Electronic Supplementary Material (ESI) for Analytical Methods

SUPPORTING INFORMATION

Synthesis of graphene nanosheets decorated with silver nanoparticles for enzymeless hydrogen peroxide detection

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1. Synthesis of graphene oxide (GO)

GO was synthesized from natural graphite powder by a modified Hummers method. In brief, graphite powder (3 g, 325 mesh) was put into a mixture of concentrated H_2SO_4 (24 mL), $K_2S_2O_8$ (5 g), and P_2O_5 (5 g). The solution was kept at 80 °C for 4.5 h. Successively, the mixture was cooled to room temperature and diluted with de-ionized (DI) water. Then, the resulting preoxidized product was filtered and washed with DI water using a 0.2 micron Nylon Millipore filte, and then was dried under ambient condition overnight. Preoxidized graphite powder was added into cold (0 °C) concentrated H_2SO_4 (120 mL). Then $KMnO_4$ (15 g) was added gradually under stirring and the temperature was maintained at below 20 °C by cooling in order to avoid overheating and explosion. Successively, the mixture was stirred at 35 °C for 6 h, and then 250 mL DI water was added. After 2 h, additional 0.3 L of DI water was added to dilute the mixture, and 20 mL of 30 % H_2O_2 was added to the mixture to completely react with excess $KMnO_4$. The color of the mixture changed into brilliant yellow along with bubbling. The resulting mixture was washed with 1:10 HCl aqueous solution (1 L) to remove metal ions followed with a large amount

of DI water until pH=7 via centrifugation. Finally, the obtained graphite oxide was dispersed into water with a certain concentration and subsequently sonicated for 30 min to give homogeneous exfoliated GO solution.

Fig. S1. Photographs of aqueous dispersions of GO (left) and PDDA-rGO (right).

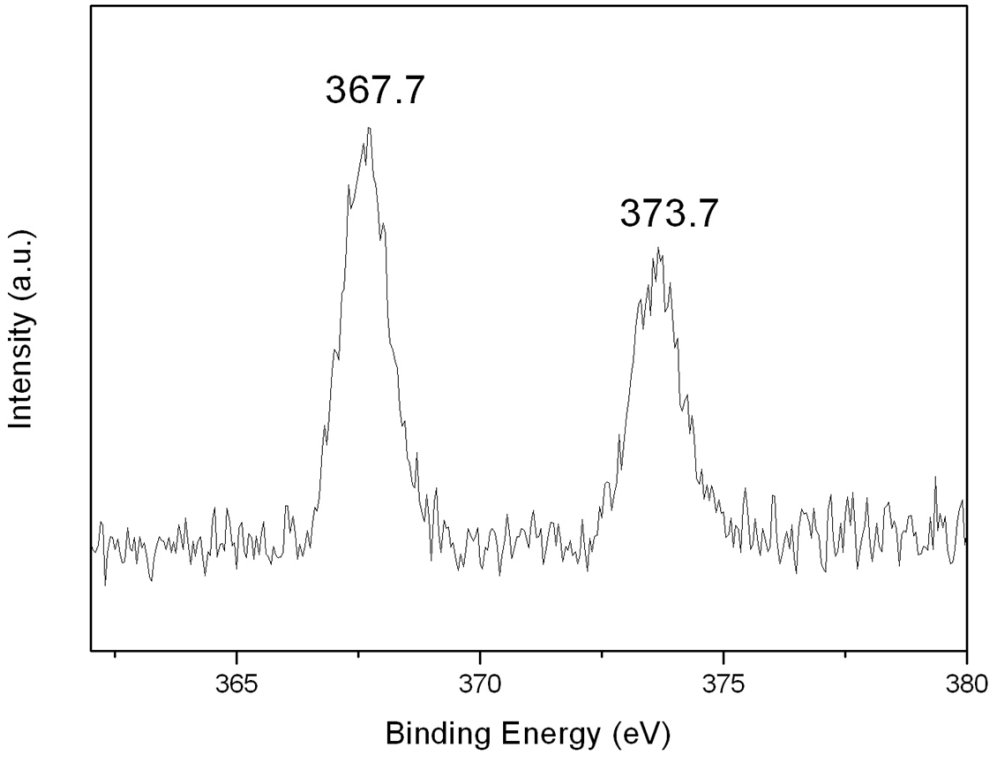

Fig. S2. XPS spectra of Ag 3d in PDDA-rGO/AgNPs.