Assessment of changes effect of Lewis number and thermophoresis parameter on nanoparticles transfer in a parallelogram enclosure

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Abstract

One of the nanoscience applications is to control dispersion of pollutants. In the present era, pollutants in air such as aerosols are one of the more recent additions that considered. Since few studies in modeling nanoparticles filtration and the use of temperature gradient inside the enclosures has been done, the present study aims to analysis the effect of Lewis number (Ln) and thermophoresis parameter on the heat transfer characteristics and concentration of nanoparticles on the laminar natural convection in an enclosure. The results show that increasing the amount of Ln to 10^3, reducing the average Sherwood number and for other values of Ln, the average Sherwood number remains almost constant. Average Nusselt number for circular cylinder also had a similar behavior; In the event that, left wall average Nusselt number remained almost constant. The results clearly show that the concentration of particles in the final time is reduced by reducing Ln. The results reveal that the variation of the thermophoresis parameter does not show any significant effect on the average Nusselt, Sherwood number and the final concentration of nanoparticles.

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