

Abstract Submitted
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Magnetic Ordering Temperature Dependence on Dilution in a 3D-XY Ferromagnet¹ G.C. DEFOTIS, W.M. MAY, T.M. OWENS, R.A. HUDLESTON, B.R. ROTHERMEL, J.H. BOYLE, E.S. VOS, Y. MATSUYAMA, A.T. HOPKINSON, College of William and Mary — The rare 3D-XY insulating ferromagnet Fe(III) bis(diselenocarbamate) chloride has been diluted with diamagnetic Zn(II) bis(dithiocarbamate), to the extent 3.6%, 7.9%, 13.7% and 20.2% in a series of mixtures. Since such magnetic systems are rare, and since the iron material is also a molecular ferromagnet of quite unusual type, the dilution dependence of the ordering characteristics is of considerable interest. Analysis of susceptibility and magnetization data on the several compositions yield the dilution dependence of the magnetic ordering temperature over a fairly broad range of composition. Below 10% dilution the relative decrease in the ordering temperature is much smaller than seen in most dilute systems or in theoretical calculations. At 13.7% dilution the rate of relative decrease of the ordering temperature is much increased, but the ordering temperature itself is only 10.6% below that of the pure system. Near 20% dilution a slight flattening of the ordering temperature vs composition curve appears. Behavior of this general qualitative type has been seen in certain materials previously. But the numerical details of relative variation of ordering temperature with dilution seen here are quite different from prior examples.

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