Fabrication of WS_{3-x} Thin Films as Photocathodes for Driving Photocatalyzed Water Splitting

*Ojeda, M.[1], Harris, C.[2]
[1]Undergraduate Research Assistant, Department of Chemistry, Physics and Geology, Winthrop University, [2]Assistant Professor, Chemistry, Department of Chemistry, Physics and Geology, Winthrop University
harrisc@winthrop.edu

Keywords: Mesoscale assemblies, 2D and 3D structures, Optical Properties, Electrical Properties, Semiconductors

Abstract: A novel spin-coating method has been developed for the synthesis of WS_{3-x} thin films on transparent conductive substrates. These films, under external bias, have been shown to catalyze hydrogen gas evolution in 0.5M H_2SO_4(aq). By layering this p-type material onto a suitable oxygen-evolving catalyst, deactivation processes such as photobleaching can be prevented without the use of sacrificial additives, and both hydrogen and oxygen evolution can be sustained over extended durations of illumination.