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Performance Evaluation of Nano-Fluids in Solar Thermal and Solar Photovoltaic Systems

Aman Patil, Asif Khan, Swati chitode, Akash Khirodkar, Bharat Pawar
Pankaj Laddhad Institute of Technology and Management Studies, Yelgaon, Buldhana, Maharashtra, India
amanpatil900@gmail.com, pathan05031999@gmail.com, swatichitode16@gmail.com,
akashkhirodkar2000@gmail.com, spawarb894@gmail.com,

Abstract: *The primary purpose of this paper is to offer a thorough analysis of the use of nanofluid in solar photovoltaic thermal (PV/T) systems, focusing on the importance of carefully selecting nanofluid parameters like concentration ratio, volume flow rate, volume fraction, high thermal conductivity, high rate of heat transfer, etc. This study focuses on the effects of nanomaterials on the thermal conductivity (k), latent heat, subcooling, phase change duration, phase change temperature, viscosity, and density of PCMs across a wide range of operating temperatures. This research is expected to shed light on the PV/T systems' underpinnings and popular conceptions, which in turn will improve the thermal performance of PV/T systems based on nanomaterials and combined with PCM or NEPCM. Incorporating nanofluids and NEPCM into a solar photovoltaic thermal system boosts the system's thermal, electrical, and overall efficiency.*

Keywords: Nanofluids, Solar energy, Renewable energy, Solar Photovoltaic-thermal system

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