



Innovation of a spiral module membrane distillation unit coupled to solar energy

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Abstract:

Our work presents a spiral module for a membrane distillation unit as being a new technology used for desalination. The Spiral Coiled Membrane Modules (SWM) are the building blocks of the new modern desalination and treatment technology for seawater or brackish water. In general, the research described in the membrane distillation literature covers laboratory experiments to analyze the potential of the technology. This work involved experimental studies of large-scale MD modules for spiral wounds with a membrane area of 5 to 14 m². The technology and the manufacture of modules are introduced, as well as the fully automated configuration of performance tests and characterization procedures. To advance this technology, a complete SWM element model and a flexible and efficient simulator is needed to optimize the SWM modules and to be integrated into the general software for designing and monitoring / controlling entire desalination plants. The desirable characteristics of the SWM model are described first, taking into account practical constraints. In the review of related work, it was recognized that the complex physicochemical phenomena (and interactions) that occur in solid waste management modules span multiple scales of length and time, making resolution impossible. direct problems. Therefore, a flexible modeling structure is needed to integrate the correctly correlated results from detailed (small-scale) flow rate and mass transfer studies into channels filled with spacers, as well as sub-models representing the function. We have described to our spiral membrane, an appropriate modeling for an in-depth analysis by simulation of the performances of the SWM modules. Then an overall evaluation of the performance of the SWM modules and the effects of the design parameters, taking into account the requirements of the sector.



Biography:

Mokhless Boukhriss is researcher in Laboratory of Electromechanical Systems (LASEM) at National School of Engineers, Tunisia. He has published 20 papers in refereed journals, He makes use of a wide range of measurement techniques for solar energy.

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