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Supplementary Materials

Cone-like titanate immobilized on polyacrylonitrile nanofibers: hierarchical architecture for effective photocatalytic activity

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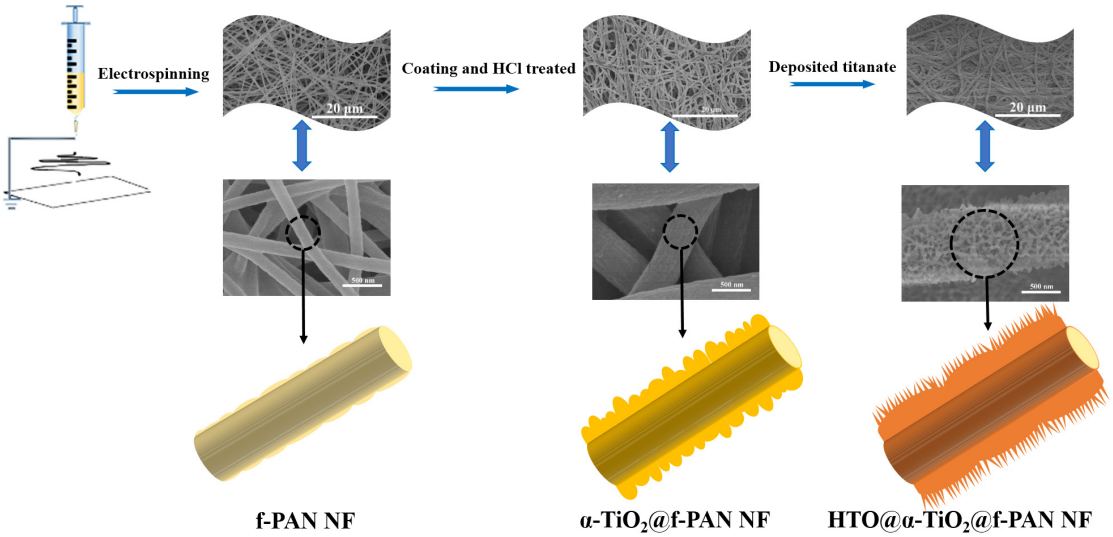

Figure S1 The scheme of fabrication process for the HTO@α-TiO_2@f-PAN NF photocatalysts.

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The spectrum of LED light source (Fig. S2) in our experiment system was investigated by USB4000 optical fiber UV-VIS spectrometer, the region between 300 nm-400 nm is about 3.5 %, while that between 400 nm-888 nm is about 96.5 %.

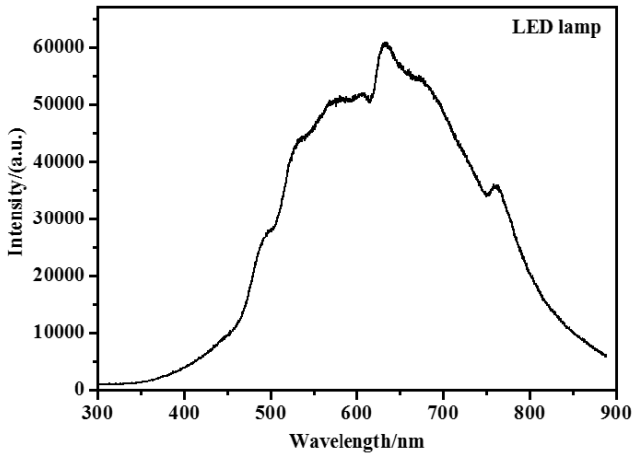

Figure S2 Relative spectral radiance of LED light source.

