Incorporating amidine groups into photonic cholesteric polymer networks for food quality sensing

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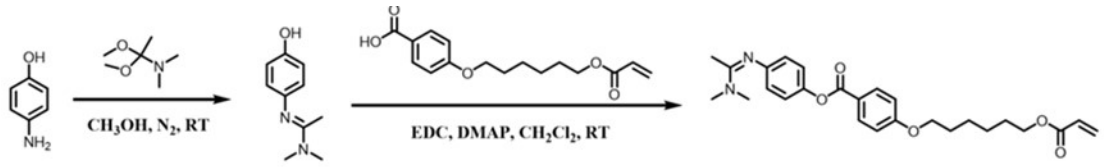


Figure S1. Synthesis route of C6AD.

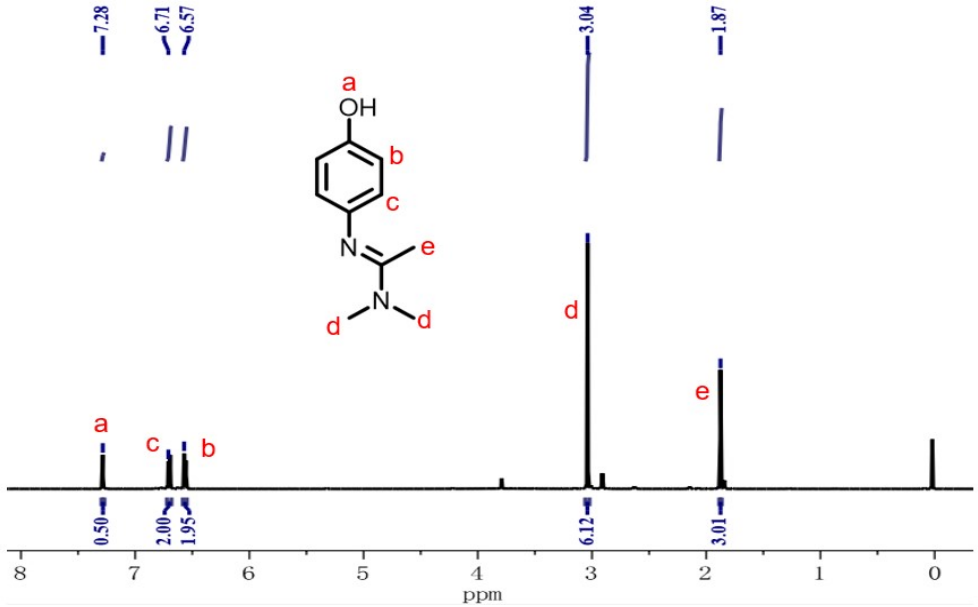


Figure S2. [1]H NMR spectrum of N'-(4-hydroxyphenyl)-N,N-dimethylacetimidamide (chloroform-*d*).

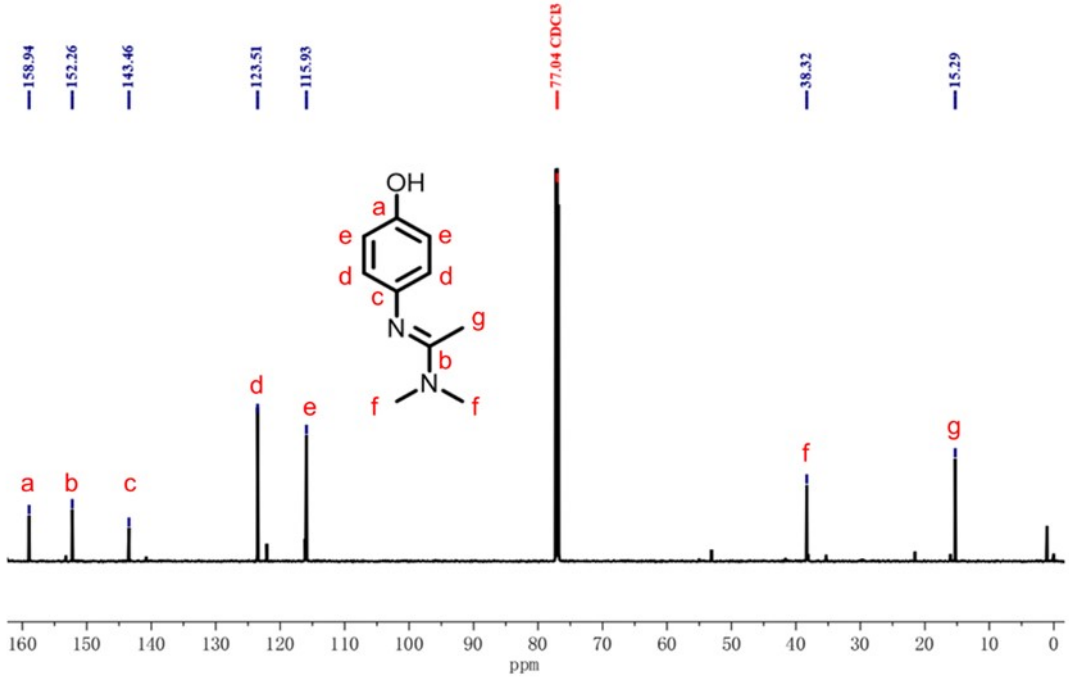
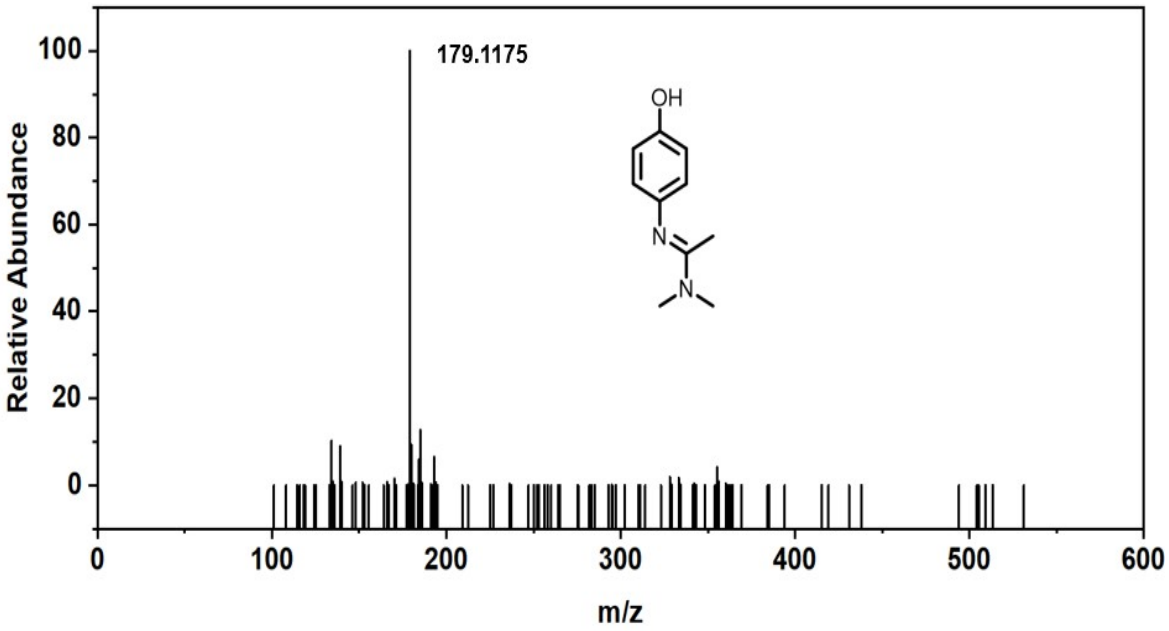


