Electronic Supplementary Material (ESI) for RSC Advances

Supporting information

Composite of Graphene Quantum Dots and Fe_3O_4 Nanoparticles: Peroxidase Activity and Application in Phenolic Compound Removal

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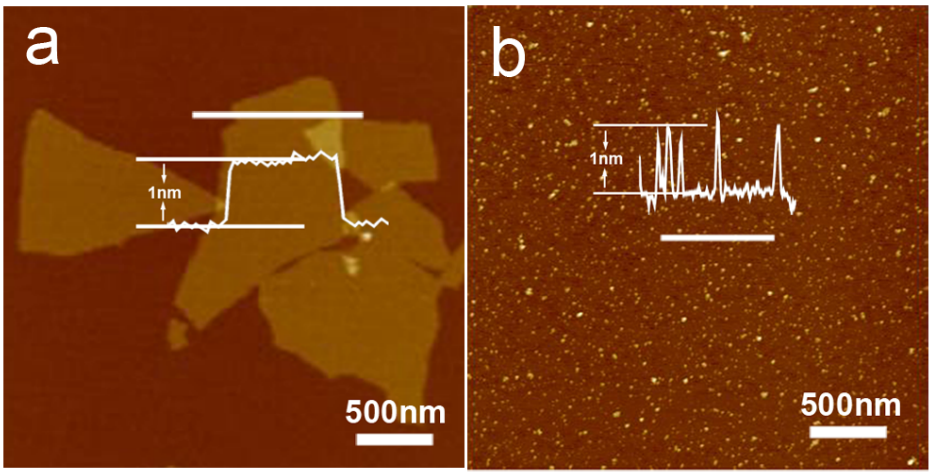

Figure S1. AFM images of graphene oxide (GO) and grapheme quantum dots (GQDs) used in the work.

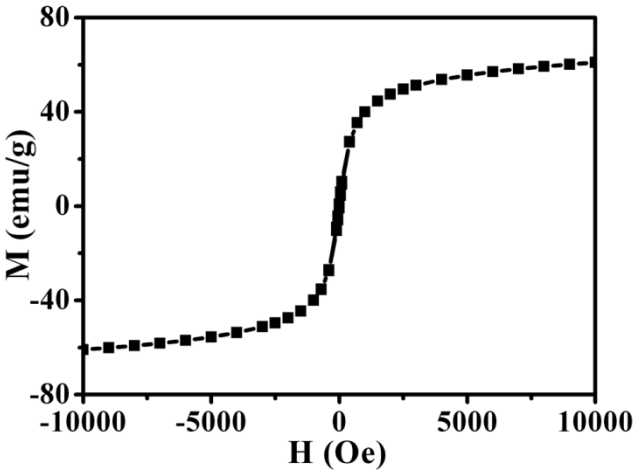

Figure S2. Hysteresis loops of the Fe_3O_4 nanoparticles prepared without GO and GQDs.

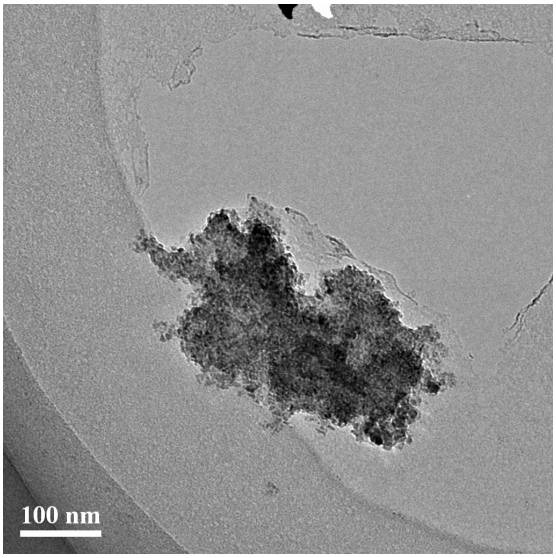

Figure S3. TEM image of Fe_3O_4 nanoparticles prepared without GO and GQDs.

