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Heat transfer enhancement in the boundary layer flow of hybrid nanofluids due to variable viscosity and natural convection
(2019) *Heliyon*, 5 (4), art. no. e01469, . Cited 3 times.

Abstract
The aim of the current work is to explore how heat transfer can be enhanced by variations in the basic properties of fluids in the presence of free convection with the aid of suspended hybrid nanofluids. Also, the influence of the Laurentz force on the flow is considered. The mathematical equations are converted into a pair of self-similarity equations by applying appropriate transformations. The reduced similarity equivalences are then solved numerically by Runge-Kutta-Fehlberg 45 th -order method. To gain better perception of the problem, the flow and energy transfer characteristics are explored for distinct values of significant factors such as variable viscosity, convection, magnetic field, and volume fraction. The results acquired are in good agreement with previously published results. The noteworthy finding is that the thermal conductivity is greater in hybrid nanofluid than that of a regular nanofluid in the presence of specified factors. The boundary layer thickness of both hybrid nanofluid and normal nanofluid diminishes due to decrease in variable viscosity. The fluid flow and temperature of the hybrid nanofluid and normal nanofluid increases as there is a rise in volume fraction. © 2019

2-s2.0-85063763417
Document Type: Article
Publication Stage: Final
Source: Scopus
Access Type: Open Access