Figure S3. [13]C NMR spectrum of N'-(4-hydroxyphenyl)-N,N-dimethylacetimidamide (chloroform-d).



Formula	Species	Expected m/z	Measured m/z	Delta ppm
C10H14N2O	+H	179.11	179.1179	-4.41

Figure S4. Mass spectrum of N'-(4-hydroxyphenyl)-N,N-dimethylacetimidamide (calculated for $C_{10}H_{14}N_2O$ $[M+H]^+$ 179.11, found 179.1179).

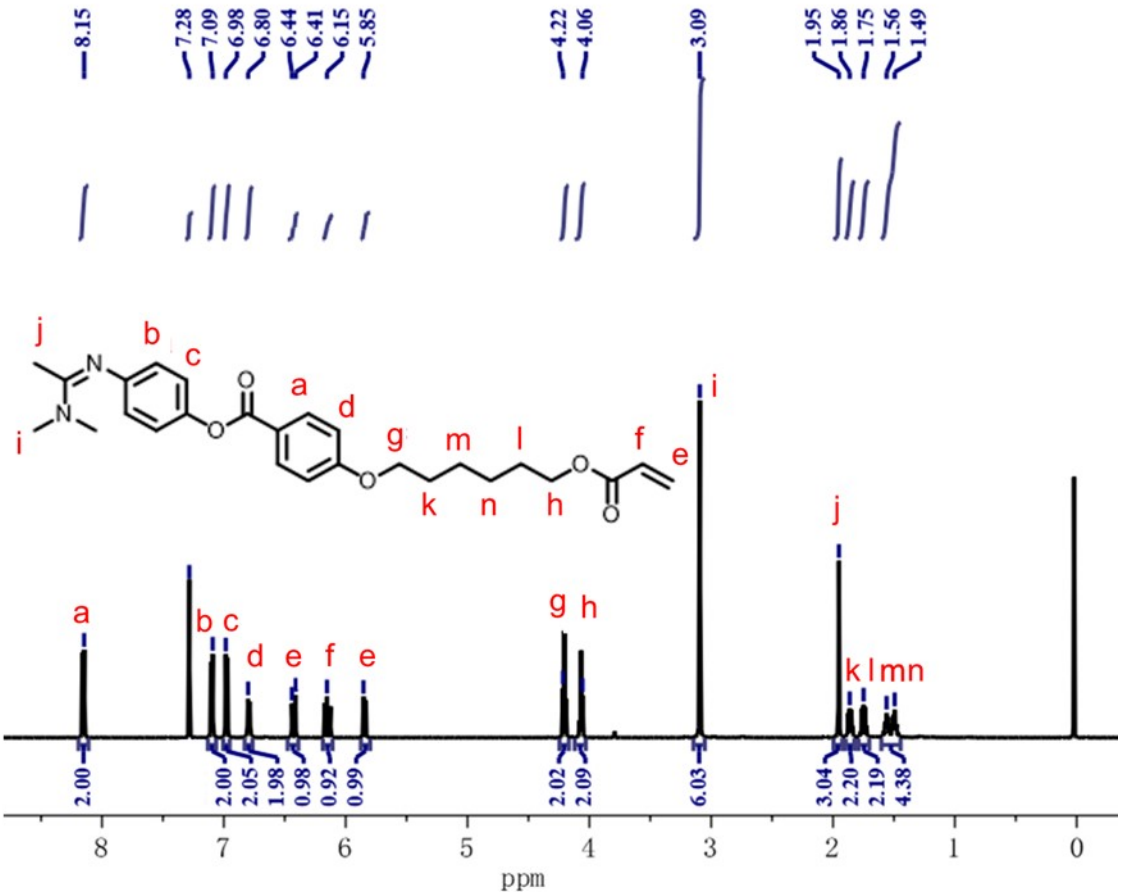


Figure S5. [1]H NMR spectrum of C6AD (chloroform-d).

