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A New Surface-Induced Dissociation FTMS Instrument and First Results

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A new FTMS research apparatus and first results are described. Reactant ions are prepared by MALDI or Electrospray ion generation, an ion funnel for efficient ion injection, a triple quadrupole mass selector and ion collisional cooling section and an energy selector preceding ion buncher and injector lenses. A high vacuum probe lock presents an orthogonally mounted surface to the ion beam inside the solenoid field. Reflected primary ions and secondary ions are trapped in a forth-order field-corrected Penning Trap and measured by conventional FT methods. This apparatus is our newest tool for investigating mechanisms of collisional activation and dissociation of ions. In this work we compare spectra obtained with carefully controlled multiple collision SORI excitation and single collisional excitation with a perfluoroalkyl self-assembled monolayer (FSAM). Using protonated model peptides and RRKM modeling of their dissociation we deduce accurate dissociation parameters and energy transfer functions for their collisional activation. Similarities and differences in results obtained in SORI and FSAM collisional activation are rationalized in the context of recent collisional dynamics and kinetics results.