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Experimental and numerical study on heat transfer intensification in turbulent flow of CuO-water nanofluids in horizontal coil

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This work presents experimental and CFD simulation results of heat transfer for water and CuO-water nanofluid flow systems stabilized by capping agents. The experiments were carried out in a helically coiled tube in the range of turbulent flow regime with Reynolds numbers from 6000 to 21,968, for practical applications importance. Nusselt number enhancement with regard to host liquid was observed, up to 18–35 % for nanofluids under investigation. Numerical calculations were performed using the ANSYS® Fluent® package employing homogenous single-phase model with the assumption of constant wall temperature condition. The k-ε Realizable Turbulence and Enhancement Wall Treatment models were applied in all analyzed cases. New type stabilizer CTAC was employed which lead to enhanced heat transfer in coil in obtained nanofluids.

Metryczka

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