Supping Information

Lightweight, Elastic and Conductive Pure PEDOT:PSS Foam for Dual-Mode Sensing

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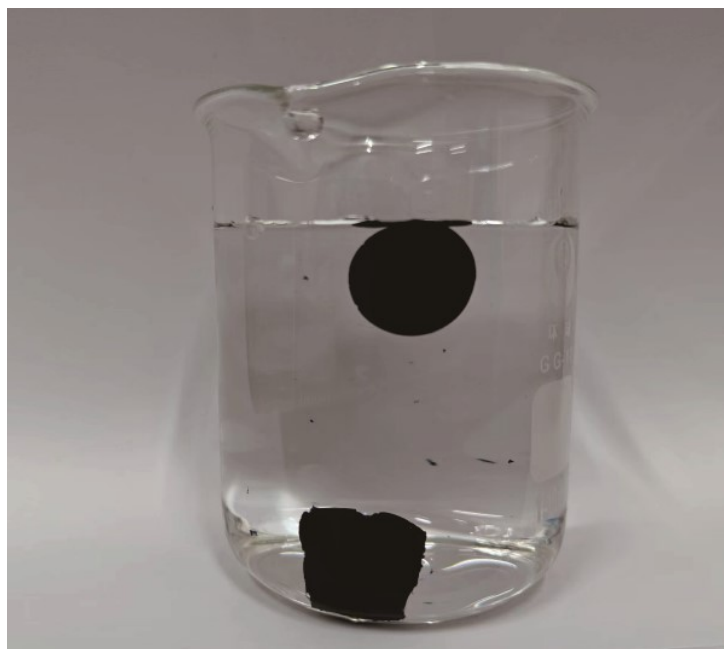
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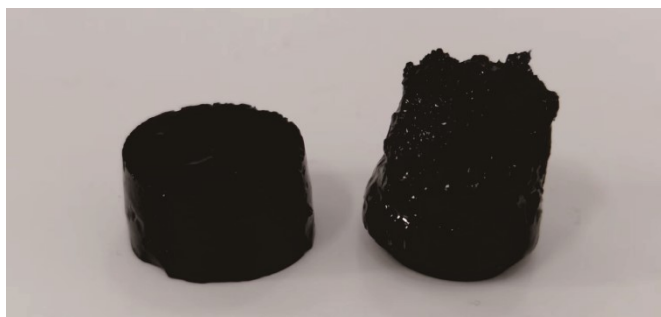**Fig. S1.** The state of foam and non-foam PEDOT:PSS hydrogels in water.

Fig. S2. Normal foamed PEDOT:PSS hydrogel (left) and over-foamed PEDOT:PSS hydrogel (right).
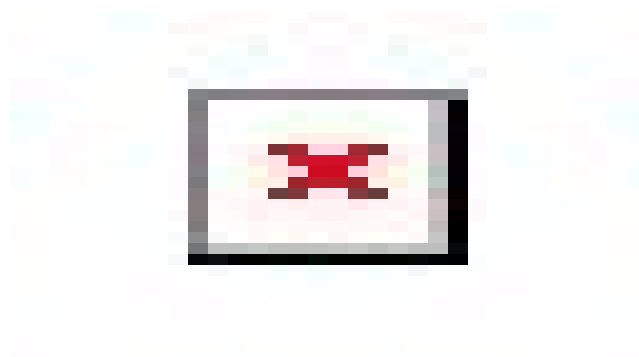

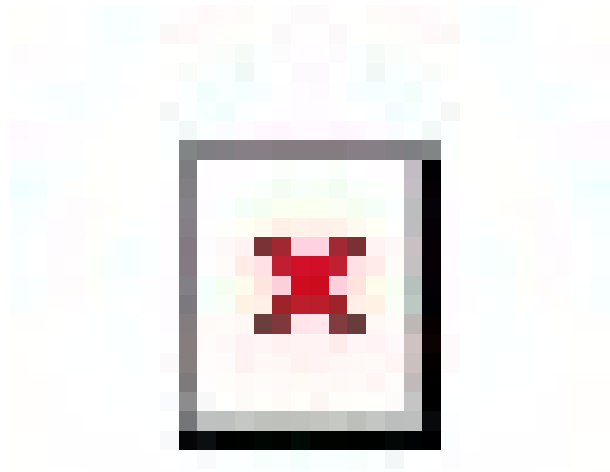**Fig.S3.** SBLPP foam on the setose asparagus.

