is known, the total energy due to the internal forces can be computed. The experimental data from electronic absorption spectra are compared with those estimated on the bases of theoretical estimations.

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MAGNETIC AND ELECTRICAL PROPERTIES OF $Ca_2Fe_{1-x}Ni_xMoO_6$ DOUBLE PEROVSKITES

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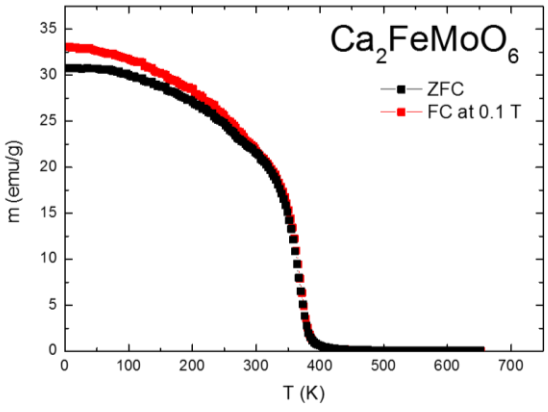
The Ca_2FeMoO_6 double perovskite is ferrimagnetically ordered, the Fe^{3+} and Mo^{5+} magnetic moments being antiparallely oriented. No presence of Ca_2NiMoO_6 compound has been reported. The above double perovskite was shown only in the strontium based system.

The $Ca_2Fe_{1-x}Ni_xMoO_6$ double perovskites have been prepared by solid state reaction. Solid solutions were obtained up to x = 0.2. Somewhat higher cobalt content (x = 0.5) can be substituted in Ca_2FeMoO_6. The $Ca_2Fe_{1-x}Ni_xMoO_6$ ($x \leq 0.2$) compounds crystyallize in a monoclinic-type lattice, having $P2_1/n$ space group. The lattice parameters increase as the nickel content is higher. From the composition dependence of the lattice parameters, a Ni^{2+} valence state is suggetsed. Thus, the nickel substitution leads to the formation of Ni^{2+}-Mo^{6+} pairs that replaced the Fe^{3+}-Mo^{5+} ones.

The saturation magnetizations, at 4 K, decrease from 3.48 μ_B/f.u. (x = 0), with a rate of 0.6 μ_B per substituted Ni atom. The presence of Ni^{2+}-Mo^{6+} pairs involves a decrease of magnetization with a rate of 1 μ_B per substituted Ni atom. The antisite effects as well as the cluster glass behaviour – Fig.1 – can explain the smaller rate for decreasing magnetization, as experimentally observed.



The $Ca_2Fe_{1-x}Ni_xMoO_6$ compounds show a metallic behaviour. The resistivities increase as the nickel content is higher. The above dependence can be correlated with the evolution of the number of Ni^{2+}-Mo^{6+} pairs. The magnetoresistivities were analysed considering both the intergrain tunneling contributions as well as the intragrain ones.

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