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Double slope solar still with implementation of ZnO nanoparticles

Activated carbon

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Abstract

ACNP prepared by Mangifera Indica; Celostia Argentea doped with ZnO nanoparticles at various weight ratios 5; 10; 15; 20; and 25 wt%. They theoretically analyzed the function used with Gibbs free energy equation. Due to the novel materials and balls performance the still achieve the output of distillate 14.92 l/m^2 day and efficiency upto 38.73%. U shape is also a novel work in the design of the solar still with construct with vapor tight.

Introduction

Sharshir et al [1] experimentally investigated the stepped double slope solar still with linen wicks and carbon black nanoparticles they enhanced the evaporation surface area and internal heat transfer. It showed that distill water protectivity of the solar is still 80.57% and energy efficiency is 110.5%. Gamel et al [2] accomplished an experimental investigation to examine the energy and exergy efficiency with activated carbon tubes of solar still are enhanced by 94.14% and 164.29% respectively. They yield freshwater productivity is 5850 ml/m^2. T. Kumar et al [3] analyzed the SSSS with green synthesis material of SiO_2 with leaf extract of Jatropha curcas L. They compared result in summer and winter season performance solar still achieved the distillate yield of 8.79 L/day (SiO_2/Jatropha curcas L.) and 6.49 L/day (SiO_2). Adewumi et al [4] prepared the ZnO Rice Husk Activated Carbon with orthophosphoric acid activation. They analyzed the physicochemical parameters concluded that 615 m2 g-1 high surface area useful in wastewater treatment.

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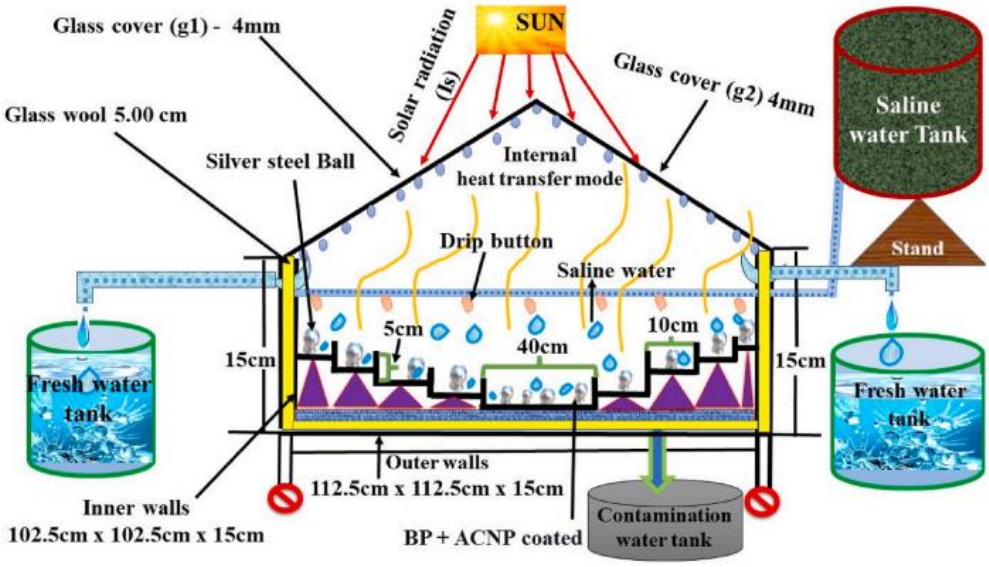

