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Effect of disorder on the Curie temperature of GaMnN and In-MnN diluted magnetic semiconductors AHMAD ALSAAD, Department of Physical Sciences, Jordan University of Science and Technology, Irbid-Jordan — The critical Curie temperatures of GaN, InN, CrN, and MnN diluted magnetic semiconductors and those of ordered and disordered diluted (Ga,Mn)N and (In,Mn)N magnetic semiconductors are investigated by using the classical Heisenberg model within the mean field approximation with the structural parameters are obtained from first principles total energy calculations. We show that Curie temperature depends on the Mn and Cr concentrations. Our calculations on these systems have shown that above room-temperature can be observed. Ferromagnetic stability in GaN, InN, CrN, and MnN is systematically studied. Our results indicate that 3d Mn and Cr impurities in GaN and InN favor the ferromagnetic state rather than the spin-glass phase. The mechanism behind this behavior is discussed and explained in details.

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