Electronic Supplementary Material (ESI) for Nanoscale.
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Supporting Information

Title: Highly Dispersible Edge Selectively Oxidized Graphene with Improved Electrical Performance

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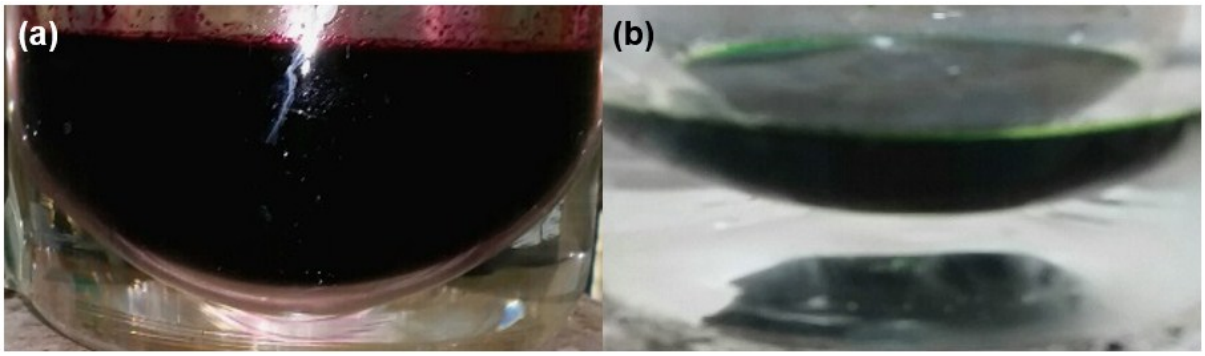

Fig. S1 (a) Solution of oxidant for step II oxidation and (b) step I oxidation.