Fig.-1. Schematic view

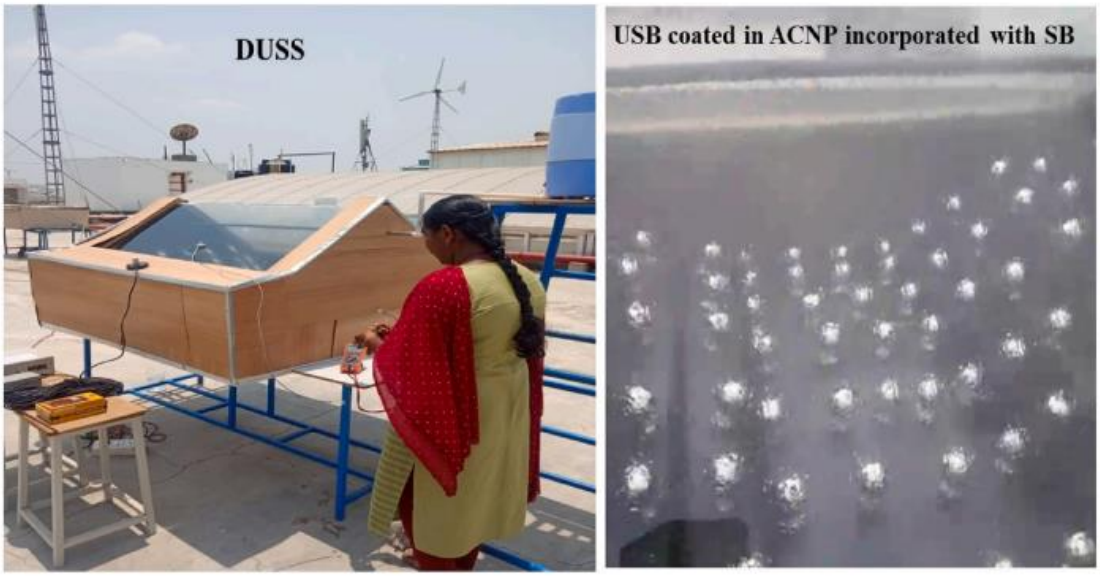

Fig- 2. Experimental setup

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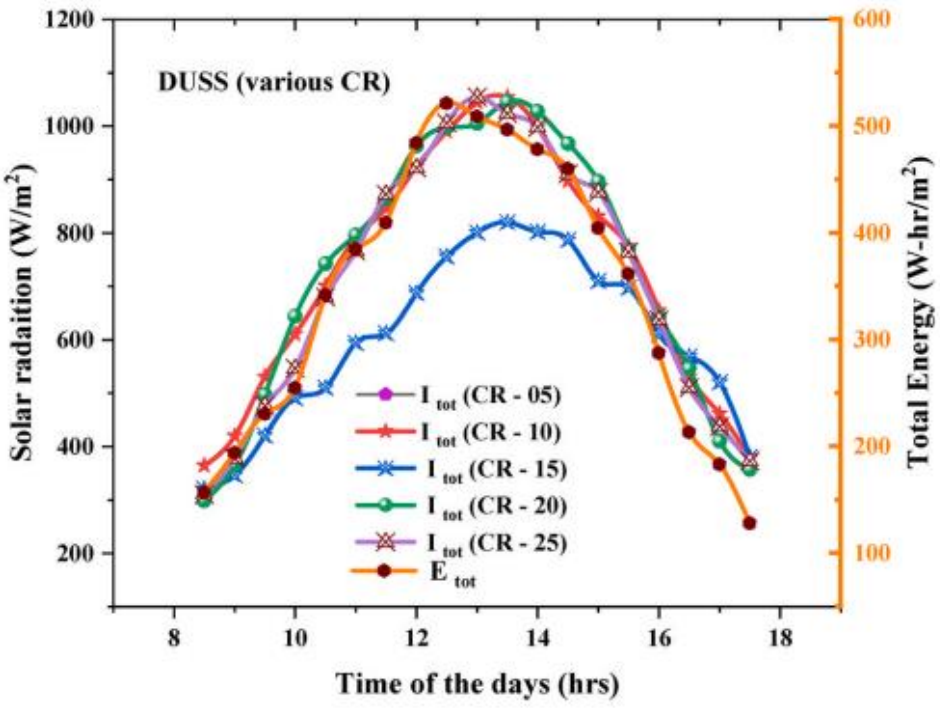

