Electronic Supplementary Material (ESI) for RSC Advances.

Efficient non-metal based conducting polymers for photocatalytic hydrogen production: comparative study between polyaniline, polypyrrole and PEDOT

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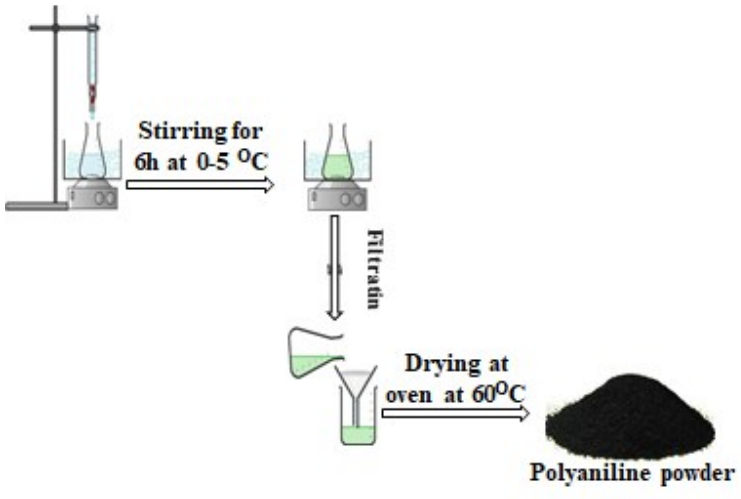

Fig.S1 Systematic illustration of stepwise preparation of PAn and PPy

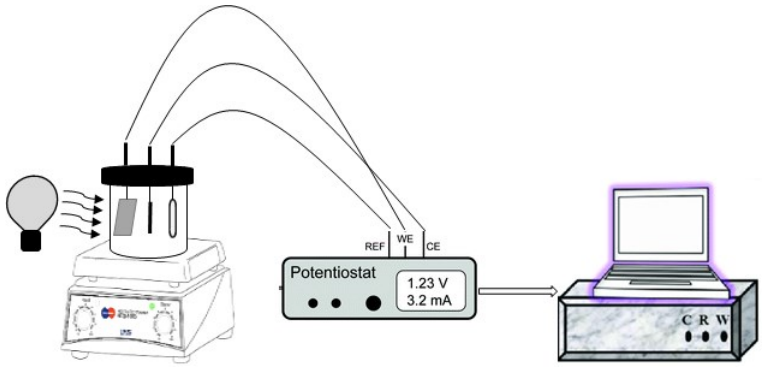

Fig.S2 the simulated apparatus of photoelectrochemical measurements

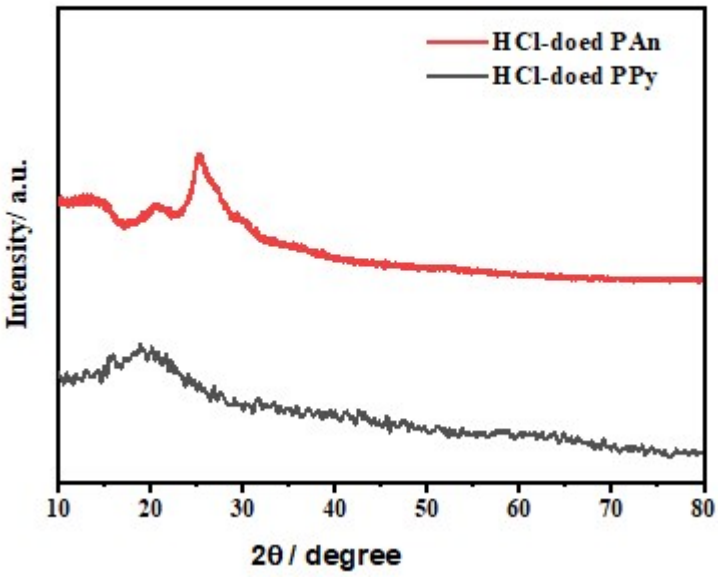

Fig.S3 The XRD of polyaniline doped HCl and polypyrrole doped HCl.

