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Supporting Information for Highly Solar Modulated and Robust PNIPAM/HEMC Smart Window

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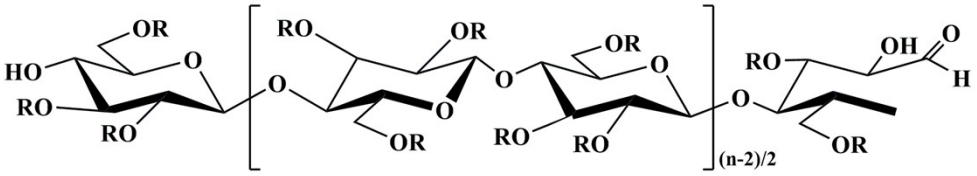
(a)



HEMC: R=H; $-CH_3$; $-[CH_2CH_2O]_nH$ or $-[CH_2CH_2O]_nCH_3$

(b)

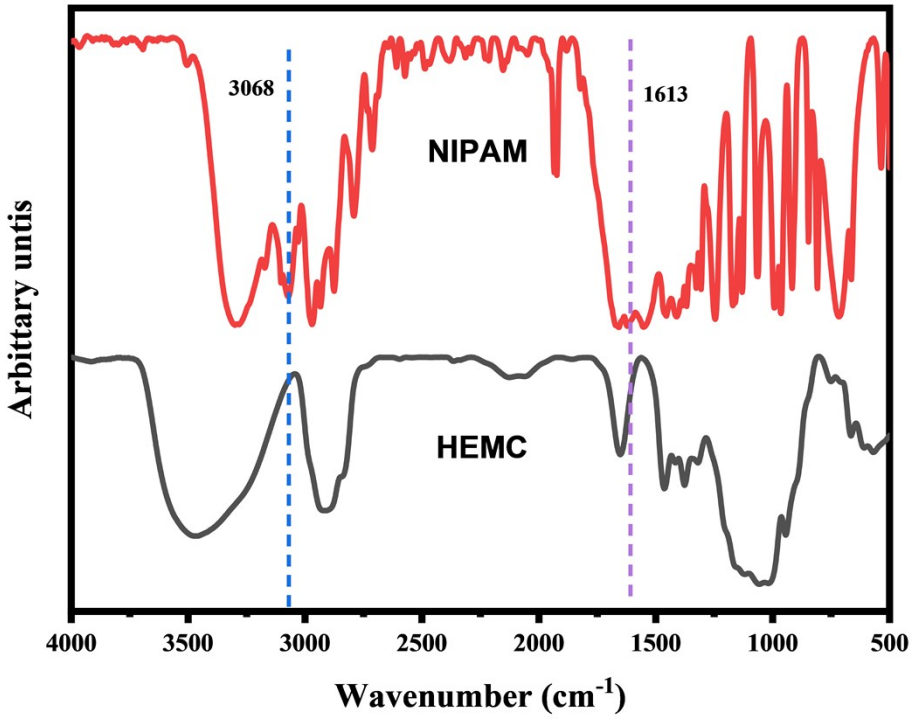


Figure S1. (a) Chemical structural formula of HEMC.[1] (b) Infrared spectra of HEMC and NIPAM.

