Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Enhancement of Mineralization Ability of C_3N_4 via lower Valence Position by Tetracyanoquinodimethane Organic Semiconductor

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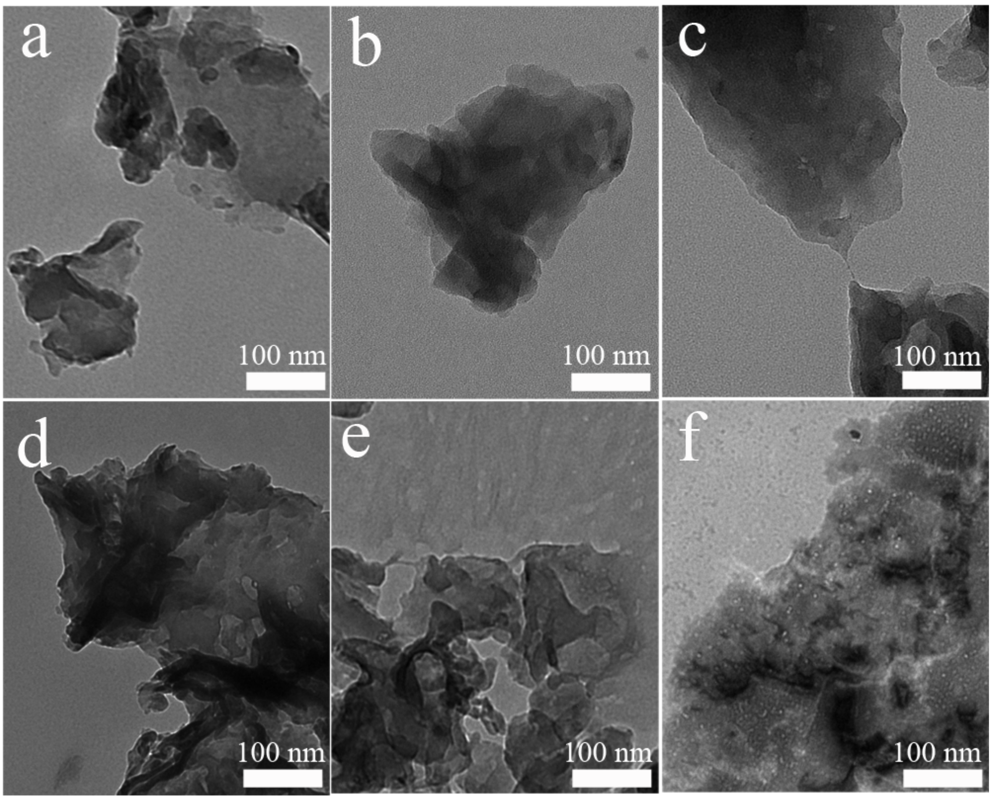

Figure S1 TEM images of pure g-C_3N_4 (a) TCNQ-C_3N_4 with TCNQ mass fraction as 1 %, 5 %, 10 %, 20% (b-e) and pure TCNQ (f)

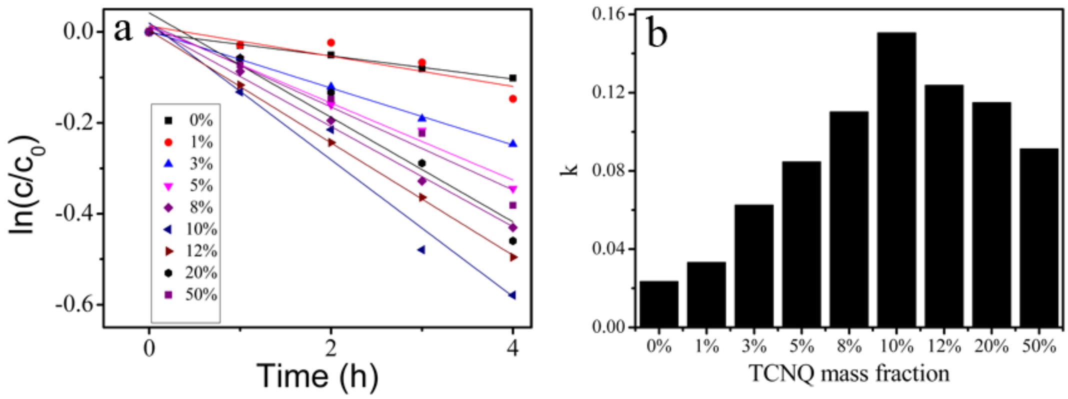

Figure S2 (a) Photocatalytic degradation of phenol and (b) the apparent rate constants over pure g-C_3N_4 (0%), pure TCNQ (100%) and TCNQ-C_3N_4 with different TCNQ mass fraction (1 % ~ 50 %) under simulated sunlight irradiation.

