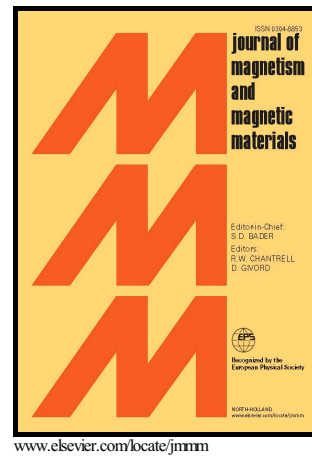


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Different approaches to analyze the dipolar interaction effects on diluted and concentrated granular superparamagnetic systems

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Abstract

Controlled magnetic granular materials with different concentrations of magnetite nanoparticles immersed in a non-conducting polymer matrix were synthesized and, their macroscopic magnetic observables analyzed in order to advance towards a better understanding of the magnetic dipolar interactions and its effects on the obtained magnetic parameters. First, by means of X-ray diffraction, transmission electron microscopy, small angle X-ray scattering and X-ray absorption fine structure an accurate study of the structural properties was carried out. Then, the magnetic properties were analyzed by means of different models, including those that consider the magnetic interactions through long-range dipolar forces as: the Interacting Superparamagnetic

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