Electronic Supplementary Material (ESI) for Analytical Methods

Electronic Supplementary Information

Synthesis of Ag_2S quantum dots by a single-source precursor: an efficient electrode material for rapid detection of phenol

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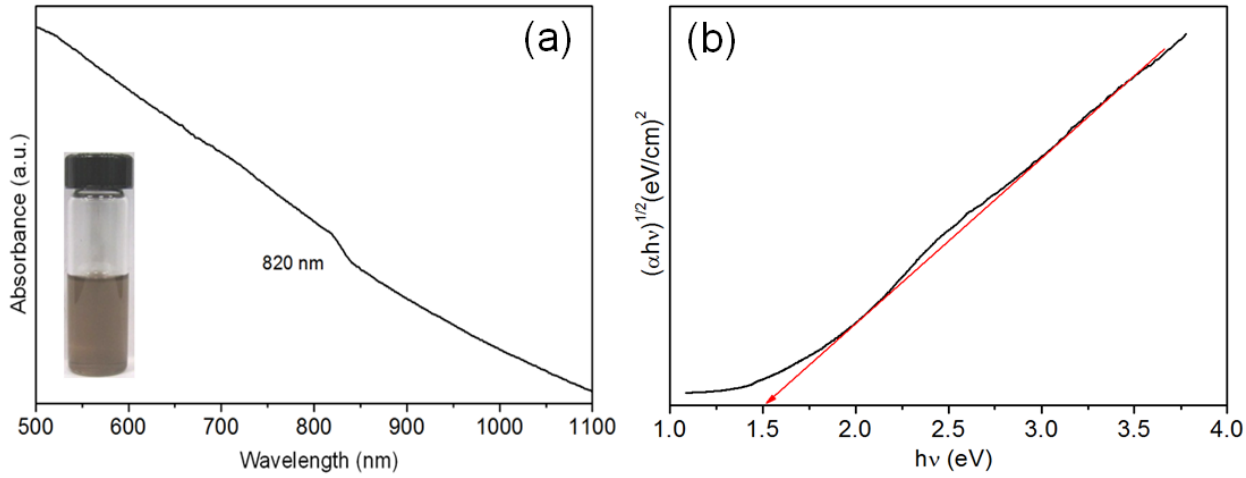

Figure S1. (a) UV-vis-NIR absorption spectrum of Ag_2S QDs. Inset: photograph of Ag_2S QDs dissolved in cyclohexane under daylight. (b) Corresponding Tauc's plot for the determination of band gap energy of Ag_2S QDs.

