9.7 cm

MAGNETIC AND ELECTRIC STUDIES OF $FeSb_{2-x}Cr_xS_4$

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Magnetic semiconductors of $FeSb_{2-x}Cr_xS_4$ $0\leq x \leq 2$ were prepared and the lattice parameters evaluated as a function of x at room temperature, show deviation from Vegard's law. This was attributed to the presence of magnetovolume effect and charge transfer. Magnetization measurements were performed in the temperature range 77-300K. The results suggest that the system undergoes a gradual transition from antiferromagnetic to ferrimagnetic with increasing x. This has been explained based on the 3d band model. Furthermore, a monotonic decrease of the Curie temperature with x was observed. Electrical resistivity studies were carried out in the temperature range 4.2-300K. An anomaly was found in the vicinity of the Curie (Néel) temperature for x=2 which has been attributed to the existence of the long-range nature of the critical fluctuations due to short-range spin ordering.

13.4 cm

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