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Isotopic effects in HD^+ collision-induced dissociation[1] A.M. SUMMERS, BEN BERRY, NORA G. KLING, A. MAX SAYLER, JACK W. MASEBERG, K.D. CARNES, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506, USA — Collision-induced dissociation (CID) of few keV HD^+ on an Ar target atom results from either electronic excitation to a dissociative state or a ro-vibrational excitation into the continuum of the electronic ground state, with the latter mechanism typically occurring in close-encounter collisions. We probe for a preferred channel (isotopic effect) in the dissociation of HD^+ into either H^++D or H+D^+ final products. Preliminary results indicate that H+D^+ is somewhat favored over H^++D when vibrational excitation drives the breakup. Existing theory [1] predicts a factor of four preference in the branching ratio favoring H+D^+ in head-on collisions. Our experiment, using a coincidence 3D momentum imaging technique, enables the measurement of this branching ratio as a function of the scattering angle, i.e. the collision distance. Recent modifications to this experimental setup will improve the quality of the CID data, in particular for the ro-vibrational excitation mechanism of interest in this work

[1] D. Rapp, J. Chem. Phys. **32**, 735 (1960)

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