

# SMALL-SCALE SEAWATER ELECTRODEIONIZATION

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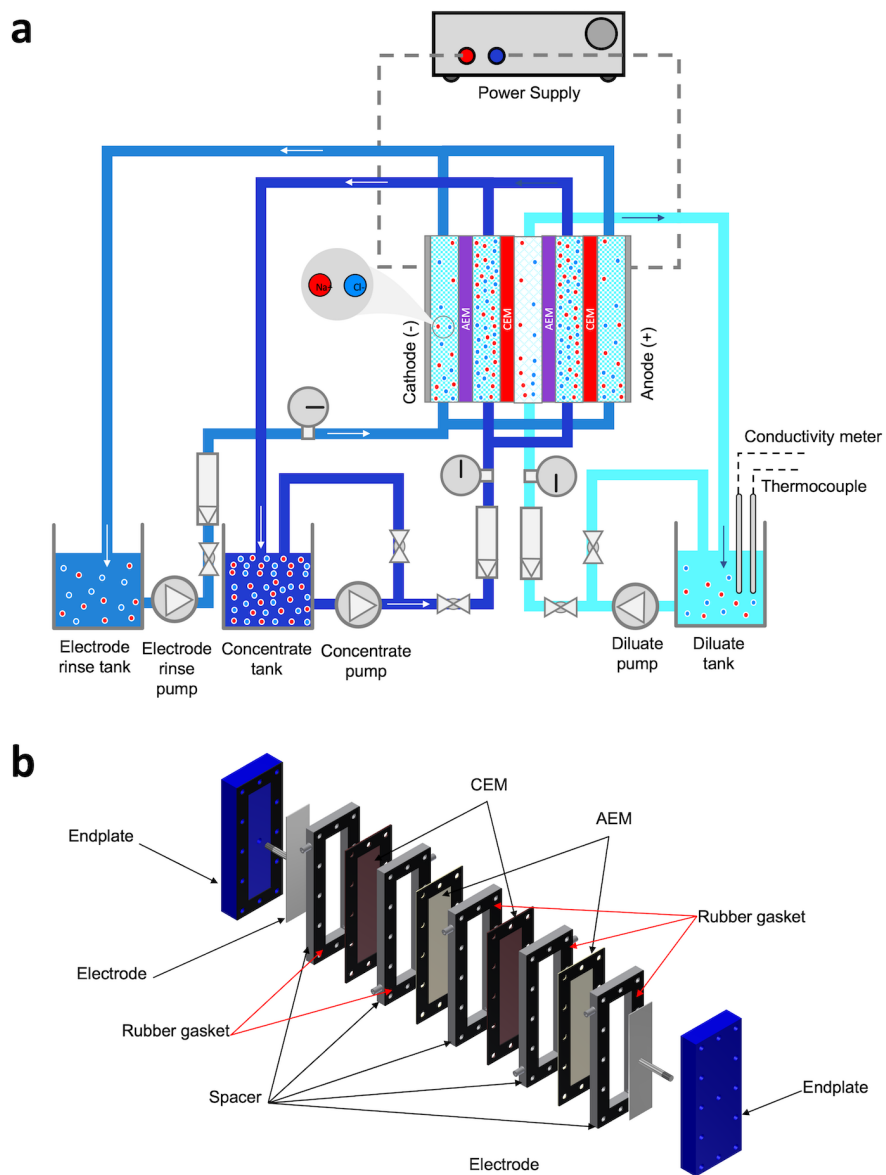
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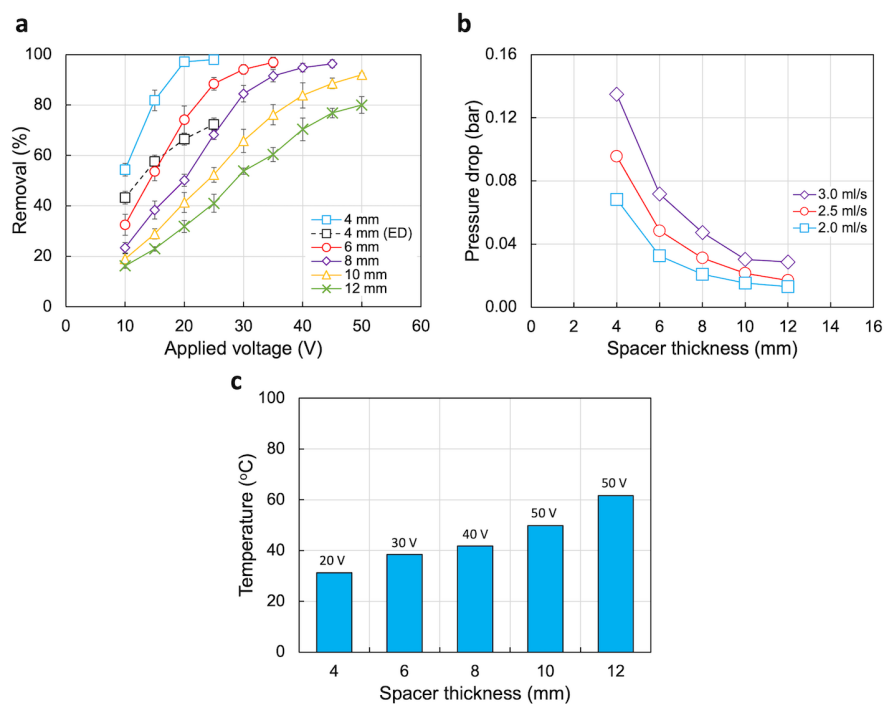
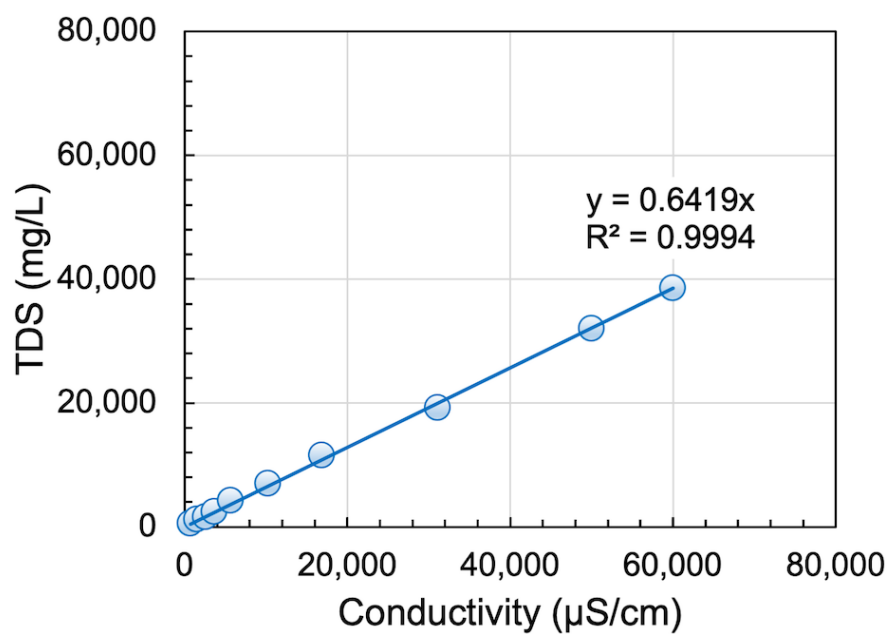
## Abstract

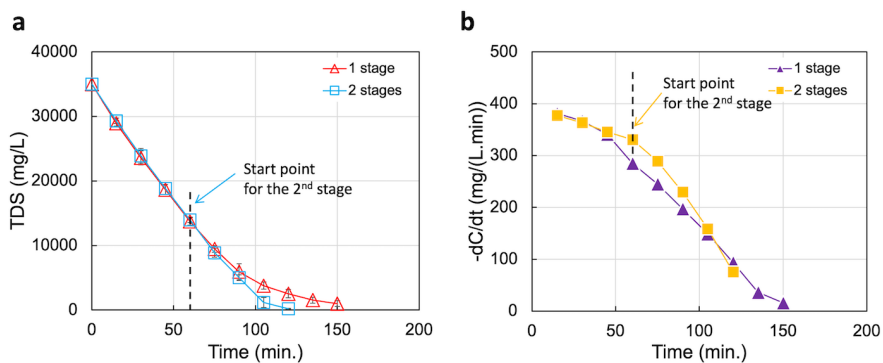
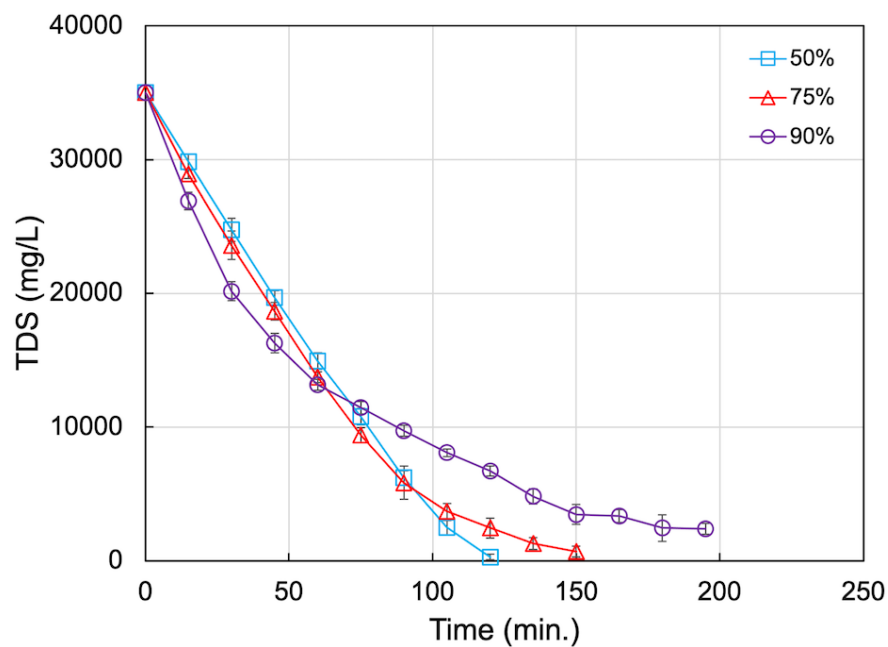
In this work, the performance of electrodeionization (EDI) in seawater desalination was investigated. EDI