Contribution ID: **6** Type: **Talk**

Memory effects of PNiPAAm brushes in different atmospheres

Thursday, 8 December 2022 11:00 (30 minutes)

Some polymer brushes show a co-nonsolvency effect: They collapse in a mixture of two good solvents at some specific mixing ratio. In contrast to previous studies, we concentrate on the partial wetting of co-nonsolvent polymer brushes, i.e., on the dynamics of a three-phase contact line moving over such brushes.

We found that poly(N-isopropylacrylamide) (PNiPAAm) brushes experience a memory effect when consecutively depositing drops at the same position. The subsequent drops adapt the brush and change the drop's wetting behavior (contact angle hysteresis). Hand in hand with the change in the contact angle, hysteresis goes the difference in the force to move the drop laterally. We measure this force with a self-built DAFI.

We measure water drops in an ethanol-saturated atmosphere on PNiPAAm brushes in further wetting experiments. The measurements show that an ethanol-enriched atmosphere strongly affects the memory effect reversibly. At the three-phase contact line, due to the drop's evaporation, the atmosphere's composition and probably the brush will transition from an ethanol-rich state to a water-enriched state. Thus, the brush might pass through the co-nonsolvency regime. On large time scales, the ethanol-enriched gas phase and the water drop will become mixtures of ethanol and water. We present strategies to counter this mixing effect.

Primary authors: SCHUBOTZ, Simon; Prof. SOMMER, Jens-Uwe; Dr UHLMANN, Petra; Prof. FERY, Andreas; Dr AUERNHAMMER, Günter K.

Presenter: SCHUBOTZ, Simon

Session Classification: Short Talks