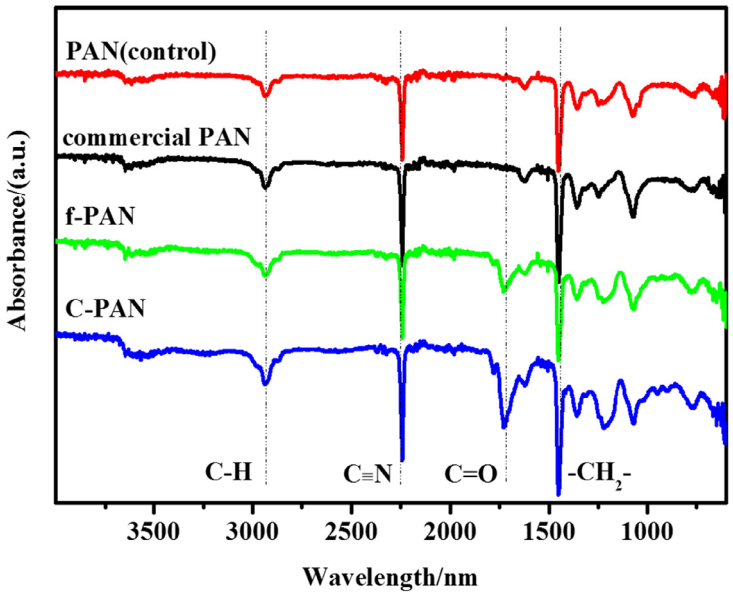

Figure S3 FTIR spectra of different samples.