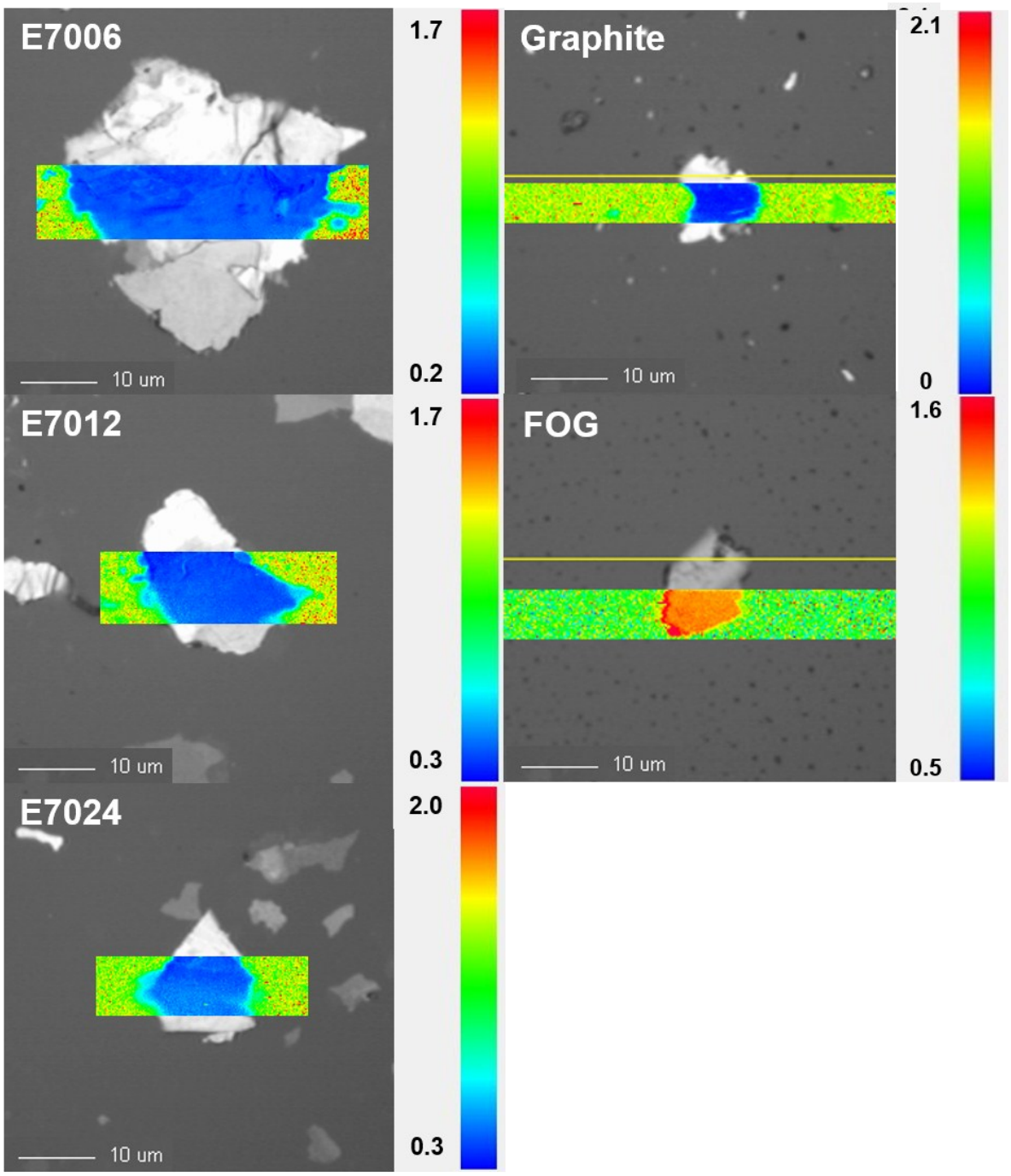

Fig. S2 Graphite, EOG and FOG's 2D mapping of I_D/I_G ratio

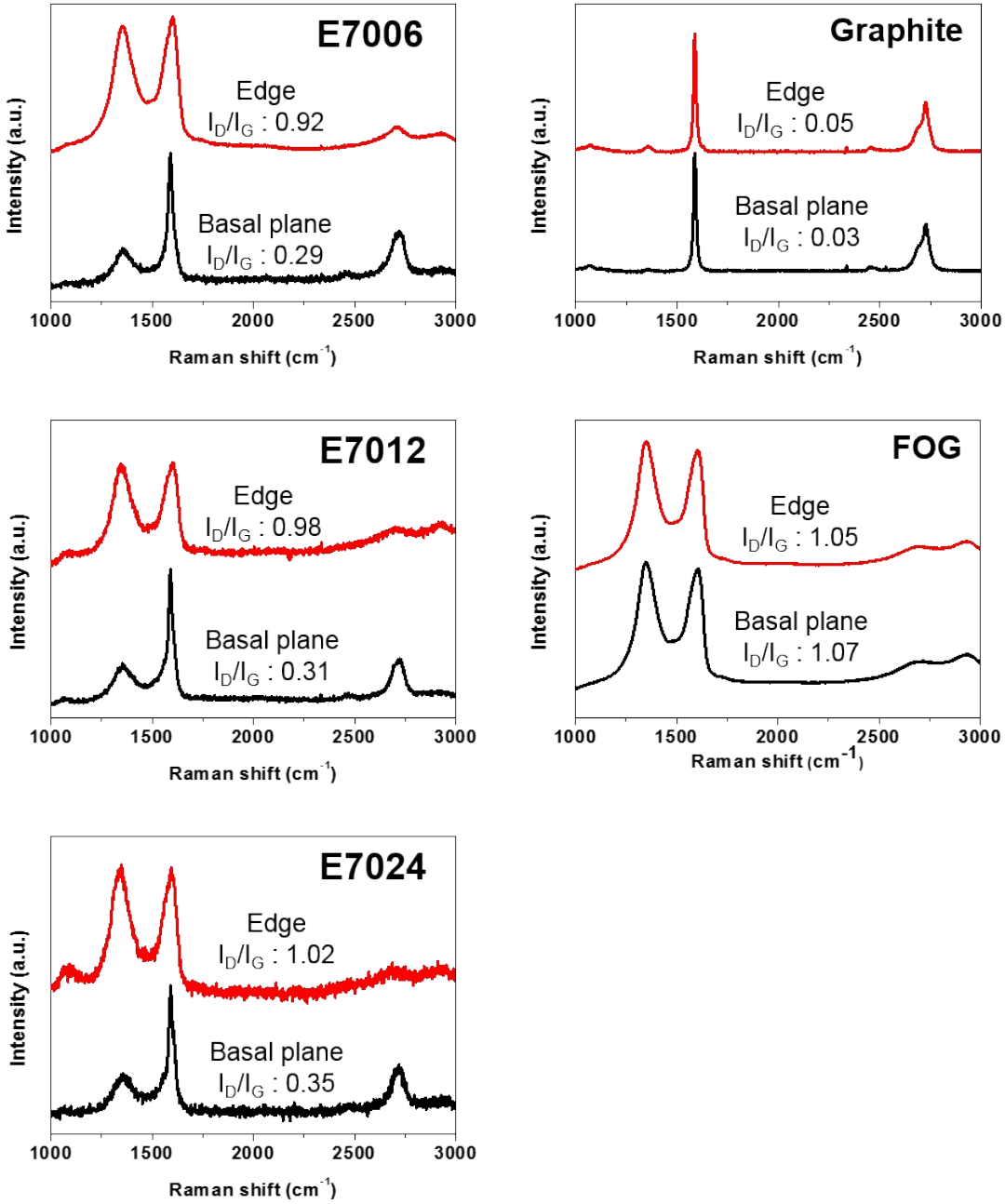

Fig. S3 Results of Raman spectroscopy and I_D/I_G ratio of graphite, EOG and FOG

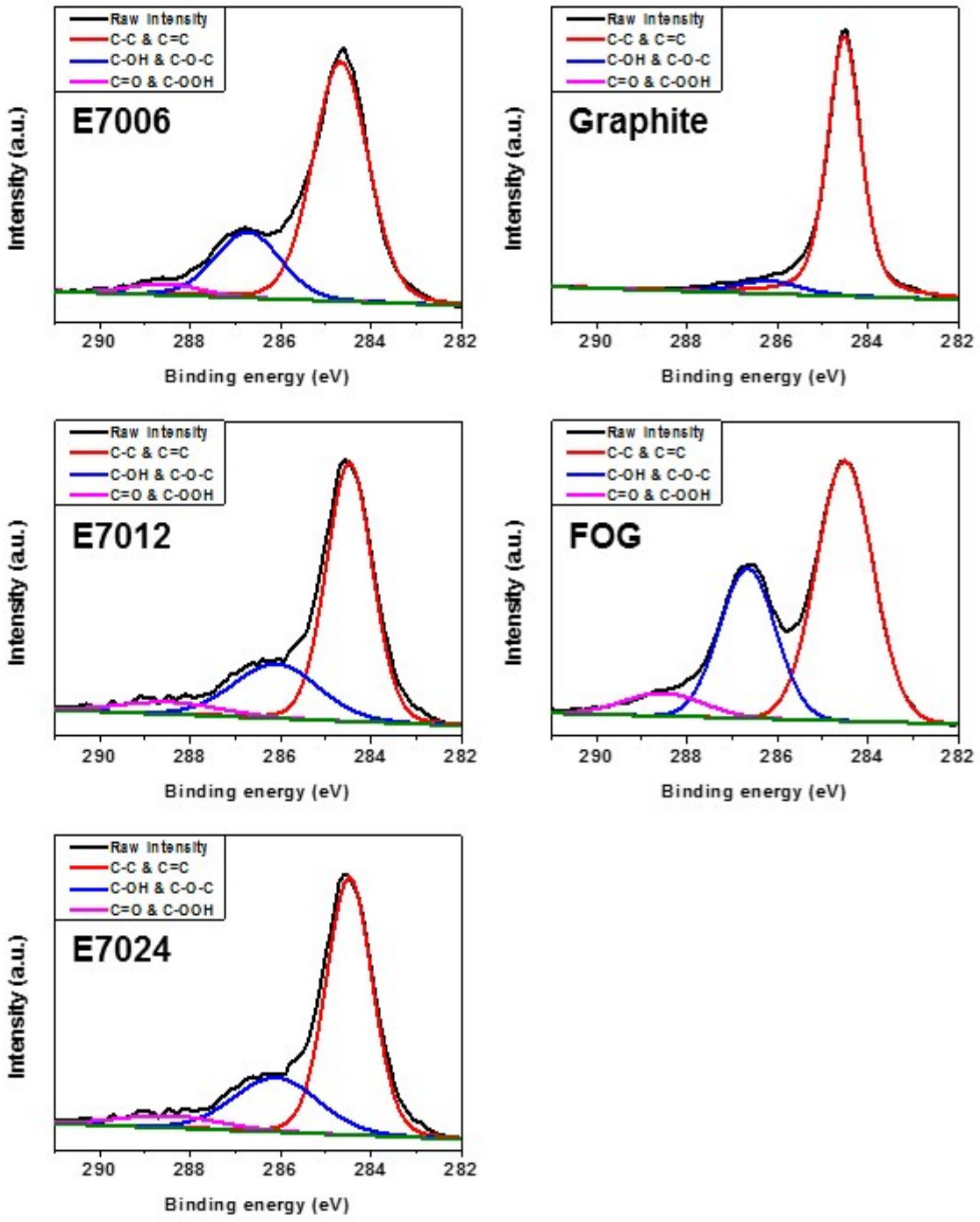

Fig. S4 Deconvoluted Cls peak measured by X-ray photoelectron