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

Combining the Silver Nanowires Bridging Effect with Chemical Doping for Highly Improved Conductivity of CVD-grown Graphene Films

- Supporting Information

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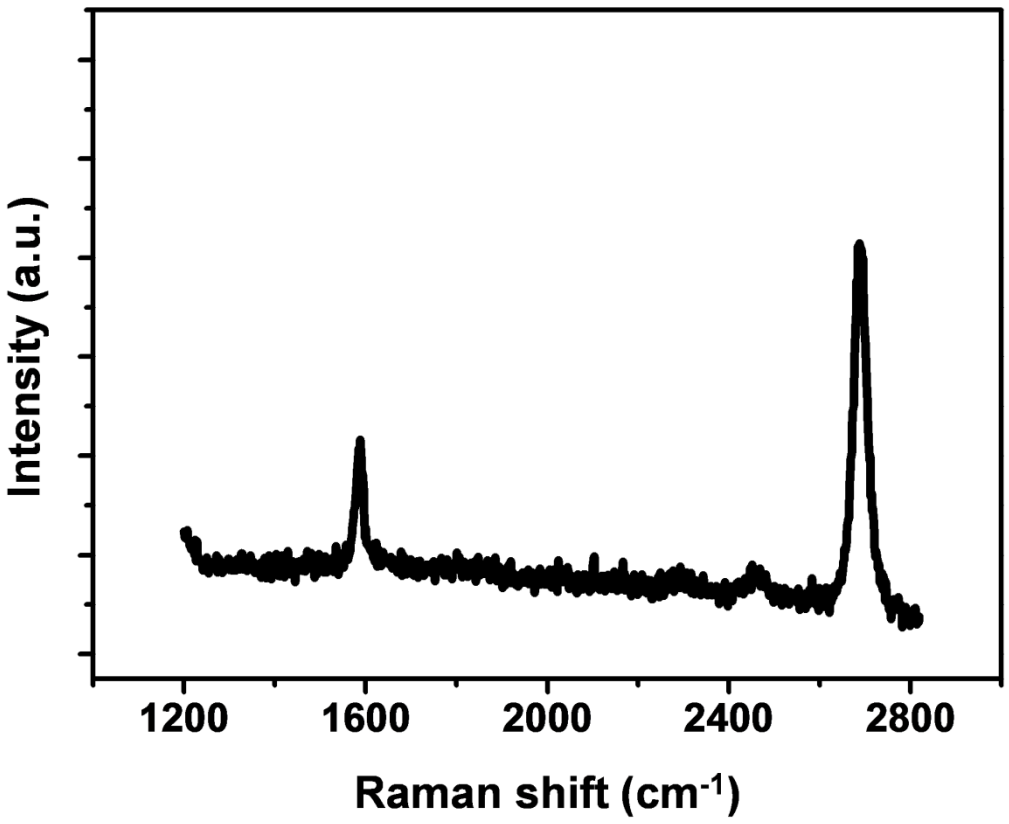

Figure S1. Raman spectra of the monolayer graphene.

