SARAH STARCOVIC, ISAAC BOYCE, KAYLEE ANDERSEN, LINDSEY LANEVE, ASHLEY RUZA, ALLISON MOORE, and ERICA HARVEY, Dept. of Natural Sciences, Fairmont State University, Fairmont, WV, 26554. Initial testing and adaptation of a new method for measuring oxygen evolution from mixed metal oxides.

The oxygen generating capacity of mixed metal oxides deposited on a conductive glass sample plate is currently tested in our lab with a fluorescence-based device called HARPOON (Heterogeneous Anodes Rapidly Perused for Oxygen Evolution), developed and disseminated as part of the nationwide Solar Army research initiative. The research goal of the Solar Army is to find metal oxide combinations that speed up the splitting of water, with the ultimate goal of creating a device for solar hydrogen fuel generation. If a new metal oxide combination is more effective at oxygen generation than the internal standards included on every sample, this may indicate a promising catalyst.

A recent literature paper outlined a new method to test for oxygen evolution that could potentially make our research and outreach significantly easier. A sample plate to be tested for oxygen evolution is placed in a suspension of $TiO_2$ nanoparticles in an electrolyte. As a voltage is applied and oxygen is produced at the surface of the metal oxides, oxygen gas bubbles are nucleated by the $TiO_2$ and visualized by light scattering. This work reports on the initial testing and adaptation of the literature method to our undergraduate laboratory setting. A preliminary comparison of results obtained from HARPOON and HARPOON 2.0 will be presented, along with an analysis of the pros and cons of the two methods. This research has been supported by the Fairmont State University College of Science and Technology as well as the NASA WV Space Grant Consortium.