^{34}K

The first observation of ^{34}K was described in 2024 by Dronchi et al. in "Evolution of shell gaps in the neutron-poor calcium region from invariant-mass spectroscopy of ^{37,38}Sc, ^{35}Ca, and ^{34}K" (2024Dr01). A 140 MeV/nucleon ^{40}Ca beam from the Coupled Cyclotron Facility of the National Superconducting Cyclotron Laboratory at Michigan State University was used to deliver a secondary 72 MeV/nucleon ^{37}Ca beam to a 0.5 mm thick Be target. ^{34}K isotopes were populated via (1p2n) removal reactions and identified by invariant mass spectroscopy by detecting ^{33}Ar fragments with a Scintillating-Fiber Array and the S800 spectrometer and protons in a ΔE-E Ring Telescope. "Data for the first observation of ^{34}K is presented in [the Figure] showing the decay-energy spectrum for p+^{33}Ar events. The spectrum has two sharp resonances at E_T = 0.608(17) and 1.009(18) MeV. The latter corresponds to an excitation energy of E^* = 0.401(25) MeV, presuming the lower-energy peak is the ground state."

A particle identification plot in the 1986 paper by Langevin et al. clearly showed that ^{34}K is beyond the dripline and has a lifetime shorter than the time-of-flight of 170 ns (1986La17).

1986La17 M. Langevin, A. C. Mueller, D. Guillemaud-Mueller, M. G. Saint-Laurent *et al.*, Nucl. Phys. A **455**, 149 (1986).

2024Dr01 N. Dronchi, R. J. Charity, L. G. Sobotka, B. A. Brown *et al.*, Phys. Rev. C **110**, L031302 (2024).

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