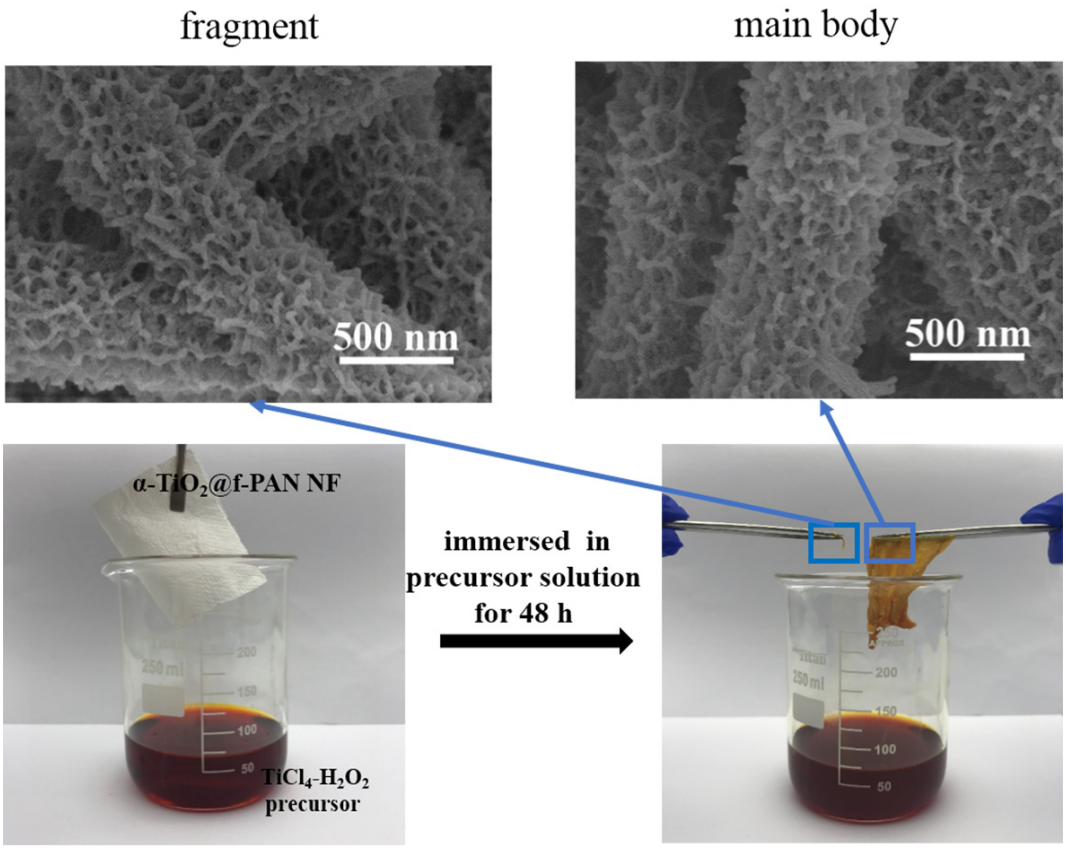

Figure S4 Photographs of the preparation process for 48-HTO@α-TiO_2@f-PAN NF and SEM images of different part of 48-HTO@α-TiO_2@f-PAN NF sample.

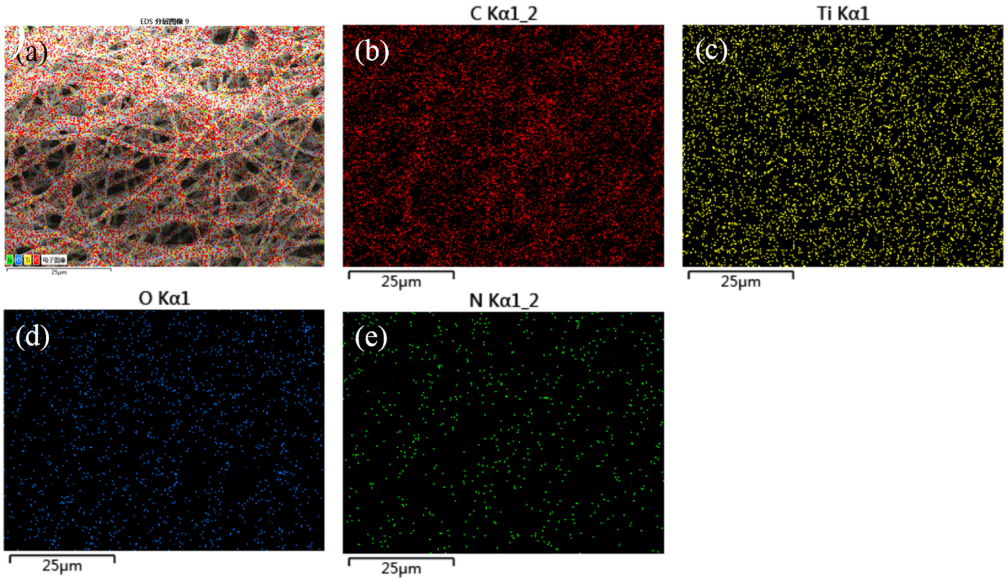

Figure S5 The SEM element mapping images of S-HTO@α-TiO_2@f-PAN NF.

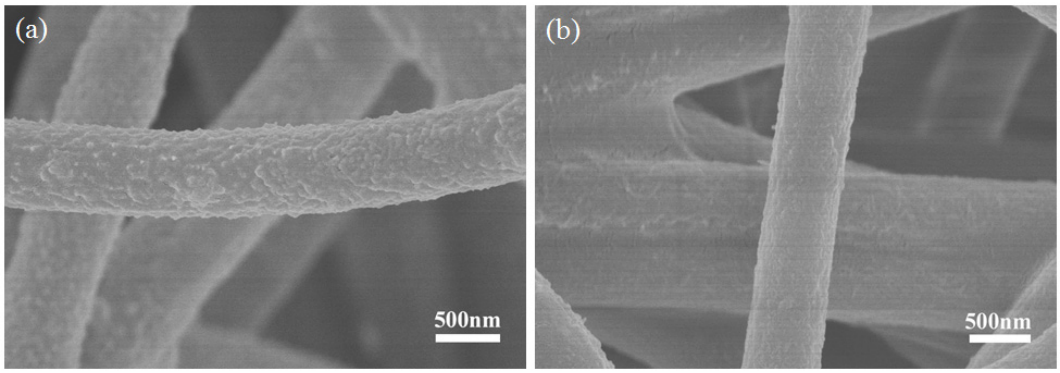

Figure S6 SEM images of (a) 36-HTO@α-TiO_2@f-PAN NF prepared without cyanuric acid and (b) HTO@f-PAN NF prepared without α-TiO_2 layer.

