Synthesis of Biomass-Based Porous Carbon Nanofibre/Polyaniline Composites for Supercapacitor Electrode Materials

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Carbonized bacterial cellulose (CBC) nanofibre surfaces coated with polyaniline(PANI) were successfully designed and prepared via in-situ polymerization with different dopant acids (i.e., H₃PO₄ and TsOH). By combining the high-specific-area CBC nanofibres and conductive PANI, the CBC/PANI composite electrode exhibited greatly improved capacitive performance. The specific capacitance of CBC/PANI-T-0.5 reached 324.8 F/g at 1 A/g. Moreover, the as-assembled CBC/PANI-T-0.5//N, P-CBC asymmetric supercapacitor showed good capacitance, great rate performance and good long-term cycling performance, distinctly demonstrating that the CBC/PANI-T composite is a promising electrode material for supercapacitor devices.

Keywords: Carbon nanofibres; Polyaniline; Supercapacitor; Composite materials; Electrode

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