

Submicron size LiCoO_2 particles prepared by spray pyrolysis

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Lithium cobalt oxide (LiCoO_2) is an important cathode material used in secondary lithium batteries. LiCoO_2 particles were prepared by various preparation methods for ceramic particles. Commercially, LiCoO_2 particles in sizes of several microns were prepared mainly by solid-state reaction method. In this work, fine-sized LiCoO_2 particles were prepared by spray pyrolysis from a spray solution with polymeric precursors at severe preparation conditions characterized with high flow rate of carrier gas, short residence time, and large reactor size. The effects of polymeric precursors on the characteristics of the fine-sized LiCoO_2 particles were investigated. The precursor particles obtained from spray solution with citric acid and ethylene glycol transformed into fine-sized LiCoO_2 particles with regular morphology after post-treatment at temperatures between 700 and 900°C. The discharge capacities of the LiCoO_2 particles changed from 132 to 151 mAh/g when the concentrations of the citric acid and ethylene glycol changed from 0 to 1 M.