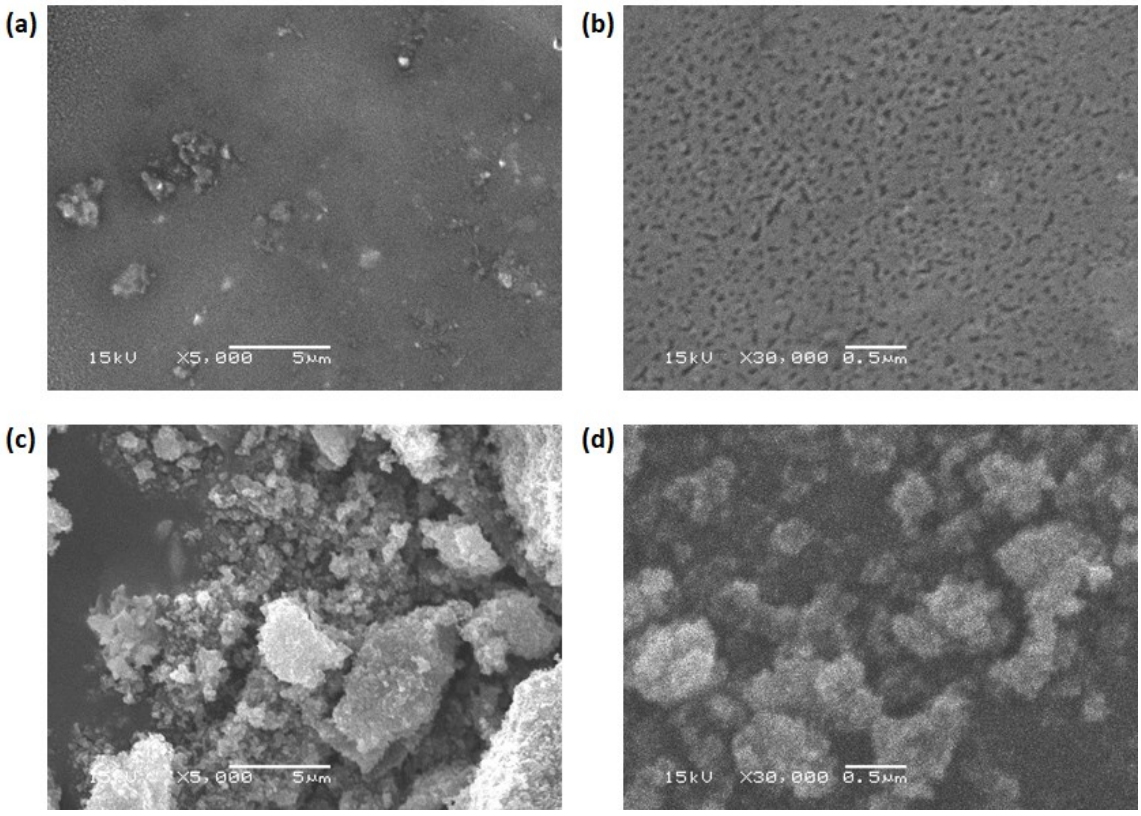

Fig.S4 SEM images (a, b) of PAn powder (c, d) TiO_2@5PAn composites.

