Supplemental Material

Impact of in-plane disorders on the thermal conductivity of $AgCrSe_2$

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I. THERMAL CONDUCTIVITY

Fig. S1 compares two samples whose relative densities are slightly different to each other. As shown here, a small difference in the relative density does not change the thermal conductivity at low temperatures below ∼50 K as well as the peak height, although it affects the thermal conductivity at high temperatures.

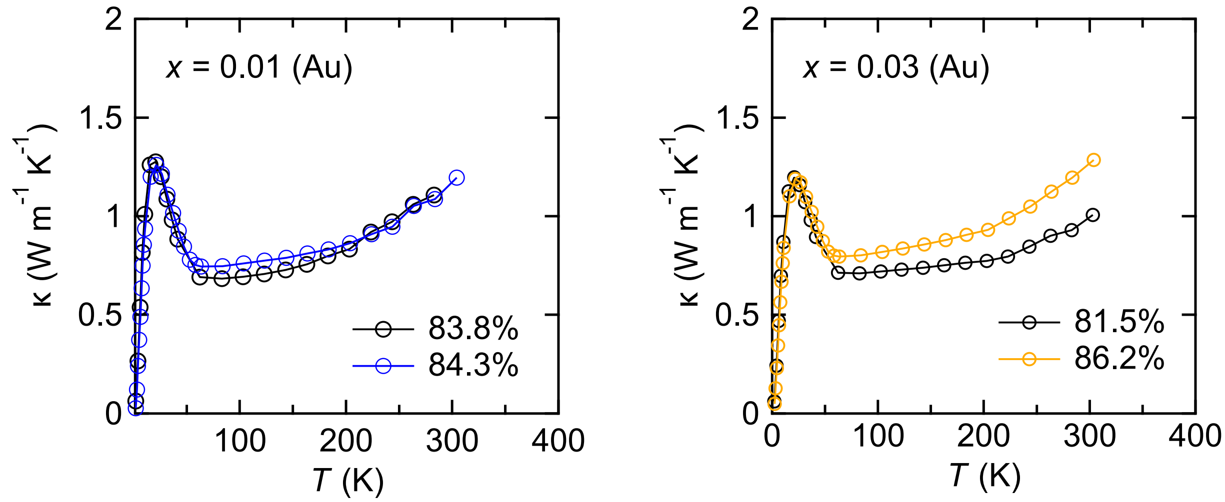

Figure S1. Thermal conductivity of $Ag_{0.97}Au_{0.03}CrSe_2$ polycrystals with relative density of 81.5% and 86.2%.

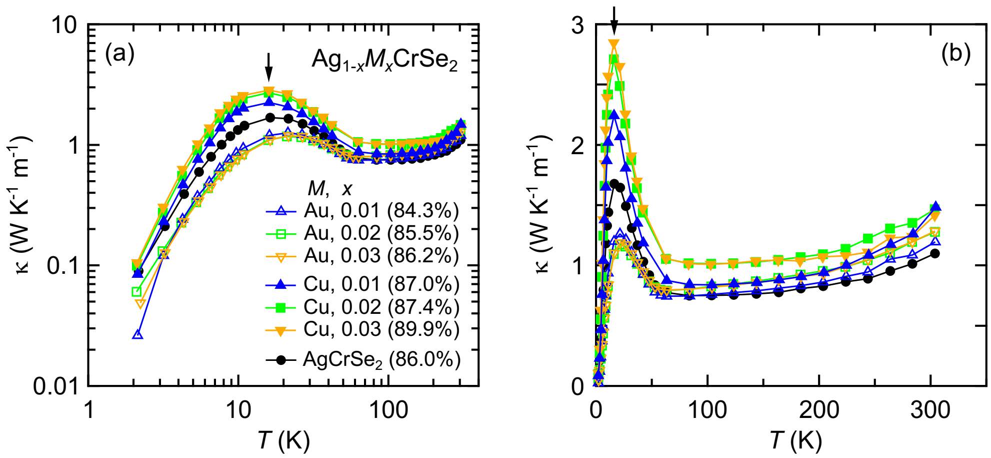

Figure S2. (a) Log-log and (b) linear plots of the thermal conductivity for $AgCrSe_2$ and $Ag_{1-x}M_xCrSe_2$ (M = Cu and Au) polycrystals. The numbers in the parentheses indicate the relative density of the samples.

