Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary information

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Fig. S4. UV-vis spectra changes of PAM1 and PAM4 in the CH_2Cl_2 as they were protonated by HCl vapor in steps decrease with the value of pH decreasing.

Fig. S5. UV-vis spectra changes of TPA as a reference in the CH_2Cl_2, concentrated sulfuric acid/ CH_2Cl_2 and concentrated hydrochloric acid/ CH_2Cl_2. Inset: the color change of TPA in the CH_2Cl_2 of different proportion sulfuric and hydrochloric acid. TPA can be protonated by the concentrated sulfuric acid to blue color state and not showed any color change from doping with concentrated hydrochloric acid.

Fig. S6. Electronic absorption spectra of films of PAM2 and PAM4 in the process of electrochemical doping with 0.1 V potential intervals in CH_3CN.

Fig. S7. The typical photocurrent (lower) and photovoltaic (upper) response for an PAM2, PAM3 and PAM4 films immobilized on ITO glass upon exposure to light with switching at room temperature.

Fig. S1

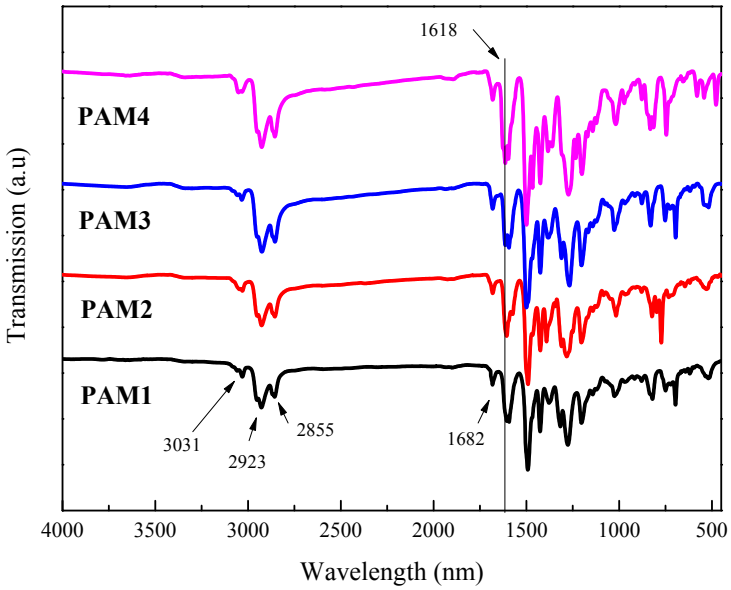

Fig.S1. FT-IR spectra of PAM1 to PAM4

Fig. S2

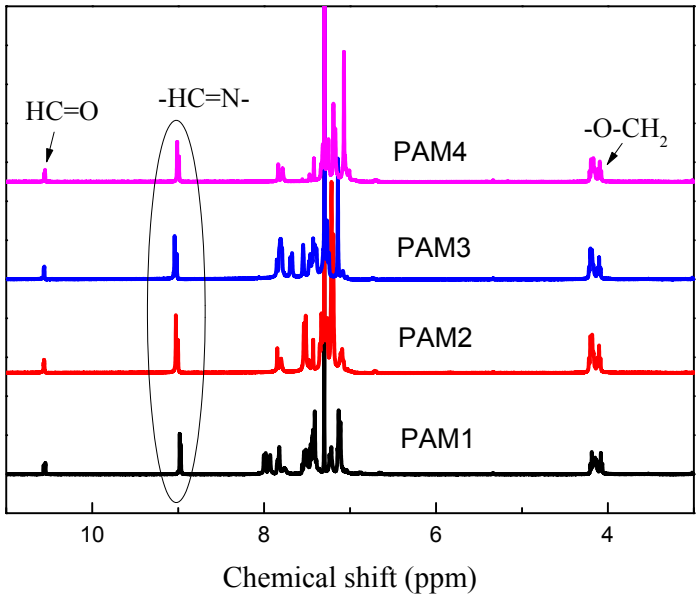

Fig.S2. ^{1}H NMR spectra of PAM1 to PAM4.

Table S1

Polymer code[a]	solvents[b]							
	NMP	DMAc	DMF	DMSO	m-cresol	THF	DCM	Toluene
PAM1	++	+	+	+	++	++	++	++
PAM2	++	+	+	+	++	++	++	++
PAM3	++	+	+	+	++	++	++	++
PAM4	++	+	+	±	++	+	++	++

[a] The qualitative solubility was tested with 10 mg of a sample in 1 mL of stirred solvent. ++: soluble at room temperature; +: soluble on heating; ±: partially soluble. [b] Solvent: NMP: N-methyl-2-pyrrolidone; DCM: dichloromethane.

