

Abstract Submitted
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Inelastic- collision cross sections for the interactions of H^+ , He^{2+} and C^{6+} ions with liquid water MARIO BERNAL, JACINTO LIENDO, Universidad Simon Bolivar — Monte Carlo codes for ion-nanodosimetry in tissue-like media require a detailed knowledge of the ionization cross sections. Secondary electrons play a main role in the radiobiological effectiveness of any radiation. The HKS and CDW-EIS formalisms are implemented to determine single ionization cross sections (SICS) corresponding to the impact of H^+ , He^{2+} and C^{6+} ions on liquid water, for incident energies from 0.3 to 10 MeV/u. Corrected expressions for the HKS method have been used. The same kind of initial electron wave functions and binding energies have been used with both models, in order to compare the formalisms themselves. Double and single differential as well as total SICS of liquid water have been calculated by use of both methods and comparisons have been made between their theoretical predictions. Also, these results have been compared with experimental values reported previously for ionization of water vapor due to protons and alpha particles. The excitation cross sections are included to determine electronic stopping cross sections in liquid water. The results based on the CDW-EIS method provide the best agreement when stopping powers are compared with corresponding data published in ICRU reports, obtaining discrepancies of about 9 %, 16 % and 19 % for incident protons, alpha particles and carbon ions respectively.

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