

Supporting Information

Highly Conductive Chemically Converted Graphene Prepared from Mildly Oxidized Graphene Oxide

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Figures and Tables

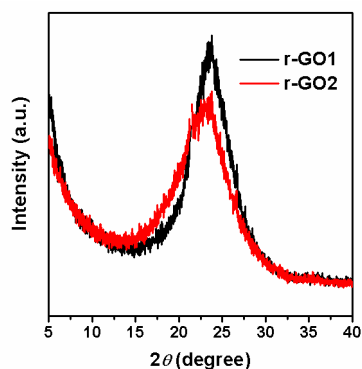


Figure S1. XRD patterns of r-GO1 and r-GO2 prepared by hydrazine reduction.

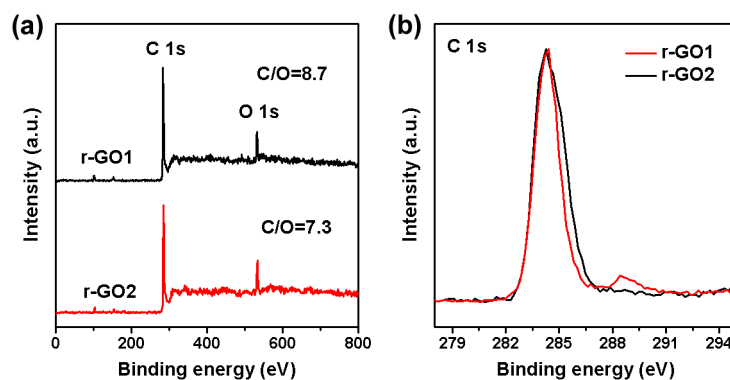


Figure S2. (a) XPS survey and (b) C 1s XPS spectra of r-GO1 and r-GO2 prepared by hydrazine reduction.

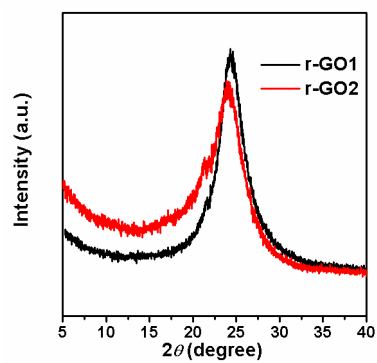


Figure S3. XRD patterns of r-GO1 and r-GO2 prepared by HI acid reduction.

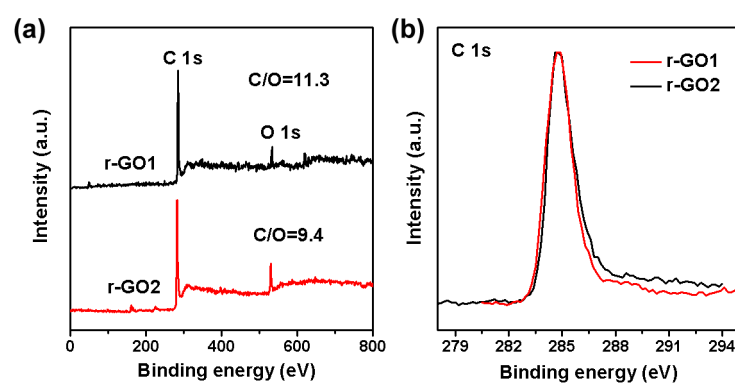


Figure S4. (a) XPS survey and (b) C 1s XPS spectra of r-GO1 and r-GO2 prepared by HI acid reduction.

Table S1. Comparison of the electrical conductivities of representative chemically converted graphene prepared by various reduction methods.

Reference	Reduction method	Graphene form	Electrical conductivity (S/cm)
1	Hydrazine reduction in ammonia solution	Free-standing paper	72 118 (annealing at 220 °C) 351 (annealing at 500 °C)
2	HI acid reduction of GO	Free-standing paper	298
3	Hydrazine reduced GO	Powder	2
4	Hydrazine reduction of noncovalent functionalized GO	Free-standing paper	2
5	Reduction of GO by NaBH ₄	Transparent conductive film	0.045
6	Pre-reduction of GO by NaBH ₄ --Sulphonation--Post reduction with hydrazine	Thin film	12
7	Flash reduction of GO	Free-standing paper	10
8	Hydrazine reduction of GO in DMF/water mixture	Free-standing paper	17 (air dried) 160 (annealing at 150 °C)
9	Hydrazine reduction of KOH modified GO	Free-standing paper	6.9
10	Thermal annealing at 1100 °C in ultra high vacuum	Transparent conductive film	~10 ³
11	Thermal annealing at 1100 °C in Ar and/or H ₂	Transparent conductive film	550 for 10 nm film 727 for 30 nm film
12	Pre-reduction of GO by NaBH ₄ --Heating in H ₂ SO ₄ --Post annealing at 1100 °C in Ar/H ₂	Powder	202
13	Rapid heating of GO up to 1050 °C	Powder	10~23
The present work	Hydrazine reduction of mildly oxide graphene	Free-standing paper	169
	HI acid reduction of mildly oxide graphene	Free-standing paper	405

References

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