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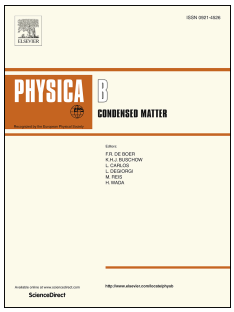

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Magnetic properties of magnetic bilayer Kekulene structure: A Monte Carlo study

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Abstract

In the present work, we have studied the magnetic properties of magnetic bilayer Kekulene structure with mixed spin-5/2 and spin-2 Ising model using Monte Carlo study. The magnetic phase diagrams of mixed spins Ising model have been given. The thermal total, partial magnetization and magnetic susceptibilities of the mixed spin-5/2 and spin-2 Ising model on a magnetic bilayer Kekulene structure are obtained. The transition temperature has been deduced. The effect of crystal field and exchange interactions on the this bilayers has been studied. The partial and total magnetic hysteresis cycles of the mixed spin-5/2 and spin-2 Ising model on a magnetic bilayer Kekulene structure have been given. The superparamagnetism behaviour is observed in magnetic bilayer Kekulene structure. The magnetic coercive field decreases with increasing the exchange interactions between σ-σ and temperatures values and increases with increasing the absolute value of exchange interactions between σ-S. The multiple hysteresis behavior appears.

Keywords: Magnetic bilayer Kekulene; Mixed spins; Monte Carlo simulations; Magnetic hysteresis; Superparamagnetism behaviour.

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