Lucas Teunissen

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Project	Rendering antifouling copolymer brushes on modified steel responsive
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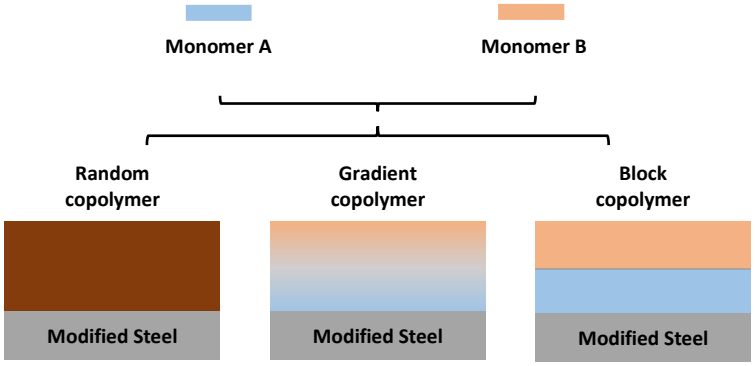
Introduction
This project was started mid-November 2018 and is part of the Chemical Industrial Partnership Project (CHIPP) entitled 'Nanostructured, self-assembled functional materials'. Five universities and six industrial partners will collaborate on the development of novel materials that are self-assembled from various nanosized building blocks. Control of the structural properties of these materials on the nanometer scale will allow highly specific tailoring of their functionalities. Therefore, self-assembled materials have the potential to exhibit improved levels of performance in relation to existing materials. Ultimately, large-scale fabrication of the self-assembled materials will be considered (Nano-for-Mega).

The main goal of this project is to design and synthesize surfaces with specific physical and chemical properties using advanced polymer brush coatings. These polymers are covalently bound to the surface and are therefore robust and durable. By variation of the polymer components and structure the nature of the brush, and subsequently that of the coated surface, can be finely tuned.



Approach
Polymer brushes will be synthesized on modified steel by grafting polymerization initiators on modified steel, followed by atom transfer radical polymerization (ATRP) from the surface. By employing two monomers in the reaction mixture, a copolymer is synthesized that combines multiple (responsive) properties. Then, by variation of the type of brush architecture (random, gradient or block) it is expected that the responsiveness of the surface can be altered.

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WAGENINGEN UNIVERSITY & RESEARCH

TATA STEEL

NWO Netherlands Organisation for Scientific Research