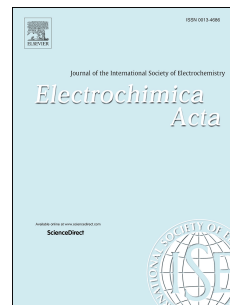


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The effect of metal ions doping on the electrochemical performance of molybdenum trioxide

Xia Zhang, Yuandong Xu*, Danqing Li, Yujun Zhang

College of Chemistry, Chemical and Environmental Engineering, Henan University of Technology, Zhengzhou 450000, China

Abstract: Transition metal elements (Ni, Cu, Mn, Co and Cr) have been doped into the host structure of molybdenum trioxide via in situ hydrothermal method. The characterizations indicate that Ni and Cu doping has no influence on the structure of the host MoO_3 while Co and Cr doping not only cause the crystalline phase transformation but also leads to the morphology change of the doped MoO_3 . These crystalline and morphology alteration have great impact on the electrochemical performance of the doped samples. The electrochemical tests demonstrate that the specific capacitance and the rate capability are enhanced after Ni, Cu and Mn doping while decline after Co and Cr doping, which may be caused by the structure and morphology change of MoO_3 as well as the formation of SEI (solid electrolyte interface) layer after Cr doping. The results manifest that metal ions doping has great impact on the electrochemical property of host materials.

Keywords: Molybdenum trioxide, transition metal element, dopant, supercapacitor

Introduction

Supercapacitors (SCs) are one of the most promising electrochemical energy-storage systems and have drawn more attention because of their high energy density, fast charge-discharge rate, long cycle stability and low maintenance cost [1,2]. These outstanding advantages make SCs play an increasingly important role in portable electronic devices, backup power sources and hybrid electric vehicles [3,4]. As a most important part of the SCs, electrode materials have significant influence on

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