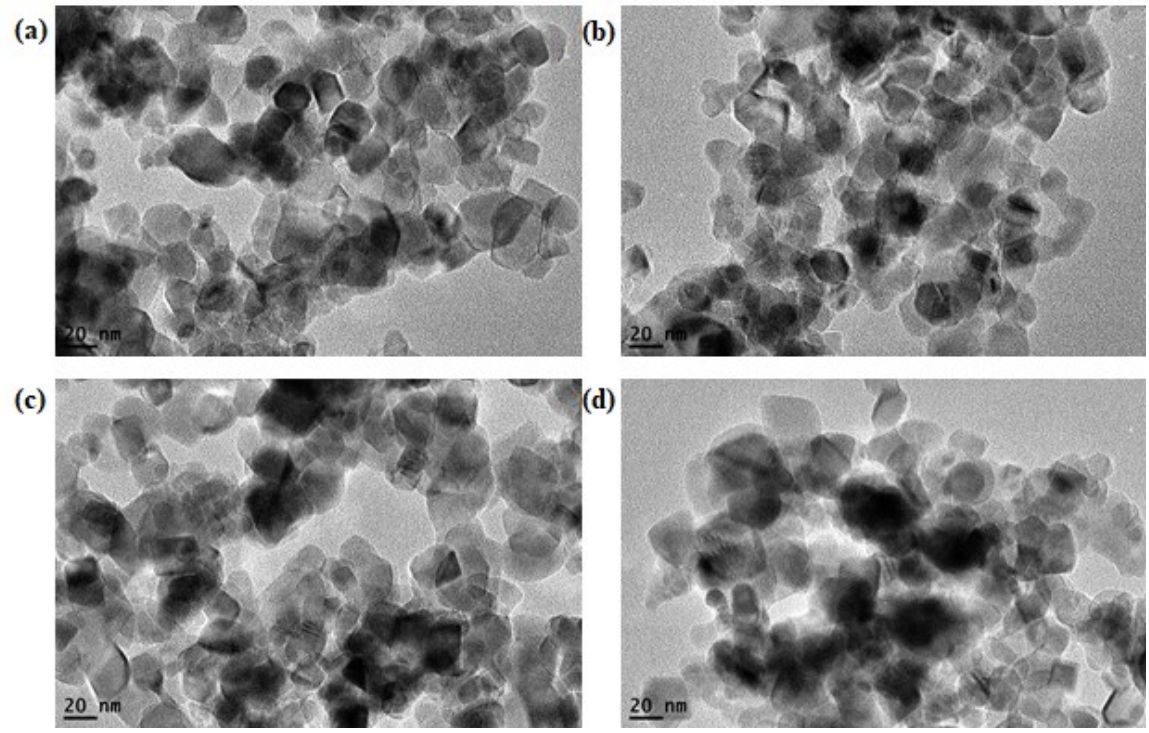

Fig.S5 Low magnification TEM images of (a)TiO_2, (b)TiO_2@2PEDOT, (c)TiO_2@2PPy, and (d)TiO_2@5PAn

Fig.S6 The TiO_2@5PAn (a), TiO_2@2PEDOT (b), and TiO_2@2PPy(c) compared to bare TiO_2.

