

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**High-pressure synthesis and unusual metallic conductivity of the A-site-ordered perovskite  $\text{CaCu}_3\text{Ir}_4\text{O}_{12}$** <sup>1</sup> J.-G. CHENG, J.-S. ZHOU, J.B. GOODENOUGH, University of Texas at Austin — Recently, much attention has been paid to the A-site-order perovskites  $\text{AA}'_3\text{B}_4\text{O}_{12}$  due to the observation of a large variety of intriguing physical properties. We have prepared an A-site-ordered perovskites  $\text{CaCu}_3\text{Ir}_4\text{O}_{12}$  under 9 GPa and 1250 °C with a Walker-type Multianvil module. Rietveld refinements to the room-temperature x-ray diffraction pattern confirmed the cubic structure with lattice parameter  $a = 7.47380(6)$  Å in the space group Im-3. Magnetic and transport properties measurements show that  $\text{CaCu}_3\text{Ir}_4\text{O}_{12}$  is a paramagnetic metal with unusual temperature dependence. The inverse magnetic susceptibility  $\chi^{-1}(\text{T})$  above 80 K follows the Curie-Weiss law with  $\mu_{eff} = 4.23 \mu_B/\text{f.u.}$  and  $\theta_W = -233$  K, while an unusual should-like feature is observed below 80 K. At the same temperature, the resistivity  $\rho(\text{T})$  deviates from a T-linear behavior and exhibits a strong downward temperature dependence down to 4 K.

<sup>1</sup>Supported by NSF-DMR-0904282.

J.-G. Cheng  
University of Texas at Austin

Date submitted: 03 Jan 2011

Electronic form version 1.4