

Supporting Information

Unlimited Recyclable Wearable Sensors Based on Ionic Liquid and Polyvinyl Alcohol Network

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Keywords: Recyclable, ionic conductive, wearable sensors

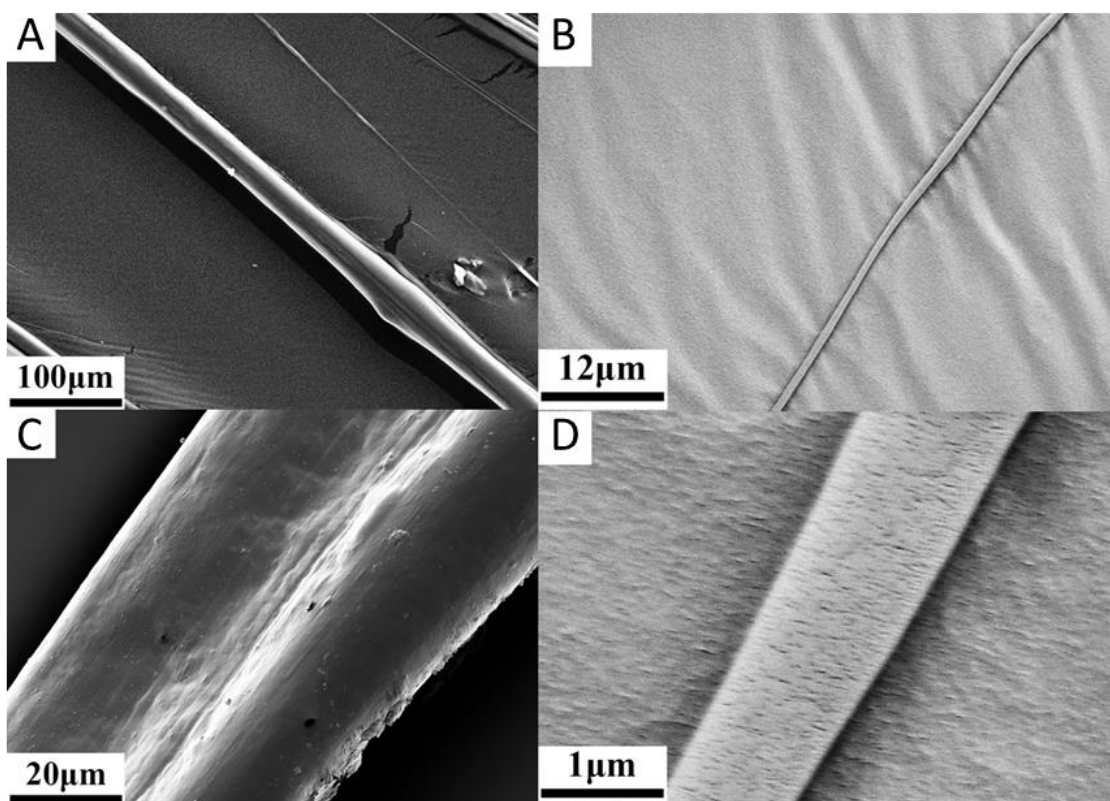


Figure S1. SEM images of PVA/Br-IL fibres at different magnifications.

