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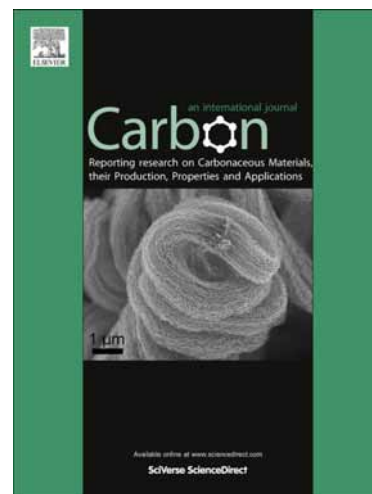
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Nitrogen-Doped Ordered Mesoporous Carbons Based on Cyanamide as the Dopant for Supercapacitor

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Abstract

Nitrogen-doped ordered mesoporous carbons (N-doped OMCs) with a high surface area of 1741 m²/g and nitrogen content up to 15 wt. % have been synthesized by nanocasting approach by using SBA-15 as a hard template, phenolic resin (resol) as a carbon source and high nitrogen-containing cyanamide as the nitrogen dopant. The introduction of cyanamide not only incorporates high-content nitrogen into the carbon matrix in the primary forms of pyridinic and quaternary species, but also greatly increases the surface area of materials. The obtained N-doped OMCs have large surface area with mesoporosity up to 92 %, uniform and appropriate pore size (3.6 - 4.1 nm), large pore volume (1.2 - 1.81 cm³/g). These merits together with high nitrogen enrichment lead to a specific capacitance (230 F/g at 0.5 A/g) and good rate capability (175 F/g at 20 A/g with capacitance retention of 77.4 %) in 6 M KOH aqueous electrolytes.

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