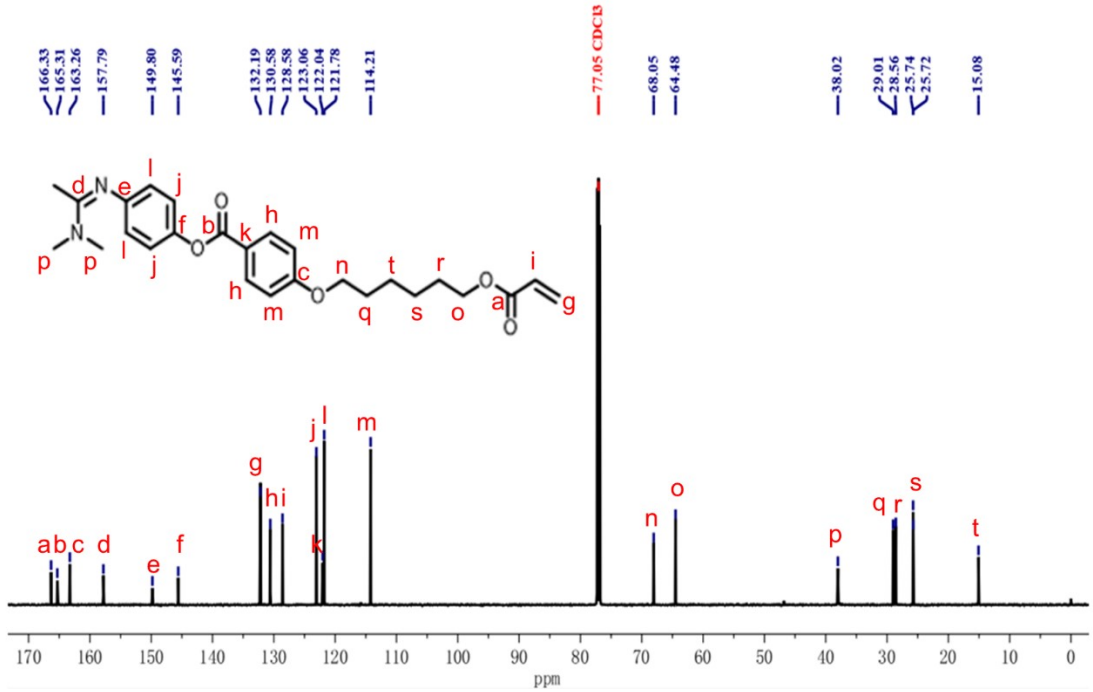
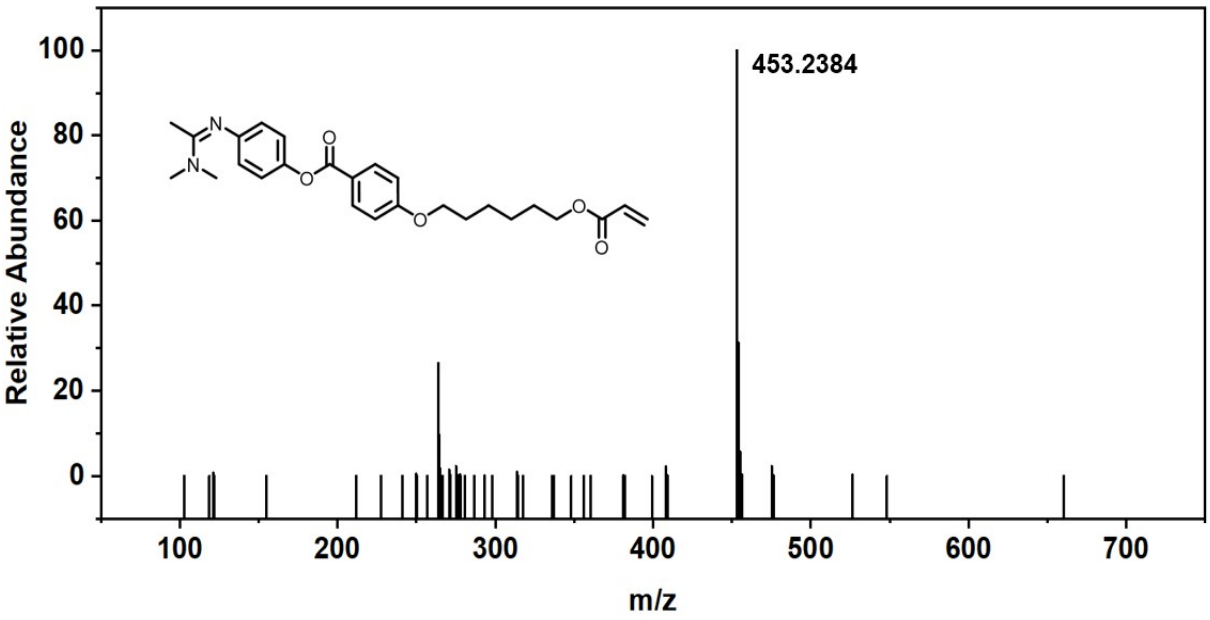


Figure S6. [13]C NMR spectrum of C6AD (chloroform-d).



Formula	Species	Expected m/z	Measured m/z	Delta ppm
C26H32N2O5	+H	453.23	453.2384	-1.85

Figure S7. Mass spectrum of C6AD (calculated for $C_{26}H_{32}N_2O_5$ $[M+H]^+$ 453.23, found 453.2384).

