Supporting Information

Reduced Graphene Oxide Wrapped Core-Shell Metal Nanowires as Promising Flexible Transparent Conductive Electrodes with Enhanced Stability

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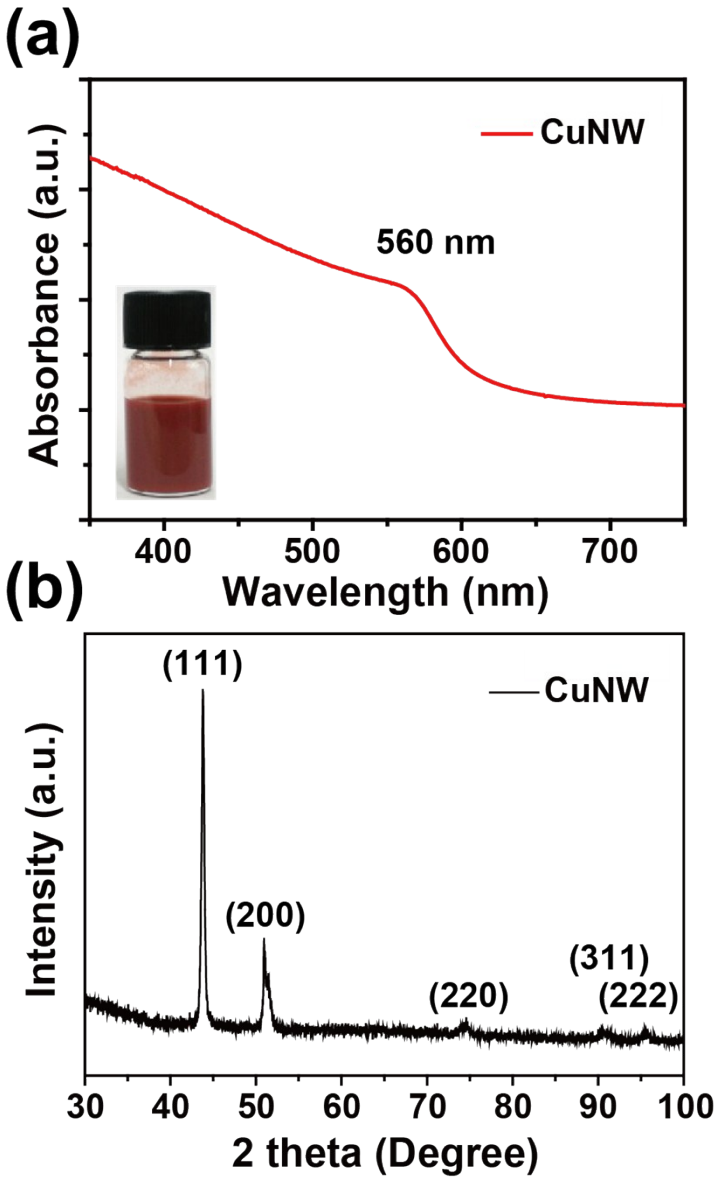

Figure S1. (a) UV-Vis absorption spectrum and (b) XRD pattern of CuNWs.

