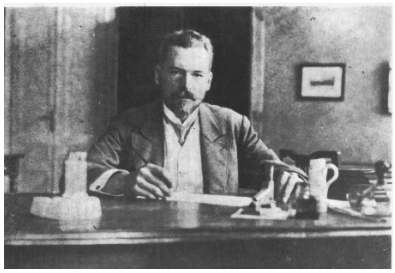

Contribution ID: **70** Type: **Poster**

Influence of a magnetic field on the drainage mechanism of the thin liquid film (TLF) and real foams stabilized by magneto-reactive surfactants

Tuesday, 28 September 2021 18:00 (3 minutes)

Foam is a dispersed system consisting of a large number of bubbles, which are divided by a thin liquid film (TLF), which is made of two interacting adsorption layers. A parameter describing the stability of TLF is its thickness h, its change over time determines the drainage kinetics. The laboratory model of the mentioned situation is an air bubble, which forms TLF with the free surface of the solution. The above-mentioned model is often used when it comes to the description of more complex dispersed systems. The carried out research consisted in the analysis of the influence of an applied magnetic field on the adsorption properties of a magneto-reactive surfactant (DTAF). Additionally, our team has researched the impact of a magnetic field on the drainage of individual TLFs, formed under dynamic conditions. To achieve this aim, an apparatus has been built, its main parts are an electromagnet, a system generating a single bubble, a tensiometer, and a refractometric spectrometer. The used set-up allowed us to determine the influence of a magnetic field on the changes of the surface tension and the changes of the TLF thickness over time. As a result of the experiments, spectacular differences in the obtained values of surface tension and kinetics of foam drainage have been acquired, in the presence of a magnetic field and its absence. Foam films interacting with a magnetic field were characterized by a faster rate of drainage, the bubble itself – with a shorter lifetime. The most probable theoretical justification of the observed effects lies in the field of magnetohydrodynamics and generations of magnetic pressure.
The research was carried out thanks to the financial support of the National Science Center (NCN) as a part of the OPUS project (2017/25/B/ST8/01247).

Primary author: Mr MARIUSZ , Borkowski (Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences)

Co-authors: Dr JAN , Zawała (Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences); Dr BENOIT, Scheid (Universite Libre de Bruxelles, TIPs-Fluid Phisics Laboratory)

Presenter: Mr MARIUSZ , Borkowski (Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences)

Session Classification: Poster Session