Supplementary information

Highly linear wearable ionic gel based on self-assembled discoid liquid crystal for human motion monitoring

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This supporting file includes:

Table S1 Composition ratio of as-prepared MBTA-TBC.

Sample	MBTA (mmol)	TBC (mmol)	BP (wt.%)
TBC	**0**	**0.8**	**5**
$MBTA_{0.01}$-TBC	**0.01**	**0.8**	**5**
$MBTA_{0.1}$-TBC	**0.1**	**0.8**	**5**
$MBTA_{0.2}$-TBC	**0.2**	**0.8**	**5**
$MBTA_{0.3}$-TBC	**0.3**	**0.8**	**5**

Table S2 Comparison of gauge factor and linearity at 80% tensile strain of this work with previously reported ionic resistive-type strain sensors.

Sample	Linearity	GF	Ref
TA@HAP NWs-PVA(W/EG)	0.99003	2.84	[1]
PAA/PANI	0.9986	0.6	[2]
Agarose/PHEA DN Ionogel	0.996	1.1	[3]
PAA/([BMIM]TfO)	0.997	1.95	[4]
PEG/CB/SWNT/SR	0.992	2.0	[5]
PVA/PAAm/XG-Zn^{2+} hydrogels	0.992	1.3	[6]
Cellulose ionic hydrogels	0.963	0.3	[7]
PDMA-RSF ionic conductive gel	0.981	0.65	[8]
$MBTA_{0.2}$-TBC	0.9995	1.29	This work

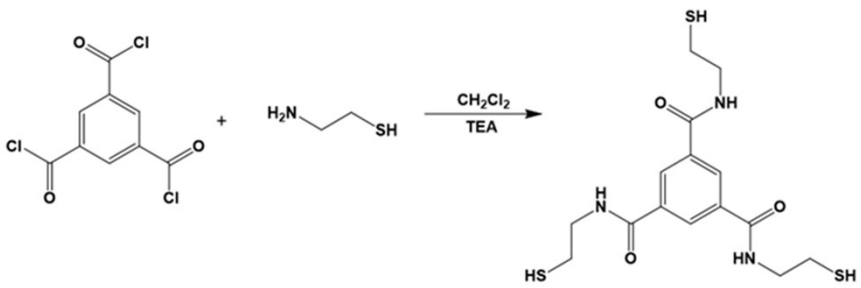

Fig. S1 Synthesis process of MBTA.

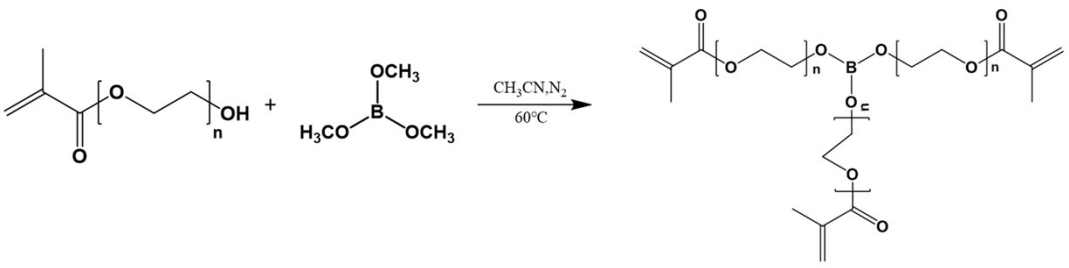

Fig. S2 Synthesis process of TBC.

