

MAGNETOCALORIC EFFECT IN MAGNETIC NANOPARTICLE SYSTEMS: A MONTE CARLO STUDY

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The entropy of a magnetic system changes upon the application of an external magnetic field as the temperature does when the process is kept adiabatic, i.e. the adiabatic effect. The main aim of this paper shall be to perform some numerical simulations to know under what conditions assemblies of nanoparticles have this effect in an optimal performance level for making refrigeration applications. We will focus this work in representing magnetization curves and hysteresis loops by a Monte Carlo technique¹ for different size distributions and concentrations of particles around the blocking temperature regimes. In this study, a particular attention will be paid to understand the influence of magnetic dipolar interaction on the magnetocaloric effect in these interacting nanoparticle systems.

[1] M.Ulrich, J.García-Otero, J.Rivas, A.Bunde, Phys.Rev.B 67,024416 (2003).