spectroscopy (XPS) of graphite, EOG and FOG

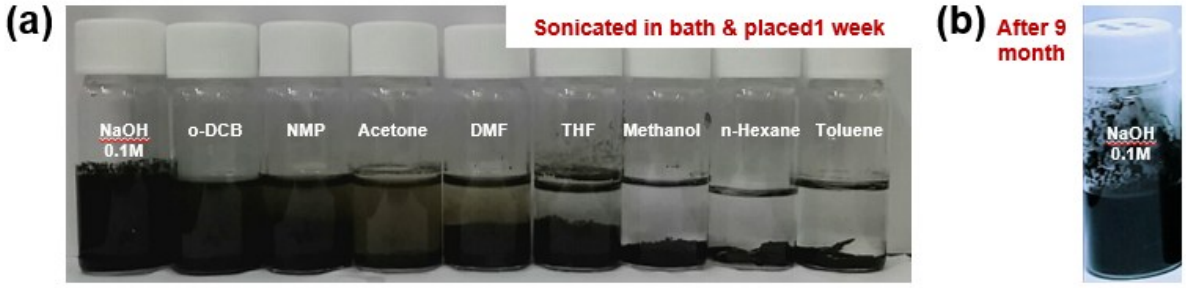

Fig. S5 EOG dispersions for various solvents and EOG, which was dispersed in NaOH 0.1M and settled for 9 months.

Fig. S6. Concentrated LE7024 before and after drying. Concentration of concentrated LE7024 were measured by weighing.

