

## Diplomarbeit / Masters Project

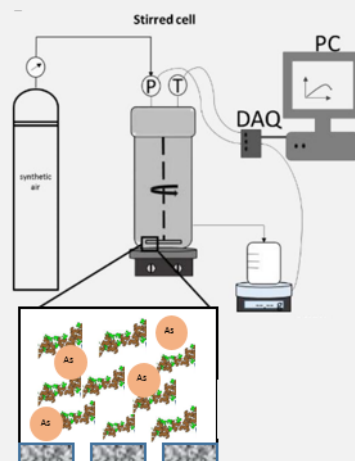
### Project Summary: **Removal of arsenic by ultra- and nanofiltration (UF/NF) membranes under varying water quality and fouling conditions**

Arsenic (As) concentration in groundwater is a ubiquitous problem and often referred to as current century's adversity. Among all the countries in different parts of the world affected by arsenic contamination in groundwater, the highest population at stake is in Bangladesh followed by West Bengal in India. Seawater level rise and subsequent increase in intrusion into groundwaters is likely to affect water quality significantly, and with this potentially the speciation and transport of As. Further, the nature of humic acid (HA) and the probable worsening of As release is to date little understood. Formation of organic-inorganic nanoparticles is likely to affect both removal and membrane fouling. Elucidating these controls is important to determine As contamination in groundwater.

There is increasing evidence that natural organic matter (NOM) strongly interacts with As, influencing its speciation and mobility in aquatic environments. NOM could affect As sorption through competition for reactive surface sites. It can change the As speciation through oxidation reduction reactions as well as the formation of NOM-As complexes.

The aim of this project is to carry out experiments that help to understand the interaction between HA and As in groundwaters and specifically carry out membrane filtration experiments to investigate the removal of As from groundwater by NF/UF membrane process at various operating conditions. The following task will be performed:

- Literature review on the topic (Arsenic occurrence and removal, ground water desalination, HA/NOM removal by membranes)
- Perform UF/NF experiments with HA and As at varying water chemistry parameters
- Determine water quality of water samples from experiments with relevant analytical instruments following calibration and validation
- Analyse data and write/co-author a research publication (in English)



### Required Skills:

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

Basic knowledge in water quality, water treatment technologies, membrane technology. Evidenced writing skills in English language, proficiency with Origin Labs software for data analysis and graphing as well as Endnote for literature management will be attained, willingness to lead or contribute to the writing of a scientific publication is appreciated with most masters projects at IFG-MT leading to a publication.

### Institute/ Department:

Membrane Technology Department, Institute for Functional Interfaces (IFG-MT) in collaboration with the University of Heidelberg

### Start Date:

Flexible/negotiable (projects are typically scoped for a duration of 6 months)

### Application Procedure:

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

### Project Advisor(s):

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