

Diplomarbeit / Masters Project

Project Summary

P25 immobilized PVDF membrane for photocatalytic degradation of micropollutants

Micropollutants include natural as well as anthropogenic persistent chemicals in water are a rapidly emerging global problem that seriously threatens environmental and human health. Membrane processes are used in advanced water purification to remove micropollutants. Remaining issues are incomplete removal of micropollutants, high energy demand and the requirement to dispose of concentrates/brines.

Hybrid photocatalysis membrane filtration system combines the advantages of both membrane filtration and in situ photocatalytic degradation. This approach enables superior removal efficiency and selectivity. Further, the process operates at higher permeability and the in situ degradation of pollutants solves the concentrate issue. Thus, the hybrid process offers significant advantages that warrant investigation.

The aim of this project is to fabricate nanocomposite (P25-PVDF) membranes with new functionality to achieve micropollutant adsorption and degradation.

The following task will be performed:

- Literature review on the topic (photocatalytic membrane and removal of contaminants, like dyes, pharmaceuticals and personal care products; integration of P25 with PVDF membrane, stability of the polymeric membranes in photocatalysis)
- Characterization of synthesized membrane using electron microscopy, surface charge, and other state-of-the art spectroscopic tools
- Perform experiments with the photocatalytic micro cross flow system connected to determine micropollutant degradation
- Analyze experimental data and write/co-author a research publication (in English)

Required Skills

Studies in Chemical/Process Engineering or equivalent (Uni, TH)

Basic knowledge in polymer chemistry, water treatment technologies, membrane technology. Evidenced writing skills in English language, proficiency with Origin Labs software for data analysis and graphing, willingness to lead or contribute to the writing of a scientific publication.

Institute

Membrane Technology Department, Institute for Functional Interfaces (IFG-MT)

Start Date

Flexible/negotiable

Application Procedure

Please email CV, transcripts and motivation letter with available time period for evaluation.

Project Advisor(s)

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