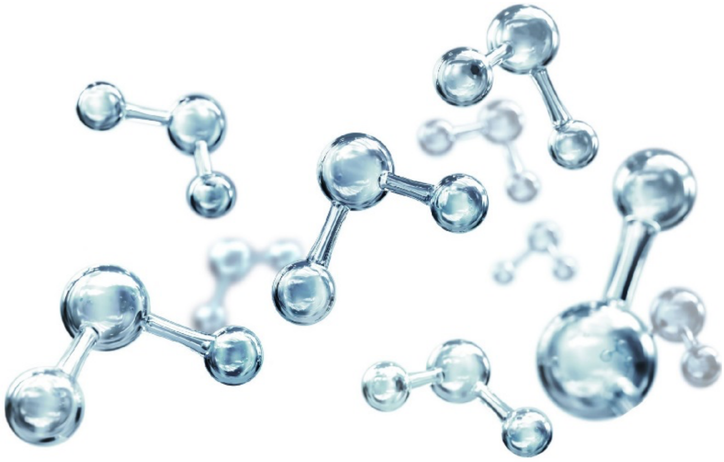
Seminar

30th of November 2023
14:00 h

Zoom Virtual Meeting:
https://tuhh.zoom.us/j/82631283465
Meeting-ID: 826 3128 3465
Password: 978444



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Spontaneous charging of hydrophobic surfaces by sliding drops

Water drops moving on surfaces are not only an everyday phenomenon seen on windows but also form an essential part of many industrial processes. Like in triboelectricity, moving drops can separate electric charges. This phenomenon is called *slide electrification*. Typically, water drops sliding down hydrophobic surfaces spontaneously acquire a positive charge while they deposit negative charges on the solid surface. The reason for this charge separation is still unknown. It is not anticipated because moving a unit charge from the aqueous environment to a solid surface requires an energy of the order of 50-100 k_BT; here k_B is Boltzmann's constant and T is temperature. The fundamental difference to tribocharging, where hard materials are in contact and due to surface roughness high local shear stresses can occur, the shear stress in slide electrification is limited due to the surface tension of the liquid. In this presentation, the protocol of how to quantify slide electrification is described and recent experimental results are presented. Consequences and opportunities of slide electrification are discussed.

(1) Stetten, A., D.S. Golovko, S.A.L. Weber, H.-J. Butt, *Soft Matter* **2019**, ***15***, 8667. (2) Li et al., *Nature Physics* **2022**, 18, 713. (3) Li, X., A.D. Ratschow, S. Hardt, H.-J. Butt, *Phys. Rev. Lett.* **2023**, arXiv:2304.13461.