Finite Temperature Magnetic Properties of the Quenched Disordered Binary Alloy Nanowire: A Monte-Carlo Simulation Study

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Abstract

Finite temperature magnetic phase transition properties of a ferromagnetic binary alloy nanowire have been investigated by means of Monte Carlo method based on local spin update Metropolis algorithm. The magnetic components A with spin-1/2 and B with spin-1 are distributed randomly throughout the nanowire with a probability of p and 1-p, respectively. Our simulation results indicate that the phase boundary lines, magnetization profiles and magnetic susceptibility behaviors of the nanowire are sensitively depend on the values of concentration of the type-A magnetic components, the exchange interaction strengths between randomly located atoms and also single ion anisotropy term.

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