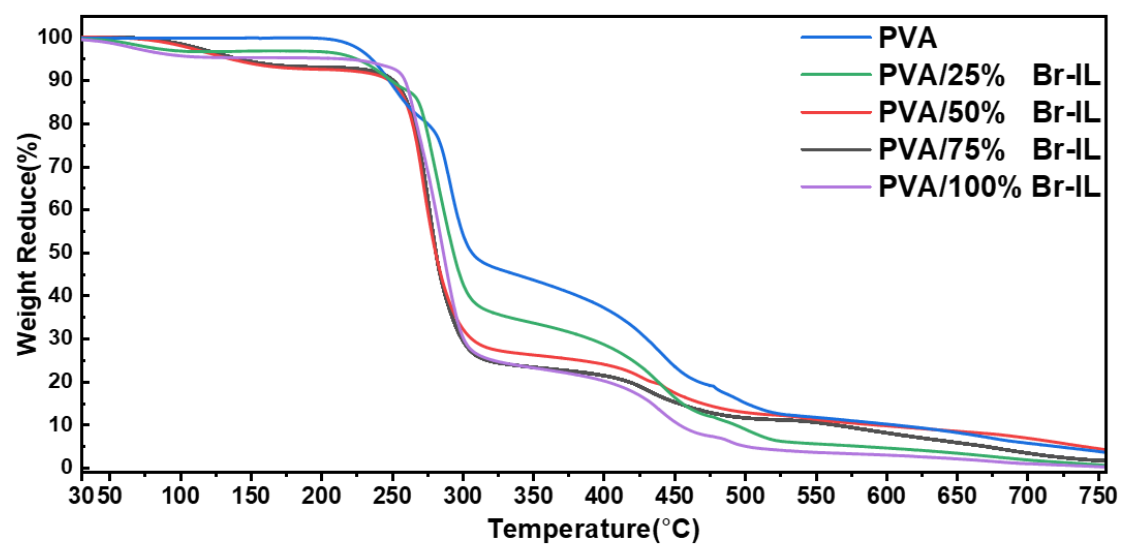


Figure S2. TGA measurements on pure PVA films and PVA films modified by different concentrations of Br-IL.

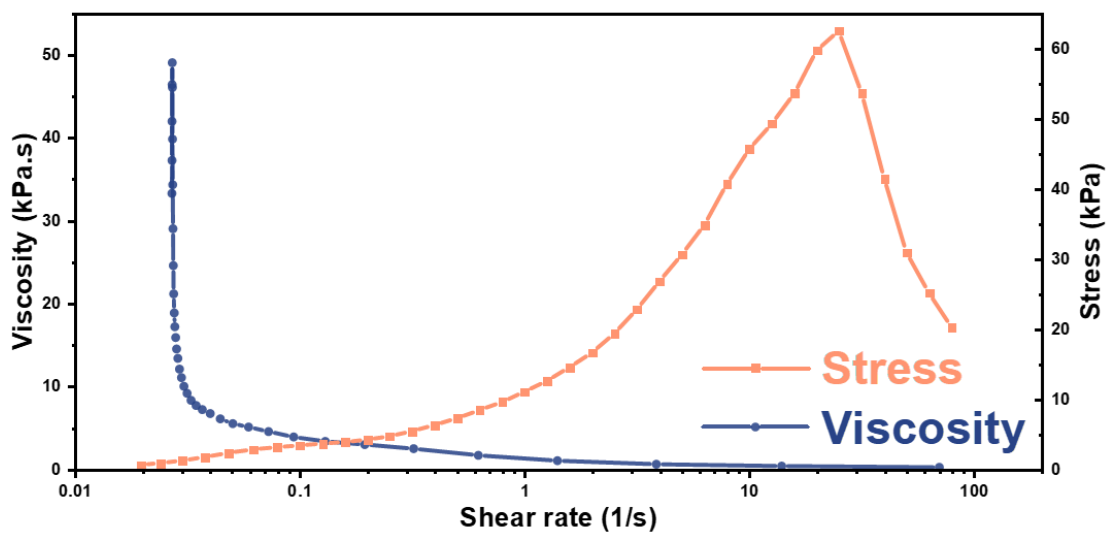


Figure S3. Rheology measurement on PVA/100% Br-IL film.

