

Research Internship / Bachelor Thesis / Master Thesis

Mini-plants | Multiphase catalysis | Reaction engineering

Investigation of Liquid-Liquid Interfaces

Our group:

The Multiphase Catalysis Group in the department of Molecular Catalysis at the Max Planck Institute for Chemical Energy Conversion (MPI CEC) is currently looking for students interested in conducting research in the field of catalysis and reaction engineering. Our research is focused on green chemistry, catalysis and process intensification. We work at the interface between chemistry and engineering and therefore offer a very versatile work environment.

Your thesis:

While hydroformylation in biphasic systems is well established for short-chain olefins, the application of long-chain olefins remains challenging due to limited mass transfer between the aqueous and organic phases. By optimizing the mixing conditions and introducing specific additives to modify the phase interactions, we aim to improve the phase contact and droplet dynamics to enable efficient hydroformylation of long chain olefins. This project offers several research topics for a research internship, a bachelor thesis or a master thesis. The biphasic system and the droplet size distribution are analyzed using photo-optical high-pressure endoscopy (figure 1). Possible topics include the screening of various additives (e.g. polymers, alcohols...) to modify the phase behavior, the development / training of a novel deep neural network for advanced droplet and bubble distribution analysis, or the transition of the process from a batch to a continuous mini-plant setup.

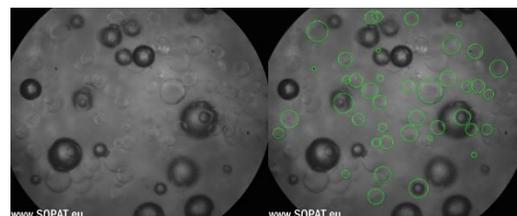


Figure 1: Example image of high-pressure endoscopy.

What we offer:

- A green and sustainable project in the field of chemical engineering on the interface between research and industry
- Working in state-of-the-art technikum and laboratory
- A fun and friendly international work environment at an excellent research institution with state-of-the-art equipment and laboratories
- HiWi contract and salary for a Bachelor Thesis / Master Thesis

Requirements:

- Interest and motivation to work in the field of homogeneous catalysis and green chemistry
- Interest and motivation in working with mini-plants
- A level of English that is sufficient for communication with your international colleagues and understanding scientific literature

If this description sounds like you and you are interested, do not hesitate to contact me with a short description of your background and interests and why you want to join the team!

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