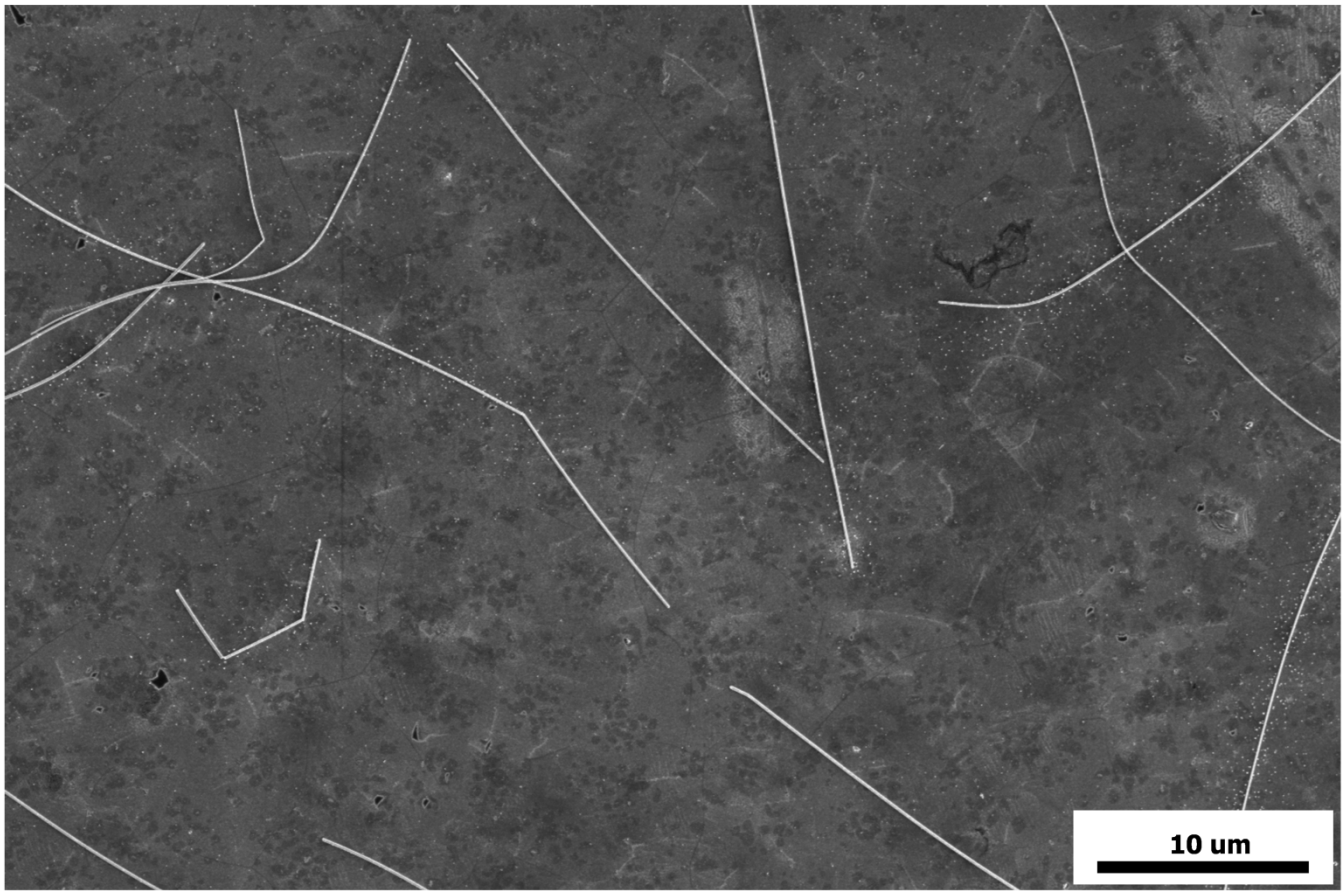

Figure S2. SEM image of the graphene films after Au doping and subsequent deposition of AgNWs (large area image corresponding to inset image in Figure 2a). Au particles and AgNWs are independently dispersed on the graphene film.

