Katie J. Palmer

katiejaepalmer@mines.edu
(614)-603-3376

EDUCATION

Doctor of Philosophy Candidate **Current**
Colorado School of Mines, Golden, CO
Major: Materials Science

Bachelor of Science (magna cum laude) **May 2024**
Rose-Hulman Institute of Technology, Terre Haute, IN *GPA 3.78*
Major: Chemical Engineering
Minors: Materials Science and Engineering
Mechanical Engineering

RESEARCH EXPERIENCE

National Renewable Energy Laboratory; Golden, CO **Summer 2023**
Science Undergraduate Laboratory Internship

- Optimized synthesis methods for electrochromic films
- Tested for electrochemical properties with cyclic voltammetry
- Presented research at a poster session and through a written report

Colorado School of Mines; Golden, CO **Summer 2022**
Undergraduate Research Assistant

- Improved research and communication skills through weekly seminars
- Developed and tested compounds for electrochemical properties
- Characterized products using x-ray diffraction, electrochemical impedance spectroscopy

Rose-Hulman Institute of Technology; Terre Haute, IN
IP/ROP Research **Spring 2024**

- Designed the process for producing carbon fiber-epoxy-iron composite toroid samples
- Researched and developed methods for testing magnetic permeability in composites

Undergraduate Research **Spring 2023**

- Built and tested electrochromic cells
- Synthesized electrochromic and transparent conductive materials

WORK EXPERIENCE

Rose-Hulman Institute of Technology; Terre Haute, IN
Rose Prime Mentor **Aug. 2022 & 2023**

- Mentored and tutored academically disadvantaged students for a 2 week summer program

Learning Center Tutor **Sept. 2021-Present**

- Tutored students, planned and conducted review sessions in physics, math, and chemistry

Teaching Assistant **Fall 2022 & Fall 2023**

- Guided students in learning Solidworks

PROJECTS

Senior Design **Aug. 2023-May 2024**

- Performed economic and process calculations for the synthesis of ammonia using AspenPlus

- Designed a production process for an allyl alcohol plant through doing research, economic and process calculations, and modeling in AspenPlus

Chemical Engineering Unit Operations Lab **Nov. 2023-Mar. 2024**

- Distillation Column – Experimented with the effect of reflux ratio on purity and recovery
- Instrumentation and Controls – Interpreted technical manuals and compared data to expected error
- Mulitpass Heat Exchanger – Tested several configurations and calculated heat transfer coefficients
- Fluid Flow – Measured and quantified frictional losses through several tubes
- Agitated Tank – Collected data and calculated heat transfer coefficients with mathematical models
- Drug Delivery – Modeled and tested various parameters for diffusion of drugs through capsules

Process Calculations for Acrylic Acid **Winter 2022**

- Collaborated to perform material balances and energy balances, addressed process safety

Chocolate Production Design **Spring 2021**

- Designed a production process including material balances, equipment selection, and cost analysis

SKILLS

Materials Characterization

Spectroscopy – IR, FTIR, Raman, NMR, electrochemical impedance, and cyclic voltammetry

Experimental Techniques – XRD, gas and liquid chromatography, melting point characterization, liquid-liquid extraction, metal and composite materials property testing, alloy characterization, and spray coating

Modeling and Numerical Analysis – MATLAB, Python, Aspen Plus, Solidworks, Autodesk Inventor, Visio

PUBLICATIONS & PRESENTATIONS

Vaselabadi, S. A., Palmer, K., Smith, W. H., & Wolden, C. A. (2023). Scalable Synthesis of Selenide Solid-State Electrolytes for Sodium-Ion Batteries. Inorganic Chemistry.

Research Symposium at Colorado School of Mines

Poster Session at National Renewable Energy Laboratory

IP/ROP Poster Session at Rose-Hulman Institute of Technology

HONORS & AWARDS

Outstanding New Graduate Student Fellowship, Fall 2024	Colorado School of Mines
IP/ROP Research Grant Spring 2024	Rose-Hulman
Dean's List 2020-2024	Rose-Hulman
CSC Academic All-District honoree in 2023 and 2024	Rose-Hulman Softball
Academic All-HCAC honoree in 2022, 2023, and 2024	Rose-Hulman Softball
HCAC All-Sportsmanship Team, 2022	Rose-Hulman Softball

ACTIVITIES & LEADERSHIP

Rose-Hulman Varsity Softball Team **Sept. 2020-May 2024**

- Developed leadership, discipline, and time management skills

Rose Research Fellows **Nov. 2023-May 2024**

- Mentored undergraduate students who are interested in research

Floor Hockey Club **Sept. 2021-May 2024**

President *Spring 2023-Spring 2024*

- Improved leadership, time management, communication, and organization skills

Engineers for a Sustainable World **Sept. 2021-May 2023**

Vice President of Environmental Awareness *Fall 2022-Fall 2023*

- Implemented projects to promote sustainability on campus