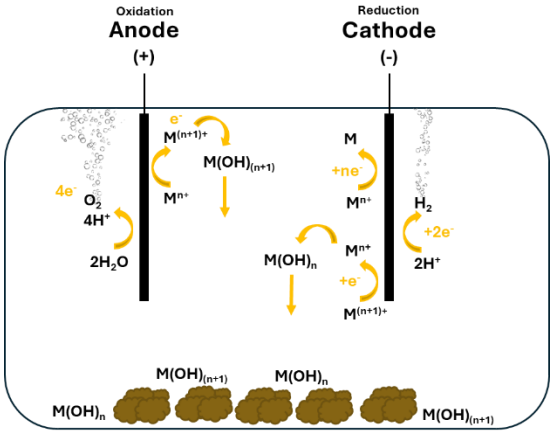
Electrochemical metal recovery from water treatment processes



Electrowinning Principle:

$M^{n+} + ne^- \rightarrow M$

Introduction

Electrochemistry is the branch of chemistry that studies the relationship between electrical energy and chemical reactions, particularly those involving electron transfer. Electrowinning is a method used in industries to obtain valuable metals such as copper, aluminium, and zinc in their refined form.

The water treatment sector produces tons of waste containing high amounts of metals, which ends up being disposed of without valorised routes. Water boards are therefore looking for efficient waste management solutions by encouraging resource recovery. What if it was possible to reduce the metal consumption in this industry?

The complexity of these waste streams hinders the application of the electrochemical processes, mostly due to the wide variety of electron-withdrawing compounds. Because of that, more studies need to be carried out to better understand properly the mechanisms and how to optimize them. Are you ready to help with this?

Objective

The goal of this internship is to define the optimal conditions for the electrowinning process of metallic cations. The assignment will comprise both a literature review and laboratory experiments. The combination of both will allow you to discover the different electrochemical mechanisms that lead to metal removal/recovery from water treatment subproducts.

Based on the literature review and your laboratory experiments you will propose which operational conditions promote an efficient metal recovery. Finally, an estimation of the operational costs will be made based on the experimental data. This allows you to compare electrowinning to other technologies and define its feasibility.

Internship specifications

Type of education: Enrolled in an MSc in Electrochemistry, Chemical or Environmental Engineering
Supervisor: Tiago Martins
Location: Doetinchem, the Netherlands
Duration: 4 – 6 months

Application

If you are interested in this internship at Nijhuis Saur Industries, please send the following to Iñigo De Eguren at internship.nwt@nijhuisindustries.com:
- your motivation and CV
- the period and duration of your internship

Or apply via: https://eu.jobs.saur.com/nl/jobs