II. DSC MEASUREMENT

図 S3(a)-(i) に、AgCrSe2(x=0), Au 置換、および Cu 置換 AgCrSe2 の DSC 測定結果を示す。各図には、昇温過程、降温過程での測定結果を示してある。AgCrSe2 の示す秩序-無秩序転移は一次転移であるため、heating と cooling ではヒステリシスが観測されている。heating と cooling でそれぞれ観測されているピーク位置の中点を、転移温度 (Tod) と定義する。

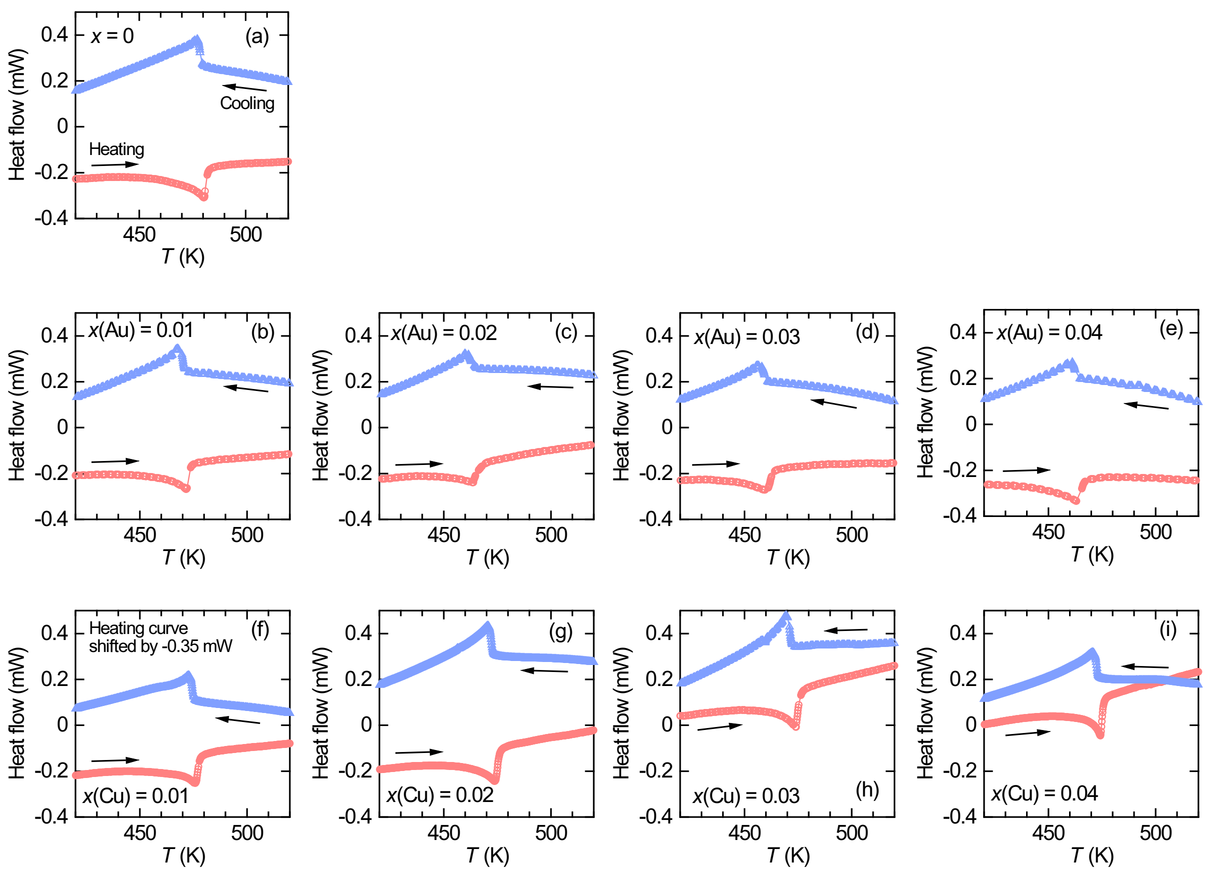

Figure S3. (a) Log-log and (b) linear plots of the thermal conductivity for $AgCrSe_2$ and $Ag_{1-x}M_xCrSe_2$ (M = Cu and Au) polycrystals. The numbers in the parentheses indicate the relative density of the samples.

図 S4 は、本文中の図 3 に示した試料とは異なる試料を用いて行った、DSC の測定結果を示す。Heating と Cooling 曲線が示すピークの位置の中点として求めた Tod を、(c) に示す。本文の図 3(d) の結果を基本的によく再現している。

