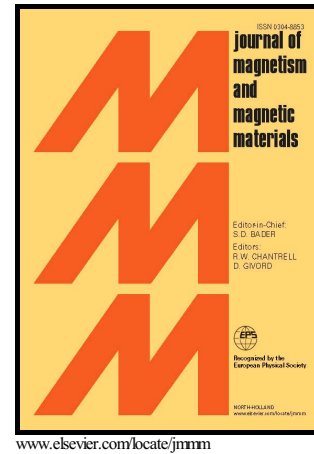


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Experimental study on heat transfer enhancement of laminar ferrofluid flow in horizontal tube partially filled porous media under fixed parallel magnet bars

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Abstract

In this study, steady state laminar ferroconvection through circular horizontal tube partially filled with porous media under constant heat flux is experimentally investigated. Transverse magnetic fields were applied on ferrofluid flow by two fixed parallel magnet bar positioned on a certain distance from beginning of the test section. The results show promising notable enhancement in heat transfer as a consequence of partially filled porous media and magnetic field, up to 2.2 and 1.4 fold enhancement were observed in heat transfer coefficient respectively. It was found that presence of both porous media and magnetic field simultaneously can highly improve heat transfer up to 2.4 fold. Porous media of course plays a major role in this configuration. Virtually, application of Magnetic field and porous media also insert higher pressure loss along the pipe which again porous media contribution is higher than magnetic field.

Keywords

Ferroconvection, Magnetic field, Laminar pipe flow, Heat transfer enhancement

1- Introduction

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