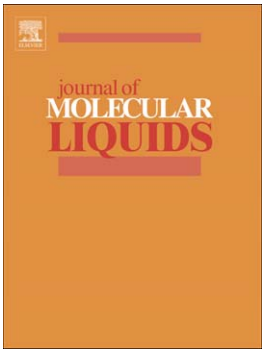

Mixed convection peristalsis of corban nanotubes with thermal radiation and entropy generation

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Mixed convection peristalsis of corban nanotubes with thermal radiation and entropy generation

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Abstract: Present study is prepared to explore the advantages of entropy generation in peristalsis of Single wall carbon nanotubes (SWCNTs) and Multiple wall carbon nanotubes (MWCNTs). Fluid is considered in a curved channel with radiative feature. Channel boundaries satisfy velocity slip condition. Flow equations subject to long wavelength are solved for pressure gradient, pressure rise per wavelenght, stream function velocity and temperature. Brinkman number is employed as the perturbation quantity. Physical impact of pertinent parameters on considered flow quantities are described through graphs. Graphical results indicate that velocity and temperature are decreasing functions of CNTs volume fraction. It is seen that temperature difference parameter has opposite impact on entropy and Bejan number. Moreover heat transfer rate for SWCNTs is more than MWCNTs.

Key words: Entropy generation; Velocity slip condition; SWCNTs and MWCNTs; Thermal radiation; Mixed convection.

1 Introduction

Movement of different viscous and non-Newtonian materials from region of lower pressure to a high pressure is termed as peristalsis. It is the naturally inherited mechanism of various biological processes. The content within the hollow muscular structures is propelled and mixed by the successive contraction and relaxation of muscular fibers. Such mechanism is very useful in transporting physiological materials like chyme through intestine, food bolus through oesophagus, urine transport from kidney to gallbladder, locomotion in earthworm, ovum in the fallopian tube, blood in small vessels, transportation of water in trees ets. Peristalsis is responsible in moving physiological fluids along the physiological ducts by

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