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Ionization and Charge Transfer in Collisions of Singly and Doubly Charged Heavy Ions with Gaseous Targets NICHOLAS EVANS, LARRY TOBUREN, JEFFERSON SHINPAUGH, East Carolina University, ROBERT DUBOIS, University of Missouri Rolla — While energetic atomic collisions can be well described for few electron systems, collisions involving many electrons are more difficult to model. Understanding these collision systems is essential to modeling energy deposition in the irradiation of materials. Experimental measurements of absolute total and partial cross sections for charge transfer and ionization have been made for collisions of C^+ , Cl^+ , and Cl^{2+} in the energy range of 1-4 MeV with various gaseous targets including Ar, Ne, N_2 , H_2O , and CH_4 . The measurements were taken at the tandem Van de Graaff accelerator facility at East Carolina University. Post-collision projectile ions were electrostatically analyzed, and total cross sections are determined by measuring the final charge fraction of the projectile beam as a function of target density. Recoil target ions were electrostatically extracted, and their final charge was determined using time of flight methods. The final charge of the projectiles were then measured in coincidence with the recoil ion charge to determine partial cross sections.

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