

Bachelor/Master/Diploma thesis - experimental

Droplet size measurement of oil-water emulsions at the inlet and outlet of a gravity settler

Background:

The separation of immiscible liquid/liquid systems with the help of gravity settlers is common in a wide range of applications in the chemical, petroleum, pharmaceutical, hydrometallurgical, food and nuclear industry. The droplet size distribution (DSD) of the incoming flow is a key factor on investigating the efficiency of the separation process in a gravity settler, and the DSD at the outlet of the settler is an important parameter for assessing the performance of a settler.

Aim of the thesis:

An experimental study will be conducted in a continuous gravity settler (as shown in Fig.1). A stirring tank is used to create oil-water emulsion. Droplet sizes are determined using an in-situ endoscope measurement technical (“DSD” in Fig.1). The separation efficiency is measured at the oil outlet in the coalescence aids.

The goal is to:

- ✚ Determine the inlet/outlet DSDs under different conditions.
- ✚ Determine the point where the total separation efficiency of the separator is lower than 1.
- ✚ Investigate the performance of the separator (master thesis).
- ✚ Model the separation process (master thesis, optional).

Tasks:

1. Literature research.
2. DSD measurements under different inlet flowrates, oil ratios and stirring speeds.
3. Separation efficiency under different inlet DSDs (master thesis).
4. Find and use suitable models to describe the separating process in the separator (master thesis, optional)
5. Analysis and discussion.

Start:

End of November 2021

Contact:

M.Sc. Song Ye, ACK7, Room 190a, Ackerstraße 76

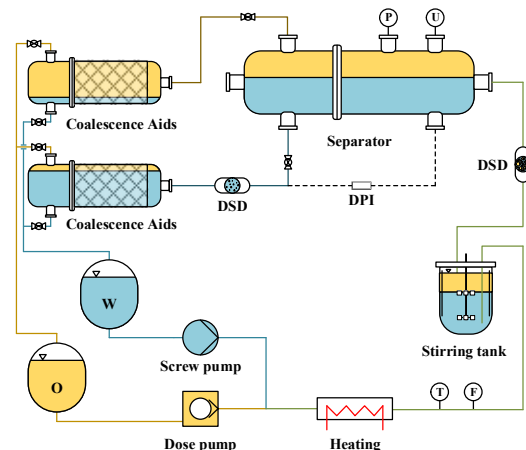


Fig. 1 Continuous gravity settler

Supervisors:

M.Sc. Song Ye (song.ye@campus.tu-berlin.de)

