Graphene Induced Porphyrin Nano-Aggregates for Efficient Electron Transfer and Photocurrent Generation

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Supporting Information

Synthesis of GO:

GO was synthesized by using the graphite powder, in order to maintain modified Hummer's method. Briefly, graphite powder (1 g) and $NaNO_3$ (1 g) was taken in a 500 mL round-bottom flask. Then 50 mL of concentrated H_2SO_4 was slowly added to the mixture maintaining the 0°C temperature and then solid $KMnO_4$ (3 g) was added to the mixture and was stirred continuously for 1 h at room temperature. The water (200 mL) and H_2O_2 (30%) solution was added to the reaction mixture under stirring condition until the gas evolution was ceased. The mixture was then washed with 5% HCl solution and water. The residue was then separated from the reaction mixture by vacuum filtration and then washed repeatedly with 5% HCl solution. Finally, it was washed with copious amount of Millipore water and dried in a vacuum to get the yellow brown solid of GO. The product was dispersed in water by sonication for 45 min, and then large particles were centrifuged out at 5000 rpm. The remaining particles were centrifuged at 12000 rpm and collected and dried at vacuum.

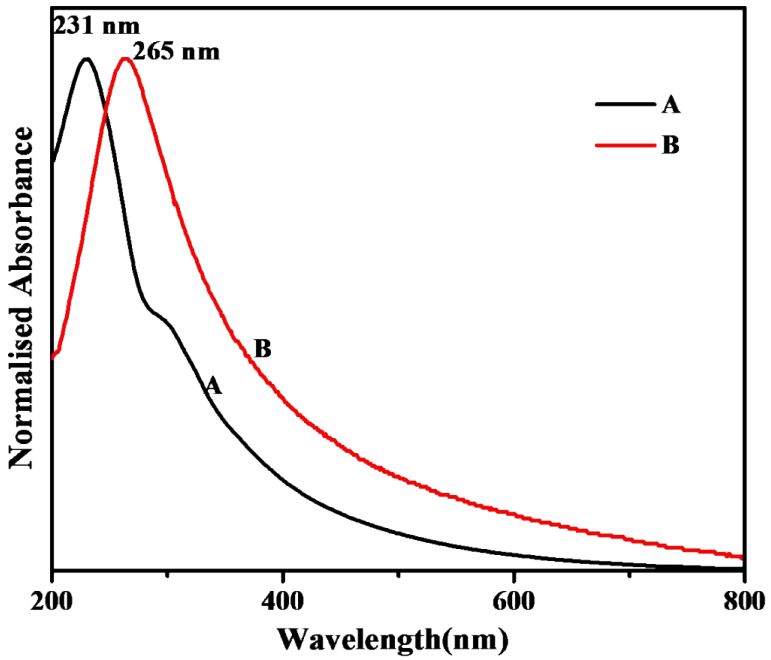

Fig. S1. UV-Vis spectrum of GO (A) and RGO (B) in water

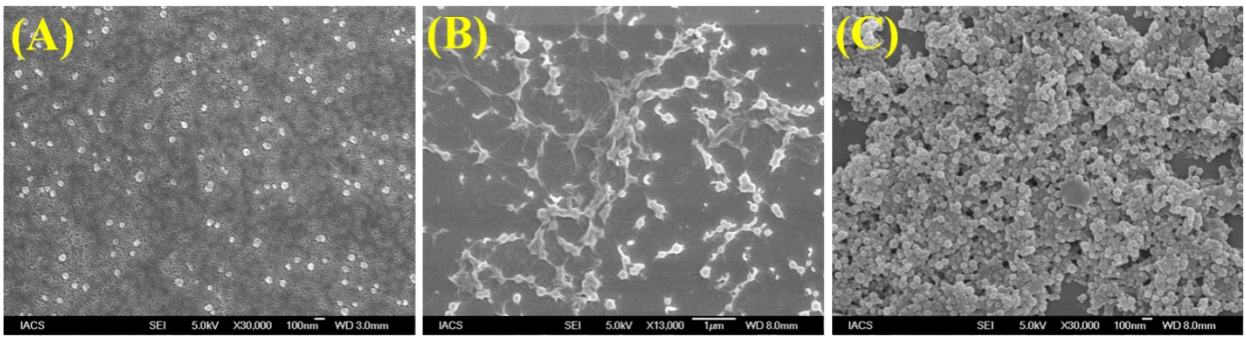

Fig. S2. SEM images of porphyrin in H_2O (A), porphyrin-GO (B) and porphyrin-RGO (C) aging for 72 hr.

