Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C

Electronic Supplementary Information for

Air-stable, surface-oxide free Cu nanoparticle for highly conductive Cu ink and their application to printed, graphene transistor

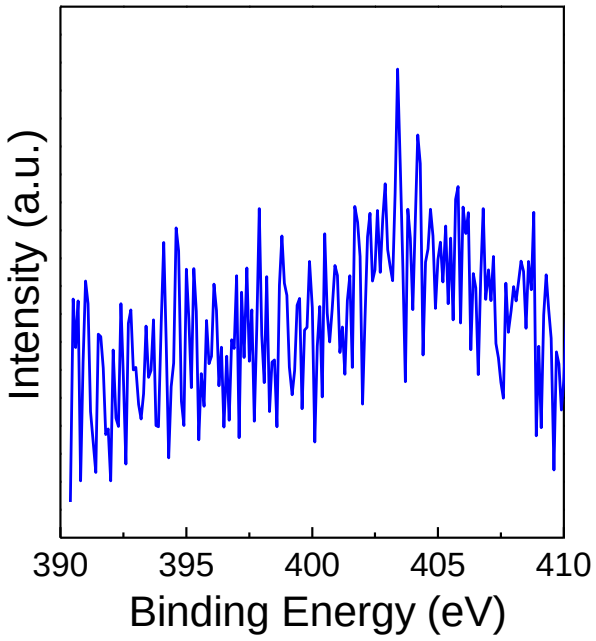

Fig. S1 XPS N 1s spectrum for surface-oxide free Cu nanoparticles.

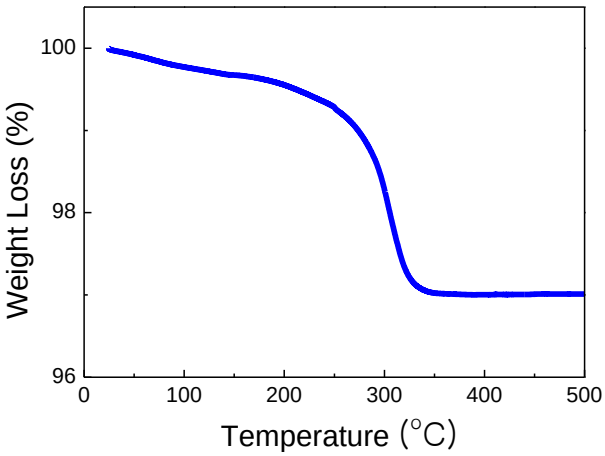

Fig. S2 Thermal gravimetric analysis curves of surface-oxide free Cu nanoparticles. The heating rate was 5 °C/min. The weight loss below 200 °C is attributed to the adsorbed solvent and the weight loss above 200 °C is due to a thermal decomposition of capping molecule, oleic acid.

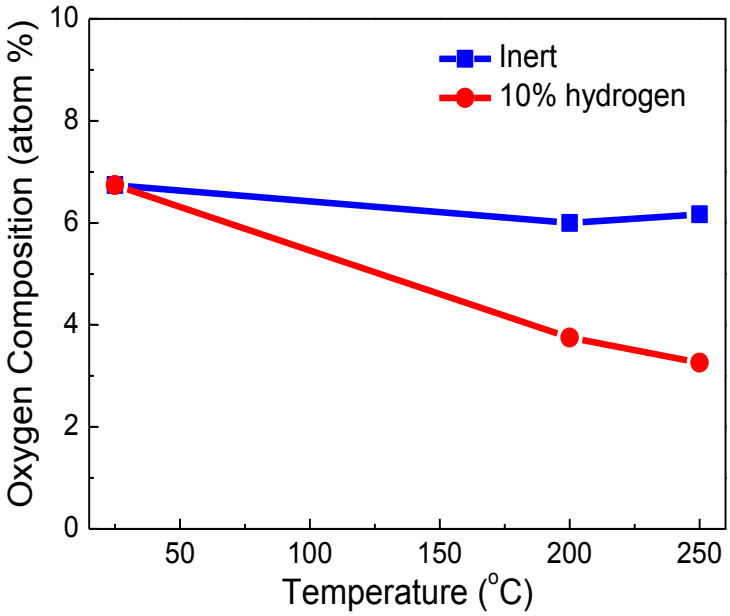

Fig. S3 The oxygen composition for Cu films annealed at different temperatures under either an inert or 10% hydrogen atmosphere.

