Supplementary Information to:

Graphene-induced Unusual Microstructural Evolution in Ag Plated Cu Foils

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A. Detailed texture analysis using EBSD

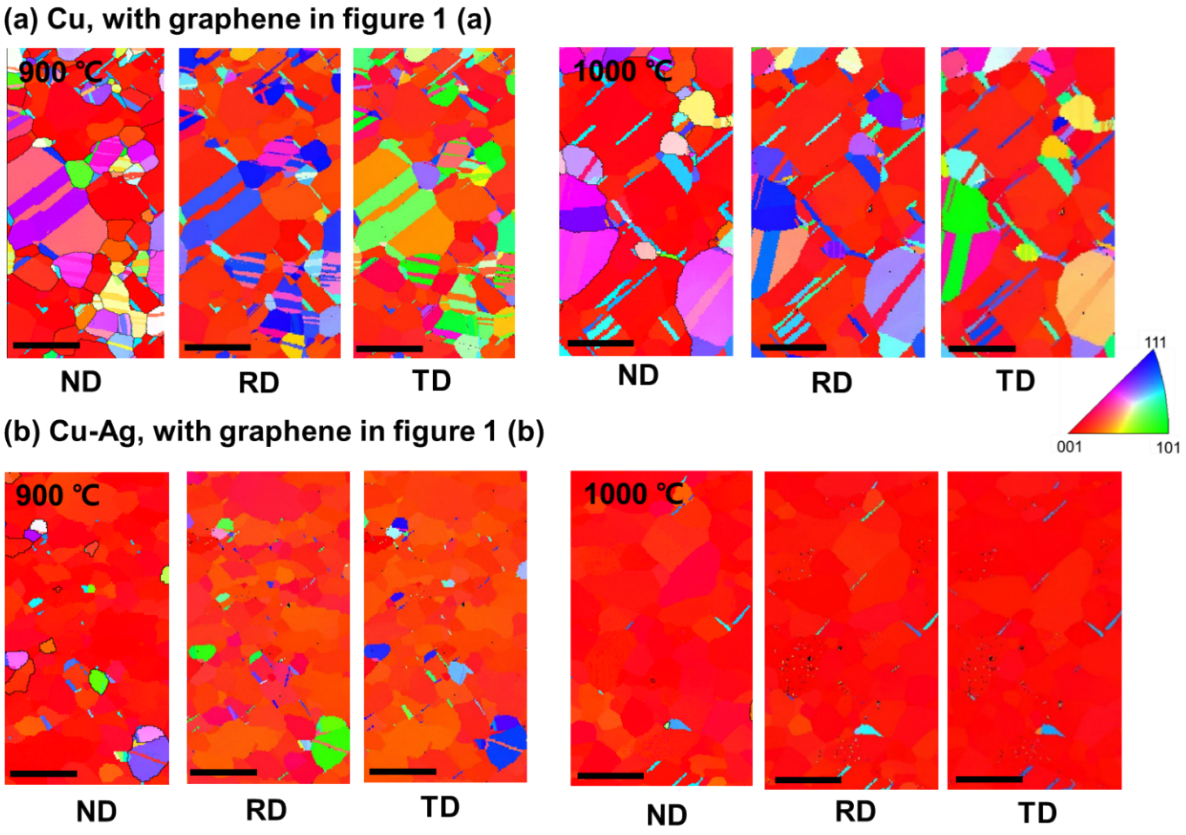

Figure S1 EBSD orientation maps of Cu with graphene synthesis on (a) Cu and (b) Cu-Ag and without graphene at 900 ℃, 1000 ℃ for 40 min, Scale bars (200 μm).

Figure S1 shows the EBSD orientation maps of Cu and Cu-Ag with graphene (after graphene synthesis at 900 ℃ or 1000 ℃ with CH4 gas for 40 min) and describes the results of the normal direction (ND), transverse direction (TD), and rolling direction (RD). ND is discussed only in the main text because this direction is the surface of the Cu foil and ND is significant for the discussion. A detailed texture analysis revealed that most of the observed (100) textured grains in ND possessed (100) texture in RD and TD and at the same time. For the consideration of all the results from the EBSD data of ND, RD, TD, grains

which have (100) orientation in ND mostly have (100)<100> texture. (100)<100> texture indicates the cube texture.