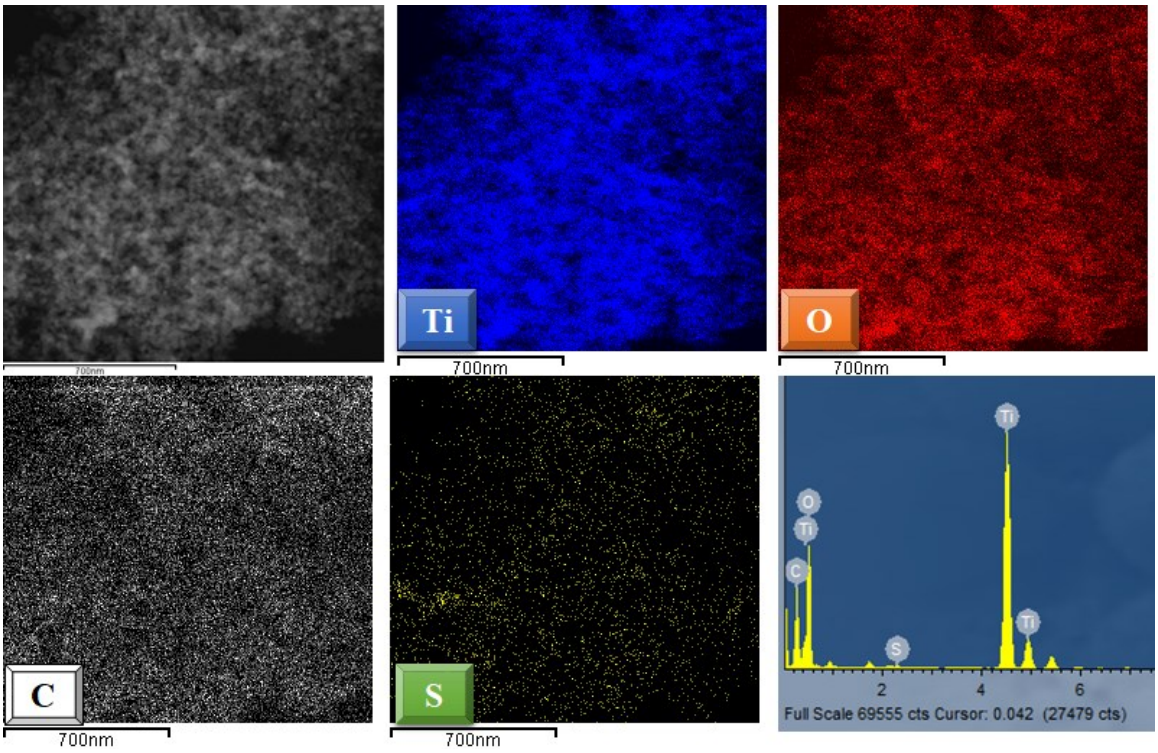

Fig. S7. EDX spectrum and elemental mapping of Ti, O, C, and S of TiO_2@2PEDOT nanocomposites.

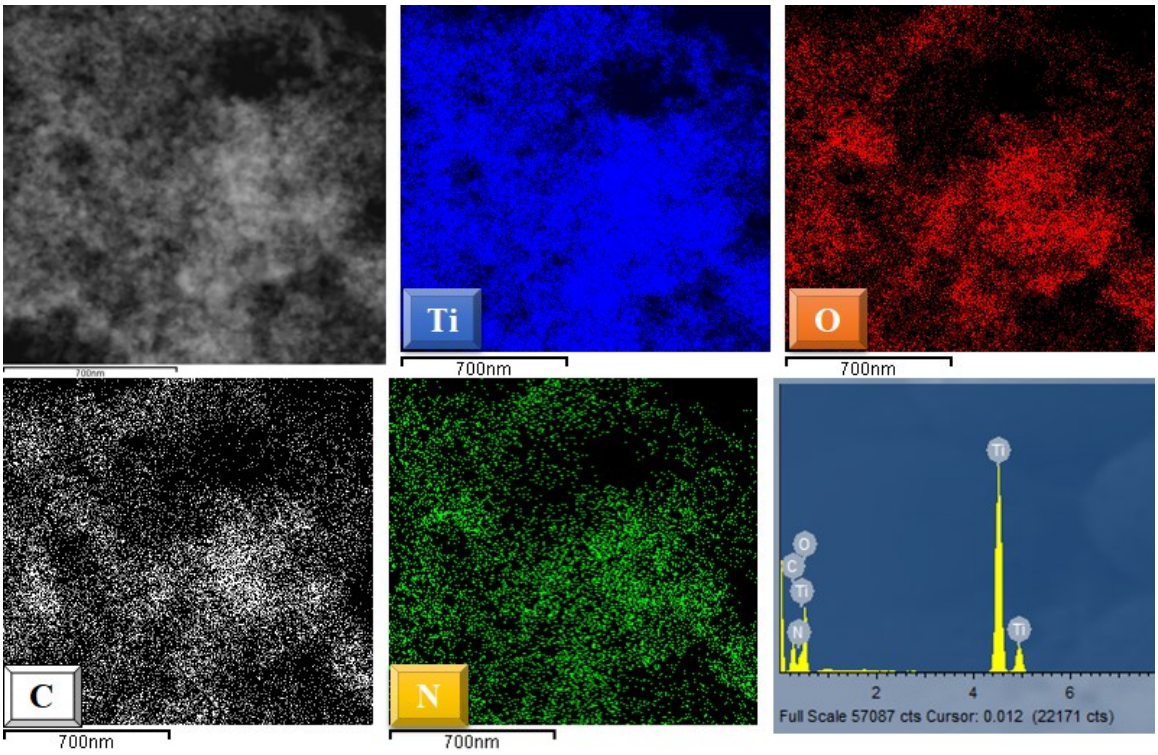

Fig. S8. EDX spectrum and elemental mapping of Ti, O, C, and N of TiO_2@2PPy nanocomposites.

