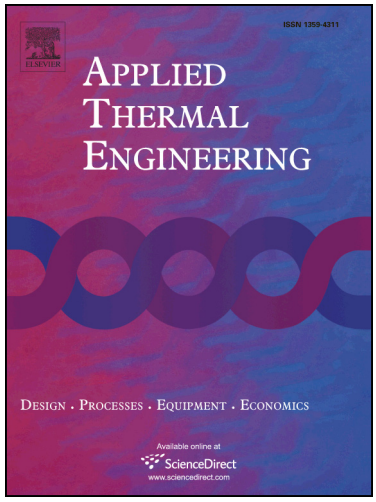

Research Paper

Heat transfer enhancement of shell-and-coiled tube heat exchanger utilizing helical wire turbulator

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Heat transfer enhancement of shell-and-coiled tube heat exchanger utilizing helical wire turbulator

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Abstract: In present study, a shell and coiled tube heat exchanger is experimentally studied in which a helical wire has been placed inside the helically coiled tube as a turbulator. The fabrication method of helically coiled tube which contains turbulator and also the effects of turbulator on thermal and frictional characteristics of heat exchanger are presented in this paper. Experiments were performed in two main modes. In first mode, the fluid of coiled tube was water and in second mode the fluid of coiled tube was air. Each mode was studied for both empty coiled tube (without turbulator) and with turbulator under different fluid flow rates. The fluid of shell side was hot water for all cases. Findings showed that this type of turbulator can be employed in coiled tubes which significantly increased the overall heat transfer coefficient and obviously pressure drop. Overall heat transfer coefficient, pressure drop, effectiveness and NTU are evaluated and discussed.

***Keywords*:** shell-coiled tube heat exchanger, experimental investigation, pressure drop, turbulator, heat transfer coefficient