

Solar still productivity improvement using nanofluids: a comprehensive review

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Abstract: The production of drinking water is a critical issue due to the lack of access to clean water and the increasing demands of the environment. One of the main technologies for water purification is solar still. Solar distillation is an economical and ecological alternative for the production of quality distilled water. Many recent researches on the use of nanofluids in solar still have focused on its performance, which subsequently implies an increase in the productivity of the solar still, whereas thermophysical and evaporation properties of the base fluid are changed by suspended metallic or non-metallic nanoparticles. According to some reports, the use of nanofluids can raise the distillate productivity up to 100%, other works revealed an improvement up to 20% in terms of thermal efficiency compared to the Conventional solar still. The current review summarizes previous works that studied the improvement of solar still productivity using nanofluids, a significant portion of analysis and discussion is devoted to how different factors affecting the global performance of these devices including nanofluids proprieties, radiation absorption, evaporation and condensation. Finally, propositions for future numerical and experimental research and application guidance are also presented.

Keywords : nanofluids and nanoparticles, Solar still, water desalination