Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

Nanocomposites of Reduced Graphene Oxide Nanosheets and Conducting Polymer for Stretchable Transparent Conducting Electrodes

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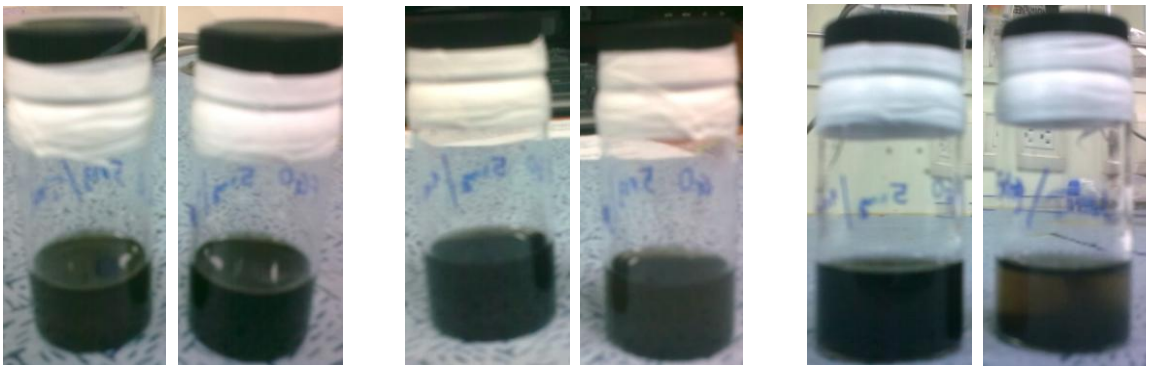
Supporting Information

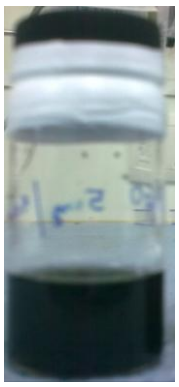
Supporting Figure S1

(a) After sonication **(b) After 6 hrs** **(c) After 1 day**



FGO GO FGO GO FGO GO

(d) After 1 week

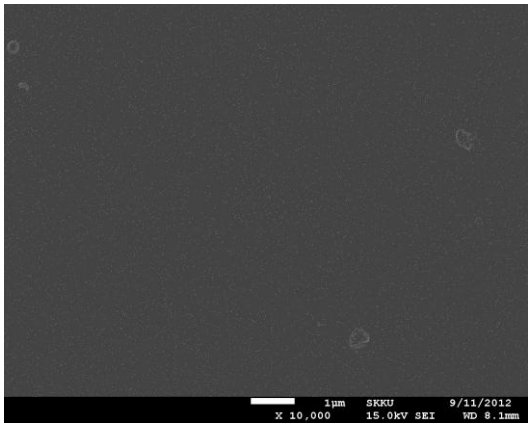


FGO

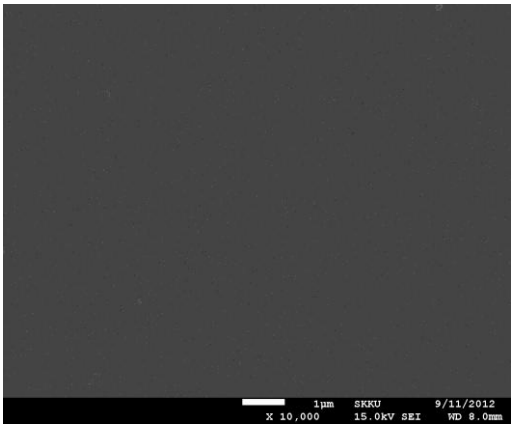
Figure S1. Comparison of dispersibility of GO and FGO nanosheets in DMF solvent. The FGO nanosheets were not agglomerated after 1 week in DMF solution but the GO nanosheets were agglomerated in within one day after preparation.

