PAPER FOR THE YOUNG SCIENTIST AWARD

Recent advancements in entropy generation analysis on chemically reactive electromagnetic Sodium Alginate fluid flow with heat and mass transfer

S. M. Sachhin[1] and U. S. Mahabaleshwar[1]

[1]Department of Studies in Mathematics, Davangere University, Shivagangothri, Davangere, 577 007, INDIA,
Email: sachinsm030@gmail.com. & u.s.m.davangereuniversity.ac.in

ABSTRACT

The current article aims to determine the influence of engineering quantities on chemically reactive electromagnetic Sodium Alginate fluid flow with energy and mass transfer with entropy generation examination, nonlinear governing equations scrutinized to ordinary differential equations by utilizing similarity terms, heat source/sink and solar radiation effects included in temperature equation and solved by using hypergeometric series solution method. The chemical reaction effect was studied by using a concentration equation, to understand the irreversibility of processes and enhance electronic cooling systems' functionality authors studied the entropy generation analysis, authors used sodium alginate as base fluid and Al2O3 and SiO2 nanoparticles to form hybrid nanofluid. Several physical terms such as inverse Darcy number, electromagnetic field, viscous dissipation, thermal radiation, heat source parameter, Schmidt number, and chemical reactions were explained through graphs. Outcomes of the present study illustrate that upsurging the magnetic field and porous media decays the momentum of the fluid and increases the temperature and skin friction, raising the thermal radiation and heat source/sink parameter upsurges the temperature and decays the Nusselt number, increasing the Schmidt number and chemical reaction increases the concentration and decreases the Sherwood number, present work has many useful applications Bingham fluids are beneficial in situations requiring controlled flow, such as the transfer of sewage, where the yield stress may prevent leakage by blocking flow under low force and enabling it when pushed with sufficient force.

REFERENCES

1. L. J. Crane, Flow past a stretching plate, Journal of Applied Mathematics and Physics, Vol 21, pp 645, (1970).
2. K. B, Pavlov, magnetohydrodynamic flow of incompressible viscous fluid caused by of a surface. M. Gidrodinamika. 4(1974), 146-147.