Comparative study of the removal of nickel(II) and chromium(VI) heavy metals from metal plating wastewater by two nanofiltration membranes

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**ABSTRACT**

The treatment of aviation industry metal plating wastewater containing Ni\textsuperscript{2+} and Cr\textsuperscript{6+} by nanofiltration was investigated in this study. Two commercial membranes (NF90 and NF270) and two membrane filtration systems (dead end and cross flow) were used. The effects of both the transmembrane pressure (10, 20, and 30 bar) and the feed pH (3.5, 7, and 10) on the membrane performance were analyzed. The rejection of both nickel and chromium ions increased with increasing pH but did not considerably change by the pressure difference for both membranes. The optimum conditions were found to be at 30 bar with a pH of 10 for both the NF90 and NF270 membranes. Under optimum conditions for the NF90 membrane, the rejection values of Ni\textsuperscript{2+} and Cr\textsuperscript{6+} were found to be 99.2 and 96.5\%, respectively. For the NF270 membrane, the rejection values of Ni\textsuperscript{2+} and Cr\textsuperscript{6+} were 98.7 and 95.7\%, respectively.

**Keywords:** Nanofiltration; Nickel; Chromium; Metal plating wastewater; Dead-end system; Cross-flow system

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