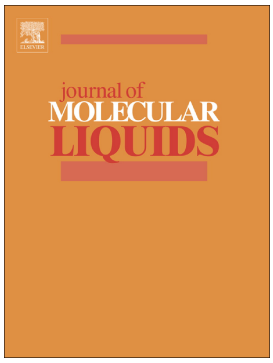

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Nanoparticle shapes on squeezed MHD nanofluid flow over a porous sensor surface

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Abstract

Issue of nanoparticle shapes on the squeezed MHD nanofluid flow of water, ethylene glycol and engine oil based Cu, Al_2O_3 and SWCNTs over a porous sensor surface in the presence of thermal radiation has been investigated. The three typical designs of nanoparticle shapes are signed into account, i.e. sphere $(m = 3.0)$, cylinder $(m = 6.3698)$ and laminar $(m = 16.1576)$. The regulating partial differential equations (PDEs) are reconstructed into ordinary differential equations (ODEs) by employing dependable obedience modification and it is resolved numerically by running Runge Kutta Fehlberg method with shooting technique. It is predicted that the sphere shape nanoparticles have dynamic achievements in squeezing flow development over a porous sensor surface, the sphere shape nanoparticle in SWCNTs – engine oil in the existence of magnetic field has more desirable enrichment on heat transfer as compared with the other nanoparticle shapes in different nanofluid flow regime.

Keywords: Nanoparticle shape factor; Squeezed flow; Sensor surface; SWCNTs; Thermal radiation energy; Magnetic field.

1. Introduction

In the fresh advancement of science and technology, review of nanofluid gained noticeable cooperation due to its extensive utilizations. The today problem of squeezing flow bounded by two parallel plates of viscous Newtonian fluid is one of the ideal issues in physics. As long as the technological development and improvement of industries, the energy and environmental involvements catches the essential aspect. At the moment, many researchers promote the benefit of nanofluids in a collection of industries and engineering equipment to enhance the energy efficiency and to improve the system's thermal performance, [1–3]. **Squeeze flows" are flows in which a material is compressed between two parallel plates and thus squeezed out radially. The sensor transduces an aid electrical signal into a mechanical wave which, distinct an electrical signal, can be freely motivated by physical development. The device then transduces this wave behind into an electrical signal. Modifications in phase, frequency, amplitude or time-delay between the aid and outlay electrical signals can be applied to count the existence of the aimed phenomenon.** The most essential physical resources of nanofluids is thermal conductivity that activates a basic play in the reinforcement of energy dynamic heat transfer materials for microelectronics, transportation, energy input/output supply, fabrication, etc. Nanofluids thermal conductivity confirms on various parameters like nanoparticles concentration, material type, size, shapes and agglomeration.