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# Supporting information:

# Molecular level controlled fabrication of highly transparent conductive reduced graphene oxide/Ag nanowire hybrid film

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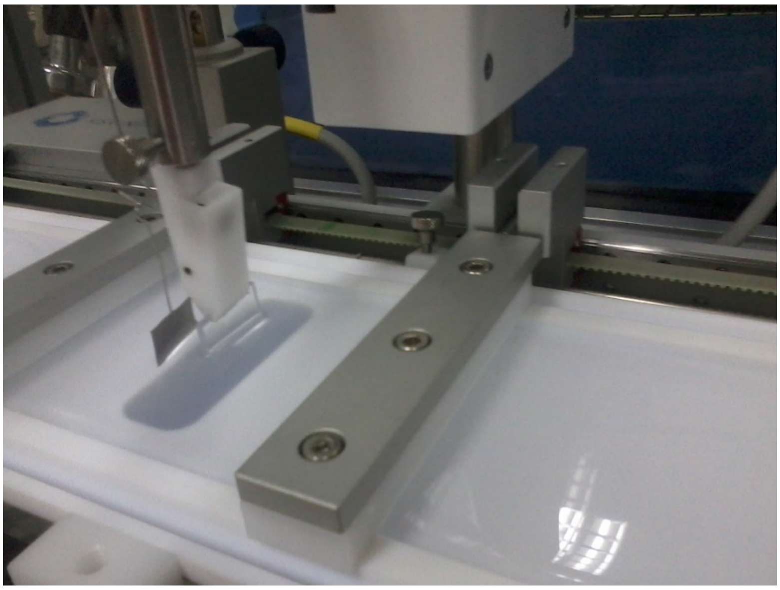

**Fig. S1** Image of the Langmuir-Blodgett (L-B) trough, showing the transfer process of the UL-GO sheets onto the quartzes substrate.

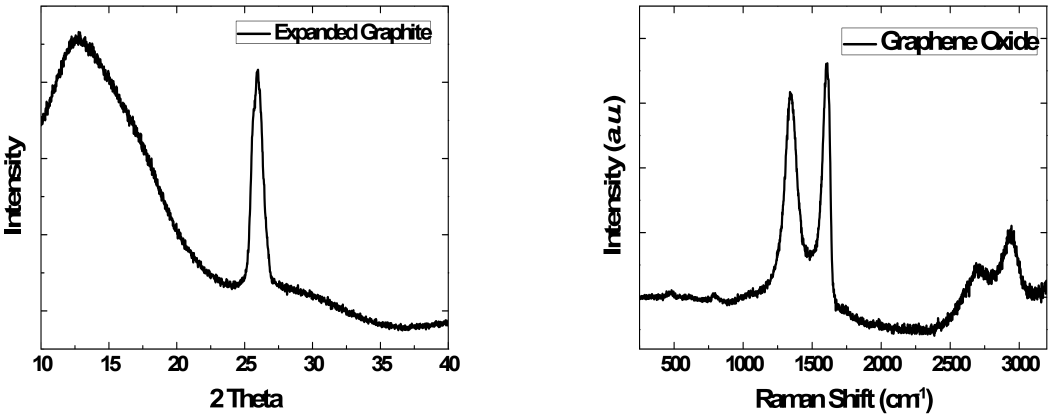


**Fig. S2** XRD spectrum of expanded graphite and 514 nm Raman spectrum of the graphene oxide. The peak around 13.5° indicates an interlayer spacing of 0.61 nm. And the peak around 27° indicate that the interlayer of the expanded graphite were not separated completely as graphene oxide[1]. *D* peak and *D+G* peak, which refer to the defect of the graphene oxide are around ~1350 cm$^{-1}$ and ~2900 cm$^{-1}$. *G* peak and 2*D+G* peak referring to the crystallinity of the graphene oxide are around ~1580 cm$^{-1}$ and ~2700 cm$^{-1}$. The intensity ratio of $I_D/I_G$ and $I_{D+G}/I_{2D}$ often used for estimating the $sp^2$ domain size of graphite-based materials. As the ratio of $I_D/I_G$ and $I_{D+G}/I_{2D}$ are 0.82 and 1.39. It showed the graphene oxide was well oxygenated as the ratio of is $I_{D+G}/I_{2D}$ more sensitive[2].

**Table S1** Relative percentages of carbon and assignations of UL-GO and rUL-GO.

| **Binding energy and assignation** | **Cg(*sp*$^2$) ~284.9eV** | **Cd(*sp*$^3$) ~285.6eV** | **C-O ~287.1eV** | **C=O ~288.1eV** | **-O-C=O ~290.0eV** |
|---|---|---|---|---|---|
| UL-GO | 36.5% | 21.5% | 21.8% | 13.6% | 6.6% |
| rUL-GO | 74.7% | 13% | 4.2% | 4% | 4.1% |

**Table S2** DC to optical conductivity ratio of current work and other works.

| Method | Materials | SR (Ω/sq) | T (%) | $\sigma_{DC}/\sigma_{Op}$ | Reference |
|---|---|---|---|---|---|
| L-B Spin-coating | GO / Ag NW | 13 | 71.9 | 81 | Current Work |
| | Graphene / Ag NW | 64 | 94 | 93.7 | Kholmanov et al.[3] |
| CVD Doping | Graphene | 202 | 96 | 45.3 | Shin et al.[4] |
| Spin-coating | Ag NW/ GO | 86 | 80 | 18.6 | Gao et al.[5] |
| | CNT/ GO/ Ag NW-Au NP | 26 | 83 | 74.2 | Kholmanov et al.[6] |
| Self-assembly | GO/ Ag NW | 86 | 80 | 19.8 | Tien et al.[7] |
| Dip coating | GO/ Ag NW | 150 | 86 | 16.0 | Yun et al.[8] |
| Transfer printing | GO/ Ag NW | 27 | 80 | 59.1 | Zhang et al.[9] |
| | GO/ Ag NW | 210 | 97 | 58.5 | Domingues et al.[10] |
| Vacuum filtration | GO/ Ag NP | 93 | 78 | 15.3 | Tien et al.[11] |

## References


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