Electronic Supplementary Information: Porous Graphene-Based Materials by Thermolytic Cracking

Deqin Fan, [a,b] Ying Liu, [a] Junpo He, *[a] Yanwu Zhou[a] and Yuliang Yang[a]

Table S1. Number average diameters, D_ns, and distributions, *PDI*s, of PS-*in*-RGOs from statistics of OM.

PVP con. (%)	GO con. (%)	D_n(μm)	*PDI*[d]
1.60	0	-[a]	-[a]
0	0.01	-[b]	-[b]
0.53	0.01	5.78	1.140
1.00	0.01	4.98	1.148
1.60	0.01	3.53	1.165
2.20	0.01	2.81	1.203
1.60	0.25	3.17	1.165
1.60	0.50	3.24	1.349
1.60	0.01[c]	3.65	1.188
1.60	0.25[c]	2.93	1.170
1.60	0.50[c]	3.10	1.426

[a.] Unable to precisely be determined due to limited resolution of the optical microscopy.
[b.] Serious coagulum observed.
[c.] The data is from the samples after chemical reduction reaction.
[d.] The average diameter D_n and polydispersity index *PDI* were calculated according to:

$$D_n = \sum_{i=1}^{n} d_i/n, D_w = \sum_{i=1}^{n} d_i^4 / \sum_{i=1}^{n} d_i^3, PDI = \frac{D_w}{D_n},$$

where n is the number of counted particles and d_i is the diameter of the individual particle.

Table S2. Raman intensity ratios of graphite, RGO and PS-*in*-RGOs.

Sample	I_D/I_G
Graphite	0.21
PS-*in*-RGO1	1.47
PS-*in*-RGO2	1.46
PS-*in*-RGO3	1.49
RGO	1.61

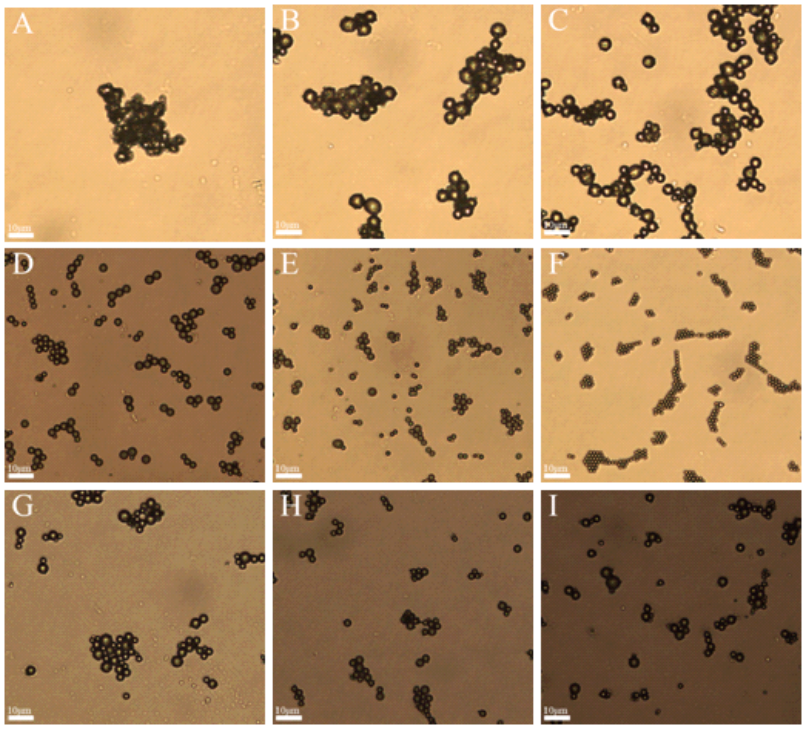

Fig. S1 Optical images of the PS-*in*-GO on glass slide with PVP concentration at (A) 0%, (B) 0.53%, (C) 1.06%, (D) 1.60%, (E) 2.20% at 0.01% GO; (F) standard control polystyrene microspheres; PS-*in*-RGOs with GO concentration at (G) 0.01%, (H) 0.25%, (I) 0.50% at 1.60% PVP. The scale bars are 10 μm.

