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Transmission electron microscopy study investigating Li intercalation in tunnel structured ζ-V_2O_5 nanowire[1] ARIJITA MUKHERJEE, HYUN DEOG YOO, GENE NOLIS, University Of Illinois At Chicago, JUSTIN ANDREWS, SARBAJIT BANERJEE, Texas AM University, JORDI CABANA, ROBERT KLIE, University Of Illinois At Chicago, JOINT CENTER FOR ENERGY STORAGE RESEARCH COLLABORATION — Energy storage research has become quite relevant in recent years with the advent of smarter electronic devices and electric vehicles that demand more efficient options. Orthorhombic α-V_2O_5 has been known as a versatile intercalation cathode host for lithium and beyond Li cations, such as Na and Mg. Recent reports have established that a novel tunnel structured polymorph, ζ-V_2O_5 can perform better as a cathode material, and can intercalate Li and Mg chemically. This contribution will focus on an in depth study of phase formation upon electrochemical Li intercalation of this new polymorph, ζ-V_2O_5 using aberration corrected scanning transmission electron microscopy(STEM) electron energy loss spectroscopy(EELS) and energy dispersive X ray spectroscopy(EDX). Results will also be presented investigating Mg and Na intercalation into this ζ-V_2O_5 polymorph and compare the electrochemical performance in the various scenarios directly with structural changes at an atomic scale.

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