

Fabrication and Characterization of Mesoporous Nickel Manganese oxide as Anode Materials in Li-ion Batteries

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mesoporous materials have high surface area, pore volume, and good structural stability against volume expansion. These characteristics are beneficial to the electrochemical properties because they can lead to fast ion/electron transfer, sufficient contact interface between active materials and electrolyte. In this study, the mesoporous anode materials with high electrochemical characteristics were designed using nickel oxide with high catalytic activity and manganese oxide with high theoretical capacity. mesoporous nickel manganese oxide (NMO) was prepared by the nanocasting method. Low-angle XRD patterns of NMO materials are similar from KIT-6 template and N₂ adsorption-desorption isotherms show that the obtained replicas possess high specific surface areas (140 m²/g). The electrochemical properties show that the NMO exhibited a higher initial coulombic efficiency (71%) than the Manganese oxide (60%) and good cyclability. This result is because NMO has two metal oxides with different reaction potentials. Thus, unreacted metal oxide serves as a support for maintaining the mesostructure during the electrochemical process.