

Abstract Submitted
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Capacitive Deionization: a coupled 2D electro-adsorption/convective-diffusive simulation for various system configurations CARLOS HIDROVO, YASAMIN SALAMAT, Northeastern University — Capacitive Deionization (CDI) is a relatively new electrically based desalination method that uses porous media to adsorb ions in solution from water, with the potential to recover part of the energy used during the desalination process. Previous studies have investigated the physics underlying the electro-adsorption process in the electrical double layers in the CDI porous electrodes. In order to improve CDI performance in terms of minimum average concentration, total amount of water treated, and duration of the desalination process, herein we propose and evaluate different CDI architectures. Two previously validated 2D and 1D models are used alongside each other to study different CDI system configurations based on various convective-diffusive layer regimes. Moreover, the effects of micro pore and macro pore capacities on the total number of ions adsorbed in the porous media is investigated. This will open new opportunities for further researches toward engineered CDI units for better desalination.

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