



ELSEVIER

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Foreword

Electron-molecule collisions initiate and drive many chemical reactions relevant in radiation and environmental sciences as well as in plasma processes and many other areas of basic research and application. In particular, the life sciences are a rapidly advancing field where the important role of electron-driven reactions is only now beginning to be recognized, for instance strand-breaking in DNA caused by the interaction of electrons at energies significantly below the ionization threshold. On the other hand, the fundamental physics and chemistry of the underlying processes is only poorly understood. While a full scale theoretical treatment of the electron-molecule interaction is presently still not possible for polyatomic molecules, the situation becomes even more complex, if the molecule under consideration is coupled to an environment (e.g., in a gas phase cluster, within a liquid or at the surface of a solid).

Although the handling of electron beams is by no means an easy task (in particular at low energies), many noteworthy advances have been made in the field, extending the investigations from single gas phase molecules to clusters and also to molecules adsorbed and condensed on solid surfaces. These studies have benefited greatly from the advent of new types of electron sources with ever increasing energy resolution. It is safe to say that the current knowledge and understanding has strongly been influenced by the introduction of the trochoidal electron monochromator in 1968 by Stamatovic and Schulz (Rev. Sci. Instruments, 39 (1968) 1752).

To provide an overview of the current state of the art in this driving field and its implication for gas-phase ion chemistry and related areas, the editors of the International Journal of Mass Spectrometry sug-

gested to us to devote a special issue to this topic. When we were asked to act as guest editors for this special issue we happily agreed, because both of us not only have a strong affinity for this subject for many years, it also gave us the chance to honor a pioneer in this field by dedicating this issue to Aleksandar Stamatovic on the occasion of his 60th birthday. This view was shared by many colleagues and friends who accepted our invitation to contribute. The 31 articles cover a broad range of processes initiated by electrons with particular emphasis on the low energy regime involving dissociative electron attachment (DEA) processes. Because of the increased interest in this field we will follow up this special issue with an "International Symposium on Low Energy Electron-Molecule Interactions (LEEMI 2001) to be held in Going/Kitzbühel, Tirol, Austria, March 4–7, 2001 which will also be dedicated to Aleksandar Stamatovic in recognition of his many contributions to this field.

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