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HIGHLY CHARGED IONS COLLISIONS WITH GAS-PHASE MULTIPLY CHARGED PROTEINS

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We have performed a study on highly charged ions (HCI) collisions with multiply charged protein ions, both positive and negative, stored in a linear ion trap. Particularly, we have measured the effect of 375 keV Xe²⁵⁺ ions collisions with cytochrome c (\approx 12.5 kDa) and BPTI (\approx 6.5 kDa) gas-phase protein poly-cations and poly-anions, as a function of the charge state, since in the gas phase the charge strongly influences the structure of the biopolymer ions [1]. The present experiment offers a possibility to investigate HCI collisions with biopolymers (proteins and DNA) isolated and maintained under well-defined conditions in the gas phase, leading to better understanding of the basic physicochemical properties of biomolecules and the interplay between these properties and their function, as well as their interaction with HCI projectiles.

The experiment has been performed by coupling a linear quadrupole ion trap mass spectrometer, equipped with the electrosprayed ions (ESI) probe, to the HCI beamline [2,3]. The system is based on a commercial linear quadrupole ion trap ("Thermo scientific LTQ XL"), which has been coupled to the ARIBE beamline, the low-energy ion beam facility of the GANIL in Caen, France [4].

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