

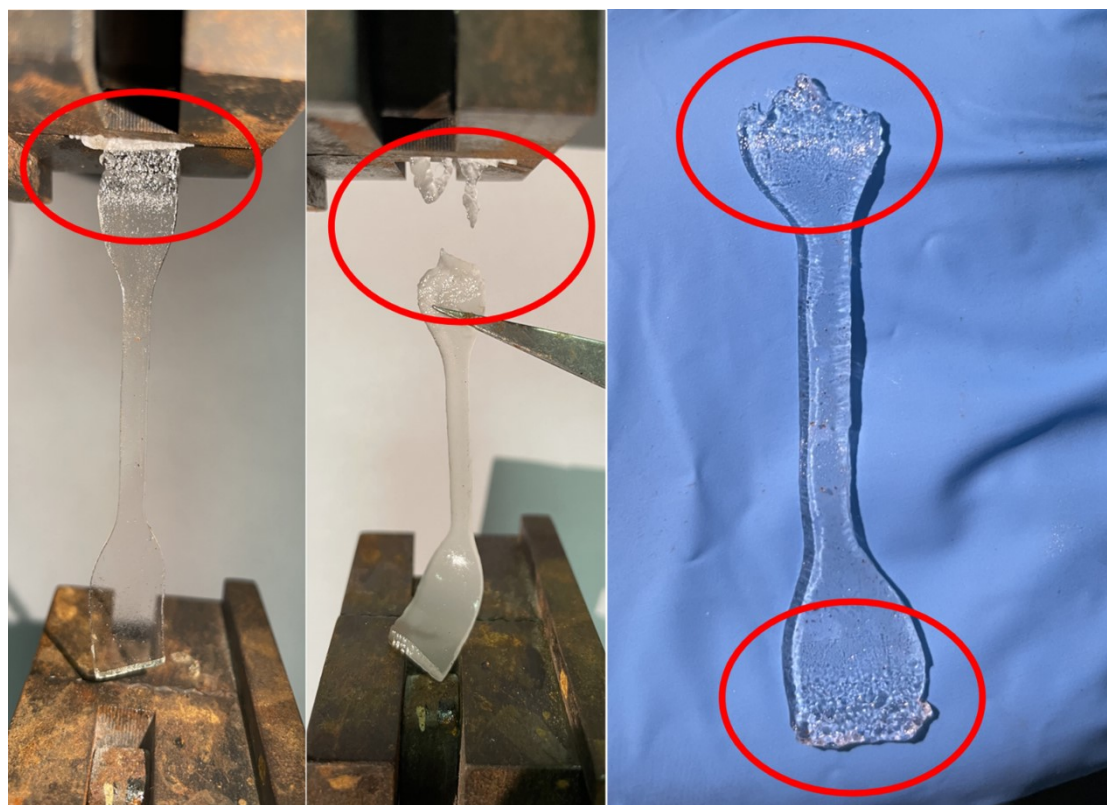
## Support information

# Preparation of PVA/Cellulose composite hydrogel electrolytes based on Zinc chloride-dissolved cellulose for flexible solid-state capacitors

