

Diplomarbeit / Masters Project

| | |
|------------------------------|--|
| Project Summary | Evaluation of arsenic removal by electro dialysis through investigation of operational and water quality parameters |
| | <p>In electro dialysis (ED) process, direct electric current is used to remove charged elements from solutions by alternatively positioned cationic and anionic charged membranes. These membranes are permeable for counter ions while repelling co ions.</p> <p>ED is well established in salt production and brackish water desalination, due to higher water recoveries compared with reverse osmosis. Recent developments have made the electro dialysis process interesting for new applications, such as water and wastewater treatment and separations in the food and drug industry.</p> <p>Raising groundwater salinity can facilitate the dissolution of different elements from soil sediments into groundwater. In this project, experiments are performed to investigate the impact relevant parameters on arsenic removal from brackish groundwater. Water quality variation can affect the performance of both ion exchange membranes and mass transfer of ions, which can lead to higher or lower removal of these ions from water.</p> <p>Tasks to be performed:</p> <ul style="list-style-type: none"> • Literature review on the related concepts and related studies (water quality focusing on the impacts of arsenic contamination, electro dialysis fundamentals, limiting current density studies) • Performing experiments with a lab scale electro dialysis system equipped with a 21 cell membrane stack • Preparing samples and standards for arsenic analysis with an ICP-MS system • Analyze and report experimental data in monthly group meetings, write/co-author a research publication |
| Required Skills | <p>Studies in Chemical/Process Engineering or equivalent (Uni, TH)</p> <p>Basic knowledge in electro-chemistry, water treatment technologies and electro-membrane processes. Evidenced skills in English language, ability to learn/use Origin Labs software for data analysis and graphing and Endnote for literature management, willingness to lead or contribute to the writing of a scientific publication.</p> |
| Institute/ Department | <p>Institute for Advanced Membrane Technology (IAMT) Bldg 352, Campus North, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen</p> |
| Start Date | <p>Flexible/negotiable</p> |
| Application Procedure | <p>Please email CV, transcripts and motivation letter with available time period for evaluation.</p> |
| Project Advisor(s) | <p>Mehran Aliaskari: mehran.aliaskari@kit.edu Prof. Dr.-Ing. Andrea Iris Schäfer: andrea.iris.schaefer@kit.edu https://www.iamt.kit.edu/</p> |