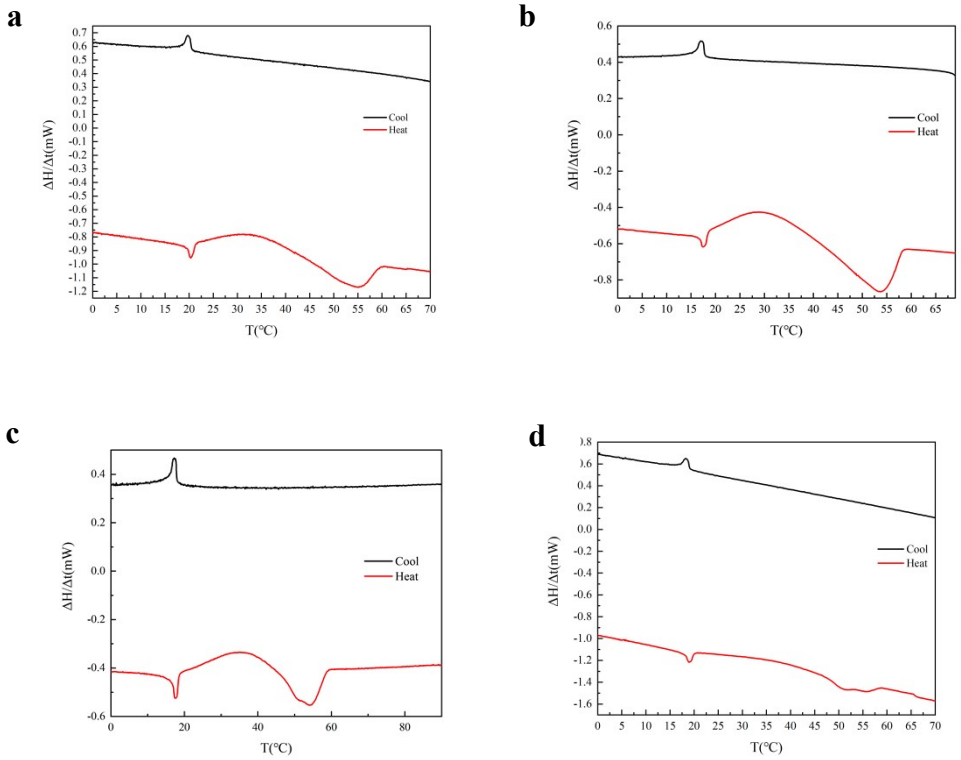
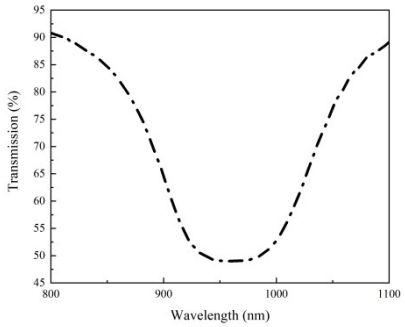
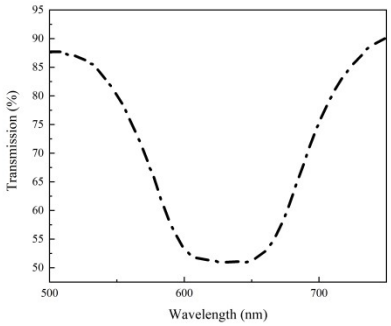


Figure S8. DSC curve of the mixtures a) mixture A. b) mixture E. c) Mixture D d) mixture F.

