

Effects of Exchange Interaction and Single Ion-anisotropy on the Hysteresis Loop of Ferrimagnetic Ternary Alloys AB_xC_{1-x} with Amorphous Structures

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Abstract

Based on the Monte Carlo simulation and the *RKKY* model, magnetic properties of mixed spin (3/2,1,1/2) ferrimagnetic ternary alloys of the type AB_xC_{1-x} are investigated. To do this, the influence of exchange energy and single ion-anisotropy on the magnetic hysteresis loop and magnetic susceptibility of ternary alloys with amorphous structures is examined. Our simulations reveal that the changes in exchange energy and single ion-anisotropy have a great influence on the magnetic hysteresis loop. It is observed that, for some values of these parameters, the stepwise curves and the triple hysteresis loop appear. Furthermore, the influence of concentration on the behavior of thermal magnetization is studied. Our results indicate that, for some values of concentration, the compensation temperature becomes less than the phase temperature.

Keywords: Ternary alloys, Ferrimagnetism, Monte Carlo simulation, RKKY model, Exchange energy, Single ion-anisotropy, Hysteresis loop

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