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**Analyses of Entropy Generation and Pressure Drop for a Conventional Flat Plate Solar
Collector Using Different Types of Metal Oxide Nanofluids**

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ABSTRACT

This paper theoretically analyzes entropy generation, heat transfer enhancement capabilities and pressure drop of an absorbing medium with suspended nanoparticles (Al_2O_3 , CuO , SiO_2 , TiO_2 dispersed in water) inside a flat plate solar collector. Steady, laminar axial flow of a nanofluid is considered. These nanofluids considered have different nanoparticles volume fractions and volume flow rates in the range of 1% to 4% and 1 to 4 *L/min*, respectively. Based on the analytical results, the CuO nanofluid could reduce the entropy generation by 4.34% and enhance the heat transfer coefficient by 22.15% theoretically compared to water as an absorbing fluid. It also has a small penalty in the pumping power by 1.58%.

Keyword: Solar collector; Nanofluid; Entropy generation; Pressure drop; Pumping power.

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