# 6 Positions (5 PhD and 1 Postdoc) available in the field of *Functional Organic Surfaces*

WAGENINGEN UNIVERSITY & RESEARCH

## Research of Laboratory of Organic Chemistry

The research conducted within the Laboratory of Organic Chemistry is directed towards the study of organic reactivity at the forefront of 21st century chemistry, specifically at the overlap of nanotechnology, chemical biology, and organic synthesis. In our lab we are closely observing surfaces, and develop or fine-tune their chemistry to allow functionalization with (bio-)organic materials. In this area we are both interested in the fundamental aspects as well as in the application thereof in practically relevant devices or techniques. Examples include self-healing antifouling materials, selective electrodes and sensors and nanomaterials for photovoltaics, often obtained by novel preparation routes and studied by state-of-the-art surface analysis techniques.

Currently we have 6 openings. For all positions we are looking for excellent chemists with experience in organic synthesis, who are interested to work in a highly interdisciplinary team (www.orc.wur.nl).

## Postdoc Position (initially 1 year) and PhD Position on Polymer-based, Ion-selective Electrodes

We are looking for a postdoctoral researcher and a PhD student to design, synthesize, and characterize polymer-based electrodes for ion-selective removal and recovery. This project focusses on phosphate and aims to develop tailor-made, ion-selective electrodes that will be integrated with electro-driven separation processes. Polymer-based electrodes display significant potential to achieve ion selectivity. One of the challenges is finding a proper balance between selectivity and reversibility, which will be addressed by polymer and surface chemistry. Another challenge is to understand and control ion transport into and out of the electrodes, which will be studied by electrochemical approaches. The project is part of an ERC Consolidator program and will be carried out in close collaboration with three PhD students and Wetsus. Contact: Dr Louis de Smet (louis.desmet@wur.nl, www.louisdesmet.nl).

## Two PhD Positions on Porous Organic Frameworks for Molecular Selectivity

We are looking for two PhD students to design, synthesize, and characterize polymer-based porous materials (here covalently organic frameworks, COFs) and to integrate these new materials with sensor devices. COFs do not only have a large surface area, they are also highly stable and have large chemical and structural possibilities. The focus of this NWO START-UP project is on the integration of new functional COF coatings with sensors, on tuning their on-device selectivity and on understanding the detection mechanisms involved. Two approaches will be pursued to make functional COF coatings: COF materials will be mixed with polymer matrices (PhD 1) and COFs will be grown in-situ from their molecular building blocks onto sensor surfaces (PhD 2). Contact: Dr Louis de Smet (louis.desmet@wur.nl, www.louisdesmet.nl).

## PhD Position on Covalently Bound Self-healing Polymer Brushes

Ever thought of steel as a hybrid organic-inorganic nanomaterial? This “nano4mega” project aims to achieve precisely that! We are looking for a PhD student on an NWO-funded project entitled “Nanostructured self-assembled functional materials” (NanoFun). The goal of this project is to prepare structured copolymer brushes onto polymer-coated steel. We aim to achieve this by synthesizing precisely defined monomers, use these for the controlled growth of polymer brushes, and aim to obtain a tunable, rational design of functional/responsive coatings. In this project we want to combine organic chemistry and nanoscale materials science with large-scale (100’s of $m^2$/day) deposition. Up for this challenge?: contact Prof Han Zuilhof (Han.Zuilhof@wur.nl) or Dr Maarten Smulders (maarten.smulders@wur.nl, www.smulderslab.nl).

## PhD Position on Organic Chemistry for Efficient Singlet Fission

How to double the efficiency of photovoltaic solar cells? A game-changing novel approach is that of singlet fission. In this strategy one absorbed photons is converted into two electrons. This requires cleverly designed molecules, and novel interlayers that can form the bridge between the light-absorbing layer and the silicon solar cell underneath. The project – which is part of a larger NWO-funded Mat4Sus project – focusses on that interlayer. Two sorts of interlayers will be investigated: silicon nanoparticles, with fine-tuned energy levels, and suitably modified organic molecules. This project encompasses organic synthesis, nanoparticle synthesis and characterization, and preliminary studies of energy transfer. Contact: Prof. Han Zuilhof (Han.Zuilhof@wur.nl).