# Supporting Information

# Assembly and Benign Step-by-Step Post-treatments of Oppositely Charged Reduced Graphene Oxides towards Transparent Conductive Thin Films of Multiple Potentials

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**Preparation of graphene oxide:** Graphene oxide was synthesized from natural graphite by a modified Hummers method. 2 g graphite and 1 g sodium nitrate were mixed with 46 mL of concentrated sulfuric acid (98%) in a 500 mL flask. The mixture was stirred for 1 h in an ice bath. 6 g potassium permanganate was added to the suspension under vigorous stirring. The rate of addition was carefully controlled to keep the reaction temperature below 20 °C. After removal of ice bath, the mixture was stirred at 35 °C for 1 h. Then, 92 mL of deionized water was slowly added with vigorous agitation. The diluted suspension was stirred for 30 min. At the end, 20 mL of $H_2O_2$ (30%) and 280 mL of deionized water were added to the mixture. The mixture was washed with 5% HCl and deionized water, and dried at 60°C to obtain GO powder.

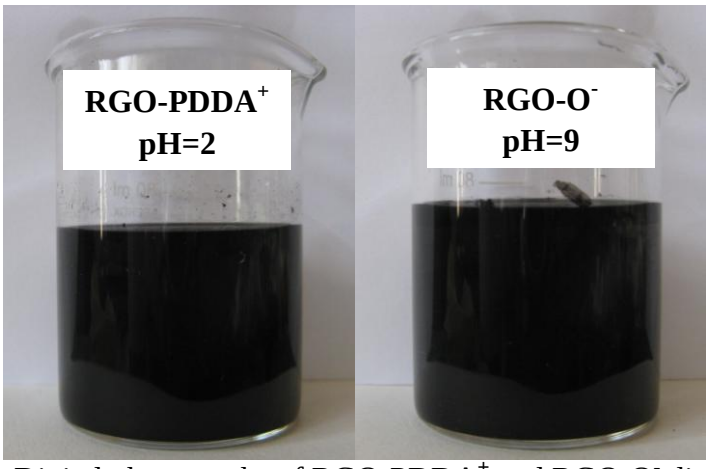


Figure S1. Digital photographs of RGO-PDDA$^+$ and RGO-O$^-$ dispersions.

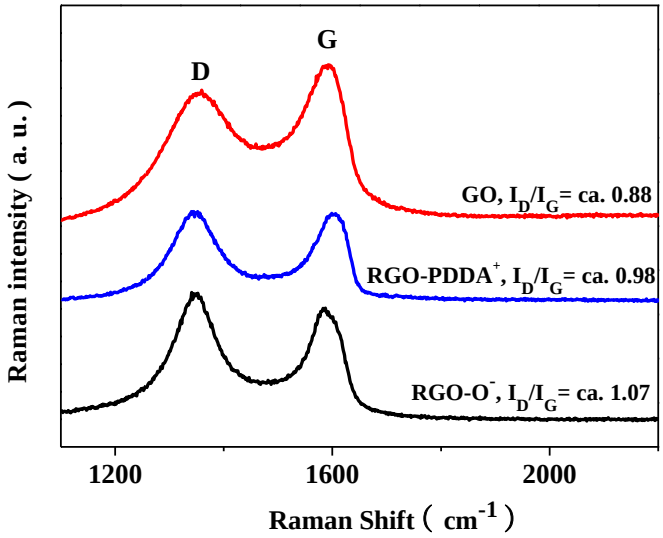


Figure S2. Raman spectra of GO, RGO-PDDA$^+$, and RGO-O$^-$.

