

Imaging with Secondary Ion Mass Spectrometry: A primer

Imaging mass spectrometry [1, 2] has matured into a technology that is applied to unravel the complexity of a variety of surfaces. Imaging MS research has focused on improving fundamental insight, instrumentation capabilities and applications in many different disciplines. Applied in material sciences, semi-conductor technology, geochemistry and life sciences MSI provides insight in molecular processes that drive local chemistry. A key strength of imaging MS is its ability to operate at the interface of disciplines. Different imaging modalities bring together discrete pieces of information at different spatial, spectral and structural levels. Higher spatial resolution techniques such as secondary ion mass spectrometry (SIMS) are crucial to unravel this complexity at the submicron level. This lecture will provide a basic insight in the technological basis of SIMS with a focus on different strategies to obtain detailed molecular information on organic surfaces. Recent innovations that provide more in depth understanding of the biochemistry at surfaces will be discussed. For that purpose we developed a novel tandem MS approach to overcome this problem [3] employing an orthogonal ion selection and high energy collision induced dissociation. This method allows the parallel acquisition of SIMS images and an selected tandem MS image. In other words: it does not discard any precious ions while conducting a tandem MS image experiment and enables molecular identification.

Special Analytical Seminar

presented by

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Hosted by Prof. Lingjun Li