substance: Mn_2O_3
property: magnetic properties

magnetic susceptibility of pure and doped samples: Figs. 1...4.

Two magnetic transitions are found; one, at 79...80 K (T_{N1}) corresponds to incipient antiferromagnetic ordering and the other, at 25 K (T_{N2}), accompanied by a first-order change in χ by a factor of two. For Fe doped material T_{N2} decreases and vanishes for x > 0.028 (Fig. 5) [68G].

Hypothesized spin structure for the cubic bixbyite phase: Fig. 6.

References:

68G Grant, R. W., Geller, S., Cape, J. A., Espinosa, G. P.: Phys. Rev. 175 (1968) 686.
70G Geller, S., Espinosa, G. P.: Phys. Rev. B1 (1970) 3763.

Fig. 1.

$(Mn_{1-x}Fe_x)_2O_3$. Magnetic susceptibility vs. temperature for five differently doped ceramic samples [68G]; Arrows point to magnetic transition temperature. χ_g in CGS-emu.

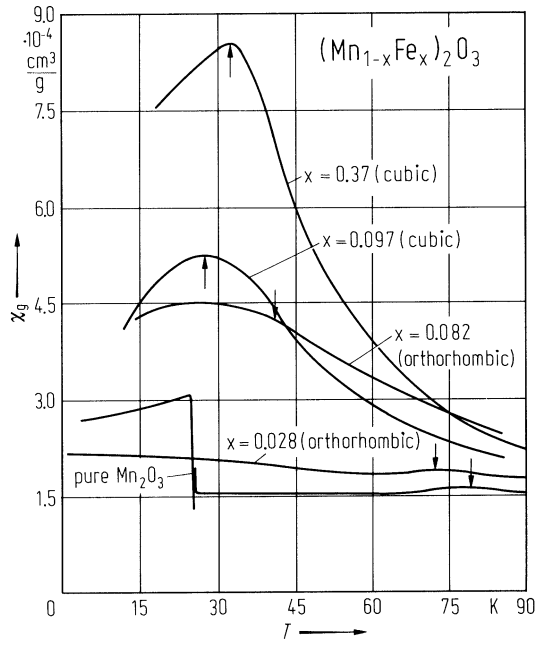

Fig. 2.

$(Mn_{1-x}Sc_x)_2O_3$. Magnetic susceptibility per mol of substance (gross formula) vs. temperature for four differently doped ceramic samples [70G]. χ_m in CGS-emu.

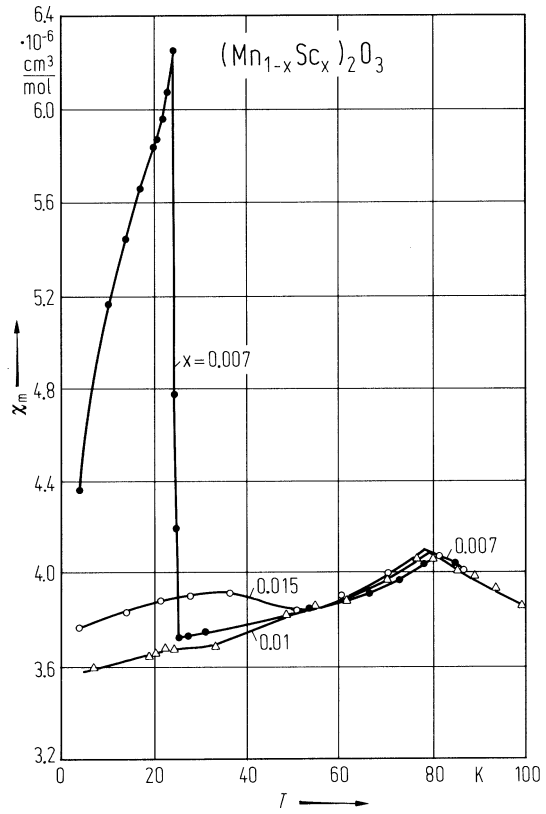

Fig. 3.

$(Mn_{1-x}Cr_x)_2O_3$. Magnetic susceptibility per mol of substance (gross formula) vs. temperature for six differently doped ceramic samples [70G]. χ_m in CGS-emu.

