Radical Filtration:
Photocatalytic membranes for water purification

Background

Advanced oxidation techniques and membrane filtration have attracted increasing attention to treat and purify water. Among these methods photocatalytic oxidation with titanium dioxide (TiO_2) is widely studied as this treatment avoids the secondary solid waste[1], and membranes have gained an important place in chemical technology and are used in a broad range of applications[2].

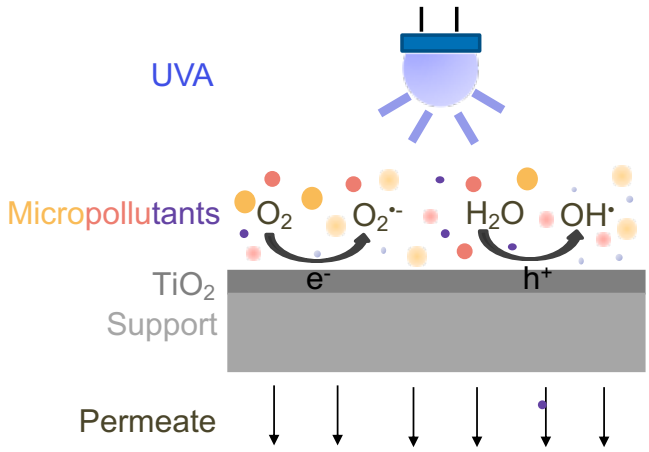

Fig 1. Graphical abstract of the project.

This project seeks to provide a novel water treatment method combining membrane separation and photocatalytic oxidation within a single material in combination with UV light to remove micropollutants and inactivate microorganisms, see Figure 1. To achieve this goal, it is needed to elucidate and optimize the synergy between membrane rejection and photocatalytic conversion by studying the transport and distribution of the UV light and its interplay with the chemical oxidation process.

[1] Leong, S. et al., *Journal of Membrane Science* 472 (2014) 167-184.
[2] Baker, R. W., Membrane Technology and Applications (2012).

Priority compound and Virus control theme:https://www.wetsus.nl/research-themes/priority-compounds/

Your task

Study the synergy between photocatalytic oxidation and membrane filtration:

- Conduct dead-end and crossflow filtration experiments with the photocatalytic membranes.
- Data analysis and scientific reporting
- Mass Transport Model

Requirements

- A student highly motivated, enthusiastic, proactive, and willing to learn new skills.
- Preferably with a background in Chemical Engineering, Chemistry or Environmental Engineering.
- A good level of English is required.
- Experience working with membranes or photocatalytic systems is appreciated.

Our offer

- Start: July 2021 until December 2021.
- Place: Wetsus, Leeuwarden – Netherlands.
- Allowance: 175 €/month*.
- Working in a multidisciplinary and international environment.

How to apply

The offer is open to all EU students and to non-EU students already living in the Netherlands.

If you are interested in this project, send an email to Shuyana Heredia: Shuyana.Heredia@wetsus.nl (subject: Internship Application). Include in the email:

- CV.
- Motivation letter (max. 1 page).

UNIVERSITY OF TWENTE.