Desalination and Water Treatment
www.deswater.com

18 (2010) 133–138
June

1944-3994 / 1944-3986 © 2010 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2010.1363

Solar membrane distillation: Theoretical assessment of multi-stage concept

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Received 30 April 2009; Accepted 17 January 2010

ABSTRACT

This paper deals with a project entitled "Seawater Desalination by Innovative Solar-Powered Membrane Distillation System", MEDESOL (FP6-2005-Global-4, FP6-036986). The main project objective is the development and experimental assessment of solar multi-stage MD concept in order to obtain a high-efficiency and cost-effective system for stand-alone seawater desalination. This concept is based on the use of some MD modules connected with a particular design arrangement to minimize both, main and auxiliary energy consumptions. The selection of the system configuration is based on a generic membrane distillation module. This paper selects the configuration of the MD system among different candidate designs, set the prospects of solar MD technology as function of available MD modules and assess the influence on system efficiency of main operational parameters of an individual module: temperature gradient across the membranes and maximum working temperature.

Keywords: Membrane distillation; Solar desalination; Seawater desalination

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