Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

Conjugated Polymer P3HT /Au Hybrid Nanostructure for Enhancing Photocatalytic Activity

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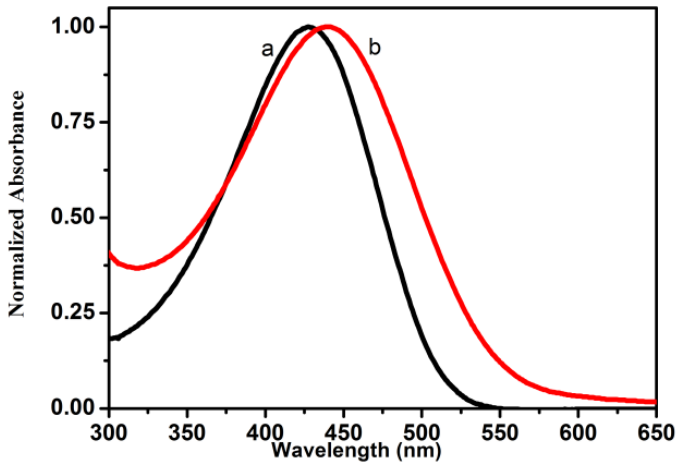


Fig. S1:UV-visible absorption spectra of P3HT in THF (a) and P3HT PNPs dispersed in water (b).

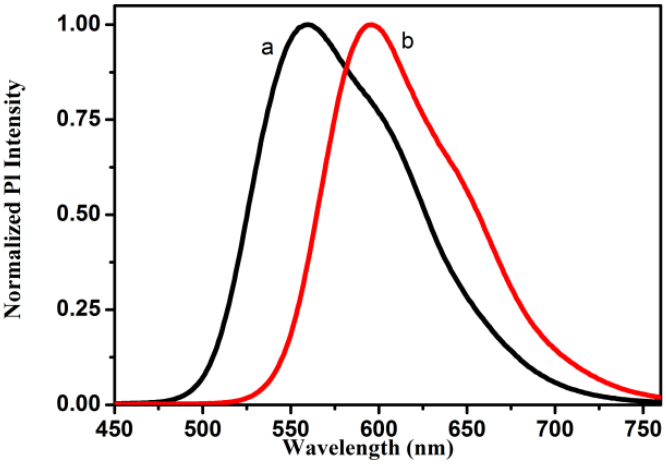
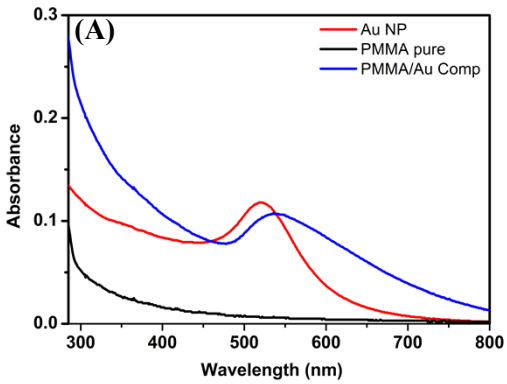


Fig. S2: Photoluminescence spectra of P3HT in THF (a) and P3HT PNPs dispersed in water (b).



(B)

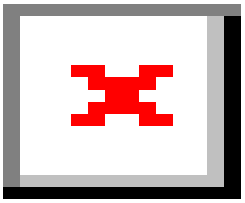


Fig. S3: (A) UV-visible absorption spectra of PMMA PNPs, Au NPs (7.8 nM), PMMA PNPs/Au NPs composite and (B) UV-visible absorption spectra of pure Au NPs (7.8 nM) (a) and aggregated Au NPs (has been evaluated by the subtraction of extinction spectra of pure PMMA PNPs from the PMMA PNPs/Au NPs composite) (b).

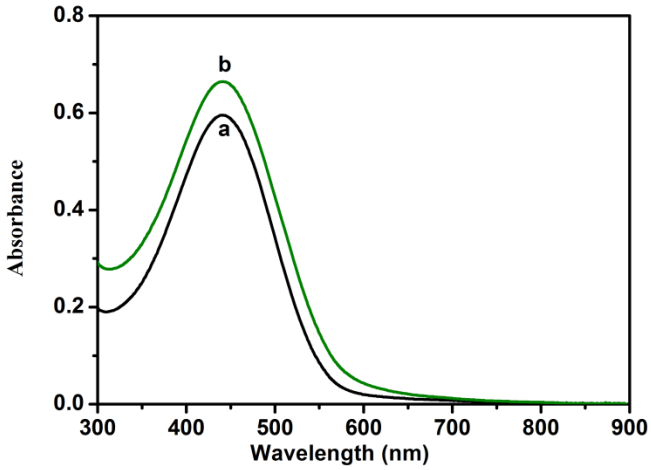


Fig. S4: UV-visible absorption spectra of P3HT PNPs (prepared without HDA) with having a concentration of 0 nM (a) and 7.8 nM (b) of Au NPs.

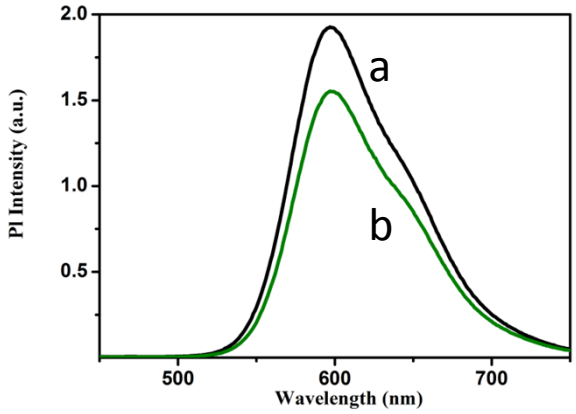


Fig. S5: Photoluminescence spectra of P3HT PNPs (prepared without HDA) with having a concentration of 0 nM (a) and 7.8 nM (b) of Au NPs.

