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Abstract

Live Poster Session

Major: Chemistry

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Synthesis of Metal Chalcogenide Materials For Energy Applications

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The examination of bandgap theory could allow for the synthesis of tunable electronic materials. Using sulfur and selenium allows for changing the bandgap size compared to using oxygen. This would allow engineers to tune the properties of the device they are attempting to make by simply selecting the material they need based on the bandgap. The bandgap theory is important for the energy to produce an electron from the valence band to the conducting band is the bandgap theory. The aim is to examine a known oxide material that has a bandgap just outside of the visible light range. We achieve the synthesis of these materials using high-temperature solid-state chemistry methods. This entails loading reactions into fused silica tubes, sealing the vessels under vacuum, and heating the reactions in a temperature-controlled furnace. The method is to make test tubes using borosilicate tubing and cut into 12- inch sections and then it is cut into 6- inch sections, a torch is used to seal one end of the tube. Acetone is used to coat the tube 3 times to create a barrier from the tube and reagent. After it is heated over the course of two weeks. When the reaction is complete the samples are examined using an optical microscope and a scanning electron microscope. Using an optical microscope help to determine if crystals were formed or anything similar. Finally, using the scanning electron microscope will help further the analysis of the crystals.