Beitrag ID: **15** Typ: **Poster**

Evaluation of photoswitchable wetting properties of hydrophobic surfaces

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Spiropyran stands among one of the most interesting molecular switches to induce changes in wetting properties due to the reversible switching between colourless hydrophobic spiropyran to magenta hydrophilic merocyanine by triggers such as light, pH, and metal ions. Spiropyran-induced changes in wetting properties were shown for various purposes and applications, such as antifouling coatings, switchable membranes, and ion sensors (1–4). However, upon any damage or defect to the surface, i.e. to the switchable groups it might lose the switching properties. Therefore, it would be beneficial to have the spiropyran in the bulk of the material, so that spiropyran units are available to show the switch in every layer or region exposed to the trigger. In addition, the wetting properties of the bulk material can be altered upon UV exposure to be used for applications such as membranes (5,6). In this study, two different spiropyran monomers were synthesized (7) and photo-polymerized with other (metha)acrylate monomers to fabricate (non)-porous polymers with switchable wetting properties. Fabricated spiropyran-containing polymeric surfaces showed a micro-meter scale resolution for the switch upon UV exposure using our maskless lithography system (8) and up to 10 ° change in contact angle for smooth surfaces. To enhance the contact angle change, roughness was introduced to the spiropyran-containing polymers by creating porous structures. Our porous photoswitchable polymers containing no fluorinated monomer presented superhydrophobic behaviour (CA > 150°) before and hydrophobic behaviour (CA < 150°) after the switch. The concept will be employed later to achieve switchable wetting properties between superhydrophobic and hydrophilic states.

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