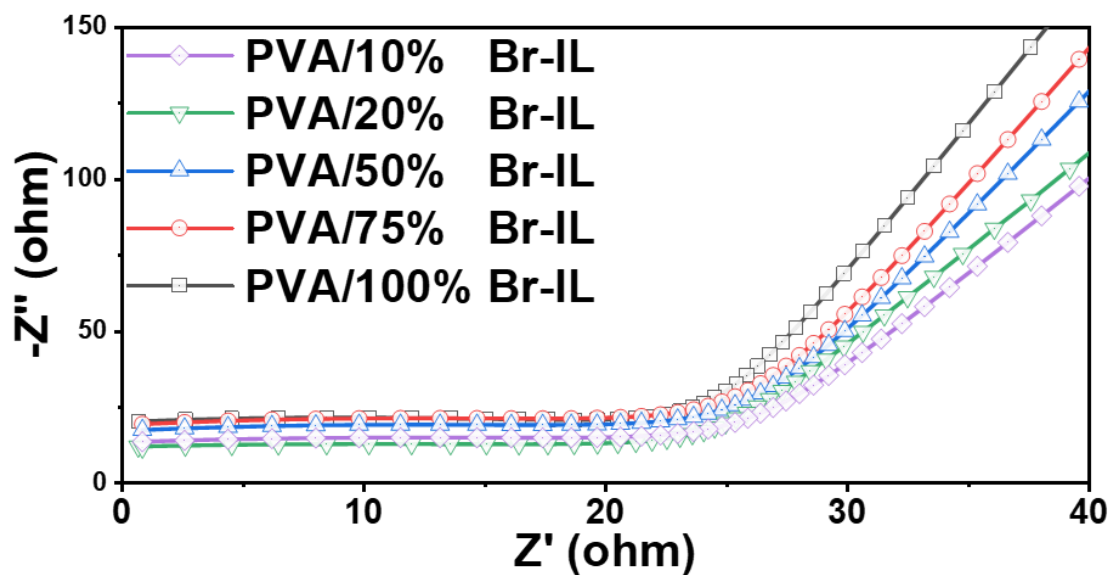


Figure S4. Impedance analyses on PVA films modified by different concentrations of Br-IL.

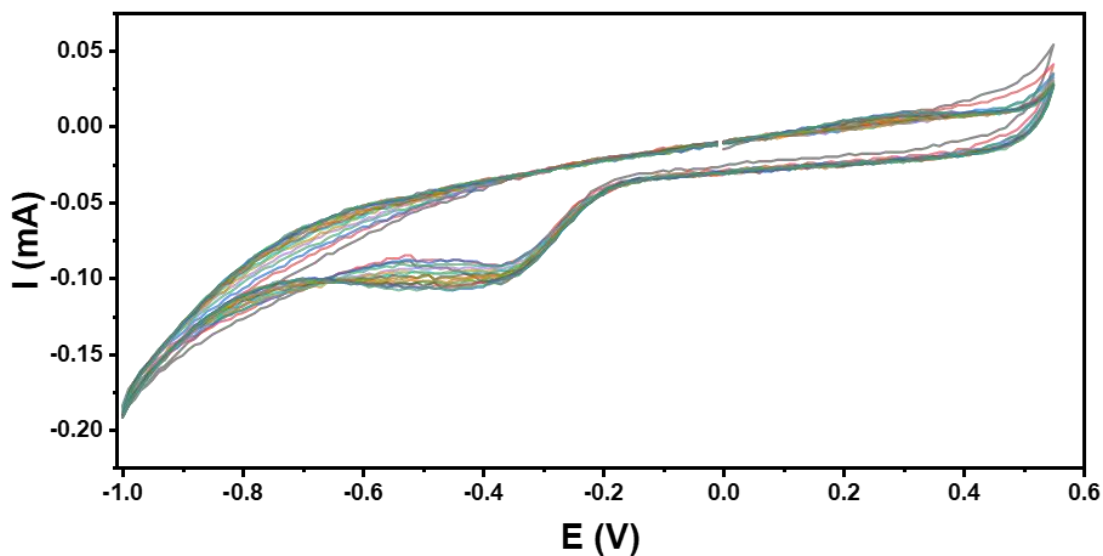


Figure S5. Cyclic voltammety measurement on PVA/100% Br-IL film.

