

Documents

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Entropy generation optimization for MHD natural convection of a nanofluid in porous media-filled enclosure with active parts and viscous dissipation
(2017) *International Journal of Numerical Methods for Heat and Fluid Flow*, 27 (2), pp. 379-399. Cited 9 times.

Abstract

Purpose - This paper aims to investigate the entropy generation due to magnetohydrodynamic natural convection flow and heat transfer in a porous enclosure filled with Cu-water nanofluid in the presence of viscous dissipation effect. The left and right walls of the cavity are thermally insulated. There are heated and cold parts, and these are placed on the bottom and top wall, respectively, whereas the remaining parts are thermally insulated. **Design/methodology/approach** - The finite volume method is used to solve the dimensionless partial differential equations governing the problem. A comparison with previously published works is presented and is found to be in an excellent agreement. **Findings** - The minimization of entropy generation and local heat transfer according to different values of the governing parameters are presented in details. It is found that the presence of magnetic field has negative effects on the local entropy generation because of heat transfer and the local total entropy generation. Also, the increase in the heated part length leads to a decrease in the local Nusselt number. **Originality/value** - This problem is original, as it has not been considered previously. © Emerald Publishing Limited.

2-s2.0-85012982000

Document Type: Article

Publication Stage: Final

Source: Scopus