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Full-Potential Investigation of the Electronic and Magnetic Properties of CdCoTe and CdMnTe Diluted Magnetic Semiconductors

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Abstract : We investigate the structural, electronic and magnetic properties of the diluted magnetic semiconductors (DMSs) CdCoTe and CdMnTe in the zinc blende phase with 25% of Co and Mn. The calculations are performed by the recent ab initio full potential augmented plane waves (FP_L/APW) method within the spin polarized density-functional theory (DFT) and the generalized gradient approximation GGA. Structural properties are determined from the total energy calculations and we found that these compounds are stable in the ferromagnetic phase. We discuss the electronic structures, total and partial densities of states and total magnetic moments. The calculated densities of states presented in this study identify the half-metallic of CdCoTe and CdMnTe.

Keywords : electronic structure, half-metallic, magnetic moment, total and partial densities of states
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