Voltage-induced chromatic phase transition in ferrocene substituted polydiacetylene thin film

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Fig. S1 The molecular structure, synthetic route and \textit{1}H NMR characterization of FEDA.

Fig. S2 The optical setup of the CMS experiments for the in situ evaluation of the voltage-induced chromatic phase transition in FEPDA samples. External voltages are applied using a source meter to observe the charge modulation of the optical signal. Detailed sample structure is also described.
Fig. S3 The typical UV-vis absorption spectra of the FEPDA samples in blue phase.

Fig. S4 The typical Raman spectra of the FEPDA samples: (a) before and (b) after the application of the negative bias voltage.

Fig. S5 CMS spectrum for (i) pure PDA sample and (ii) the FEPDA samples obtained the application of -60 V, respectively.
The xps peak of Fe2P shifted to a higher energy position after the application of a negative voltage. The peak of Fe2P$_{3/2}$ shifted from 708eV to 712eV. And the peak of Fe2P$_{5/2}$ shifted from 721eV to 725eV. It indicated that ferrocene was oxidized from Fe(II) to Fe(III)\(^1\).

Fig. S7 Transimission FTIR spectra of FEPDA samples (i) before and (ii) after the application of the negative bias voltages.