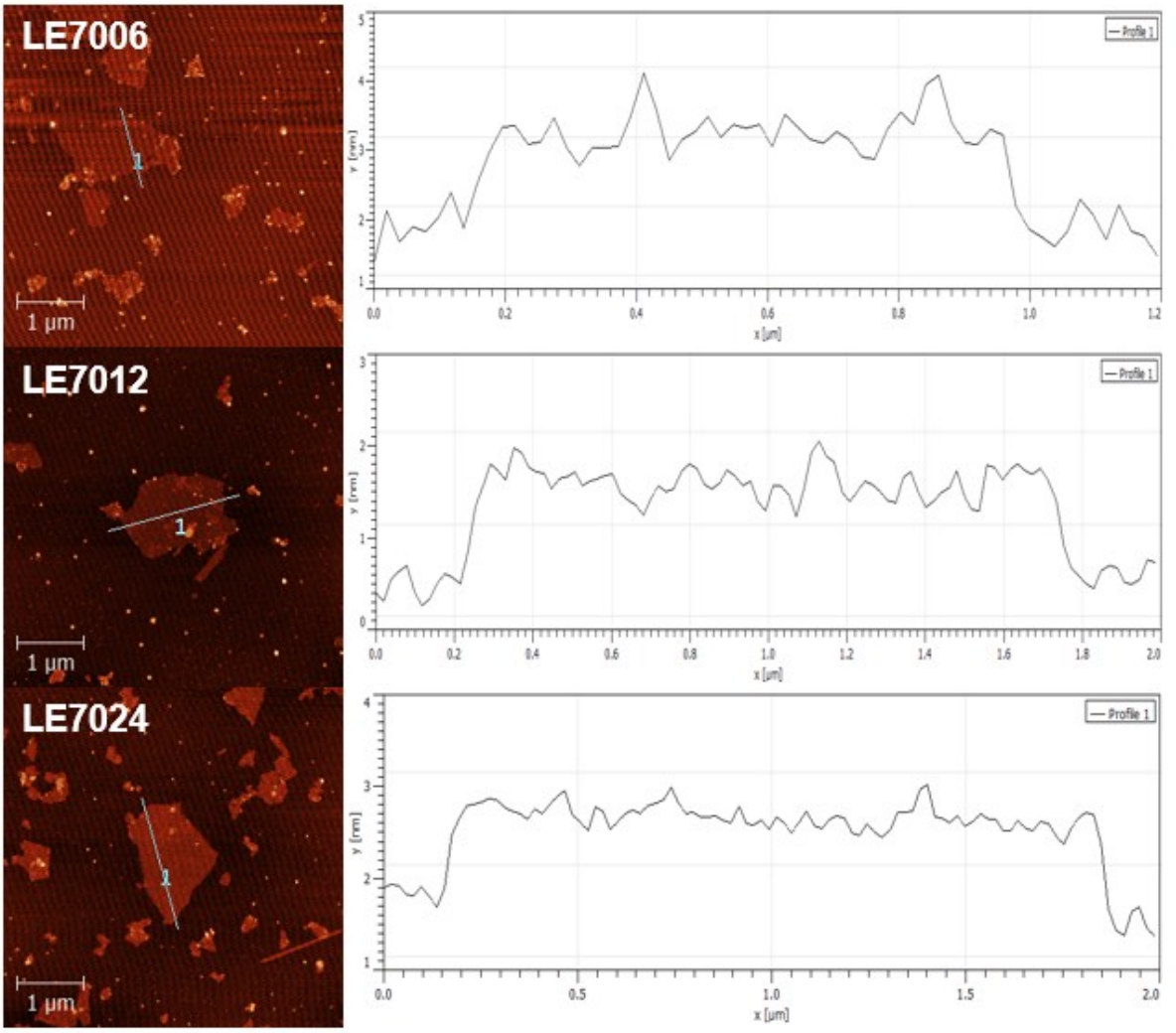

Fig. S7 Atomic Force Microscopy (AFM) topology image and profiles of the LPEOG sheets.

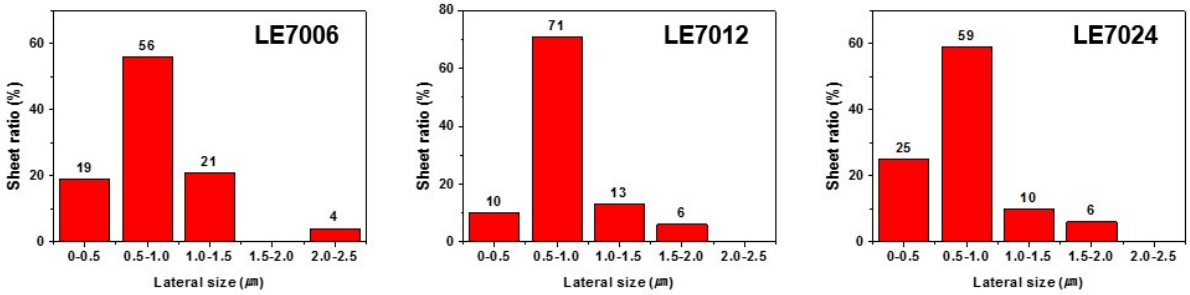

Fig. S8 Lateral size distribution of the LPEOG sheets measured by AFM.

