Ionization and charge transfer in collisions of singly charged intermediate-energy heavy ions with gas targets. J.L. SHINPAUGH, N.L. EVANS, E.L.B. JUSTINIANO, L.H. TOBUREN, East Carolina University, R.D. DUBOIS, University of Missouri - Rolla — Absolute total and partial cross sections for charge transfer and ionization are presented for collisions of C\(^+\), F\(^+\), Cl\(^+\), and Cl\(^{++}\) projectile ions with H\(_2\), He, Ar, Ne, N\(_2\), H\(_2\)O, and CH\(_4\) gas targets in the energy range of 25 - 200 keV/u. The cross sections were determined by measuring post-collision projectile ion charge states in coincidence with target recoil ion charge states at the 2-MV tandem Van de Graaff accelerator facility at East Carolina University. Experimental data for collision processes for low-charge-state heavy ions incident on many-electron targets in this intermediate-energy range are particularly scarce. The present results are compared to available experimental data, to the recommended (theoretical) cross sections compiled by Janev, Phaneuf, and Hunter,\(^1\) and to scaling laws from Santos and DuBois.\(^2\) For electron capture for singly charged ions colliding with 10-electron targets (Ne and CH\(_4\)), the cross sections are observed to follow a single curve, independent of projectile Z, over several orders of magnitude of velocity.
