Abstract Submitted
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Self-consistent electron impact cross-sections for THF: A swarm investigation[1] MADALYN CASEY, DANIEL COCKS, GREGORY BOYLE, James Cook University, JAIME DE URQUIJO, Universidad Nacional Autonoma de Mexico, DARRYL JONES, MICHAEL BRUNGER, Flinders University, RONALD WHITE, James Cook University — An accurate quantitative description of electron transport in biological systems is necessary for applications in medical imaging and dosimetric treatments. Modelling charged particle transport in the human body on a molecular level involves interactions with many complex molecules but is often reduced to the comprehensively studied surrogate of water. Simple analogues for the sugars and DNA bases, such as tetrahydrofuran (THF), a sugar linking the phosphate groups in the DNA backbone, represents a first step to include the structure of DNA. The first experiments of macroscopic transport of electrons in pure THF and mixtures with N_2 and Argon have become available, and we use these measurements to perform rigorous testing of existing THF cross-sections. To model transport through THF we solve Boltzmann's equation to iteratively modify cross-sections and obtain a set that best reproduces the experimental transport coefficients. Negative differential conductivity is present in mixtures with THF, but is absent in the pure gas, and we observe the thermal activation of this phenomenon.

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