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Nitrogen-doped hierarchical porous carbon materials derived from diethylenetriaminepentaacetic acid (DTPA) for supercapacitors

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Nitrogen-doped porous carbon materials (NPCs) have been successfully fabricated by a simple one-step pyrolysis of diethylenetriaminepentaacetic acid (DTPA) in the presence of KOH. The as-synthesized NPCs displayed a high specific surface area ($3214 \text{ m}^2 \text{ g}^{-1}$) and a well-defined porous structure when the annealing temperature reached 800°C , which showed superior electrochemical performance as supercapacitor electrode materials. Electrochemical tests showed that the NPCs achieved an impressive specific capacitance of 323 F g^{-1} at a current density of 0.5 A g^{-1} in 6 M KOH aqueous solution and an outstanding cycle stability, negligible specific capacitance decay after 5000 cycles at 10 A g^{-1} . This strategy offered a new insight into the preparation of novel carbon materials for the advanced energy storage devices, such as supercapacitors, fuel cells and lithium ion batteries.

Keywords: Supercapacitors; DTPA; Nitrogen-doped porous carbon materials;

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