



## Study of carbon aerogel-activated carbon composite electrodes for capacitive deionization application

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### ABSTRACT

Electrodes synthesized using mesoporous carbon aerogel (CA), microporous-activated carbon (AC), and different combinations of the two were evaluated for capacitive deionization application. Composite electrodes with CA and AC in the ratio of 75:25 provided the highest specific capacitance value (90 F/g at scan rate of 2 mV/s). Further, it was observed that on increasing the scan rates to up to 10 mV/s, the reduction in specific capacitance values for the electrodes with 75:25 CA/AC composition was only 5%, whereas the reduction for pure CA and pure AC electrodes were 23 and 52%, respectively. The test cell made using 75:25 CA/AC composite electrodes (size 10 cm × 10 cm with material loading of 15 mg/cm<sup>2</sup>) showed fast adsorption and desorption cycle of ~15 min and salt removal efficiency of 51% was obtained.

*Keywords:* Carbon aerogel; Activated carbon; Cyclic voltammetry; Capacitive deionization

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