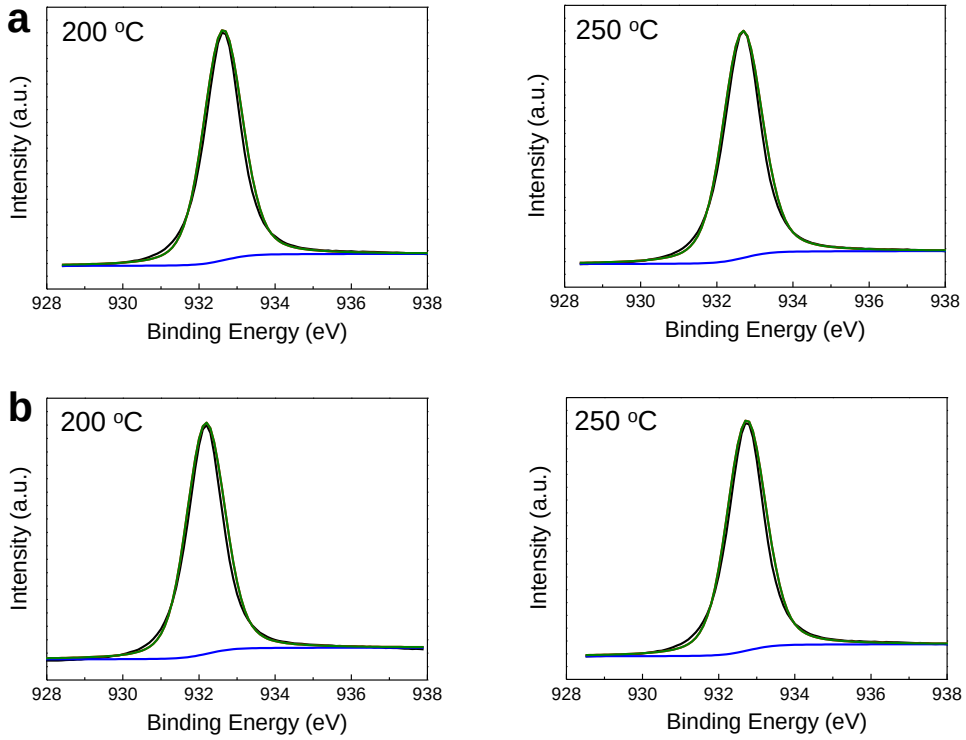

Fig. S4 Cu $2p_{3/2}$ spectra for solution-processed Cu electrode layer annealed under either (a) Ar atmosphere or (b) hydrogen (10%) atmosphere.

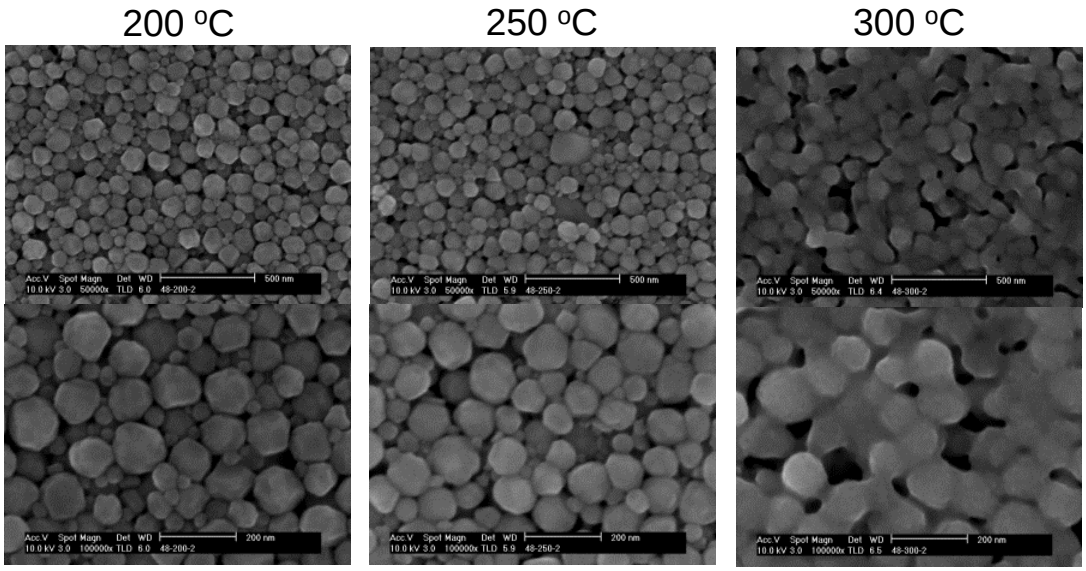

Fig. S5 Top-view SEM image for solution-processed Cu electrode layers annealed at 200, 250 or 300 °C under Ar atmosphere.