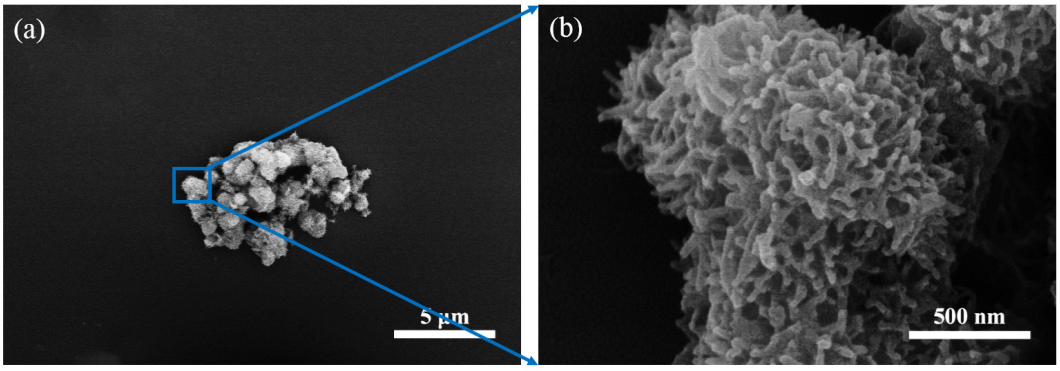

Figure S7 SEM images using different magnification of titanate powder deposited for 36h in the peroxide precursor with no fiber carriers.

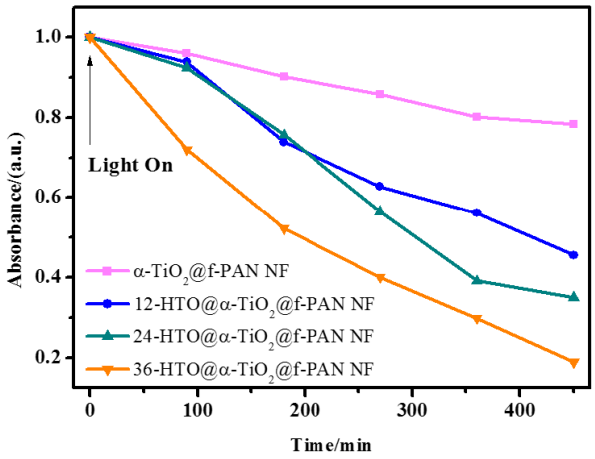

Figure S8 The absorbance (λ=554 nm) of RhB aqueous solution when using HTO@α-TiO_2@f-PAN NF samples under LED light irradiation.

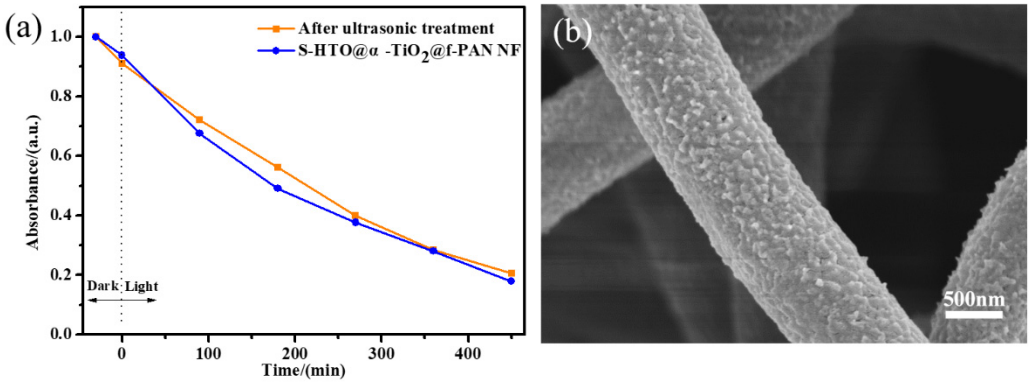

Figure S9 (a) The absorbance of RhB (λ=554nm) under LED over S-HTO@α-TiO_2@f-PAN NF before and after ultrasonic treatment and (b) SEM image of HTO@α-TiO_2@f-PAN NF after ultrasonic treatment.