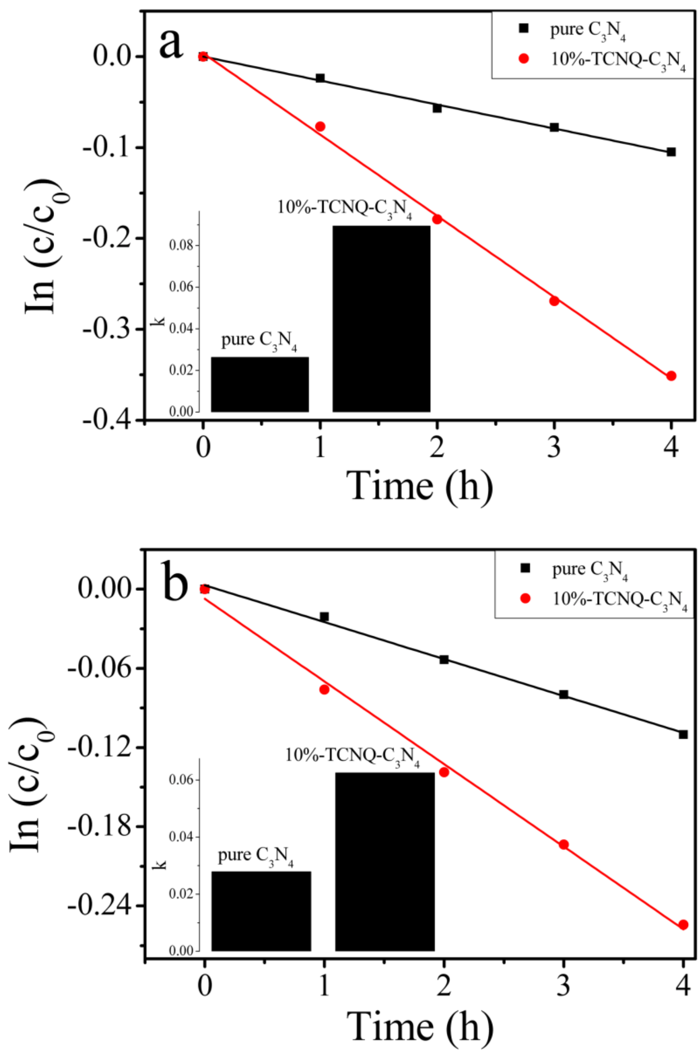

Figure S3 Photocatalytic degradation of 2,4-dichlorophenol (a) and bisphenol A (b), (inset) the apparent rate constants over pure g-C_3N_4 (0%) and 10%-TCNQ-C_3N_4 under visible light irradiation (λ>420 nm).

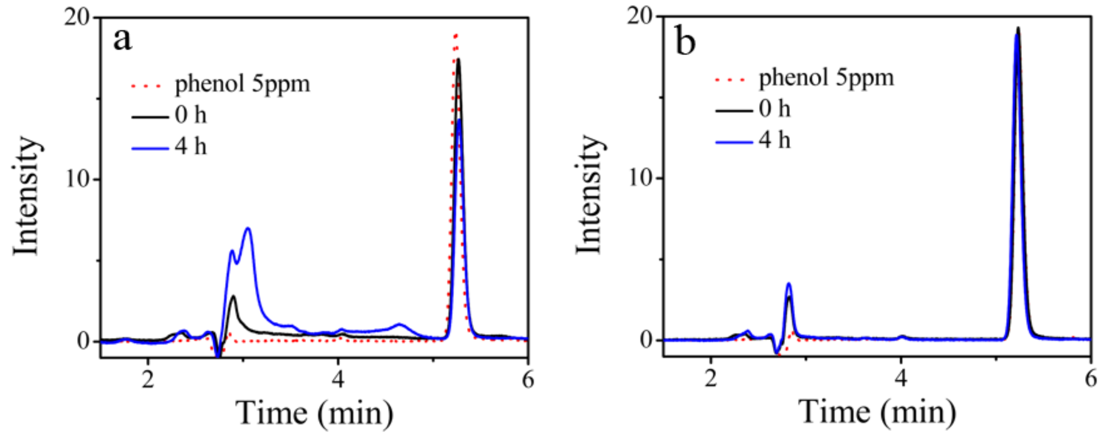

Figure S4 HPLC chromatograms of phenol and after photocatalytic degradation by TCNQ-C_3N_4 (a) and pure C_3N_4 for 4 h monitored at 275 nm ([phenol] = 5 ppm, catalyst = 25 mg/50 mL)

