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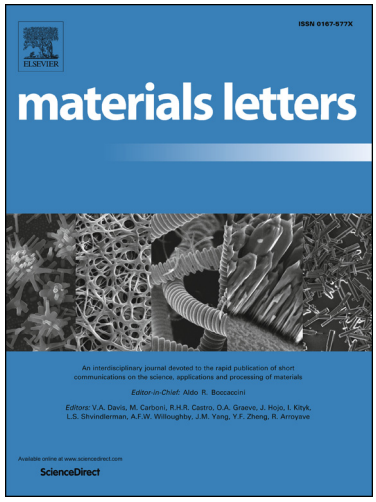

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Hierarchical porous carbon materials from bio waste-mango stone for high-performance supercapacitor electrodes

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Abstract: Porous activated carbon was successfully fabricated from bio waste-mango stone via a two-step chemical etching strategy. The optimized carbon material (denoted as MGKZ-2) displayed a high specific capacitance of 353.8 F g^{-1} at 0.5 A g^{-1} and a satisfactory rate capability in the three-electrode supercapacitor system. Moreover, MGKZ-2-based symmetric cell presented a high energy density of 27.6 Wh kg^{-1} at 159.9 W kg^{-1}, as well as long-term cycling stability due to its hierarchical pores to offer large ion-accessible surface area, efficient ion diffusion and electron transport pathways.

Keywords: Mango stone; Carbon materials; Hierarchical pores; Electrical properties; supercapacitor.

1. Introduction

Among numerous available energy storage technologies, electrochemical capacitors are attractive because of their high power density, good rate capability, and long cycling life [1, 2]. As one possible resource of carbons served as electricial double layer capacitors (EDLCs) electrode materials, biomass has unique advantages including easy availability, low cost, renewability and friendly to the environment [3-5]. Additionally, biomass-derived carbon materials inherit both the structural flexibility and chemical diversity of the natural resources, which can facilitate improving capacitive performance.

Mango is a common fruit and a large amount of bio waste-mango stone is generated. Herein, we adopt a

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