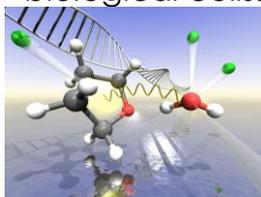


COLOQUIOS 2019

Electron Impact Ionization of **Atoms, Molecules and Clusters**

Ionizing collisions of electrons with atoms or molecules are very fundamental few-body reactions and they are ubiquitous in our environment as well as in various applications like radiation therapy. By measuring the momentum vectors of all free electrons and ions produced in a collision we get detailed insight into the ionization dynamics. Moreover, the fully differential cross sections obtained promote the development of accurate theoretical models for increasingly complex systems. In going from gaseous target species to condensed matter like clusters new phenomena show up in the ionization process. We have identified interparticle energy and charge transfer processes like the so-called Intermolecular Coulombic Decay (ICD) in basic atomic dimers as well as in clusters of organic molecules. As an example, ICD was found in complexes of one water molecule and one tetrahydrofuran molecule (C_4H_8O , THF) which is the simplest analog of deoxyribose in the DNA backbone. Such reactions are suspected to enhance radiation damages which are induced by ionizing radiation in biological cells.



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