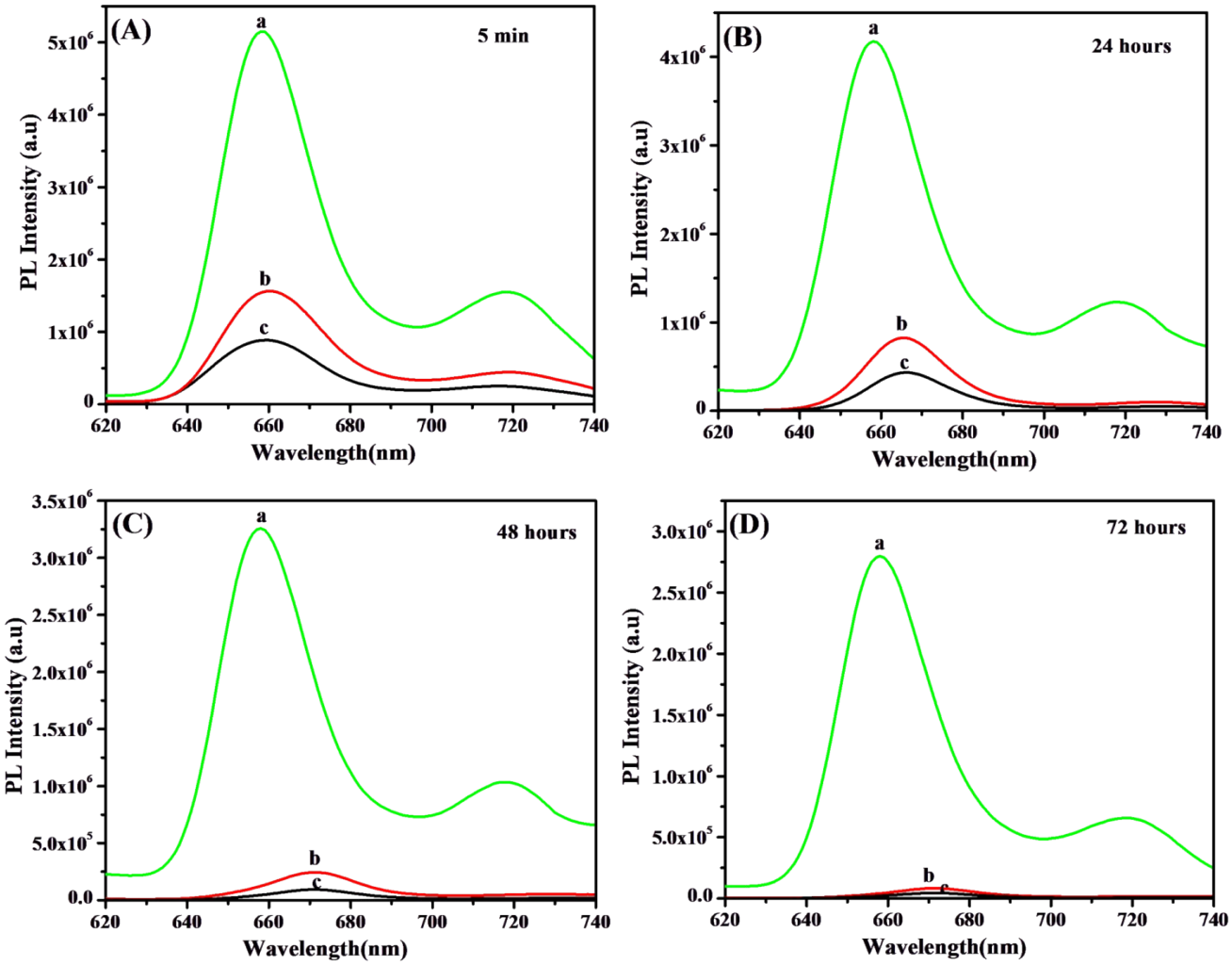

Fig. S3. Emission spectra of porphyrin in H_2O (a), porphyrin/RGO (0.01mg mL^{-1}) (b) and porphyrin/RGO (0.02mg mL^{-1}) (c), with 5 min (A), 24 h (B), 48 h (C) and 72 h (D) aging.