

The Analysis of a Reactive Hydromagnetic Internal Heat Generating Poiseuille Fluid Flow through a Channel

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Abstract : In this paper, the analysis of a reactive hydromagnetic Poiseuille fluid flow under each of sensitized, Arrhenius and bimolecular chemical kinetics through a channel in the presence of heat source is carried out. An exothermic reaction is assumed while the concentration of the material is neglected. Adomian Decomposition Method (ADM) together with Pade Approximation is used to obtain the solutions of the governing nonlinear non - dimensional differential equations. Effects of various physical parameters on the velocity and temperature fields of the fluid flow are investigated. The entropy generation analysis and the conditions for thermal criticality are also presented.

Keywords : chemical kinetics, entropy generation, thermal criticality, adomian decomposition method (ADM) and pade approximation

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