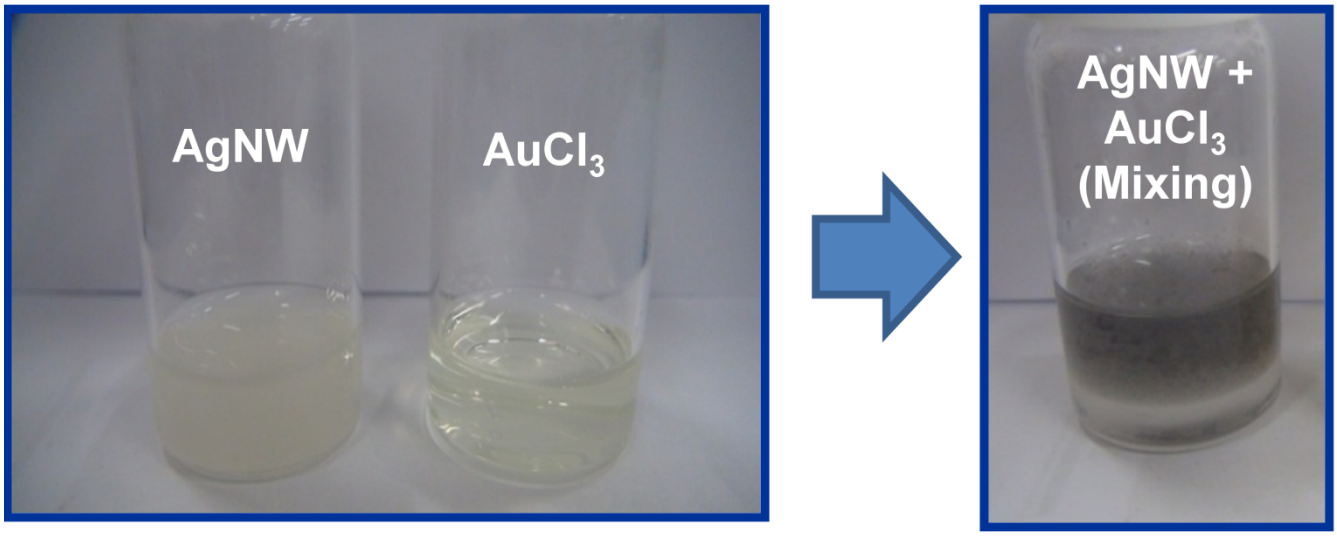

Figure S3. Photographic image of a mixture of AgNW solution and $AuCl_3$ solution. After mixing, t he color became black.

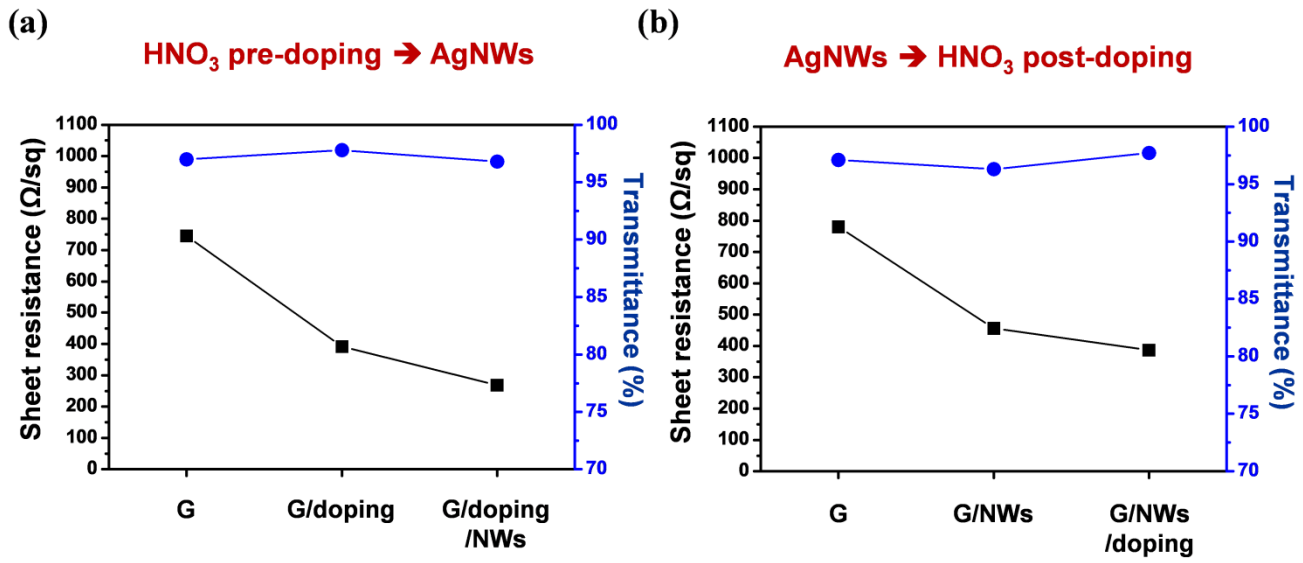

Figure S4. Optoelectrical and electrical properties of the graphene films prepared by a combination of AgNW deposition and chemical doping. Sheet resistance (-■-) and transmittance (-●-) at 550 nm of the CVD graphene films **(a)** with HNO_3 doping and subsequent deposition of AgNWs, **(b)** with deposition of AgNWs and subsequent HNO_3 doping. A small number of AgNWs were deposited by spin-coating an AgNW solution (0.25 mg/mL) onto the graphene films. HNO_3 doping was achieved by placing the graphene film in concentrated HNO_3 (65%) for 5 min.