Supporting Figure S2

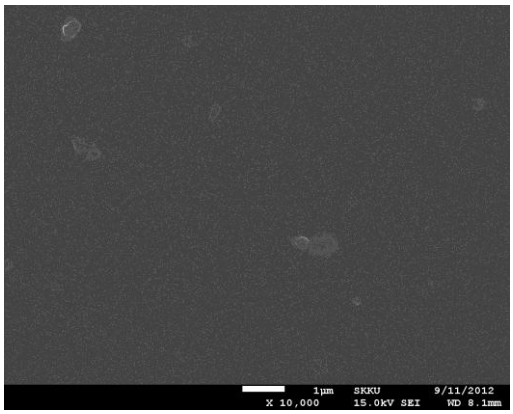
(a) PEDOT:PSS



(b) PEDOT:PSS+DMSO+IPA



(c) GO/ PEDOT:PSS+DMSO+IPA



(d) FGO/ PEDOT:PSS+DMSO+IPA

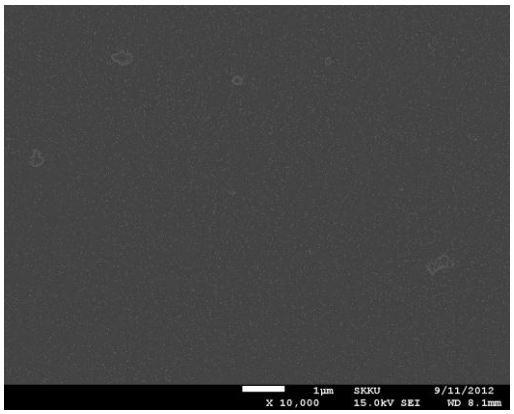


Figure S2. The FE-SEM images of four different films spin-coated with (a) PEDOT:PSS, (b) PEDOT:PSS + DMSO + IPA, (c) GO/ PEDOT:PSS + DMSO + IPA, and (d) FGO/ PEDOT:PSS + DMSO + IPA solution. The agglomeration of GO or FGO nanosheets was not clearly indentified in the FE-SEM images.

Supporting Figure S3

(a) PEDOT:PSS (b) PEDOT:PSS+DMSO+IPA

(c) GO/ PEDOT:PSS+DMSO+IPA (d) FGO/ PEDOT:PSS+DMSO+IPA

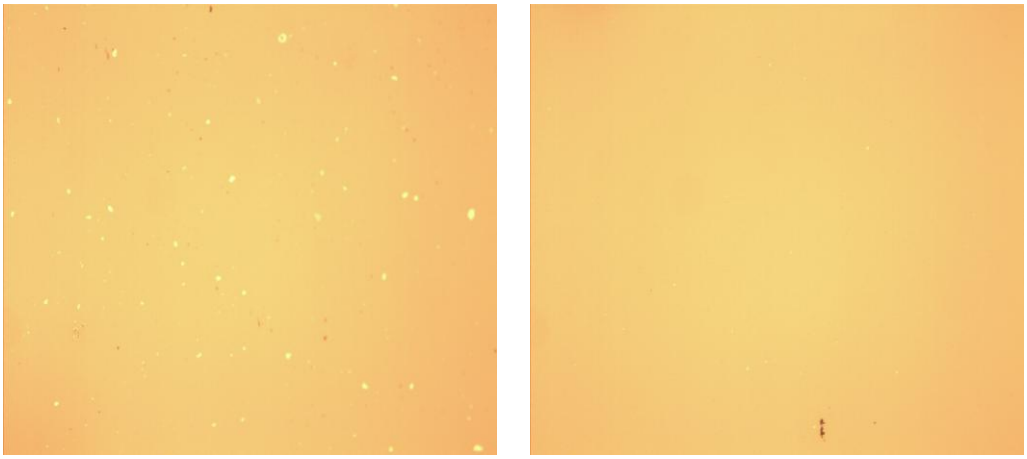


Figure S3. The optical images (500 µm x 500 µm) of four kind thin films spin-coated with (a) PEDOT:PSS, (b) PEDOT:PSS + DMSO + IPA, (c) GO/ PEDOT:PSS + DMSO + IPA, and (d) FGO/ PEDOT:PSS + DMSO + IPA solution. The large particles formed by agglomeration of GO nanosheets are clearly observed in the film prepared from the GO/PEDOT:PSS + DMSO + IPS solution (Fig. S3(c)) compared to the film prepared from the FGO/ PEDOT:PSS + DMSO + IPS solution (Fig. S3 (d)).

