عنوان مقاله:

Transient Forced Convection with Viscous Dissipation in Circular Duct Filled with Saturated Porous Media

محل انتشار:

سومین کنفرانس ملی کاربرد CFD در صنایع شیمیایی (سال: 1390)

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خلاصه مقاله:

Transient thermal development of forced convection in a circular duct occupied by saturated porous medium with heat generation due to viscous dissipation was studied. The unsteadiness in the problem originates from impulsive change in the wall heat flux of the outer duct. To describe the flow field a Brinkman-Forchheimer Darcy model was used while a finite difference method was applied in order to solve the dimensionless form of thermal energy equation subjected to appropriate initial and boundary conditions. The numerical procedure used in the present study was validated with an analytical solution for the special case of Brinkman (Br) and Forchheimer (F) numbers equal to zero. Moreover, the effects of the Darcy, Da, Forchheimer, F, and Brinkman, Br, numbers on the Nusselt number were carefully investigated.

کلمات کلیدی:

Porous medium, Unsteady forced convection, Brinkman-Forchheimer model, Circular duct

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