Table S1 Solubility of PAMs

Fig. S3

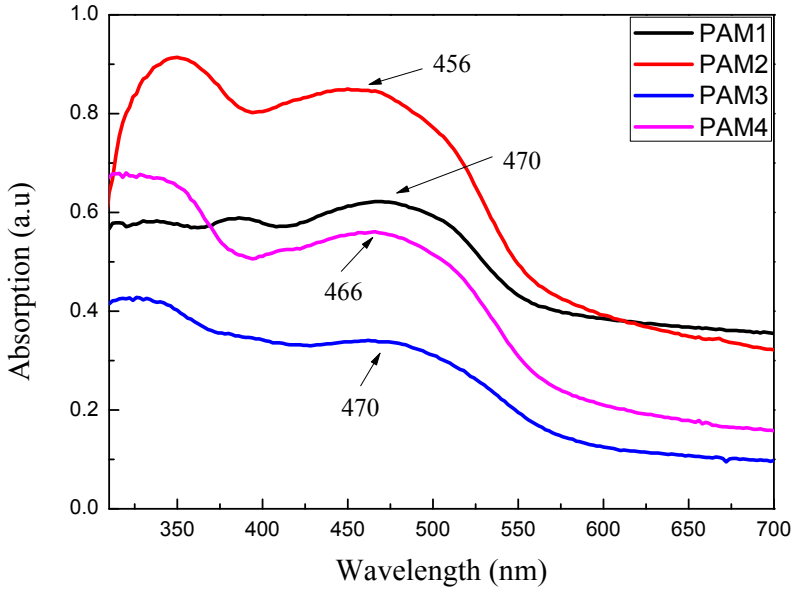

Fig.S3. UV-visible absorption spectra of PAMs in solid state at room temperature.