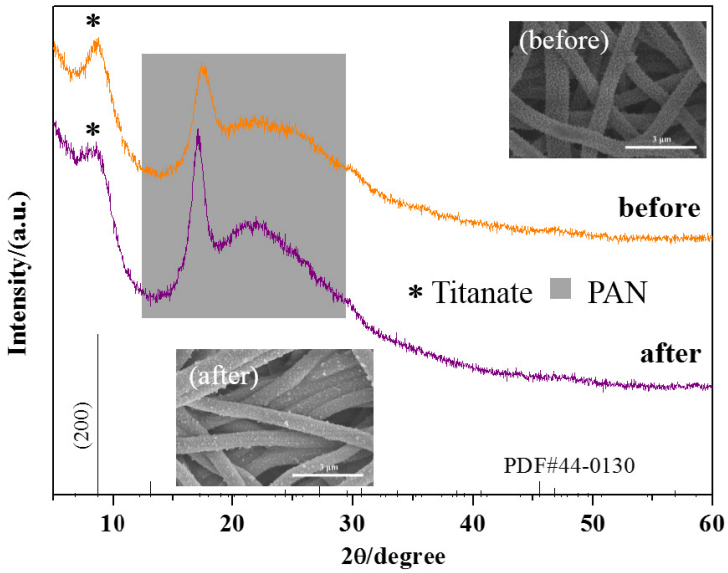

Figure S10 XRD patterns of S-HTO@α-TiO_2@f-PAN NF after five times photocatalytic degradation of RhB aqueous solution and inset SEM images of S-HTO@α-TiO_2@f-PAN NF before and after photocatalytic degradation of RhB.

The photocatalytic activity of tetracycline hydrochloride (TC-HCl), a colorless organic pollutant, was also tested here. In these typical experiments, 0.06 g S-HTO@α-TiO_2@f-PAN NF composite photocatalyst was dispersed in the reactor containing 100 mL TC-HCl aqueous solution of different concentration (100mg/L, 50mg/L, 25mg/L). The removal rate of organic pollutant was determined by UV–vis spectrophotometer (TU-1900, China) at the characteristic wavelength of 357 nm. [S1-S3]

