Abstract Submitted
for the DAMOP05 Meeting of
The American Physical Society

State-Selective Single-Electron Capture by Ne^{q+} (q = 3 – 6) Ions from H_2 O and CO_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^{q+} recoil ions with H_2O and CO_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.

O. Abu-Haija
Western Michigan University

Date submitted: 02 Feb 2005 Electronic form version 1.4