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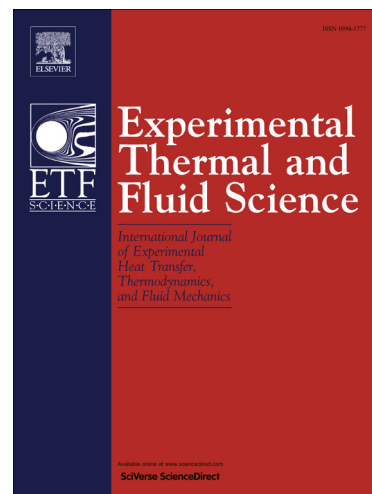
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Experimental study on the effects of inclination situation of the sintered heat pipe on its thermal performance

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Abstract:

In this study, the impacts of angular changes, the effects of the temperature of the cooling fluid and the influence of the entrance power on the thermal performance of the U-shaped heat pipe are discussed and it aims at discovering performance parameters as regards heat pipes compared to the pure base fluid of 70% ethanol (99%) and 30% DI-water.

The heat pipe in question is of sintered type with a diameter of 6 mm and each branch length of 135 mm. The heat pipe was filled with equal amounts of silver nanofluid with base fluid Ethanol and DI-water with concentrations of 10, 50, and 1000 ppm respectively. The respective percentages of volume concentrations are 0.1, 0.005, and 0.001. The entrance power was changed from 10 W to 40 W and the temperature of the cooling fluid was increased from 20 °C to 40 °C. In conclusion, with an increase in the concentration of the nanofluid, in most cases, the amount of thermal resistance undergoes a substantial decline and also Overall heat transfer coefficient experiences a remarkable increase in all angles. The highest percentage of decline and rise is that of silver nanofluid with 50 ppm. Also, the angle for which the lowest amount of thermal resistance for silver nanofluid with 50ppm is perceived is at +30° and the maximum percentage of decline in thermal resistance with an entrance power of 40 W and a temperature of 40 °C for the cooling fluid is 40%.

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