Fig-3. Solar Intensity

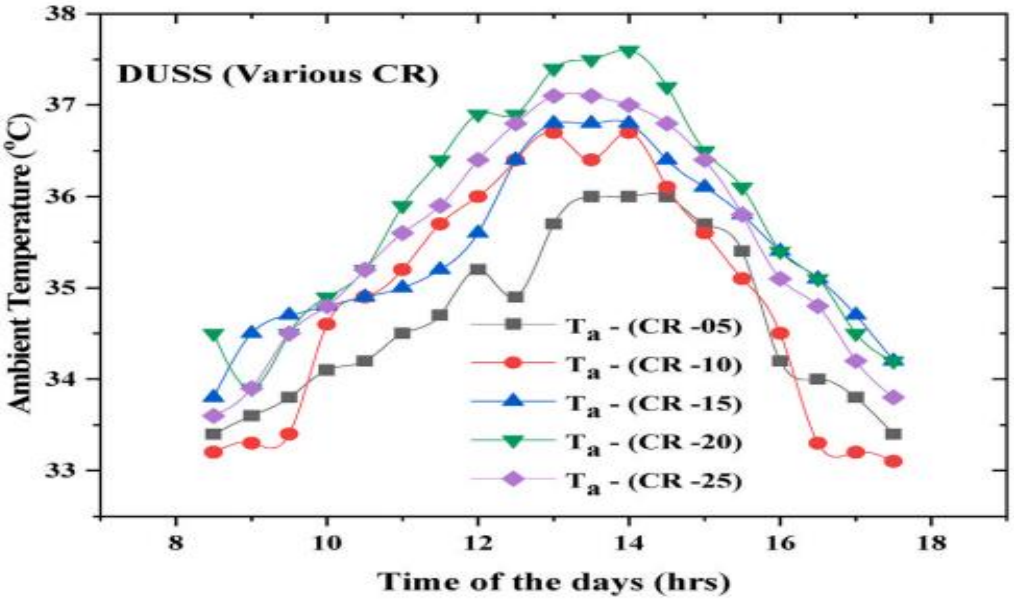

Fig-4 Ambient temperature

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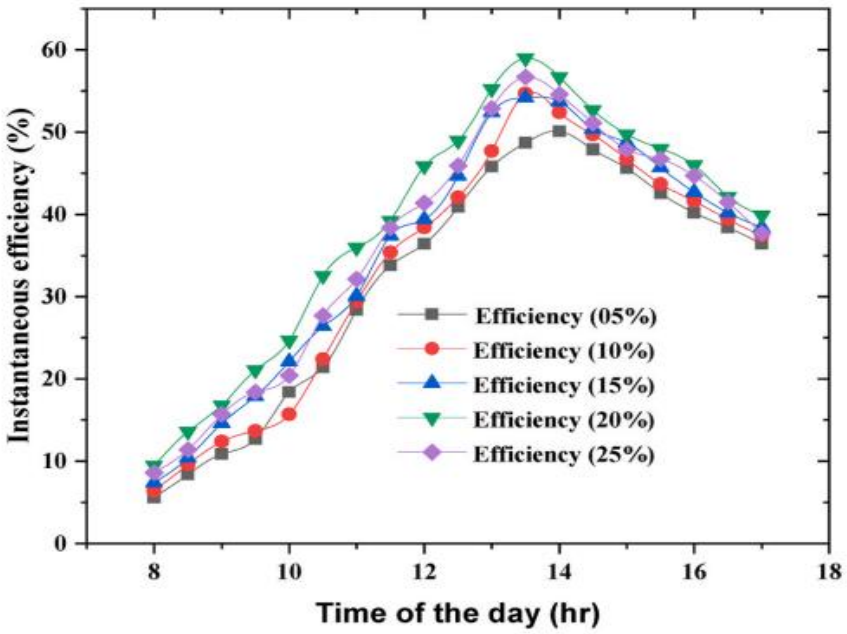

Fig-5. Overall efficiency

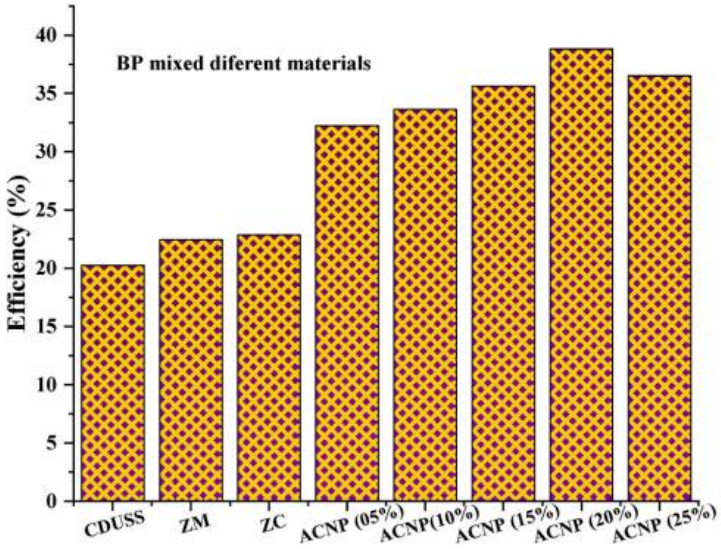

Fig.-6. Efficiency comparison

Conclusion:

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In the novel work the role of ACNP produce from ZMC enhance the heat transfer in the solar distiller then mixed with mat black paint coated in the basin area of the U shape. The 20% researcher achieved the high USB temperature upto 62 °C. Maximum of the instantaneous efficiency of 58.98% reached at 1 p.m. The sensible heat materials enhance the inside temperature produce the distillate output upto 14.92 l/m^2 day and higher performance of 64%.

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