Fig.S4. Photograph of (a) SBPP foam, (b) BLPP foam, (c) SLPP foam, (d) SBLPP foam.
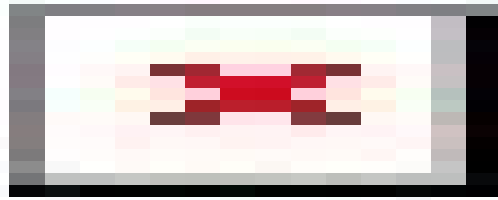

Fig. S5. SEM images of the axial cross-sections of (a) SLPP foam and (b) SBLPP foam.
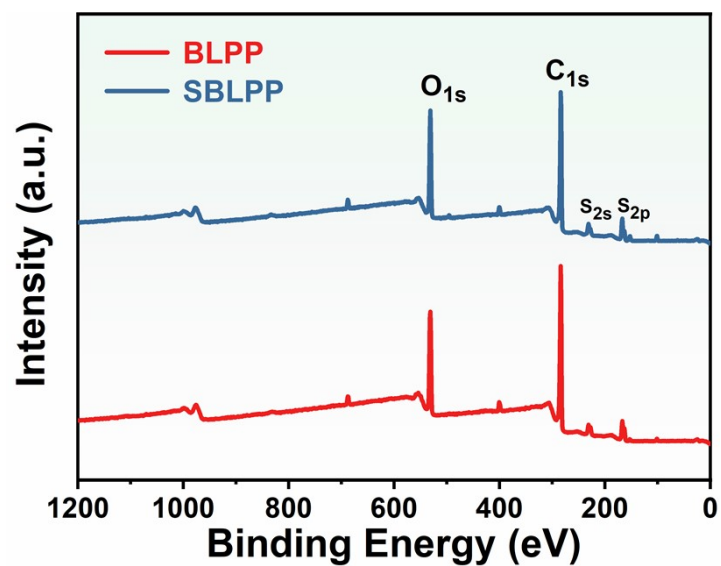
Fig. S6. XPS spectra of BLPP and SBLPP foams.

Fig. S7. Photographs of the loading-unloading process of the SBPP foam

Fig. S8. Photographs of the loading-unloading process of the BLPP foam
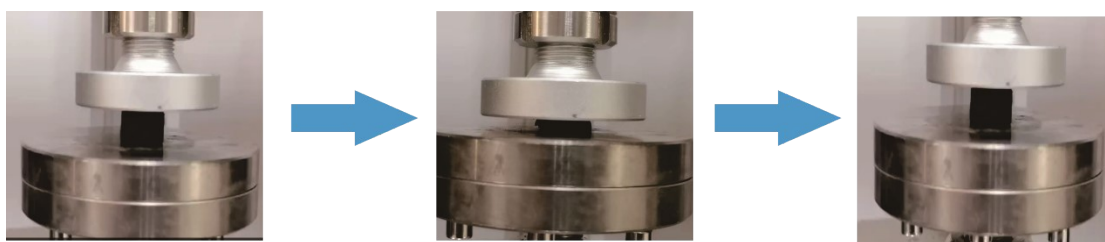

Fig. S9. Photographs of the loading-unloading process of the SBLPP foam
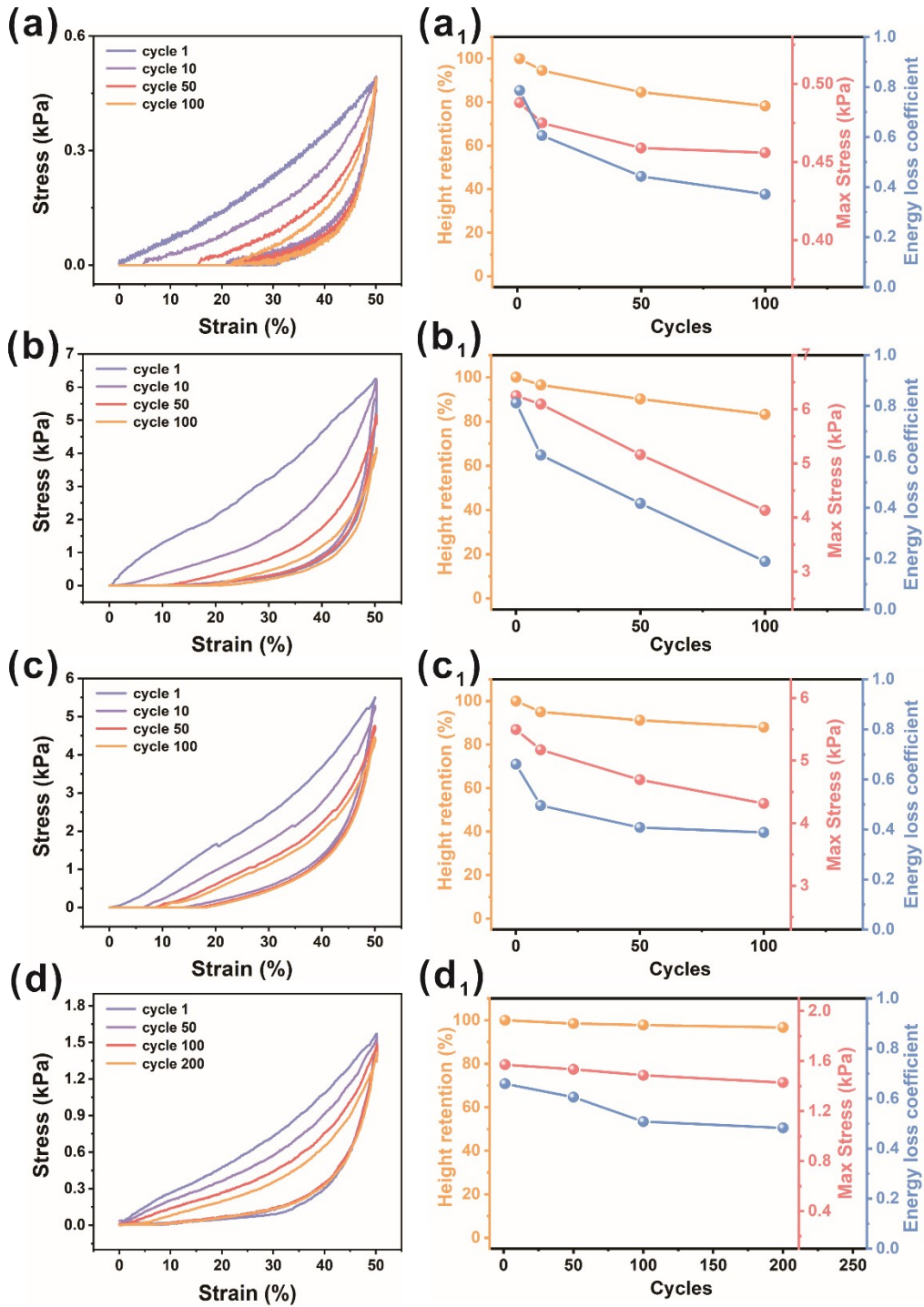
Fig. S10. Cyclic compressive stress-strain curves, height retention, maximum stress and energy loss coefficient of (a, a_1) SBPP foam, (b, b_1) BLPP foam, (c, c_1) SLPP foam, (d, d_1) SBLPP foam.

