

# Characterizing & preventing inorganic Scaling during electrochemical ammonia recovery

**Type of project:** Thesis / Internship

**Location:** Wetsus, Leeuwarden, The Netherlands

**Starting date:** November 2021 (adjustable)

## Project description:

Adoption of electrochemical systems (ES) for ammonia recovery from wastewater is an important step in reducing global energy consumption (ammonia production by Haber-Bosch represents 2% of the world energy consumption) and nitrogen emissions. One of the hampering factors in the adoption of ES is the scaling of the ion exchange membranes which can be found in these systems. Inorganic scaling is often removed by cleaning in situ or pre-treatments. However, this means added costs or energy to the overall process. In this project, we want to characterize how/when scaling is formed in the membrane and develop a more sustainable way to prevent it.

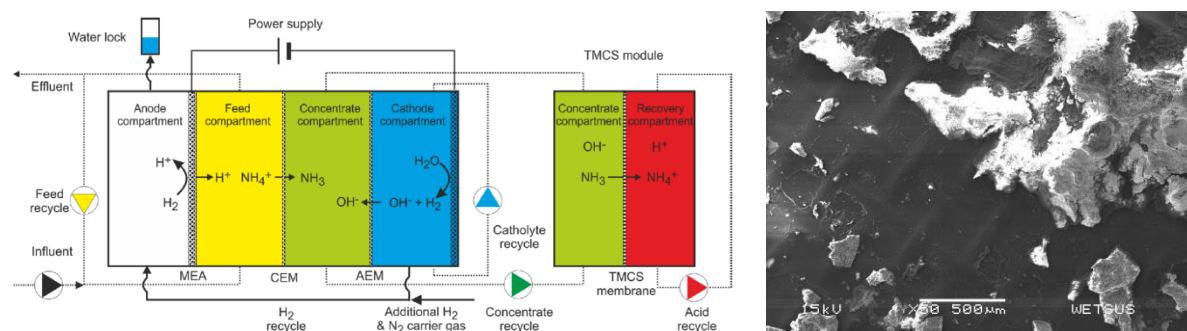


Figure 1. Left) Electrochemical system for ammonia recovery. Right) Scaled ion exchanged membrane.

## Tasks:

- Operate an ES system for ammonia recovery independently at different conditions
- Performing and preparing a broad variety of lab analyses
- Evaluating and optimizing the system performance
- Data processing (excel or other)
- Model the phenomena observed (optional)

## Requirements:

- Practical lab skills
- Background in chemistry, biology, process engineering, environmental engineering or a related field. Knowledge in electrochemistry is beneficial for the application
- Fluent in English (good writing and communication skills)
- Experiencing a multidisciplinary and international working environment

## Benefits and how to apply:

You will work in a highly-skilled environment for water research and contact with different topics and people. We offer a monthly allowance of 175 € if you do not have a scholarship (i.e. Erasmus +). To apply to the project, send an email to [mariana.rodriques@wetsus.nl](mailto:mariana.rodriques@wetsus.nl) (indicate the preference for internship or thesis); please include an updated curriculum vitae. Please note, Non-EU students need to be enrolled at a Dutch university to be eligible for this project.