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Electron collisions with α -D-glucose and β -D-glucose monomers¹ ROMARLY DA COSTA, Universidade Federal do ABC, MÁRCIO BETTEGA, Universidade Federal do Paraná, MÁRCIO VARELLA, Universidade Federal do ABC, MARCO LIMA, Laboratório Nacional de Ciência e Tecnologia do Bioetanol — The development of new alternative routes for production of second generation ethanol from sugarcane biomass poses a challenge to the scientific community. Current research in this field addresses the use of a plasma-based pretreatment of the lignocellulosic raw material. With the aim to provide a theoretical background for this experimental technique we investigate the role of low-energy electrons from the plasma in the rupture of the matrix of cellulosic chains. In this paper we report calculated cross sections for elastic scattering of low-energy electrons by the α and β -D-glucose monomers. The calculations employed the Schwinger multichannel method with pseudopotentials and were carried out at the static-exchange and static-exchange plus polarization levels of approximation. Resonant structures appearing at different energies for α -and β -glucose at the low-energy regime of impact energies can be understood as a fingerprint of an "isomeric effect" and suggest that distinct fragmentation mechanisms proceeding via σ^* shape resonances may become operative depending on the glucose anomer under consideration.

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