*Desalination and Water Treatment*
www.deswater.com

24 (2010) 293–301
December


doi: 10.5004/dwt.2010.1657

# Desalination/concentration of reverse osmosis and electrodialysis brines with membrane distillation

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Received 26 November 2009; accepted 3 May 2010

A B S T R A C T

Brines produced by desalination processes such as reverse osmosis (RO), electrodialysis reversal (EDR) and ion-exchange (IX) holds pollution potential for the water environment if not properly handled. These brines contain a high water content (95–98%) and chemicals that could possibly be recovered for reuse. Therefore, direct contact membrane distillation (DCMD) which has the potential for water and chemical recovery from brines was investigated for water and chemical recovery from RO and EDR brines originating from difficult to treat petrochemical effluents. It was shown that water recoveries of between 70% and 80% could be obtained with membrane distillation (MD). Salt rejections of more than 99.5% were obtained. The quality of the treated brine is suitable for boiler feed make-up. However, fouling of the membranes took place at high water recovery similarly to as in the last modules in RO as a result of concentration polarisation and cleaning of the membranes with acid and salt/caustic solution almost restored condensate flux.

***Keywords:*** Membrane distillation; Concentration/desalination; Petrochemical effluents; RO brine; EDR brine; Fouling/scaling

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