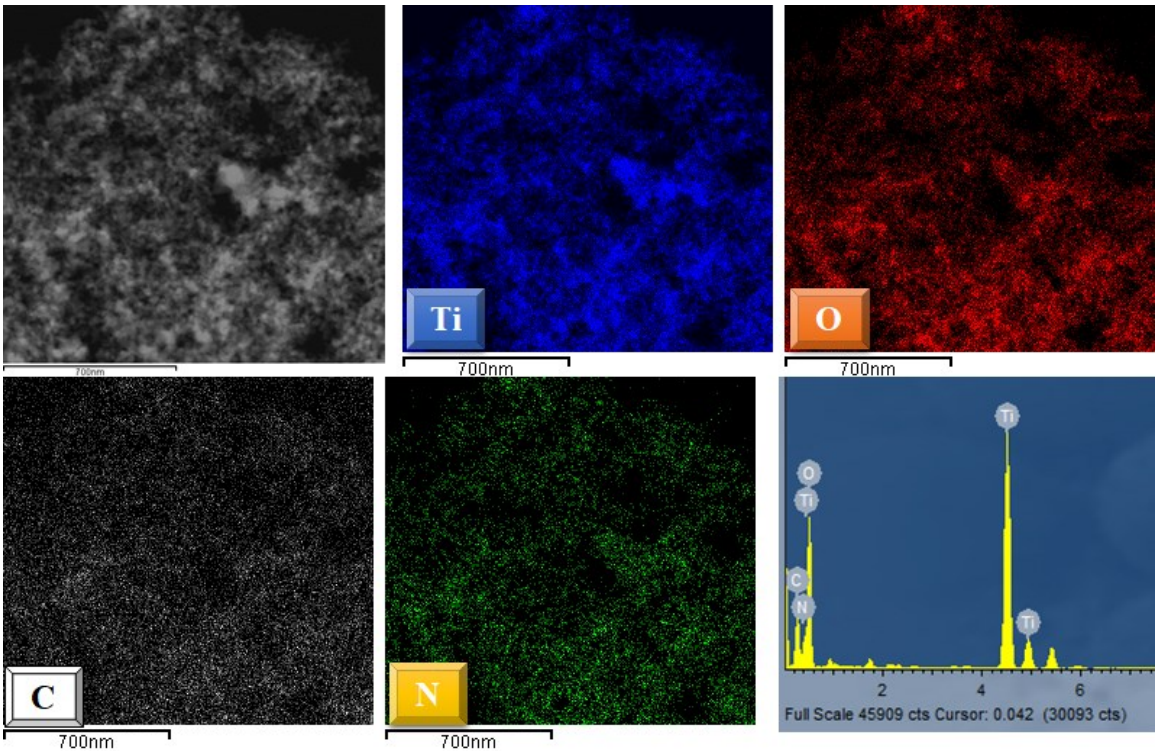

Fig. S9. EDX spectrum and elemental mapping of Ti, O, C, and N of TiO_2@5PAn nanocomposites.

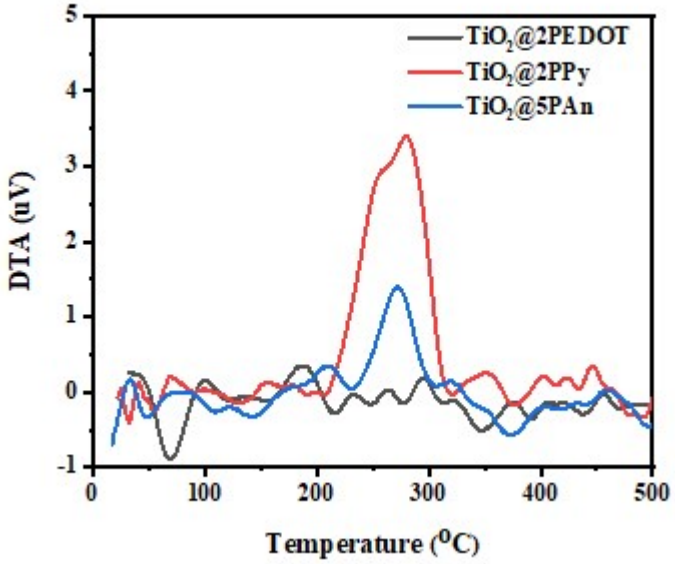

Fig.S10 The DTA curves TiO_2@2PEDOT, (c) TiO_2@2PPy, and (d) TiO_2@5PAn nanocomposites

