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Solar energy by using direct waves with Evacuated Solar Tube

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Abstract:

Principle of working of the system is heating the saline water using PTSC and control the water flow through EP. Using SU system salt water. Finally the condenser into the CU give the distillate output. When the lower flow rate attained the highest evaporation system then automatically enhanced the productivity of the still. It shows 6 L/h, achieved 92°C. Best performance of the distiller attained by 7.5 L/h - 44.7 L/daytime and 59.6%. Cost of water is 0.0085 $/L.

Introduction:

Rajamanickam and Ragupathy [1]. The double slope distiller achieved maximum daily productivity around 3.07 Litre/m^2 day aquatic deepness for 0.01m. Also impact of water movement amount mass transfer as everyday efficiency on cascaded solar distiller produced as Tabrizi et al [2]. The total purified yield was 4.30 and 7.50 kg.m^2.day, maximum, least movement taxes, individually. On the other hand, researchers by nanoparticles have used ameliorate performance desalination system. Sahota and Tiwari [3] investigate the property of Al_2O_3 nanoparticle at diverse concentrations (0.04%, 0.08% and 0.12%) in Passive double slope solar stiller. The effects of 0.12% Al2O3 nanoparticle concentration achieved the protectivity of 35kg (12.2%) and 80kg (8.4%). Madhu et al[4] use Al2O3 , CuO and TiO2 nanoparticles in a stepped solar still varied the concentration from m 0.05 to 0.2%. Compared to another nanomaterial Al_2O_3 (0.2%) improves the stepped solar still performance up to 67% compared to conventional solar still. Kabeel et al. [5] have investigated the effect of using of cuprous oxide ratio various upto (10% to 40%) and examine the thermal performance of the solar still.

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Fig 1. Photograph of test-rig.

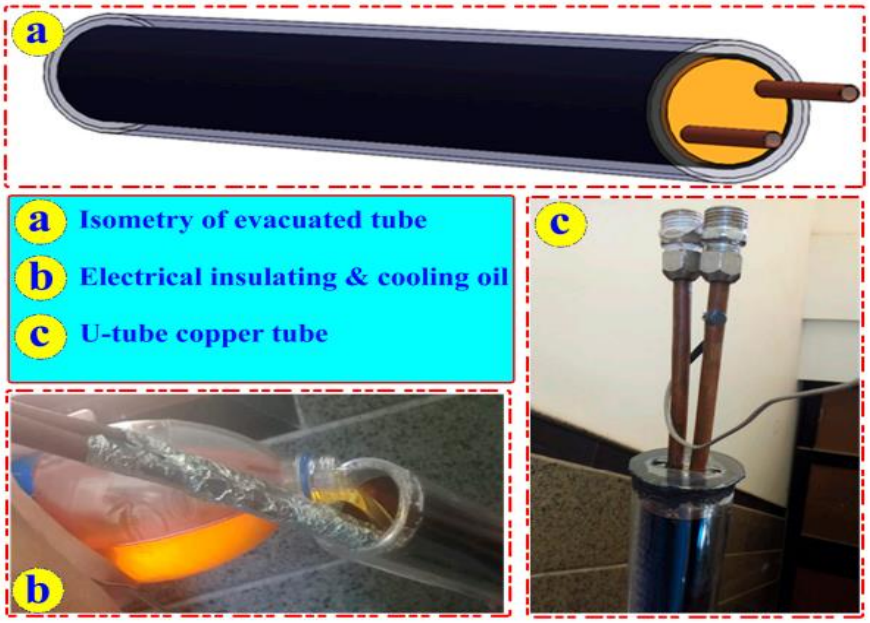

Fig. 2 PTSC Evacuated pipe

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Fig-3 before and after installation of proposed system