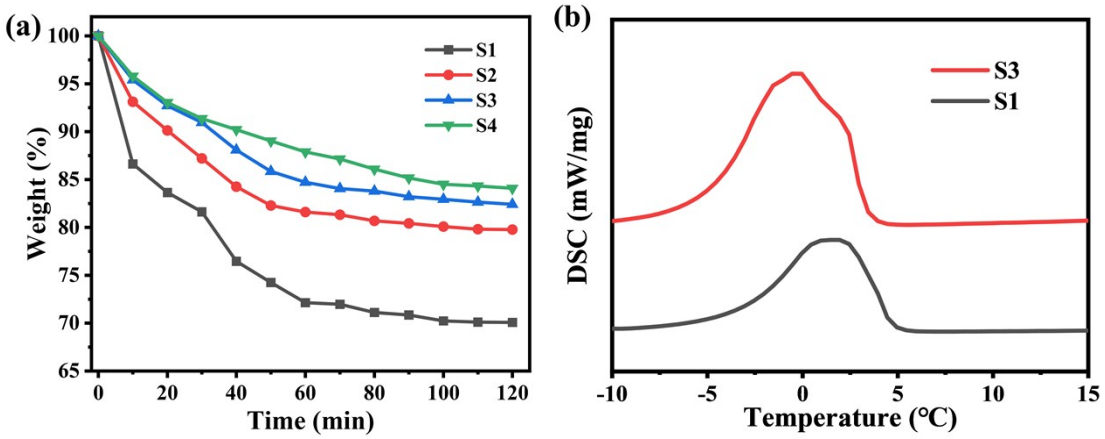


Figure S2. (a)Weight change of samples S1~S4 with intact sealing at 60 °C environment. (b) The low-temperature DSC test for samples S1 and S3.

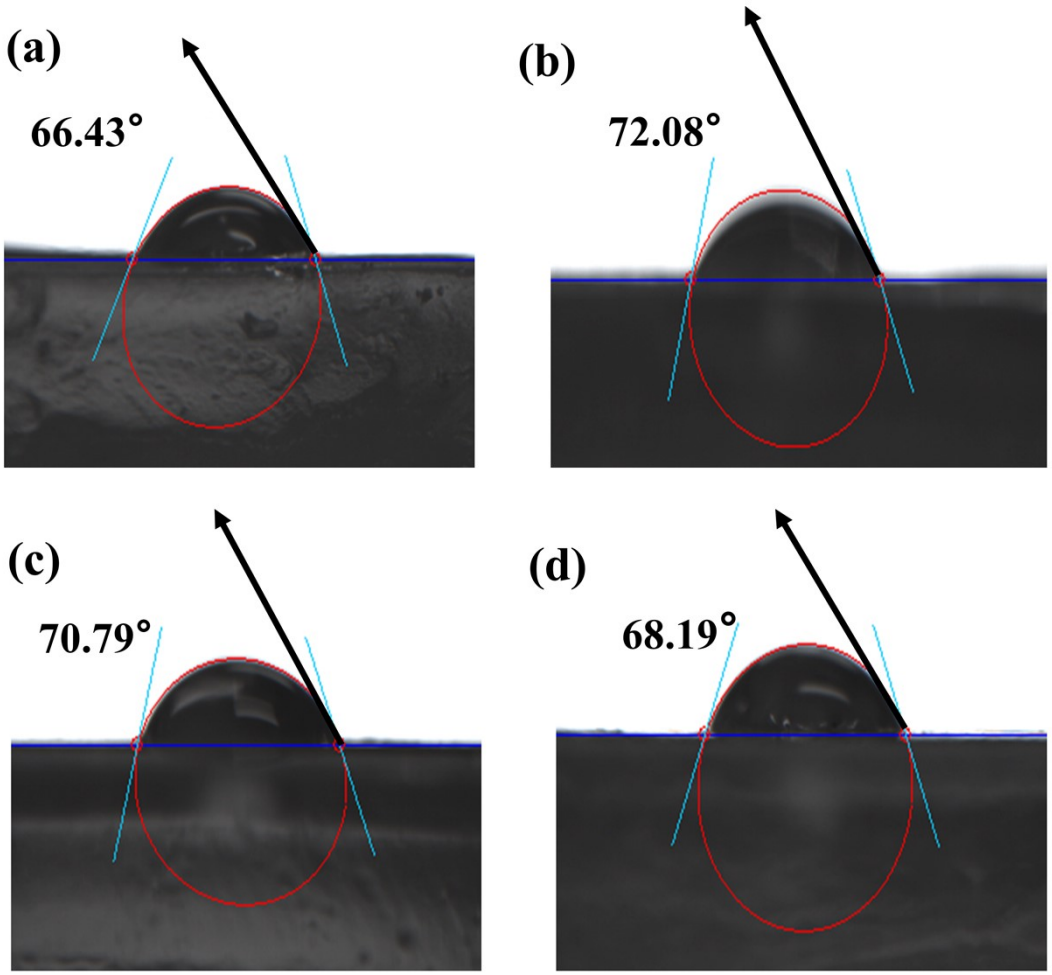


Fig. S3. (a) Water contact angle of S1. (b) Water contact angle of S2. (c) Water contact angle of S3. (d) Water contact angle of S4.

