



EXTENDING THE CAPABILITIES OF MS TECHNOLOGIES FOR POLYMERS ANALYSIS USING NOVEL SOURCES AND ION MOBILITY

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The analysis of high polymers is a demanding application where a wide variety of powerful analytical techniques is usually required. High Resolution Mass Spectrometry (HR-MS) has widely been adopted in this arena as a powerful research tool due to the specific information that it offers.

The analysis of samples like high molecular weight polymers is a challenging matter as samples can be very complex and exhibit a high dynamic range. This can make the observation and analysis of minor species difficult. Any separation technique that allows a reduction in the sample complexity is beneficial for the complete characterisation of polymers. Demands for increased throughput and elucidation of increasingly complex samples means chemists are constantly striving for techniques that add dimensions of orthogonality to separations. Ion mobility spectrometry (IM) separates gas-phase ions based on their cross-section and can be coupled with a quadrupole-time-of-flight (Q-TOF) mass spectrometer to yield a powerful tool used in the identification and characterisation of complex samples. Assuming the cross-section is different, spatial isomers, selected by the quadrupole of the Qtof instrument, will be separated in the ion mobility cell, then fragmented in a collision cell, and their structure studied by using isomeric specific fragmentation data. Exact mass information on the isomers and fragments will be provided by the high resolution ToF analyser. A specific software tool will facilitate the representation of the 3 dimensional data (M/z, ion mobility drift time and intensity) and the extraction of relevant information.

ESI and MALDI are currently the most common ionisation techniques in MS. A wider range of ionisation techniques will be of benefit as it widens the possibilities for analysis. Two novel sources will be presented: an atmospheric pressure probe that allows the direct introduction and ionisation of liquid or solid samples. Applicability to oil and polymer samples will be mentioned.