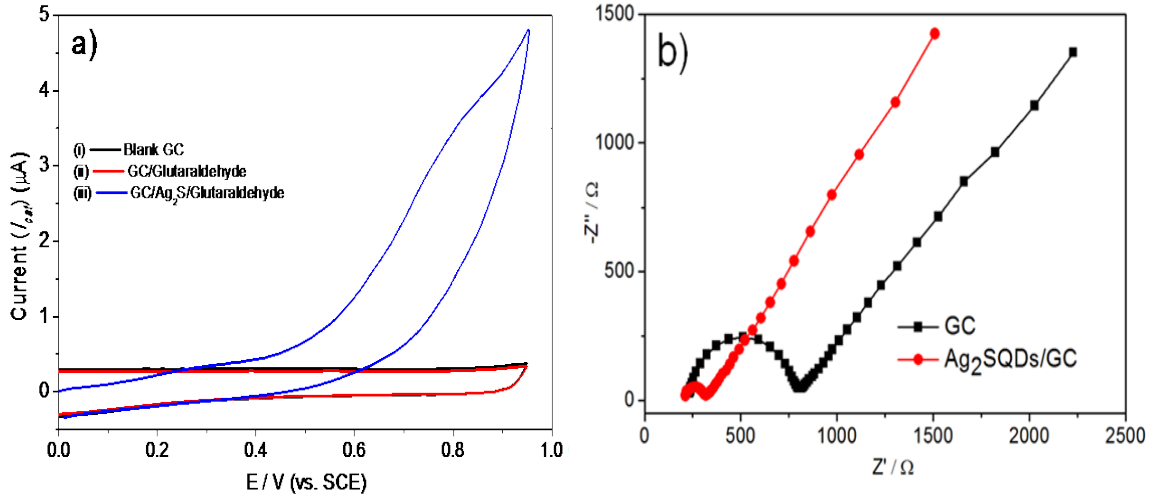

Figure S2. a) Cyclic voltammograms of GC, GC coated with glutareldehyde, and Ag_2S QD/GC coated with glutareldehyde in 0.1 M PBS (pH 7, 40 °C) at scan rate of 0.1 Vs^{-1}. b) Nyquist plots of GC and Ag_2S QD/GC electrodes in 0.1 M KCl containing 5 mM $Fe(CN)_6^{4-/3-}$ solution (40mL, 1:1) from 0.1 Hz to 10.0 kHz.

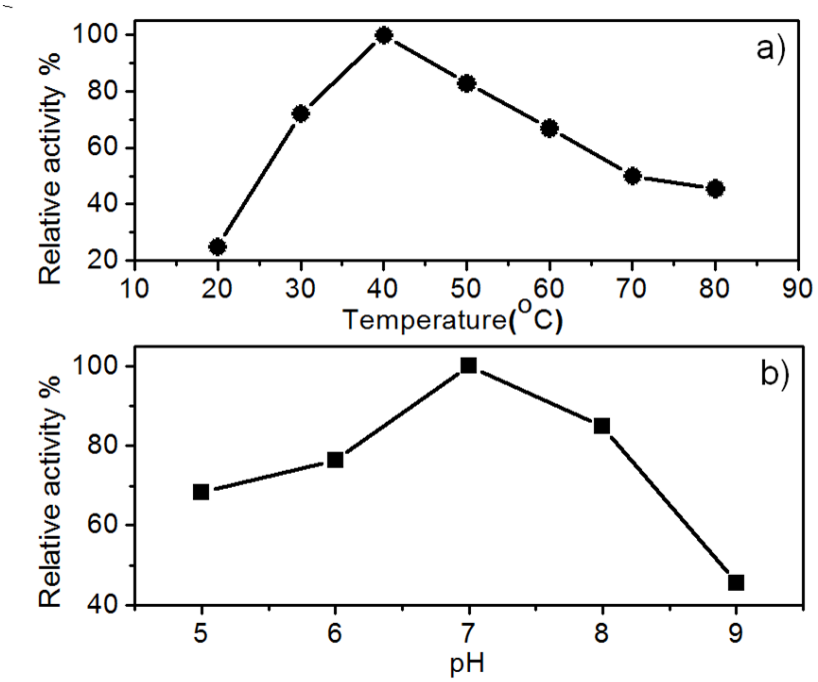

Figure S3. Effects of (a) temperature and (b) pH on the electro-catalytic activity of Ag_2S QD/GC electrode in 0.1 M PBS (vs. Ag/AgCl).