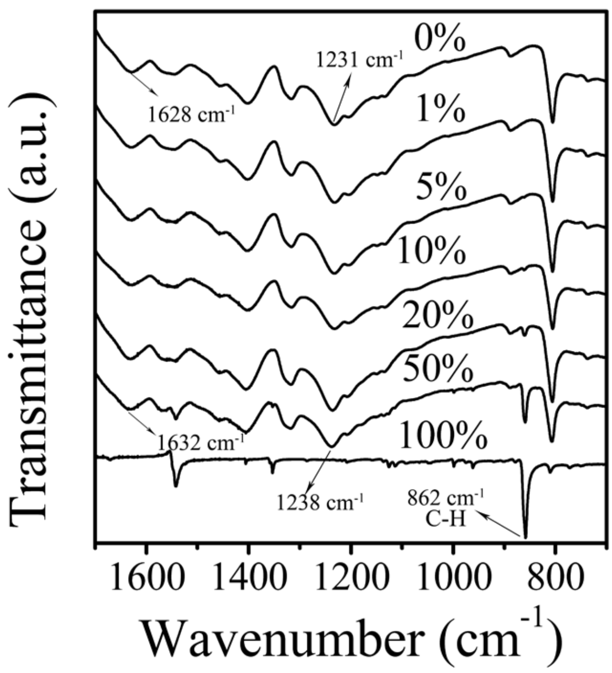

Figure S5 IR spectra of g-C_3N_4, pure TCNQ and TCNQ-C_3N_4 materials.

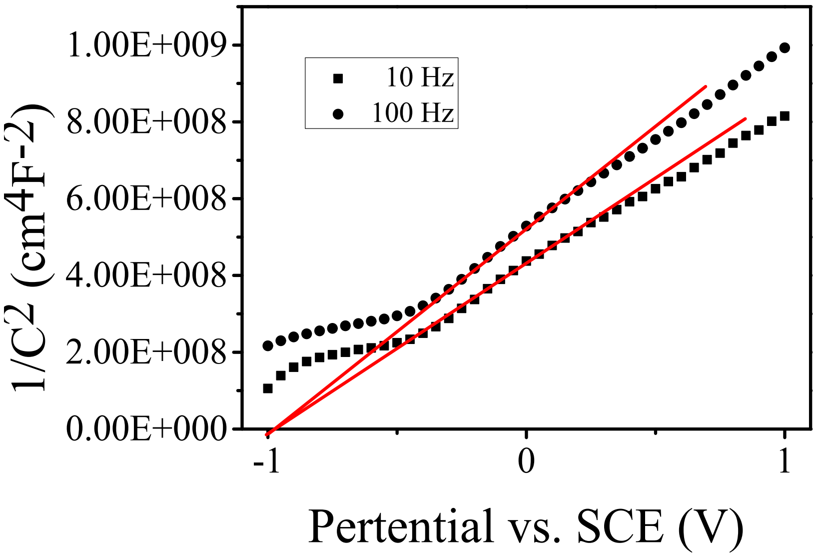

Figure S6 Mott-Schottky (MS) plots of pure C_3N_4 film electrodes at a frequency of 10 Hz and 100 Hz in an aqueous solution of Na_2SO_4 (0.1 M).

