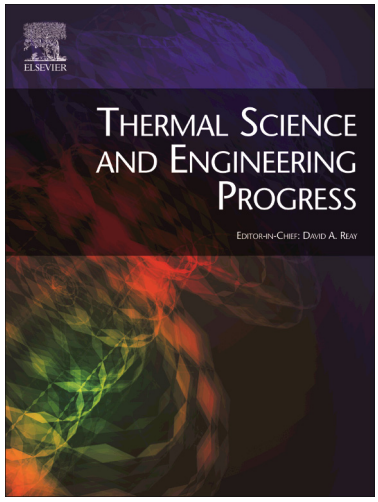

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M.A. Mansour, Sadia Siddiqa, Rama Subba Reddy Gorla, A.M. Rashad

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M.A. Mansour[1], Sadia Siddiqa[2], Rama Subba Reddy Gorla[3], A.M. Rashad[4]

[1]Department of Mathematics, Assuit University, Faculty of Science, Assuit, Egypt

[2]Department of Mathematics, COMSATS Institute of Information Technology, Attock, Pakistan

[3]Department of Mechanical Engineering, Cleveland State University, Cleveland, Ohio 44115 USA

[4]Department of Mathematics, Aswan University, Faculty of Science, Aswan, 81528, Egypt

Abstract

The present work is focused on the analysis of the entropy generation andmagneto-hydrodynamics natural convection flow and heat transfer in a square porous cavity differentially heated and cooled by heat source and sink, respectively filled with the Cu-Al_2O_3-Water hybrid nanofluid. The effectivesegments of the left and right sides of the cavity are kept at cooled temperature and the effectivesegments of top and bottomsides are kept at hot temperature. The enclosure's ineffectivesegments of its sides are kept adiabatic.The thermal conductivity and the dynamic viscosity of the nanofluid are represented by different experimental correlations those are suitable to each nanoparticles (see [19, 20, 23]).The finite differencemethodology is used to solve the dimensionless partialdifferential equations governing the problem. A comparison with previously published studies and the present results shows very good agreement.Results are presented for entropy production in terms of Hartmann number, nanoparticle volume fraction and geometric paramaters of the cavity.

Keywords: *Magneto-hydrodynamics; Entropy Generation,natural convection; hybrid nanofluid; square cavity.*