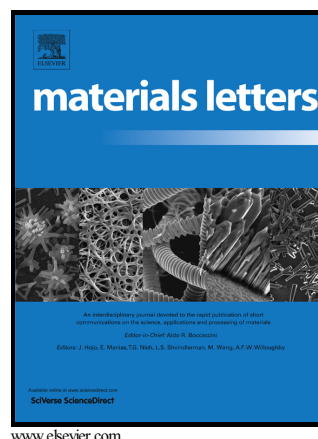


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Ionic liquid-assisted synthesis and electrochemical properties of ultrathin Co_3O_4 nanotube-intercalated graphene composites

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Abstract

Ultrathin Co_3O_4 nanotube-intercalated graphene composites were synthesized using a facile one-step hydrothermal method in a mixture of ionic liquid and ethanol. No templates were used to form the Co_3O_4 nanotubes. The electrode modified as-prepared composites exhibited a high specific capacitance of 1010 F g^{-1} at a high discharge current of 5 A g^{-1} , as well as excellent cycling stability (89.2 % capacitance retention after 5000 cycles).

Keywords: Co_3O_4 nanotubes; Graphene; Ionic liquid; Hydrothermal method; Supercapacitors

Introduction

Cobalt oxide (Co_3O_4) has attracted considerable attention as an important magnetic and intrinsic *p*-type semiconductor (direct optical band gaps at 1.48 and 2.19 eV) for many applications, such as the fabrication of sensors, heterogeneous catalysts, electrochromic devices, Li-ion batteries, supercapacitors, and rotatable magnets [1-4]. Therefore, considerable efforts have been made regarding the fabrication of nanostructured Co_3O_4 with

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