SARAH STARCOVIC, ALLISON MOORE, REBECCA RUTHERFORD, ERICA HARVEY, Dept. of Chemistry, Fairmont State University, Fairmont, WV, 26554. Testing metal oxides for oxygen generation capacity with HARPOON.

Our Solar Army research tests the oxygen generating capacity of metal oxides on conductive sample plates using a device called HARPOON (Heterogonous Anodes Rapidly Perusing Oxygen Overpotential for Neutralization). The purpose of our research is to find metal oxide combinations that exceed the efficiency of the oxygen generating capacity internal standards on every sample plate. If a new combination is more effective at oxygen generation than the standards, this may indicate that the sample is a promising electrocatalyst. The long-term project goal is to discover photoelectrocatalysts for the sunlight driven reaction:

$$H_2O \rightarrow H_2 + \tfrac{1}{2} O_2$$

The hydrogen gas will be harvested and subsequently used as a clean, renewable fuel.

In the present work, we show that copper and iron oxides can serve as internal standards for HARPOON. This means that sample plates made for other types of Solar Army testing can also be analyzed using HARPOON. We have also investigated various ultraviolet light sources, which are key components in the setup of HARPOON.

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