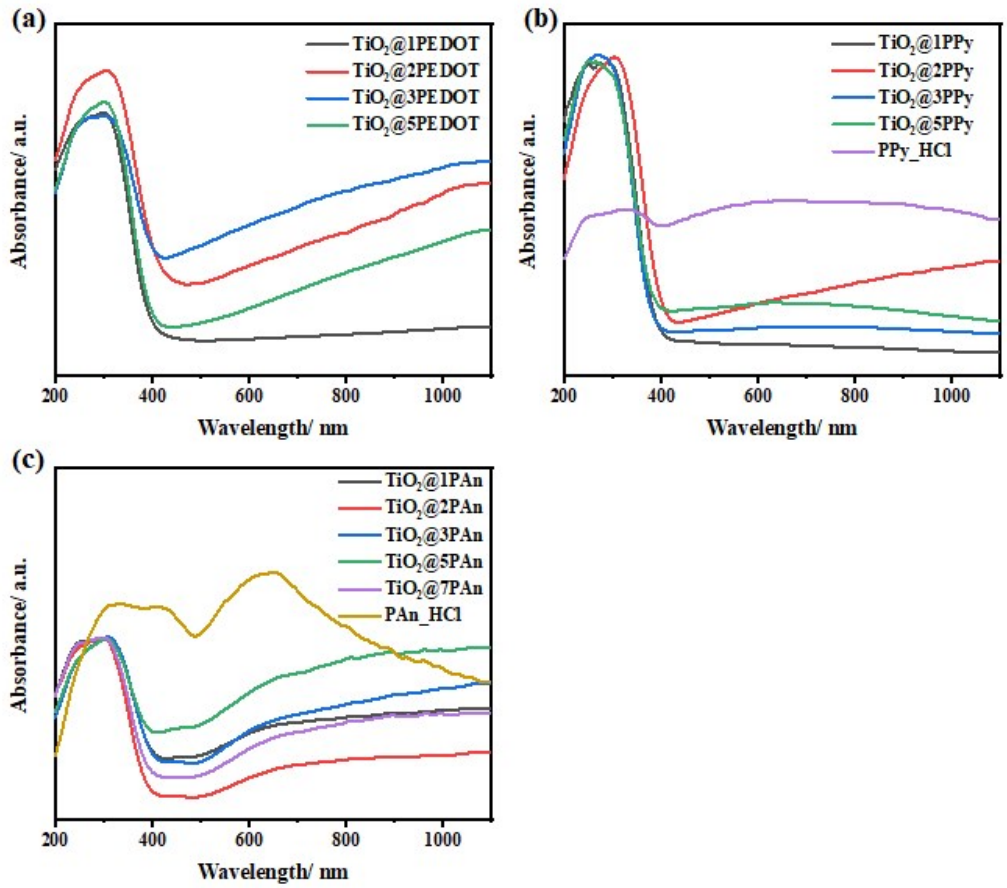

Fig.S11 The DRS curves (a) series of TiO_2@PEDOT (b) series of TiO_2@PPy, and (c) series of TiO_2@PAn composites.