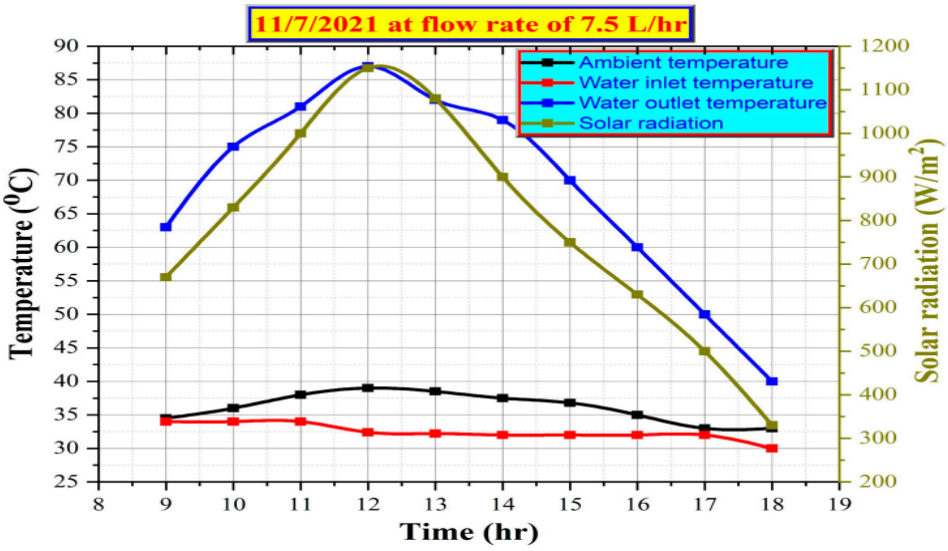

Fig-4 7.5 L/h Solar radiation analysis

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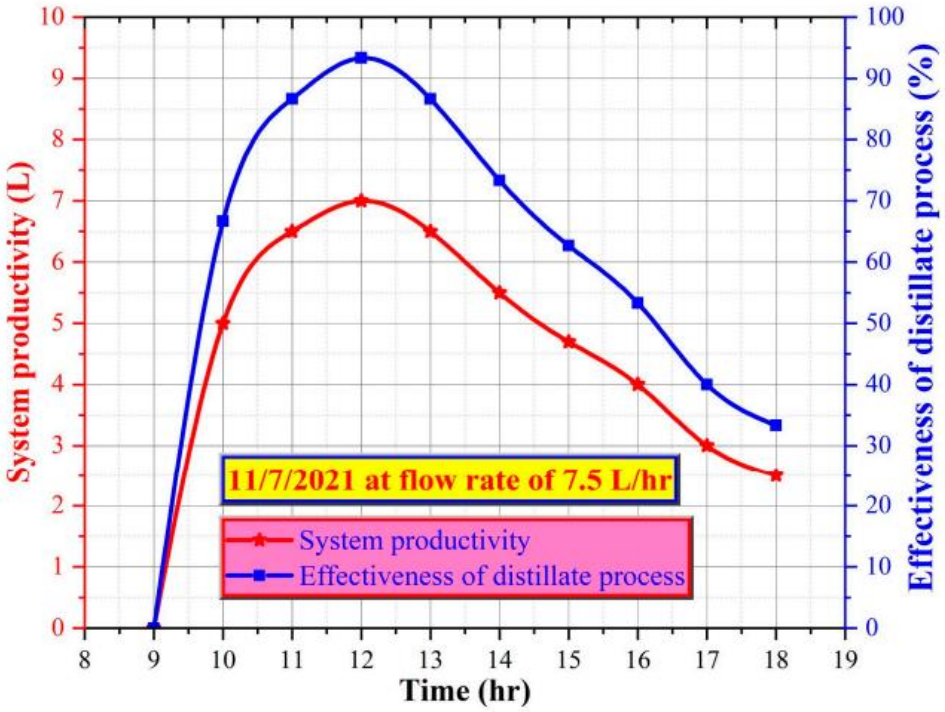

Fig. 5 7.5 L/h system distillation production

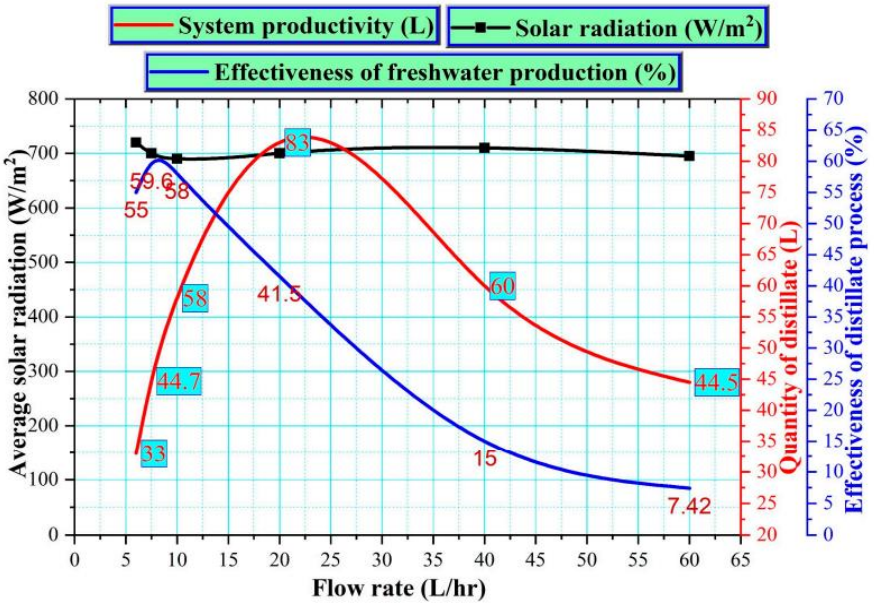

Fig. 6 system performance of different water flow rates

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Conclusion

In that chapter author attained at the lower flow rate attained the highest evaporation system then automatically enhanced the productivity of the still. It shows 6 L/h, achieved 92°C. Best performance of the distiller attained by 7.5 L/h - 44.7 L/daytime and 59.6%. Cost of water is 0.0085 $/L. Using graphite nanoparticles EP was reached 11.86%. Flow rate is the only parameter to reach high output.

Reference

[1] MR. Rajamanickam, A. Ragupathy, Influence of Water Depth on Internal Heat and Mass Transfer in a Double Slope Solar Still, Energy Procedia, 14, 2012. https://doi.org/10.1016/j.egypro.2011.12.1155.

[2] F. Farshchi Tabrizi, M. Dashtban, H. Moghaddam, K. Razzaghi. Effect of water flow rate on internal heat and mass transfer and daily productivity of a weir-type cascade solar still, Desalination, 260, 2010. https://doi.org/10.1016/j.desal.2010.03.037.

[3] L. Sahota, GN. Tiwari, Effect of Al2O3 nanoparticles on the performance of passive double slope solar still, Solar Energy, 130, 2016. https://doi.org/10.1016/j.solener.2016.02.018.

[4] B. Madhu, E. Balasubramanian, P. Nagarajan, S. Ravishankar, AE. Kabeel, T. Arunkumar,Improving the yield of fresh water from conventional and stepped solar still with different nanofluids, Desalination and Water Treatment, 100, 2017. https://doi.org/10.5004/dwt.2017.21279.

[5] AE. Kabeel, ZM. Omara, FA. Essa, A. Abdullah, T. Arunkumar, R. Sathyamurthy, Augmentation of a solar still distillate yield via absorber plate coated with black nanoparticles, Alexandria Engineering Journal, 56, 2017. https://doi.org/10.1016/j.aej.2017.08.014