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**Solar collectors and nanofluid applications**

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Since the nanofluid has revealed a considerable capability for increasing heat transfer in comparison to the traditional pure fluids, it has been considered as an effective heat transport fluid. To enhance the convective heat transfer passively, factors including the flow geometry and boundary conditions can be changed or thermal conductivity of the fluid can be enhanced. For this purpose, several approaches have been developed for heat transfer augmentation of fluids. Considerable efforts have been made by researchers to enhance the thermal conductivity of base fluids. They have suspended micro or larger-sized solid particles in fluids due to the higher thermal conductivity of solid compared to liquids. Nevertheless, preventing the solid particles from settling out of suspension is not recommended since the size of the particles is large and their density is high. Possible erosion and extra flow resistance are induced due to the lack of stability of these suspensions. Therefore, there have not been any commercialization of fluids with dispersed coarse-grained particles. Novel nanotechnology enables us to produce and process materials with average crystallite sizes lower than 50 nm. Nanofluids are defined by fluids with nanoparticles suspended in them. The fluid flow as well as the heat transfer properties of the base fluids can be altered by suspended nanoparticles in several base fluids. In this special issue, not only experimental researches about heat transfer of nanofluid, but also simulation of thermal treatment of nanofluid are presented. Various applications of nanomaterial are presented in different field of science such as: mechanical, aerospace, chemical, civil and energy engineering.

**Keywords**: Experimental approach; Nanoparticle; Thermal performance; Numerical approach; Heat transfer; Heat exchanger; Ferrofluid; Solar collector.