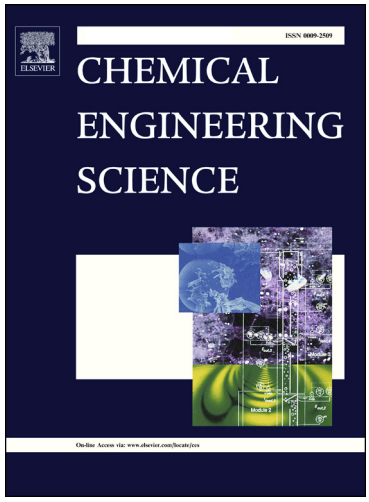

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Heat transfer performance assessment of hybrid nanofluids in a parallel channel under identical pumping power

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Abstract

In the study, a mathematical model of hybrid nanofluids was established with the consideration of nanoparticles migration, which has significant influence on the thermophysical properties of hybrid nanofluids. In order to investigate heat transfer and friction factor characteristics of hybrid nanofluids in a channel, the corresponding governing equations were solved by using the Runge-Kutta-Gill method. A Performance Evaluation Criteria (*PEC*) was used to assess heat transfer performance of hybrid nanofluids under identical pumping power. Two hybrid nanofluids, which are alumina-titania/water nanofluid and alumina-zirconia/water nanofluid, respectively, were discussed. The results clearly indicated that alumina-titania/water nanofluid exhibits higher Nusselt number and lower friction factor than alumina-zirconia/water nanofluid. Moreover, it has been found that with the variation of volume fraction ratio of two single-particle nanofluids, maximum *PEC* values of alumina-titania/water nanofluid were observed, proving that alumina-titania/water nanofluid has better heat transfer performance than either alumina/water nanofluid or titania/water nanofluid under identical pumping power. The effects of N_{BT1} variation and N_{BT2} variation of alumina-titania/water nanofluid on Nusselt number