Supplementary Information

Flexible Electrochromic Energy-saving Windows with Fast Switching and Bistability Based on Transparent Solid-state Electrolyte

Jinming Zeng [a, b], Zhijun Wan [a], Mimi Zhu [a], Lianghui Ai[a], Ping Liu[1a], Wenji Deng [c]

[a] State Key Laboratory of Luminescent Materials and Devices, Research Institute of Materials Science, South China University of Technology, Guangzhou 510640, China

[b] Engineering research center for hydrogen energy materials and devices, School of Materials Science and Engineering, Jiangxi University of Science and Technology, 86 Hong Qi Road, Ganzhou 341000, PR China

[c] Department of Applied Physics, South China University of Technology, Guangzhou 510640, China

[1]Corresponding author: Tel./fax: +86 20 87111686.
E-mail address: mcpliu@scut.edu.cn (P. Liu)

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1. Optoelectrochemical properties of PTCDA, 4E-2B-COOCH3, and transparent soild-state electrolyte

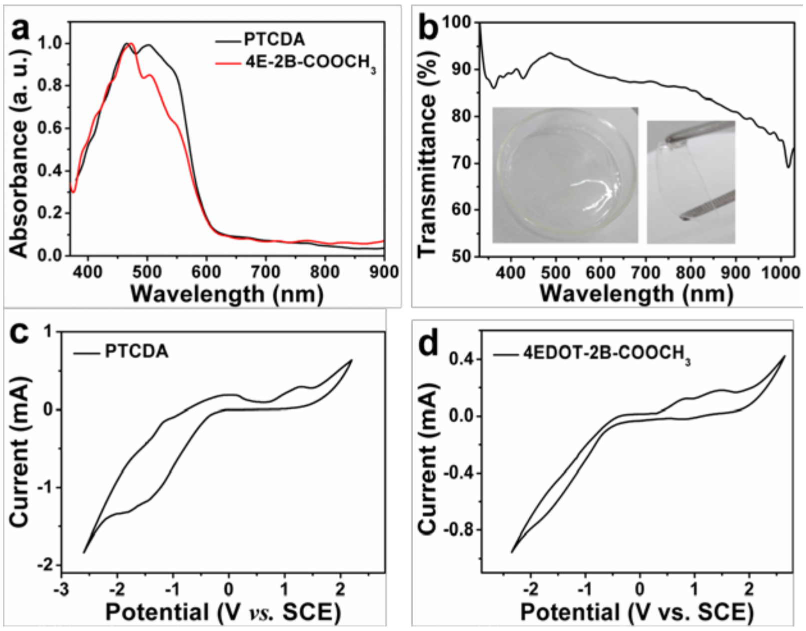


Figure S1. a) UV-vis absorption spectra of PTCDA and 4E-2B-COOCH3 films; b) transmittance spectra of solid-state electrolyte (insets were photos of solid-state electrolyte); cyclic voltammetry curves of c) PTCDA film and d) 4E-2B-COOCH3 film.

2. AC impedance spectroscopy of the T-SE

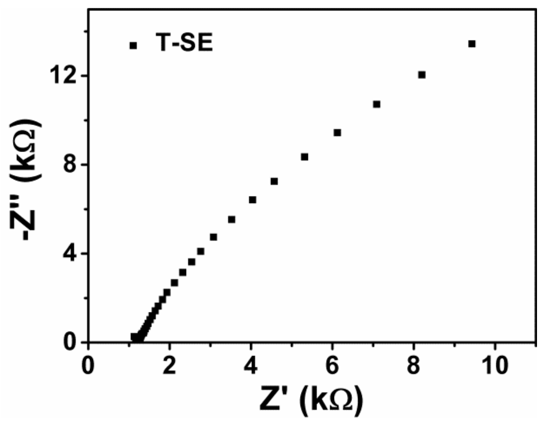


Figure S2. Nyquist impedance plots for Cu/T-SE/Cu at room temperature.

3. Spectroelectrochemistry of ECD 3, and ECD 4 under bending state

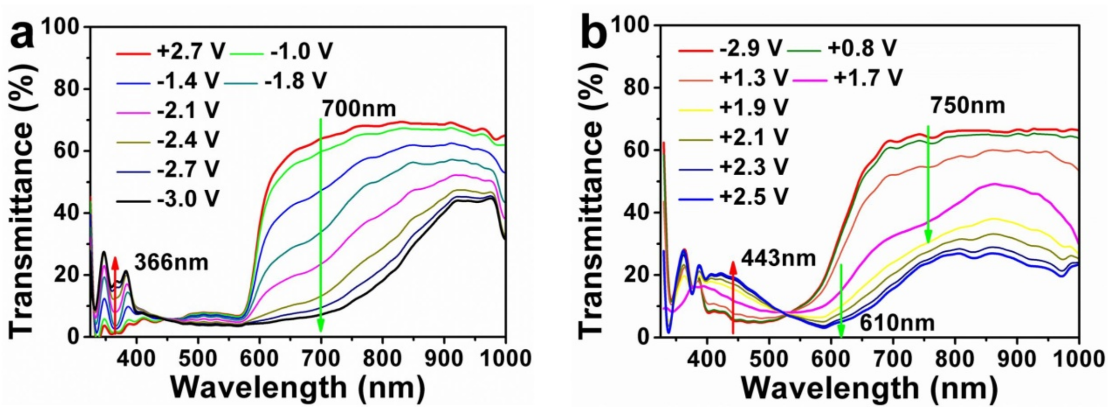


Fig. S3 Spectroelectrochemistry of (a) ECD 3, and (b) ECD 4 under bending state.

