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TRAPPING AND DISSOCIATION OF MOLECULAR IONS

Molecular reactions and the interaction of molecules with charged particles and photons are central to the chemical sciences. In this talk, I will talk about: (i) a hybrid electrostatic ion beam trap (HEIBT) and (ii) the dissociation dynamics of molecular ions produced through interactions with charged particles and photons. The HEIBT enables coincidence imaging of both cationic and neutral fragments resulting from interactions of electrostatically trapped molecular ion beams with laser fields, as well as from low-energy collision processes involving merged beams of counterions or neutral species. Building on the electrostatic ion beam trap (EIBT) [1] and a multi-fragment spectrometer [2], the HEIBT mirror design allows ions to be trapped on stable trajectories while minimizing disturbances to the trajectories of ions with either the same or opposite charge [3]. The ionization and subsequent fragmentation of molecules induced by charged particles and photons are studied using recoil-ion momentum spectroscopy to understand the underlying dissociation dynamics. From these measurements, the kinetic energy release (KER) and the angular distributions of the fragments are also obtained [4-5].

References

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