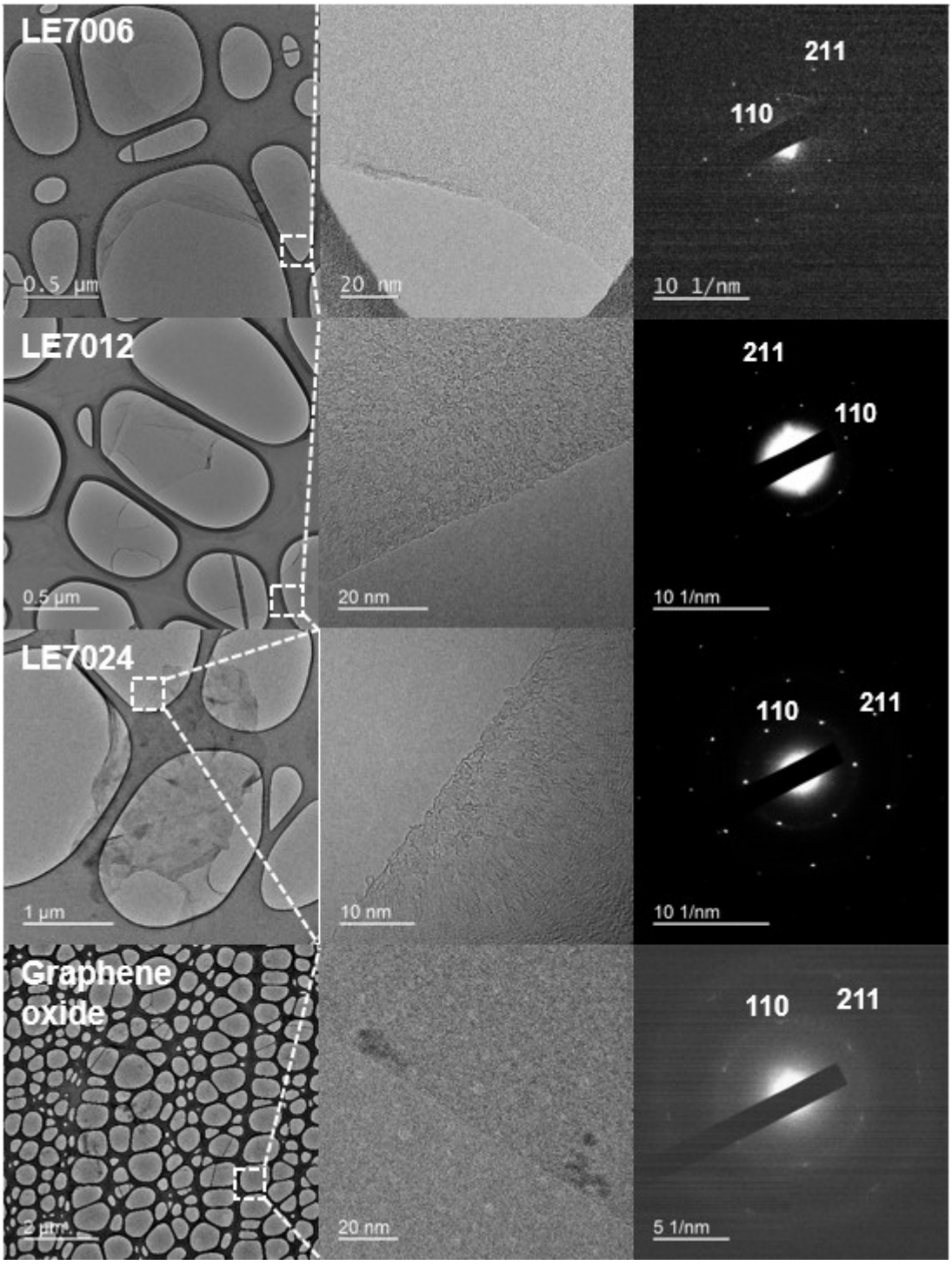

Fig. S9 Transmission electron microscopy (TEM) normal images, high resolution images of the edge, and selective area electron diffraction (SAED) peaks of LPEOG and GO sheets.

