

MnO₂ or PANI-coated 3D carbon pattern electrodes for thin film micro-supercapacitors

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Thin film micro-supercapacitors (MSCs) with high areal energy density are attractive for applications in compact energy storage devices. Here, we demonstrate a MnO₂ or PANI-coated 3D carbon pattern electrodes using 3D carbon patterns obtained by carbonization of a polymer pattern fabricated by interference lithography. Then, a thin film shell of MnO₂ and PANI was coated on 3D carbon patterns by electrodeposition. The composite electrodes were applied to solid-state MSCs by selective etching and coating with polymer gel electrolyte. We achieve the highest areal energy density of 3.67 μWh/cm² in the PANI-3D carbon pattern MSC.