Supporting Information

Responsive Smart Windows Enabled by the Azobenzene Copolymer Brush with Photothermal Effect

Ze-Yang Kuang, a# Yuan Deng, a# Jun Hu, a Lei Tao, a Ping Wang, a Jian Chen, b He-Lou Xie a,b*

a Key Lab of Environment-friendly Chemistry and Application in Ministry of Education, and Key Laboratory of Advanced Functional Polymer Materials of Colleges, Universities of Hunan Province and College of Chemistry, Xiangtan University, Xiangtan Hunan, 411105, China.

b Key Laboratory of Theoretical Organic Chemistry and Functional Molecule of Ministry of Education, Hunan Provincial Key Laboratory of Controllable Preparation and Functional Application of Fine Polymers, Hunan University of Science and Technology, Xiangtan, Hunan, 411201, China

# Ze-Yang Kuang and Yuan Deng contributed equally to this work

*To whom the correspondence should be addressed.

E-mail: xhl20040731@163.com (HLX)
Figure S1. $^1$H NMR spectra of copolymer MAzo-co-GMA.

Figure S2. 2DWAXD pattern of MAzo-co-GMA polymer brush at room temperature.

Figure S3. The optical textures of unaligned chiral LC mixture under crossed polarizers at (a) 46.7°C (Iso), (b) 40°C (N*), (c) 33.5°C (N* - SmA*), and (d) 30°C (SmA*) are shown, respectively. The sample was cooled at 1 °C/minute.
**Figure S4.** Phase behavior of a chiral liquid crystalline (ChLC) mixture (2%, 20 μm thick cell with homeotropic alignment) under crossed polarizers upon cooling from the isotropic phase at a rate of 1 °C/min. (a) 46.7°C (Iso), (b) 40°C (N*), (c) 33.5°C (N* - SmA*), and (d) 30°C (SmA*)

**Figure S5.** The DSC curve of chiral LC mixture (ChLC).

**Figure S6.** The optical textures of polymer stabilized chiral liquid crystalline thin film (2%, 20 μm thick cell with homeotropic alignment) under crossed polarizers upon cooling from the isotropic phase at a rate of 1 °C/min. (a) 48°C (Iso), (b) 40°C (N*), (c) 33.5°C (N* -SmA*), and (d) 30°C (SmA*)
Figure S7. Plots of temperature rise of different concentration MAzo-co-GMA copolymer coated PSLC cell with UV irradiation time.

Figure S8. The UV–vis absorption spectra of 2wt% (a) and 0.5 wt% (b) MAzo-co-GMA copolymer brush under UV light (365nm, 400w m\(^{-2}\)) irradiation.

Figure S9. Photographs of the opaque state and transparent state of an ITO PSLC cell upon application of an electric field.
Figure S10. The voltage dependence of the transmittance for the smart window modified with 2 wt% Azo-co-GMA copolymer brush.