B. Grain size analysis

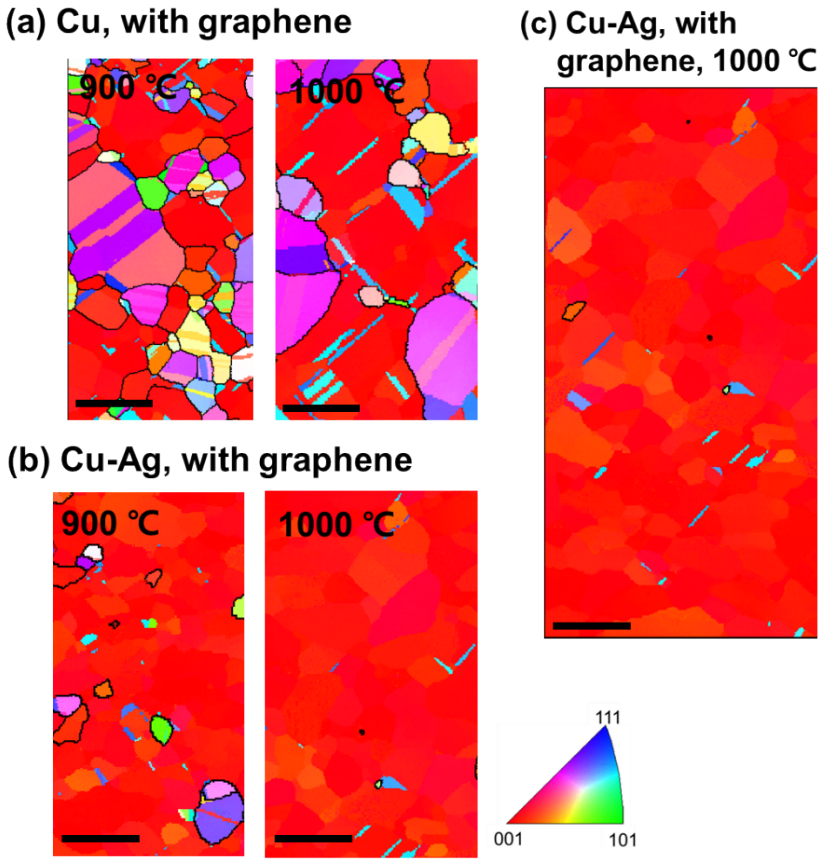

Figure S2 EBSD orientation maps of Cu with graphene synthesis on (a) Cu and (b) Cu-Ag at 900 ℃, 1000 ℃ for 40 min. (c) EBSD orientation maps of Cu-Ag with maximized measurement area of (b) for grain size calculation of cube texture. Every grain boundaries are highlighted with the thicker black lines. ; Scale bars (200 μm).

Figure S2a-b show the EBSD orientation maps of Cu and Cu-Ag which was shown in Fig.1 in the main text and the grain boundaries in these figures are highlighted more with bold black lines. Grain structure analysis for the calculation of grain size was conducted using REDS which is reprocessing program of EBSD Data in Seoul National University.[1] Grain identification is analyzed with the criteria of 5 ° which is the most common optimum criteria.

Figure S2c shows the largest EBSD result for Cu-Ag with graphene synthesis; Fig. 1b shows some part of this figure due to the same area comparison of all EBSD results. Most of Cu orientation is (100) and only very small regions are not (100), therefore the grain in this figure is considered almost one grain for grain size calculation. The width is 0.74 mm and the height is 1.43 mm, so the area is 1.05 mm^2. The maximum grain size is more 1.05 mm^2 because most of Cu orientation was (100) for every EBSD measurement with additional analysis of other samples.

[1] REDS, *Repressing of EBSD Data in Seoul National University*, User Manual, Texture Control Lab, Republic of Korea, 2002.