Abstract Submitted
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Isotopic effects in collision induced dissociation of HD^+ on atomic targets.[1] NORA G. JOHNSON, A.M. SAYLER, J.W. MASEBERG, M.A. SMITH, K.D. CARNES, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS 66506, USA — Isotopic effects in collision induced dissociation of molecules and molecular ions have been studied for many years yielding conflicting reports on branching ratios. Of particular interest is HD^+ dissociating into $H^+ + D$ or $H + D^+$ due to the simplicity of the molecular ion. Previous studies have resulted in all possible conclusions: some say the $H^+ + D$ channel dominates, some say the $H + D^+$ channel dominates, while others say there is no isotopic preference. In our experiment, the fragments were measured in coincidence by a 3D momentum imaging system. A weak longitudinal electric field following a field free collision region was utilized for distinguishing the dissociation channels of interest in order to resolve the discrepancy of this particular branching ratio. In addition, two dissociation mechanisms were identified, namely electronic excitation in soft collisions and vibrational excitation in hard collisions.

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