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# Cocoon derived nitrogen enriched activated carbon fiber networks for capacitive deionization

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## Abstract

Capacitive deionization (CDI) has been attracted great interest as an emerging desalination technology and the electrode materials play a critical role on improving CDI performance. In this work, nitrogen-enriched activated carbon fibers (AN-CFs) were prepared from the natural based silk cocoon through simple carbonization and CO<sub>2</sub> activation. Their electrochemical and electrosorption behaviors were studied in NaCl solution. The results show that AN-CFs exhibit a fibri form porous structure with rich nitrogen element and CO<sub>2</sub> activation enhances their specific surface area. Compared with unactivated nitrogen-enriched carbon fibers (196.05 F g<sup>-1</sup> at 1 mV s<sup>-1</sup>, 12.02 mg g<sup>-1</sup> in 1000 mg l<sup>-1</sup> NaCl solution), AN-CFs exhibit more excellent capacitive (236.03 F g<sup>-1</sup>) and CDI (16.56 mg g<sup>-1</sup>) performances, showing that CO<sub>2</sub> activation is proved to be an effective method to improve electrochemical and electrosorption performances and the AN-CFs should be a promising electrode material

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