

Abstract Submitted
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Electrical and electrochemical characterization of nano-sized LiFePO₄ cathode materials synthesized by a lauric acid-based sol-gel method KHADIJE BAZZI, AMBESH DIXIT, M. B. SAHANA, C. SUDAKAR, Wayne State University, M. NAZRI, Applied Sciences Inc., Cedarville, Ohio, P. P. VAISHNAVA, Kettering University, Flint, Michigan, V. NAIK, University of Michigan-Dearborn, G. A. NAZRI, R. NAIK, Wayne State University — We synthesized pure LiFePO₄ and C-LiFePO₄ nanoparticles by sol-gel technique. Carbon coating was accomplished by including Lauric acid in the sol-gel precursor solution. Three C-LiFePO₄ samples of particle sizes 29, 27, 23 nm, were prepared by varying lauric acid concentration in the precursor solution. All the samples were characterized by X-ray diffraction, Raman, conductivity, and electrochemical measurements. The micro-Raman measurements showed two major bands at $\sim 1585\text{ cm}^{-1}$ (G) and at $\sim 1345\text{ cm}^{-1}$ (D) in all the C-LiFePO₄ samples. The 23 nm particle size sample showed minimum (D/G) band ratio and the maximum electrical conductivity among the three samples. The measured value of the capacity for 23 nm sized sample, $\sim 170\text{ mAh/g}$, approached the theoretical capacity limit value for LiFePO₄

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