Fig. S4

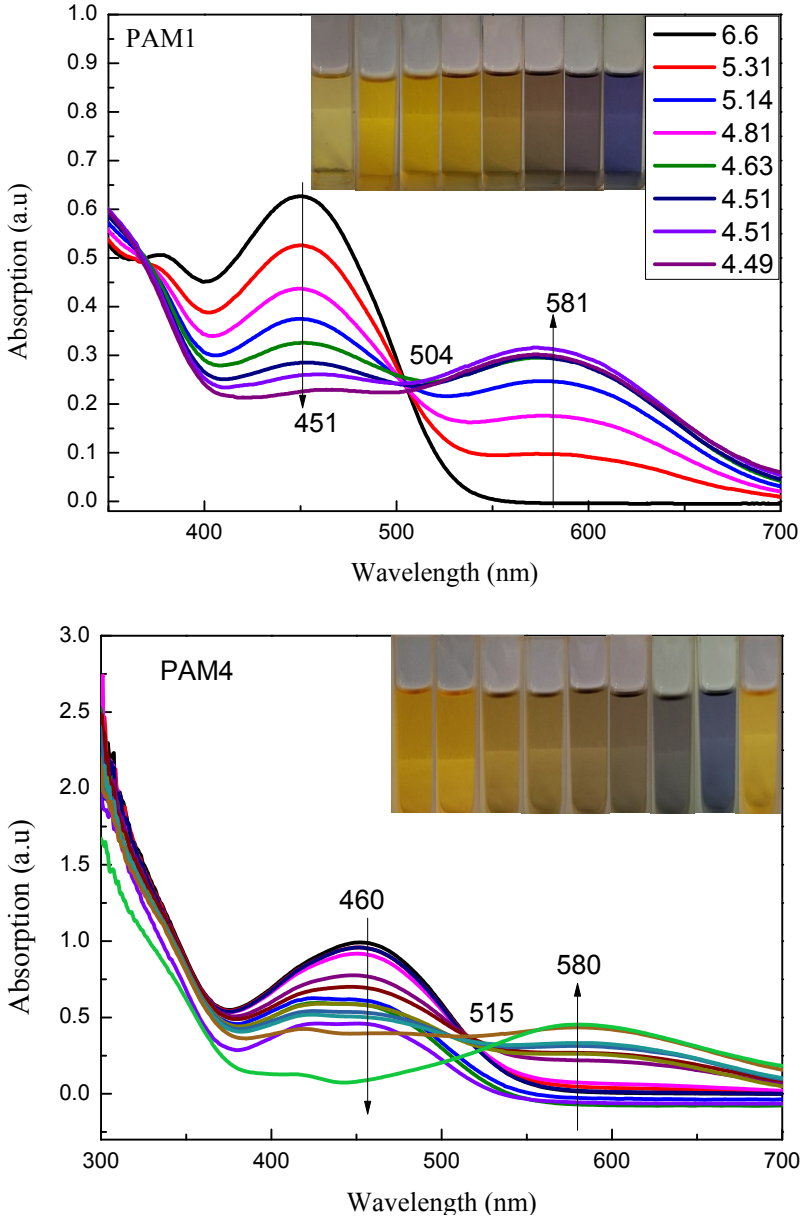

Fig. S4. UV-vis spectra changes of PAM1 and PAM4 in the CH_2Cl_2 as they were protonated by HCl vapor in steps decrease with the value of pH decreasing.

Fig. S5

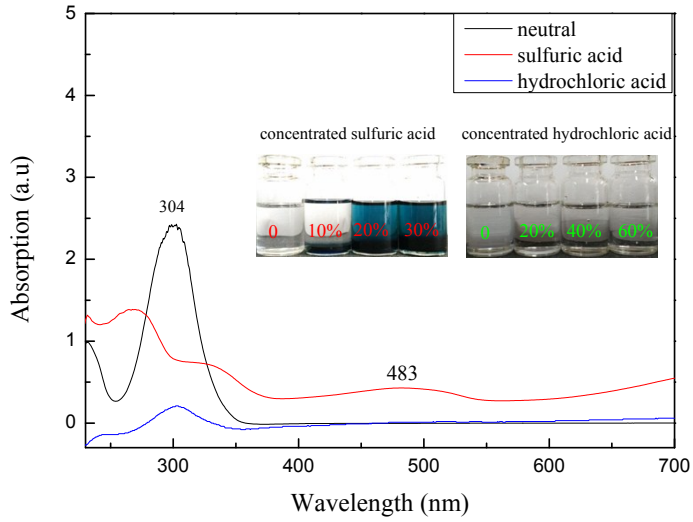

Fig S5. UV-vis spectra changes of TPA as a reference in the CH_2Cl_2, concentrated sulfuric acid/ CH_2Cl_2 and concentrated hydrochloric acid/ CH_2Cl_2 solutions. Inset: the color change of TPA in the CH_2Cl_2 solution containing different proportional sulfuric and hydrochloric acid. TPA can be protonated by the concentrated sulfuric acid to blue color state and not showed any color change from doping with concentrated hydrochloric acid.