a

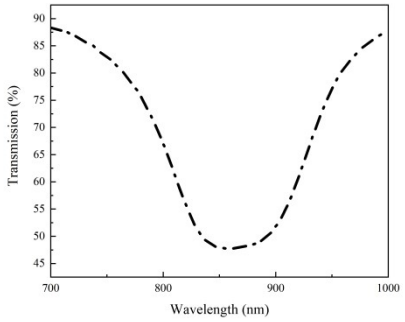


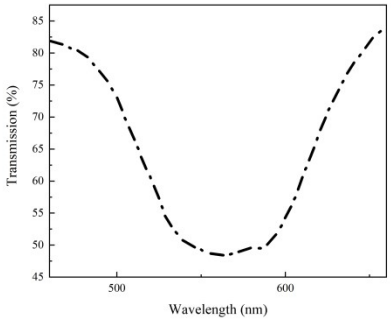


After photopolymerization

After removing CB15 and 5CB

b

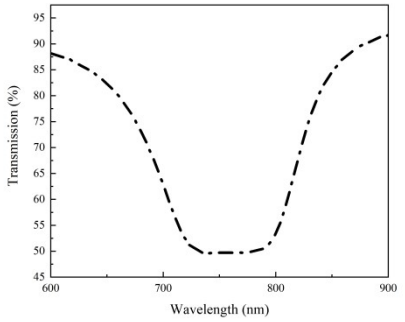


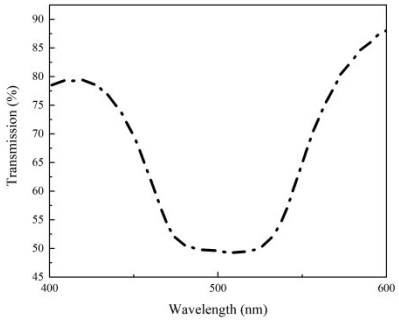


After photopolymerization

After removing CB15 and 5CB

c

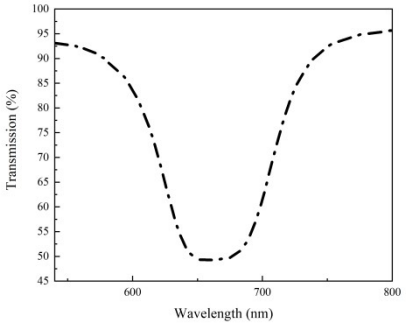


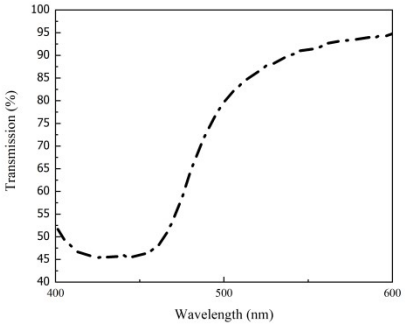


After photopolymerization

After removing CB15 and 5CB

d





After photopolymerization

After removing CB15 and 5CB

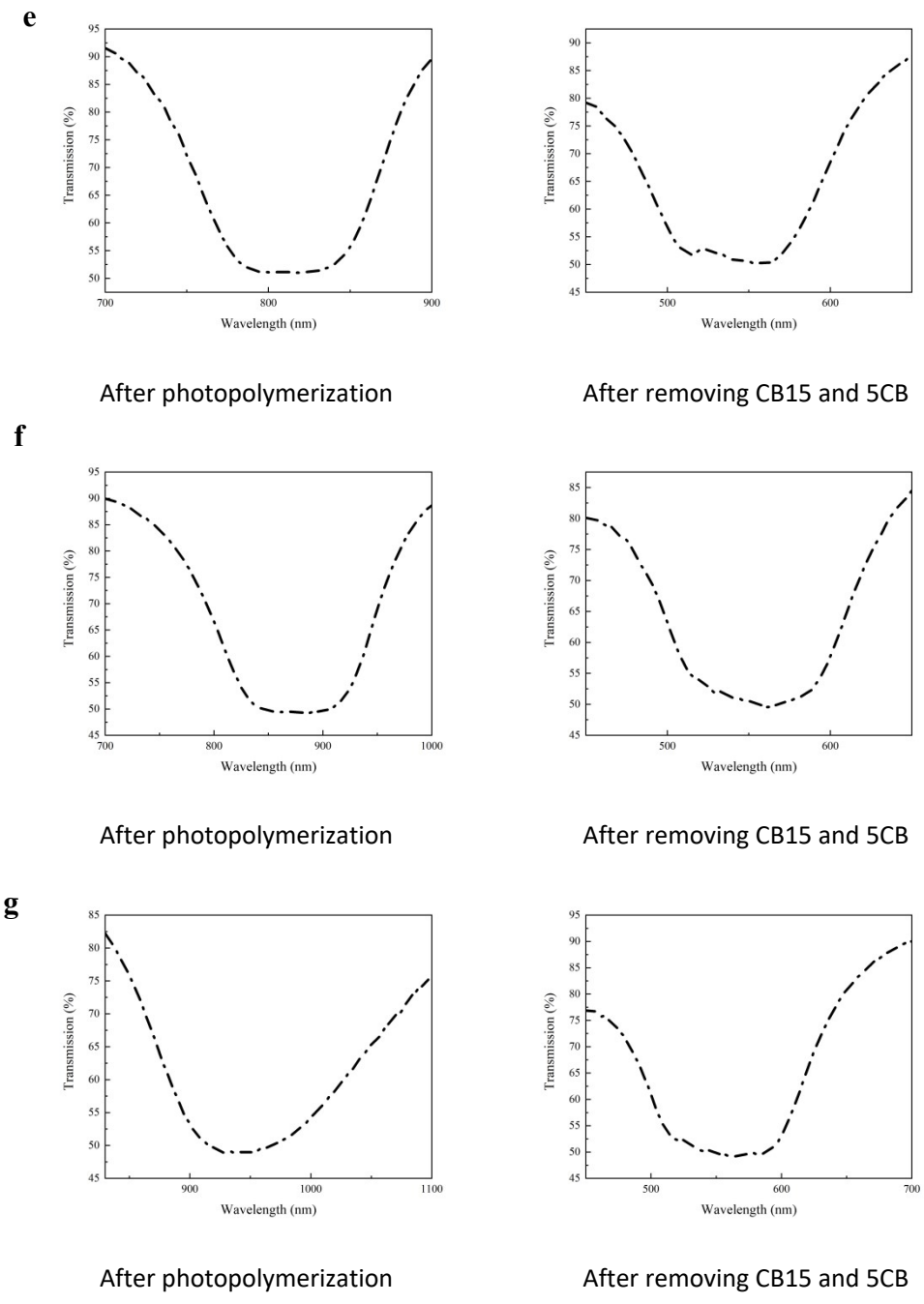


Figure S9. Transmission spectra of all samples after polymerization and after removal of CB15 and 5CB. a) Mixture A. b) Mixture X. c) Mixture B. d) Mixture C. e) Mixture D. f) Mixture E. g) Mixture F.

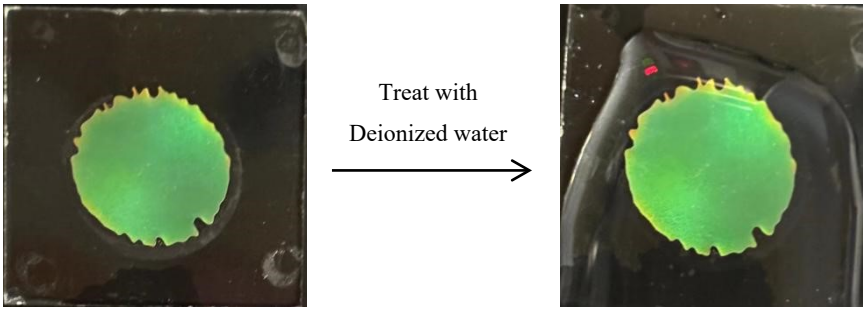


Figure S10. Lack of responsiveness of the cholesteric polymer film prepared from mixture B to pure water.

