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Complete and consistent cross-section sets for electrons in biomolecular gases using swarm techniques¹

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The determination of a comprehensive set of electron-biomolecule cross-sections is fundamental to understanding electron induced processes arising in plasma medicine and radiation damage modelling. Formulation of complete sets is generally based on a critical assessment of available experimental “beam” studies and theoretical calculations, and interpolations/extropolations. Issues of completeness and accuracy of cross-section sets arise and it is here that swarm experiments play a key role. In this presentation we report on recent swarm measurements in the biomolecules of water and tetrahydrofuran (THF) using the pulsed-Townsend technique of the de Urquijo group. We present and assess the consistency of cross-section sets for water and THF through a comparison of calculated transport coefficients using a multi-term Boltzmann equation solution with the available experimental swarm measurements provides a discriminating test on consistency and accuracy of the cross-section sets. Co-authors: J. de Urquijo, M. Casey, D. Konvalov, M. J. Brunger, G. Garcia and Z. Petrovic.

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