Electronic Supplementary Information

Air Activation by Metal-free Photocatalyst for "Total-green" Hydrocarbon Selective Oxidation

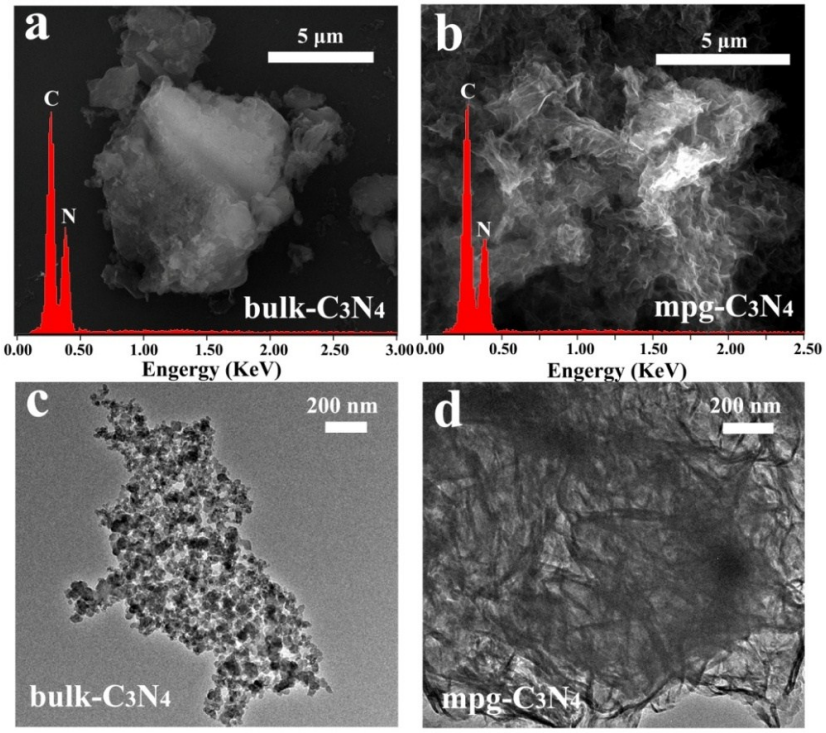

Fig. S1 (a and b) SEM images and EDS spectra (shown as the red curve overlay at the bottom portion of the panel) of bulk-C_3N_4 and mpg-C_3N_4, respectively. (c and d) TEM images of bulk-C_3N_4 and mpg-C_3N_4, respectively.

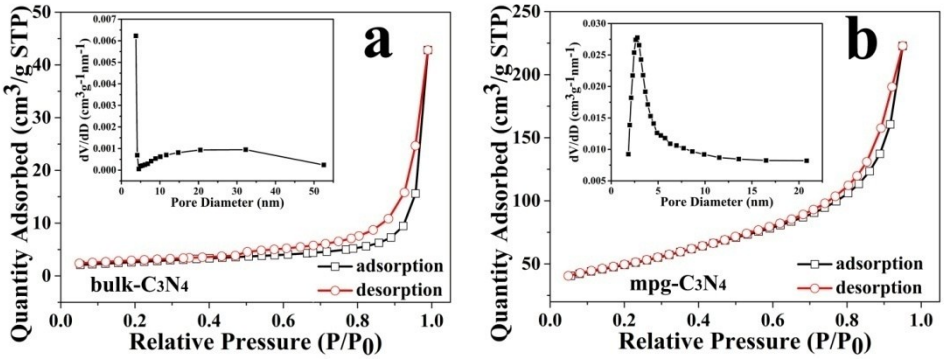

Fig. S2 (a) Nitrogen adsorption-desorption isotherms of bulk-C_3N_4. The inset pattern is the corresponding pore size distribution. (b)Nitrogen adsorption–desorption isotherm of mpg-C_3N_4. The inset pattern is the corresponding pore size distribution.

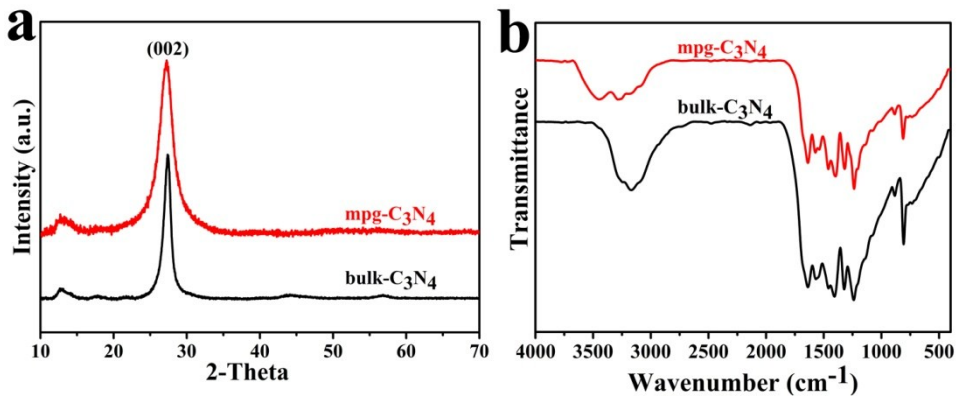

Fig. S3 (a) XRD patterns; (b) FT-IR spectra of bulk-C_3N_4 and mpg-C_3N_4 (the black trace represents bulk-C_3N_4 and the red trace represents mpg-C_3N_4).