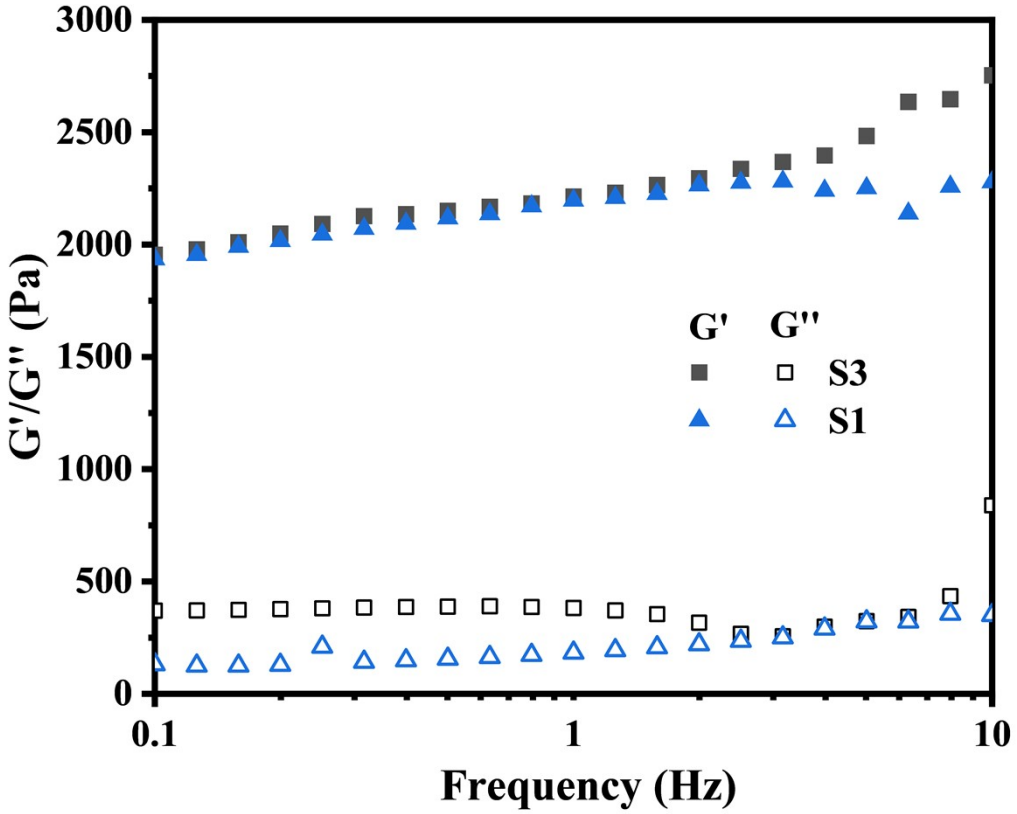


Figure S4. Frequency-sweeping rheological behavior of S1 and S3 system hydrogels.

