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Encapsulation by interaction of positively charged chitosan polymer and anionic sodium dodecyl sulphate (SDS) surfactant

SHK work/ Master theses/ Diploma theses/ Compulsory Internship

Here we study the interactions of oppositely charged polymer and surfactant pairs. A solution of cationic polymer of Chitosan is placed in direct contact with a SDS surfactant solution. Thereby, a membrane spontaneously forms between the two solutions due to the precipitation of polymer-surfactant complexes. The membrane then progresses in the direction of polymer solution. We can also use the membrane formation to make capsules simply by dripping the polymer solution in the surfactant solution (figure 1).

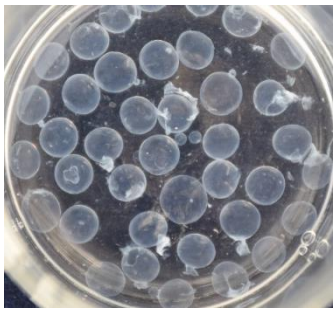

Figure 1. Capsules made by interaction of chitosan and SDS

Here, we use profile analysis tensiometry to measure the interactions between chitosan and SDS. In addition, a pressure sensor is used to measure the dynamic pressure changes through the membrane.

We aim to investigate:

- The surface tension behaviour of the chitosan-SDS complex using profile analysis tensiometry (PAT) technique
- Osmotic pressure variations through the membrane upon capsule formation using a pressure sensor
- Membrane progress in Hele-Shaw setup

Requirements:

- Study in process engineering (or comparative field of study)
- Interest in this field of research, experimental experience

Conditions:

- duration 5-6 month, start: earliest from 1st September 2022, workplace: TU Dresden