Supporting Information for

High-performance blue fluorescent/electroactive polyamide bearing *p*-phenylenediamine and asymmetrical SBF/TPA-based units for electrochromic and electrofluorochromic multifunctional applications

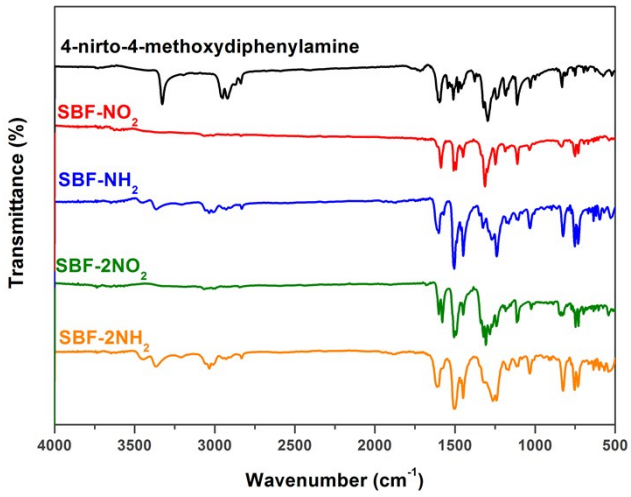

Fig. S1 FTIR spectra of the compounds 4-nitro-4-methoxydiphenylamine, SBF-NO_2, SBF-NH_2, SBF-$2NO_2$ and SBF-$2NH_2$.

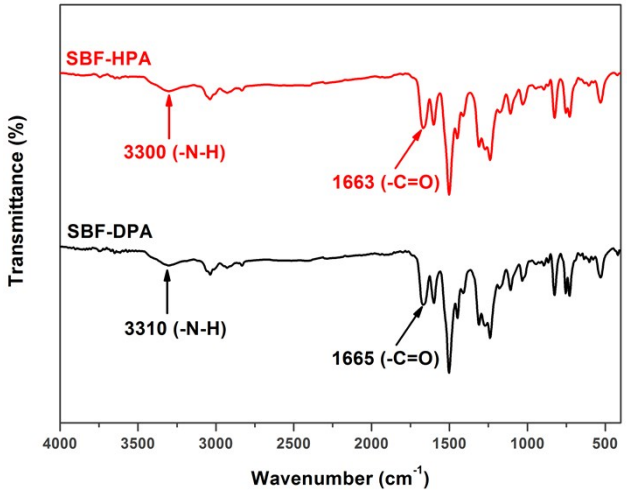

Fig. S2 FTIR spectra of SBF-HPA and SBF-DPA.

