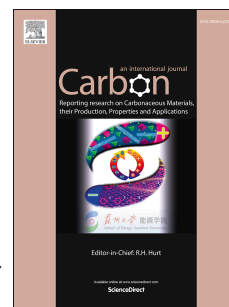


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Electrochemical Capacitive Energy Storage in PolyHIPE derived Nitrogen Enriched Hierarchical Porous Carbon Nanosheets

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Abstract

Porous and interconnected electrodes based on carbon nanoarchitectures offer comprehensive advantages of large specific surface area and high porosity consequently increasing the specific capacitance of ultracapacitor energy storage systems. Emulsion-templated polymers, PolyHIPEs (Polymerized High Internal Phase Emulsions) are highly porous polymers with a structure of cages interconnected by windows thus provide suitable framework to create such porous carbon nanostructures. Herein, nitrogen enriched porous carbon nanosheets are synthesized by pyrolysis of polymer-silica hybrid PolyHIPE and subsequent silica removal. This nitrogen enriched porous carbon nanosheets when tested as an electrode for ultracapacitor, showed specific capacitance as high as 209 F/g at a current density of 1A/g in 1M H₂SO₄ with excellent capacity retention over long cycling.

Keywords: nitrogen enriched porous carbon nanosheets, PolyHIPE template, ultracapacitor, energy storage.

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