عنوان مقاله:

Thermal performance enhancement of automobile radiator using water-CuO nanofluid: an experimental study

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خلاصه مقاله:

In the present paper, the effect of water-CuO nanofluid on the radiator heat transfer of an automobile, Peugeot 405 XU7 engine type is investigated experimentally. The experiments are carried out for the radiator water (water-ethylene glycol with a volume fraction of 80-20, respectively) as a base fluid and water-CuO nanofluid with the volume fraction of 0.5% and 1%. Sodium Dodecyl Sulfate (SDS) is used to increase the stability of nanofluid. The results demonstrated that a significant increase in the heat transfer of the engine to the environment is obtained by adding CuO nanoparticles to the base fluid. For nanofluid volume fraction of 0.5 and 1% for a mass flow rate of 30 liters per minute, the heat transfer rate enhances 3% and 6.9%, respectively, in comparison with the base fluid. Although convective heat transfer coefficient increased by increasing the nanofluid volume fraction, the experiments showed that this coefficient increases with the mass flow rate up to 20 liters per minute and then decreases with the mass flow rate. Besides, the radiator pressure drop increases by increasing of the pressure of nanofluid. The results revealed that the ratio of heat transfer and pump power (merit parameter) decreases as the nanofluid pressure increases

کلمات کلیدی:

Car Engine, Heat Transfer, Radiator, Water-CuO Nanofluid