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Magnetic Properties of the Insulating Lower Dimensional Mixed Magnet Mn/Ni Dichloride Monohydrate[1] G.C. DEFOTIS, T.M. OWENS, W.M. MAY, J.H. BOYLE, E.S. VOS, Y. MATSUYAMA, A.T. HOPKINSON, College of William and Mary — This new mixed magnet is composed of the lower dimensional insulating magnets Mn dichloride monohydrate and Ni dichloride monohydrate, both studied previously by us. Each is a quasi-one-dimensional Heisenberg system with antiferromagnetic ordering appearing near 2.17 K (Mn system) and 5.6 K (Ni system) due to interchain exchange. The mixed system has been prepared and studied across the complete composition range. High temperature magnetic susceptibilities are analyzed to yield Curie and Weiss constants of mixtures. Analysis of the composition dependence of the Weiss constant implies that unlike-ion exchange interactions are comparable to like-ion interactions and are ferromagnetic. The temperature and composition dependence of magnetization isotherms is also examined. Most notable is the dependence of the magnetic susceptibility on temperature and composition. The kind of maxima seen for the pure components do not appear in mixtures, though sometimes subtler features can be identified. This behavior, across the entire composition range, seems to be unprecedented. Presumably disorder resulting from mixing, along with the lower dimensional character, is strong enough that magnetic long range order does not occur.

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