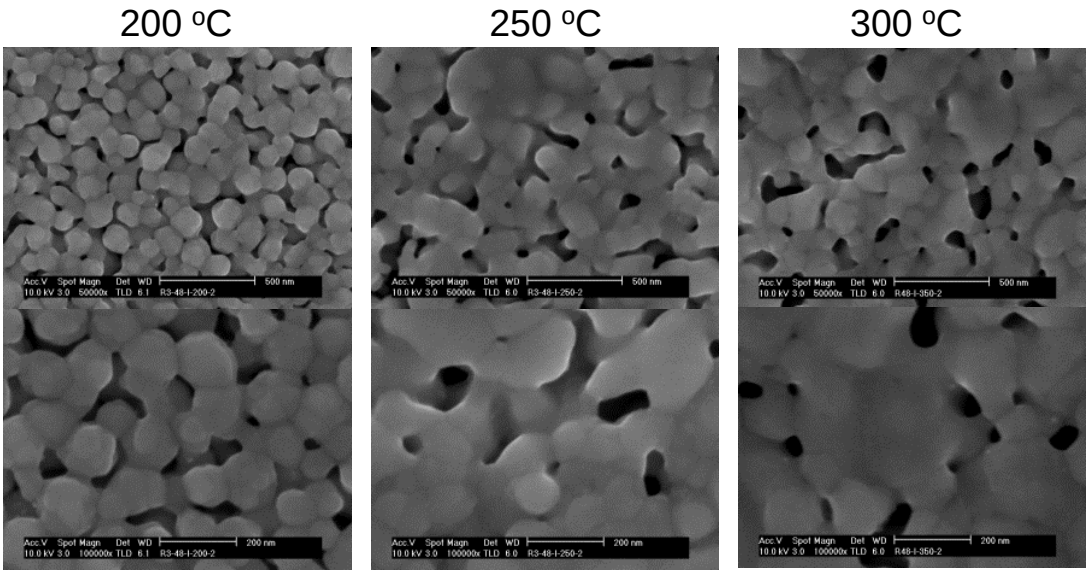

Fig. S6 Top-view SEM image for solution-processed Cu electrode layers annealed at 200, 250 or 300 °C under hydrogen (10%) atmosphere.

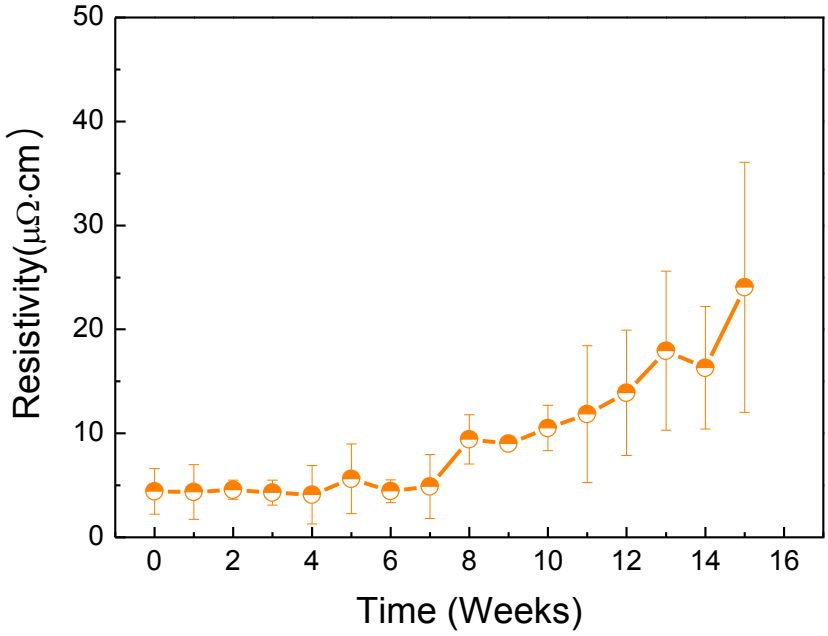

Fig. S7 The resistivity variation of Cu films prepared using Cu nanoparticles stored in ink for different timeframes up to 15 weeks.