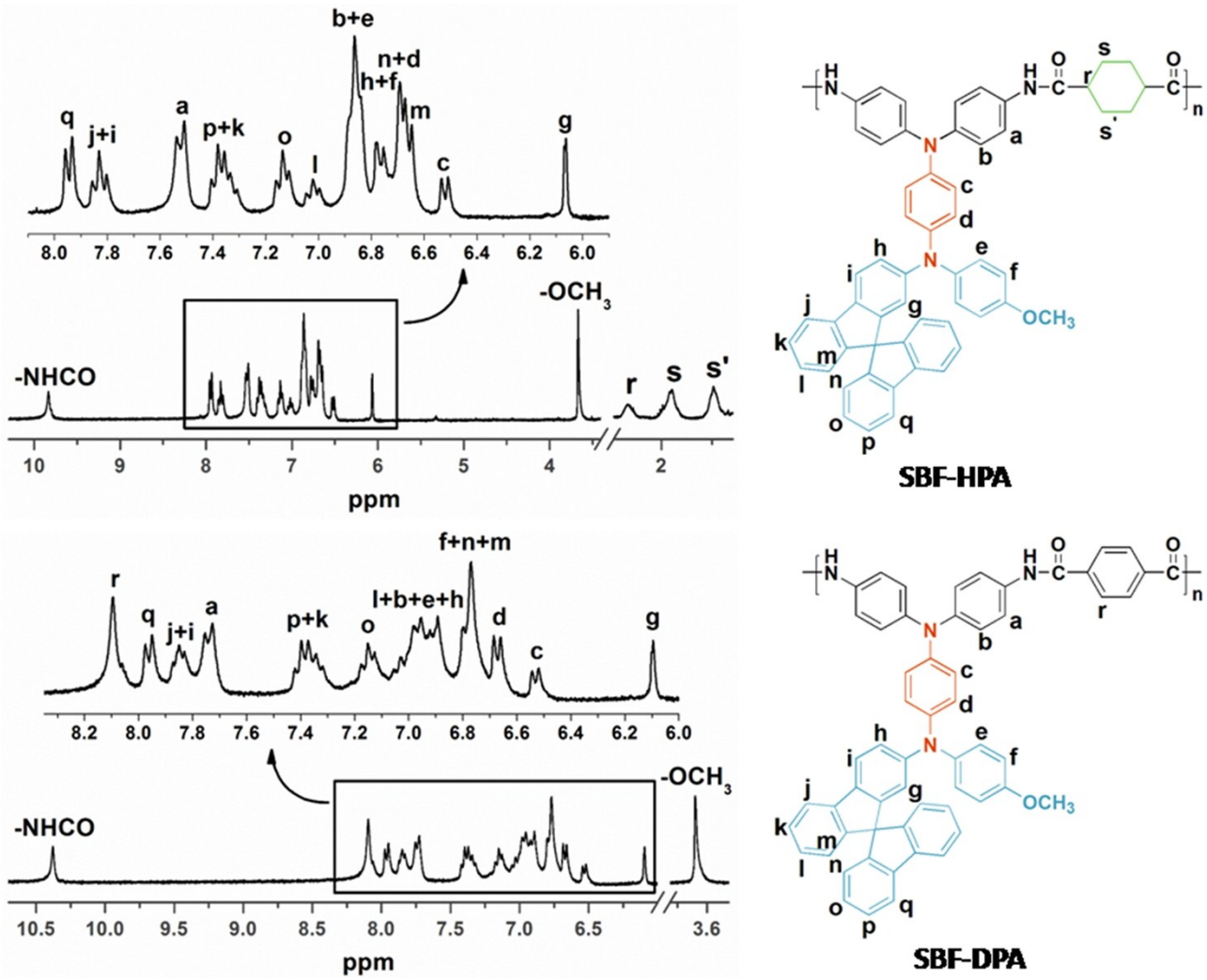

Fig. S3 ^{1}H NMR spectra of SBF-HPA and SBF-DPA.

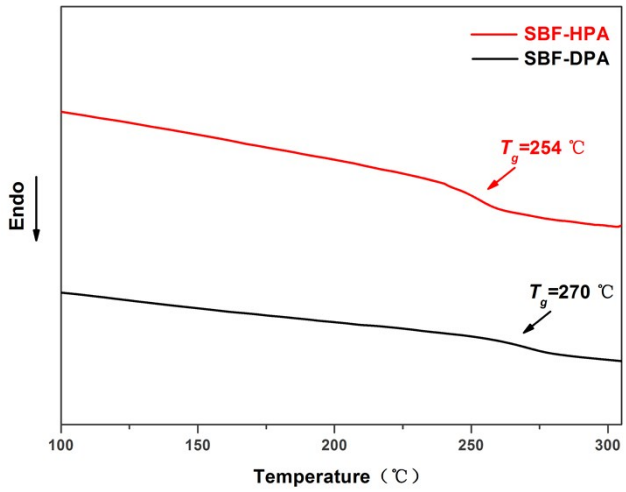

Fig. S4 DSC curves of SBF-HPA and SBF-DPA.

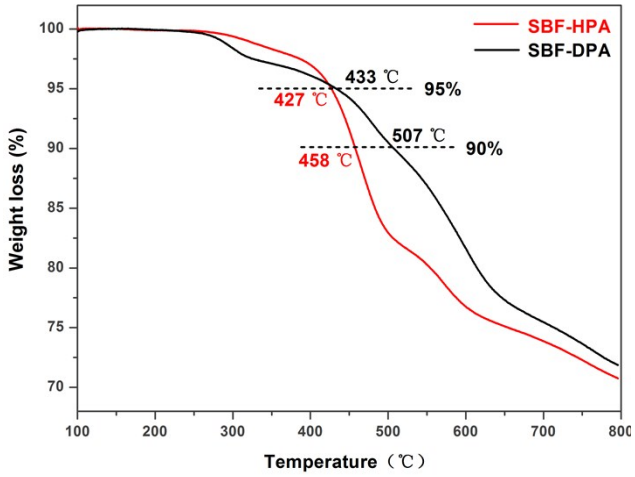

Fig. S5 TGA curves of SBF-HPA and SBF-DPA.