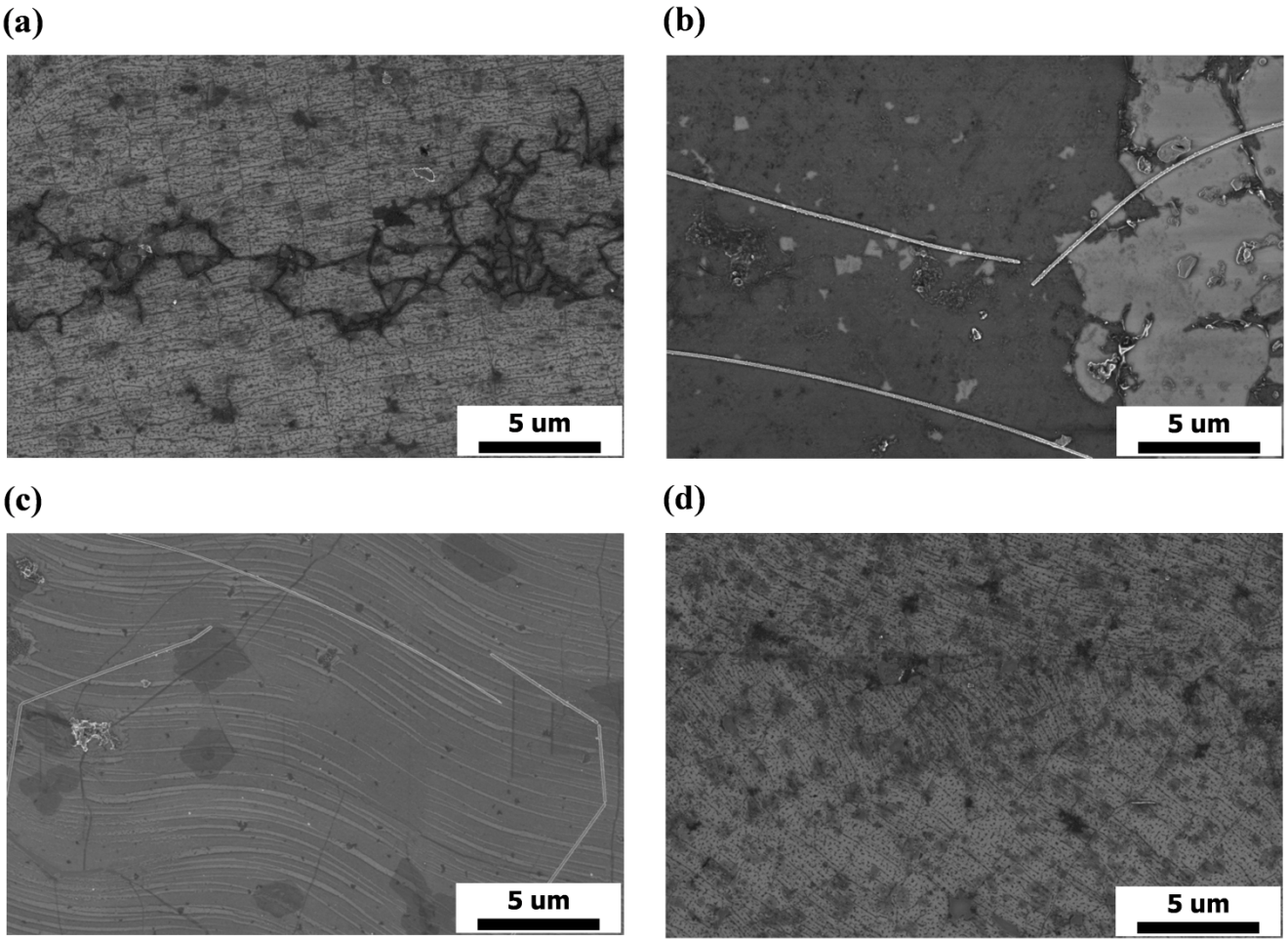

Figure S5. Morphologies of the monolayer graphene films after a combination of AgNW depositio n and HNO_3 doping. (a) SEM image of HNO_3 treated graphene film. **(b)** SEM image of HNO_3 treated graphene after AgNW deposition. **(c)** SEM image of graphene film after several AgNWs were deposited. **(d)** SEM image of AgNW deposited graphene film after HNO_3 doping. The scale bar indicates 5 μm. H NO_3 doping was achieved by placing the graphene film in concentrated HNO_3 (65%) for 5 min.

