur targets were bombarded with 8-MeV deuterons from the Berkeley 37" cyclotron. The resulting activity was measured with an ionization chamber and Dershem electrometer and recorded on a kymograph. "The record showed a decay curve which could be analyzed into two components of 2.5 min. and 2.8 sec. The former is P^{30} formed in the known reaction of S^{32}+d→P^{30}+α. The short period gives an exponential decay over a factor of 100 in intensity. The saturation activities of the two periods are almost the same, which would rule out the possibility that the short one was due to a contamination or to any of the rare sulphur isotopes. The only other common type of reaction to be expected is S^{32}+d→Cl^{33}+n. A (d,2n) reaction giving rise to Cl^{32} can almost be ruled out on energetic grounds. We therefore conclude that the 2.8-sec. period is due to the decay of Cl^{33} in the reaction Cl^{33} →S^{33}+e^{+}."

Adapted from reference (2012Th10)

1940Ho01 J. B. Hoag, Phys. Rev. **57**, 937 (1940).
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