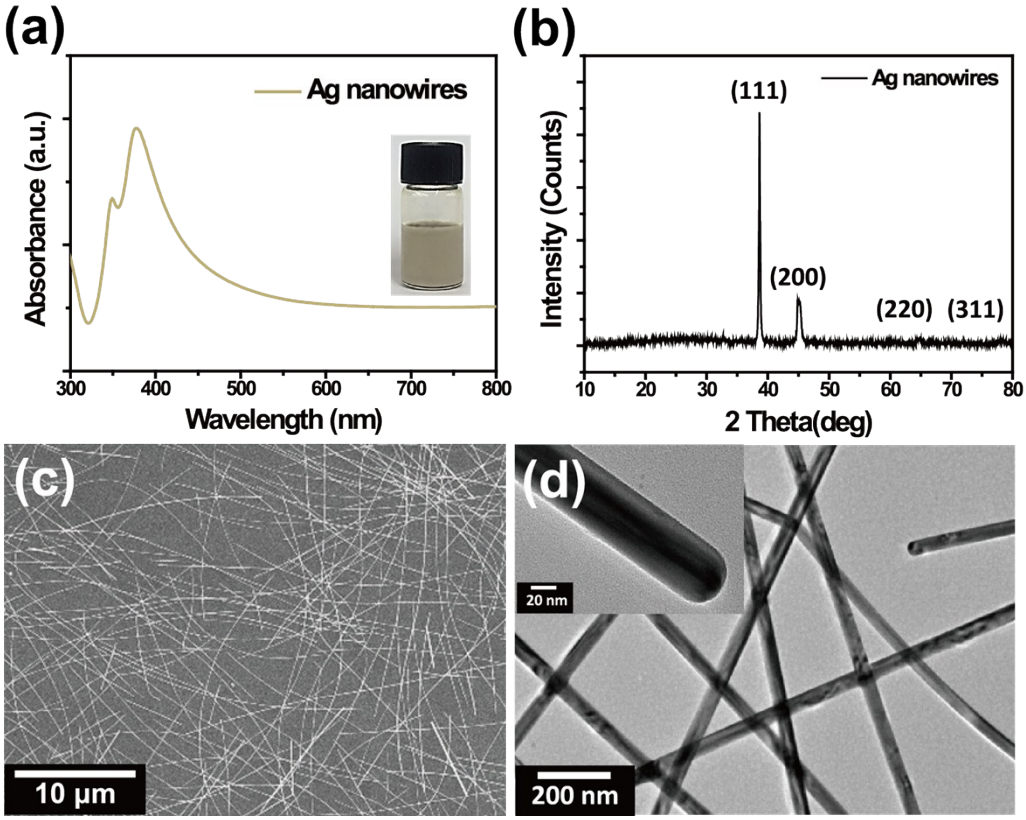

Figure S2. (a) UV-Vis absorption spectrum and (b) XRD pattern of AgNWs. (c) SEM and (d) TEM images of AgNWs.

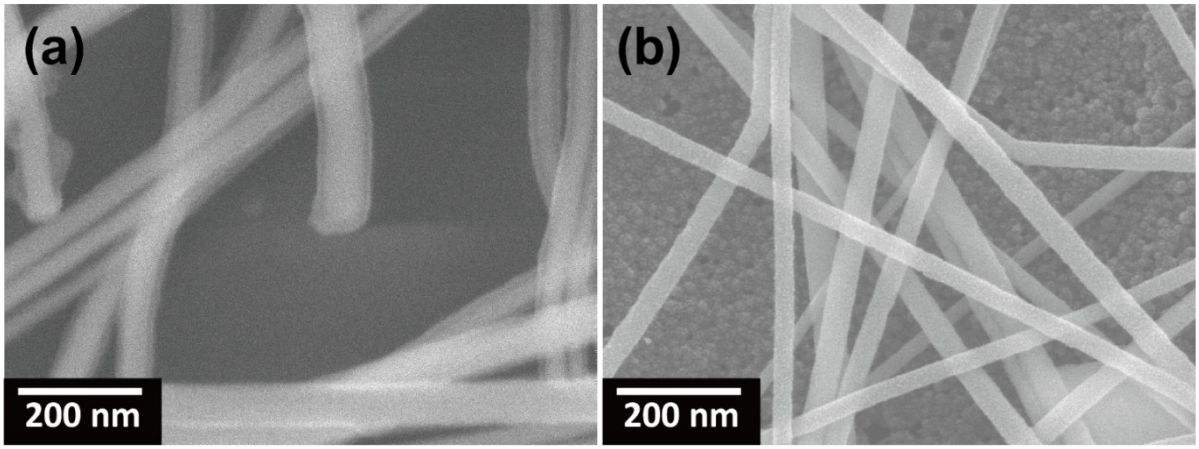

Figure S3. SEM images of CuNWs (a) before and (b) after acetic acid treatment.