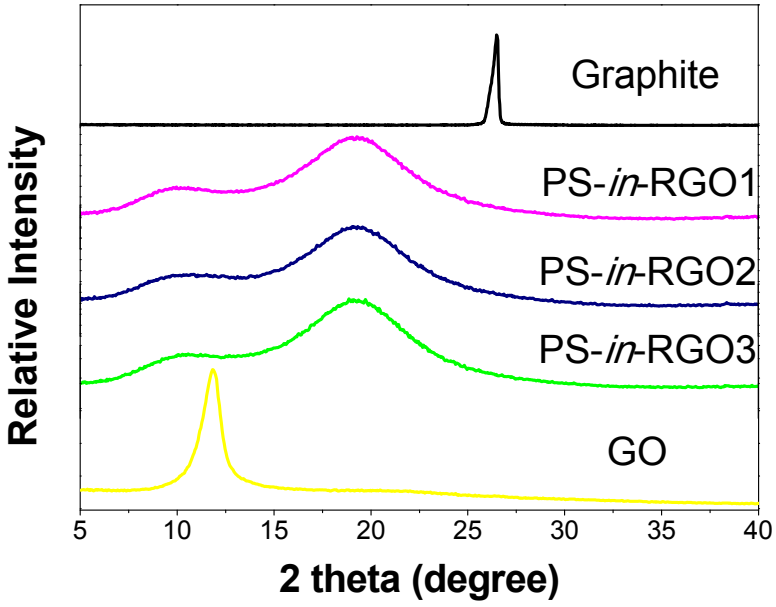

Fig. S2 XRD spectra of GO, PS-*in*-RGOs and graphite.

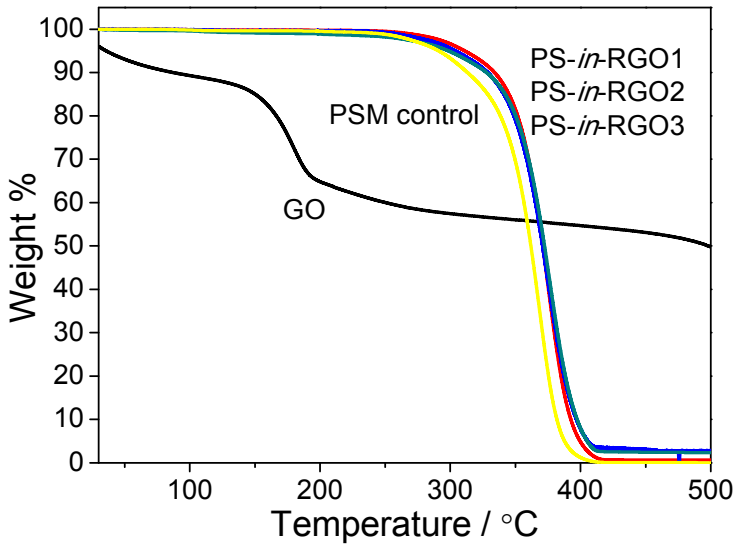

Fig. S3 TGA curves of GO, PS-*in*-RGOs and control polystyrene microspheres (PSM) prepared in the absence of GO.

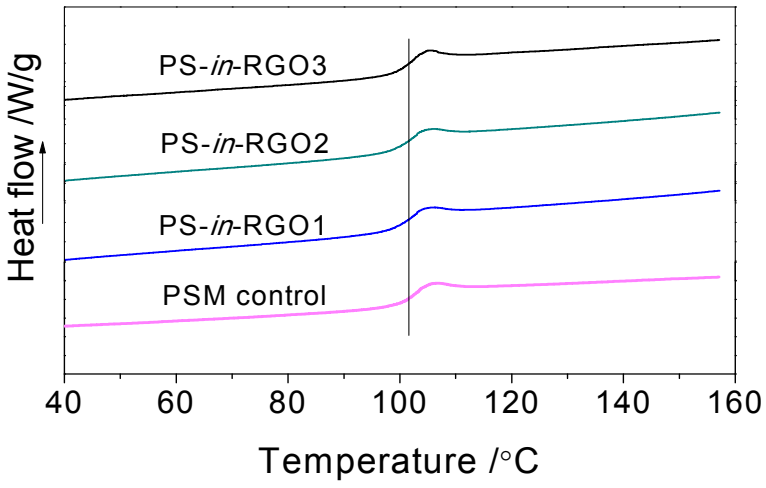

Fig. S4 DSC curves of PS-*in*-RGOs and control polystyrene microspheres (PSM) prepared in the absence of GO.