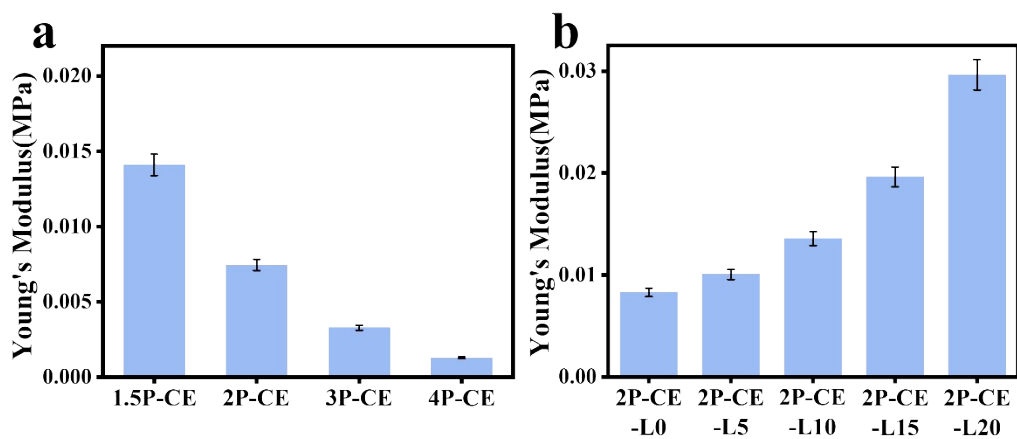
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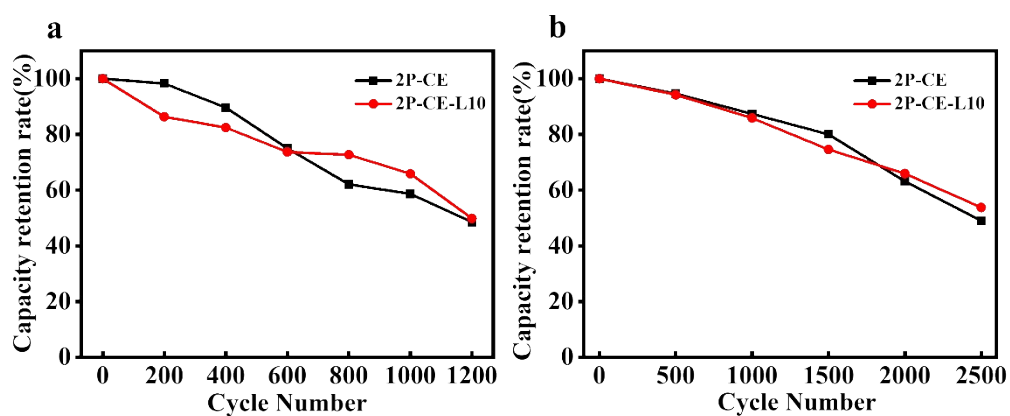
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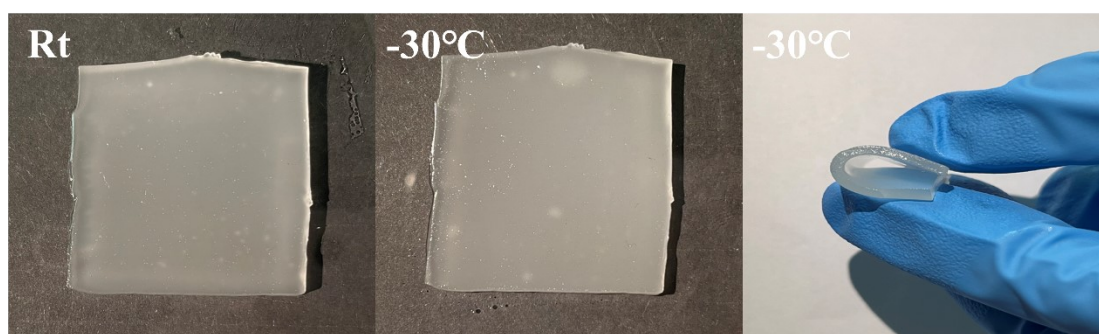
**Figure S1** Photos of pure cellulose hydrogel being clamped by a fixture.



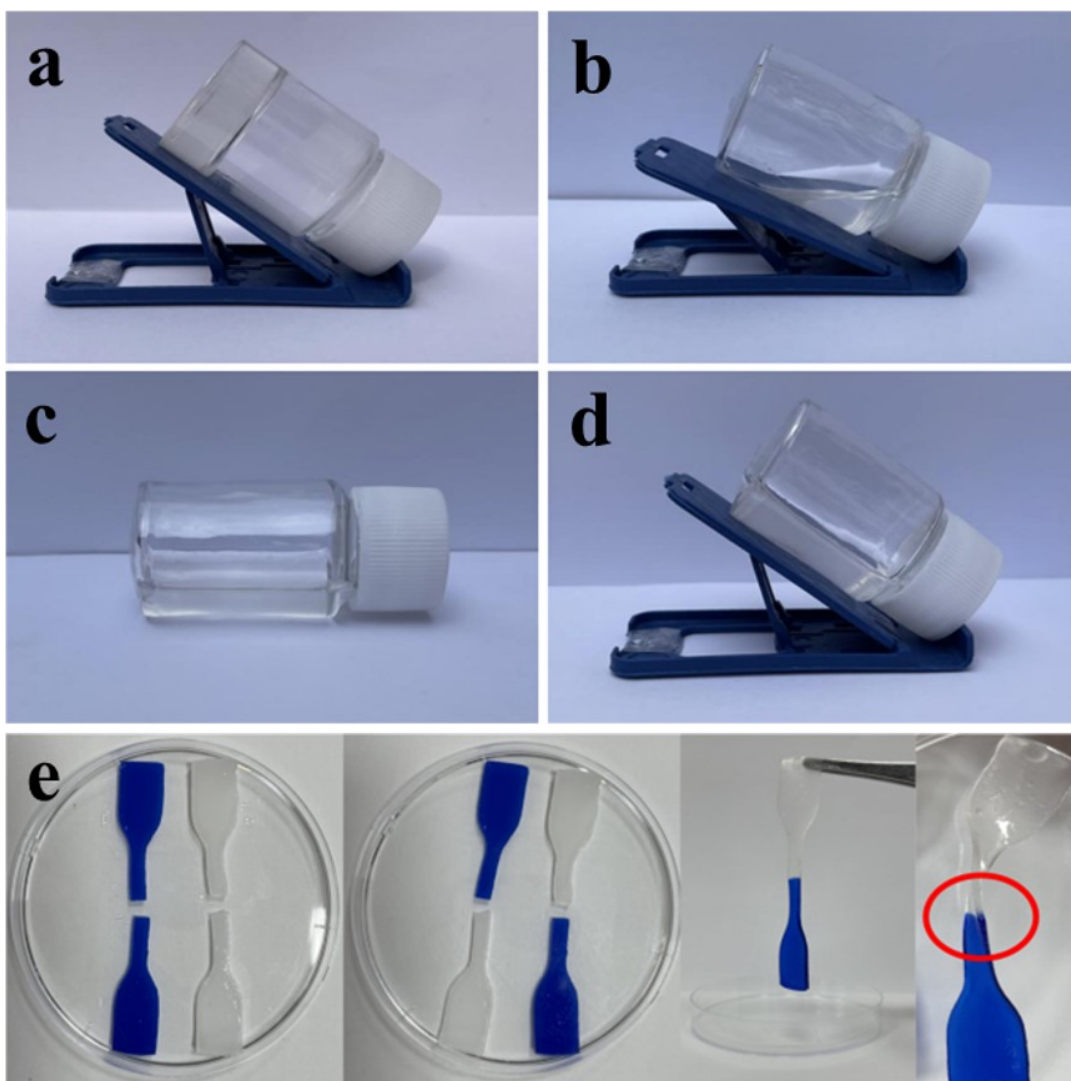
**Figure S2** a: Young's modulus of PVA/cellulose composite hydrogels; b: young's modulus of PVA/cellulose/LiCl composite hydrogels.



