Scopus

Documents

Srinivas, J., Murthy, J.V.R., Chamkha, A.J.

Analysis of entropy generation in an inclined channel flow containing two immiscible micropolar fluids using HAM
(2016) *International Journal of Numerical Methods for Heat and Fluid Flow*, 26 (3-4), pp. 1027-1049. Cited 11 times.

Abstract
Purpose - The purpose of this paper is to examine the flow, heat transfer and entropy generation characteristics for an inclined channel of two immiscible micropolar fluids. Design/methodology/approach - The flow region consists of two zones, the flow of the heavier fluid taking place in the lower zone. The flow is assumed to be governed by Eringen's micropolar fluid flow equation. The resulting governing equations are then solved using the homotopy analysis method. Findings - The following findings are concluded: first, the entropy generation rate is more near the plates in both the zones as compared to that of the interface. This indicates that the friction due to surface on the fluids increases entropy generation rate. Second, the entropy generation rate is more near the plate in Zone I than that of Zone II. This may be due to the fact that the fluid in Zone I is more viscous. This indicates the more the viscosity of the fluid is, the more the entropy generation. Third, Bejan number is the maximum at the interface of the fluids. This indicates that the amount of exergy (available energy) is maximum and irreversibility is minimized at the interface between the fluids. Fourth, as micropolarity increases, entropy generation rate near the plates decreases and irreversibility decreases. This indicates an important industrial application for micropolar fluids to use them as a good lubricant. Originality/value - The problem is original as no work has been reported on entropy generation in an inclined channel with two immiscible micropolar fluids. © Emerald Group Publishing Limited.

2-s2.0-84968912296
Document Type: Article
Publication Stage: Final
Source: Scopus