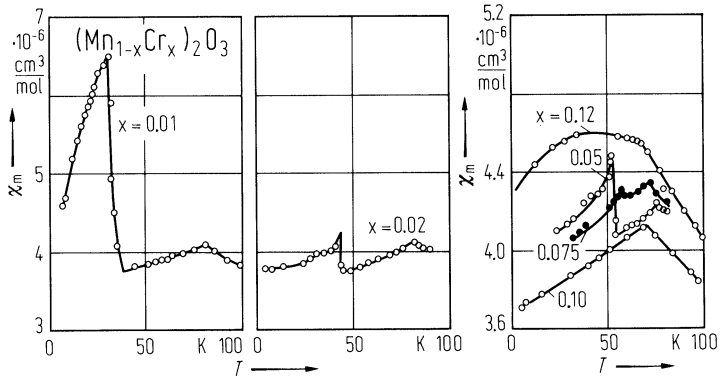

Fig. 4.

$(Mn_{1-x}Ga_x)_2O_3$. Magnetic susceptibility per mol of substance (gross formula) vs. temperature for ten differently doped ceramic samples [70G]. χ_m in CGS-emu.

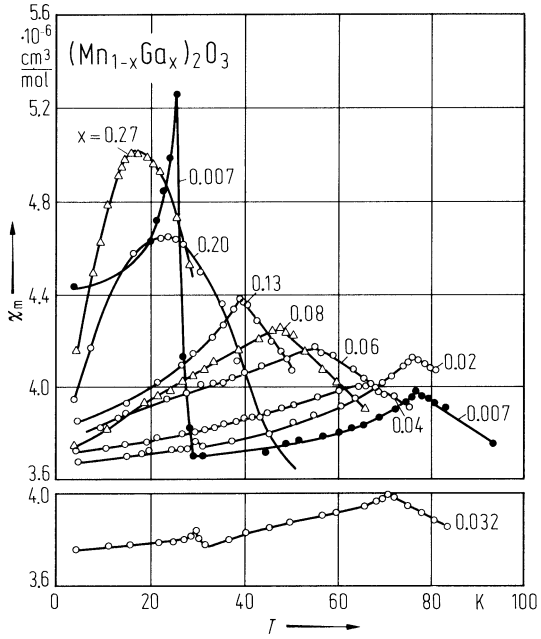

Fig. 5.

$(Mn_{1-x}Fe_x)_2O_3$. (a) Crystallographic transition temperature, (b) upper Néel temperature (inset: lower Néel temperature), (c) difference $T_{tr} - T_{N1}$ vs. composition. Open circles: X-ray diffraction, open triangles: Moessbauer spectroscopy, full triangles: magnetic susceptibility [68G].

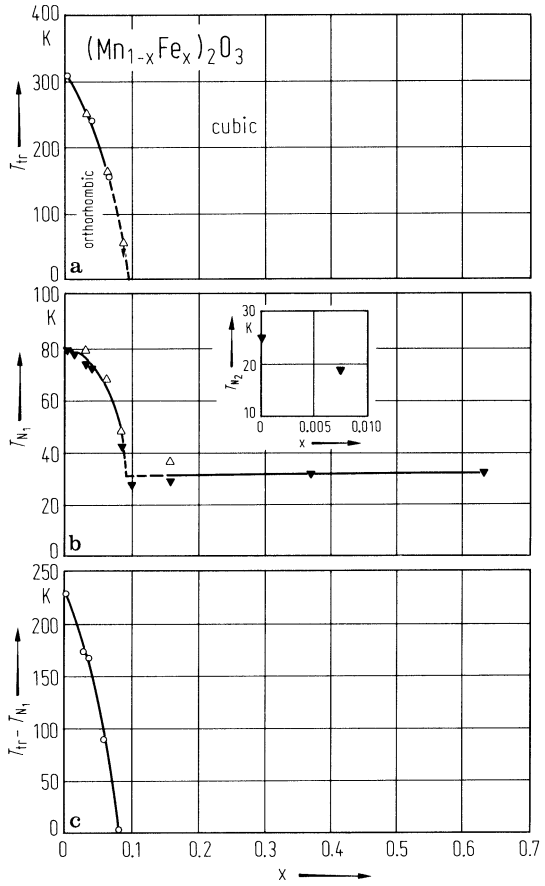

Fig. 6.

Mn_2O_3. Proposed magnetic structure for cubic phases belonging to T_h^7 -Ia3 [68G]. Shown are spin directions on b sites (along 3-fold axes) and d sites (in planes perpendicular to 2'-fold axes).