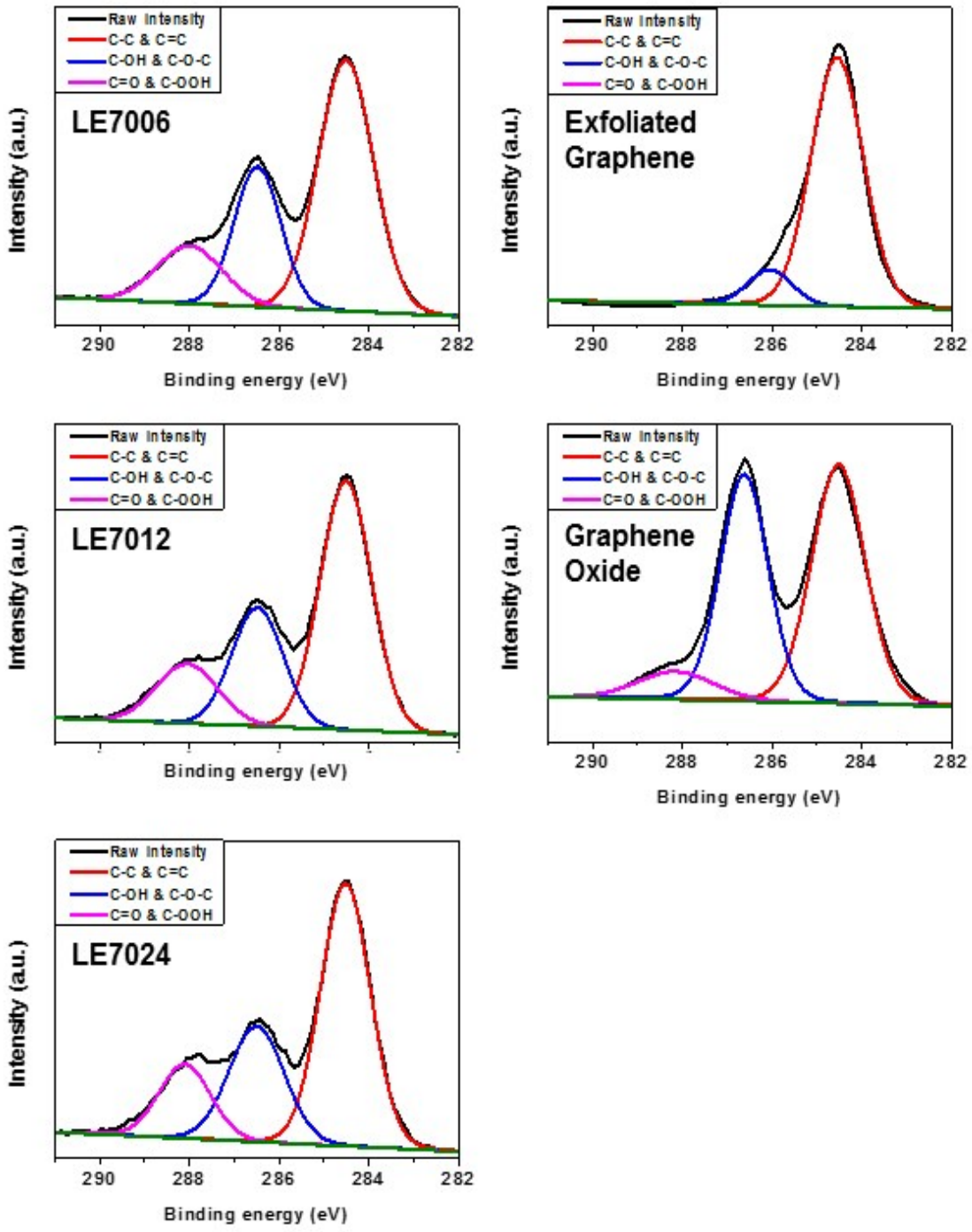

Fig. S10 Deconvoluted Cls peak of exfoliated graphite, and LPEOG and graphene oxide measured by XPS.

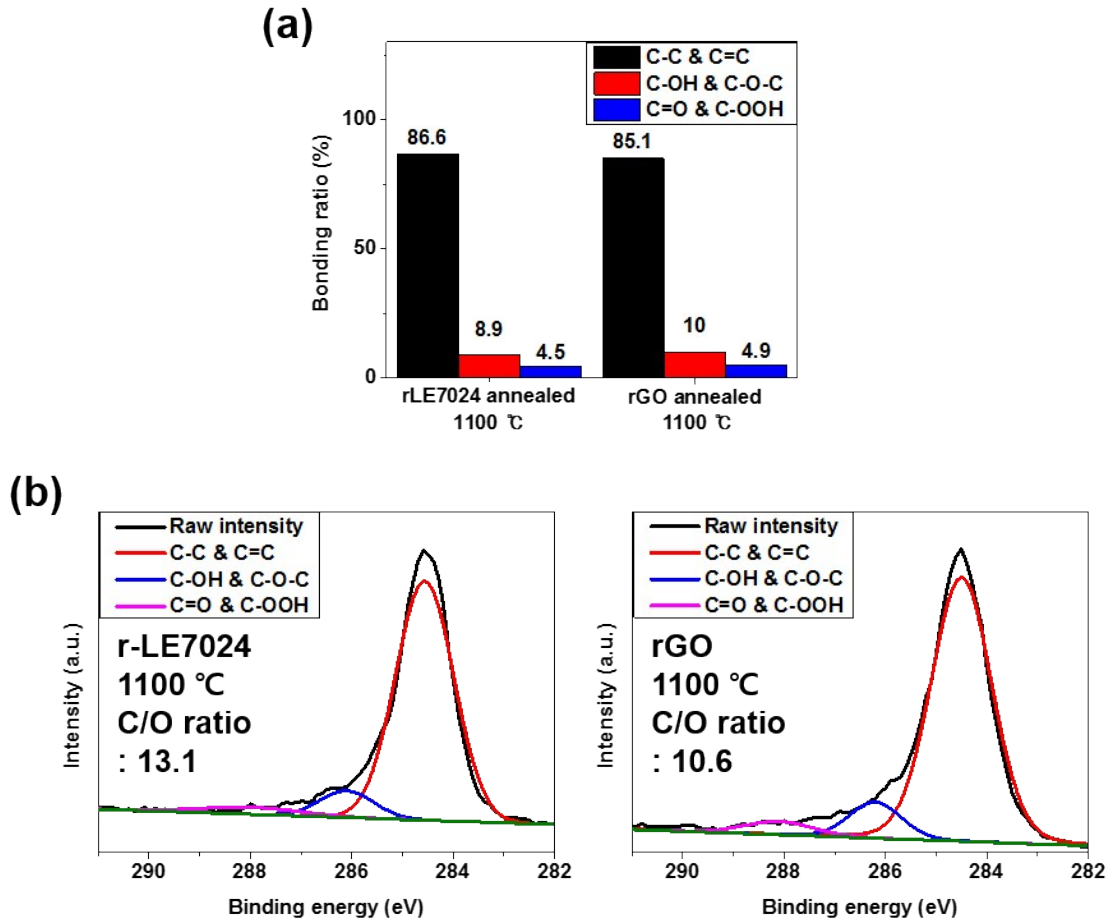

Fig. S11 (a) Binding ratios and C/O ratios, and (b) deconvoluted C1s peak measured by (XPS)of 1100 ˚C annealed rLE7024 and rGO.

