Membrane Materials and Processes

Membranes for the removal of micropollutants for drinking water production

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Introduction
The development of membranes for effective water purification processes of industrial waste streams and drinking water production is a key step in the recovery and reuse of resources. Nanofiltration (NF) membranes have a great potential but separation at a true molecular level is still a challenge. Especially the presence of micropollutants (e.g. industrial chemicals, medicines, hormones etc.) are very difficult to remove due to their diverse nature. In this work we develop isoporous membranes with tunable pore size and pore functionality for the retention of micropollutants for water purification.

Project summary

A covalently templated liquid crystal (LC) with polymerizable tails is synthetized. The LC material is crosslinked through polymerization and the core of the disk is removed to obtain an isoporous membrane. The chemical structure of the pores is modified by introducing different functional groups in order to control the pore size. The modification will lead to the selective removal of specific molecules based on their sizes and functional groups. The performance of the membranes is investigated with artificial and real industrial feed streams.

Project goals

Possible projects:
In this project you will have the freedom to focus on the synthesis and characterization of the liquid crystalline material or on the membrane development, membrane characterization and performance analysis. The project can be discussed further in detail to take your interest into account.

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