

Western Illinois University
2021 Thomas E. Helm Undergraduate Research Conference

Abstract

Live Poster Session

Major: Chemistry

Faculty Mentor: Brian Bellott

Solid State Chemistry: The synthesis of Copper Sulfide

Quinn Branch

Solid State Chemistry is a division of chemistry that has a large impact on students entering the workforce after graduation. Solid State Chemistry acts as a basis of principles for a large number of industrial reactions. The purpose of this research is to give students a background of knowledge regarding metal binaries. Metal binaries are utilized extensively as industrial catalysts as well as key components in electronics. These compounds are the targets of this research due to the fact that this area of study holds countless applications to the workforce after graduation.

The objective of this research was to synthesize the metal binary Copper Sulfide. This is being achieved by mixing pure Copper and Sulfur in an exact 1 to 1 stoichiometric ratio which is then sealed in glass reaction tube under vacuum and heated in an oven for several weeks. The material is then studied under a polarized light microscope as well as the Scanning Electron Microscope. Copper Sulfide has a distinct physical characteristic that aides in identification: The crystals form with hexagonal sides that can be seen under a microscope. The other tool being utilized to identify the crystals is an Energy-dispersive X-ray spectroscopy (EDS) which can identify atoms within a sample.