Fig. S6

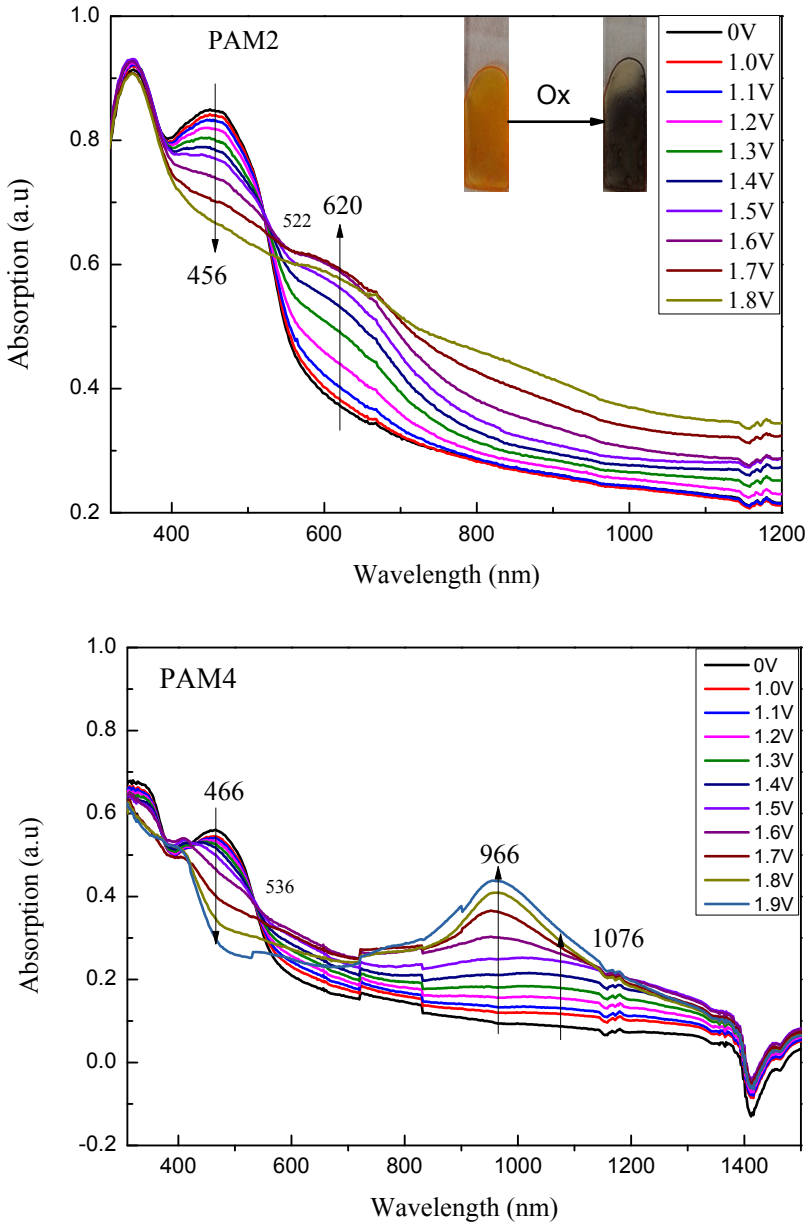

Fig.S6. Electronic absorption spectra of films of PAM2 and PAM4 in the process of electrochemical doping with 0.1 V potential intervals in CH_3CN.

Fig. S7

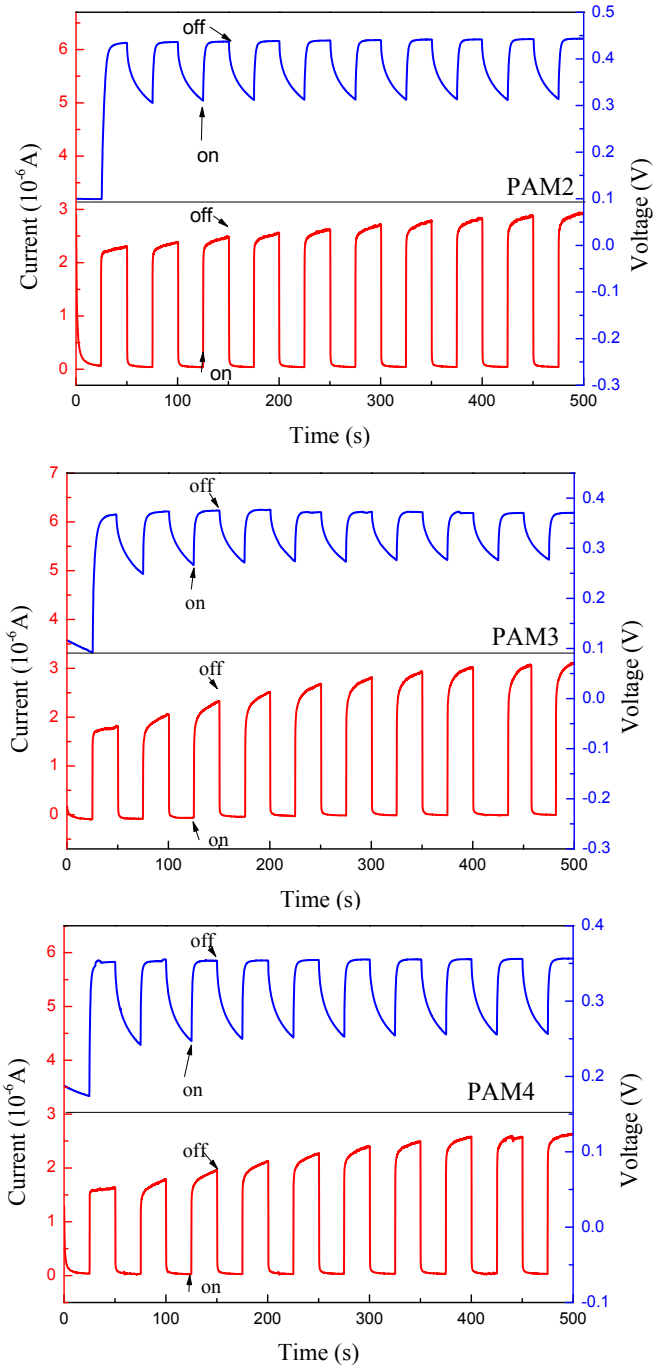

Fig.S7. The typical photocurrent (lower) and photovoltaic (upper) response for an PAM2, PAM3 and PAM4 films immobilized on ITO glass upon exposure to light with switching at room temperature.