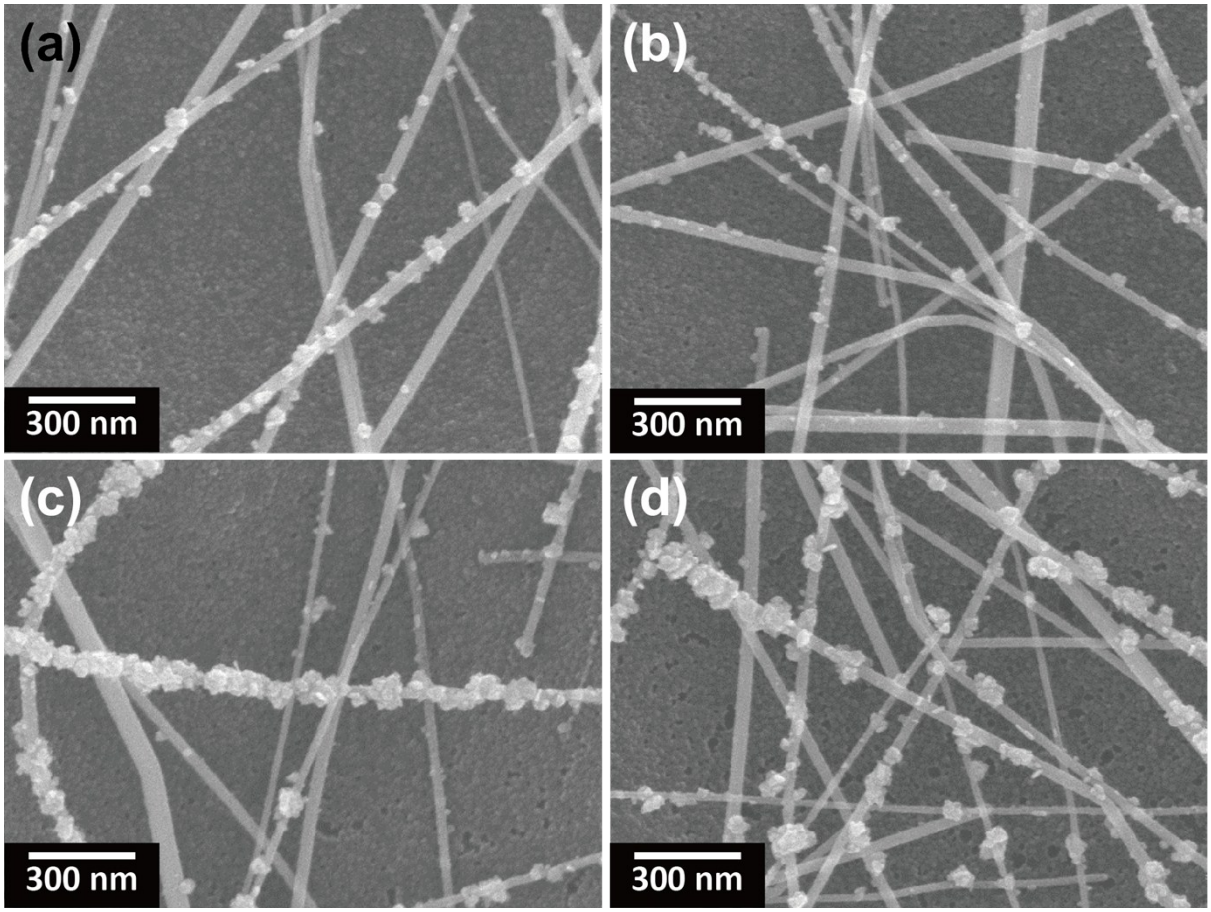

Figure S4. SEM images of Cu-AgNWs after 0.1 mM $AgNO_3$ solution dipping times of (a) 10, (b) 20, (c) 40, and (d) 80 min with copper oxide shell.

