Abstract

The effects of Soret number, heat source parameter and order of chemical reaction on separation of a binary fluid mixture for the case of a two dimensional steady free convective and mass transfer flow of an incompressible, viscous, chemically reacting, electrically conducting fluid through a porous medium bounded by two stationary infinite vertical porous plates in the presence of transverse magnetic field and heat generation/absorption are investigated. The governing non linear partial differential equations are transformed into coupled non dimensional non linear ordinary differential equations by using non-dimensional quantities and are solved numerically by using MATLAB’s built in solver bvp4c. The influence of the Dufour number, Soret number, heat source parameter and order of chemical reaction on velocity, temperature and concentration profiles as well as on skin friction, Nusselt number and Sherwood number are illustrated graphically. It is concluded that the Soret number, Dufour number and the chemical reaction parameter play a crucial role on the heat and mass transfer.

Index Terms

Computer Science

Applied Sciences
Keywords

Heat and Mass transfer; MHD; porous medium; two vertical plates; Dufour and Soret effects; chemical reaction.