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Second law analysis for flow of a nanofluid containing graphene–platinum nanoparticles in a minichannel enhanced with chaotic twisted perturbations

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Highlights

- Second law features of a new nanofluid are researched in a chaotic twisted channel.
- A hybrid nanofluid containing graphene nanoplatelets decorated with Pt is employed.
- Geometrical perturbations cause formation of counter rotating Dean roll-cells.
- Thermal entropy generation reduces by increase of distance from inlet of each bend.
- Overall irreversibility decreases with increasing concentration and Dean number.

Abstract

The second law and entropy generation characteristics of a new hybrid nanofluid containing graphene nanoplatelets decorated with platinum nanoparticles are evaluated in a chaotic twisted channel. Although several investigations have been carried out on flows inside chaotic channels in the relevant literature, very few studies have employed nanofluids as working fluids in such configurations. The geometrical perturbations cause formation of counter rotating Dean roll-cells

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