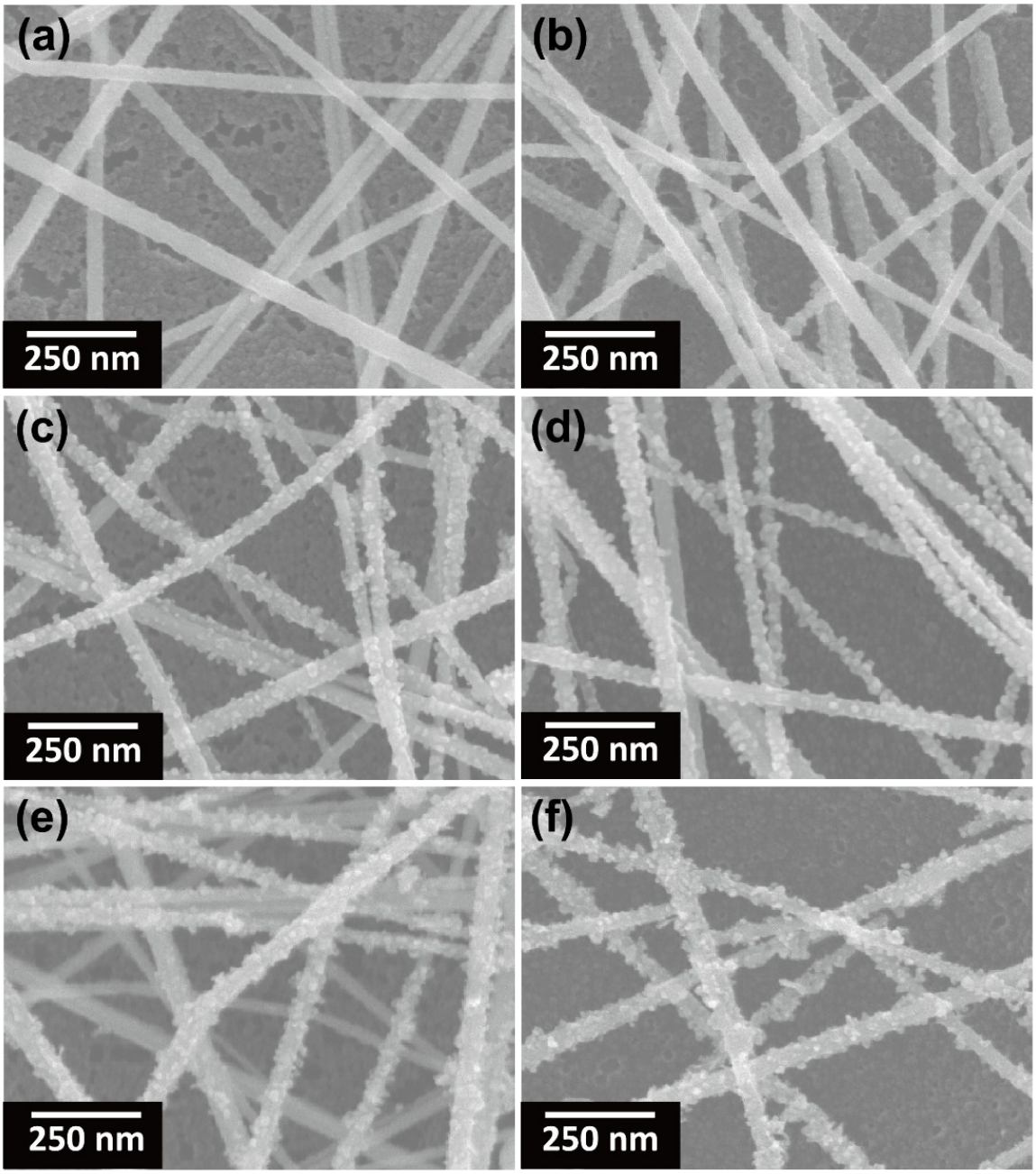

Figure S5. SEM images of Cu-AgNW TCEs after 0.1 mM $AgNO_3$ solution dipping times of (a) 1, (b) 3, (c) 10, (d) 20, (e) 40 and (f) 80 min. Before dipping in the $AgNO_3$ solution, Cu-AgNW TCEs are dipped in acetic acid to remove the oxidation layer.

