Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary information

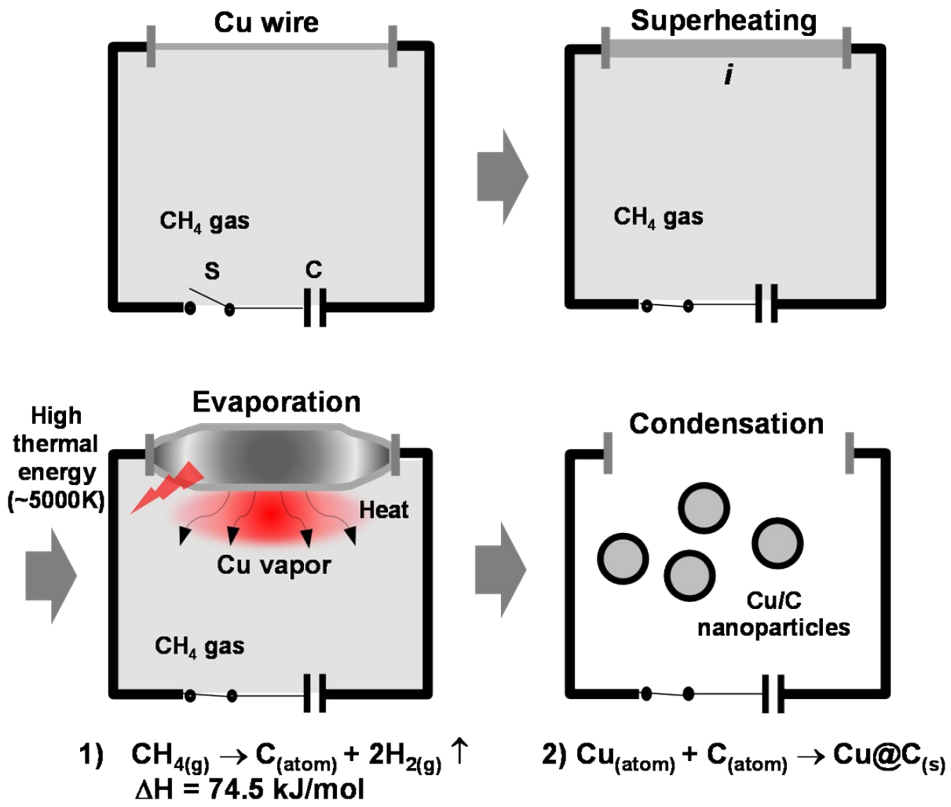

Figure S1. A schematic illustration of formation of the Cu/C core/shell NPs by the EEW method.

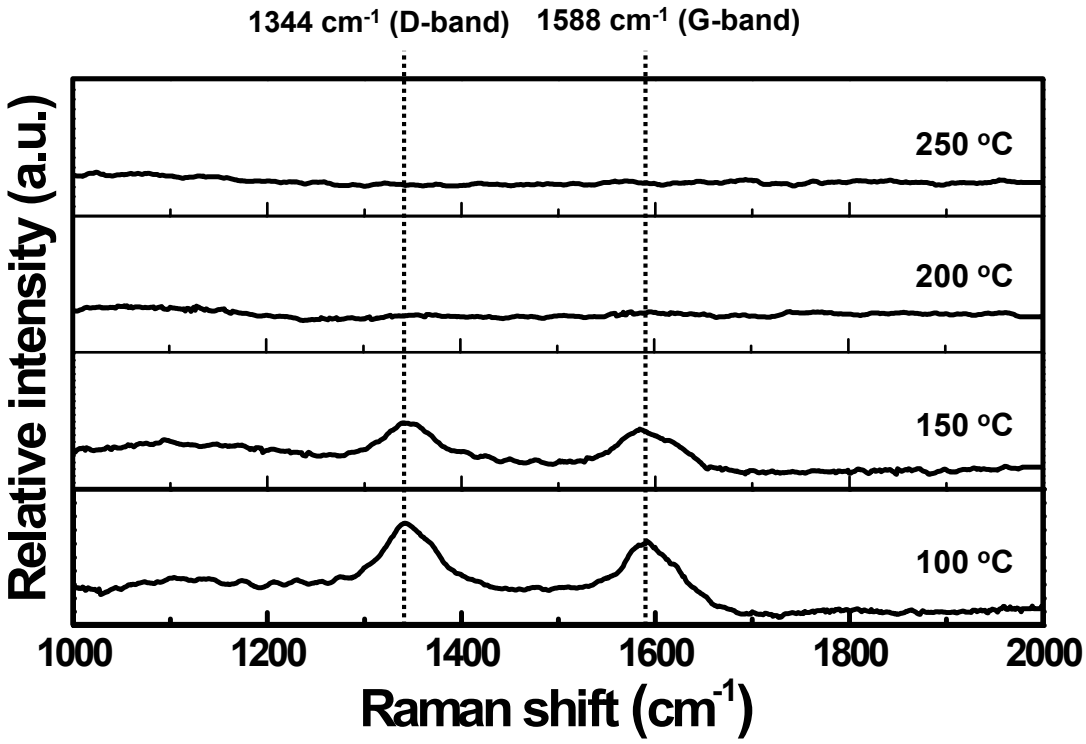

Figure S2. Raman spectra of the Cu/C NPs heat-treated at different temperatures in air.