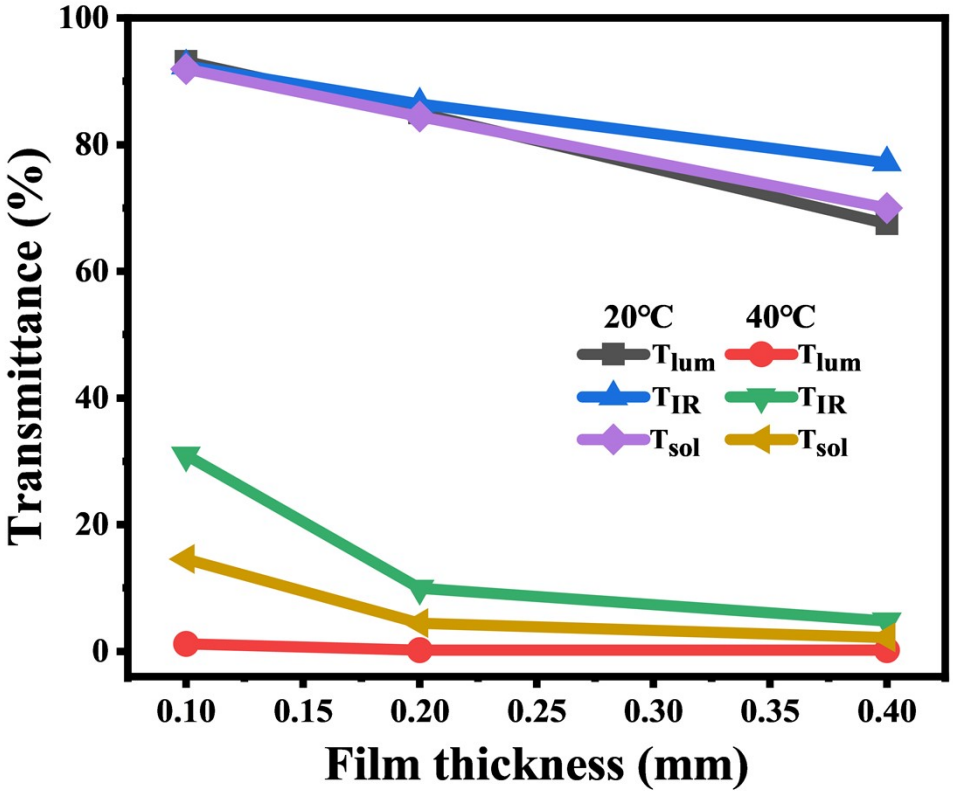


Fig. S5. Optical properties of hydrogels of different thicknesses.

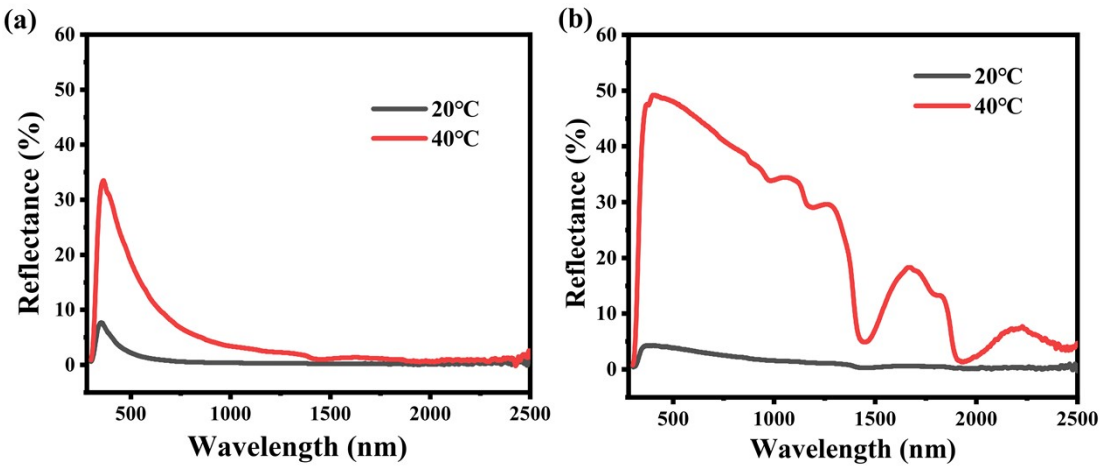


Figure. S6. (a) Reflectance spectra of S1 hydrogels at T<LCST and T>LCST. (b) Reflectance spectra of S3 hydrogels at T<LCST and T>LCST.