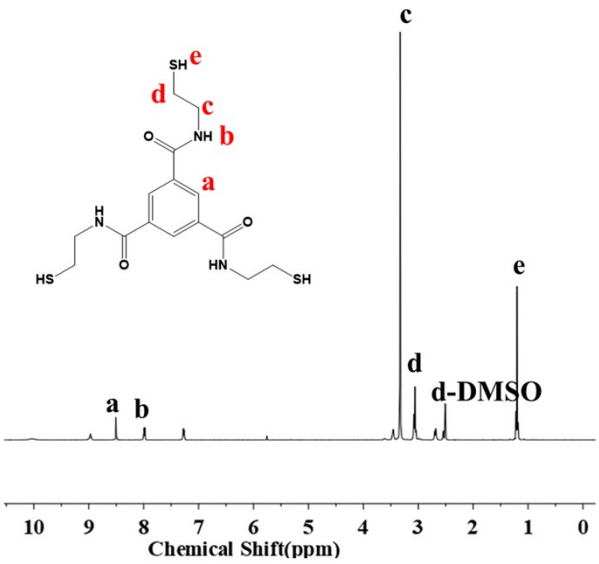

Fig. S3 ^{29}H NMR spectrum of MBTA.

1H NMR (400 M, DMSO): δ =8.55 (1H, CH), δ =8.05 (1H, NH), δ =3.45 (2H, CH_2), δ =3.12 (2H, CH_2), δ =1.34 (1H, SH).

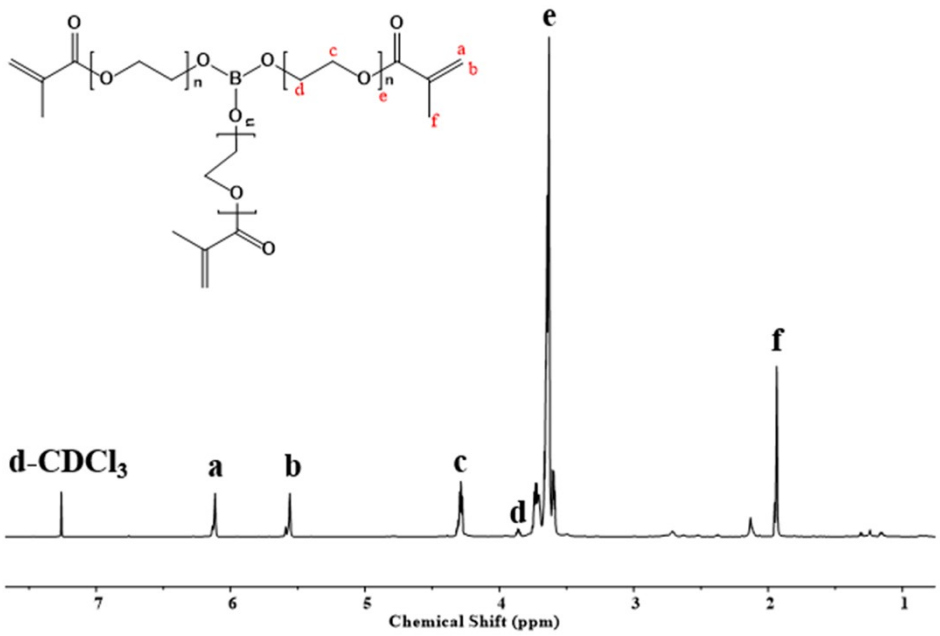

Fig. S4 [29]H NMR spectrum of TBC.

1H NMR (400 M, DMSO): δ =6.04 (1H, -(CH_3)C=CH_2), 5.69(1H, -(CH_3)C=CH_2), 4.21 (2H, -CH_2-O-C(O)), 3.67-3.63 (H_2, -CH_2-O-B), 3.57-3.45 (4H, -CH_2-CH_2-O), 1.89 (3H, -CH_3).

