عنوان مقاله:

Comparison of entropy generation minimization principle and entransy theory in optimal design of thermal systems

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خلاصه مقاله:

In this study, the relationship among the concepts of entropy generation rate, entransy theory, and generalized thermal resistance to the optimal design of thermal systems is discussed. The equations of entropy and entransy rates are compared and their implications for optimization of conductive heat transfer are analyzed. The theoretical analyses show that based on entropy generation minimization principle by decreasing irreversibility, thermodynamic optimization can be obtained. Significantly, the entransy concept merely describes the heat transfer ability and the minimum and maximum entransy dissipation principle can only lead to thermal optimization. However, due to decreasing thermal resistance both principles are considered as optimization tools for the optimal design of energy and thermal systems. Also, it is shown that the concept of entransy theory is more suitable than the concept of entropy generation for optimizing the performance of heat transfer processes.

کلمات کلیدی:

Entropy generation, Entransy Theory, Thermal Resistance, Optimization