4. Chronoamperometry of ECD 3 and ECD 4 under bending state

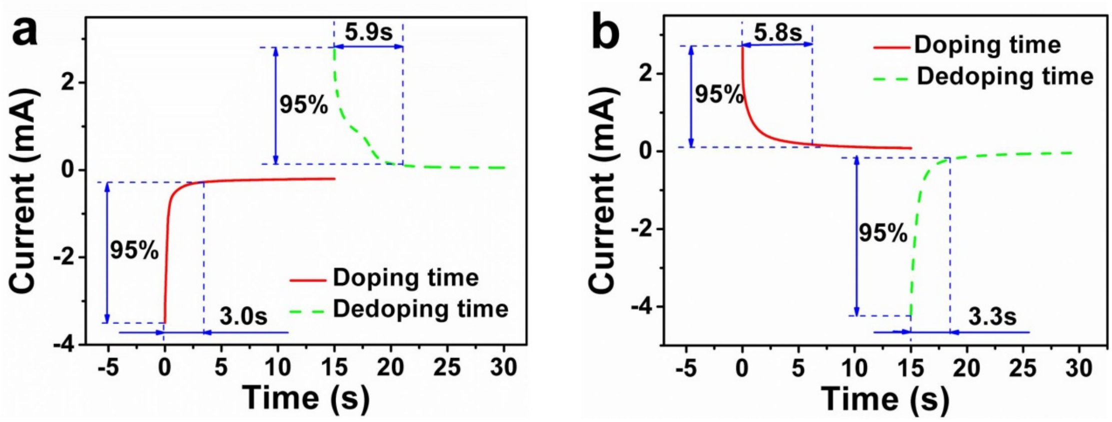
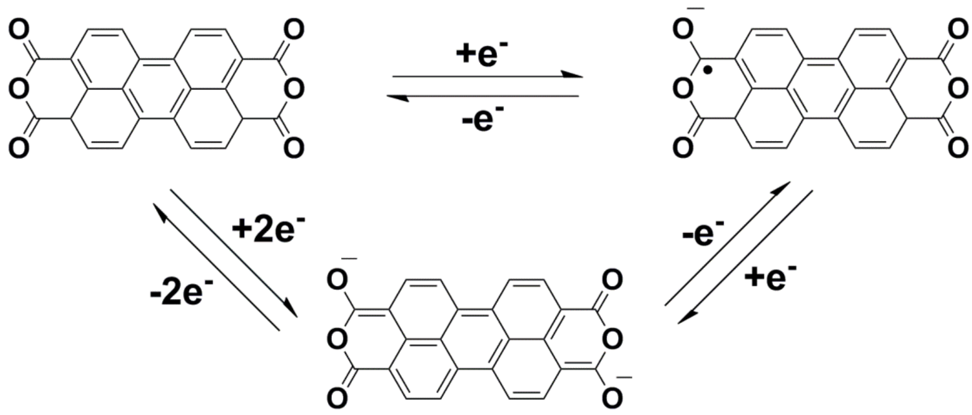


Fig. S4 Chronoamperometry of (a) ECD 3 and (b) ECD 4 under bending state.

5. Proposed electrochromic mechanism of PTCDA



Scheme S1. The proposed electrochromic mechanism diagram of PTCDA.

6. Optoelectrochemical properties of compound films

Table S1 Optoelectrochemical properties of compound films

Film	λ_{edg} a) (nm)	E_g^{opt} b) (eV)	E_{ox}^{onset} (V)	E_{red}^{onset} (V)	E_{HOMO} c) (eV)	E_{LUMO} d) (eV)	E_g^{elec} e) (eV)
PTCDA	596	2.08	+0.87	- 0.54	- 5.27	- 3.94	1.41
4EDOT-2B-COOCH3	601	2.06	+0.46	- 0.78	- 4.86	- 3.62	1.24

a) band edge wavelength; b) $E_g^{opt} = 1240/\lambda_{edge}$; c) $E_{HOMO} = -e(E_{ox}^{onset} + E_{ref})$; d) $E_{LUMO} = -e(E_{red}^{onset} + E_{ref})$; e) $E_g^{elec} = E_{LUMO} - E_{HOMO}$