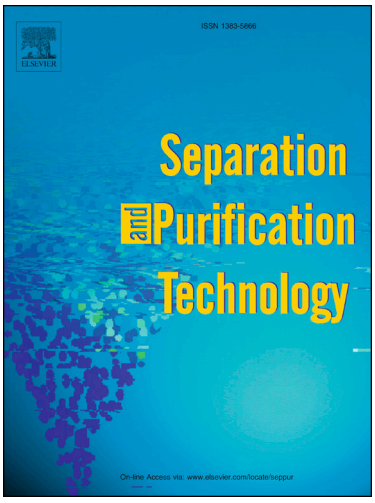

Treatment of paper mill wastewater using a composite inorganic coagulant prepared from steel mill waste pickling liquor

Shuo Yang, Wang Li, Hongjie Zhang, Yangbing Wen, Yonghao Ni

PII: S1383-5866(18)31337-6
DOI: https://doi.org/10.1016/j.seppur.2018.07.049
Reference: SEPPUR 14780

To appear in: *Separation and Purification Technology*

Received Date: 19 April 2018
Revised Date: 17 July 2018
Accepted Date: 19 July 2018

Please cite this article as: S. Yang, W. Li, H. Zhang, Y. Wen, Y. Ni, Treatment of paper mill wastewater using a composite inorganic coagulant prepared from steel mill waste pickling liquor, *Separation and Purification Technology* (2018), doi: https://doi.org/10.1016/j.seppur.2018.07.049

Treatment of paper mill wastewater using a composite inorganic coagulant prepared from steel mill waste pickling liquor

Shuo Yang[a,b], Wang Li[c], Hongjie Zhang[a], Yangbing Wen[a], Yonghao Ni*[a,b]

a. Tianjin Key Laboratory of Pulp and Paper, Tianjin University of Science & Technology, Tianjin 300457, China.

b. Limerick Pulp & Paper Centre & Department of Chemical Engineering, University of New Brunswick, Fredericton, NB, E3B 5A3, Canada.

c. Tianjin Haoyu Auxiliary Co., Ltd., Tianjin, 301800, China

Corresponding author: Yonghao Ni. Department of Chemical Engineering, University of New Brunswick, Fredericton, E3B 5A3, Canada. Email address: yonghao@unb.ca. Tel: +1-506-451-6857. Fax: +1-506-453-4767

Abstract:

In this study, a waste pickling liquor from a steel mill, which is rich in iron and acid, was used as the main raw material to prepare a composite coagulant: polymeric ferric aluminum sulfate chloride (PFASC). The as-prepared PFASC was used, together with PAM, for the tertiary treatment of papermaking wastewater to decrease its COD and Chroma. The Results from FT-IR and XRD of PFASC, supported the conclusion that polymeric ferric aluminum hydroxide hydrates compounds/ complexes are formed in the synthesized PFASC. When applied to a waste water sample from a paper mill, PFASC, together PAM, leads to decreases in COD and Chroma by 65.3 % and 71.2 %, respectively (initial pH 7.5, 1 ml/L PFASC, 1.0 ppm PAM). The technology has been implemented at a paper mill, and the obtained results are consistent with those from the laboratory.

Graphical Abstract: