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Dynamic Wetting of Self-Assembled Monolayers functionalized with Photoresponsive Arylazopyrazoles

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Light is a particularly attractive external stimulus to modify surface properties since it can be applied with very high local and temporal resolution. Molecular photoswitches such as azobenzenes,1 diarylethenes2 and spiropyranes3 have been explored in a range of photoresponsive coatings which utilize their photoisomerization to induce changes in macroscopic properties such as wettability.4 This results in a substantial and reversible change of wettability.5
Current approaches using immobilized photoswitches still suffer from certain drawbacks1, while in contrast arylazopyrazoles (AAPs) offer significant improvements of photophysical properties. Such as a much more favorable photostationary state (>98 % in both directions), very slow thermal relaxation of the cis-isomer towards the thermodynamically favored trans-isomer and very good fatigue resistance.6 In the talk we present the synthesis of multiple AAP-silane derivatives and the successful functionalization of glass and silicon surfaces using self-assembled monolayers.

References
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