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The Effect of the Crystal Field Interaction on the Critical Temperatures and the Sublattice Magnetizations of a Mixedspin-3/2 and Spin-5/2 Ferromagnetic System

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Abstract : The influence of the crystal field interactions on the mixed spin-3/2 and spin-5/2 ferromagnetic Ising system is considered by using the mean field theory based on Bogoliubov inequality for the Gibbs free energy. The ground-state phase diagram is constructed, the phase diagrams of the second-order critical temperatures are obtained, and the thermal variation of the sublattice magnetizations is investigated in detail. We find some interesting phenomena for the sublattice magnetizations at particular values of the crystal field interactions.

Keywords : crystal field, Ising system, ferromagnetic, magnetization, phase diagrams
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