

# Zhihao Guo



## Personal Information

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**Phone number:** 0086-13286540880

**Date of Birth:** December, 1997

**Nationality:** Chinese

**Institute:** School of Minerals processing and Bioengineering, Central South University, Changsha, Hunan, 410083, P. R. China

## Research Interests

- Design and synthesis of flotation collectors
- Mechanism of flotation collectors on mineral surfaces

## Education

### **Central South University**

M. Sc. in Resources and Environment

Sep. 2021–Now

- **Relevant Courses:** Flotation Interface Chemistry; Advancements in Mineral Processing; Advanced Research Techniques in Contemporary Resource Processing; Application of Computational Chemistry and Fluid Dynamics in Mineral Processing Simulation

### **Wuhan Institute of Technology**

B. Eng. in Mineral Processing Engineering

Sep. 2016–Jun. 2020

- **Relevant Courses:** Organic Chemistry; Analytical Chemistry; Physical Chemistry; Principle and Application of Flotation Reagent; Mineralogy and Petrology

## Research Experience

### **Participation in National Natural Science Foundation, China**

Sep. 2021–Now

- **Project name:** Design of Flotation Collectors Based on Surface Property Differences of Bastnaesite
- My work involves the design and synthesis of novel collectors for mineral flotation, including structural design and synthesis route determination. I investigate the adsorption mechanisms of collectors on mineral surfaces, including adsorption

quantity, strength, and structural characteristics. My investigation involves the use of techniques such as **IR, XPS, XRD and Zeta potential analysis**.

## **Research Papers**

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- **Z. Guo**, S. Khoso, J. Wang, et al. Interaction mechanism of 2-hydroxy-3-naphthyl hydroxamic acid and 1-hydroxy-2-naphthyl hydroxamic acid in the flotation separation of bastnaesite/fluorite: Experiments and first-principles calculations. Sep. Purif. Technol. 285 (2022) 120307, <https://doi.org/10.1016/j.seppur.2021.120307>. (IF=8.6, Q1)
- **Z. Guo**, M. Tian, G. Qian, et al. Flotation separation of bastnaesite and fluorite using styrylphosphonic acid and cinnamohydroxamic acid as collectors. J. Mol. Liq. 362 (2022) 119766, <https://doi.org/10.1016/j.molliq.2022.119766>. (IF=6.0, Q1)
- **Z. Guo**, M. Tian, Z. Gao, et al. A novel surfactant N-hydroxy-9,10-epoxy group-octadecanamide. Part I. Application in the flotation separation of fluorite/calcite and adsorption selectivity on the mineral surfaces. J. Mol. Liq. 387 (2023) 122563, <https://doi.org/10.1016/j.molliq.2023.122563>. (IF=6.0, Q1)
- S. Nie<sup>1</sup>, **Z. Guo**<sup>1</sup>, M. Tian, et al. Selective flotation separation of cassiterite and calcite through using cinnamohydroxamic acid as the collector and Pb<sup>2+</sup> as the activator. Colloids Surf. A Physicochem. Eng. Asp. 666 (2023) 131262, <https://doi.org/10.1016/j.colsurfa.2023.131262>. (IF=5.2, Q2) (S. Nie and Z. Guo contribute equally to this work)
- **Z. Guo**, S.A. Khoso, M. Tian, et al. Utilizing N-hydroxy-9-octadecanamide as a collector in flotation separation of bastnaesite and fluorite. J. Rare Earths (2023), <https://doi.org/10.1016/j.jre.2023.07.001>. (IF=4.9, Q1)
- **Z. Guo**, P. Liu, W. Zhang, et al. An integrated experimental and computational investigation of N,9,10-trihydroxyoctadecanamide as a potential collector for the flotation separation of fluorite and calcite. Miner. Eng (2023), <https://doi.org/10.1016/j.mineng.2023.108442>, (IF=4.8, Q1)

## **Skills and Self-Evaluation**

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### **Experimental Design and Operation Skills:**

- Proficient in independently designing experimental plans with excellent hands-on abilities, capable of flexibly addressing various challenges encountered during experiments.

### **Data Processing and Analysis Skills:**

- Proficient in using materials characterization and optoelectronic performance characterization techniques such as XPS (for studying surface chemical composition), XRD (to identify crystal structures), IR (for determining chemical functional groups), Zeta potential analysis (for assessing surface charge and stability), as well as NMR (for determining molecular and compound structures).

### **English Proficiency:**

- IELTS 6.0 (Reading 6.5, Listening 6.0, Writing 6.0, and Speaking 5.5), possessing English reading skills, capable of fluently reading English literature in relevant fields and staying updated with cutting-edge research.