Supplementary Data

## Enhanced Synthesis Method of Graphene Oxide

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Figure S 1. a) Digital image of GO obtained through Lu et al. method, b) some of its black particles collected c) XRD spectra of the collected black particles



Figure S 2.graphite mixed with piranha a) before b) after expansion (EG).



Figure S 3. a) GO-2 after 6h of oxidation reaction b) after ice cubes addition c) after water and  $H_2O_2$  addition.



Figure S 4. a) GO-2 after washing by sedimentation b) after exfoliation c) GO multilayers precipitated by low speed centrifugation.



Figure S 5. HI reduction of a) GO-0, 1 and 2 prepared by VAF, b-c) GO-2' prepared by doctor-blade



Figure S 6 a) attachment of rGO strips to paper frames for tensile test. b) fracture of rGO-2 during the tensile test.



Figure S 7. a) FTIR, b) Raman and c) TGA of GO films.



Figure S 8. AFM of a typical GO monolayer.



Figure S 9.Deconvolution of C1s XPS peak of GO-0, 1 and 2 respectively.



Figure S 10. Raman spectra of rGO films obtained by VAF.





Figure S 12. High resolution TEM image of GO-2 showing some crystalline and some amorphous regions.

Table S 1. Results of XPS survey and C1s peak deconvolution

Sample	GO-0	GO-1	GO-2
C/O ratio	2.39	2.41	2.35
Fraction of C=C/C-C (%)	41.78	40.92	39.13
Fraction of C-OH/C-O-C (%)	35.87	46.71	49.67
Fraction of C=O/O=C-O (%)	22.35	12.37	11.21
Sulfur content (at%)	1.24	0.85	1.05

Table S 2. Results of Raman peaks deconvolution or rGO films

Area (%) / Peak	D*	D	D**	G	D'	$A_D/A_G$	$A_{(all D peaks)}/A_{G}$
rGO-0	4.8	54.9	8.8	25.3	6.2	2.2	3.0
rGO-1	2.2	57.9	3.2	31.9	4.9	1.8	2.1
rGO-2	1.2	59.8	4.9	29.2	4.8	2.0	2.4