Supporting Figure S4

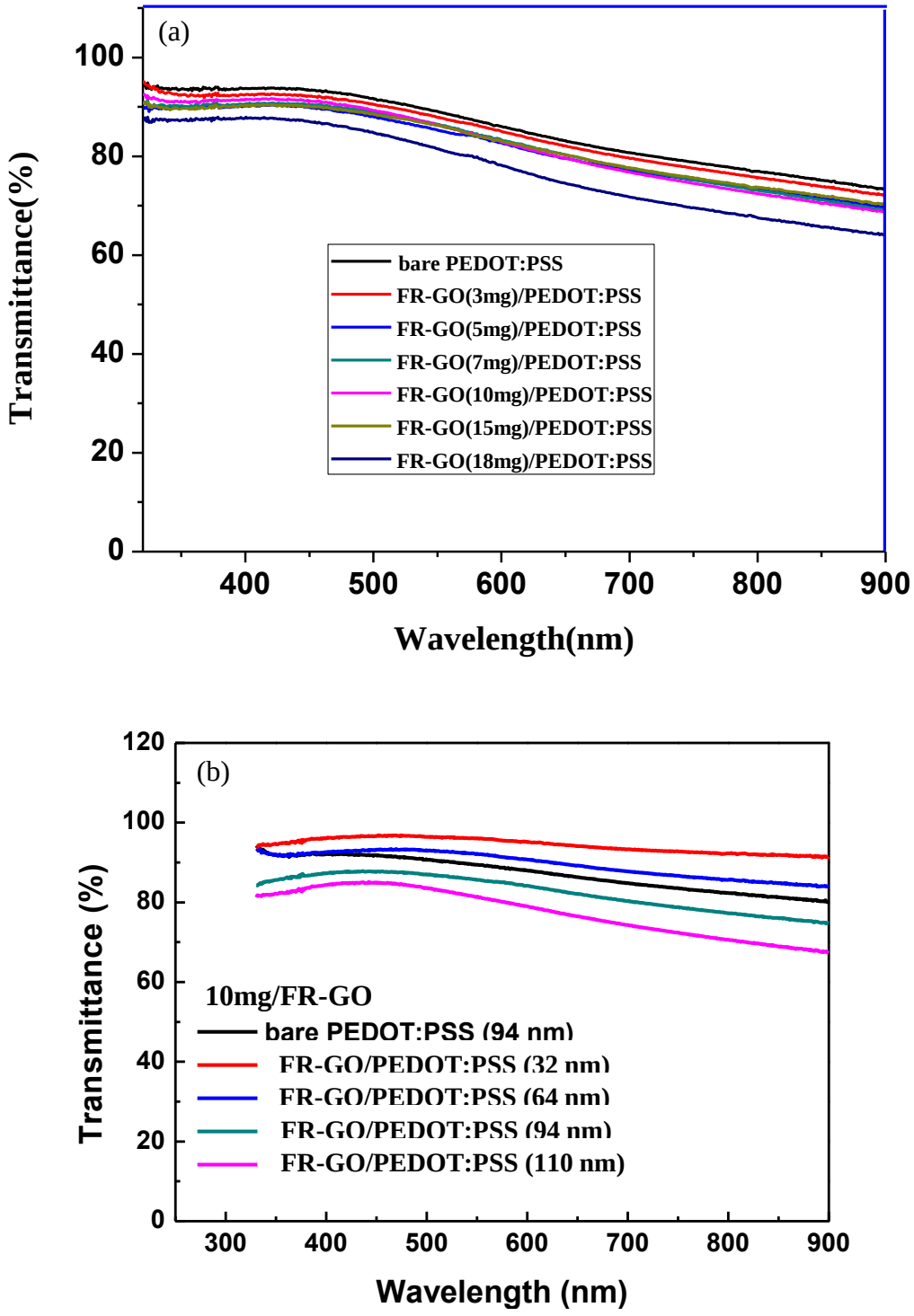


Figure S4. The optical transmittance of nanocomposites films with (a) different FR-GO concentration (mg/10 ml PEDOT:PSS solution) and (b) varying thickness at the concentration of 10 mg FR-GO/10 ml PEDOT:PSS solution.

Supporting Figure S5

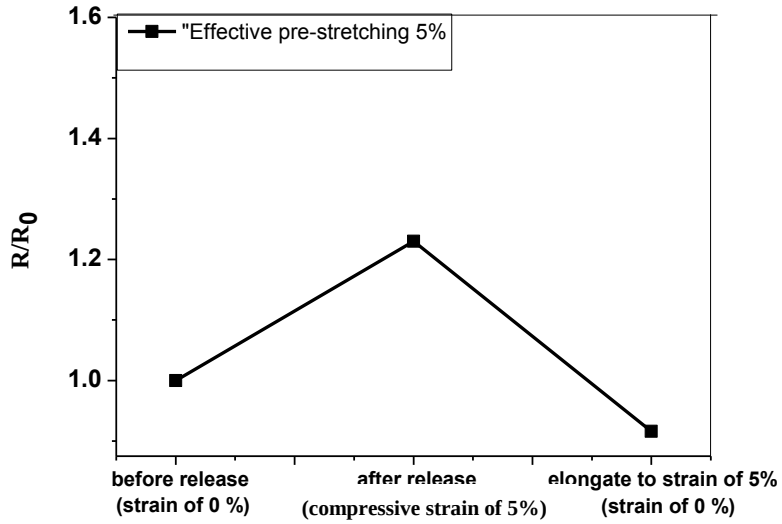


Figure S5. Resistance variation of the nanocomposite film (10 mg FR-GO/10 ml PEDOT:PSS solution) with an "effective" pre-strain of 5% (compressive) was measured at three conditions: before release of the pre-strained PDMS substrate after nanocomposite film fabrication (the nanocomposite film strain of 0%), after release of the pre-strained PDMS substrate (the nanocomposite film compressive strain of 5%), and after 5% tensile elongatation of the released PDMS substrate (the nanocompoiste film strain of 0%). Compressive strain in the nanocompoite film produced on the pre-strained PDMS substrate increases the electrical resistance.