عنوان مقاله:

Investigation of natural convection of nanofluid with variable properties in a trapezoidal enclosure under the influence of magnetic field

محل انتشار:

کنفرانس بین المللی مهندسی و علوم کاربردی (سال: 1394)

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نویسندگان:

Ali Arefmanesh - *Associate Prof., Mech. Eng., Univ. of Kashan, Kashan, Iran*

Alireza Aghaei - *Ph.D. Student, Mech. Eng., Univ. of Kashan, Kashan, Iran*

Hamidreza Ehteram - *Ph.D. Student, Mech. Eng., Univ. of Kashan, Kashan, Iran*

masih shekaramiz - *M.Sc. Student, Mech. Eng., Univ. of Kashan, Kashan, Iran*

خلاصه مقاله:

The flow under the influence of magnetic field is employed in cooling electronic devices and voltage transformers and so on. In this study, the effects of magnetic field on flow field and heat transfer of Cu-water nanofluid natural convection have been explored in a trapezoidal enclosure by considering the Brownian motion of nanoparticles. The study is conducted in Rayleigh numbers of 103, 104, 105 and 106, Hartmann numbers of 0, 25, 50, 75 and 100 and the nanoparticles volume fractions of 0 to 0.04. The governing equations have been solved numerically using the Finite Volume Method (FVM) and SIMPLER algorithm. The results demonstrated that by applying the magnetic field and increasing it, the nanofluid convection and the strength of flow decrease and the flow tends toward natural convection and finally to pure conduction. For all of the considered Reynolds numbers and volume fractions, as the Hartmann number increases, the average Nusselt number decreases

کلمات کلیدی:

Nanofluid, Magnetic field, Hartmann number, Variable properties, Natural convection