Abstract Submitted
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A Dilute Three-Dimensional XY Ferromagnet G.C. DEFOTIS, T.R. LEFTWICH, R.A. HUDDLESTON, B.C. ROTHERMEL, J.H. BOYLE, E.S. VOS, College of William and Mary, Williamsburg, VA 23187-8795 — Iron(III) bis(diselenocarbamate) chloride is a pentacoordinate molecular ferromagnet ordering near 3.4 K. The unusual site symmetry yields a spin 3/2 ground state. A rather substantial zero-field splitting occurs, with D positive, leading to XY like magnetic properties at low temperature. Significant exchange interactions occur between molecules via Fe-Se...Se-Fe contacts, without substantial spatial anisotropy. It is of interest to examine the effects of diamagnetic dilution on such a system. We have succeeded in dissolving modest amounts of diamagnetic Zn(II) bis(dithiocarbamate) into the Fe(III) system lattice. Analysis of susceptibility and magnetization data reveals a sizable reduction of the magnetic ordering temperature of the pure material on dilution. Comparisons are possible with previous work in which dilution of the approximate 3D-Ising system Fe(III) bis(dithiocarbamate) chloride was studied.
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