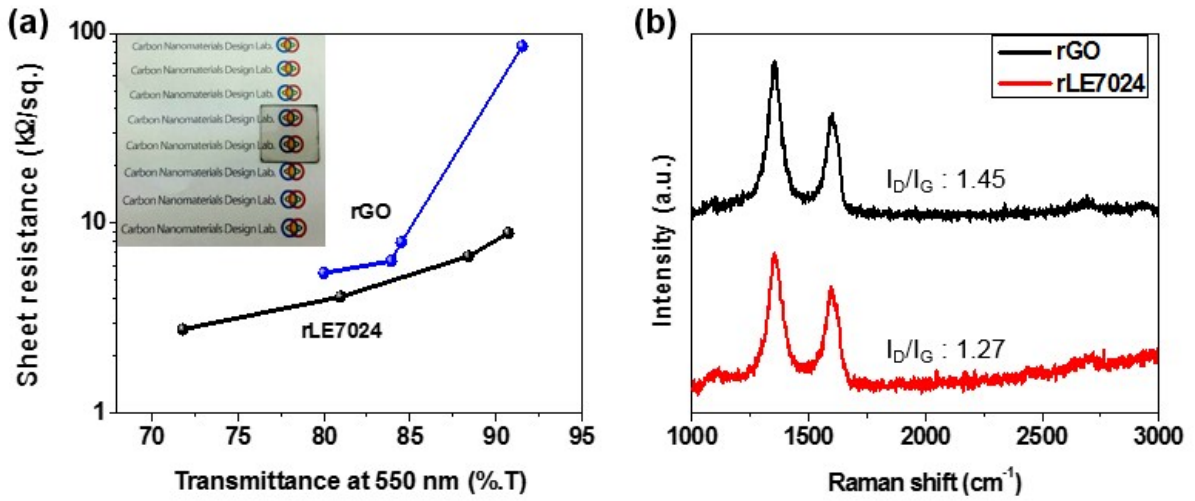

Fig. S12 (a) Optoelectrical performance of rLE7024 and rGO transparent conductive film (TCF) measured by a 4-point probe and ultraviolet–visible (UV-vis) spectroscopy, and (b) results of Raman spectroscopy and I_D/I_G ratio of RLE7024 and RGO.

