

Supplementary Information

Excellent Capacitive Deionization Performance of Meso-Carbon Microbeads

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1. Material information and characterization of activated carbon (AC)
2. AC electrode fabrication

1. Material information and characterization of activated carbon (AC)

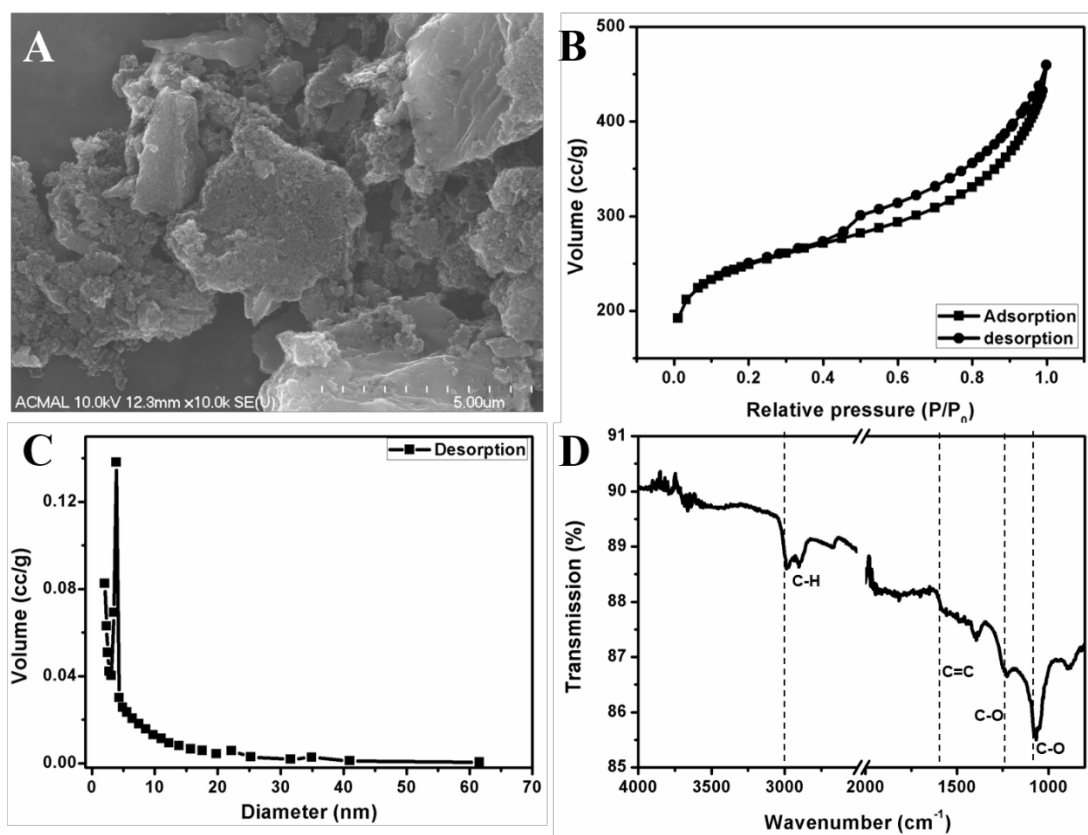


Figure S1 Characterization of AC, (A) SEM image, (B) N₂ adsorption/desorption curves, (c) pore size distribution, and (D) FTIR spectrum.

Activated carbon (~100 mesh) was obtained from Aldrich Chemical Company, Inc. The microstructure of AC was characterized by Hitachi-4700 field emission scanning electron microscope (FESEM). As shown by SEM images in Figure S1A, one can see that the particle sizes of AC are about 4 μm. Its surface area and pore size distribution were determined by N₂ adsorption at liquid nitrogen temperature (77 K) with ASAP 2000 instrument. The adsorption and desorption curves are shown in Figure S1B. The total BET surface area of AC is 844 m²/g, in which 500 m²/g is micropore surface area. This indicates the most pores of the AC are micropores, which is supported by pore size

distribution (Figure S1C). Fourier transform infrared (FTIR) spectrum of the AC was recorded with a Perkin Elmer Spectrum One (KBr pellets method) and shown in Figure S1D. The IR absorption peaks associated with C-O stretching were observed at 1100 and 1250 cm^{-1} . Furthermore, The stretching vibrations of C=C and C-H were also detected at 1610 and 2982 cm^{-1} , respectively.

2. AC electrode fabrication

The active carbon (AC) electrode was fabricated with the same method used for the MCMB electrode, which can be described as follows: AC (51 mg), carbon black (3 mg), and poly(tetrafluoroethylene) (6 mg) were mixed in isopropyl alcohol (20 ml) to form a homogeneous slurry. The slurry was dropped on graphite foil (0.254 mm thick, Alfa Aesar) and its thickness was controlled by film casting knife (micrometer adjustable film applicator, 50 mm). The obtained AC electrode was dried at 80 °C for 24 hours before its performance tests.