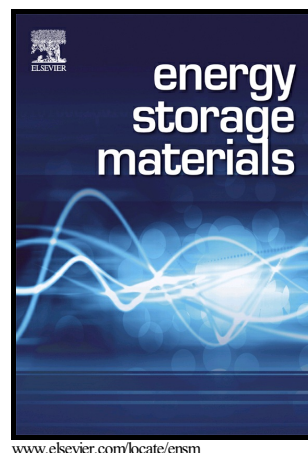


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4-Butylbenzenesulfonate Modified Polypyrrole Paper for Supercapacitor with Exceptional Cycling Stability

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4-Butylbenzenesulfonate Modified Polypyrrole Paper for Supercapacitor with Exceptional Cycling Stability

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Abstract:

Polypyrrole (PPy) is a highly conductive polymer and promising pseudocapacitive material for energy storage. However, the poor stability of PPy based supercapacitors (SCs) limits their applications. Here we demonstrate a facile dipping process to uniformly grow 4-butylbenzenesulfonate modified PPy film on a filter paper substrate. The flexible and free-standing PPy paper electrode demonstrated excellent cycling stability with capacitance retention of ~84.8% after 200,000 cycles. We believe that the 4-butylbenzenesulfonate modification could increase the order degree of PPy via layer-by-layer stacked α - α coupled chains, leading to a robust structure under the charging and discharging progress. This work pushes the cycling limitation of PPy based SCs and realizes their potentials for practical applications.

Keywords:

PPy, stability, supercapacitor, 4-butylbenzene –sulfonate, order degree

1. Introduction

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