



Beitrag ID: 4

Typ: Talk

## 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,<sup>1</sup> diarylethenes<sup>2</sup> and spiropyranes<sup>3</sup> have been explored in a range of photoresponsive coatings which utilize their photoisomerization to induce changes in macroscopic properties such as wettability.<sup>4</sup> This results in a substantial and reversible change of wettability.<sup>5</sup>

Current approaches using immobilized photoswitches still suffer from certain drawbacks<sup>1</sup>, 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.<sup>6</sup> 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

- (1) Bandara, H. M. D.; Burdette, S. C. Photoisomerization in different classes of azobenzene. *Chem. Soc. Rev.* 2012, 41, 1809–1825.
- (2) Tian, H.; Yang, S. Recent progresses on diarylethene based photochromic switches. *Chem. Soc. Rev.* 2004, 33, 85–97.
- (3) Klajn, R. Spiropyran-based dynamic materials. *Chem. Soc. Rev.* 2013, 43, 148–184.
- (4) Xin, B.; Hao, J. Reversibly switchable wettability. *Chem. Soc. Rev.* 2010, 39, 769–782.
- (5) Groten, J.; Bunte, C.; R uhe, J. Light-induced switching of surfaces at wetting transitions through photoisomerization of polymer monolayers. *Langmuir : the ACS journal of surfaces and colloids* 2012, 28, 15038–15046.
- (6) Weston, C. E.; Richardson, R. D.; Haycock, P. R.; White, A. J. P.; Fuchter, M. J. Arylazopyrazoles: azo-heteroarene photoswitches offering quantitative isomerization and long thermal half-lives. *Journal of the American Chemical Society* 2014, 136, 11878–11881.

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**Sitzung Einordnung:** Short talks