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The study of membrane capacitive deionization from charge efficiency

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ABSTRACT

Membrane capacitive deionization (MCDI) is a promising technology for desalination with the potential of lowering energy consumption and treatment cost. In this paper, batch mode experiments were carried out to evaluate the charge efficiency of the MCDI process. Specifically, charge efficiency is a very functional tool to examine the double layer structure inside of porous electrode. The results show that the charge efficiency in MCDI is a function of both cell voltage and solution conductivity. Specifically, it was found that the charge efficiency was proportional to cell voltage while inversely to solution conductivity. The maximum charge efficiency (0.55) in MCDI was far less than one, indicating the high transient resistivity between membrane and carbon electrodes.

Keywords: Membrane capacitive deionization; Removal amount; Capacitive deionization; Porous electrode; Resistivity; Charge efficiency

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