

Nanoscale Surface Adsorption and Disordering in Battery Materials

Jian Luo, Associate Professor
School of Materials Science and Engineering
Clemson University

The Scientific Basis (built largely via a CAREER program during 2005-10) – Nanoscale “surface phases” with the following *distinct characteristics*:

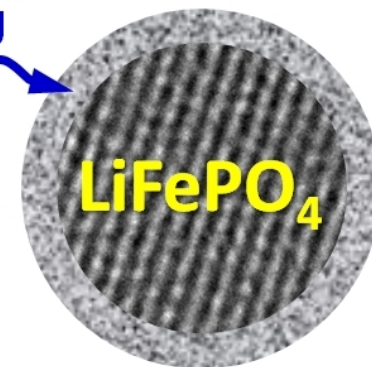
- a self-selecting or “equilibrium” thickness;
- structures and compositions that are neither observed nor stable as bulk phases; and
- properties unattainable by bulk phases.

Twofold Objectives of the New Project (2010-14):

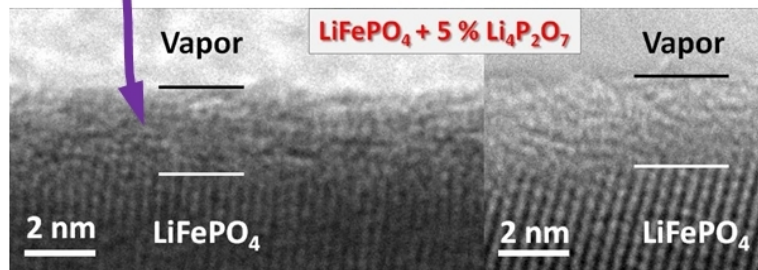
- using nanoscale “surface phases” of self-selecting thickness to improve the performance of *lithium-ion battery materials*; and
- using lithium-ion battery materials as model systems to advance the fundamental interfacial science for high-T ceramic systems.

Nanoscale “surface phase” form spontaneously with self-selecting thickness:

- Stabilize interfaces; improve battery life
- Improve transport → rate capability



HRTEM



A. Kayyar, H. Qian and J. Luo
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