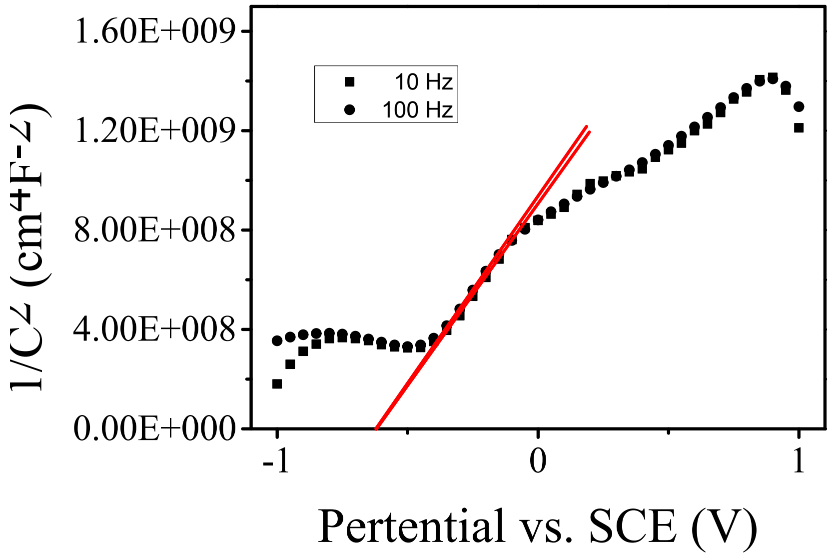

Figure S7 Mott-Schottky (MS) plots of pure TCNQ film electrodes at a frequency of 10 Hz and 100 Hz in an aqueous solution of Na_2SO_4 (0.1 M).

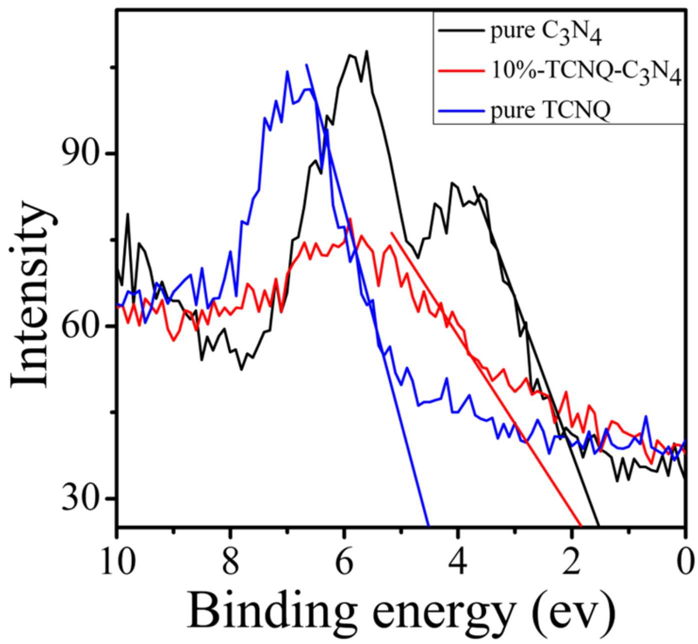

Figure S8 The valence band spectra of X-ray photoelectron spectroscopy for pure C_3N_4, 10%-TCNQ-C_3N_4 and pure TCNQ.

