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Magnetic properties of a doped quasi-triangular lattice material, $\mathbf{Cu_{2(1-x)}Zn_{2x}(OH)_3NO_3/(C_7H_{15}COO)}$ JIAN WU, ANUP K. GANGOPADHYAY, S.A. SOLIN, Washington University in St. Louis — $Cu_2(OH)_3NO_3$,is a geometrically frustrated layered compound in which spin S=1/2 Cu^{2+} ions are arranged on a slightly distorted triangular lattice. The magnetic properties of the pure compound and of the compound intercalated with alkanecarboxylate have been extensively studied.[1] However, the effects of intralayer doping remain unexplored. The substitution of non-magnetic ions such as Zn^{2+} for Cu^{2+} will ultimately drive the ordering temperature toward zero [2] which may provide a candidate system possessing an exotic spin-liquid ground state. We have prepared powder samples of the $Cu_{2(1-x)}Zn_{2x}(OH)_3NO_3$ family and systematically investigated them by magnetic susceptibility measurements. The ordering temperature decreases from 11K to 5.6K while the C-W temperature increases from -5.1K to +2.8K as the Zn concentration increases from 0 to 65%. To enhance the 2-dimensional characteristic and reduce the interlayer interaction, we introduce an alkanecarboxylate $C_7H_{15}COO$ into the interlayer space. The experimental results we have obtained indicate that this new class of materials have much higher frustration levels $|\Theta_{cw}\ /T_c| \sim 20$ and order at a lower temperature than the doped parent compounds.

[1] M. A. Girtu et al, Phys Rev B 61,4117(2000).
[2] M. Mekata et al, J. Phys. Soc. Japan 56, 4544(1987).

Jian Wu
Washington University in St. Louis

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