SUPPORTING INFORMATION

$Cu_3Ru_6Sb_8$—a new ternary antimonide with a new structure type

Jai Prakash,[a] Nian-Tzu Suen,[a] Minseong Lee,[b] Eun Sang Choi,[b] James A. Ibers,[c] and Svilen Bobev[a]

[a] Department of Chemistry and Biochemistry, University of Delaware, Newark, DE 19716, USA.
[b] Department of Physics and National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL 32310, USA.
[c] Department of Chemistry, Northwestern University, Evanston, IL 60208, USA.

Magnetic susceptibility.

The inverse susceptibility ($1/\chi$) data gathered at low applied field was fit using the modified Curie-Weiss law ($1/(\chi-\chi_0) = (T-\theta_{CW})/C$) with a temperature independent susceptibility term χ_0. As shown in Figure S1, the modified Curie-Weiss law reasonably fits the data. The following fitting parameters were obtained from the slope and the abscissas: effective moment equal to 0.78 μ_B, θ_{CW} = –8.8 K and $\chi_0 = 1.29 \times 10^{-3}$ emu/mol/Oe.

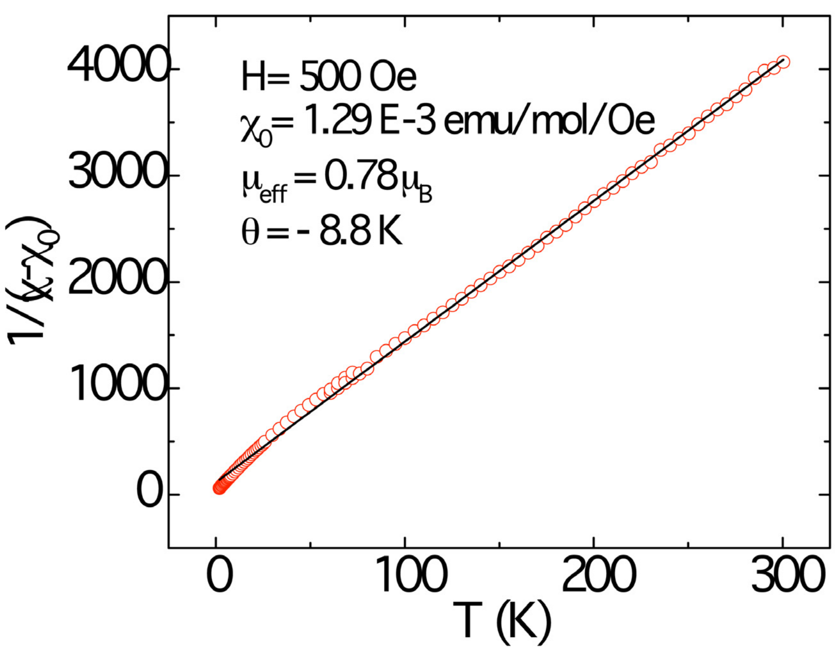

Figure S1. The modified Curie-Weiss fitting results of $Cu_3Ru_6Sb_8$ for H=500 Oe

Resistivity.

The temperature dependence of resistivity measured on a sintered polycrystalline pellet of $Cu_3Ru_6Sb_8$ shows a metallic behavior (Figure S2). The resistivity monotonically decreases on lowering the temperature until about 19 K. At lower temperatures, the resistivity is almost temperature-independent—a typical behavior for a metal. A resistivity of 2.35×10^{-6} Ω.m was estimated for $Cu_3Ru_6Sb_8$ at 300 K, also indicating a typical metallic-like conductivity. The residual resistivity ratio (ρ_{300K}/ρ_{5K}) of 3.2 is suggestive of grain-boundary contribution to the conductivity of the sintered polycrystalline pellet.

