Hexavalent chromium removal from chromium plating rinsing water with membrane technology

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Received 27 October 2013; Accepted 16 June 2014

ABSTRACT

The objective of this work is to assess the water reuse potential of aqueous streams from a metal finishing industry containing chromium using nanofiltration (NF) and reverse osmosis (RO). Process waters with hexavalent chromium were treated with NF (NF90 and MPS-34) and RO (BW30) membranes. The efficiency in terms of metal removal was very high. The NF90 membrane showed the best performance (highest flux and excellent selectivity, typically above 99%). An ultrafiltration pretreatment was required to remove the solid particles present in the process waters. NF makes possible to recycle the pure water (permeate) into the process whilst the retentate may be subjected to precipitation to recover the metal for reuse or further treatment.

Keywords: Hexavalent chromium; Nanofiltration; Reverse osmosis; Plating; Water reuse

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Presented at the conference Engineering with Membranes—Towards a Sustainable Future (EWM 2013) Saint-Pierre d’Oléron, France, 3–7 September 2013

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