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In order to demonstrate the potential of magnetic refrigeration which can provide cooling effects without affecting the environment, an experimental setup was built, in which a rotating regenerative gadolinium beds of 350 g were used. Water was used as a heat transfer fluid, and a magnetic field of 1.5 T was applied using permanent magnets. With this setup, the influence of the heat transfer fluid, the temperature drop was studied systematically. The analytical solution for entropy change as a function of enthalpy and temperature were obtained in MATLAB and compared with the experimental results. The thermodynamic properties of gadolinium were studied to find out the appropriate temperature drop and entropy change in the refrigeration process. The flow over the gadolinium were analysed in STAR CCM+. The results in this analysis provide useful data for efficient design and development of room temperature magnetic refrigerators for commercial purposes.

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