Positron Interactions with Atoms and Molecules – New Results and Insights

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Positrons (the electron antiparticle) are ideal vehicles for scientific research as they not only hold much fundamental interest in the way in which they interact with matter, but also have considerable applications in fields such as material science and medical diagnostics. For example, they are the key component in the diagnostic technique Positron Emission Tomography (PET) which is now commonly used in the early detection of cancer. Despite this, little quantitative information has been available about the interaction of positrons with biologically important molecules.

This paper will review what we know about positron-matter interactions, touch on some of the experimental and theoretical challenges that their study poses, and reveal some of the exotic complexes they form, such as positronium and positronic atoms. Recent studies on biologically relevant molecules will be highlighted, and the use of this data in modeling positron transport in various media will be demonstrated.

A caption should be attached to each figure (Times font, 14pt, normal).