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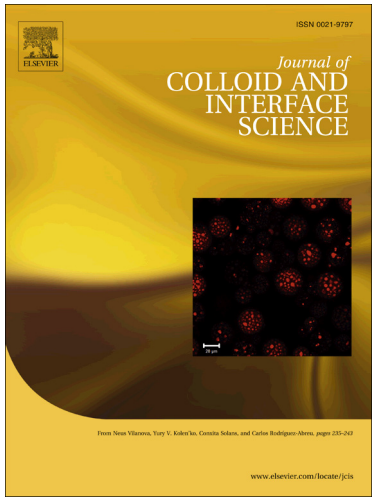

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Colloidal study of Casson fluid with homogeneous-heterogeneous reactions

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Abstract: Magnetohydrodynamic (MHD) stagnation point flow of Casson fluid towards a stretching sheet is addressed. Homogeneous-heterogeneous reactions together with homogeneous heat effect subject to a resistive force of electromagnetic origin is discussed. It is assumed that the homogeneous process in the ambient fluid is governed by first order kinetics and the heterogeneous process on the wall surface is given by isothermal cubic autocatalator kinetics. Ordinary differential systems have been considered. Solutions of the problems are presented via a numerical technique namely built in shooting method. Graphical behaviors of velocity, temperature and concentration are analyzed comprehensively. Velocity is noticed a decreasing function of Hartman number.

Keywords: Casson fluid; Homogeneous-heterogeneous reactions; Stagnation point flow; MHD.

1 Introduction

The flow investigations regarding nonlinear materials are extremely important in applied science and engineering areas. In order to explore the properties of flow and heat transfer several rheological models have been proposed. Casson fluid [1] is one of such materials. This

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