


Improve the efficiency and heat transfer rate' trend prediction of a flat-plate solar collector via a solar energy installation by examine the Titanium Dioxide/Silicon Dioxide-water nanofluid

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Abstract

The idea behind Flat-plate Solar collector is uncomplicated, Sun heats a flat surface, that collect as much energy as desirable, and then the energy is shifted to water, or alternate fluid for additional purpose. Titanium Dioxide has employed in electric conductors and electrical ceramics, while Silicon Dioxide has employed in semiconductors. In this research, Titanium Dioxide and Silicon Dioxide were mixed to make a composite. XRD and FESEM tests were studied to confirm the phase, and then, the composite dispersed in water to make a nanofluid. Thermal conductivity of the nanofluid (at 1.0 to 4.0wt%) was measured via hot-transient technique (at 25 to 50°C). Then, ANN algorithms and Fuzzy models employed to find the investigation-trend. Moreover, nanofluid used in Flat-plate Solar-collector and its efficiency enhancement was measured. Then, ANN algorithms and Fuzzy models employed to find the investigation-trend. Results indicated the trend of thermal conductivity and efficiency enhancement of TiO_2/SiO_2 nanofluid, and proved its high capability in energy systems.