



Recovery of caustic from mercerizing wastewaters of a denim textile mill

Cihangir Varol^a, Nigmet Uzal^{b,1}, Filiz B. Dilek^a, Mehmet Kitis^c, Ulku Yetis^{a,*}

^aDepartment of Environmental Engineering, Middle East Technical University, 06800 Ankara, Turkey, Tel. +90 312 210 5868; Fax: +90 312 2101246; email: uyetis@metu.edu.tr (U. Yetis)

^bFaculty of Engineering and Natural Sciences, Abdullah Gul University, Melikgazi, 38039 Kayseri, Turkey

^cDepartment of Environmental Engineering, Suleyman Demirel University, 32260 Isparta, Turkey

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ABSTRACT

The objective of this study was to evaluate caustic recovery from mercerizing wastewater originating from a denim textile producing plant using membrane technology. For this purpose, ultrafiltration (UF) and nanofiltration (NF) processes were considered. In the first stage, in an attempt to control the possible membrane fouling, pretreatment alternatives of flocculation, centrifugation, and microfiltration were evaluated. These pretreatment application alternatives were unsuccessful as they did not provide considerable color and solids removal. In the second stage, UF and NF processes were tested using a tight UF membrane (GR95PP, Alfalaval) and three NF membranes (NP010 and NP030, Microdyn Nadir, and MPF34, Koch Membranes) to accomplish the caustic recovery without applying any pretreatment. The best performance was obtained with NP010 NF in terms of permeate flux along with color and COD rejections. Then, for this membrane the effects of transmembrane pressure (4.03 and 6.23 bar), cross-flow velocity (from 0.40 to 1.40 m/s), and feed temperature (20 and 40°C) were investigated. Temperature positively affected the permeate flux without significant loss in recovery and rejections. Caustic stream produced had about 98–100% of NaOH in the feed at a concentration of 30–40 g/L and therefore was recyclable after a concentration process.

Keywords: Caustic recovery; Mercerizing wastewater; Membrane filtration; Textile industry

*Corresponding author.

¹At the time of the study, the author Nigmet Uzal was affiliated with the Department of Environmental Engineering, Middle East Technical University, 06800 Ankara, Turkey.

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