

Abstract Submitted
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Target K-shell ionization for 35-45 MeV $F^{7,8,9+}$ + Ar resulting in single and double capture¹ DAVID LA MANTIA, NUWAN KUMARA, ASGHAR KAYANI, JOHN TANIS, Western Michigan University — Cross sections for target Ar K-shell ionization associated with single and double electron capture, as well as the corresponding total capture cross sections, were determined for 35-45 MeV $F^{7+,8+,9+}$ projectiles. Previous work for Ar K-shell ionization was performed for fully-stripped fluorine projectiles.² This work was performed at Western Michigan University with the tandem Van de Graaff accelerator. The various charge-state beams collided with argon atoms in a differentially pumped cell. Surface barrier detectors were used to detect the charge-changed projectiles and a Si(Li) x-ray detector, placed at 90° to the incident beam, was used to measure coincidences of the Ar K x rays with the charge-changed ions. The results are compared to previous experiments where coincidence techniques were not employed.³ The coincidence cross sections are about three orders of magnitude smaller than the total cross sections and the ratios for double to single capture are found to vary strongly with the incident charge state, with the ratios for F^{9+} exceeding unity. Possible explanations for this anomalous behavior are discussed.

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²D. S. La Mantia, *et al*, NIMB **408**, 187 (2016)

³J. R. Macdonald and F. W. Martin, PRA **4**, 1965 (1971)

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