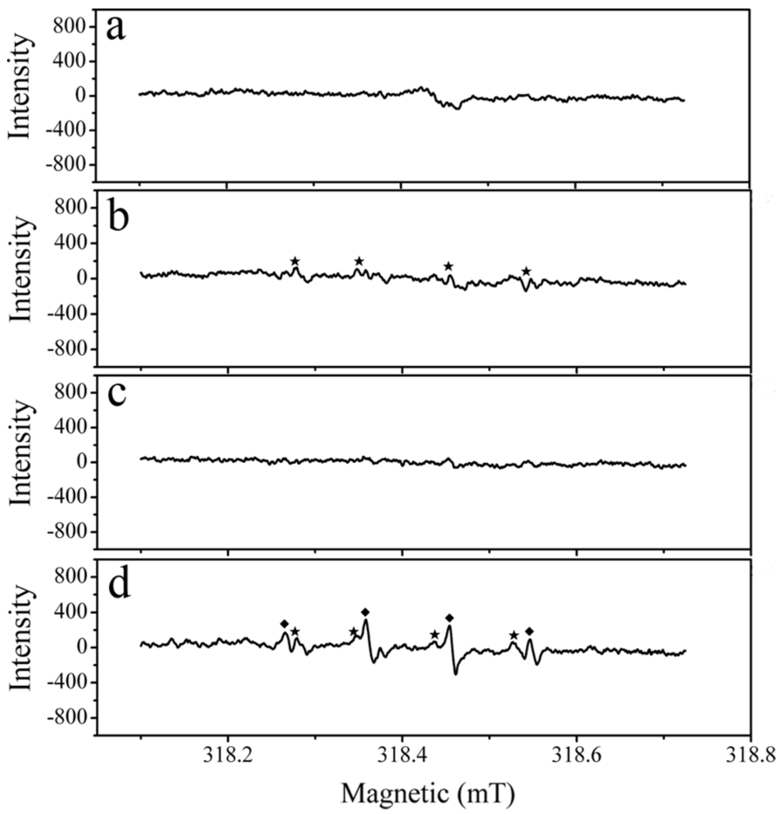

Figure S9 ESR spectra of 10%-TCNQ-C_3N_4 in dark (a) 10%-TCNQ-C_3N_4 under visible light irradiation (λ > 420 nm) in water (b) pure C_3N_4 in dark (c) and pure C_3N_4 under visible light irradiation (λ > 420 nm) in water (d).★label as superoxide radicals ◆label as hydroxy radical.

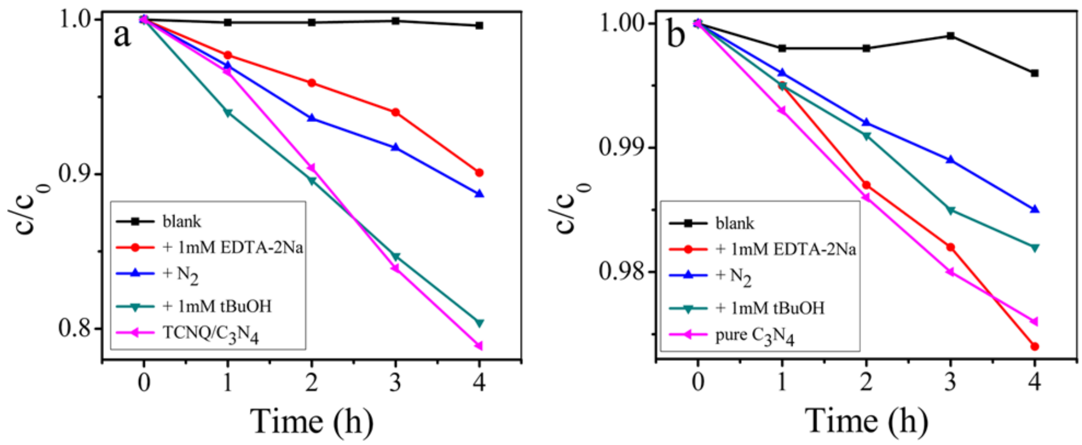

Figure S10 The plots of photogenerated carriers trapping in the system of photodegradation of phenol by 10%-TCNQ-C_3N_4 and pure C_3N_4 under visible light irradiation (λ > 420 nm)

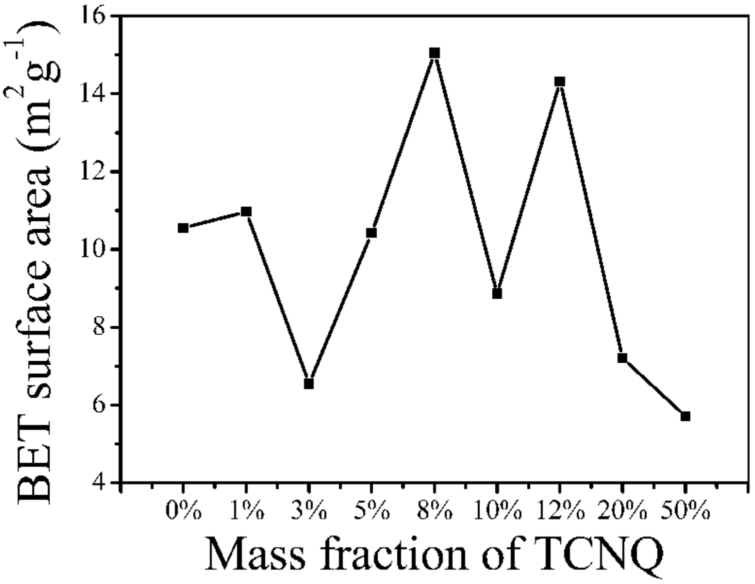

Figure S11 BET specific surface areas of pure g-C_3N_4, pure TCNQ and TCNQ-C_3N_4 with different TCNQ mass fraction.