Ising-like model for the two-step spin-crossover systems: Static properties with magnetic field effects using cluster variation method

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We investigate the static properties of a two−sublattice Ising−like Hamiltonian for spin-crossover (SCO) systems in the presence of an external magnetic field. Self−consistent equations are obtained using cluster variation method in the lowest approximation. From the solutions of these equations, we present high−spin state fraction vs. temperature and magnetic field variations for various values of the degeneracy ratio between high−spin and low−spin states (r). It is shown that two metastable and one unstable (or saddle) branches in the SCO region are displayed in the $r > 1$ case while the metastable states disappear and only one saddle point occurs when $r = 1$. However, only stable states are obtained at high temperatures outside the SCO region. The comparison of our results to other theoretical treatments is also given.

References:

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