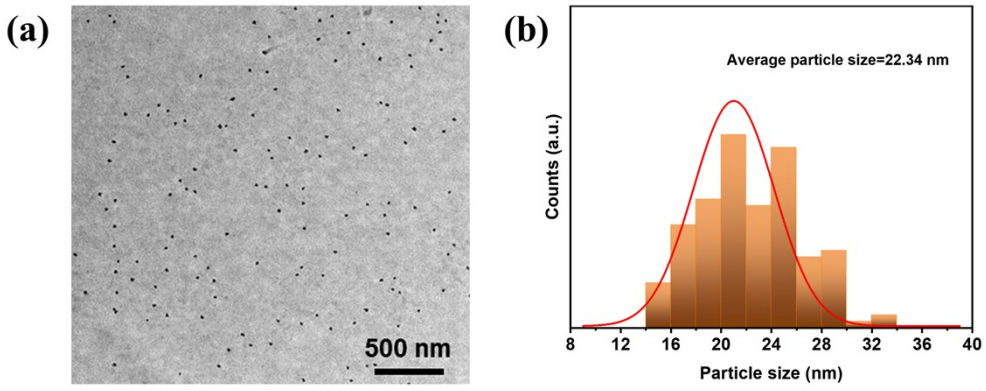

Fig. S5 (a) TEM image of MBTA (b) Schematic diagram of particle size distribution of MBTA crystals.

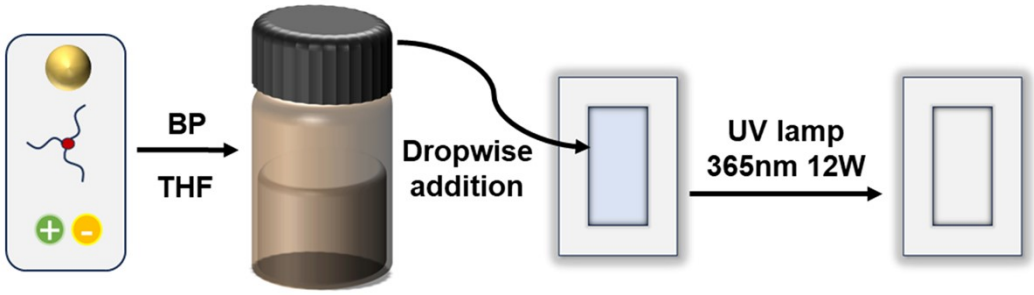

Fig. S6 Schematic diagram of preparation process of MBTA-TBC ionic gel membrane.

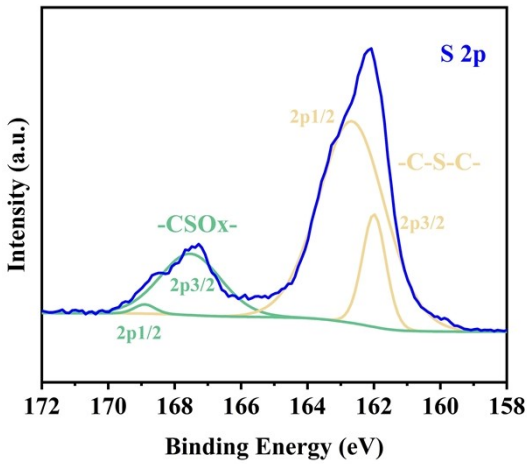

Fig. S7 XPS spectra of S 2p in $MBTA_{0.2}$-TBC ionic gel.

