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Project	**Self-Repairing Antifouling Fluorinated Polymer Brushes**
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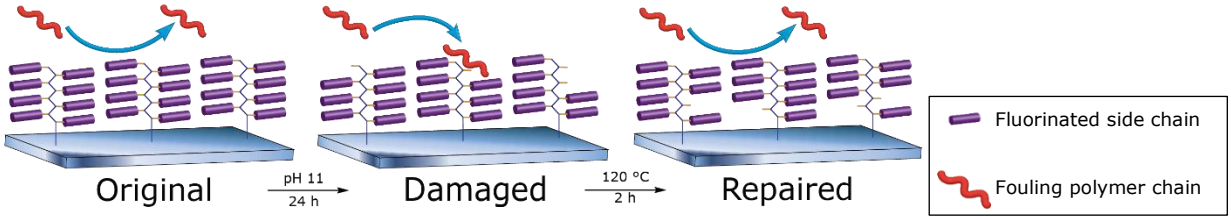


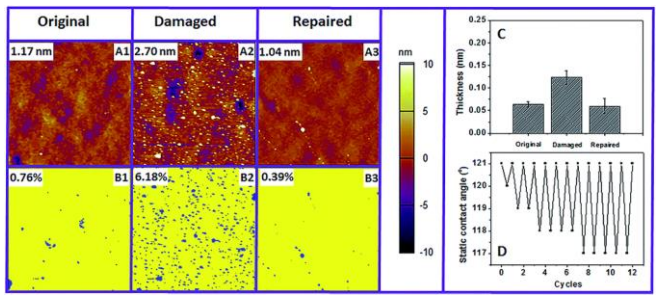
Introduction

Most research of antifouling coatings is focussed on biological fouling. This has led to a deep understanding of the early stages of biofouling and the development of anti-biofouling coatings, such as polyethylene oxide polymers and zwitterionic polymer brushes.

In contrast, little is known of antifouling behaviour in non-aqueous media, while fouling by organic polymers is forming a major problem in the industries of *e.g.* high-quality 3D-printing, paper manufacturing and food processing. The current research is therefore fully focussed on the development of such polymer-repellent coatings. Initial results from our group indicate that fluorinated polymer brushes can withstand organic fouling to a very high degree.[1] In addition, they provide the potential for self-repair via chain rearrangements at slightly elevated temperatures.[2]

Goal

This project aims to develop a range of self-repairing antifouling polymer brushes, and to explore the self-healing mechanism that they employ. In order to achieve this, fluorinated monomers are synthesised and polymerised to produce a large variety of brushes. Antifouling and self-healing experiments will show how well the brushes perform, after which successful brushes will be implemented in two applications. Meanwhile, molecular modelling will shine a light on the self-healing mechanism of the polymer brushes.



The repeatability of the self-healing property of an antifouling polymer brush is analysed by AFM and water contact angle measurements.[2]

References

(1) Wang, Z.; Zuilhof, H. *Langmuir* **2016**, *32* (26), 6571–6581.
(2) Wang, Z.; Zuilhof, H. *J. Mater. Chem. A* **2016**, *4* (7), 2408–2412.

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