Table S1. Comparison of foam porosity

Sample	Porosity (%)
BLPP foam	98.3
SBPP foam	98.6
SLPP foam	99
SBLPP foam	99.25

Table S2. Comparison of the sensing performance of SBLPP sensor with previously reported pressure sensors.

Pressure sensor	Sensitivity (kPa^{-1})	Sensing range (kPa)	Reference
SBLPP	**171.23**	**3.5**	**This work**
PEDOT:PSS/PDMS	85	10	[1]
PEDOT:PSS/CNF	5	1	[2]
AgNW/PEDOT:PSS/PI	31	2.75	[3]
PEDOT:PSS/CNT@melamine	3.35	100	[4]
PDMS@MWCNTS/PP	16.6	35	[5]
PEDOT/PSS/CNF	0.015	97	[6]
PEDOT:PSS/NFC	190	0.3	[7]

CNT/PEDOT:PSS/NFC	4.48	4	[8]
PEDOT:PSS/CNT	1.97	100	[9]
PEDOT:PSS/CNT	25.7	20	[10]
MXene/PEDOT:PSS	26.65	11	[11]
PEDOT:PSS/PI	5.4	16	[12]
SEBS/PEDOT:PSS/melamine	6.4	30	[13]

PDMS: polydimethylsiloxane; PEDOT:PSS: poly (3,4-ethylenedioxythiophene):poly (styrenesulfonate); CNT: Carbon nanotube; MWCNT: multi-walled carbon nanotube; CNF: Cellulose nanofibers; PI: polyimide; NFC: carboxymethylated.

Table S3 Properties of PEDOT:PSS foams prepared by different processes

Structure	Method	Matrix	Filler	Conductivity (S/m)	Density (mg/cm^3)	Porosity (%)	Max Stress (kPa)	Seebeck factor (μV/k)	Ref.
Foam	**SA+DFD**	**PEDOT:PSS**	**-**	**0.06**	**7.2**	**99.25**	**1.68**	**18.7**	**This work**
	SCD	PEDOT:PSS	-	0.1	138	98.87	/	/	[14]
	SCD	PEDOT:PSS	-	235	33.6	97.5	/	13	[15]
	SCD	PEDOT:PSS	MWCNTs	2.5	54	94.5	/	/	[16]

DFD	PEDOT:PSS	PI	3.5	/	/	1.85	/	[3]
FD	PEDOT:PSS	CNF	2.12×10^{-4}	18	/	14	/	[2]
DFD	PEDOT:PSS	PDMS	0.04	/	0	100	/	[17]
FD	PEDOT:PSS	-	0.001	1225	89.2	/	/	[18]
DFD	PEDOT:PSS	-	0.11	/	95	3.18	/	[1]
FD	PEDOT:PSS	-	3	/	/	/	10	[19]
FD	PEDOT:PSS	-	2.2	/	/	/	/	[20]
FD	PEDOT:PSS	MWCNTs	571	121.5	80	/	/	[21]
FD	PEDOT:PSS	PDMS	6	/	0	1.2	/	[22]
FD	PEDOT:PSS	NFC	500	10.8	/	/	20	[23]

SA: self-assembly; SCD: supercritical CO_2 drying; DFD: Directional freeze drying; FD: Freeze drying; PI: polyimide; CNF: Cellulose nanofibers; NFC: carboxymethylated; PDMS: polydimethylsiloxane; /: Does not have this functionality or not tested.

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