Abstract

In the present work, the effects of variable viscosity and thermal conductivity on the boundary layer flow and heat and mass transfer of a MHD micropolar fluid past a continuously moving plate embedded in porous media with Soret and Dufour effects have been studied. Both viscosity and thermal conductivity are assumed to be the inverse linear functions of temperature. The governing partial differential equations are transformed into dimensionless forms using similarity transformations. The effects of variable viscosity, variable thermal conductivity and the other parameters involved in the study on the velocity, micro-rotation, temperature and concentration distribution profiles as well as skin fraction coefficients, couple stress, Nusselt number and Sherwood number are investigated by solving the governing transformed ordinary differential equations with the help of Runge-Kutta fourth order method with shooting technique and shown graphically and in tabulated form and discussed in detail.
The Effects of Variable Viscosity and Thermal Conductivity of a MHD Micropolar Fluid Past a Continuously Moving Plate with Soret and Dufour Effects


Index Terms

Computer Science  Applied Mathematics

Keywords

Variable viscosity, variable thermal conductivity, micropolar fluid, magnetic field, heat transfer, mass transfer, Soret and Dufour effects, shooting technique.