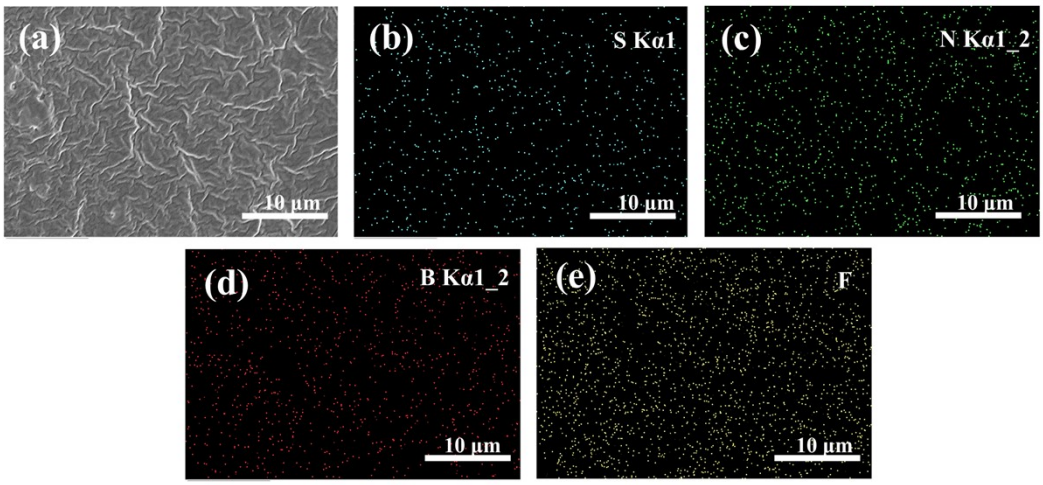

Fig. S8 SEM and EDS images of $MBTA_{0.2}$-TBC ionic gel membrane.

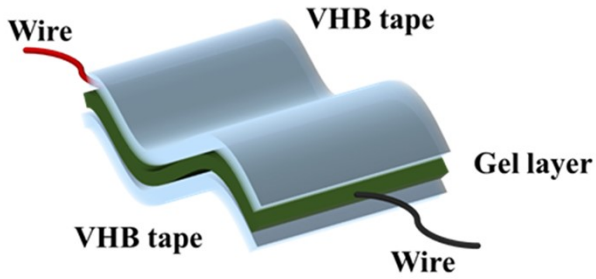

Fig. S9 Structure diagram of MBTA-TBC ionic gel flexible strain sensor.

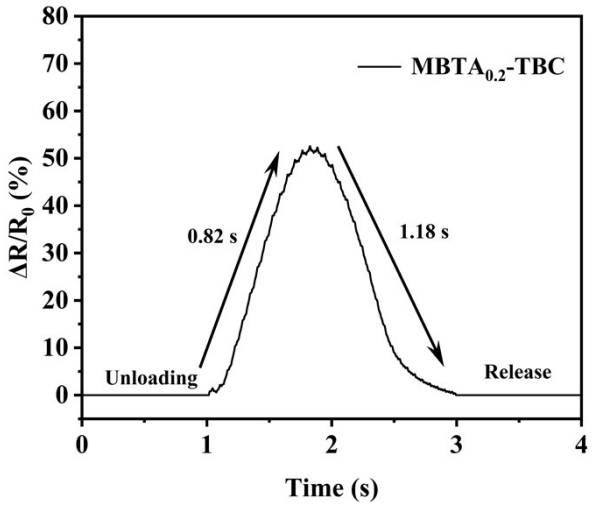

Fig. S10 Response time of $MBTA_{0.2}$-TBC ionic gel.

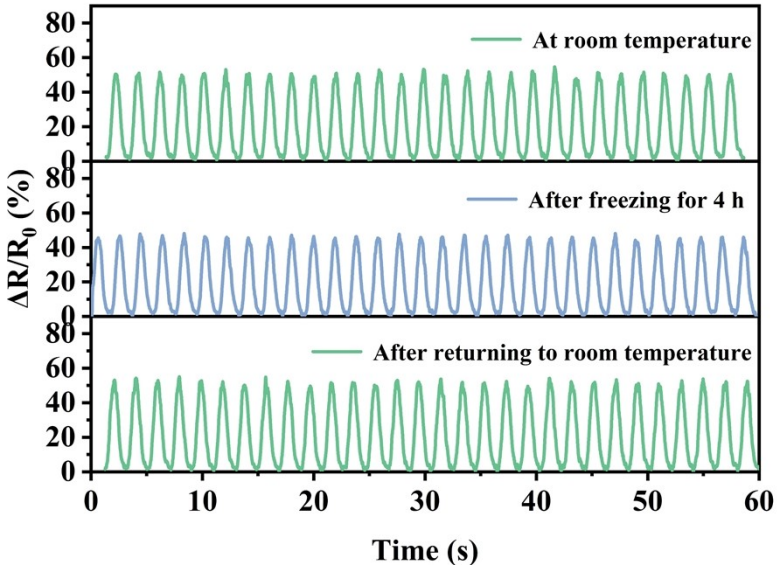

Fig. S11 Freeze resistance of $MBTA_{0.2}$-TBC ionic gel.

References

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