

## PROFESSIONAL SUMMARY

- Innovative materials research scientist with a strong background in materials synthesis, characterization, and optimization.
- Proficient in using advanced characterization techniques, such as electron microscopy and X-ray diffraction, to investigate material structures and properties.
- Demonstrated ability to lead research projects, mentor junior scientists, and publish findings in reputable scientific journals.
- Material characterization skills including SEM, CT-Scan, TGA, DSC, XRD and Mechanical testing.

## EDUCATION

Missouri University of Science and Technology, Rolla, MO December 2023

### Ph.D. Material Science and Engineering

Missouri University of Science and Technology, Rolla, MO May 2019

### M.S. Chemical Engineering

Satyabhama University of Science and Technology, Chennai, India May 2016

### B.Tech. Chemical Engineering

## SKILLS

- **Software:** MATLAB, PHREEQC, JMP, Programmable Logic Controllers (PLC), Flow-3D
- **Thermodynamic Modelling:** Gibbs Energy Minimization Software (GEMS), FactSage
- **Material Characterization:** X-ray CT scan, Mechanical testing (Instron), Scanning Electron Microscopy (SEM), Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), X-ray Diffraction (XRD), X-ray fluorescence (XRF), BET Analysis, Particle Size Distribution (PSD).

## EXPERIENCE

**Graduate Research Assistant** January 2020-Present  
**Missouri University of Science and Technology, Rolla, MO**

- Experience in characterizing infrastructural materials using different characterizing techniques.
- Acquired leadership skills and management skills when working in different cross-functional teams.
- Assisted in the NSF funded project on the high alumina cements.
- Wrote papers on research findings and experimental data that are published in different research journals.
- Designed and executed experiments, including data collection and analysis, to support research objectives.
- Collaborated with faculty members and research team members to plan and execute research activities.
- Presented research findings at conferences and meetings, both orally and in writing.
- Assisted with manuscript preparation, including drafting and editing manuscripts for publication in peer-reviewed journals.

**Graduate Teaching Assistant**  
**Missouri University of Science and Technology, Rolla, MO**

August 2020 - August 2022

- Instructed 20-25 senior level undergraduate students as a teaching assistant in thermodynamic modelling lab.
- Designed lab modules, assignments, proctored tests in compliance with course requirements and university standards.

**Process Engineer**  
**Ranar Agrochem Limited, Visakhapatnam, India**

June 2016 - February 2017

- Proficiently managed process data sheets, Safety Data Sheets (SDS), and Standard Operating Procedure (SOP) documents for Sulphuric acid production.
- Collaborated effectively with a cross-functional team to conduct a comprehensive HAZOP study following a boiler failure incident.
- Played a crucial role in mitigating a potential disaster by assisting during a manual failure of boiler equipment.
- Implemented lean six sigma manufacturing principles, including waste reduction and 5S methodology, to optimize manufacturing operations.

**Internship**  
**Hindustan Petroleum Corporation Limited, India**

May- July 2015

- Investigated complete process in merox, sulphur recovery unit, and the phosphorous recovery unit.
- Investigated the overview of the plant by studying the PID and PFD.
- Achieved practical knowledge on process operations, design and separation processes in a distillation column.

**Certification**

- Green Belt in Six Sigma by Institute of Industrial and Systems Engineers
- Programmable Logic Controllers (PLCs) on Allen Bradley Systems by Dr. Kelvin T. Ericson, Missouri S&T

**PUBLICATIONS**

1. **Ponduru, Sai Akshay**, et al. "Predicting Compressive Strength and Hydration Products of Calcium Aluminate Cement Using Data-Driven Approach." *Materials*, vol. 16, no. 2, Jan. 2023, p. 654. Crossref, <https://doi.org/10.3390/ma16020654>.
2. **Ponduru, Sai Akshay**, et al. "Studying the Effects of Fly Ash Content and Composition on Properties of Calcium Aluminate Binders." (In-progress).
3. Taihao Han, Rohan Bhat, **Ponduru Sai Akshay**, et al. "Deep learning to predict the hydration and performance of fly ash-containing cementitious binders." *Cement and Concrete Research*, Volume 165, 2023, 107093, ISSN 0008-8846, <https://doi.org/10.1016/j.cemconres.2023.107093>.

4. Han Taihao, **Ponduru Sai Akshay**, et al. “A Deep Learning Approach to Design and Discover Sustainable Cementitious Binders: Strategies to Learn From Small Databases and Develop Closed-form Analytical Models.” *Front. Mater.*, 04 January 2022, Sec. Structural Materials, vol 8 – 2021. Crossref, <https://doi.org/10.3389/fmats.2021.796476>.
5. Rohan Bhat, Taihao Han, **Ponduru Sai Akshay**, et al. “Predicting compressive strength of alkali-activated systems based on the network topology and phase assemblages using tree-structure computing algorithms.” *Construction and Building Materials*, Volume 336, 2022, 127557, ISSN 0950-0618, <https://doi.org/10.1016/j.conbuildmat.2022.127557>.
6. Han, Taihao, **Ponduru Sai Akshay**, et al. “Predicting Dissolution Kinetics of Tricalcium Silicate Using Deep Learning and Analytical Models.” *Algorithms*, vol. 16, no. 1, Dec. 2022, p. 7. Crossref, <https://doi.org/10.3390/a16010007>.
7. Lapeyre, J., **Ponduru Sai Akshay**, et al. “Hydration of high-alumina calcium aluminate cements with carbonate and sulfate additives.” *J Therm Anal Calorim* 147, 5575–5587 (2022). <https://doi.org/10.1007/s10973-021-10939-4>.

## PRESENTATIONS

Oral Presentations:

**Ponduru, Sai Akshay**. (2023, April). “*Effects of Fly Ash on the Properties of Calcium Aluminate Binders*”, ACI Concrete Convention, San Francisco, California.

Poster Presentations:

**Ponduru, Sai Akshay**. (2023, April). “*Effects of Fly Ash on the Properties of Calcium Aluminate Binders*”, Graduate Research Showcase, Missouri S&T, Rolla, Missouri.