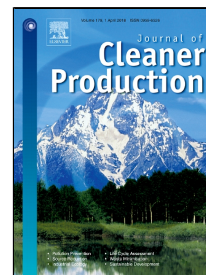


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Enhancing the performance of single basin solar still using high thermal conductivity sensible storage materials



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## Enhancing the performance of single basin solar still using high thermal conductivity sensible storage materials

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### Abstract

In the present experimental study, a traditional single-basin still and single-basin still with high thermal conductivity sensible storage materials was **designed, manufactured and operated in the same weather conditions, to illustrate the influence of high thermal conductivity sensible storage materials (graphite) on the thermal performance of a single-basin still.** The high thermal conductivity sensible storage materials (graphite) works as an energy source to basin within the times **of lower intensity of solar radiation and also after sunset.** The graphite used in the present study is more effective than the other sensible storage materials used in the previous studies such as (sand, black gravel, and glass balls), mainly due to the high thermal conductivity of graphite and the graphite properties used in this study in Table 1. The experimental results showed that the daily production of a single-basin still with graphite is bigger than that of a traditional single-basin still. The daily production up to almost 7.73 l/m<sup>2</sup> day for single-basin still with graphite while its value was registered 4.41 l/m<sup>2</sup>day for traditional single-basin still. The single-basin still with graphite **as a sensible storage material** is better in daily production (74.89% - 80.05% increasing) compared to a traditional single-basin still. Additionally, the daily efficiency range between 33.41-34.6 % for traditional single-basin still and 59.9-60.54 % for the single-basin still with graphite as a high thermal conductivity sensible storage materials.

**Keywords:** Solar desalination, Single-basin solar still, Graphite, High thermal conductivity sensible storage materials, Productivity enhancement.

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