Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Effect of excess Li on electrochemical properties of $LiFePO_4$ cathode material for Li ion batteries K. BAZZI, M. NAZRI, Wayne State University, P. VAISHNAVA, Kettering University, V.M. NAIK, University of Michigan-Dearborn, G.A. NAZRI, R. NAIK, Wayne State University — Application of lithium iron phosphate as a cathode material in lithium cell is limited by its poor electronic and ionic conductivity. Here, we report the synthesis of C-$LiFePO_4$ and C- $Li_{1.05}FePO_4$ cathode materials via sol gel method using oleic acid as a surfactant/source of carbon to improve the electronic conductivity. Our aim is to investigate the role of excess Li on the electrochemical performance of C-$LiFePO_4$. The phase purity was confirmed by x-ray diffraction. When excess lithium is used, the agglomeration is reduced and spherical particles are formed. Our results show that C-$Li_{1.05}FePO_4$ has lower charge transfer resistance, higher Li-ion diffusion coefficient, and superior electrochemical performance in terms of the specific capacity, rate capability and cycling stability. The correlation between the electrochemical characteristics and the particle size and morphology will be presented.

Khadije Bazzi
Wayne State University

Date submitted: 11 Nov 2013 Electronic form version 1.4