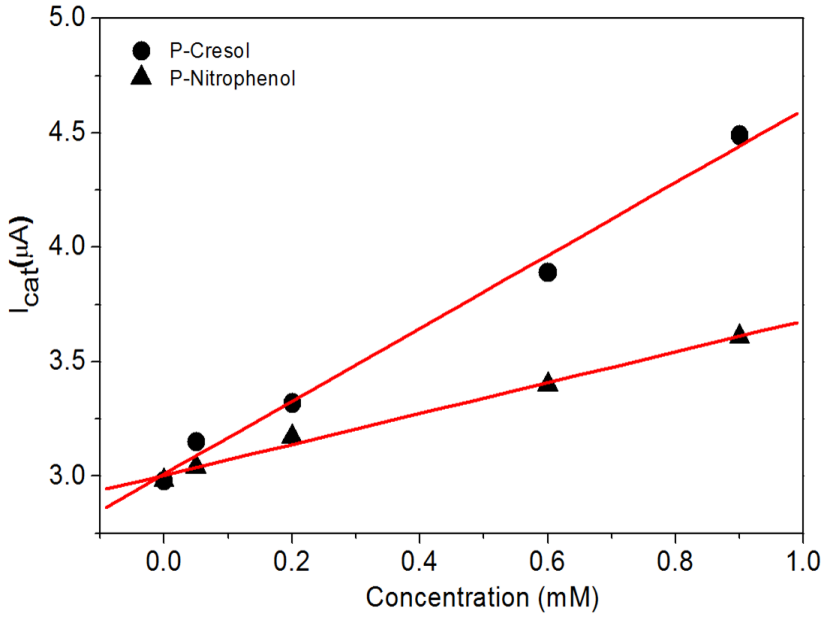

Figure S4. Calibration plots (oxidation current vs. concentration) of Ag_2S QD/GC electrode upon successive addition of *p*-cresol and *p*-nitrophenol to 0.1 M PBS (pH 7, 40 °C).

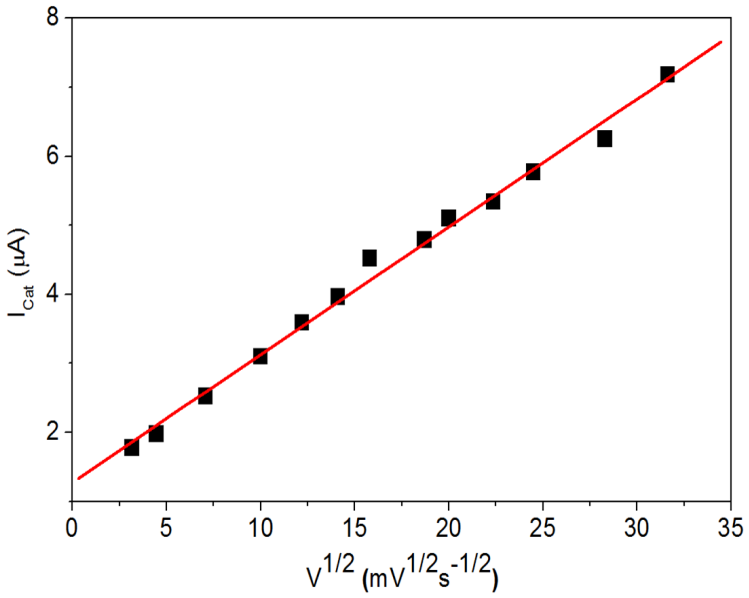

Figure S5. Linear relationship between the oxidation peak current (+0.78 V) and the square of scan rates (scan rates: 20, 50, 100, 300, 500, 600 mVs^{-1}) for Ag_2S QD/GC electrode in 0.1 M PBS (pH 7, 40 °C) with 0.05 mM phenol.

