livMatS

UNI FREIBURG

Colloquium

Superhydrophobic and switchable materials for the study of wetting behavior

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Abstract

Novel materials and processes are key for the development of tailored structures and surfaces. Materials with enhanced chemical resistance such as super repellent materials are especially relevant for chemical and microfluidic applications. Porous fluorinated polymer foams are highly resistant polymers that provide surfaces with special wetting properties. We have recently reported nano-/microporous polymer foam “Fluoropor” with superhydrophobic properties. The nano-/microstructure results in a Cassie state of the droplet and is present throughout the bulk of the material, rendering the superrepellent effect insensitive to abrasion. To achieve surfaces that are switchable between wetting states, spiropyran molecules are attached to the surface of Fluoropor. The “BioBitmaps” technology allows to produce high-resolution images of biomolecules in greyscale on various surfaces including glass, paper, polymers and metals. With a toolbox of material development, material shaping and material functionalization various possibilities for new applications in engineering, chemistry and biology emerge.

Brief Bio

Dorothea Helmer studied Chemistry at the TH Karlsruhe and finished her PhD on Chemokine inhibitors at the University of Darmstadt. She joined the KIT in 2014 for a postdoc at the Institute of Microstructure Technology (IMT) and moved to IMTEK in 2018. She is working at the chair of process technology, and Co-Founder of the Spin-Off Glassomer. Her DFG project “Evaluation of droplet shape and three-phase contact line movement on dynamically switchable spiropyran surfaces” is associated to the livMatS cluster and she will be leading a BMBF NanoMat Futur Project - starting by the end of this year - on novel 3D printing techniques.

1 July, 2020, 16:00-17:00 p.m.

Online

Gefördert durch DFG Deutsche Forschungsgemeinschaft

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