Ordered Mesoporous Nickel Manganese Oxide with Stabilized Nanostructure as Anode Material for Lithium Ion Batteries

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In the previous researches, it is reported that ordered mesoporous anode materials showed buffer effect against volume expansion during lithiation of electrode. Among various transition metal oxide electrodes, manganese oxide showed high capacity with low operation voltage, but low initial capacity. In order to overcome this disadvantage, we designed binary metal oxide system using NiO due to its catalytic behavior on SEI decomposition. Thus, this work synthesized ordered mesoporous nickel manganese oxide (NMO) for higher electrochemical performance than manganese oxide. In this study, NMO was well-prepared via nano-casting method. Synthesized NMO has high surface area and pore volume. The electrochemical properties showed that NMO exhibited higher initial coulombic efficiency (71%) better cyclability and higher rate capability than manganese oxide and Nickel oxide. In conclusion, we developed ordered mesoporous anode material with high initial efficiency and rate capability using binary system.