

## **Session XC26 - Ladders, Chains, and Charge Density Waves.**

*ORAL session, Friday morning, March 26  
Room 170W, GWCC*

### **[XC26.09] Magnetic Properties of the Doped Spin-Chain Compound $\text{Ca}_{2+x}\text{Y}_{2-x}\text{Cu}_5\text{O}_{10}$**

*M. D. Chabot, J. T. Markert (The University of Texas at Austin)*

- We report the results of heat capacity, x-ray diffraction, and SQUID magnetometry studies of polycrystalline and magnetically aligned  $\text{Ca}_{2+x}\text{Y}_{2-x}\text{Cu}_5\text{O}_{10}$ , which contains infinite one-dimensional chains.  $\text{Ca}_2\text{Y}_2\text{Cu}_5\text{O}_{10}$ , the  $x=0$  parent compound of this system, exhibits long-range antiferromagnetic order with  $T_N=28$  K. Susceptibility measurements suggest that the nature of the magnetic order is changing as holes are introduced, as observed previously.\* The  $x=2$  compound has a broad maximum at  $T=30$  K and a shoulder near  $T=13$  K. The samples were magnetically aligned in epoxy in a magnetic field of 8.2 T. Susceptibility measurements indicate that the easy axis is perpendicular to the planes containing the copper oxide chains. To further explore this system, specific heat measurements from 5-40 K were made on the  $x=0, 1,$  and  $2$  compounds. A sharp peak is observed for the undoped system at  $T_N$ . The peak flattens out and is barely visible for the intermediate doping level,  $x=1$ . However, results for  $\text{Ca}_4\text{Cu}_5\text{O}_{10}$  show a clear peak corresponding to the shoulder in the susceptibility at  $T=13$  K. \vskip 1 pt \*A.~Hayashi et al., Phys.~Rev.~B 58, 2678 (1998).