

Abstract Submitted
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Angular dependence of collision-induced dissociation of H_2^+ on internuclear distance¹ BEN BERRY, NORA G. KLING, A. MAX SAYLER, DAG HATHIRAMANI, JACK W. MASEBERG, K.D. CARNES, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506, USA — In slow (keV) collisions between molecular ions and atoms, the dominant processes are collision-induced dissociation (CID: $\text{H}_2^+ + \text{Ar} \rightarrow \text{H}^+ + \text{H} + \text{Ar}$) and dissociative capture (DC: $\text{H}_2^+ + \text{Ar} \rightarrow \text{H} + \text{H} + \text{Ar}^+$). Using a coincidence 3D momentum imaging technique, CID and DC are experimentally separated. Furthermore, CID by electronic excitation to a repulsive state is distinguished from that caused by ro-vibrational excitation. In electronic excitation CID the measured angular distribution varies with the kinetic energy release (KER) of the molecule. By converting KER to internuclear distance using the reflection method, the results are found to be in agreement with theory based on the 1st Born approximation [1]. We have also upgraded the experimental setup, improving the detection of low energy fragments which allows for better measurement of the ro-vibrational CID mechanism.

[1] T.A. Green and J.M. Peek, Phys Rev. **183**, 166 (1969)

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