GESELLSCHAFT DEUTSCHER CHEMIKER E.V.

Ortsverband Bonn
Vorsitzender: Prof. Dr. Jeroen Dickschat

Prof. Dr. Christoph A. Schalley
Freie Universität Berlin

Dienstag, 18.6.2024

17 Uhr s.t. Hörsaal 2

Chemische Institute, Bonn-Endenich

Supramolecular Gels & Polymers: From Superhydrophobic and Slippery Surfaces to Directional Transport along Gradients

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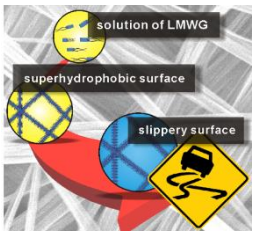
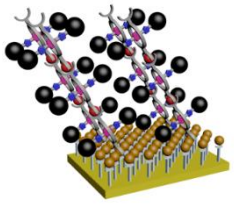
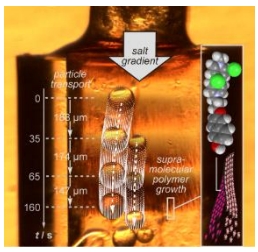


In the first part, a very simple production procedure for superhydrophobic and slippery surfaces is reported. The deposition of a gel leads to the surface roughness needed for superhydrophobicity and in a way mimics the Lotus leaf effect. While the superhydrophobic surfaces repel water, but not solutions of detergents such as SDS, infusion of a lubricant into the cavities of a gel provides a slippery surface, which also repels SDS solutions and more complex liquids such as serum or blood. Both surfaces are stable to extended exposure to running water. In addition, the slippery surfaces are self-healing.



The second part of the talk discusses approaches to chemically and light-switchable mono- and multilayers of rotaxanes on gold surfaces. With alternating layer-by-layer deposition of the tetralactam macrocycles or the corresponding rotaxanes and various connecting metal ions, coordination oligomers with well-defined sequences can be built that are anchored on one end on the surface. Pseudorotaxane formation can occur within multilayers of macrocycles. Different layers containing different switchable rotaxanes can be addressed separately by different external stimuli.



The third part discusses how to use a supramolecular polymer self-assembling from easy-to-synthesize monomers as a supramolecular machine for the directional transport of particles as their cargo over millimeter distances. The direction is defined by a salt gradient and the energy dissipated in the process comes from the crystallization of flexible, bent and partially amorphous ribbons into rigid rods. Overall, this supramolecular machine generates external work from chemical energy. The structural details have been unraveled by electron microscopy, small and wide angle X-ray scattering and electron diffraction experiments.

Gäste sind herzlich willkommen