

Special Issue

Non-Equilibrium Thermodynamics of Micro Technologies

Message from the Guest Editors

Recently, micro heat sink thermal systems have been used for a wide range of thermal and biological purposes. Among these, microchannels filled with porous materials have received particular attention as they feature favorable characteristics for cooling and pumping technologies in biomedical engineering. Utilization of microchannels has further resulted in the development of the so-called “microreactors” for chemical process intensification. Micro porous tubes have also been used for miniaturized cryocoolers. The applications of microreactors and miniaturized cryocoolers are now at their most extensive and include applications in combustion, hydrogen, cryogenic and syngas production and industrial chemicals. Second law analysis has started to be employed in microchannels and microtubes with applications in micro thermal, mechanical, chemical and biological systems. Further developments in this front call for a more rigorous understanding and modeling of thermodynamic processes in micro devices under highly irreversible conditions.

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