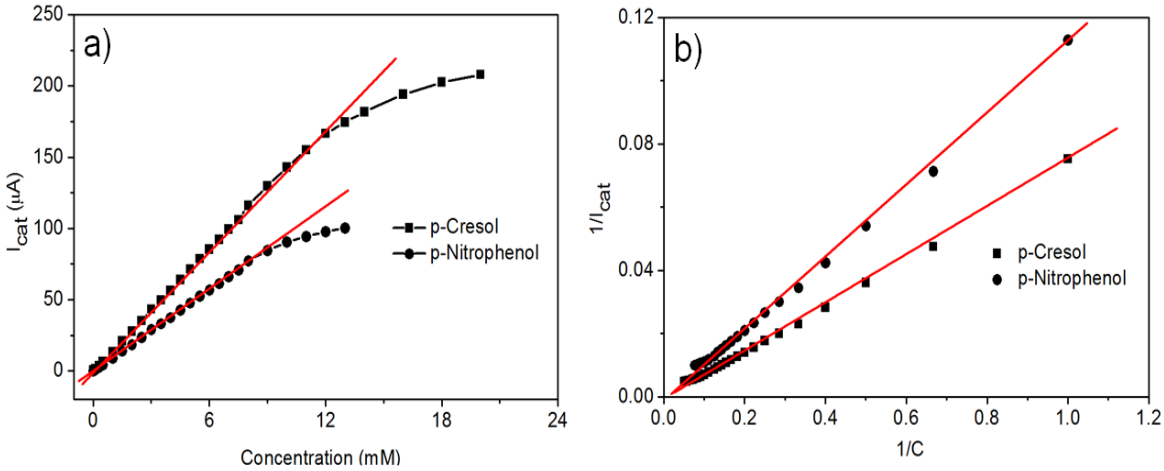

Figure S6. (a) Calibration plots derived from amperometric responses and (b) Lineweaver-Burk plot of Ag_2S QD/GC electrode with successive addition of *p*-cresol and *p*-nitrophenol into 0.1 M PBS (pH 7, 40 °C) at +0.78 V (vs. Ag/AgCl).

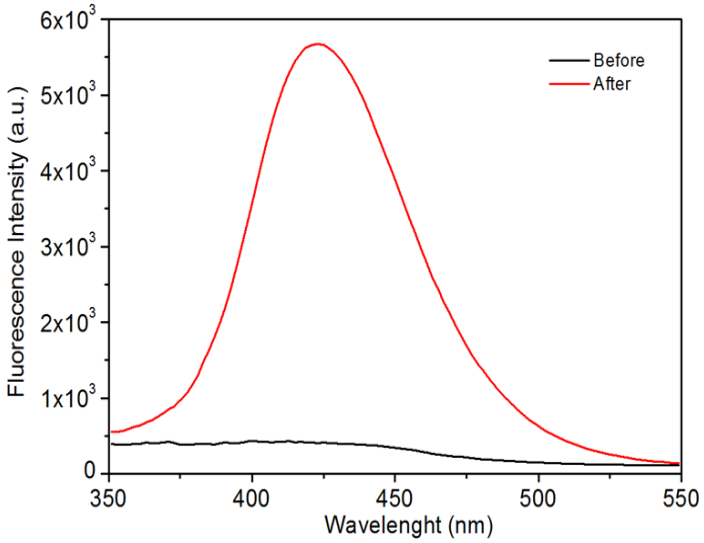

Figure S7. Proof for hydroxyl radical generation. Photoluminescence spectral changes of terephthalic acid solution analyzed after electro-decomposition of Ag_2S QD/GC electrode.

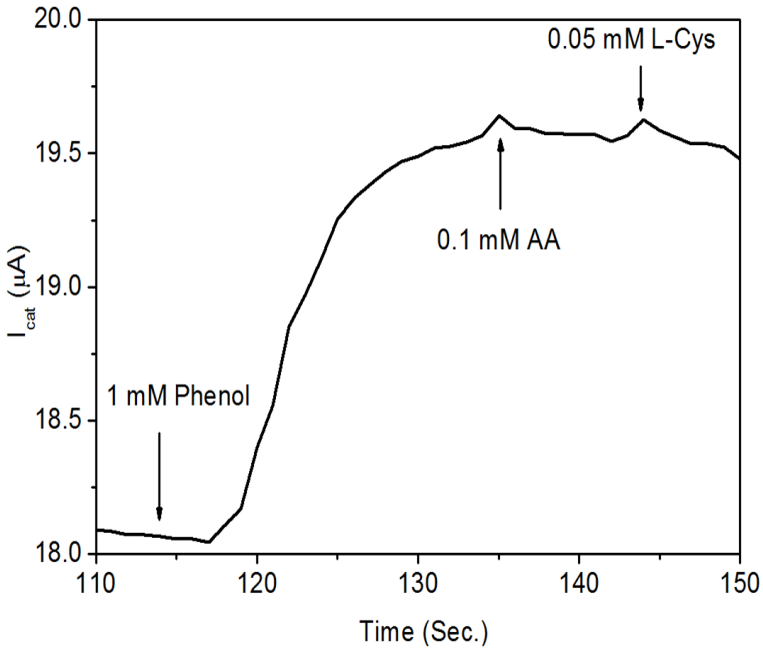

Figure S8. Amperometric response of Ag_2S QD/GC electrode with successive addition of 1 mM phenol, 0.1 mM AA and 0.05 mM *L*-Cys into 0.1 M PBS at +0.78 V (vs. Ag/AgCl) (pH 7, 40 °C).