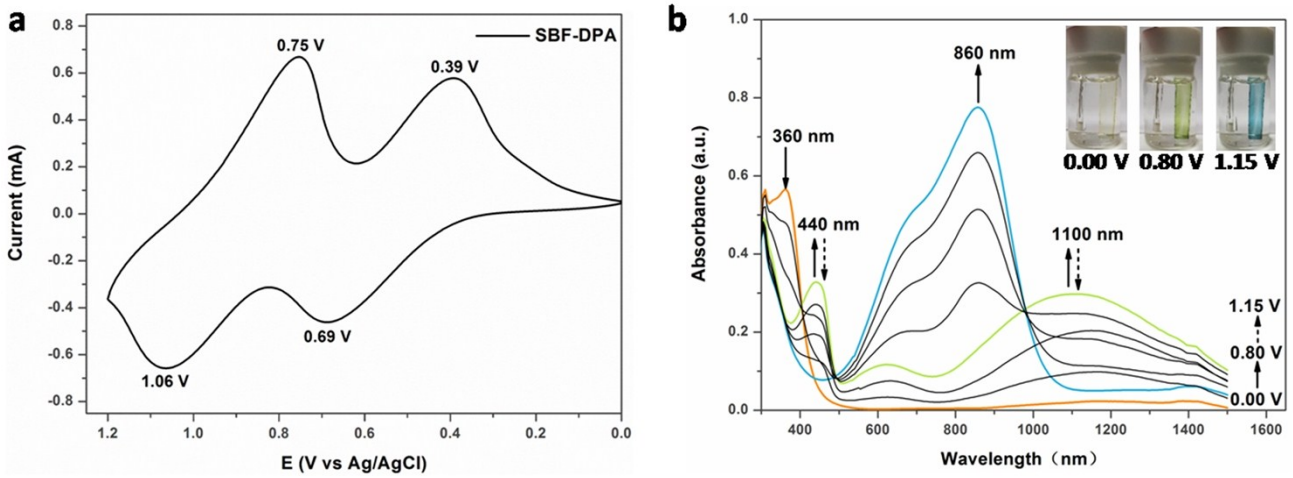

Fig. S6 (a) Cyclic voltammetric diagrams of SBF-DPA at a scan rate of 50 mV s^{-1}. (b) Absorbance spectra of SBF-DPA thin film electrode in 0.1 M TBAP/CH_3CN at different applied potentials from 0.00 to 1.15 V.

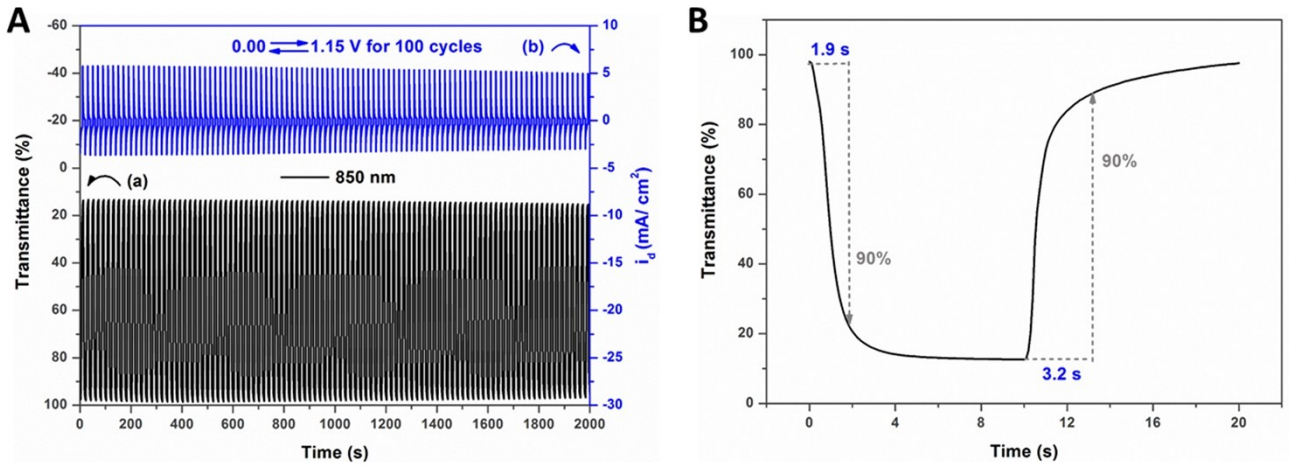

Fig. S7 (A) EC switching of SBF-HPA film between 0.00 and 1.15 V with a cycle time of 20 s: (a) transmittance changes and (b) current consumption at the monitored wavelength of 850 nm. (B) Optical switching time at 850 nm.

Table S1. Molecular Weights and Solubilities of SBF-HPA and SBF-DPA.

	GPC[a]			Solvents[b]						
Sample	M_w	M_n	PDI	NMP	DMAc	DMF	DMSO	THF	$CHCl_3$	CH_3CN
SBF-HPA	95300	92000	1.04	++	++	++	++	++	+-	--
SBF-DPA	55600	40200	1.38	++	++	++	++	++	+-	--

[a] Relative to polystyrene standard, using DMF as the eluent. [b] Qualitative solubilities were tested with 10 mg of polymers in 1mL of solvent. ++, soluble at room temperature; +-, partially soluble; --, insoluble even on heating.

Table S2. Thermal properties of SBF-HPA and SBF-DPA.

		N_2		
Sample	T_g (°C)[a]	$T_{d5\%}$ (°C)[b]	$T_{d10\%}$ (°C)[b]	Char yield (wt %)[c]
SBF-HPA	254	427	458	71
SBF-DPA	270	433	507	72

[a] Obtained at the baseline shift in the second heating DSC traces, with a heating rate of 10 °C/min under N_2.

[b] Decomposition temperature at which a 5 or 10% weight loss was recorded *via* TGA at a heating rate of 10 °C/min.

[c] Residual weight percentage at 800 °C in N_2.