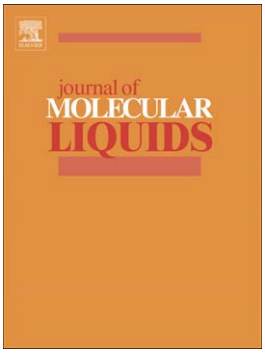


# Thermal deposition on magnetohydrodynamic nanofluidic transport of viscoplastic fluid with microrotations

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# Thermal deposition on magnetohydrodynamic nanofluidic transport of viscoplastic fluid with microrotations

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**Abstract:**

**Background and Objectives:** The prime focus of this investigation is to explore nonlinear radiation effects on MHD micropolar Casson fluid over a stretching surface. Impact of microrotation on flow and heat transfer characteristics has been examined under the influence of thermophoresis and Brownian motion phenomenon.

**Methodology:** The prevailing nonlinear coupled system of equations is solved numerically by means of shooting algorithm keeping the iterative precision up to six decimal places. Influence of sundry parameters on velocity profile, temperature and concentration profiles are portrayed through graphs and discussed analytically. Physical quantities of practical engineering significance such as skin friction coefficient, local heat and mass flux at the surface are computed and discussed physically.

**Conclusion:** The obtained physical results revealed some significant facts such as increasing magnetic field strength accelerates microrotation and temperature profiles while it decreases local heat and mass flux at the wall. Nusselt and Sherwood numbers can be enhanced by increasing thermal radiation factor for the case of strong concentration. Thermophoretic phenomenon leads to an increase in concentration profile of the fluid.

**Keywords:** Microrotation; Nanoparticles; Magnetohydrodynamics (MHD); Viscoplastic fluid.

## 1 Introduction

Nanofluids are composite materials which contains nanometer-sized particles dispersed in a liquid. Now a day, it is a proven fact that nanofluids exhibits promising novel attributes such as altered viscosity, density and enhanced heat transfer rate when compared with traditional base fluids. Nanofluids finds encouraging applications in micro electromechanical systems

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