

Abstract Submitted  
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**Single and double capture in  $F^{9+} + Ar$  collisions: Comparison of total capture with capture occurring from the Ar K shell**<sup>1</sup> DAVID LA MANTIA, NUWAN KUMARA, ASGHAR KAYANI, Western Michigan University, ANNA SIMON, University of Notre Dame, JOHN TANIS, Western Michigan University — Total cross sections for single and double capture, as well as the corresponding cross sections for capture resulting in the emission of an Ar K x ray, were measured. This work was performed at Western Michigan University with the use of the tandem Van de Graaff accelerator. A 45 MeV beam of fully-stripped fluorine ions was collided with argon gas molecules in a differentially pumped cell. Surface barrier detectors were used to observe the charge changed projectiles and a Si(Li) x-ray detector, placed at  $90^\circ$  to the incident beam, were used to measure coincidences with Ar K x rays. The total capture cross sections are compared to previously measured cross sections in the existing literature.<sup>2,3</sup> The coincidence cross sections, considerably smaller than the total cross sections, are found to be nearly equal for single and double capture in contrast to the total cross sections, which vary by about an order of magnitude. Possible reasons for this behavior are discussed.

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<sup>2</sup>J. H. Houck, et al, Phys. Rev. A **56**, 1954 (1997)

<sup>3</sup>J. R. Macdonald and F. W. Martin, Phys. Rev. A **4**, 1965 (1971)

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