

Hierarchically Structured Macro/mesoporous Graphitic Carbon : Emulsion/Block-copolymer Co-template synthesis and application for High Power Supercapacitor

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The rate performance is a very important feature of energy storage device. Because the rate of charge-discharge is dependent on the mass transport of ions in electric double layer capacitor (EDLC), we can improve the rate performance by controlling the nanostructure of electrode materials. We synthesized hierarchically structured macro/mesoporous graphitic carbon (MMGC) with simple method and applied to EDLC electrode material. We employed emulsion and block co-polymer templates that generate macropores and mesopores, respectively, instead of pre-formed template. The macropores connect mesopores and shorten the ionic diffusion distance significantly and the graphitic pore wall enhances the charge transfer rate. at the electrode layer. MMGC had higher capacitance retention and much less resistance than commercial activated carbon and ordered mesoporous carbon. We expect that MMGC can be a good candidate for high power density EDLC electrode material because of its excellent rate performance and simple synthetic procedure.