

## SUPPLEMENTARY INFORMATION

### An aqueous process to flexible transparent electrodes using non-oxidized graphene and SWNT hybrid solution

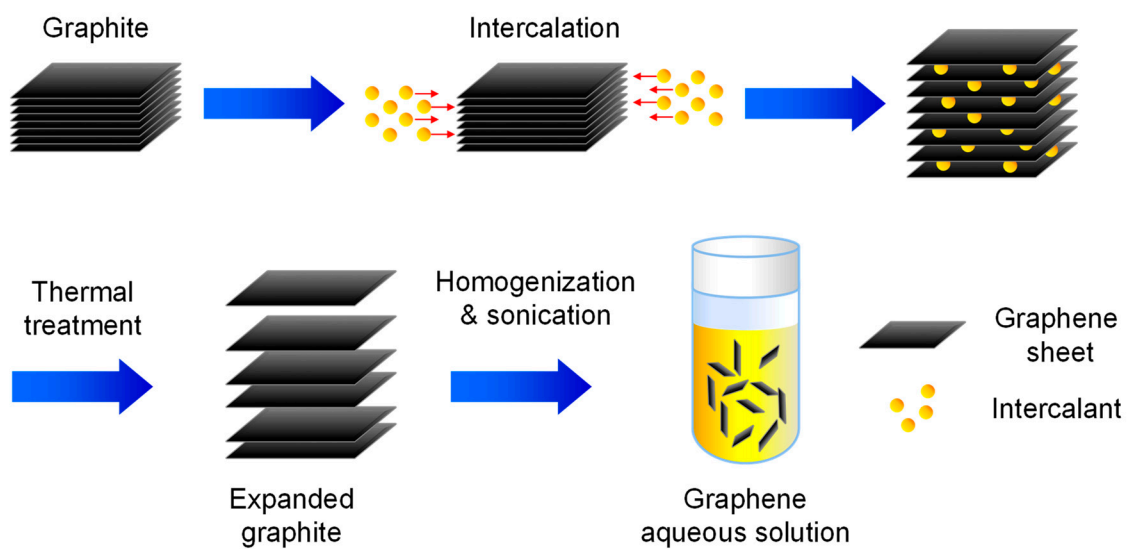
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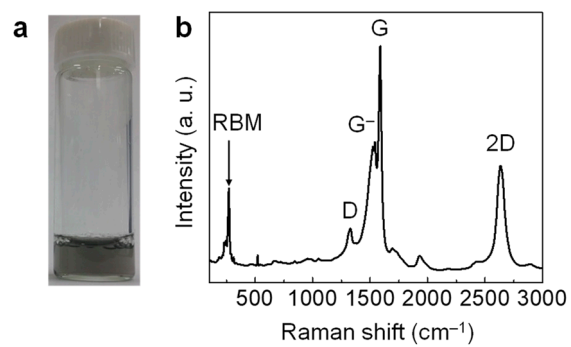
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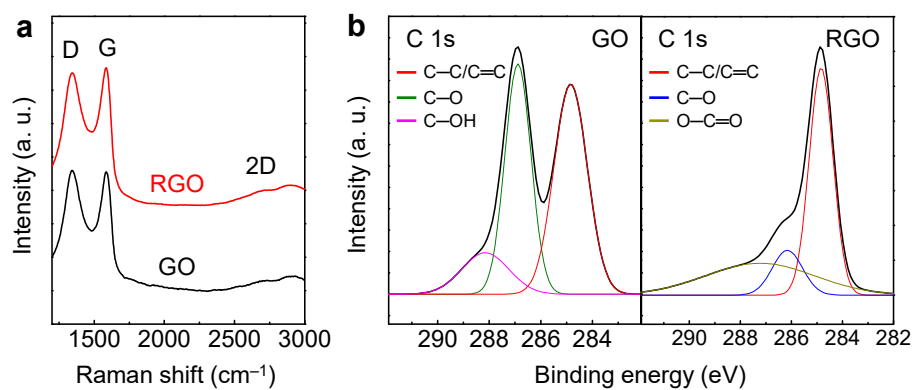
Keywords: flexible transparent electrode, non-oxidized graphene, single-walled carbon nanotube, aqueous solution, transparent thin film transistor