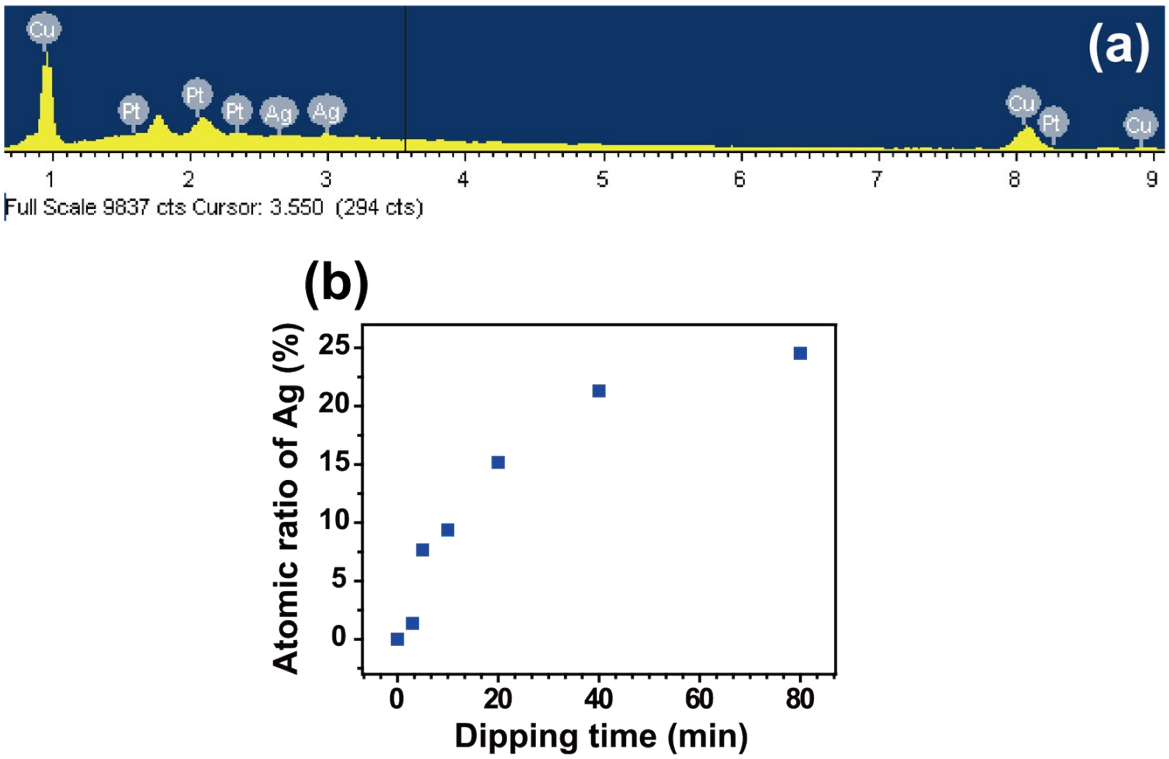

Figure S6. (a) SEM-EDS spectra of Cu-AgNWs (0.1 mM $AgNO_3$ solution dipping time: 5 min). (b) Atomic ratio of Ag as a function of 0.1 mM $AgNO_3$ solution dipping times of 1, 3, 5, 10, 20, 40 and 80 min for Cu-AgNWs TCEs.