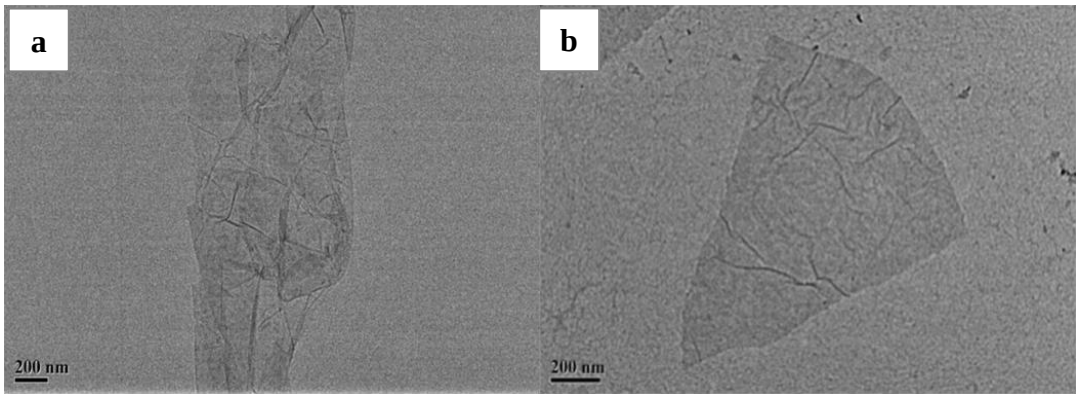


Figure S3. TEM images of RGO-$PDDA^{+}$ (a) and RGO-$O^{-}$ (b).


Figure S4. Digital photographs of glass substrate (a), $(RGO\text{-}PDDA^{+}/RGO\text{-}O^{-})_{10}$ (b), $(RGO\text{-}PDDA^{+}/\ RGO\text{-}O^{-})_{20}$ (c) and $(RGO\text{-}PDDA^{+}/\ RGO\text{-}O^{-})_{30}$ (d) films.

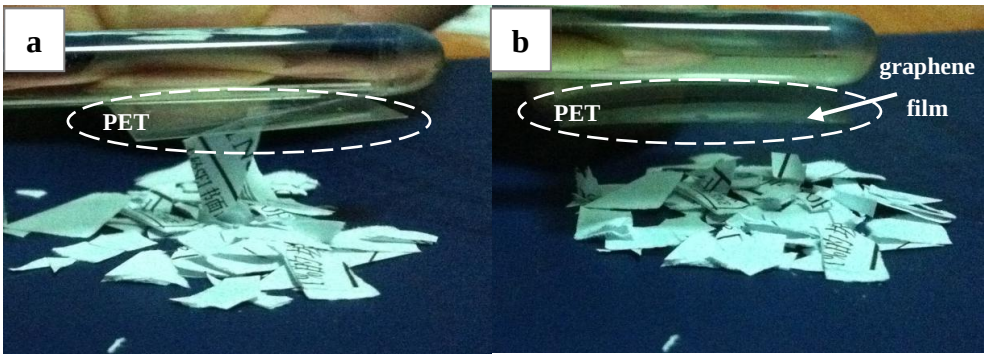


Figure S5. Simple static charge dissipation tests. (a) PET substrate (b) PET substrate coated with $(RGO\text{-}PDDA^{+}/RGO\text{-}O^{-})_{30}$ film after the low-temperature step-by-step post-treatments.

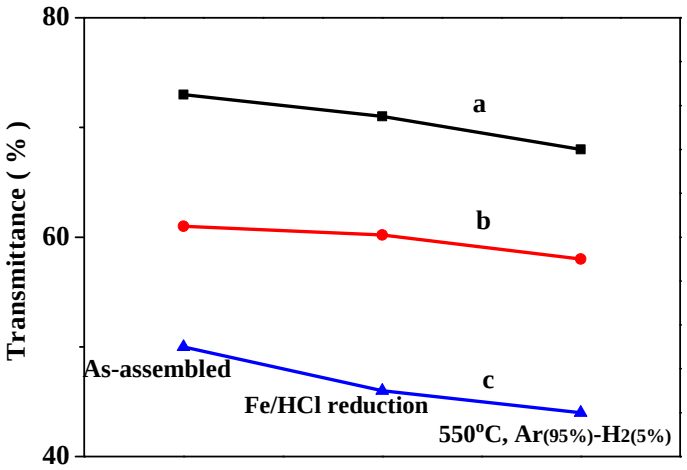


Figure S6. Dependence of transmittance (550 nm) on step-by-step post-treatments for $(RGO\text{-}PDDA^{+}/RGO\text{-}O^{-})_{10}$ (a), $(RGO\text{-}PDDA^{+}/ RGO\text{-}O^{-})_{20}$ (b) and $(RGO\text{-}PDDA^{+}/ RGO\text{-}O^{-})_{30}$ (c) films. Slight losses in film transmittance were observed after step-by-step post-treatments.

**References:**

1. W. S. Hummers and R. E. Offeman, *J. Am. Chem. Soc.*, 1958, **80**, 1339-1339.