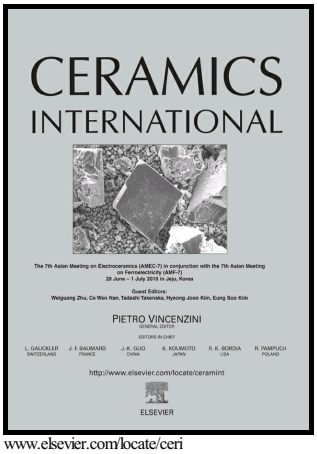

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Improved Li-storage performance of CNTs-decorated $LiVPO_4F$/C cathode material for electrochemical energy storage

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Abstract

Lithium vanadium fluorophosphate ($LiVPO_4F$) has been attracted increasing attention as an advanced cathode for Li-ion batteries because of its excellent thermal stability and high operating voltage. Nevertheless, the pure $LiVPO_4F$ possesses a low electrical conductivity which prevents its usage for practical application in energy storage. In this work, the CNTs-decorated $LiVPO_4F$/C (CNTs@$LiVPO_4F$/C) nanocomposite has been prepared via a conventional sol-gel approach. The XRD results reveal that all the diffraction peaks obtained for CNTs@$LiVPO_4F$/C are indexed to the triclinic structure. TEM images show that the conductive CNTs are distributed homogeneously over the $LiVPO_4F$/C particles. Benefiting from the enhanced conductivity, the as-prepared CNTs@$LiVPO_4F$/C electrode exhibits outstanding electrochemical performance with high reversible capacity of 121.1 mAh g^{-1} at a high current rate of 10 C. Therefore, the novel CNTs@$LiVPO_4F$/C cathode material developed from this investigation with superior Li-storage performance has promising practical applications in electrochemical energy storage systems.