Centennial Honors College Thomas E. Helm Undergraduate Research Day 2025

ABSTRACT

Major: Chemistry Poster

Faculty Mentor(s): Brian Bellott

Solid State Synthesis of Athabascaite (Cu_5Se_4).

Owen Beck

Athabascaite (Cu_5Se_4) is a copper selenide mineral that has not been extensively studied in detail. This project focuses on the synthesis of athabascaite (Cu_5Se_4), a copper selenide crystal. To synthesize this compound, 5 moles of copper (Cu) and 4 moles of selenium (Se) are carefully mixed in a 1:1 ratio and placed in small glass tubes coated with carbon to prevent unwanted reactions. The tubes are then sealed carefully under vacuum and then run through various heating programs over the course of one week. After the heating program is done, the tubes are cracked open, and any potential crystal samples are examined using a dissection/compound microscope. Acknowledgeable crystal samples are then selected and transferred onto stubs for further analysis using scanning electron microscopy (SEM). However, SEM imaging is still incomplete. Altogether, the goal of this research is to optimize the synthesis of athabascaite and characterize its crystal structure to better understand its properties and potential applications.