Desalination and Water Treatment
www.deswater.com
1944-3994 / 1944-3986 © 2009 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2009.644

6 (2009) 54–60
June

Mine water treatment by membrane filtration processes — Experimental investigations on applicability

A. Rieger[a]*, P. Steinberger[a], W. Pelz[b], R. Haseneder[a], G. Härtel[a]

[a]*TU Bergakademie Freiberg, Department of Thermal, Environmental and Natural Products Process Engineering, Leipziger Str. 28, D-09596 Freiberg, Germany*
[b]*SIEMENS AG, Industry Sector, Metals Technology, I&S MT MI, Schuhstr. 60, D-91052 Erlangen, Germany*
Tel. +49 3737 392283; Fax +49 3737393652; email: andre.rieger@tun.tu-freiberg.de

Received 15 September 2008; Accepted 8 April 2009

ABSTRACT

Mine waters, rich in sulphate, acid and different metal species, are an environmental risk of great importance. Untreated mine waters released into the environment influence complete ecosystems and can reduce species of plant and animal life drastically from thousands to some microbial and algae species. Hence, mine waters are treated before released into the environment by state-of-the-art procedures such as lime treatment or constructed wetlands which focusing on future legislation will not meet discharge criteria especially for sulphate. Therefore the Department for Thermal, Environmental and Natural Products Process Engineering of TU Bergakademie Freiberg investigated the applicability of membrane filtration using nanofiltration (Alfalaval NF99) and reverse osmosis (Alfalaval RO 98pHt) membranes. Experiments covered parameter and long-term studies to determine applicability of membrane filtration theory and appearance of scaling (precipitation of inorganic solutes). Results suggest applicability of desalination by membrane filtration as well as the occurrence of scaling due to strong flux decline during long-term studies for some experimental conditions.

Keywords: Nanofiltration; Reverse osmosis; Mine water Scaling

* Corresponding author.

Presented at the conference on Membranes in Drinking Water Production and Wastewater Treatment, 20–22 October 2008, Toulouse, France.