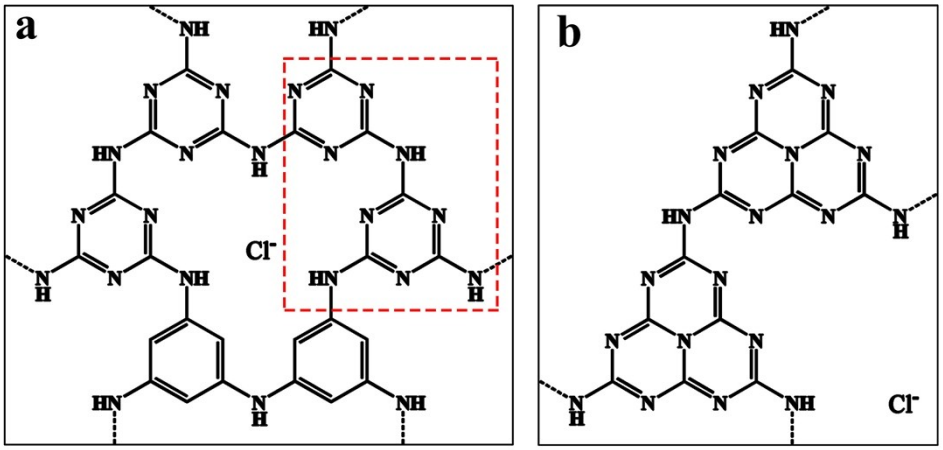

Fig. S4 The possible two kinds of structure of PTI: (a) triazine structure; (b) heptazine structure. The content in the dashed red border (a) is exhibited in Fig. 2(d).

