

Controlled synthesis of Lithium cobalt oxide nanoparticles by Flame Spray Pyrolysis

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LiCoO₂, among other cathode materials, has been the most promising cathode material. However, lithiated cathode material has some limitations (poor electric conductivity, low charging rate, partial polarization). To make better these limitations, nano-structured electrode material were recently suggested.

Flame spray pyrolysis (FSP) is one way producing nano-sized metal oxide particles with high purity. Lithium-Cobalt oxide (LiCoO₂) nano particles were synthesized by the oxidation of lithium-cobalt acetates and nitrates in FSP reactor. Molar concentration of precursors, molar ratio of lithium to cobalt in the precursor solution, and flow rates of combustion gases such as hydrogen were chosen as experimental variables for controlling particle size and crystal structure. The particle morphology and size were characterized by transmission electron microscopy (TEM). The phase purity and crystal patterns were elucidated by X-ray diffractometer (XRD).