MODELING OF A ROOM TEMPERATURE MAGNETIC REFRIGERATOR BASED ON NANOFUID

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Abstract

In this paper, a room-temperature magnetic refrigerator based on nanofluid, consisting of permanent magnets as magnetism source, gadolinium as magneto caloric 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 with nanofluids.

Key words

magnetic cooling, nanofluid, gadolinium, permanent magnets, heat exchange.