

Spectroscopy of Element 115 Decay Chains

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During the past decade, a number of correlated α -decay chains, which all terminate by spontaneous fission, have been observed in several independent experiments using ^{48}Ca -induced fusion-evaporation reactions on actinide targets [1]. These are interpreted to originate from the production of neutron-rich isotopes with proton numbers $Z = 113$ -118. However, neither their mass, A , nor their atomic number, Z , have been measured directly.

In November 2012, a three-week experiment was conducted at the GSI Helmholtzzentrum für Schwerionenforschung GmbH in Darmstadt, Germany, using high-resolution α , electron, X -ray and γ -ray coincidence spectroscopy to observe α - X -ray events to identify uniquely atomic numbers of isotopes in $Z = 115$ decay chains. The reaction $^{48}\text{Ca}+^{243}\text{Am}$ was used, with fusion-evaporation products being focused into the TASISpec set-up [2-4], which was coupled to the gas-filled separator TASCA [5,6].

A beam integral of roughly $7 \cdot 10^{18}$ ^{48}Ca particles led to the observation of about 25 correlated α decay chains with characteristics similar to those previously published [7,8]. Results from the ongoing data analysis will be presented.

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