TECHNISCHE UNIVERSITÄT DRESDEN

HZDR

Fakultät Maschinenwesen Inst. Verfahrenstechnik u. Umwelttechnik, Prof. Transportprozesse an Grenzflächen

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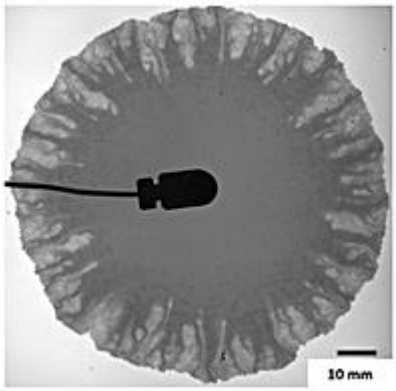
Experimental investigation of a viscous-fingering instability in a radial displacement.



Bachelor theses / Master theses / Diploma theses / Compulsory internship

Chemical reactions fronts and instabilities comprise fields of research that constantly call for new challenges. Present in numerous technological applications (porous media, reactive mass transfer, CO2 capturing) they present diverse challenges. The potential intern/diplomand will be asked to conduct experiments where a Xanthan Gum dispersion is injected into a surfactant (C14TAB) solution which is already inside a thin gap (Hele-Shaw cell) reactor. In this process, a weak gel membrane is formed by physicochemical interaction and a viscous instability emerges.

The candidate is expected to:

- Conduct experiments in the lab, using different chemical (e.g. concentrations) and hydrodynamic parameters (e.g. flow rate, flow cell).
- Image post-processing of the results and data analysis

References
[1] Keshavarzi et al. (2019) Langmuir 35(42) 13624-13635
[2] Riolfo et al. (2012) Phys Rev E 85 015304.

Requirements:

- Study in Process Engineering, Chemical Engineering, Mechanical Engineering (or relative field)
- Basic fluid dynamics and transport phenomena knowledge
- Experience in image post-processing is preferred but not obligatory (i.e. using ImageJ, MATLAB, Python)
- Motivation, interest in the field, ability to solve problems, good academic track records

Conditions:

- Duration min. 6 month, start: Feb/Mar 2023, workplace: TU Dresden

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Exzellenz aus Wissenschaft und Kultur