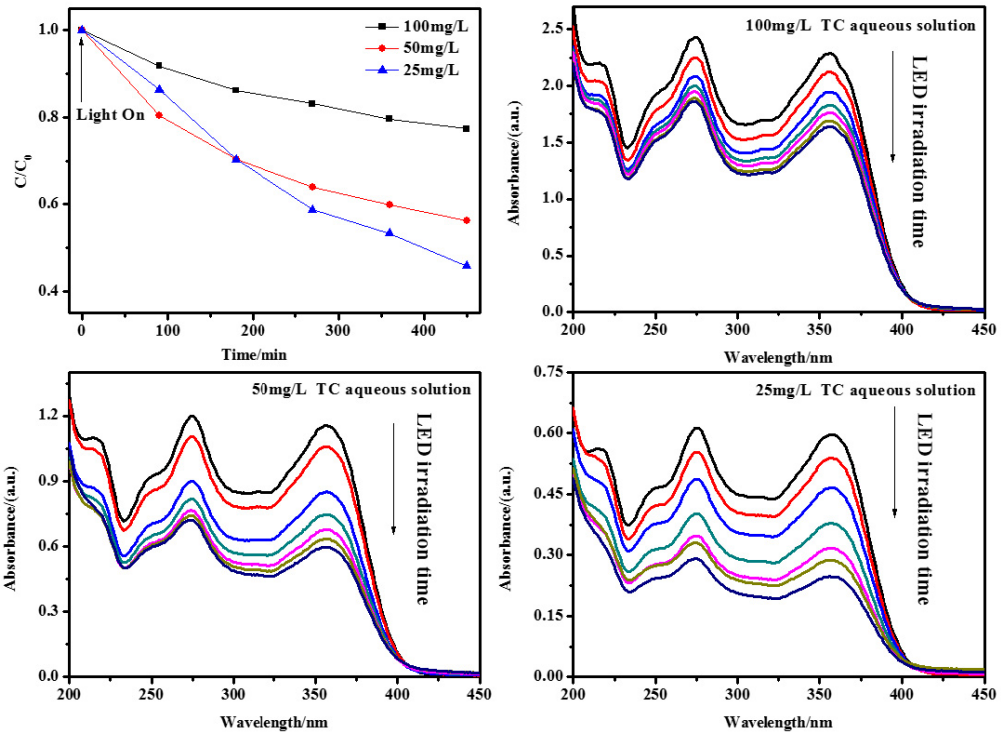

Figure S11 Concentration variation of TC-HCl aqueous solution under LED light irradiation in presence of S-HTO@α-TiO_2@f-PAN NF composite photocatalyst.

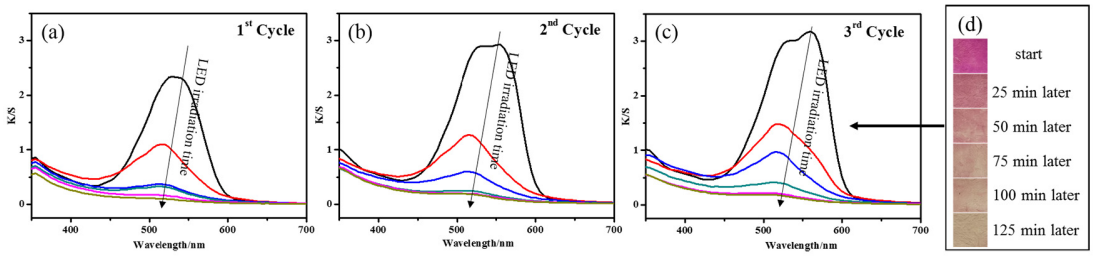

Figure S12 (a-c) The K/S curves of S-HTO@α-TiO_2@f-PAN NF stained by RhB under LED irradiation for three cycles and (d) Photos of the S-HTO@α-TiO_2@f-PAN NF stained by RhB in the third cycle.