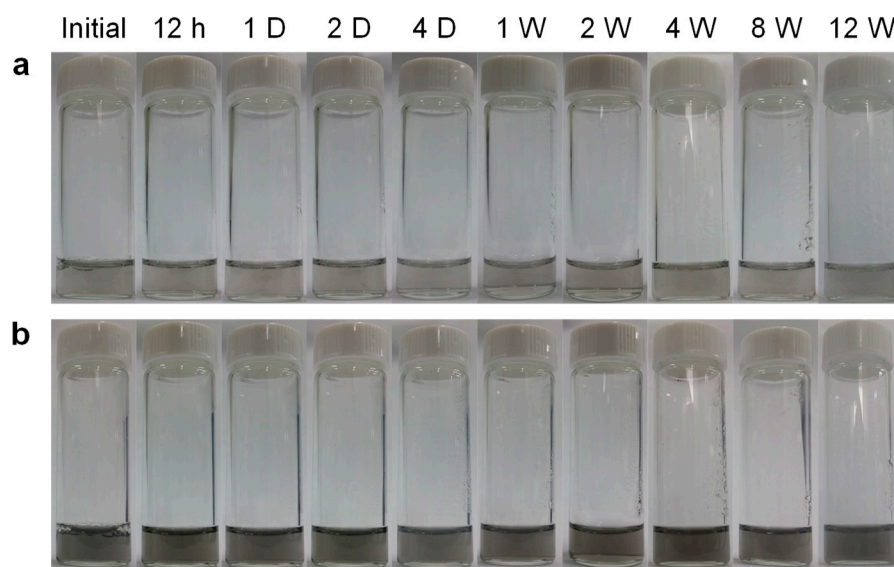
**Figure S1.** Schematic illustration showing the sequential procedures for preparing non-oxidized graphene aqueous solution using halogen intercalation method.



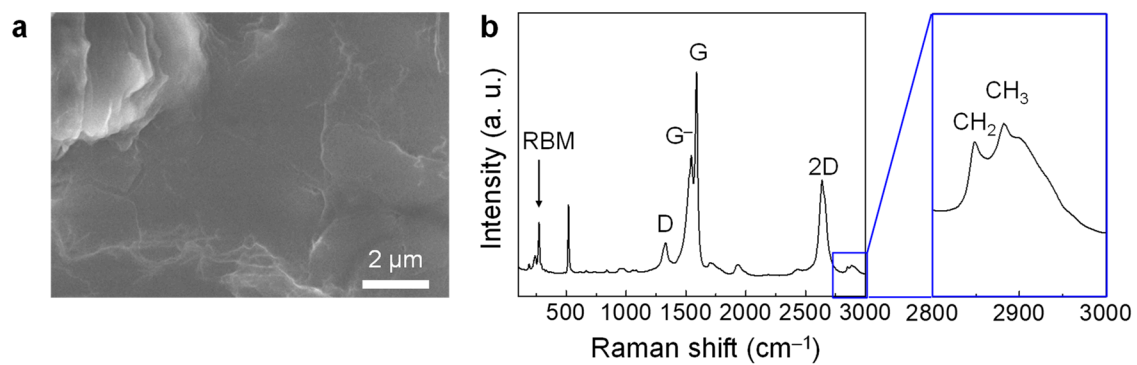
**Figure S2.** (a) Photograph of aqueous SWNT solution and (b) Raman spectrum of SWNT film.



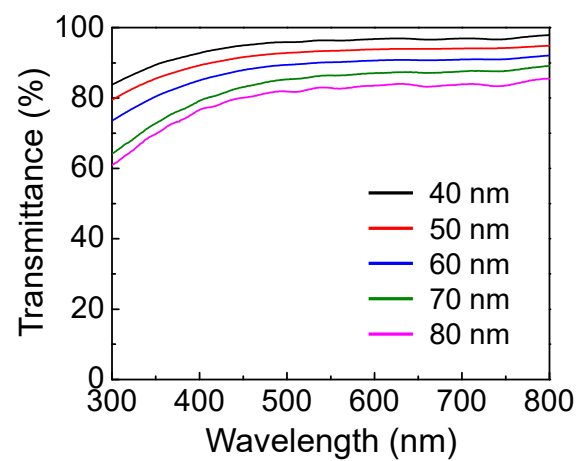
**Figure S3.** (a) Raman spectra and (b) XPS spectra of GO and RGO synthesized by Hummers' method.



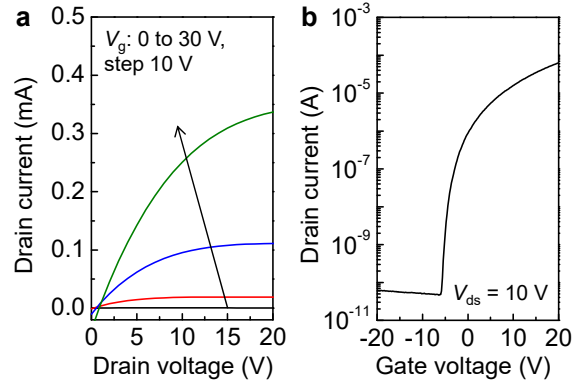
**Figure S4.** Photographs of (a) non-oxidized graphene and (b) aqueous SWNT solutions showing the dispersion stability.



**Figure S5.** (a) SEM image and Raman spectrum of as-prepared non-oxidized hybrid graphene/SWNT film without removal of SDS surfactant.



**Figure S6.** (a) Optical transmittance at 550 nm for 30 wt.% graphene contained hybrid electrodes with various film thickness.



**Figure S7.** (a)  $I_{ds}$ - $V_{ds}$  and (b)  $I_{ds}$ - $V_g$  curves of IGZO TFTs with Al source and drain electrodes.