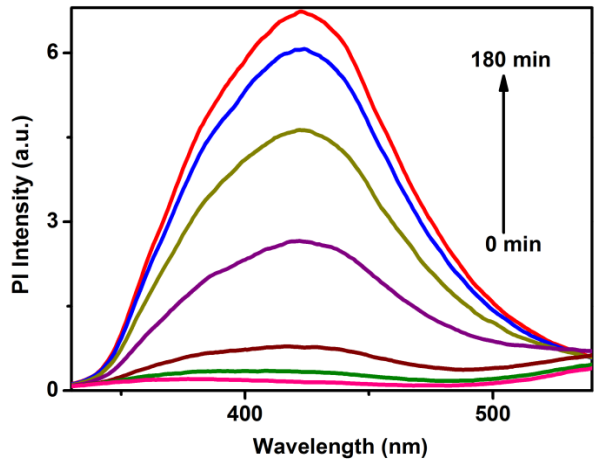


Fig. S6: Changes in intensity fluorescence spectra of TA measured during the visible light irradiation on P3HT PNPs/ Au NPs composite in a basic solution of TA (excited at 315 nm).

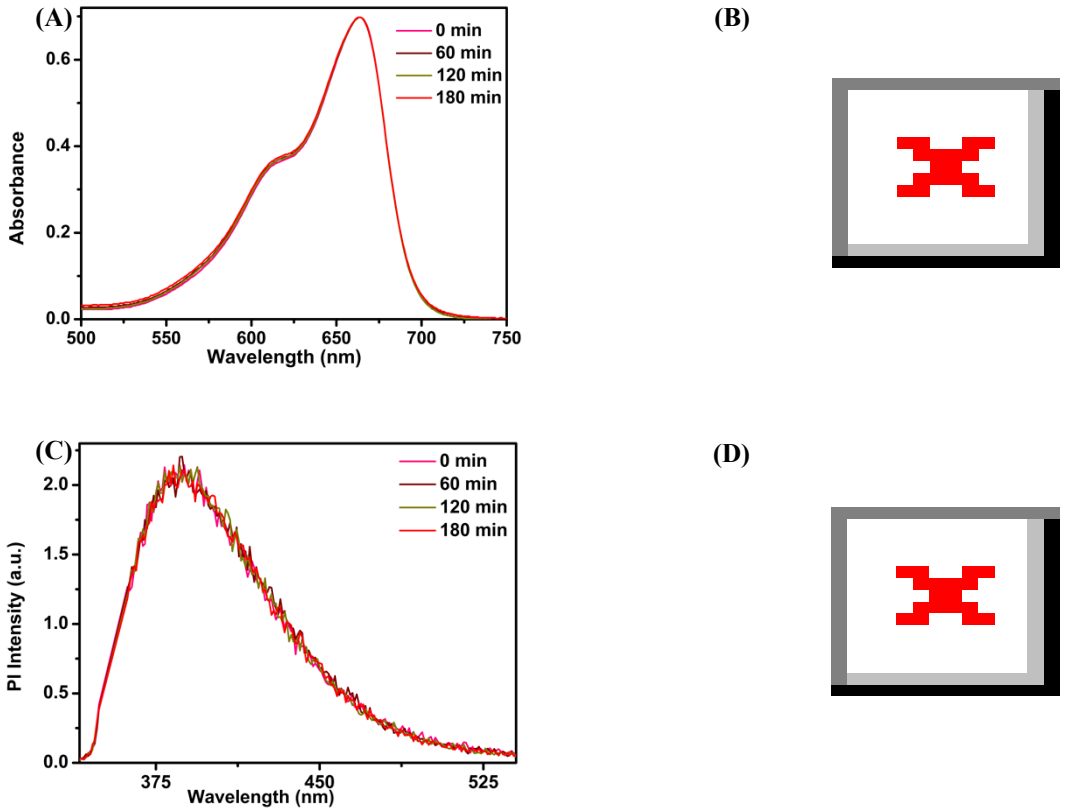


Fig S7: (A) UV-visible absorption spectra of MB under no illumination in presence of P3HT PNPs/ Au NPs composite (here 7.8 nM Au NPs is used) (B) plot of C/C_0 vs. time for the photocatalytic degradation of MB under illumination in absence (a) and presence (b) of P3HT PNPs/ Au NPs composite and under no illumination in presence of P3HT PNPs/ Au NPs composite, (C) changes in intensity fluorescence spectra of TA measured during the visible light irradiation on a basic solution of TA (excited at 315 nm) in absence of P3HT PNPs/ Au NPs composite, and (D) plot of C/C_0 vs. time for fluorescence spectra of TA.

Measurement of the quantum yield (QY):

The quantum yields of P3HT in THF and P3HT PNPs have been measured by using following equation:[42]

$$QY_s = (F_s \times A_r \times \eta_s^2 / F_r \times A_s \times \eta_r^2) \times QY_r \quad (1)$$

Here, 'QY_s' represents the calculated quantum yield of the sample and 'QY_r' represents the standard quantum yield of reference dye rhodamine 6G in ethanol (96 %). 'A_r' and 'A_s' represents the actual absorbance value of reference dye and sample, respectively at 405 nm. 'F_s' and 'F_r' define the integrated area of emission spectra excited at 405 nm for samples and reference dye, respectively. 'η' represents the refractive index of the solvent medium.