

Project Summary

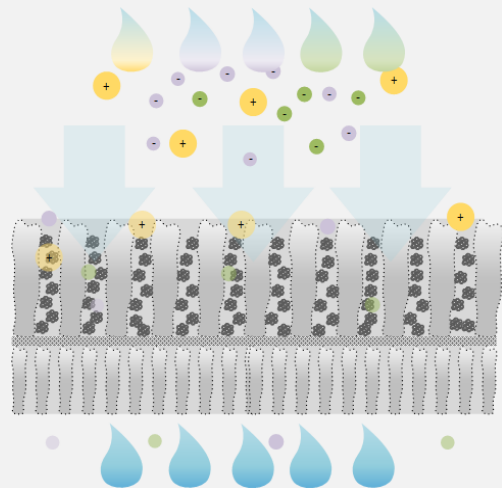
Title: Zeolite immobilized ultrafiltration membranes for the removal of inorganic water contaminants

The consumption of drinking water contaminated with elevated levels of inorganic ions such as fluoride, nitrate and uranium is a major health concern. A low energy filtration process such as ultrafiltration (UF) would be a viable option for water treatment in remote areas, at the same time challenging as it cannot perform ion removal like nanofiltration or reverse osmosis. Composite UF membranes involving inorganic adsorbents such as zeolite would enhance the ion removal ability.

This project is a part of a DFG funded collaborative programme with KNUST, Ghana. As the synthesis of zeolites is feasible from the locally available clay materials in Ghana, treatment of the local water using a low energy filtration route involving zeolite is more interesting.

The aim of this project is to establish the feasibility of using composite zeolite UF membranes for the removal of inorganic ion pollutants common in Ghana waters. The following specific task will be performed as a part of the project:

- establish the fundamental principles of adsorption by zeolites
- infiltrate the zeolite into a UF membrane
- Perform ultrafiltration experiments with a dead end stirred cell to evaluate the performance of zeolite composite membrane for ion removal
- Master student will have the opportunity to co-author a research publication, provided the results are promising
- Take part in group activities, oral presentation in group meeting and writing of reports (medium of all communications and writing will be in English)



Required Skills

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

Basic knowledge in chemistry and membrane technology. Understanding of adsorption kinetics, inorganic and physical chemistry is favourable. Evidenced writing skills in English language, ability to use MS Word, Excel, know-how for Origin Labs software and Endnote for data analysis, graphing and citation management, willingness to lead or contribute to the writing of a scientific publication.

Institute/ Department

Institute for Advanced Membrane Technology (IAMT)

Bldg 352, Campus North, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen

Start Date

Flexible/Negotiable

Application Procedure

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

Project Advisor(s)

Dr. Akhil Gopalakrishnan: akhil.gopalakrishnan@kit.edu

Prof. Dr.-Ing. Andrea Iris Schäfer: andrea.iris.schaefer@kit.edu

<https://www.iamt.kit.edu/>