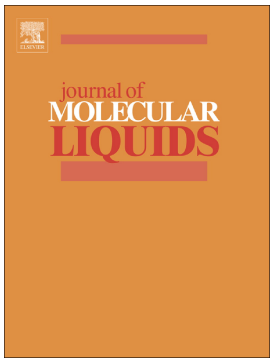

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Influence of thermophoresis and induced magnetic field on chemically reacting mixed convective flow of Jeffrey fluid between porous parallel plates

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Abstract

In the present article, the effect of thermophoresis on an unsteady two-dimensional laminar incompressible mixed convective chemically reacting flow and heat transfer of Jeffrey fluid between two parallel porous plates under the influence of the induced magnetic field is considered. The flow is generated due to periodic injection or suction at the plates. It is assumed that the non-uniform temperature and concentrations are varying periodically with time at the plates. The flow field equations are reduced into nonlinear ordinary differential equations by using suitable similarity transformations and solved by shooting method. The results are analysed for non-dimensional velocity components, temperature distribution, concentration, induced magnetic field, skin friction, heat and mass transfer rates with respect various fluid and geometric parameters in details through graphs and tables. It is observed the temperature of the fluid is enhanced with inverse Darcy parameter, whereas the concentration of the fluid decreases with increasing of Deborah number. Also the induced magnetic field increases with thermophoresis whereas it decreases with increasing of magnetic parameter. The present results have the better agreement with published work for the Newtonian case.

Key words: Jeffrey fluid, Induced magnetic field, Thermophoresis, Chemical reaction, Mixed convection, Periodic suction/injection

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