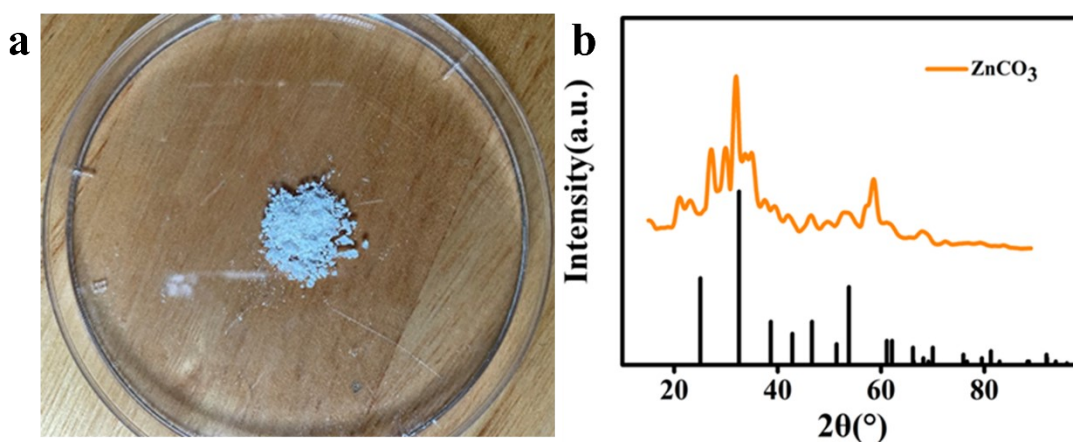
**Figure S3** a: Capacitance retention rate in cycling of the carbon symmetric capacitors assembled with different hydrogel electrolytes; b: Capacitance retention rate in cycling of the zinc/carbon asymmetric capacitors assembled with different hydrogel electrolytes.



**Figure S4** Hydrogel frost resistance and flexibility at low temperature display.



**Figure S5** a-d: Hydrogel electrolyte thermoplastic display; e Hydrogel electrolyte self-healing display.



**Figure S6** a: Recycled zinc carbonate picture; b: XRD pattern of zinc carbonate.

**Table S1** : Formulation of PVA/cellulose hydrogel

Sample	ZCE	1P-CE	1.5P-CE	2P-CE	3P-CE	4P-CE
PVA:Cellulos e	0:1	1:1	1.5:1	2:1	3:1	4:1

**Table S2** : Electrolyte composition in hydrogel electrolytes

Sample	2P-CE-L0	2P-CE-L5	2P-CE-L10	2P-CE-L15	2P-CE-L20
Electrolyte solution	20wt% CaCl <sub>2</sub>	20wt% CaCl <sub>2</sub> 5wt% LiCl	20wt% CaCl <sub>2</sub> 10wt% LiCl	20wt% CaCl <sub>2</sub> 15wt% LiCl	20wt% CaCl <sub>2</sub> 20wt% LiCl