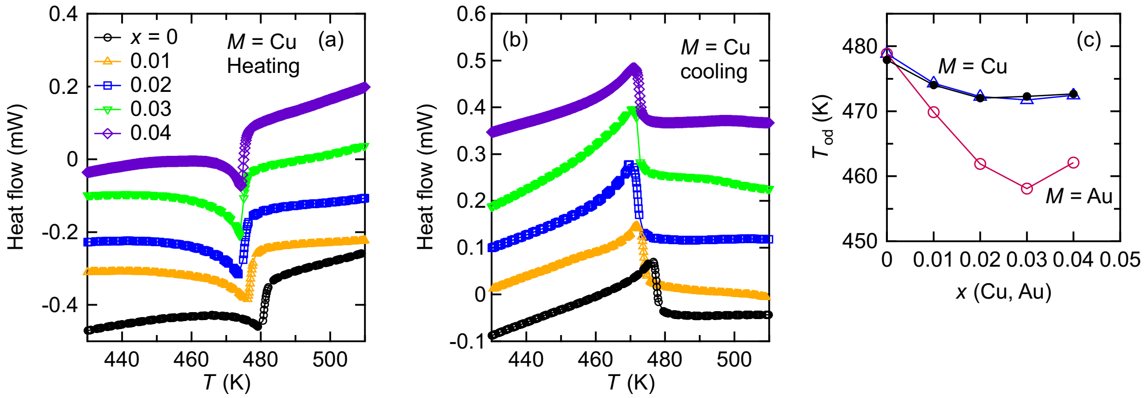

Figure S4. Cu-DSC.

III. SYNCHROTRON X-RAY DIFFRACTION AND STRUCTURE REFINEMENT

Powder x-ray diffraction was carried out at the BL19B2 beamline (SPring-8) at room temperature. The x-ray energy was set at 24 keV. Fine powder was filled into a fused quartz capillary with a diameter of 0.2 mm for the measurements. Obtained diffraction data were fitted using FullProf software. Figs. S5(a)–(c) display the synchrotron x-ray diffraction patterns of $AgCrSe_2$ and $Ag_{0.97}M_{0.03}CrSe_2$ (M = Cu and Au).

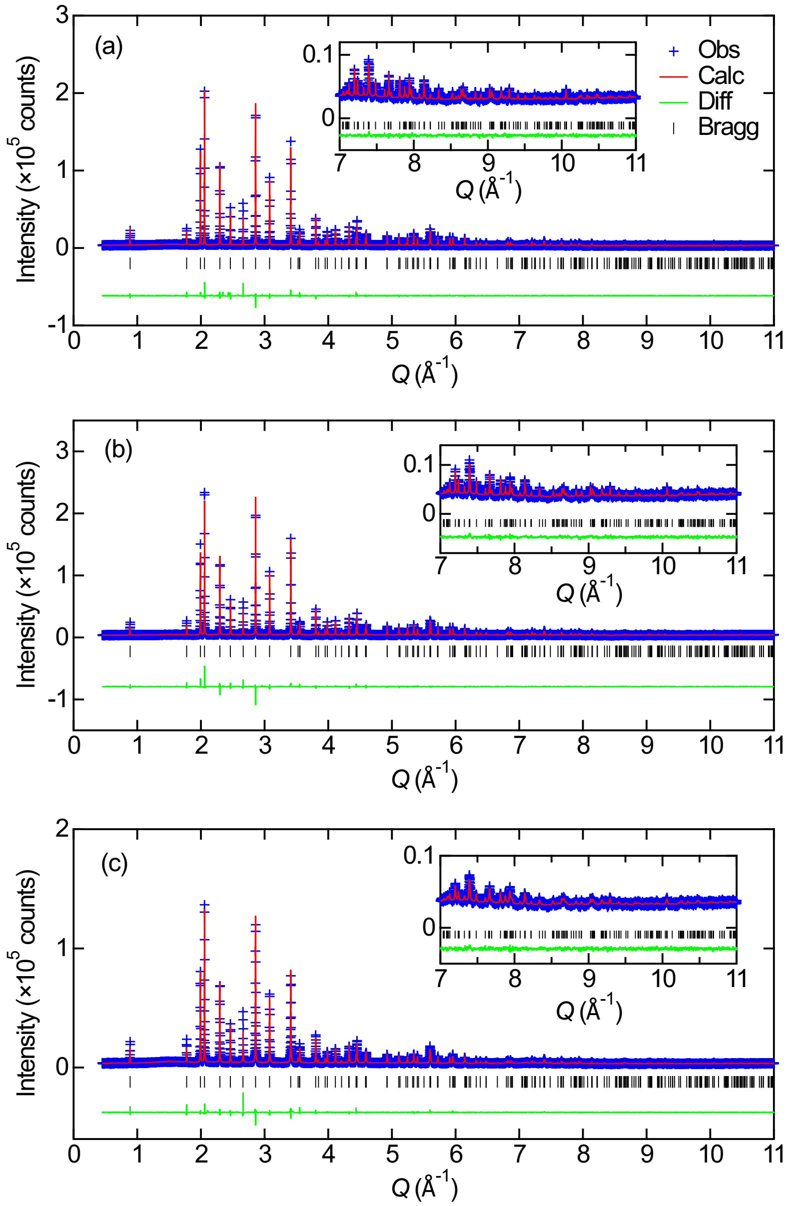

Figure S5. (a) Synchrotron x-ray diffraction patterns of (a) $AgCrSe_2$, (b) $Ag_{0.97}Cu_{0.03}CrSe_2$, and (c) $Ag_{0.97}Au_{0.03}CrSe_2$. The incidence x-ray energy is 24 keV (λ = 0.51689 Å, calibrated).