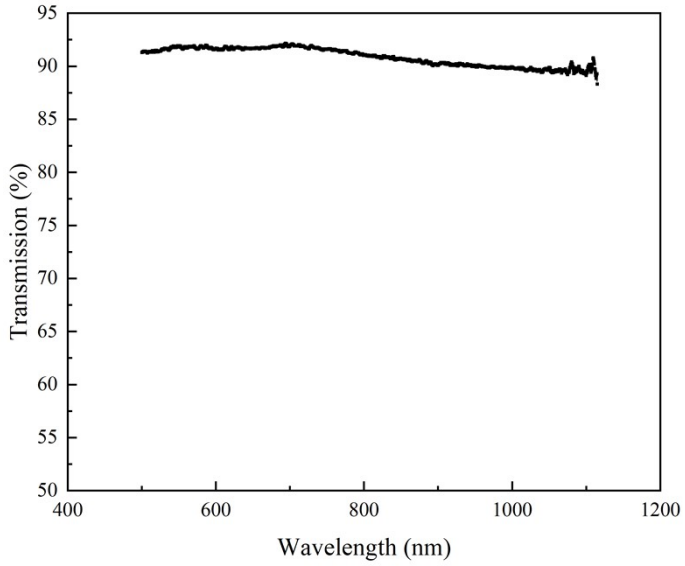


Figure S11. Transmission spectra in the visible and infrared bands of the film that becomes colorless after treatment with pure acetic acid.

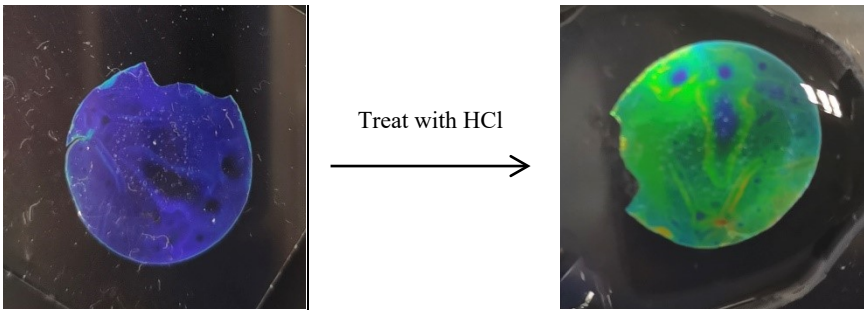


Figure S12. The cholesteric polymer film prepared from mixture C treated with HCl.

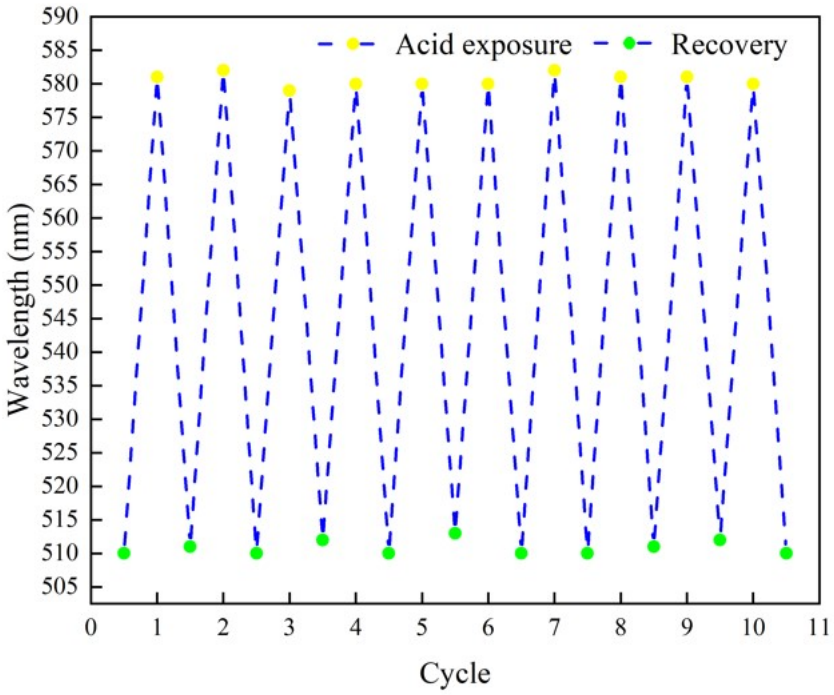


Figure S13. One film 10 cycles of acid exposure and recovery .