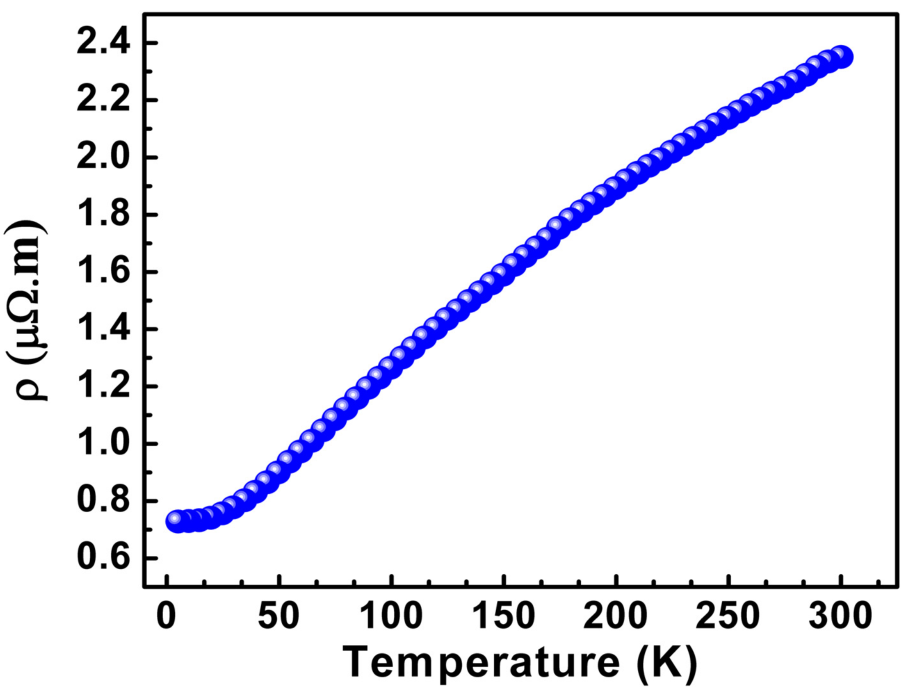

Figure S2. The temperature dependence of resistivity of polycrystalline $Cu_3Ru_6Sb_8$.

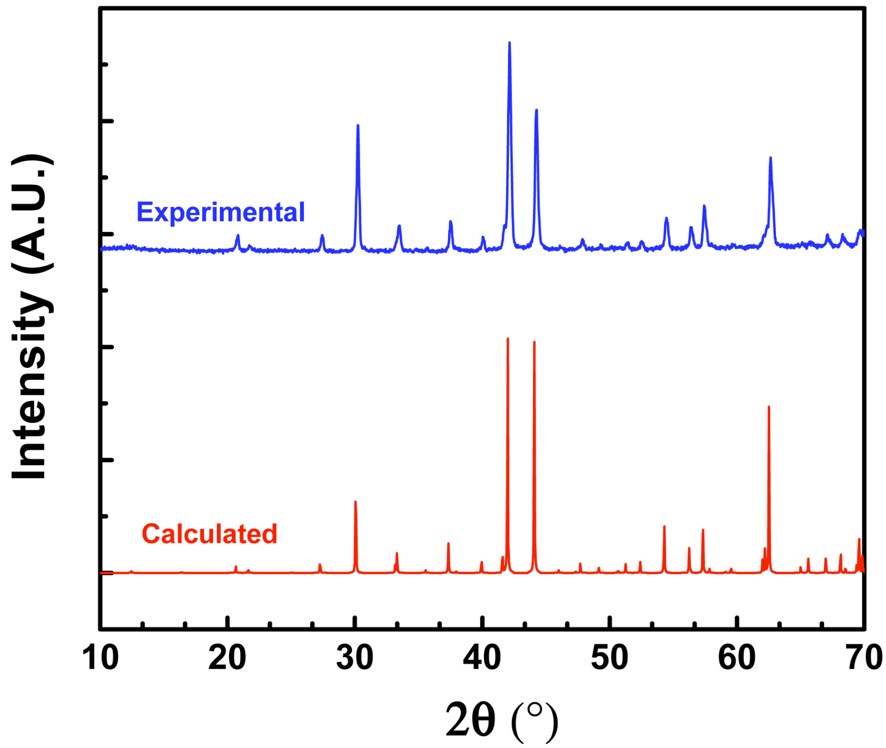

Figure S3. Experimental and calculated powder X-ray diffraction pattern of $Cu_3Ru_6Sb_8$.