

عنوان مقاله:

Numerical study of convective heat transfer of fuel-oil-alumina nanofluid in a channel in the laminar flow

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خلاصه مقاله:

In this study, the numerical simulation of laminar flow of fuel-oil-alumina nanofluid in a channel is conducted. The simulation is performed for three different volume fractions and particles size in the laminar flow with constant heat flux. A second order discretization method is applied to solve equations and SIMPLE algorithm is used for pressure-velocity coupling using CFD code. The effect of nanoparticles volume fraction and particles size in different Reynolds number of $900 \leq Re \leq 2100$ on convective heat transfer coefficient has been studied. It is concluded that the increase of volume fraction of nanoparticles causes to increase the convective heat transfer coefficient and Nusselt number so that the Nusselt number has increased about 56% in volume fraction of 6% and at Reynolds number of 2100 for nanofluid with particles of 60 nm compared to base fluid. Also, in the same Reynolds number and volume fraction with increasing the size of nanoparticles, the value of convective heat transfer coefficient is decreased. The results of this study can be used in refineries and petrochemical industries where the fuel-oil fluid flows in the channels.

کلمات کلیدی:

Convective Heat Transfer, Reynolds number, Laminar flow, Nanofluid, Nusselt number

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