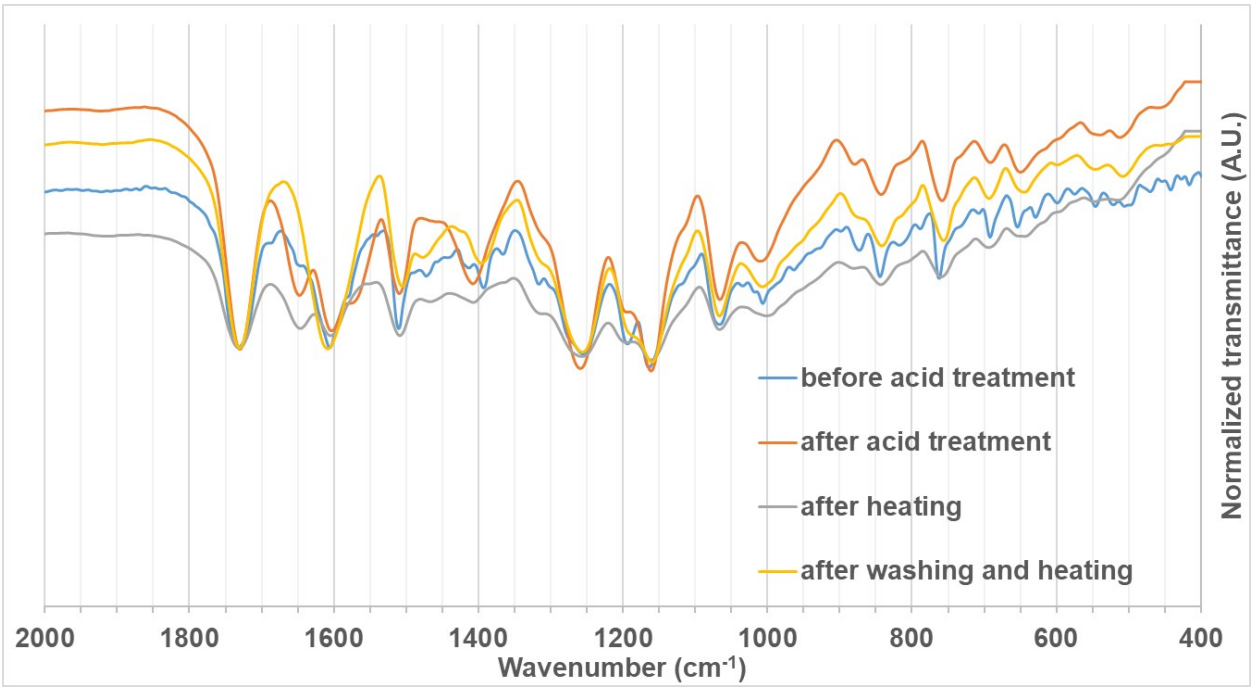


Figure S14. IR spectra of a film made using mixture B before acid exposure, after exposure to 1% aqueous acetic acid, after heating to 80 ℃, and after washing in water and heating at 100 ℃.

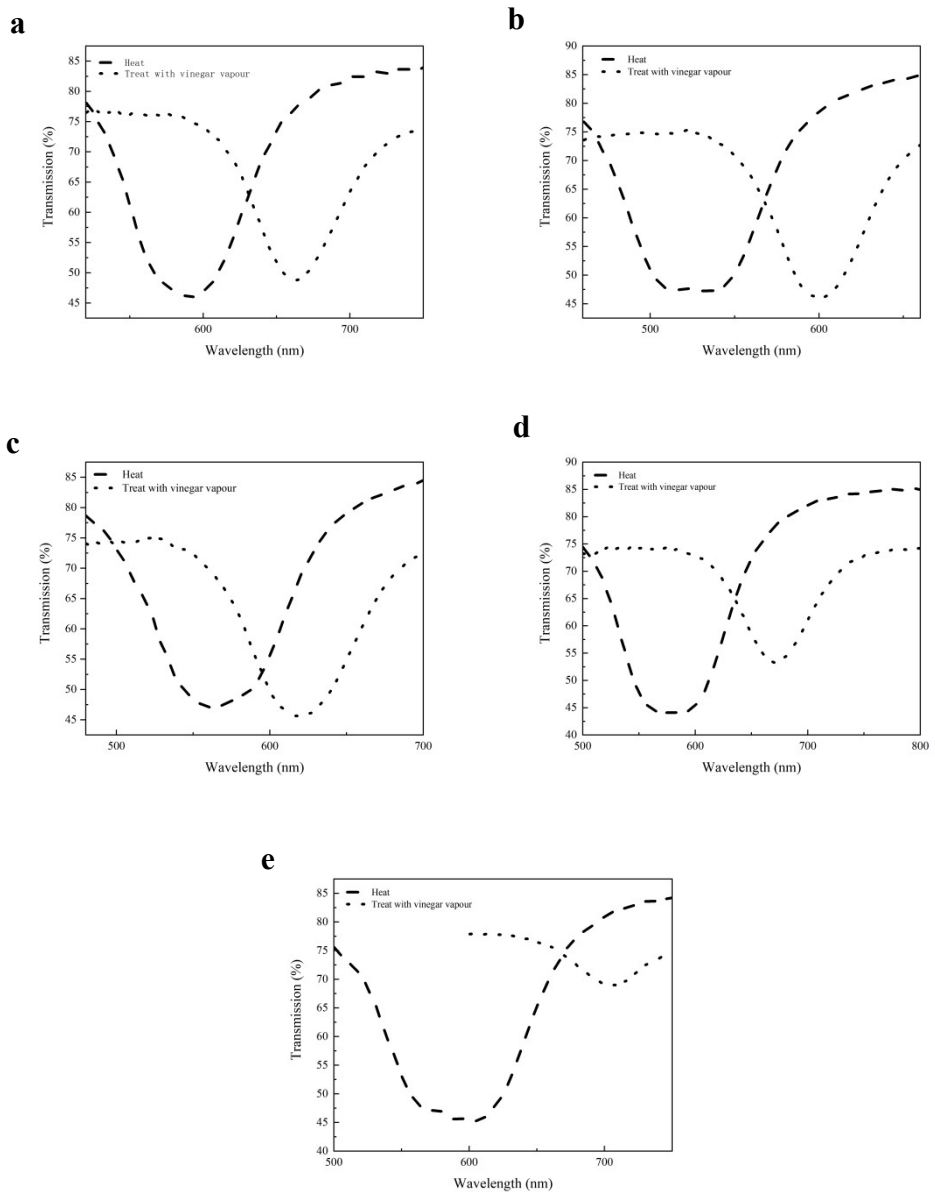


Figure S15. Transmission spectra of the films after 1% acid treatment and after heating. a) Mixture X. b) Mixture B. c) Mixture D. d) Mixture E. e) Mixture F.

