Supplementary Information

A one-step method for reduction and self-assembling of graphene oxide into reduced graphene oxide aerogels

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Table S1. The C/O ratio of rGO prepared by using different reductants

Sample	C/O ratio	Reduction time	Reducing agent	Reference
RGO	8.1	0.5h	mercaptoacetic acid	
RGO	4.78	2h	$NaBH_4$	1
RGO	12.0	12h	HI	2
RGO	10.3	24h	Hydrazine	3
RGO	7.7	12h	Pyrrole	4
RGO	7.4	24h	p-phenylene diamine	5
RGO	6.9	9h	chitosan	6
RGO	11.9	72h	Wild carrot	7

Preparation of rGO[2] by freeze-drying and thermal reduction

GO suspension was injected into a plastic tube (20mm in diameter and 50mm in length). The plastic tube was placed in an insulated styrofoam container, with only the bottom surface of the plastic tube exposed. The styrofoam container was placed onto the top of a 6 cm diameter metal disk, which in turn rested on a 6 cm-deep pool of

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liquid nitrogen to create a uniaxial thermal gradient. As the liquid nitrogen evaporated, the mixture was unidirectionally frozen from bottom to the top. The solid was then transferred to a freeze-drying vessel (Alpha1–2, Christ, Germany) and freeze-dried for 48 h under vacuum (less than 20 Pa) to obtain porous GO monoliths. Then, GO monoliths was heated in an oven at 200 °C for 24 h to obtain rGO^2.[8]

Absorption of rGO aerogels and rGO^2 to Cu^{2+} ions

The freeze-dried rGO aerogel and rGO^2 were put into a hermetic vessel containing 20 mL of an aqueous solution with 320 ppm of Cu^{2+} ion. Then the vessel was put on a WH-4 multi-function shaker and shaken gently. The solution was taken out at 0.5 h, 1 h, 2 h, 4 h, 8 h, and 12 h to measure the absorbance of UV-Vis absorption spectra by using TU-1901 UV-Vis spectrophotometer. And the concentration of Cu^{2+} ion was calculated by standard curve method.

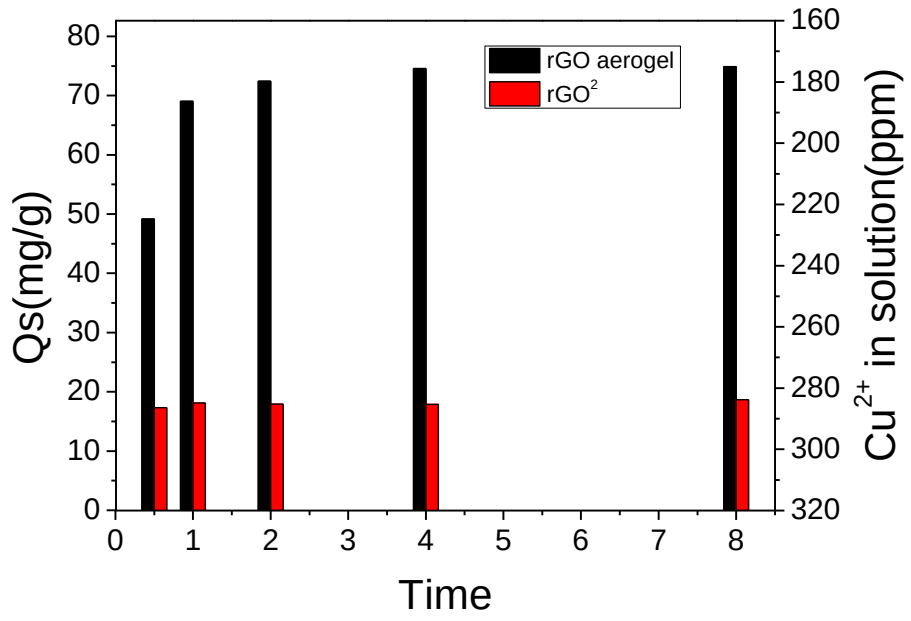

Figure S1. The absorption of Cu^{2+} by rGO aerogels and rGO^2

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