

PT10 Evaluation of electron transfer dissociation in a hybrid quadrupole-hexapole Fourier transform ion cyclotron resonance mass spectrometer

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ETD, ECD, MSMS, FT-ICR MS,

Comparison of ETD and ECD MS/MS spectra performed on peptides and proteins generated from the same ion-source on an FTICRMS

Introduction: Electron transfer dissociation (ETD) and electron capture dissociation (ECD) tandem mass spectrometry techniques have been shown to be useful for characterisation of peptides and proteins (e.g. top-down analysis). Both techniques produce c- and z-type fragment ions, which are complementary to b- and y-type fragment ions produced in collision induced dissociation (CID). This work will describe the implementation and evaluation of ETD in the hexapole of a hybrid Qh-FTICR as well as comparisons between ETD and ECD using a set of standard peptides and proteins.

Preliminary Results: A custom built hybrid Qh-FTICR capable of performing ETD in the hexapole and ECD in the ICR cell was used in these experiments. ETD and ECD experiments were performed on various charge states of Substance-P, Melittin, Ubiquitin, and Myoglobin. In general for peptides, ETD had two to three times greater dissociation efficiency than ECD, whilst both techniques yielded similar sequence coverage and mass accuracies ranging from 0.2-1.2ppm. ETD of intact proteins also yielded two to three times greater dissociation efficiencies than for ECD, however the sequence coverage ETD experiments was ~20-30% smaller than for ECD. High mass accuracy and resolving power (~225,000 at m/z 845) allowed for the successful identification of all of the proteins analysed through MASCOT searches without need for PTR. This work represents the first successful implementation of ETD in the hexapole of a hybrid Qh-FTICR.