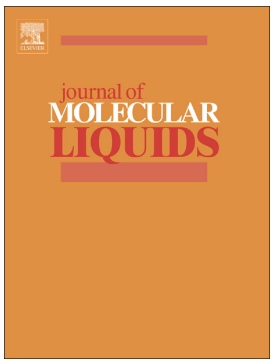

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M. Sheikholeslami, M. Shamlooei, R. Moradi

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Fe_3O_4- Ethylene glycol nanofluid forced convection inside a porous enclosure in existence of Coulomb force

M. Sheikholeslami [1,a], M. Shamlooei [a], R. Moradi [b]

[a] *Department of Mechanical Engineering, Babol Noshirvani University of Technology, Babol, Iran*

[b] *Department of Chemical Engineering, School of Engineering and Applied Science, Khazar University, Baku, Azerbaijan*

Abstract

In this article, impact of shape factor on nanofluid forced convection in existence of electric field is simulated via Control Volume based Finite Element Method. Effect of thermal radiation on energy equation is taken into account. The porous enclosure is filled with Fe_3O_4- Ethylene glycol nanofluid. Viscosity of nanofluid is varied with electric field. The bottom wall is considered as positive electrode. Numerical method is employed to find the roles of Reynolds number (Re), Darcy number (Da), radiation parameter (Rd), nanofluid volume fraction (ϕ) and supplied voltage $(\Delta\varphi)$. Results proved that Nusselt number augments with augment of thermal radiation. Thermal boundary layer thickness decreases with increase of Darcy number and Coulomb force.

Keywords: Electrohydrodynamic; Nanofluid; Thermal radiation; Porous medium; Shape of nanoparticles; CVFEM.

Nomenclature

[1] Corresponding author:
Email: mohsen.sheikholeslami@yahoo.com, mohsen.sheikholeslami@nit.ac.ir (M. Sheikholeslami)