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An Enhanced Room Temperature Magnetic Refrigerator Based on Nanofluid: From Theoretical Study to Design

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Abstract : In this research, an enhanced room-temperature magnetic refrigerator based on nanofluid, consisting of permanent magnets as a magnetism source, gadolinium as magnetocaloric material, water as base liquid, and carbon nanotubes (CNT) as nanoparticles, has been designed. The magnetic field is supplied by NdFeB permanent magnets and is about 1.3 Tesla. Two similar heat exchangers are employed to absorb and expel heat. The cycle performance of this self-designed device is analyzed theoretically. The results provide useful data for future optimization of room-temperature magnetic refrigeration using nanofluids.

Keywords : magnetic cooling, nanofluid, gadolinium, permanent magnets, heat exchange
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