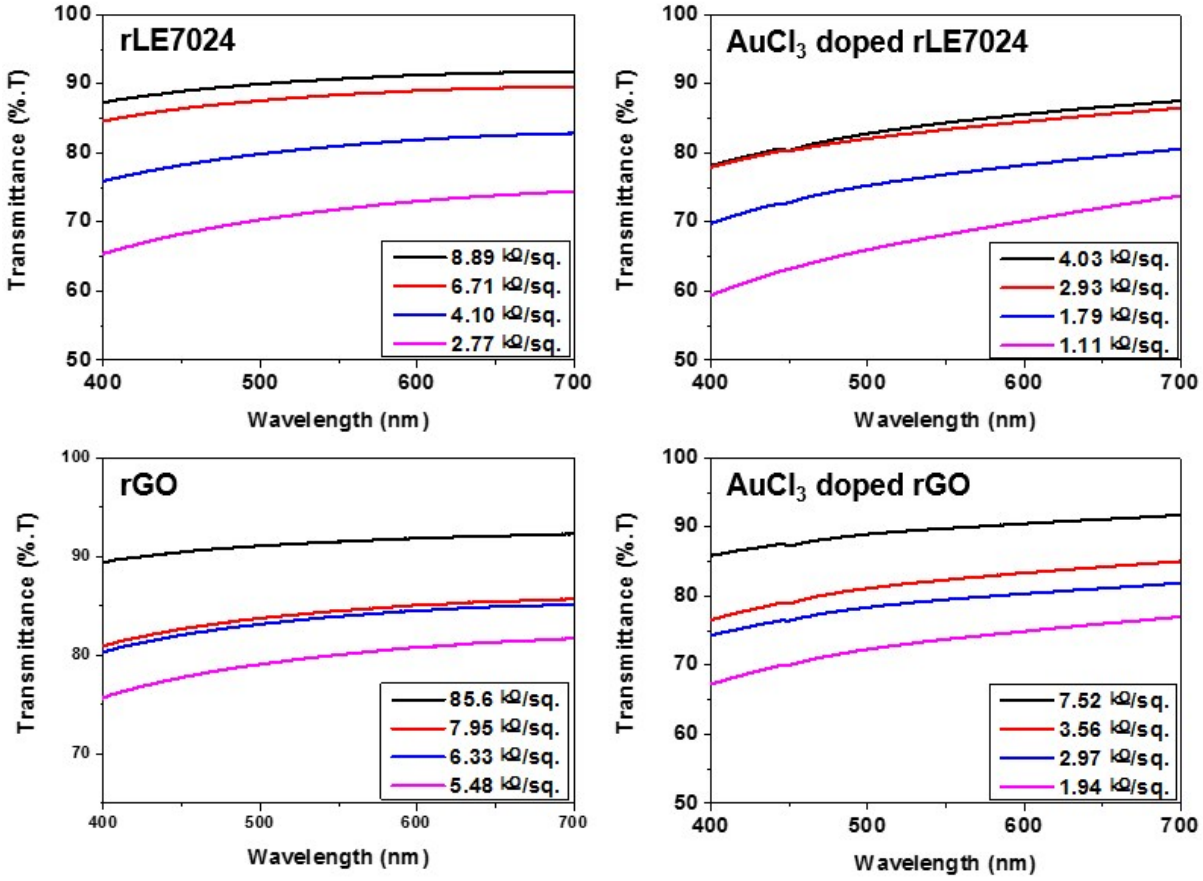

Fig. S13. Transmittance at visible light range of rLE024, rGO, $AuCl_3$ doped rLE024, and $AuCl_3$ doped rGO transparent conductive film.

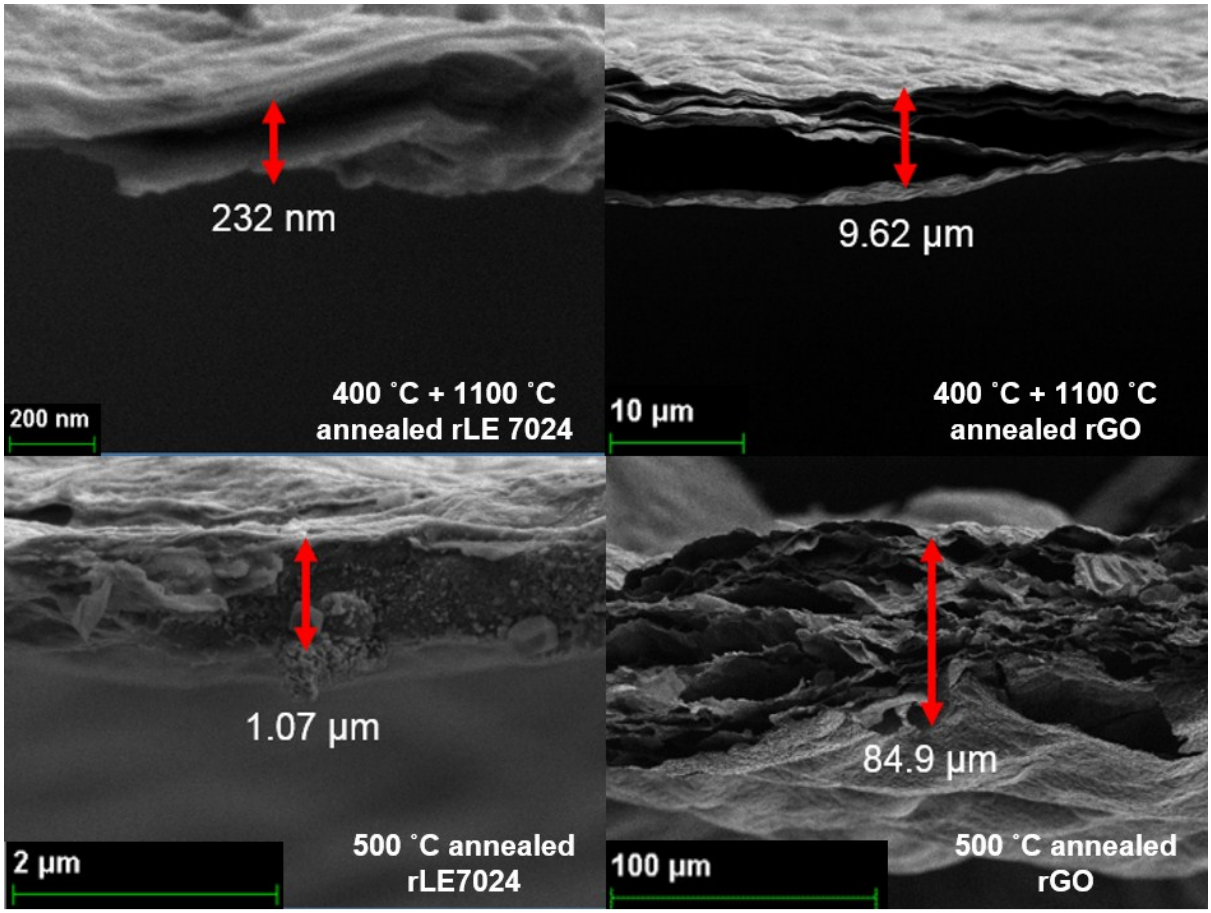

Fig. S14. Thickness of rLE7024, rGO which were annealed under temperature condition of 400˚C + 1100˚C and 500˚C.