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Second law analysis in the peristaltic flow of variable viscosity fluid

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Abstract

In this paper, a complete thermodynamical analysis has been made for the peristaltic motion of a viscous fluid with variable viscosity in a symmetric channel. The entire study is carried out in a moving frame of reference. The governing equations are normalised and exact solutions are obtained. The causes of entropy production in the peristaltic motion have been examined. Graphical illustrations of the total entropy generation number and the Bejan number have been provided and effects of pertinent parameters of interest are discussed. It is established that the entropy generation is minimum in the expanding region of the channel. Moreover, the fluids with variable viscosity with low viscous dissipation can be helpful in minimising the entropy generation. Copyright © 2016 Inderscience Enterprises Ltd.

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