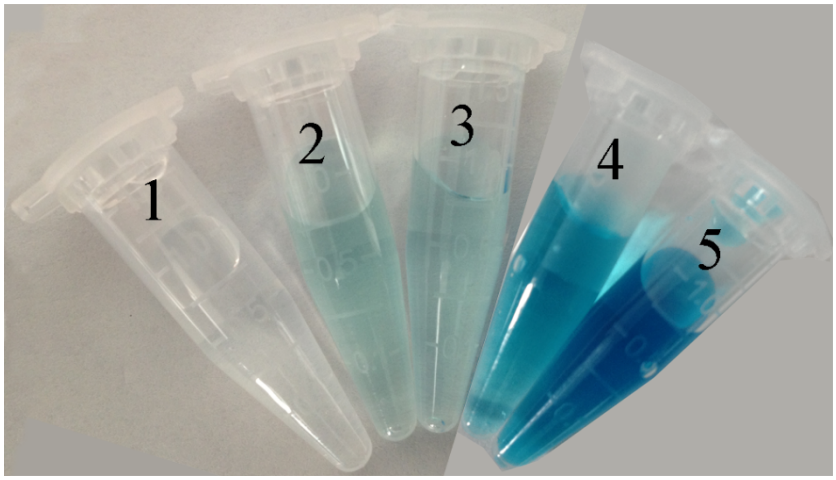

Figure S4. Optical microscopy images of the oxidation products of TMB. Control (1), with GQDs (2), Fe_3O_4 (3), GO/$Fe_3O_4$1-1(4), and GQDs/$Fe_3O_4$1-1(5) as catalysts.

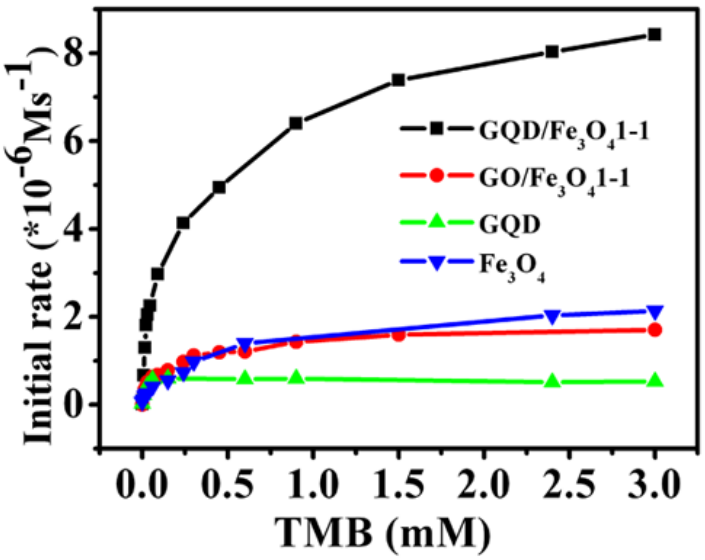

Figure S5. The reaction rates with different materials (10 μg) as catalysts *versus* the concentration of TMB at 30 ℃, with H_2O_2 (5 mM) in 1 mL of NaAc (pH 3.5).

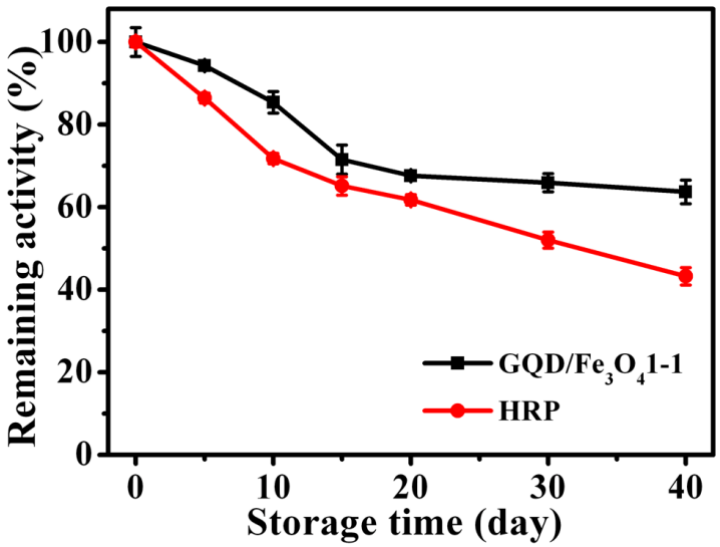

Figure S6. Comparison of the storage stability of the GQDs/$Fe_3O_4$1-1 and HRP.

Table S1.

	K_m (mM)	V_{max} (μM/min)	K_{cat} (μM/min/g)
GQD/$Fe_3O_4$1-1	0.05	5.76	5.8×10^5
GO/$Fe_3O_4$1-1	0.08	1.42	1.4×10^5
GQD	0.05	5.24	5.2×10^5
Fe_3O_4	0.67	1.13	1.1×10^4
HRP	0.58	27.6	9.2×10^9

Table S1. Comparison of the apparent kinetic parameters, Michaelis constant (K_m) and maximum reaction rate (V_{max}) of the different materials (TMB as a substrate). Turnover number (K_{cat}) was determined with the same amount of the materials or HRP.