

MOFs-derived star-like ZnO/N-doped carbon nanobox interconnected by MWCNTs networks for high performance lithium ion battery anodes

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Transition metal oxides (TMOs) with outstanding theoretical capacities and out of danger potential range have engaging competence as anode materials for LIBs. However, it is crucially required to design rational 3D structure of TMOs and carbon nanocomposite with facile one step combination method and strong interfacial bonding. In this work, MOF-derived hollow star-like ZnO/N-doped carbon nanobox interconnected by CNTs was obtained by a simple method via stirring and pyrolysis process. N-doped carbon layer provides the sufficient space for buffering volume expansion and effective redox active site. Beside, N-doped carbon layer has good interfacial interaction with both ZnO and CNTs. Moreover, the interconnecting CNTs act as a strong structural scaffold to maintain the hierarchical structure and enhanced electronic conductivity of electrode. The prepared ternary composite of ZnO, N-doped carbon, and CNTs exhibits enhanced lithium ion storage performance, including stable cycle performance and excellent rate-response performance.