MnO₂ Nanosheets-Decorated CuO Nanoneedles Arrays@Cu Foils For Supercapacitors

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Using a scaleable chemical method, the ultrathin MnO₂ nanosheets-decorated CuO nanoneedle arrays@Cu sheet has been synthesized and applied as electrodes, while CuO nanoneedles were obtained via an electrochemical deposition at room temperature. Such binder-free Cu/CuO@MnO₂ electrodes were measured by using X-ray diffraction (XRD), and field emission scanning electron microscopy (FESEM) to investigate the structure and morphology. Further electrochemical characterizations revealed that the specific capacitance of samples prepared in 24-hour reaction was as high as 177 mF cm⁻² at current density 0.5 mA cm⁻², with a stable cycling performance of 87.3% retention after 1000 cycles. These findings suggest that the Cu/CuO@MnO₂ electrode is a promising candidate for excellent electrochemical capacitors.

Keywords: copper; copper oxide; manganese dioxide; supercapacitors

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