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PREPARATION AND CHARACTERIZATION OF LITHIATED CATHODE MATERIALS FOR LITHIUM BATTERIES

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Abstract

Four different cathode materials, LiNiO_2 , LiCoO_2 , $\text{LiCo}_{0.2}\text{Ni}_{0.8}\text{O}_2$ and $\text{LiCo}_{0.4}\text{Ni}_{0.6}\text{O}_2$ were synthesized by sol - gel technique. The prepared materials were characterized using X-ray diffraction pattern, FT-IR and cyclic voltammetry. X-ray diffraction pattern shows crystallinity of materials, increases with higher calcination temperature. From FT- IR studies, it was shown, that the purity of sample also increased with prolong heating at higher temperatures. It was possible to obtain pure and highly crystalline LiNiO_2 after heating for fourteen hours at 800°C . Cyclic voltammetry shows the four prepared materials are suitable for fabrication of cathode, as lithium ions can intercalate and de-intercalate. LiNiO_2 was used in battery fabrication. Charge / discharge characteristic curve was obtained.

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