

Mixed Convective Heat Transfer in Water-Based Al₂O₃ Nanofluid in Horizontal Rectangular Duct

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Abstract : In the present study, mixed convection in a horizontal rectangular duct using Al₂O₃ is numerically investigated. The effects of different Rayleigh number, Reynolds number and radiation on flow and heat transfer characteristics were studied in detail. This study covers Rayleigh number in the range of $2 \times 10^6 \leq Ra \leq 2 \times 10^7$ and Reynolds number in the range of $100 \leq Re \leq 1100$. Results reveal that the Nusselt number increases as Reynolds and Rayleigh numbers increase. It was also found that the dimensionless temperature distribution increases as Rayleigh number increases.

Keywords : numerical simulation, mixed convection, horizontal rectangular duct, nanofluids

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