Scopus

Documents

Raja Obula Reddy, Y., Suryanarayana Reddy, M., Sudarsana Reddy, P., Chamkha, A.J.

Effect of brownian motion and thermophoresis on heat and mass transfer flow over a horizontal circular cylinder filled with nanofluid
(2017) *Journal of Nanofluids*, 6 (4), pp. 702-710. Cited 2 times.

Abstract
In this study, MHD heat and mass transfer boundary layer flow over a horizontal circular cylinder saturated by porous media filled with nanofluid under the impact of Brownian motion and thermophoresis is numerically examined. The transformed boundary layer equations for momentum, temperature and concentration subject to the appropriate boundary conditions are solved numerically by using an optimized, efficient and extensively validated finite element method. The impact of the non-dimensional parameters such as magnetic parameter (M), thermophoresis parameter (Nt), Brownian motion parameter (Nb), tangential coordinate ($) and Lewis parameter (Le) on velocity, temperature and concentration evolutions in the boundary layer region are analyzed in detail and the results are shown graphically. Furthermore, the influence of these parameters on local Nusselt number and local Sherwood number is also investigated and the results are shown in tabular form. The comparison of present results with existing results shows good agreement. Increases in the values of the thermophoresis parameter (Nt) accelerate both the thermal and concentration boundary layer thicknesses. The heat and mass transfer rates enhance with higher values of the Brownian motion parameter (Nb) in the boundary layer region.

2-s2.0-85046457355
Document Type: Article
Publication Stage: Final
Source: Scopus