Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Magnetic order and glassiness in distorted triangular lattice materials, $\mathbf{Cu_{2(1-x)}Zn_{2x}(OH)_3NO_3/(C_7H_{15}COO)}$ JIAN WU, FLETCHER WERNER, JULIA S. WILDEBOER, ALEXANDER SEIDEL, ZOHAR NUSSINOV, S.A. SOLIN, Washington University in St. Louis — We have synthesized two series of distorted triangular lattice materials $Cu_{2(1-x)}Zn_{2x}(OH)_3M$, where M = NO_3^- or $C_7H_{15}COO^-$, by hydrothermal reaction. The powder X-ray diffraction measurements show that the substitution of Zn for Cu leads to a series of isostructural doped compounds [1]. The $C_7H_{15}COO^-$ long chain intercalated samples display a series of intense $(00l)$ reflections, which signals their enhanced 2D structures with an almost doping-independent interlayer distance 24.2Å. In the DC magnetic susceptibility data for all NO_3^- samples, we observe clear evidence of transitions from a paramagnetic to antiferromagnet phase. The onset of long-range order is further proven by the prominent features in specific heat data. However, all the long chain intercalated samples were found to display several spin-glass-like behaviors. A clear bifurcation between the ZFC and FC data was observed at T $<$ 15K. The time evolution of isothermal remnant magnetization M_{ZFC}(t) has a linear dependence on $\ln(t)$. No peak features or broad maximum have been discovered in the specific heat measurements. Further analysis of the above results suggest that the long chain intercalated samples are cluster spin glasses at low temperature.
[1] J.Wu et al, J. Phys. Condens. Matter. 22, 334211(2010).

Jian Wu
Washington University in St. Louis

Date submitted: 14 Dec 2010 Electronic form version 1.4