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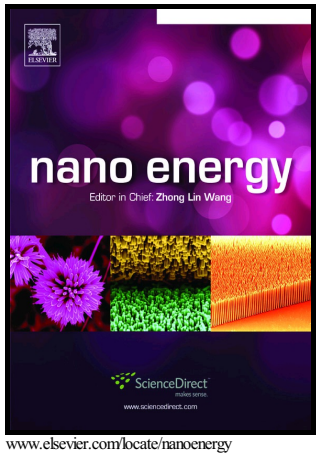

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Exploring Hydrogen Molybdenum Bronze for Sodium Ion Storage: Performance Enhancement by Vertical Graphene Core and Conductive Polymer Shell

ACCEPTED MANUSCRIPT

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Abstract

Rational construction of high-performance electrode materials is crucial for advancement of sodium ion batteries (SIBs). In this work, for the first time, we explore the sodium ion storage performance of hydrogen molybdenum bronze (HMB). To perfect its performance, we controllably sandwich HMB into conductive vertical graphene (VG) skeleton and poly(3,4-ethylenedioxythiophene) shell forming free-standing VG/HMB/PEDOT composite arrays with the help of powerful successive electrodeposition methods. HMB is completely compatible with VG and PEDOT, and intimately combined with them. Due to the unique integrated porous structure and omnibearing conductive network, the designed VG/HMB/PEDOT composite arrays show high sodium ion storage capacities (385 mA h g^{-1} at 200 mA g^{-1}) and superior long-term cycling stability (320 mA h g^{-1} at 200 mA g^{-1} after 500 cycles) when used as anode of SIBs, much better than the VG/HMB and HMB/PEDOT counterparts. Our proposed fabrication strategy offers a new route for designing high-performance electrodes for applications in electrochemical energy storage and electrocatalysis.

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