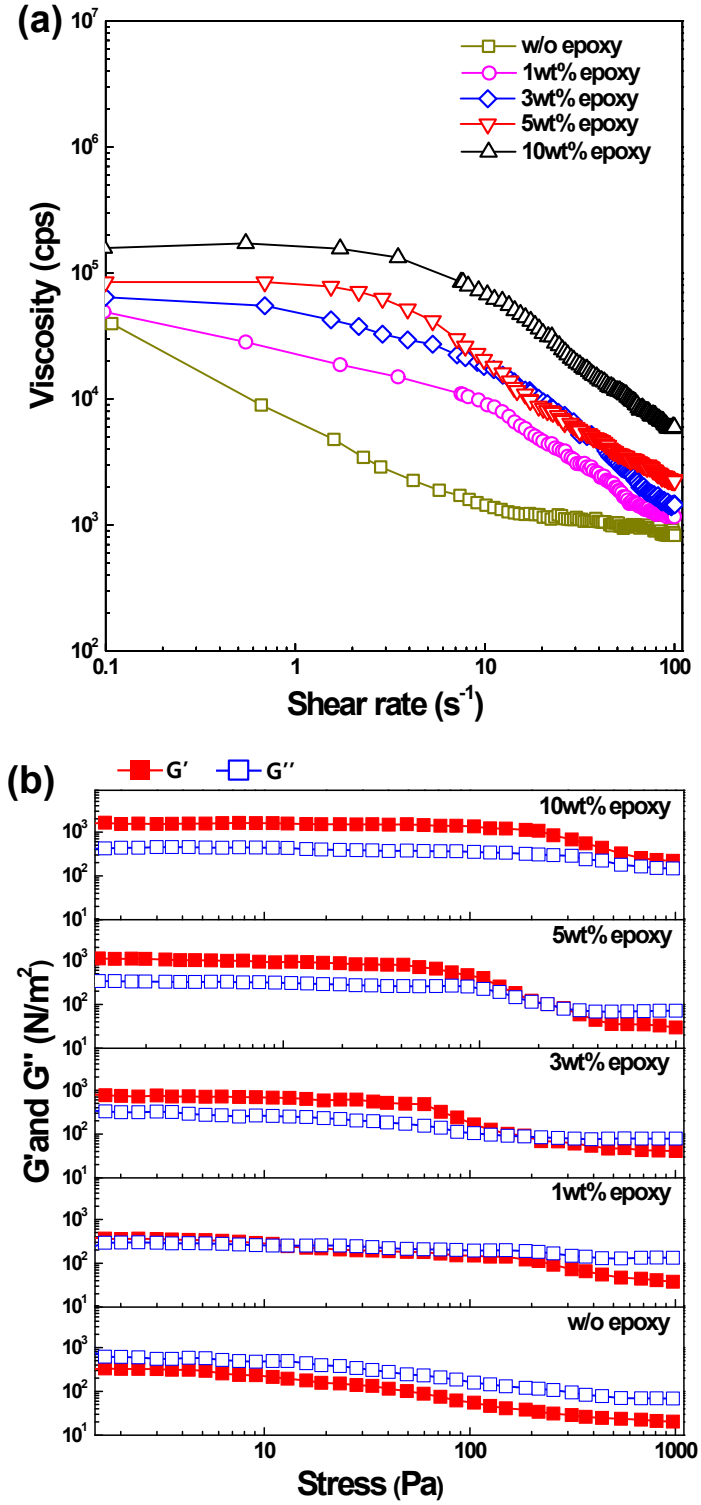

Figure S3. a) Viscosity vs. shear rate curves and b) oscillatory stress sweep for the Cu/C nanoinks formulated as a function of the epoxy content in EG.

Table S1. Summary of the rheological properties of the Cu/C nanoinks and the film characteristics.

Measured parameters	Ink 1[a)]	Ink 2[b)]	Ink 3[c)]	Ink 4[d)]	Ink 5[e)]
Viscosity test results					
shear rate 0.1 s^{-1} (cps)	39,567	49,254	64,268	84,722	157,467
shear rate 1.0 s^{-1} (cps)	6,819	22,955	48,256	82,688	161,435
shear rate 100 s^{-1} (cps)	829	1,194	1,860	3,286	5,897
Viscoelastic test results (amplitude sweep)					
Elastic modulus, *G*' (at 1 Pa, N/m^2)	319.5	369.0	817.1	1192.4	1842.5
Viscous modulus, *G*'' (at 1 Pa, N/m^2)	850.5	293.2	315.9	542.6	380.2
Cross-over stress, *G*' = G'' (Pa)	-	12.0	168.1	199.7	-
Elastic modulus, *G*' (at 1000 Pa, N/m^2)	20.4	38.0	40.5	51.8	217.7
Viscous modulus, *G*'' (at 1000 Pa, N/m^2)	68.3	82.2	125.6	152.2	162.5
Adhesion strength (Class)	0B	0B	3B	5B	5B
Electrical resistivity (μΩ·cm)	25.1	26.2	24.2	25.0	802

[a)] Ink 1: 65 wt% Cu/C NPs, 35wt% EG; [b)] Ink 2: 65 wt% Cu/C NPs, 34 wt% EG, 1 wt% epoxy binder, 6.8 phr hardener; [c)] Ink 3: 65 wt% Cu/C NPs, 32 wt% EG, 3 wt% epoxy binder, 6.8 phr hardener; [d)] Ink 4: 65 wt% Cu/C NPs, 30 wt% EG, 5 wt% epoxy binder, 6.8 phr hardener; [e)] Ink 5: 65 wt% Cu/C NPs, 25 wt% EG, 10 wt% epoxy binder, 6.8 phr hardener. All of the films were annealed at 200 °C for 5 min in air and 5min under Ar/10 % H_2 atmosphere.