State-Selective Single-Electron Capture by Ne\textsuperscript{q+} (q = 3 – 6) Ions from H\textsubscript{2}O and CO\textsubscript{2} O. ABU-HAIJA, Western Michigan University, R. SACKS, Kalamazoo Area Math and Science Center, S. M. FERGUSON, Western Michigan University, E. Y. KAMBER, Physics Department, Western Michigan University, Kalamazoo, MI 49008-5252 — Using translational energy-gain spectroscopy technique, we have measured the energy-gain spectra and absolute total cross sections for single-electron capture in collisions of Ne\textsuperscript{q+} recoil ions with H\textsubscript{2}O and CO\textsubscript{2} at laboratory impact energies between 15 and 200 qeV (q = 3 - 6, where q is the projectile charge state) and scattering angles between 0° and 5°. The translational 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. Additional measurements of differential cross sections compared with available theoretical calculations will also be presented.

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Date submitted: 02 Feb 2005

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