Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Target Ionization in Collisions with Few-keV Molecular Ions[1]
KEVIN CARNES, NORA G. JOHNSON, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS 66506, USA, WANIA WOLFF, Instituto de Fisica, Universidade Federal do Rio de Janeiro, Brazil, BEN BERRY, A. MAX SAYLER, ITZIK BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS 66506, USA —
The dominant channel in slow (few keV) collisions between a molecular ion and a target atom is dissociative capture, *e.g.* $H_2^+ + Ar \rightarrow H + H + Ar^+$. Our coincidence imaging method allows us to collect all three collision products and therefore determine the efficiency of detecting the recoil ion. Using that efficiency, we measure the probability of target ionization (*e.g.* $H_2^+ + Ar \rightarrow H + H^+ + Ar^+ + e^-$) relative to all collision induced dissociation (*e.g.* $H_2^+ + Ar \rightarrow H + H^+ + Ar + e^-$, $H + H^+ + Ar^+ + e^-$). We find that the probability for target ionization, and by implication target excitation, is greater than 10% and therefore should not be neglected in theory calculations.

[1]This work is supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U.S. Department of Energy.

Kevin Carnes
J. R. Macdonald Laboratory, Department of Physics,
Kansas State University, Manhattan, KS 66506, USA

Date submitted: 02 Feb 2011 Electronic form version 1.4