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Mass spectrometry of reactive low-pressure and atmospheric plasmas JAN BENEDIKT, Christian-Albrechts-University Kiel — Reactive plasmas are highly valued for their ability to produce large amounts of reactive radicals and of energetic ions bombarding surrounding surfaces. The non-equilibrium electron driven plasma chemistry is utilized in many applications such as anisotropic etching or deposition of thin films of high-quality materials with unique properties. However, the non-equilibrium character and the high power densities make plasmas very complex and hard to understand. Mass spectrometry (MS) is a versatile diagnostic method, which has a prominent role in the characterization of reactive plasmas. It can access almost all plasma generated species: stable gas-phase products, reactive radicals, positive and negative ions or even internally excited species. It can provide absolute densities of neutral particles or energy distribution functions of energetic ions. This talk will focus on quadrupole MS with an electron impact ionization ion source as the most common MS technique applied in plasma analysis. Necessary information for the understanding of this diagnostic and its application and for the proper design and calibration procedure of an MS diagnostic system for quantitative plasma analysis will be discussed.

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