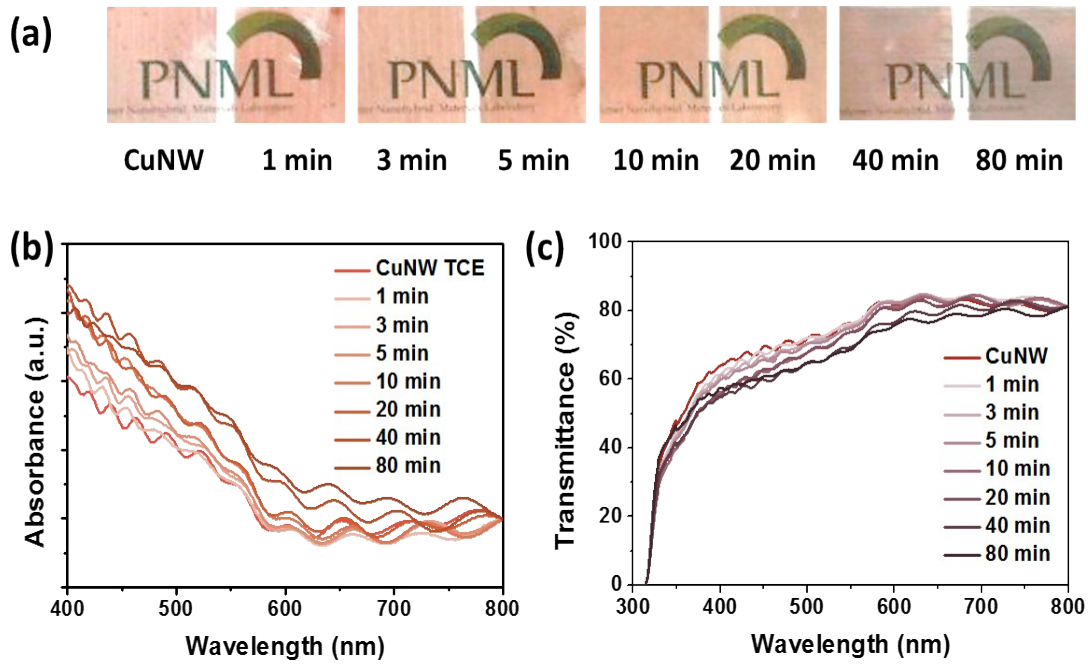

Figure S7. (a) Optical photographs, (b) absorbance and (c) transmittance spectra of CuNW and Cu-AgNW TCEs with different galvanic displacement reaction time.

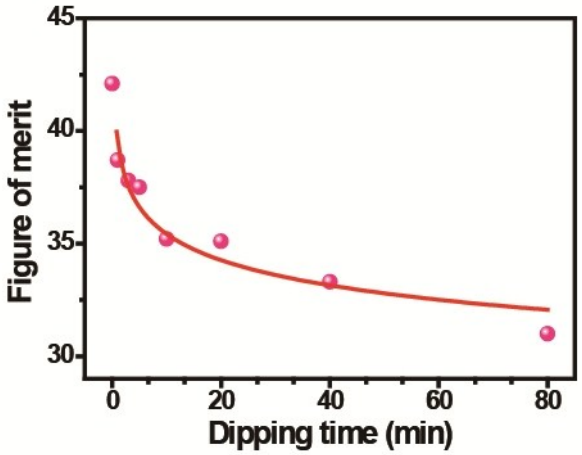

Figure S8. The figure of merit as a function of 0.1 mM $AgNO_3$ solution dipping times of 1, 3, 5, 10, 20, 40 and 80 min for Cu-AgNWs TCEs.