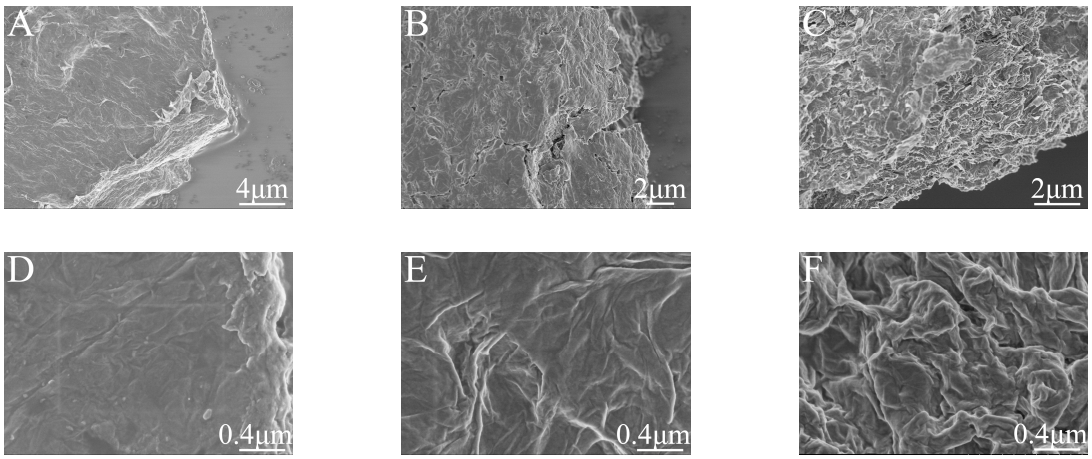

Fig. S5 SEM images of recycled RGO by solvent abstract of PS-*in*-RGO1 (A, D), PS-*in*-RGO2 (B, E) and PS-*in*-RGO3 (C, F).

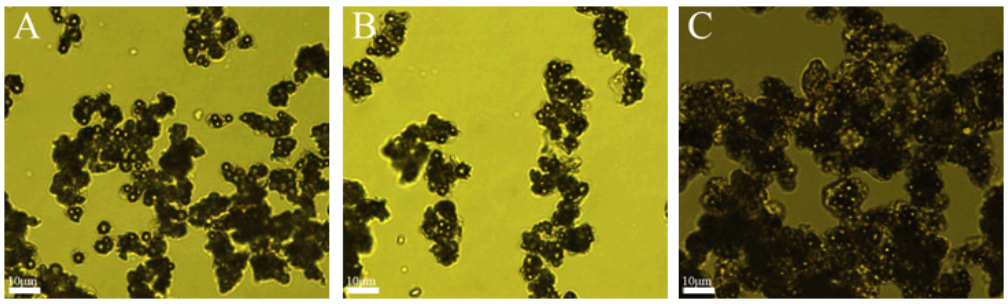

Fig. S6 Optical images of (A) PS-*in*-GO/$SiO_2$1, (B) PS-*in*-GO/$SiO_2$2 and (C) PS-*in*-GO/$SiO_2$3.

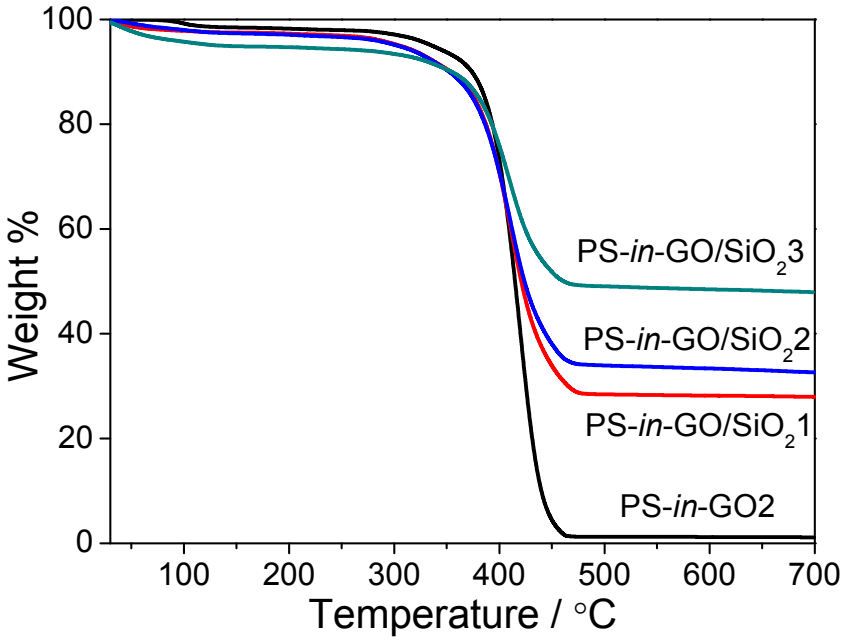

Fig. S7 TGA curves of (A) PS-*in*-GO2, (B) PS-*in*-GO/$SiO_2$1, (C) PS-*in*-GO/$SiO_2$2 and (D) PS-*in*-GO/$SiO_2$3.