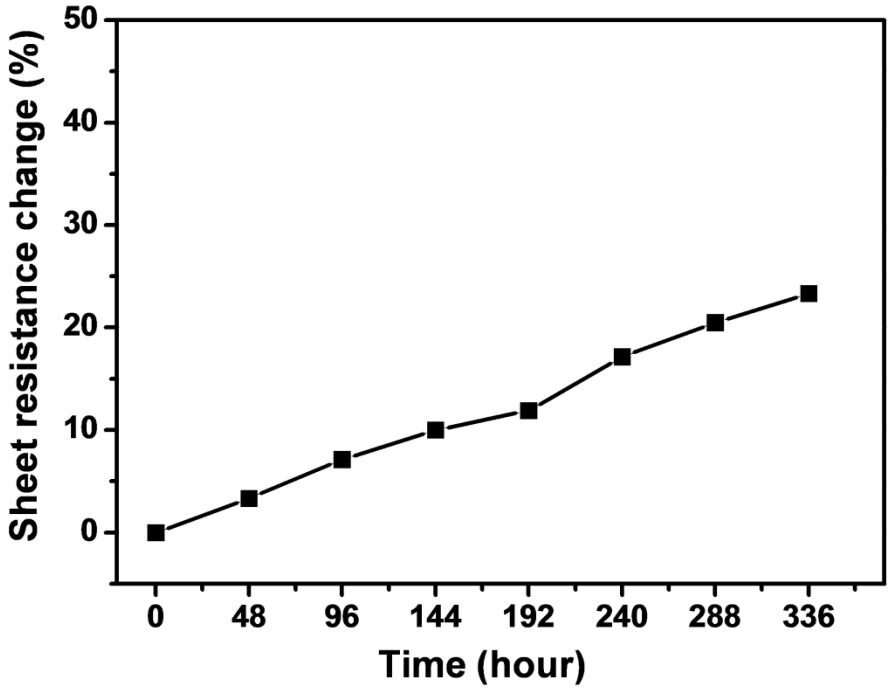

Figure S6. Sheet resistance change of Au pre-treated graphene-AgNW hybrid film over time in air condition.

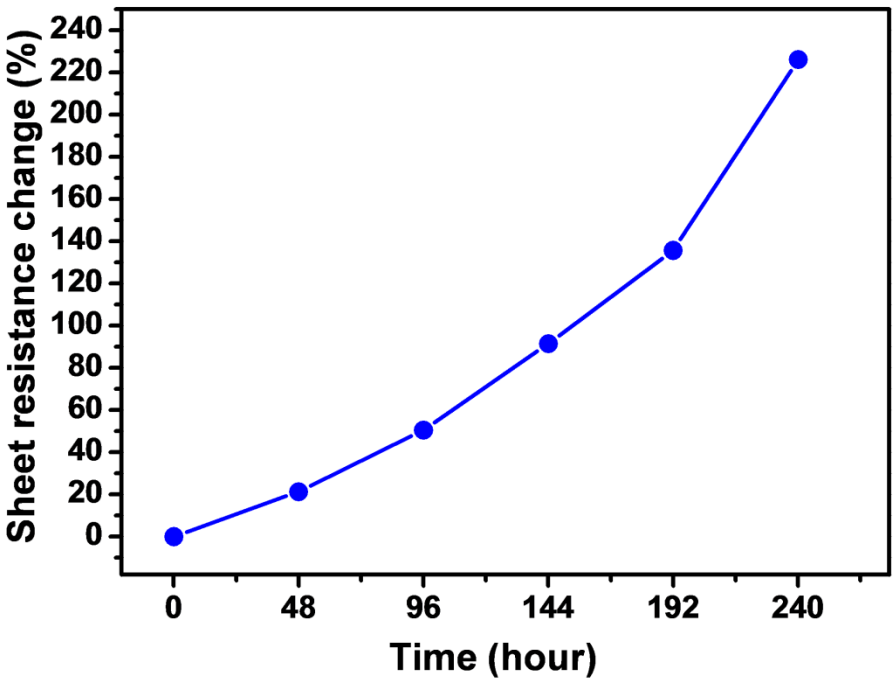

Figure S7. Sheet resistance change of Au pre-treated graphene-AgNW hybrid film during reliability test at 85°C and 85% RH for 10 days.