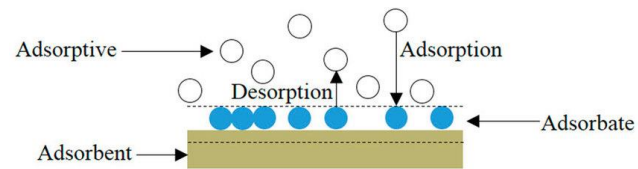


Bachelor's Thesis/ Research Internship/ Master's Thesis (Experimental)

Screening Adsorbents for the Recovery of Formaldehyde from Aqueous Solutions

Objective:

This project focuses on improving the recovery and concentration of formaldehyde from aqueous solutions through temperature swing adsorption (TSA), a promising alternative to traditional energy-intensive distillation methods.



Background:

Formaldehyde is a key feedstock for products such as plastics and renewable fuels. It is typically produced as an aqueous solution and requires energy-intensive distillation for concentration. At the Laboratory of Chemical Process Engineering, we aim to optimize downstream processes for formaldehyde recovery, with TSA being a potential solution.

Tasks:

- Familiarize yourself with formaldehyde systems and the experimental setup.
- Design and conduct adsorption experiments to determine equilibrium behavior for various adsorbents.
- Perform desorption studies with different solvents to identify optimal recovery conditions.
- Investigate the impact of salts on adsorption equilibrium and performance.
- Analyze and fit experimental data to appropriate adsorption models (e.g., Langmuir, Freundlich).

Requirements:

- Strong interest and prior experience in laboratory analytical work.
- Basic knowledge of thermodynamics, phase equilibria, and adsorption principles.
- Proactive mindset with a high degree of independence and responsibility.

What You Will Gain:

- Hands-on experience in experimental design and data analysis.
- Knowledge in adsorption processes and downstream chemical engineering.
- Opportunity to contribute to an energy-efficient industrial process.

Earliest Possible Start: 15.01.2025

Contact: Hamzah Elfaity

Office: Uferstrasse 53, 01.3505.110

Phone: +49 (0) 9421 187-292

Email: hamzah.elfaity@tum.de

