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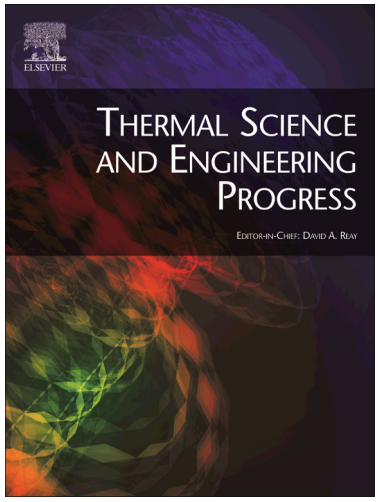

Hydrothermal Analysis Of Transient Natural Convection In a Finned Cavity Filled With Sulfuric acid-Water (25-75%) For Applications in High-Performance Lead-Acid Batteries- Numerical Study

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Hydrothermal Analysis Of Transient Natural Convection In a Finned Cavity Filled With Sulfuric acid-Water (25-75%) For Applications in High-Performance Lead-Acid Batteries- Numerical Study

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Abstract

The transient natural convection and entropy generation is investigated in a finned cavity filled with sulfuric acid-water (25-75 vol%). The cavity is subjected to the uniform and constant hot and cold temperature from left and right side walls, respectively, and the fins are in heated and cooled constantly and uniformly as well. The Navier-Stokes equations are solved based on three-dimensional form, and finite volume approach is utilized. The influences of different governing parameters of Rayleigh number ($10^3 < Ra < 10^5$), gap distances($0.05 < GD < 0.2$) and time on the flow structure, temperature field, average Nusselt number, skin friction coefficient and heatlines have been presented comprehensively.

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