

Numerical Investigation of Mixed Convection for Rarefied Gases in Square Enclosures

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Abstract : Numerical simulations to study heat transfer and flow characteristics of mixed convection for rarefied gas in a square enclosure are utilized. Effect of the geometry in terms of the location of the inlet and exit openings are investigated. Moreover, effect of Knudsen number on the flow and heat transfer characteristics is illustrated and discussed. Results of the simulations show that there is a configuration that yields better heat transfer. This configuration is found to be the geometry in which the inlet opening is in the top left corner and the exit opening is at the bottom right corner. In addition, it is found that by increasing Knudsen number, Nusselt number will decrease.

Keywords : Knudsen number, mixed convection, rarefied gas, square enclosure

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