Influence of wall thickness on initial efficiency of mesoporous Mn_2O_3 anode materials for lithium ion battery

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Mesoporous manganese oxides can be used as anode materials characteristic of high electrochemical capacity, good capacity retention and high rate performance. Unfortunately, due to the complicated oxidation states of Mn, the diversity of manganese oxides and interference from factors such as surface chemistry and morphology of the material, the lithium-storage mechanisms of the manganese oxides are still in argument. In addition, the low initial coulombic efficiencies (below 60%) of the manganese oxides in the first cycle were usually attributed to the formation of a solid electrolyte interface (SEI) layer and the pulverization of the active materials

To overcome this problem, we present generic concept involving metal oxide with Tailoring the pore size/wall thickness as high initial coulombic efficiency anode materials for Li ion battery. Specifically, highly ordered mesoporous Mn_2O_3 material with Tailoring the pore size/wall thickness for lithium ion battery was prepared using KIT-6 silica template *via* nano-replication. The tools for this study included electron microscopy (SEM) , nitrogen sorption, XRD and standard electrochemical techniques.