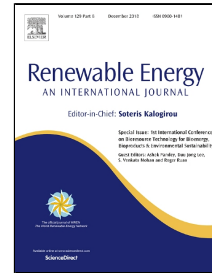


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Effect of graphite mass concentrations in a mixture of graphite nanoparticles and paraffin wax as hybrid storage materials on performances of solar still

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1 **Effect of graphite mass concentrations in a mixture of graphite nanoparticles and**
2 **paraffin wax as hybrid storage materials on performances of solar still**

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8 **Abstract**

9 In the present paper, the hybrid storage materials have been used to improve the solar
10 still productivity. The hybrid storage materials represent a mixture of paraffin wax and
11 graphite nanoparticles, the objective of using the present hybrid storage materials
12 improve the thermal properties of storage materials as well as improve the still
13 productivity. The conventional still and the solar still with a hybrid storage material was
14 constructed and tested to investigate the improvement in a distillate production. Also,
15 the effects of graphite nanoparticles mass concentrations in hybrid storage materials on
16 the performance of solar still have been investigated. The experimental results showed
17 that the accumulated distillate production of a solar still with hybrid storage materials is
18 more than that of conventional basin still. The accumulated distillate production of solar
19 still with hybrid storage materials reached to 7.123, 7.475, 7.937, 8.249, and 8.52 l/m²
20 day for 0.0%, 5%, 10%, 15%, and 20% graphite nanoparticles mass concentrations,
21 respectively. While the distillate production reached to 4.38 l/m² day for the
22 conventional still. The percentage improvement in a water production was recorded
23 62.62%, 70.66%, 81.21%, 88.33%, and 94.52% for 0.0%, 5%, 10%, 15%, and 20%
24 graphite nanoparticles mass concentrations, respectively, as compared to the
25 conventional still. Also, the daily efficiency of solar still with hybrid storage materials
26 was about 51.41%, 54.94%, 59.2%, 62.38%, and 65.13% for 0.0%, 5%, 10%, 15%, and
27 20% graphite nanoparticles mass concentrations, respectively, but for the conventional
28 still the daily efficiency was about 32.257%.

29 **Keywords:** Solar desalination, Hybrid storage materials, Solar still, Mixture of graphite
30 nanoparticles and paraffin wax, Productivity enhancement.

31 **1. Introduction**

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