Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Transmission Electron Microscopy and First Principle Studies Investigating Intercalation Phenomenon Of Vanadium Pentoxide(V_2O_5) nanowire cathode[1] ARIJITA MUKHERJEE, UIC, HASTI ASAYESH ARDAKANI, MTU, TANGHONG YI, CHEON JUNG KIM, UIC, JUSTIN ANDREWS, SARBAJIT BANERJEE, Texas AM, JORDI CABANA, REZA S YASSAR, ROBERT F KLIE, UIC, JCESR COLLABORATION — Vanadium Pentoxide(V_2O_5) is an attractive intercalation compound due to its characteristic layered structure from weak vanadium-oxygen bonding which enables the intercalation of ions between the layers. Here, we will discuss an in-situ transmission electron microscopy and electron energy-loss spectroscopy approach investigating lithiation of orthorhombic α-V_2O_5 nanowires where the center of the nanowire undergoes a transformation to γ-$Li_2V_2O_5$ phase. Since V_2O_5 has also been predicted as a potential cathode host for magnesium ion intercalation, we also investigate Mg intercalation in α-V_2O_5 nanowire and determine if our reaction pathway leads to the formation of ε-$Mg_{0.5}V_2O_5$ phase, as predicted by density functional theory calculations. In-situ Li and Mg intercalation experiments into the new tunnel structured ζ- V_2O_5 nanowires will also be presented and the resulting phases will be compared with theoretical predictions.

[1]This work is supported by Joint Center for Energy Storage Research(JCESR)

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Date submitted: 06 Nov 2015 Electronic form version 1.4