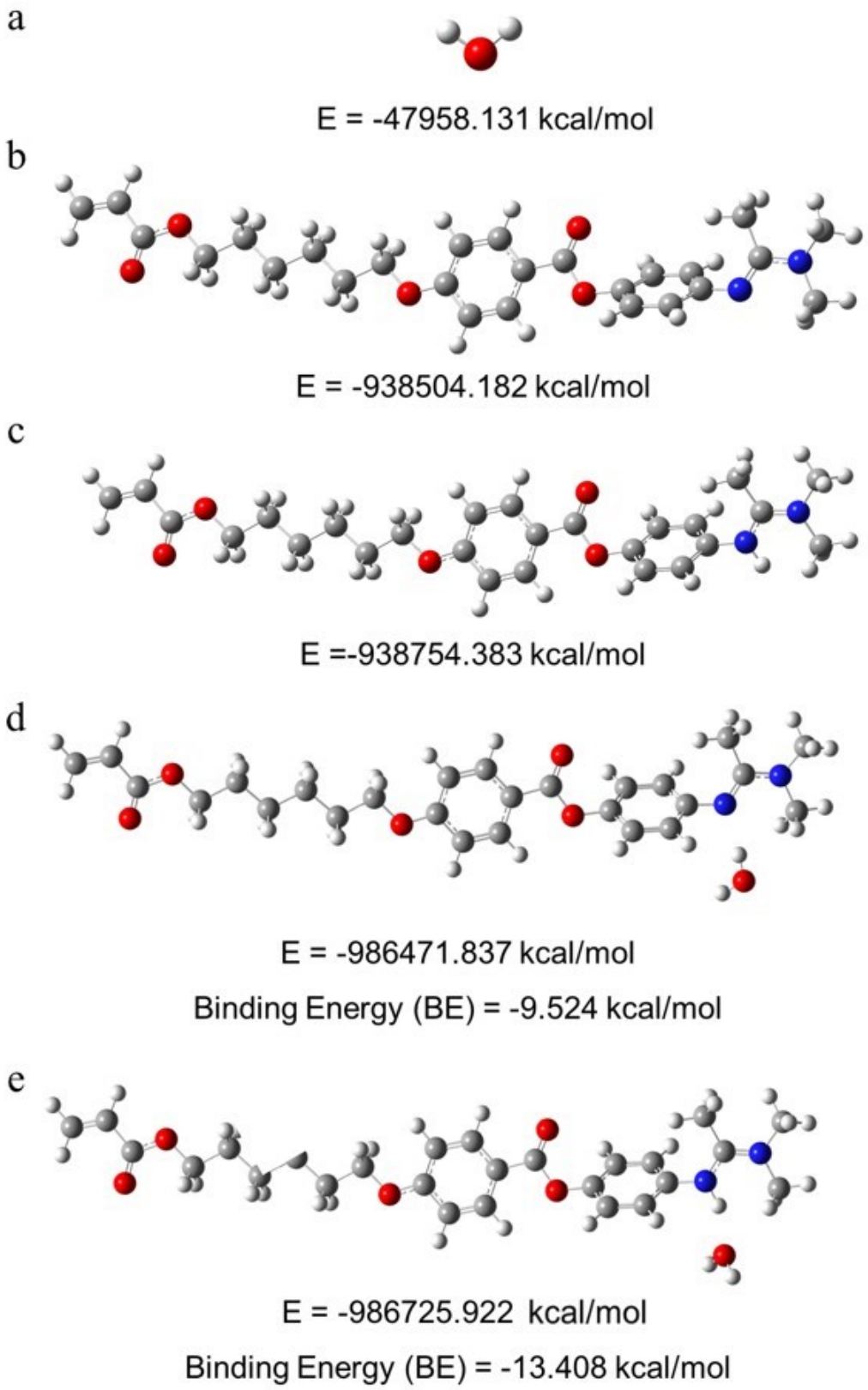


Figure S16. Stable structures of (A) H_2O, (B) C6AD, (C) C6AD_H^+, (D) C6AD and H_2O dimer, (E) C6AD_H^+ and H_2O dimer.

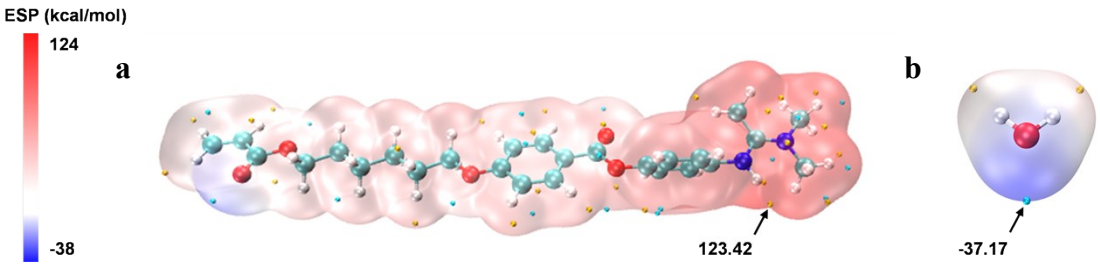


Figure S17. Electrostatic surface potential of (a) C6AD_H^+ and (b) H_2O.