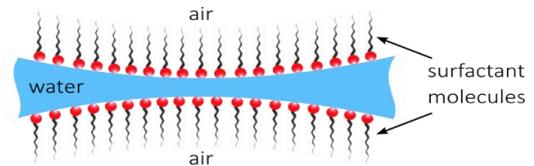


Master's Thesis - Masterarbeit

Experimental Characterization of Functionalized Soap Films

Electronic devices have become indispensable in our lives. However, many of those solid-state devices cause significant environmental burdens in the form of toxic waste and high energy consumption. Moreover, many electronic materials are incompatible with living systems causing challenges in the development of bioelectronics interfaces for medical sensing, diagnostics, prosthetics and augmented biological perceptions. This is due to the fact that communications in and between living cells are largely protonic instead of electronic.

The PROGENY project tries to address those issues by utilizing the unique properties of specifically designed soap films as functional soft materials to be used in fundamentally new types of electronic and protonic devices. A common soap film consists of thin, aqueous body surrounded by a proton-conducting, flexible, semipermeable, surfactant monolayers. Depending on the particular properties of the surfactant layers, those films may be functionalized to serve as charge transport, mechanical, optical or diffusion-based devices. Examples of possible applications are transistors, optical waveguides and gas or vibration sensors.



Schematic structure of a soap film

This project is a collaborative effort of a number of European research institutions funded by the EU. It encompasses all developmental steps, including the design and synthesis of the surfactants, their physical and biological characterization, their theoretical analysis as well as the fabrication of experimental devices. Within this consortium, the IAPP is responsible for characterizing the transport properties of the surfactants synthesized by our partners, the realization of the devices and the construction of the required experimental setup.

We are looking for a Master's student interested in performing several experimental techniques to gain insights into the properties of soap films and document the results in a master's thesis.

The IAPP is a place where more than 120 physicists, chemists and engineers are working together on virtually all topics related to organic electronics – fundamentals and applications. Hence, the IAPP provides a perfect platform to interact with other scientists in order to get a broad overview of other research topics in the field of organic electronics.

Dresden Integrated Center for Applied Physics and Photonic Materials – www.iapp.de

Hermann-Krone-Bau

Head: Prof. Dr. Karl Leo

Group: ODS – Organic Devices and Systems

Contact person:

Dr. Hans Kleemann – hans.kleemann1@tu-dresden.de – 0351 / 463-43379

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