Scopus

Documents

Reddy, P.S., Sreedevi, P., Chamkha, A.J.

Heat and Mass Transfer Flow of a Nanofluid over an Inclined Plate under Enhanced Boundary Conditions with Magnetic Field and Thermal Radiation
(2017) *Heat Transfer - Asian Research*, 46 (7), pp. 815-839. Cited 4 times.

Abstract
This article presents the magnetohydrodynamic boundary layer flow, heat and mass transfer characteristics of a nanofluid over an inclined porous vertical plate with thermal radiation and chemical reaction. The new enhanced concentration boundary condition on the surface of the wall is considered in this analysis. The governing nonlinear partial differential equations are transformed into a system of nonlinear ordinary differential equations using the similarity variables and are solved numerically using the finite element method. The effect of key parameters such as magnetic parameter (M), buoyancy ratio (Nr), Prandtl number (Pr), thermal radiation (R), Brownian motion (Nb), thermophoresis (Nt), Lewis number (Le), and chemical reaction parameter (Cr) on velocity, temperature, and concentration distributions is discussed in detail and the results are shown graphically. Furthermore, the impact of these parameters on skin-friction coefficient, Nusselt number, and Sherwood number is also investigated and the results are shown in tabular form. The developed algorithm is validated with works published previously and was found to be in good agreement. The thermal boundary layer thickness is elevated, whereas the solutal boundary layer thickness retards with the improving values of the Brownian motion parameter (Nb). The rates of nondimensional temperature and concentration both decelerate with higher values of the thermophoresis parameter (Nt). © 2016 Wiley Periodicals, Inc.

2-s2.0-84989323328
Document Type: Article
Publication Stage: Final
Source: Scopus