Scopus

Documents

Alsabery, A.I., Chamkha, A.J., Hussain, S.H., Saleh, H., Hashim, I.

Heatline visualization of natural convection in a trapezoidal cavity partly filled with nanofluid porous layer and partly with non-Newtonian fluid layer
(2015) *Advanced Powder Technology*, 26 (4), pp. 1230-1244. Cited 29 times.

Abstract
Abstract The problem of natural convection in a trapezoidal cavity partly filled with nanofluid porous layer and partly with non-Newtonian fluid layer is visualized by heatline. Water-based nanofluids with silver or copper or alumina or titania nanoparticles are chosen for investigation. The governing equations are solved numerically using the Finite Volume Method (FVM) over a wide range of Rayleigh number (Ra=105and 106), Darcy number (10-5≤ Da ≤ 10-1), nanoparticle volume fraction (0 ≤ ∅ ≤ 0.2), power-law index (0.6 ≤ n ≤ 1.4), porous layer thickness (0.3 ≤ S ≤ 0.7), the side wall inclination angle (0° ≤ ∅ ≤ 21.8°) and the inclination angle of the cavity (0° ≤ ω ≤ 90°). Explanation for the influence of various above mentioned parameters on streamlines, isotherms and overall heat transfer is provided on the basis of thermal conductivities of nanoparticles, water and porous medium. It is shown that convection increases remarkably by the addition of silver-water nanofluid and the heat transfer rate is affected by the inclination angle of the cavity variation. The results have possible applications in heat-removal and heat-storage fluid-saturated porous systems. © 2015 The Society of Powder Technology Japan.

2-s2.0-84938953227
Document Type: Article
Publication Stage: Final
Source: Scopus