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Natural convection of a hybrid nanofluid-filled triangular annulus with an opening
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Abstract
Natural convection of an Al2O3/Cu-water hybrid nanofluid filled triangular annular cavity was numerically investi-gated. The inner and outer surfaces of the concentric triangular cavities are isothermal, and an opening is considered in the inclined side wall of the outer triangle. The governing equations are solved with the finite element method. The influence of the Rayleigh number (between 104 and 5 × 105), opening ratio (between 0 and 0.625), and solid volume fraction of the nanoparticles (between 0 and 0.02) on the fluid flow and heat transfer was considered. It was observed that the Nusselt number is enhanced with the Rayleigh number and opening ratio. The effects of the opening ratio on the heat transfer enhancement is more effective for higher values of Rayleigh numbers. The increment in the average heat transfer versus the solid nanoparticle volume fraction shows a linear relation, and the slope of the linear curve is higher for the solid volume fraction with higher thermal conductivity. © 2016 by Begell House, Inc.

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