عنوان مقاله:

Forced convective heat transfer of MgO/water nanofluid under constant heat flux: experimental and statistical investigation

محل انتشار:

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خلاصه مقاله:

This paper examines experimentally the heat transfer of the internal convection of MgO-water nonofluids in a copper tube for a fully turbulent regime under constant heat flux boundary condition. The Nusselt number and convective heat transfer coefficients of nonofluids in different volumetric concentrations (۰, ۰.۰۵%, and ۰.۱۵%) of nonofluids were estimated. Local convective heat transfer coefficient was also observed at different points along the pipe at different Reynolds numbers. The results showed a larger heat transfer coefficient with nonofluids compared to the base fluid. Heat transfer coefficient increased with an increase in the flow rate of nofluids from ۶ to ۱۰ l/min and the concentration of nonofluids from ۰ to ۰.۱۵ vol.%. Conversely, the heat transfer coefficient decreases with increasing the nanofluid inlet temperature from ۳۰ to ۴۰ °C .Nusselt numbers increased to ۴۵.۹% as a result of the implementation of nonofluids at concentration of ۰.۱۵ vol.% in comparison with the base fluid. The Taguchi method was also used to analyze the results statistically. The maximum Nusselt number in nonofluids, the effect of each operational parameter on the .Nusselt number, as well as the optimal values of each parameter was determined

کلمات کلیدی:

Design of experiment, heat transfer, Nanofluid, Nusselt number