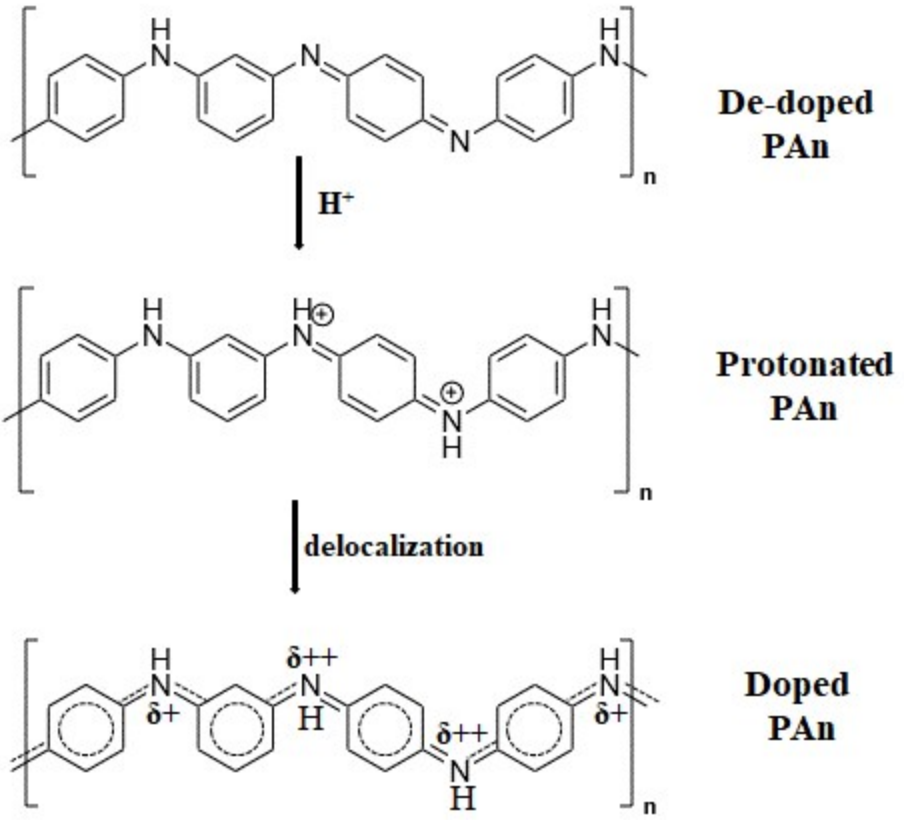

Fig. S12. The doping mechanism of PAn by protonic acids

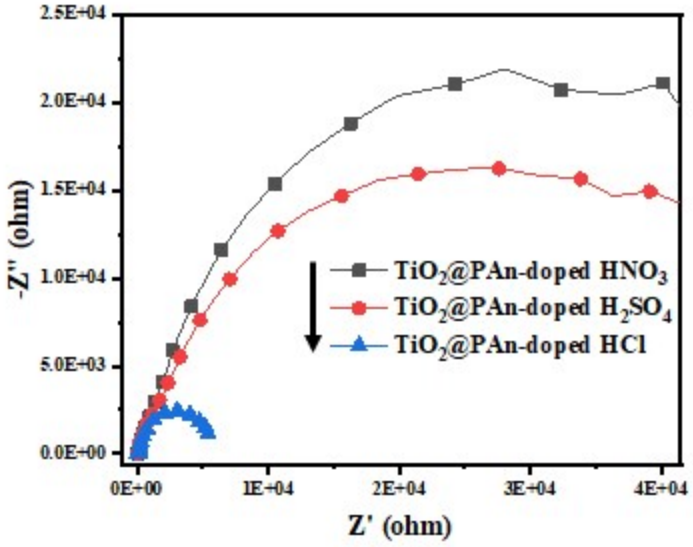

Fig. S13. The electrochemical impedance spectroscopy (EIS) measured under light irradiation of TiO_2@PAn prepared by various counterions.

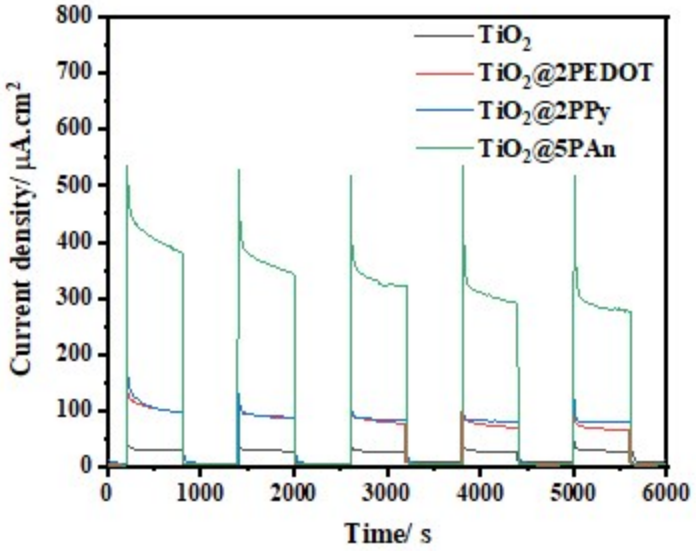

Fig.S14 Transient photocurrent response (I-t) curves of TiO_2, TiO_2@2PEDOT, TiO_2@2PPy and TiO_2@5PAn photocatalysts.