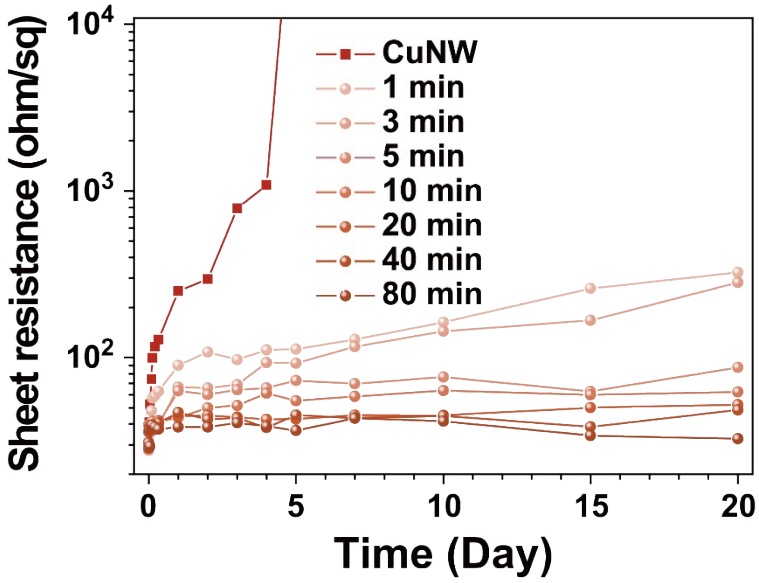

Figure S9. Plots of sheet resistance as a function of time for CuNW and Cu-AgNW TCEs with different galvanic displacement reaction time at 80°C in air.

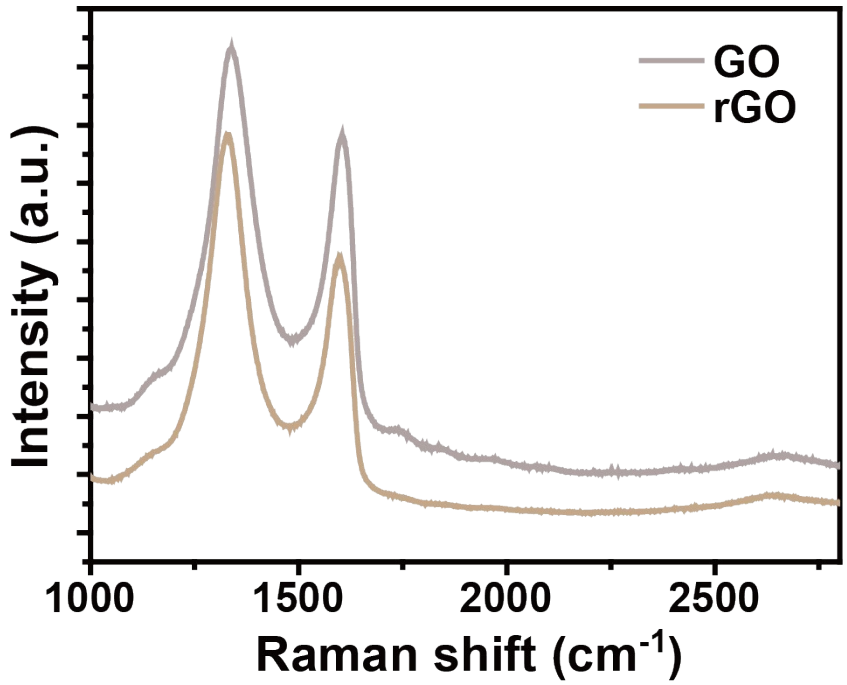

Figure S10. Raman spectra of graphene oxide and reduced graphene oxide.

Table S1. Ag atomic ratio, transmittance (T_{550}), sheet resistance and Figure of Merit (FOM) obtained from CuNW and Cu-AgNW TCEs.

	Atomic ratio of Ag (%)	Transmittance (%) (λ = 550 nm)	Sheet resistance (Ω/sq)	FOM
CuNW	0	75.6	29.8	42.1
1 min	< 0.1	75.4	32.1	38.7
3 min	1.4	74.8	31.9	37.8
5 min	7.7	74.2	31.2	37.5
10 min	9.4	73.1	31.5	35.2
20 min	15.2	72.9	31.3	35.1
40 min	21.3	71.3	30.7	33.3
80 min	24.5	70.6	31.9	31.0