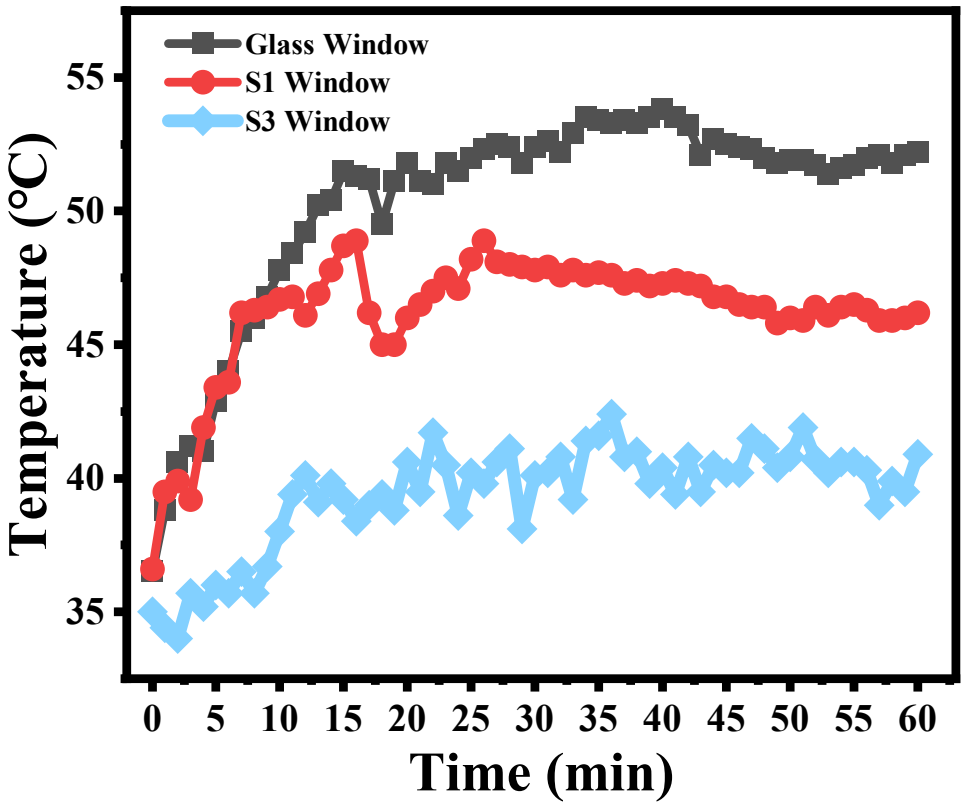


Figure. S7. Outdoor test result curve.

Table. S1. Substance content of S1-S4 hydrogel samples.

Sample	NIPAM (g))	MBA (g)	HEMC (g)	APS (g)	TEMED (μl)	Water (ml)
S1	**1**	**0.02**	**0**	**0.02**	**13**	**15**
S2	**1**	**0.02**	**0.03**	**0.02**	**13**	**15**
S3	**1**	**0.02**	**0.05**	**0.02**	**13**	**15**
S4	**1**	**0.02**	**0.07**	**0.02**	**13**	**15**

Table. S2. Thermochromic properties of S4 hydrogels of different thicknesses.

Thicknesses (mm)	T_{lum} (20℃)	Tl_{um} (40℃)	T_{sol} (20℃)	T_{sol} (40℃)	ΔT_{lum}	ΔT_{sol}	ΔT_{IR}
0.4	**67.49**	**0.2**	**69.98**	**2.16**	**67.29**	**67.82**	**72.38**
0.2	**85.02**	**0.21**	**84.43**	**4.44**	**84.81**	**79.99**	**76.48**
0.1	**93.11**	**1.2**	**91.93**	**14.52**	**91.91**	**77.41**	**61.51**

Table. S3. Optical properties of the same thickness of S1~S4.

Samples	T_{lum} (20℃)	T_{lum} (40℃)	T_{sol} (20℃)	T_{sol} (40℃)	ΔT_{lum}	ΔT_{sol}	ΔT_{IR}
S1	**86.03**	**56.95**	**85.07**	**62.28**	**29.08**	**22.79**	**10.69**
S2	**87.59**	**2.09**	**85.94**	**13.17**	**85.50**	**72.76**	**59.70**
S3	**84.98**	**0.66**	**84.37**	**9.40**	**84.32**	**74.97**	**66.17**
S4	**85.02**	**0.21**	**84.43**	**4.44**	**84.81**	**79.99**	**76.48**

1. K. Liu, K. Fang, W. Chen, C. Zhang, L. Sun and J. Zhu, *Int. J. Biol. Macromol.*, 2023, **224**, 1252-1265.