Facile PVP-Assisted Synthesis of MnO₂@MWNT Composites and their Application in Supercapacitors

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A composite of well dispersed MnO₂ nanoparticles adhered on multi-walled carbon nanotubes (MnO₂@MWNT) is obtained through facile hydrothermal process and followed by high temperature annealing. The nanoscale MnO₂ particles were homogeneously distributed on the surface of MWNTs under polyvinyl pyrrolidone (PVP)-assisted reaction. The MnO₂@MWNT composite (34.43 wt. % MnO₂) displays a high specific capacitance of 285.12 F/g at a current density of 1 A/g in 1 M Na₂SO₄ electrolyte. The electrode exhibits good cycling stability, which the specific capacitance retention retains up to 90.17% after 1000 cycles at 1 A/g.

Keywords: Supercapacitor; MnO₂@MWNT; PVP-assisted synthesis

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