

## Supercritical Hydrothermal Synthesis of Lithium Iron Phosphate (LiFePO<sub>4</sub>) Nanoparticles

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Lithium iron phosphate (LiFePO<sub>4</sub>) has been attracted much attention as a promising cathode active material in lithium secondary battery because stability at high temperature, safety under abusive conditions, good energy density, inexpensive price of the starting materials, and relative lack of toxicity. Various methods have been used to synthesis well-crystalline LiFePO<sub>4</sub> particles including solid-state reaction, co-precipitation method, emulsion-drying method and hydrothermal method. Supercritical hydrothermal synthesis (SHS) of LiFePO<sub>4</sub> is a very promising method to produce high-quality, highly crystalline, and nanosize particles. In addition, SHS is an environmental-friendly, fast and continuous method and readily scalable. The object of this study is to prepare single phase, small size particle, single crystal LiFePO<sub>4</sub> particles using SHS. Synthesized LiFePO<sub>4</sub> particles were analyzed in detail using scanning electron microscope (SEM), X-ray diffraction (XRD), transmission electron microscope (TEM) and charge/discharge experiments.