Synthesis of Lithium-Manganese Orthosilicate and its Application as Cathode Material in Lithium-Ion Batteries

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Lithium-manganese orthosilicate powders were synthesized by a modified sol-gel method. The LMS powders were carbon coated by two different methods. The conductive cathode layer has been obtained by carbonization of organic precursor either on the grains of previously synthesized lithium-manganese orthosilicate or reduction of carbon source during active material synthesis (internal coating). Synthesized materials were analyzed by XRD, SEM, N₂ adsorption/desorption and electrochemical CP and CV methods. The internal coating approach improved the electrochemical performance of Li₂MnSiO₄ powder, increasing its specific capacity and cyclability by enhancing its electrical conductivity and enlarging its electrochemically active surface area.

Keywords: Li₂MnSiO₄, li-ion battery, sol-gel synthesis, carbon coating, lithium-manganese orthosilicate

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