عنوان مقاله:

Mixed convection fluid flow and heat transfer and optimal distribution of discrete heat sources location in a cavity filled with nanofluid

نویسندگان:

A. A Abbasian Arani - *Mechanical Engineering Department, University of Kashan, Kashan, I. R.Iran*

M. Abbaszadeh - *Mechanical Engineering Department, University of Kashan, Kashan, I. R.Iran*

A. Ardeshiri - *Mechanical Engineering Department, University of Kashan, Kashan, I. R.Iran*

خلاصه مقاله:

Mixed convection fluid flow and heat transfer of water-Al_2O_3 nanofluid inside a lid-driven square cavity has been examined numerically in order to find the optimal distribution of discrete heat sources on the wall of a cavity. The effects of different heat source length, Richardson number and Grashof number on optimal heat source location has been investigated. Moreover, the average Nusselt number on the heat source for two models of nanofluid, constant properties and variable properties, are compared. The obtained results showed that by decreasing the Richardson number and increasing the Grashof number, heat transfer rate decreases. Also by reducing the Richardson number, optimal heat source location move to the top of the wall and with augmentation of Richardson number, heat source optimal location move to the middle of the wall. Furthermore, the overall heat transfer increases by increasing nanoparticles volume fraction. Moreover, it was found that for two different models of nanofluids and in $Ri=1$, the values of the average Nusselt number are close together.

کلمات کلیدی:
Mixed convection, Nanofluids, Heat sources, Optimization

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1487288