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Electron capture by bare ions on water molecules ROBERTO RIVAROLA, PABLO MONTENEGRO, JUAN MONTI, OMAR FOJÓN, Instituto de Física Rosario (CONICET-UNR), Rosario, Argentina — Single electron capture from water molecules by impact of bare ions is theoretically investigated at intermediate and high collision energies. This reaction is of fundamental importance to determine the deposition of energy in biological matter irradiated with ion beams (hadrontherapy), dominating other ionizing processes of the target at low-intermediate impact velocities and giving principal contributions to the energetic region where electronic stopping power maximizes. The dynamics of the interaction between the aggregates is described within the one active-electron continuum distorted waveeikonal initial state theory. The orbitals of the target in the ground state are represented using the approximate self-consistent complete neglect of differential orbitals (SC-CNDO) model. The contribution of different molecular orbitals on the partial cross sections to selected n-principal quantum number projectile states is discriminated as well as the collaboration of these n-states on total cross sections. The latter ones are dominated by capture to n=1 states at high enough energies decreasing their contribution as n increases.

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