

Highly Ordered Mesoporous Mixed Ni-Mn Oxide System as Anode Material with an Excellent Electrochemical Performance for Lithium Ion Battery

김경호, 박귀옥¹, 이현아², 박수빈², 김지만[†]
성균관대학교; ¹성균관대학교 에너지과학과;
²성균관대학교 화학과
(jimankim@skku.edu[†])

Manganese oxide is one of the most promising anode materials for lithium ion battery since it is naturally abundant, low cost, eco-friendly, and high theoretical capacity (1000 mAh/g). However, manganese oxide shows low initial Coulombic efficiency originated by poor decomposition of Li_2O at the first charge. Nickel oxide introduction within transition metal oxide frameworks is the breakthrough to overcome the present problem due to the high catalytic activity of Li_2O decomposition of nickel oxide. Also, the initial coulombic efficiency of transition metal oxide would be enhanced. In this study, nickel oxide was introduced into the mesoporous manganese oxide frameworks by the nano-casting method using mesoporous silica template (KIT-6). Therefore, ordered mesoporous mixed Mn-Ni system was successfully prepared and analyzed. Synthesized material has a specific BET surface area of 140 m^2/g and pore diameters of 3 nm and 10-20 nm. As-prepared product was evaluated as the anode material for lithium ion battery. It exhibits high reversible capacity, and higher initial Coulombic efficiency.