Characterization of Phthalic Anhydride and Their Derivatives by Electron Capture Detection／Collisional Activated Dissociation in Ion Trap Mass Spectrometer with an External Ionization Source

Electron Capture Detection Mass Spectrometry is a sensitive and selective technique for the analysis of compounds containing electrophilic functional groups. It has been used extensively for the analysis of many classes of compounds in the traditional mass spectrometers but none was reported from the ion trap mass spectrometer since the traditional ion trap MS can not perform negative ion analysis. However, in this study we have examined a series of phthalic anhydride and their derivatives by electron capture detection in the ion trap tandem mass spectrometer with an external source ( the Finnigan GCQ/sup plus/). GCQ is the first commercial benchtop ion trap mass spectrometer with the capability to perform negative ion analysis. In this study, a series of halogenated Phthalic anhydride and their derivatives will be examined. Since these halogenated compounds possess higher electron affinities, negative ions can be formed through a resonance electron capture process. Besides, by using the tandem in time ion trap mass spectrometry one can select a specific m/z of ion to perform MS/MS. Then the selected precursor ion can further dissociate by the collisional activation technique. From the fragments, the structure of ions can be determined. These novel experiments can provide valuable results for negative ions which could not be detected by an traditional internal ionization ion trap mass spectrometer in the past.