stack design and operating parameters (applied voltage, recovery, and multi-stage process) were examined during a batch-mode desalination process. The results show that EDI can achieve 99.5% salt removal in a stack with 4 mm spacer thickness (at 20 V applied voltage, 75% recovery, and 2 mL/s circulation flow rate). A thinner spacer thickness can enable a higher desalination rate and lower final solution temperature. Compared to a single-stage process, two-stage desalination can maintain the salt-removal rate, suppress reverse salt diffusion, and shorten the desalination time required to produce similar water quality. The specific energy consumption of EDI is below 12 kWh/m<sup>3</sup> or less than 120 Wh for producing 10 L freshwater. Considering its simplicity, EDI can be an attractive alternative for small-scale, decentralized desalination facilities.

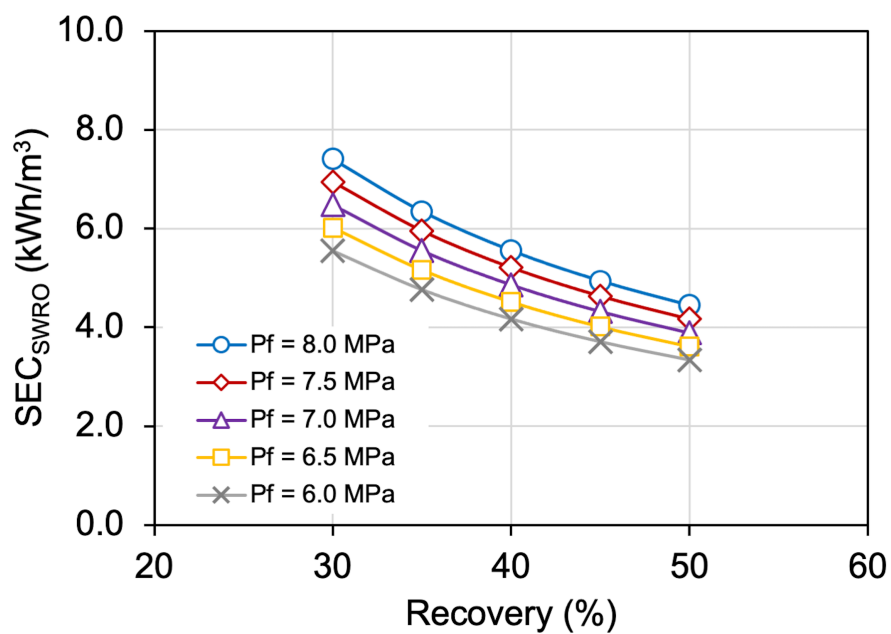
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