HEAT TRANSFER ENHANCEMENT USING FERRO-NANOFLUID WITH MEGNATIC FIELD IN TUBE

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Relevance. Computational Fluid Dynamics (CFD) studies are performed to grow a more profound knowledge into the field of the stream. To explain the impact of the disturbance model, which includes the arrangement of two-vehicle condition, (k-ε) model is utilized.

Goal of the work – The main objectives of present work are: Evaluate the enhancement in heat transfer by using ferro-nanofluid and twisted tape. Study the effect of increasing the nanofluid concentration and Reynolds number on Nusselt number. Simulated the effect of magnetic field on ferro-nanofluid to enhance heat transfer rate.

Result analysis – Effect of Cycles of Rotation Cycles of rotation are one of the influential factors in enhancement in heat transfer which play an important role. it has been noticed that when is, intensity of magnetic field is 6 Tesla, and concentration 0.5 wt. %, the effect of cycles on the pressure of fluid decreased from 351.782 to -13.5 Pa at 30 width of magnetic field, at 50 width of magnetic field, the pressure still decreased from 414.584 to -11.627 Pa. The same results have been obtained at 70 width of magnetic field, the pressure of fluid decreased from 352.222 to -21.005 Pa.

Conclusion. From the current research, the following findings may be drawn: Fe_2O_3 nanofluid was employed in the current investigation to examine heat transmission [1]. In the end, it is true that heat transfer (whether of water or nanofluid, with or without the twisted tape) significantly rises with Reynolds number. The base fluid's heat transport is partially improved by the addition of nanoparticles. Based on the results, the using of ferro-nanofluid and magnetic field to enhance the rate of heat transfer was successful and very efficient applied.

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Литература

1. PetrishinG.V. Method of providing wear-resistance of the blades of paddle mixers / GV Petrishin, VM Bystrenkov, VI Odarchenko - Litiyo i Metallurgiya, 2019. p. 32-34.