

Abstract Submitted
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High-pressure synthesis and unusual metallic conductivity of the A-site-ordered perovskite $\text{CaCu}_3\text{Ir}_4\text{O}_{12}$ ¹ 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.

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