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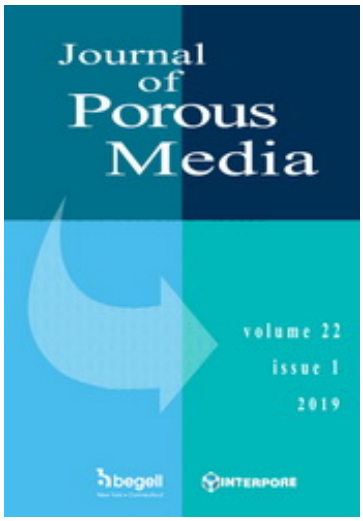

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Effects of Chemical Reactions, Heat, and Mass Transfer on Nonlinear Magnetohydrodynamic Boundary Layer Flow over a Wedge with a Porous Medium in the Presence of Ohmic Heating and Viscous Dissipation

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ABSTRACT

An analysis is carried out to study the effects of chemical reactions, heat, and mass transfer on nonlinear magnetohydrodynamic (MHD) boundary layer flow over a wedge with a porous medium in the presence of Ohmic heating and viscous dissipation. The fluid is assumed to be incompressible, viscous, electrically conducting, and Boussinesq. A magnetic field is applied transversely to the direction of the flow. A numerical solution for the steady MHD laminar boundary layer flow over a wall of the wedge with suction in the presence of species concentration and mass diffusion has been obtained by transforming the governing equations to nonlinear ordinary differential equations through similarity transformations and further utilizing the R. K. Gill method. Numerical calculations up to the third level of truncation are carried out for different values of dimensionless parameters of the problem under consideration. An analysis of the results obtained shows that the flow field is influenced appreciably by the strength of the magnetic field, chemical reactions, and suction at the wall of the wedge.

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