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Journal

Published Online: 25 June 2019

Volume 49, Issue 2


Improvement of Solar Distiller Productivity by a Black Metallic Plate of Zinc as a Thermal Storage Material

CODEN: JTEVAB

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Stock #: JTE20190119

ISSN: 0090-3973

DOI: 10.1520/JTE20190119

Abstract

The lack of drinking water is a real global problem. Transforming polluted water into freshwater is another problem. Solar distillation seems a simple and economical solution to this problem, but the yield of a solar still is low, and this poses another problem. One of the best ways to improve the productivity of freshwater from solar energy is to incorporate sensible heat energy storage materials; i.e., the temperature elevation of a material allows for the storage of energy, and that is exactly the purpose of our work. Two similar solar distillers were exposed to the sun in May 2017 under the same weather conditions. Distiller Dc is retained as a reference and distiller Ds contains in its basin a black plate of zinc 48 by 48 cm with a thickness of 0.2 cm. This plate is used as a sensitive thermal storage material to improve the productivity of our device. The results of this simple and inexpensive technique have improved the productivity of distiller Ds by 1.54 times compared with the conventional Dc still. Thus, this technique increases the productivity of the distiller and participates in solving a technical problem affecting the solar still.

Author Information

Khechekhouche, Abderrahmane

Laboratory of Valorisation and Technology of Sahara Resources (VTRS), University of El Oued, El Oued, Algeria Renewable Energy Development Unit in Arid Zones (UDERZA), University of El Oued, El Oued, Algeria

Haoua, Boubaker Ben

Renewable Energy Development Unit in Arid Zones (UDERZA), University of El Oued, El Oued, Algeria

Kabeel, Abd Elnaby

Mechanical Power Engineering Department, Tanta University, Tanta, Egypt

El Hadi Attia, Mohammed

Physics Department, University of El Oued, El Oued, Algeria

El-Maghlany, Wael M.

Mechanical Engineering Department, Alexandria University, Alexandria, Egypt



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