# Magnetic properties of the ferrimagnetic system $CoIn_{2-2x}Cr_{2x}S_4$

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It is well known that $CoCr_2S_4$ is a ferrimagnetic compound with $T_c$= 240K(1) crystallizing in the spinel structure with a = 9.934 Ă (2) as lattice parameter.
The exchange interactions in materials with this structure are of indirect type. The strongest interaction is between the Co (A) cations in tetrahedral sites and the Cr cations (B) in the octahedral sites. It is possible to realize that a selective dilution in one of the two sublattices leads to different distribution and ratios between the strenght of the magnetic interactions.
Recently V.Sagredo et al. reported for this system spin-glass behaviour in low concentration samples for $x \leq 0.15$, due to the random positions of the $Co^{2+}$ and $Cr^{3+}$ ions in the sublattices.
The purpose of this work is to present the results of magnetization as a function of temperature in samples with chromiun concentration: x = 0.25 and x = 0.4.
The high temperature data for T > 250 K allows us to determine the paramagnetic Curie temperature and the others factors characteristic for ferrimagnetic materials.
However the low temperature magnetization data, T< 240, is faily anomalous because presents a maximun at about 175K and a further decreasing towards the zero magnetization axis. This behaviour was interpreted in terms of a sublattice compensation mechanism typical for ferrimagnets with a compensation temperature.

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