Numerical Study of Entropy Generation in a Vertical Square Channel Packed with Saturated Porous Media

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Abstract

Entropy generation in a vertical square channel packed with saturated porous media, and subjected to differentially heated isothermal walls has been numerically investigated.

The effect of Darcy, Reynolds, and Eckert numbers on Entropy generation was studied. The entropy generation was found to be inversely proportional to both Reynolds and Darcy number, while it was directly proportional with the Eckert number.

It was shown that as Darcy and Reynolds numbers were increasing, the Bejan number decreases, i.e., the irreversibility due fluid friction is dominated, while as the Eckert increases, their reversibility due to heat transfer increases.

Keywords: entropy generation, porous media, Bejan number

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