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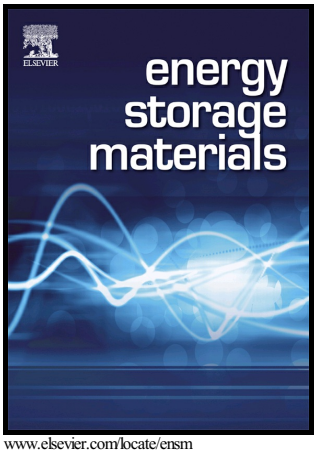

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ACCEPTED MANUSCRIPT

Electrolyte mobility in supercapacitor electrodes – solid state NMR studies on hierarchical and narrow pore sized carbons

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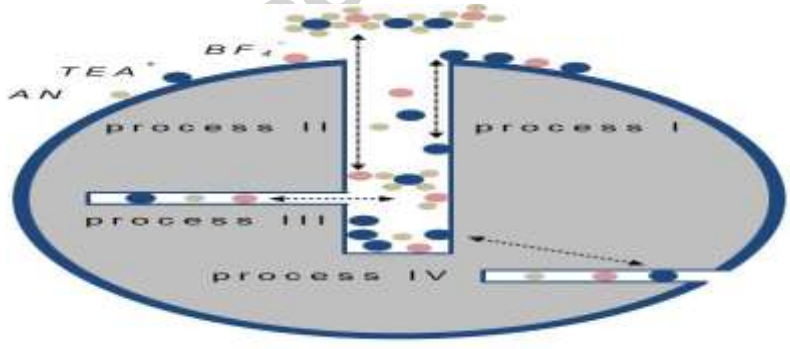
ABSTRACT

Electrical double layer capacitors are in the special focus of current energy storage research due to their high power density. They store charge physically by quick electrosorption of electrolyte ions on the surface of porous carbon electrodes. However, fundamental insight into the storage mechanism, especially on a molecular level is limited despite of the crucial importance to understand and improve this promising technology. We have investigated and quantified the mobility of electrolyte ions in supercapacitor electrodes by means of solid-state nuclear magnetic resonance (NMR) spectroscopy. We could discriminate between the mobility of cations, anions, and solvent molecules. The exchange of these species between different pore systems as well as between pore system and external bulk environment is studied in detail by NMR spectroscopic methods.

Graphical abstract



Keywords

Electrical double layer capacitors, porous carbons, nuclear magnetic resonance spectroscopy

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