

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Magnetic and spectroscopic characterization of C-LiFePO₄ nanoparticles for cathode material for Li ion batteries AMBESH DIXIT, K. BAZZI, M.B. SAHANA, C. SUDAKAR, Wayne State University, M. NAZRI, 2Applied Sciences Inc., Cedarville, Ohio, P.P. VAISHNAVA, Kettering University, Flint, Michigan, V. NAIK, University of Michigan-Dearborn, V.K. GARG, A.C. OLIVEIRA, Universidade de Brasilia, Instituto de Fisica, G.A. NAZRI, R. NAIK, Wayne State University — We synthesized pure and carbon coated LiFePO₄ nanoparticles (size ~25 nm) by sol-gel technique. All the samples were characterized by X-ray diffraction, XPS, SQUID, and Mossbauer spectroscopy measurements. The elemental chemical states for Li 1s, Fe 2p, P 2p, O 1s and C 1s were examined by using XPS for LiFePO₄ and compared with those of C-LiFePO₄ material. Temperature dependent magnetic measurements suggest an antiferromagnetic transition ~50 K in both LiFePO₄ and C-LiFePO₄ samples. The role of various phases, such as LiFePO₄, Fe_xP, α -Fe and Fe₃O₄ identified by Fe⁵⁷ Mossbauer spectroscopy, will be discussed in relationship with the electrochemical properties of the cathode materials.

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Date submitted: 23 Dec 2010

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