

# Evaluation of Fenton Pretreatment and MBBR Performance for Leachate Biodegradability Improvement

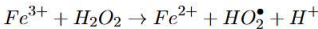
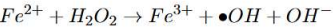
## Introduction

Leachate Treatment challenge:  
 Low Biodegradable organic content  
 & high concentrations refractory hazardous substances

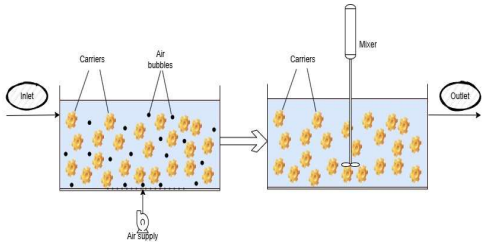
- Limits biological treatment
- PFAS removal: High COD [mg/L] in competition MPs (µg/L or ng/l) adsorption sites
- MUDP Project: DTI

## Methodology

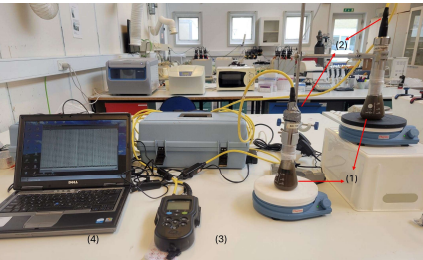
Fenton Oxidation: Iron (catalyst) + Hydrogen Peroxide



Moving Bed Biofilm Reactor (MBBR)

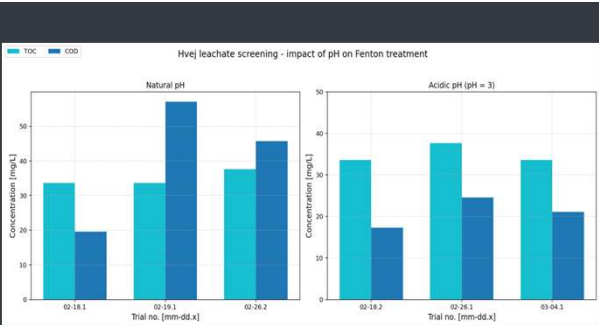


Oxygen Uptake Rate (OUR)

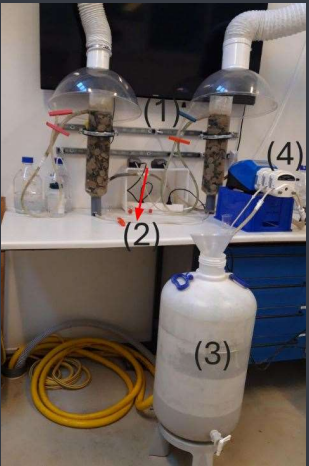
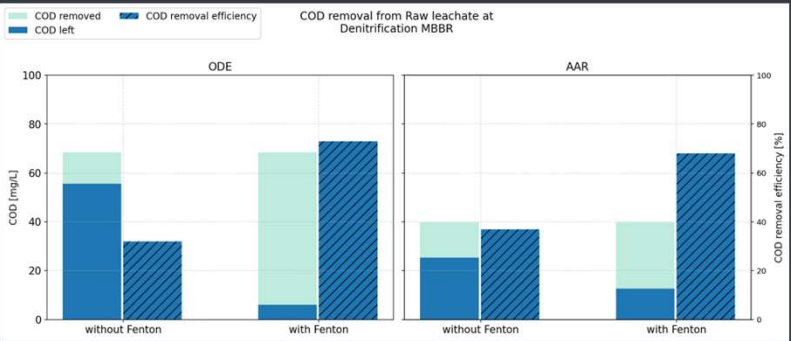


## Results

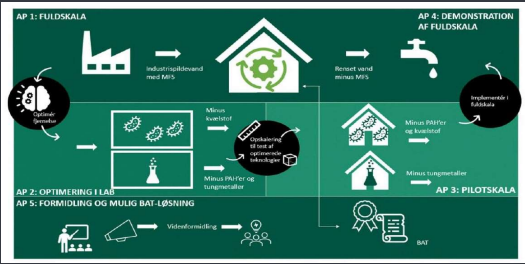
- Leachates screened: High & Low COD
- Fenton conditions: acidic pH  
 $Fe^{2+}$ : $H_2O_2$  (1:5)  
 30-minute Reaction Time



- 24-hour MBBR experiments (With Fenton- Significant COD reductions)
- Denitrification reactors: 73% for AAR & 68% for ODE

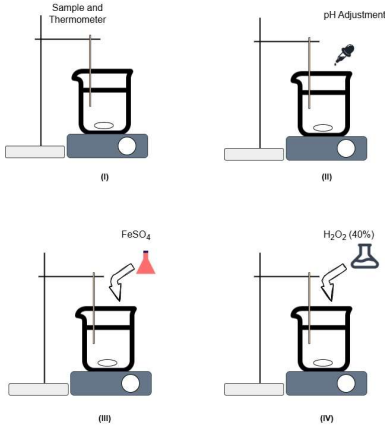


- OUR measurements, TOC, and  $OX_c$ : already highly biodegradable
- Inhibitory Analysis: No Detectable elements - Young Leachate/source
- Fenton primarily removed readily available leachate rather than converting refractory part
- MBBR showed good performance : Nitrification & Denitrification (Ammonium oxidization & COD reductions)
- **Perspective:** BOD measurements & Optimize Process: Denitrification Reactor

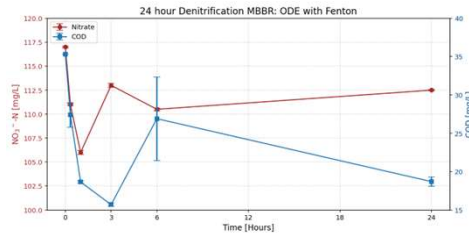
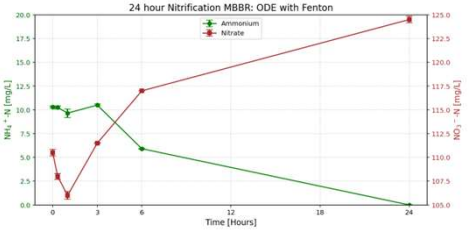


## Note:

Experimental Values:  
 Impact pH, Reaction Time & Molar ratio ( $Fe^{2+}$ : $H_2O_2$ )

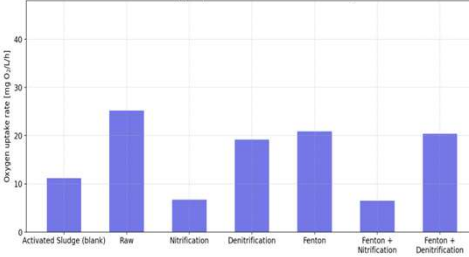


Nitrification/Denitrification: ODE with Fenton



## OUR: ODE

ODE : Oxygen uptake rate of leachate at different stages



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