

Abstract Submitted
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State-Selective Single-Electron Capture by Ne^{q+} ($q = 3 - 5$) Ions from CO_2 ASAD HASAN, American University of Sharjah, P. O. Box 26666, Sharjah, United Arab Emirates, OSAMA ABU-HAIJA, Tafila Technical University, P.O. Box 179, Zip Code 66110, Tafila, Jordan, ASGHAR KAYANI, EMANUEL KAMBER, Physics Department, Western Michigan University, Kalamazoo, MI 49008-5252 — Energy-gain spectra and absolute total cross sections have been measured for single-electron capture processes in collisions of Ne^{q+} recoil ions with CO_2 at laboratory impact energies between 25 and 300 qeV ($q = 3 - 5$, where q is the projectile charge state) and scattering angles between 0° and 5° using translational energy-gain spectroscopy technique. The energy-gain spectra show that only a few final states were selectively populated depending on the charge state of the projectile. In all collision systems studied here, the dominant reaction channels are due to non-dissociative single-electron capture into excited states of the projectile product. The final state populations will be discussed on the basis of the reaction windows, which are calculated using the single-crossing Landau-Zener model and the extended version of the classical over-the-barrier model. Further measurements of total cross sections for single-electron capture will also be presented and compared with theoretical calculations based on the multi-channel Landau-Zener (MCLZ) model.

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