

## Supporting information

Materials: Natural graphite powder (40  $\mu\text{m}$  with purity >99.85%) was supplied by Xiamen Knano Graphene Technology Co., Ltd, and hydrazine hydrate (85%),  $\text{H}_2\text{SO}_4$ ,  $\text{NaNO}_3$ ,  $\text{KMnO}_4$ ,  $\text{H}_2\text{O}_2$  were purchased from Sinapharm Chemical Reagent Co., Ltd, China.

Preparation of graphene oxide (GO): In a typical experiment, graphite powder (3 g) was placed in a 1000 mL beaker, and then 80 mL  $\text{H}_2\text{SO}_4$  solution and 1.5 g  $\text{NaNO}_3$  were added in an ice-water bath with stirring. The mixture was kept at 0  $^\circ\text{C}$  for 40 min and then 9 g  $\text{KMnO}_4$  was gradually added and the mixture was heated at 35  $^\circ\text{C}$  for 1 h. The mixture was then diluted with 200 mL of 30  $^\circ\text{C}$  deionized (DI) water and heated at 60  $^\circ\text{C}$  for 1 h until the color of the solution became dark brown.  $\text{H}_2\text{O}_2$  (10 mL) was then added to the mixture under stirring and the color changed to brilliant yellow along with bubbling. Centrifugation at relative centrifugal force of  $9900 \times g$  for 10 min was then performed to separate GO and the liquid. The obtained solid was washed with 1:10 HCl aqueous solution (1 L) to remove metal ions, centrifuged ( $7000 \times g$  for 5 min), washed with 1 L DI water, and centrifuged ( $7000 \times g$  for 5 min) more than 3 times to remove impurities. The product was dissolved in 500 mL DI water and ultrasonicated for 6 h. The solution was centrifuged ( $4000 \times g$  for 5 min) and the obtained liquid was GO solution.

The GO obtained was multilayered and had a size of 2-20  $\mu\text{m}$  (a small amount of single layer GO also could be found shown in Fig. S1). The concentration GO was determined by  $W_1/W_2 \times 100\%$ , where  $W_2$  and  $W_1$  are the weight of the 25mL GO solution before and after heating at 50  $^\circ\text{C}$  for 12 h respectively.

The size of rGO sheets (the GO that is reduced by hydrazine hydrate) ranges from 10-200  $\mu\text{m}$  shown in Fig. S2.

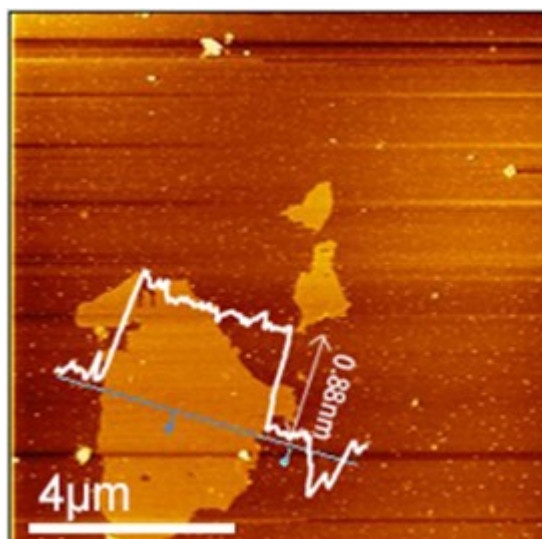


Fig. S1 The atomic force microscope (Nanonavi E-Sweep, SEIKO) of single-layer GO sheet

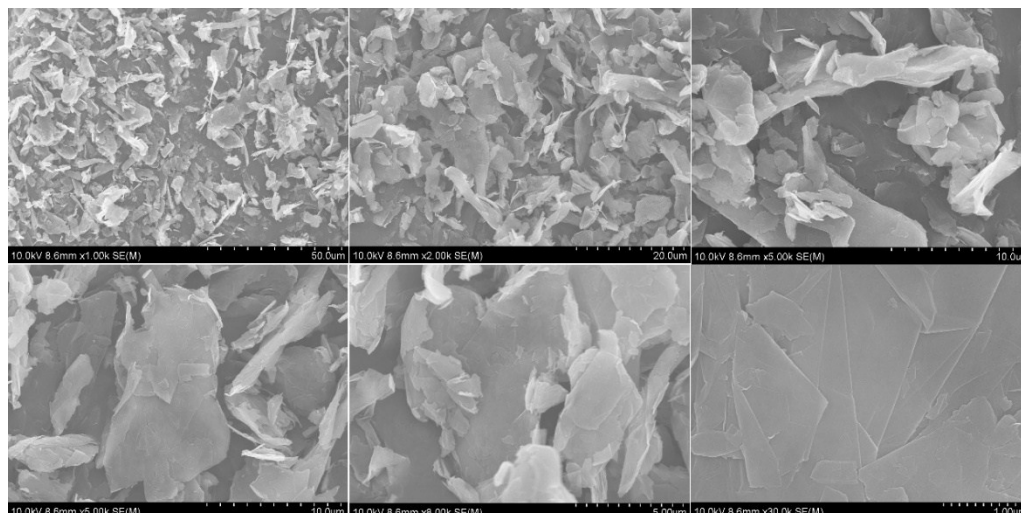


Fig. S2 SEM images of rGO sheets