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Ionothermal Synthesis of Graphene-Based Hierarchically Porous Carbon for High-Energy Supercapacitors with Ionic Liquid Electrolyte

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Keywords. Nanoporous carbon, supercapacitors, ionic liquids, ionothermal synthesis

ABSTRACT. Electrochemical double layer capacitors (EDLCs), storing charges by electrostatic attraction of electrolyte ions to the surface of charged electrodes, require an improved energy density to broaden their applications. Here a high-energy-density EDLC is reported by employing ionic liquids not only as the solvent for material synthesis but also as electrolyte. Graphene-based hierarchically porous carbon (GPC) are synthesized via ionothermal method, and exhibits high specific capacitance of 313 F g⁻¹ and 212 F g⁻¹ at a current density of 0.5 A g⁻¹ in aqueous and ionic liquid electrolytes, respectively. The obtained GPC electrode retains about 94.2% of the initial capacitance after 10000 charge/discharge cycles at a current density of 2 A g⁻¹ in aqueous

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