

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Structure and properties of high-oxygen-pressure annealed  $\text{Sr}_{1-x}\text{La}_x\text{Co}_{0.5}\text{Fe}_{0.5}\text{O}_{3-d}$  ( $0 \leq x \leq 0.5$ )** S. REMSEN, K. SWIERCZEK, B. DABROWSKI, L. SUESCUN, S. KOLESNIK, Department of Physics, Northern Illinois University, DeKalb, IL and Materials Science Division, Argonne National Laboratory, Argonne, IL — Synthesis, oxygen content, structural, magnetic, and resistive properties will be discussed for the  $\text{Sr}_{1-x}\text{La}_x\text{Co}_{0.5}\text{Fe}_{0.5}\text{O}_{3-d}$  perovskites. The  $x=0$  sample shows oxygen-vacancy ordered  $\text{Sr}_8\text{Co}_4\text{Fe}_4\text{O}_{23}$  tetragonal I4/mmm structure. With an increase of the La content the materials became oxygen stoichiometric and a lowering of the crystal symmetry is observed from cubic Pm3m ( $x=0.1$  and  $0.2$ ) to tetragonal I4/mcm ( $x=0.3$  and  $0.4$ ), and finally to monoclinic I12/c1 ( $x=0.5$ ). All samples show ferromagnetic ordering with the maximum Curie temperature near 290 K at  $x=0.2$ . Conductivity is enhanced and small negative magneto-resistance is observed below  $T_C$ . Transport measurements up to  $1100^\circ\text{C}$  show high conductivity that is affected by the varying oxygen content. Work at NIU was supported by the NSF (DMR-0706610) and at ANL by the U.S. DOE under contract No. DE-AC02-06CH11357.

Steven Remsen  
Department of Physics, Northern Illinois University, DeKalb, IL

Date submitted: 21 Nov 2008

Electronic form version 1.4