Short Communication

Synthesis of a Highly Porous Nitrogen-Doped Carbon Material from a Melamine/Formaldehyde Resin with Potassium Citrate

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Nitrogen-doped porous carbons were synthesized from an aqueous solution of melamine and formaldehyde. The addition of potassium citrate to the solution mixture led to a tremendous increase in the surface area from 74 m²/g to 2718 m²/g, indicating that potassium citrate served as an excellent pore former. The nitrogen-doped carbon exhibited remarkable capacitive performance, such as a high capacitance of 320 F/g at 0.1 A/g, an excellent rate capability (70 % at 10.0 A/g), and a high cycling stability (94.6 % retention after 2000 cycles) in 6.0 M KOH aqueous solution. Furthermore, the nitrogen-doped carbon delivered a high energy density of 7.8 Wh/kg even at a high power density of 5000 W/kg. We believe that the synthesis strategy presented in this work could be used as a promising way to fabricate electrode materials for high-performance supercapacitors.

Keywords: Melamine, Formaldehyde, Potassium Citrate, N-doped Porous Carbon

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