

Abstract Submitted  
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**Effect of Cu doping on the magnetism of  $\text{MnCo}_{2-x}\text{Cu}_x\text{O}_4$  cubic spinels** S.K. SINGH, M.S. SEEHRA, Department of Physics and Astronomy, West Virginia University, Morgantown-26506, WV, USA, S. THOTA, Department of Physics, Indian Institute of Technology Guwahati, Guwahati-781039, Assam, India —  $\text{MnCo}_{2-x}\text{Cu}_x\text{O}_4$  is a cubic spinel whose magnetic properties are not yet properly understood [1]. Here we report changes in the magnetic properties of  $\text{MnCo}_{2-x}\text{Cu}_x\text{O}_4$  samples with change in  $x = 0, 0.05$  and  $0.20$ . X-ray diffraction measurements of the samples, synthesized by the sol-gel method followed by calcination at  $700^\circ\text{C}$  for 2 hours, showed lines only due to the cubic spinel phase without any CuO impurity. Measurements of the magnetization “M” vs. temperature “T” in  $H=100$  Oe for the ZFC and FC modes showed ferrimagnetic ordering at  $T_c = 175$  K,  $175$  K and  $166$  K for  $x = 0, 0.05$  and  $0.20$  samples, respectively. However, for  $T \ll T_c$ , M for  $x = 0.05$  ( $0.20$ ) is smaller (larger) by a factor of three (five) as compared to that for the  $x = 0$  sample. Hysteresis loops for the  $x = 0.20$  sample show strong domain wall pinning. These unusual changes in the magnetic properties observed with Cu doping will be discussed in terms of changes in the site occupancies of  $\text{Cu}^{2+}$  ions on the A and B sites [2].

[1] P.A. Joy et al, J. Magn. Magn. Mater. 218, 229 (2000).

[2] J. D. Rall et al, Appl. Phys. Lett. 100, 252407 (2012).

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