

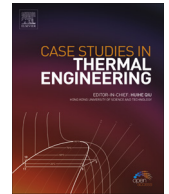


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Case Studies in Thermal Engineering

journal homepage: www.elsevier.com/locate/csite



Heat transfer augmentation in the straight channel by using nanofluids



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ARTICLE INFO

Article history:

Received 29 March 2014

Received in revised form

16 April 2014

Accepted 17 April 2014

Available online 24 April 2014

Keywords:

Nanofluid

Heat transfer

Straight channel

CFD

FLUENT

ABSTRACT

Heat transfer enhancement of nanofluids under turbulent flow through a straight square channel under constant heat flux conditions at the upper and lower walls is studied numerically. The nanofluids are prepared as solid nanoparticles of CuO, TiO₂ and Al₂O₃ suspended in water. CFD analysis by FLUENT software using the finite volume method is conducted. The boundary conditions are applied under a heat flux of 5000 W/m², Reynolds numbers of 10⁴–10⁶ and a constant volume concentration of 1–4%. The results show that the heat transfer rates and wall shear stress increase with an increase of the nanofluids' volume concentration. It seems that the CuO nanofluid significantly enhances heat transfer. The results show good agreement with results of other researchers by a 10% deviation.

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