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Investigating corrosion effects and heat transfer enhancement in smaller size radiators using CNT-nanofluids (Article)

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Abstract

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Nanofluids have been extensively studied in the past to enhance the heat transfer performance and efficiency of systems. However, corrosion effects have been paid very little attention and thus this work presents an experimental study on the effect of carbon nanotubes (CNT) on corrosion of three different metals under study such as aluminium alloy, stainless steel and copper, respectively. The work was further extended to study the heat transfer performance in a car radiator of two different sizes. Both the studies were performed using four different fluids such as water, ethylene glycol, 0.02 % CNT-nanofluid and 0.1 % CNT-nanofluid, respectively. It was observed that among the three metals, the highest rate of corrosion occurs to aluminium, followed by stainless steel and copper, irrespective of the fluid used. The rate of corrosion increased with the increase in temperature (27-90 °C) in all cases. The experimental results showed that the stable CNT-nanofluids prepared in this work showed better heat transfer performance in both engines. Moreover, the smaller radiator using the CNT-nanofluids depicted enhanced heat transfer rates compared to the standard radiator using water and ethylene glycol. © 2014 Springer Science+Business Media New York.

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Engineering controlled terms: Automobile radiators Copper Corrosive effects Ethylene glycol Polyols

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Effect of carbons

Enhanced heat transfer

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