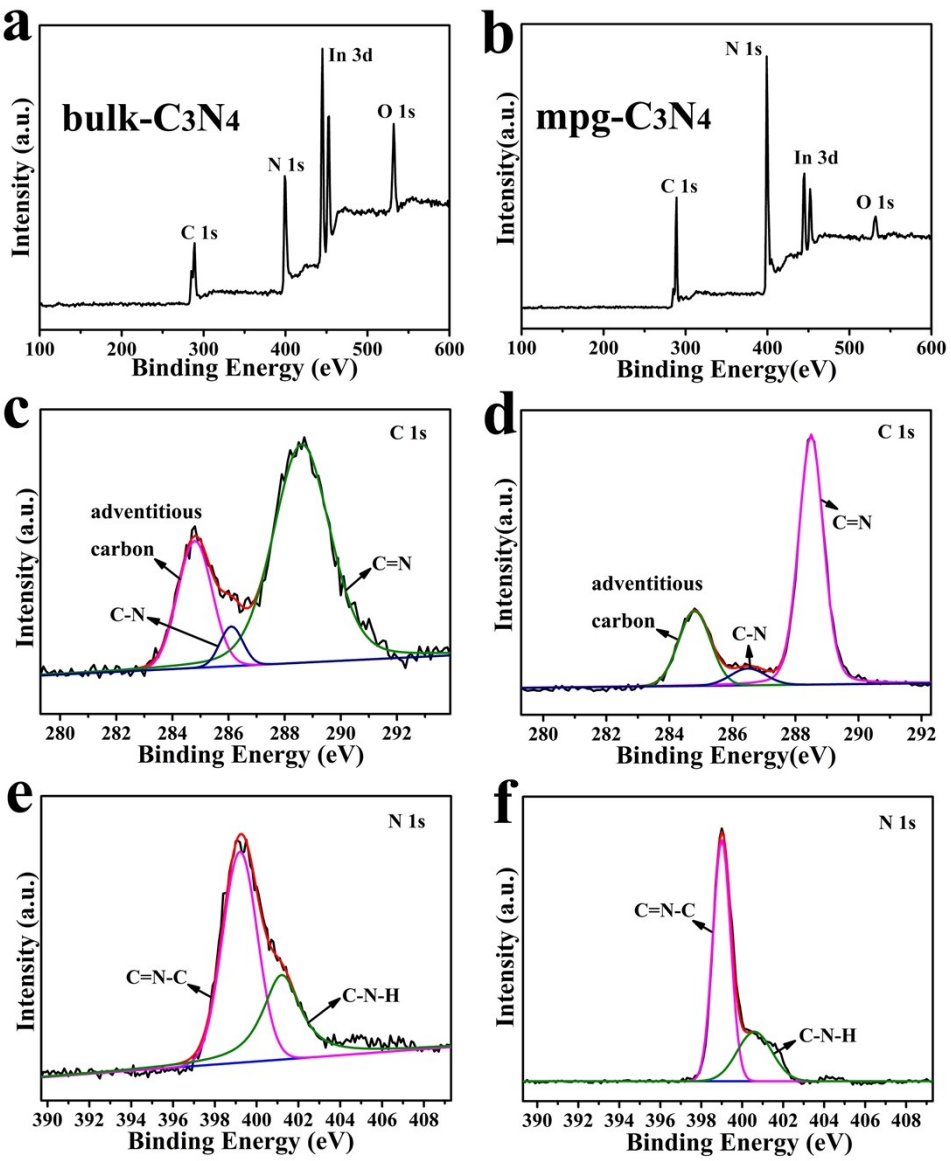

Fig. S5 (a, c and e) XPS full spectra, high-resolution C 1s and N 1s XPS spectra of bulk-C_3N_4. (b, d and f) XPS full spectra, high-resolution C 1s and N 1s XPS spectra of mpg-C_3N_4.

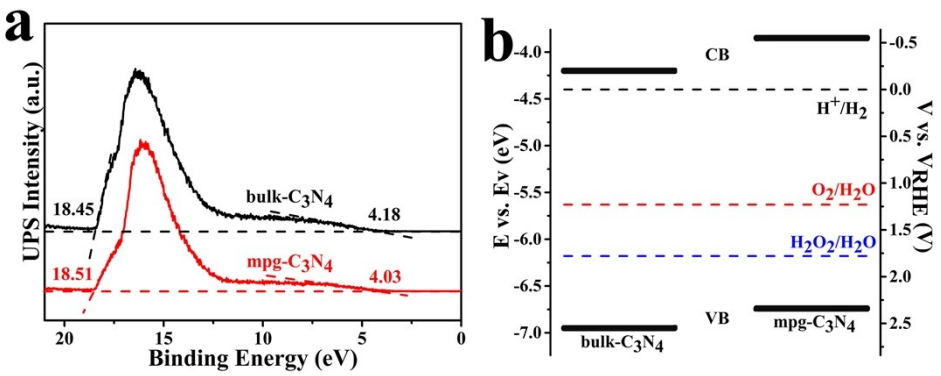

Fig. S6 (a) UPS spectra; (d) Band structure diagram of bulk-C_3N_4 and mpg-C_3N_4, respectively.

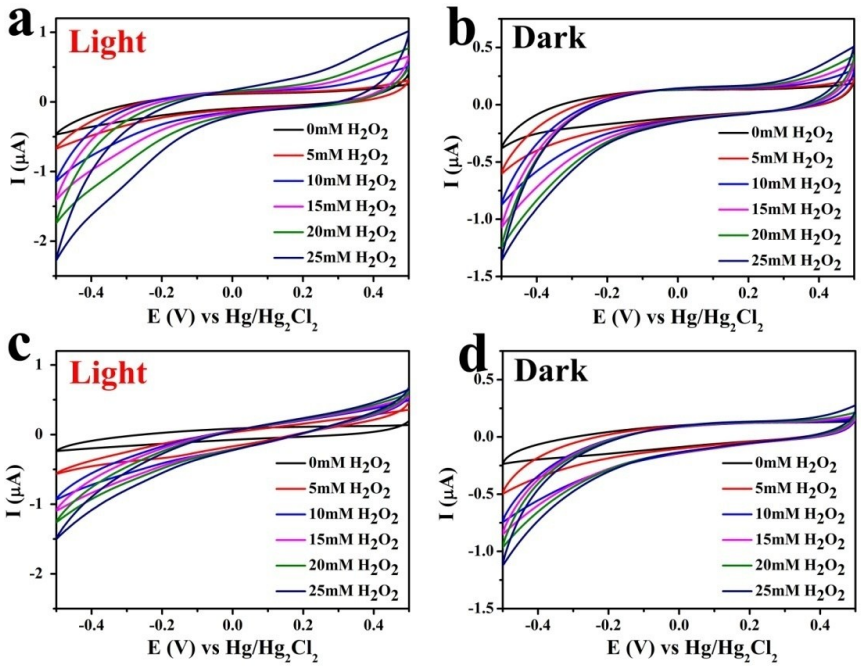

Fig. S7 (a and b) Cyclic voltammograms of bulk-C_3N_4-modified GC electrode under light illumination and dark condition, respectively. (c and d) Cyclic voltammograms of mpg-C_3N_4-modified GC electrode with light and dark, respectively.