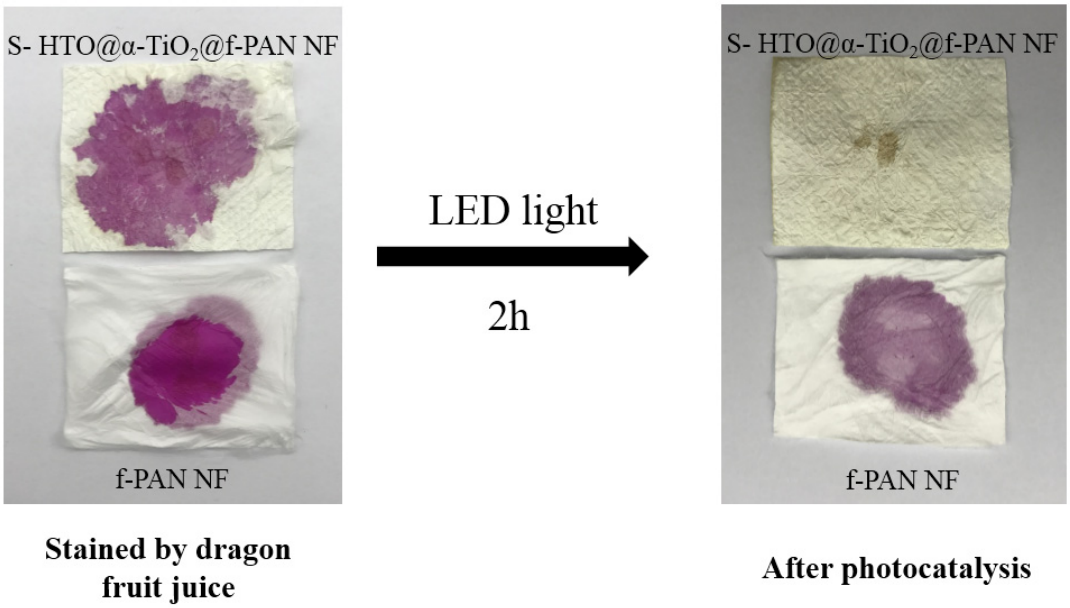

Figure S13 Photocatalytic degradation of dragon fruit juice stains.

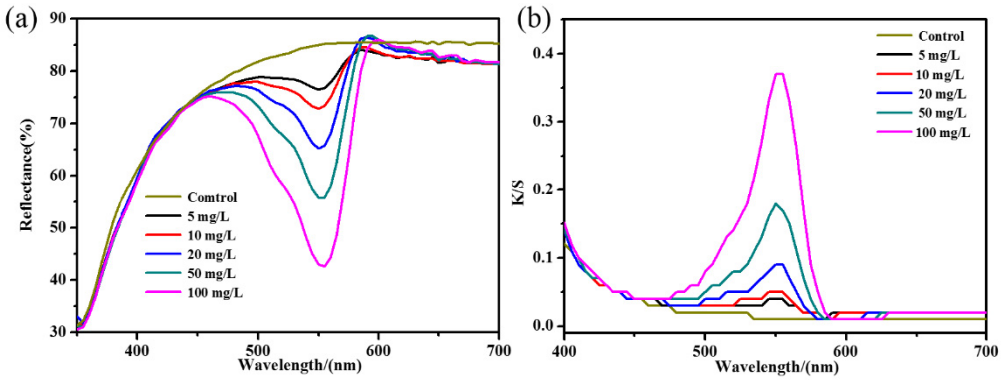

Figure S14 (a) Reflectance and (b) K/S curves of PAN fabric stained with different concentrations of RhB aqueous solution.

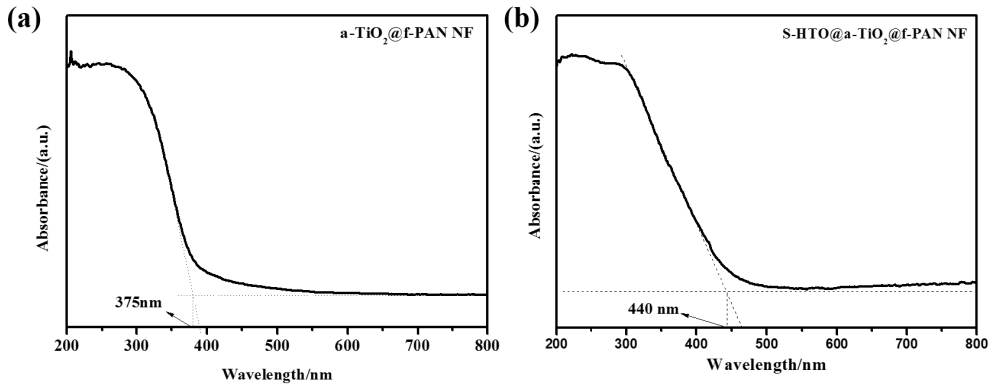

Figure S15 UV-vis-DRS of (a) α-TiO_2@f-PAN NF and (b) S-HTO@α-TiO_2@f-PAN NF.

References

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