

Interfacial rheology of microgels at fluid-fluid interfaces

Who: At the Chair of Physical Chemistry II of RWTH Aachen, we are looking for a motivated master's student that will investigate the interfacial rheological properties of microgels. This work can be conducted either as a master's thesis project or as a Forschungsarbeit.

Topic: In this project, the interfacial shear and dilatational rheology of PNIPAM-based microgels are studied at oil-water (and air-water) interfaces. In particular, the student will perform experiments with a novel custom-made research instrument that allows the measurement of interfacial shear properties while simultaneously controlling the compression state of the microgel monolayer [1]. The student may also perform additional rheological characterization by oscillating barrier [2] and oscillating pendant drop [3] methods, as well as morphological characterization of deposited microgel monolayers by atomic force microscopy [4].

Required: The student should be interested in the rheological material characterization and possess basic knowledge in the characterization of macromolecules and colloids. Furthermore, the student must be willing to learn new measurement techniques and data analysis methods. Good communicational skills in English are also required.

New knowledge:

- Interfacial rheometry (double wall ring, Langmuir trough and pendant drop techniques)
- Viscoelastic data analysis
- Atomic force microscopy

Start: The start date can be agreed individually with Dr. Laukkanen
Length: 6 months (master's thesis) / 6 weeks (research project)
Workload: Full-time
Professor: Prof. Dr. Walter Richtering
Interested? If you are interested, please send an email to Olli-Ville Laukkanen containing your CV, motivation, and if applicable a short description of your previous research activities.
Contact person: Dr. Olli-Ville Laukkanen
Email: laukkanen@pc.rwth-aachen.de

References

- [1] Hermans, E. & Vermant, J. (2014) *Soft matter*, **10**, 175-186.
- [2] Lucassen, J. & Van Den Tempel, M. (1972) *Chemical Engineering Science*, **27**, 1283-1291.
- [3] Ravera, F., Loglio, G. & Kovalchuk, V. I. (2010) *Current Opinion in Colloid & Interface Science*, **15**, 217-228.
- [4] Scheidegger, L., Fernández-Rodríguez, M. Á., Geisel, K., Zanini, M., Elnathan, R., Richtering, W. & Isa, L. (2017) *Physical Chemistry Chemical Physics*, **19**, 8671-8680.