

Support information for

Bidirectional optical response hydrogel with adjustable human comfort temperature for smart windows

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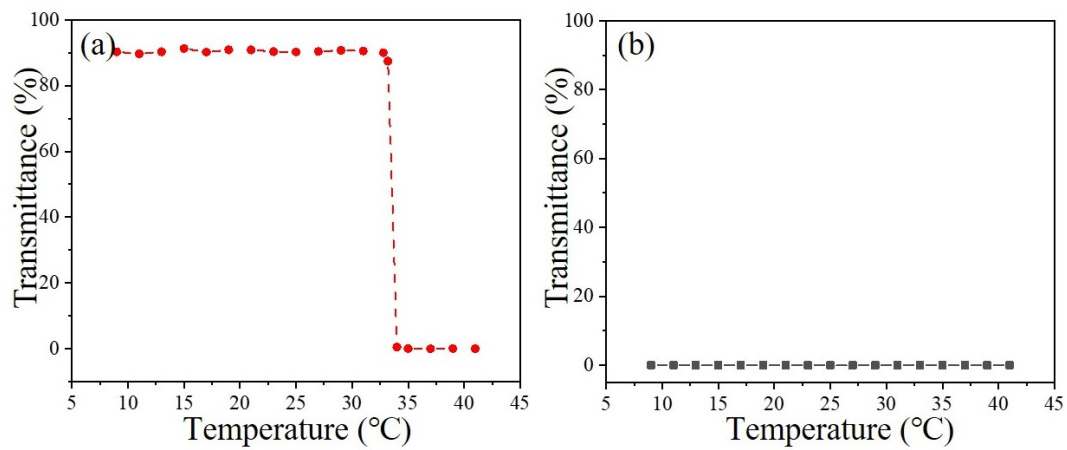


Fig. S1 The effects of temperature on the transmittance of (a) PNIPAM and (b) SDS/PTH micelles at 550 nm.

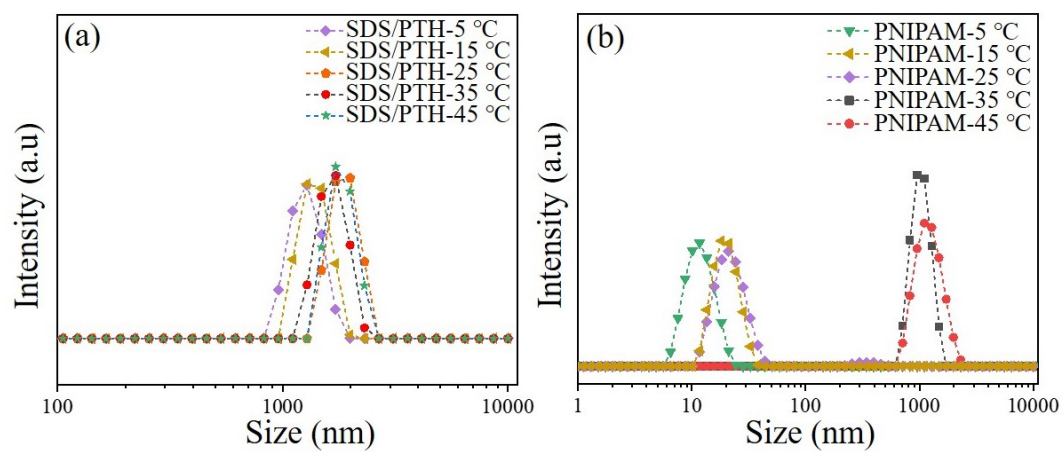


Fig. S2 The particle size distribution of (a) SDS/PTH micelles and (b) PNIPAM at different temperatures.

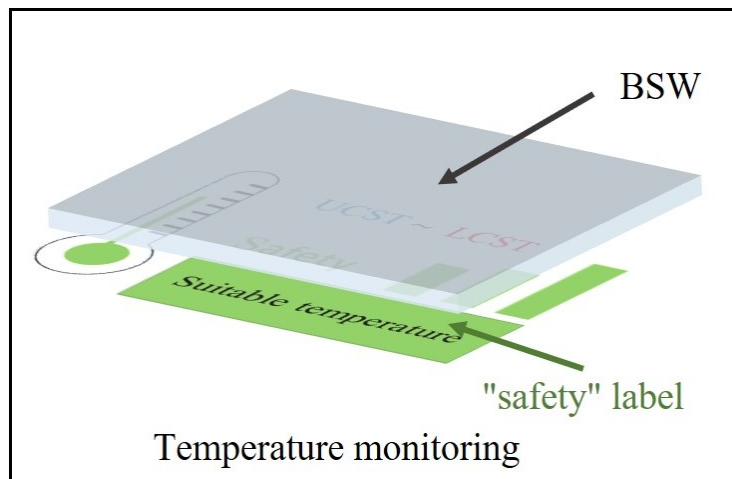


Fig. S3 Schematic diagram of the smart temperature monitoring device based on BSW.

Table S1 Summary of composite hydrogels BSW under different conditions.

Runs	SDS (g)	PTH (g)	AlCl ₃ ·6H ₂ O (g)	NIPAM (g)	APS (g)	TEMEDA (μL)	DI water (mL)
1	0.6	1.125	2.25	0.75	0.08	20	60
2	0.6	1.5	2.25	0.75	0.08	20	60
3	0.6	2.25	2.25	0.75	0.08	20	60
4	0.6	3.0	2.25	0.75	0.08	20	60
5	0.6	3.75	2.25	0.75	0.08	20	60
6	0.6	4.5	2.25	0.75	0.08	20	60
7	1.2	1.5	2.25	0.75	0.08	20	60
8	1.8	1.5	2.25	0.75	0.08	20	60
9	2.4	1.5	2.25	0.75	0.08	20	60
10	3.0	1.5	2.25	0.75	0.08	20	60
11	3.6	1.5	2.25	0.75	0.08	20	60
12	4.2	1.5	2.25	0.75	0.08	20	60

Table S2 Performance Comparison of BSW and Other Thermochromic Smart Window Materials

Materials	Bidirectional optical response	UCST (°C)	LCST (°C)	T _{lum} (%)	Δ T _{lum} (%)	Δ T _{sol} (%)	Irradiation times	Temperature amplification (°C)	Ref.
PNIPAM/ ethanol	No	/	28-32	89.83	88.45	71.81	500 s	14.5	1
PNIPAM	No	/	30	55	54	58	40 min	14	2
PNIPAM/HPMC	No	/	32	90.82	90.72	81.52	300 s	16.3	3
pNIPAm/AgNW	No	/	31	78.3	70	58.4	40 min	6	4
pNIPAm/AEMA	No	/	32	87.2	/	81.3	30 min	4.9	5
VO ₂ /TTWF	No	/	47.6	50.5	/	3.4	45 min	33.9	6
VO ₂ /WO ₃	No	/	61.5	30.1	/	10.2	/	/	7
VO ₂ /ZnO	No	/	/	55.71	/	17.8	/	/	8
HPC/PAM	No	/	43.2	/	86	80.5	60 min	10	9
HPC/PVA	No	/	50	91.3	21.8	19.4	/	/	10
Hydrogel	No	20-50	/	99.05	/	33.42	60 min	6.1	11
TRSWs	Yes	8-75	/	92	42 and 62	12.07	/	/	12
PVA- PNIPAM/Li _m Cs _n WO ₃	Yes	-10	32	67.48	50.72	/	700 s	40	13
BSW	Yes	9.5 -25.5	25.5-50	91.31	90.95 and 91.21	76.34 and 76.75	200 s	23.2	Our work

Note: ‘/’ means not mentioned.

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