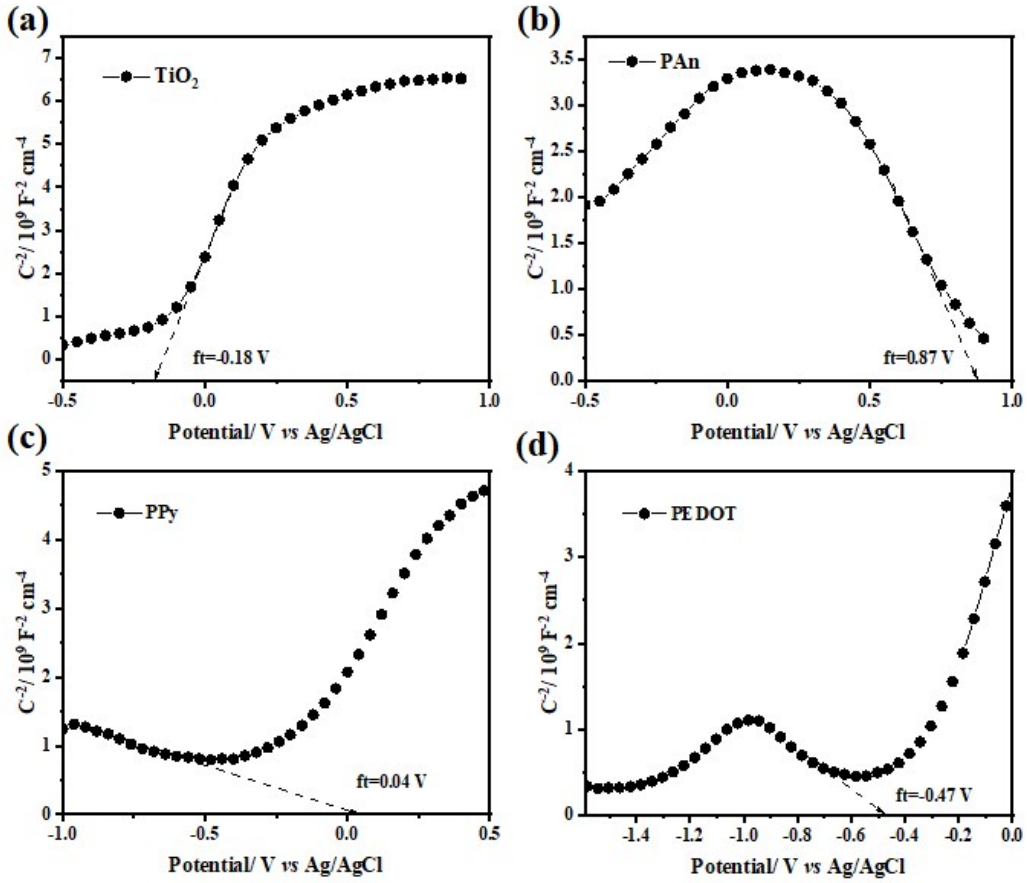

Fig. S15 The Mott- Schottky plots of TiO_2, PAn, PPy, and PEDOT.

Table S1: Charge transfer properties at TiO_2@CPs /electrolyte interface from EIS data

Photocatalyst	Serial resistance R_s (Ω)	Interfacial resistance R_{ct} (Ω)
TiO_2	**34.66**	**9.14×10^4**
TiO_2@PEDOT	**28.60**	**1.35×10^4**
TiO_2@PPy	**35.53**	**3.60×10^4**
TiO_2@PAn	**22.39**	**1.03×10^2**