

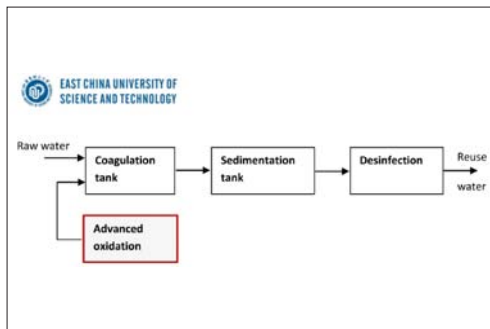


Ralf Inauen

Graduate Candidate	Ralf Inauen
Examiner	Prof. Dr. Rainer Bunge
Co-Examiner	Christoph Hug, HUG Engineering AG, Elsau, ZH
Subject Area	Energy and Environmental Technology
Project Partner	East China University of Science and Technology

Enhanced Coagulation by Preoxidation

19 Wastewater Treatment



Overview of reusable-water treatment

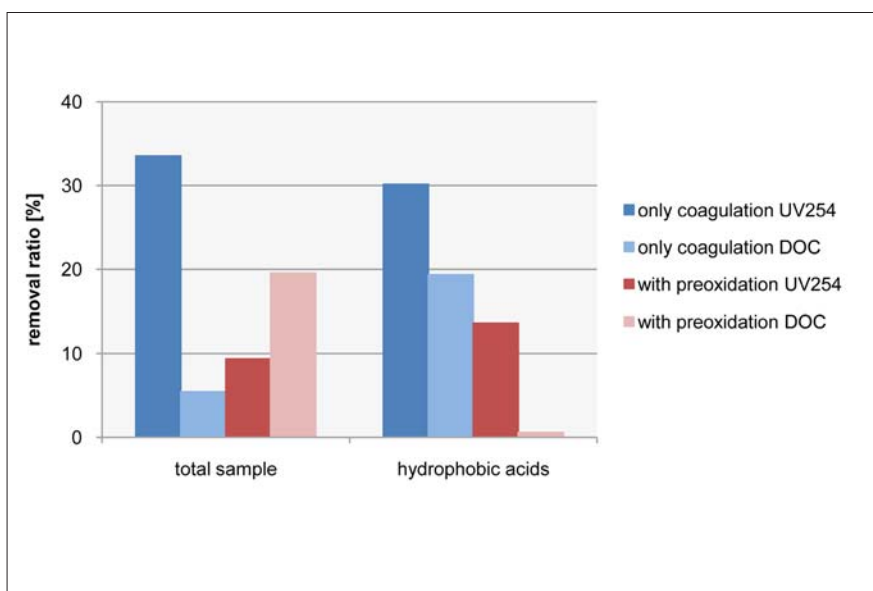
Task: The objective of this thesis has been to observe the removal ratio of four different kinds of organic matter (hydrophobic acids, non-acid hydrophobics, hydrophilics and transphilics) by enhanced coagulation and advanced oxidation.

Proceeding: Hydrophobic acids in water can be harmful to humans and the environment and must therefore be removed as effectively as possible. The raw water which was used in the experiments originated from a municipal wastewater plant in Shanghai. After treatment in the laboratory (the experiments), the water quality met the standard for reusable water. Aluminum sulfate $Al_2(SO_4)_3$, one of the most common coagulants, was used to determine the best suitable coagulation conditions (time, dosage). To investigate the influence of advanced oxidation, permanganate $KMnO_4$ solution was applied.



Advanced oxidation with permanganate $KMnO_4$

Result: Comparison to only coagulation shows a slight improvement for best suitable preoxidation conditions with $KMnO_4$. The results demonstrate an improvement of 8% with optimum dosage and again 5% for the maximum treatment time considered. Classification into different kinds of organic matter always shows a positive removal trend for the total sample and hydrophobic acids. These two are most important and are finally used to present the effectiveness of preoxidation.



Removal ratio of UV254 and DOC for coagulation and preoxidation