

## Element 115 studied with TASISpec

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An experiment was conducted at GSI to fingerprint the proton number of one or several isotopes along anticipated decay chains of element 115 by means of high-resolution coincidence spectroscopy of  $\alpha$  decays and photons. The fusion-evaporation reaction  $^{48}\text{Ca}+^{243}\text{Am}$  [1] was used. The residues were separated from primary beam and background by TASCA [2-4] and guided into the TASISpec set-up [cf. Fig. 1(a)] [5, 6].

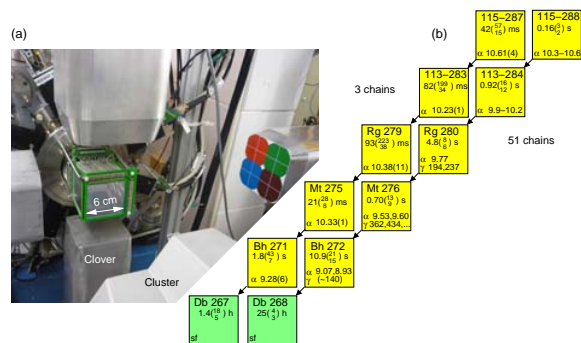


Figure 1: (a) Photograph of the TASISpec  $\alpha$ -photon coincidence set-up [5] in the focal plane of the TASCA gas-filled separator at GSI [2]. See text for details. (b) Proposed decay chains of  $^{287,288}115$  based on the combined data and assignments of Refs. [7-9].

22 and 1 correlated decay chains were found to be consistent with 31 and 2 previously reported chains associated with  $^{288}115$  and  $^{287}115$ , respectively [cf. Fig. 1(b)] [7, 8]. 16 prompt  $\alpha$ -photon coincidences were recorded along the  $^{288}115$  chain [9-11]. Seven short chains of types recoil- $\alpha$  ( $\alpha$ )-fission deserve specific attention [12].

The conclusion of Ref. [9] notes that “thirty correlated  $\alpha$ -decay chains were observed following the reaction  $^{48}\text{Ca}+^{243}\text{Am}$ . Decay schemes arising from high-resolution spectroscopic coincidence data, in conjunction with comprehensive Monte-Carlo simulations, open the

door for direct nuclear structure insights of these heaviest man-made atomic nuclei. Previous assignments linking the majority of the decay chains to the decay of  $^{287,288}115$  [7, 8] are confirmed. This includes first candidates for  $Z$ -fingerprinting the decay of Mt by means of characteristic  $K$ - $X$  ray detection. There is clearly potential for direct determination of the atomic number of the descendants of superheavy elements.”

Following press releases the topic received significant media attention [13], not least due to precisely element 115 starring in various computer games – and Area 51 [14].

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