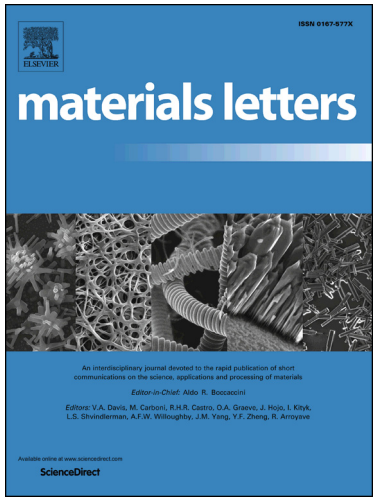

Facile Synthesis of Porous Mn_2TiO_4/TiO_2 Composites for High Performance Supercapacitors

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Facile Synthesis of Porous Mn_2TiO_4/TiO_2 Composites for High Performance Supercapacitors

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ABSTRACT:

Herein, porous Mn_2TiO_4/TiO_2 composites were successfully fabricated via a facile sol-gel approach. Scanning and transmission electron microscopy results demonstrated that Mn_2TiO_4/TiO_2 composites have pore structure, which not only improves the surface area of the sample but also provide more surface reaction sites. The electrochemical measurements show that such composites electrode possesses a specific capacitance of 98.2 F g^{-1} at a current density of 0.5 A g^{-1}. Moreover, the capacity retention of the fabricated material is 92.3% after 10000 cycles in 3M KOH aqueous electrolyte with a current density of 0.5 A g^{-1} at room temperature. These excellent results demonstrated that the porous Mn_2TiO_4/TiO_2 composites are promising for high-performance supercapacitors.

Keywords: sol-gel, porous structure, energy storage and conversion; microstructure, supercapacitors

1. Introduction:

Supercapacitors have attracted much attention due to their excellent properties such as rapid rechargeability, good recyclability and great power density [1-3]. In general, supercapacitors can be classified as electrical double-layer capacitors (EDLCs) and pseudo-capacitors on the basis of their mechanism of energy storage [4,5]. As compared to the EDLCs, the pseudocapacitors exhibit higher specific capacitance because of its fast and reversible redox reaction [6]. Thus, many of the researchers focus on fabrication of pseudocapacitors to obtain high-performance energy storage