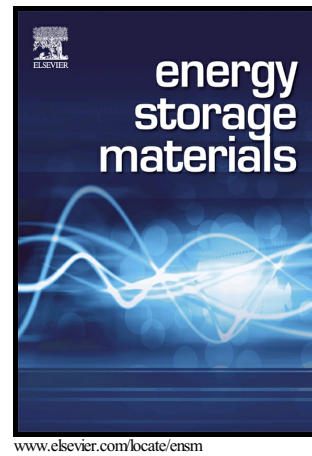


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Carbon electrodes for capacitive technologies

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Abstract

An overview of capacitive technologies based on carbon materials (energy storage in electrical double-layer capacitors (EDLCs), capacitive deionization (CDI), energy harvesting, capacitive actuation, and potential controlled chromatography) is presented. The review reveals the role of carbon for these scientific and industrial purposes with disclosing the benefits and limitations of various nanostructured carbons for a certain application. A special attention is placed on the electrical double-layer (EDL) formation mechanisms affected by the porous texture of carbon and the electrode architecture. The importance of a careful selection of the electrolytic solution for the EDL formation inside the intraparticle pores of carbon electrodes is also enlightened.

Keywords: carbon materials; electrical double-layer capacitors; energy storage and harvesting; capacitive deionization and actuation; potential controlled chromatography

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