OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

VST FACULTY OF PROCESS AND SYSTEMS ENGINEERING

Internship/ HiWi with an option for Master thesis

"Mineralization-based Carbon dioxide capture: Integrating Experiments and Models"

Background:

As the global community grapples with the escalating threat of climate change, the urgent need for innovative and effective strategies to mitigate carbon dioxide emissions has become increasingly evident. Among the various methods being explored, CO_2 capture through carbonate precipitation has emerged as a promising and sustainable solution. Carbonate precipitation involves the conversion of gaseous CO_2 into stable carbonate minerals through a chemical process. This method offers a dual benefit by not only capturing and removing CO_2 from emission sources but also transforming it into a solid and inert form, such as $CaCO_3$ and $MgCO_3$.

Task:

Atmospheric carbon dioxide is to be captured as carbonates of calcium and magnesium from the extraction solution of the mine tailings through the pH swing process. The carbonates have several industrial applications, necessitating the pure carbonate production through pH control. The goal of the study is to analyze the precipitation of pure $CaCO_3$ from several mixture solutions, administering the nucleation and crystal growth by particle size distribution measurements. Based on the experimental implementation and analysis of the precipitation process, a model for the selective precipitation process is to be improved and further developed.

Requirements:

1. Sufficient knowledge of chemical and process engineering.
2. Preliminary lab work experience.
3. Hands-on experience with programming in MATLAB/ Python.

Duration: 6 months

Desired Start: January 2024

Interested students of the relevant master's program, please send your Curriculum vitae and current Transcript of records via email to:

MSc. Chinmay L. Hegde chinmay.hegde@ovgu.de