Abstract: NeSA202100poster-01: Study of Perovskite and Spinel Complex Oxide Films and Nanocomposites Grown for Catalytic Behavior

Time: 12:00-1:00 PM

Presenter:

Rajendra Paudel

Authors:

[1]Rajendra Paudel, [1]Miles Blanchet, [1]Alexandria C. Bredar, [1]Andricus Burton, [1]Byron H. Farnum, and [1]Ryan B. Comes

[1]*Department of physics, Auburn University, Alabama, USA*

Complex metal oxides have attracted great deal of interest among researchers for their catalytic behavior. There is evidence that spinel and perovskite-type complex oxides exhibit highly efficient catalytic performance for oxygen reduction reaction (ORR) and oxygen evolution reaction (OER). The charging-discharging of hydrogen fuel cells are mediated by ORR and OER. Typical catalysts used in these reactions are usually the expensive metals like Pt, Ir. Complex metal oxides can provide a better low-cost alternative for those expensive metals. Our goal is to grow perovskite-spinel nanocomposite which serves as efficient bi-functional electrocatalyst for ORR and OER. We have successfully grown perovskites such as LaNiO3 and LaCoO3 and spinels such as CoMn2O4, NiMn2O4 using molecular beam epitaxy. Grown films were examined for chemical composition and valency via in-vacuo x-ray photoelectron spectroscopy. In addition, cyclic voltammetry and electrochemical impedance measurements were performed to understand the catalytic behavior of the oxide films. We will also show preliminary results on the synthesis of nanocomposites combining spinel and perovskite oxides.