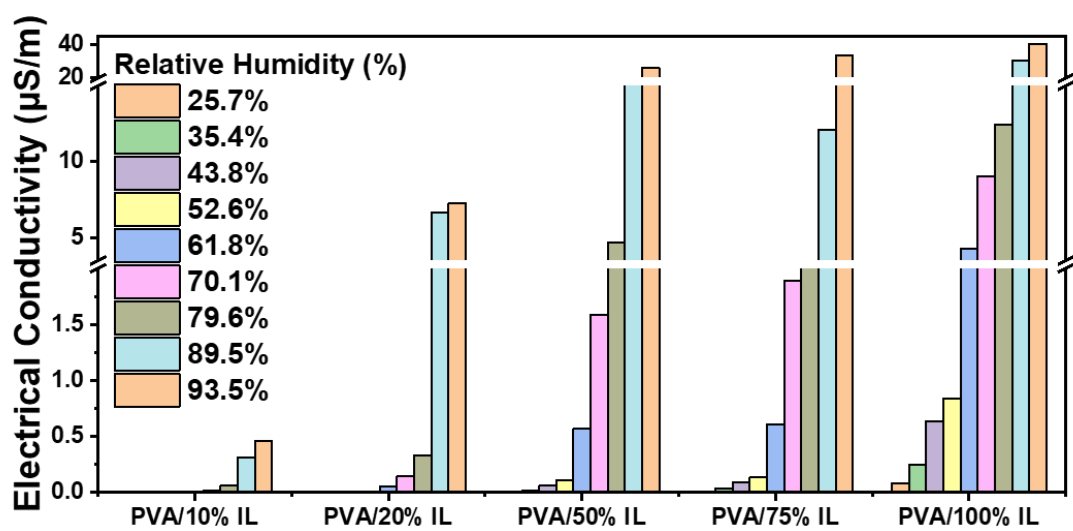


Figure S6. Electrical conductivity measurements on ionic conductive PVA films with different concentrations of Br-IL at various Relative Humidity.

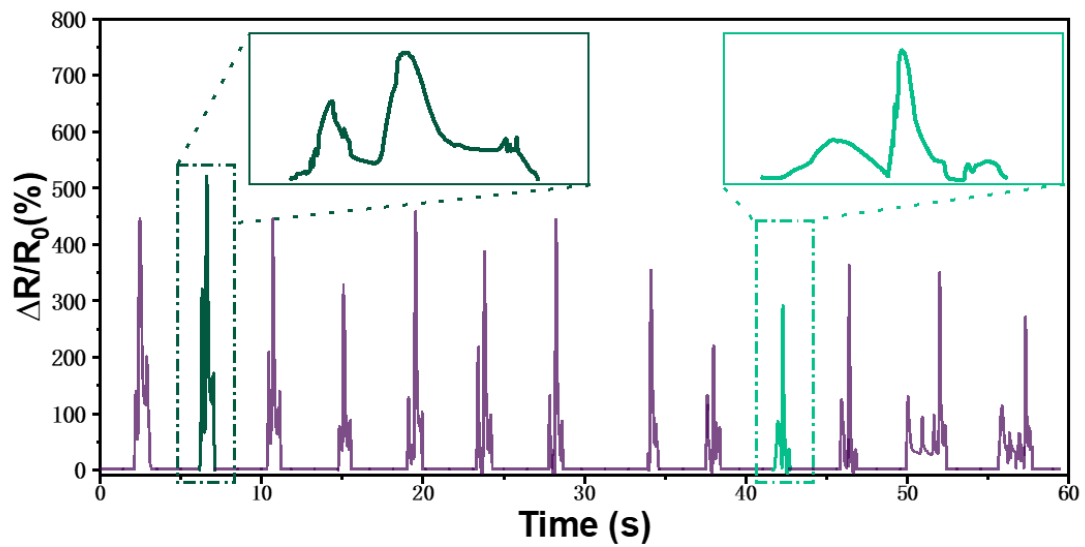


Figure S7. Swallowing signals from the PVA/Br-IL film

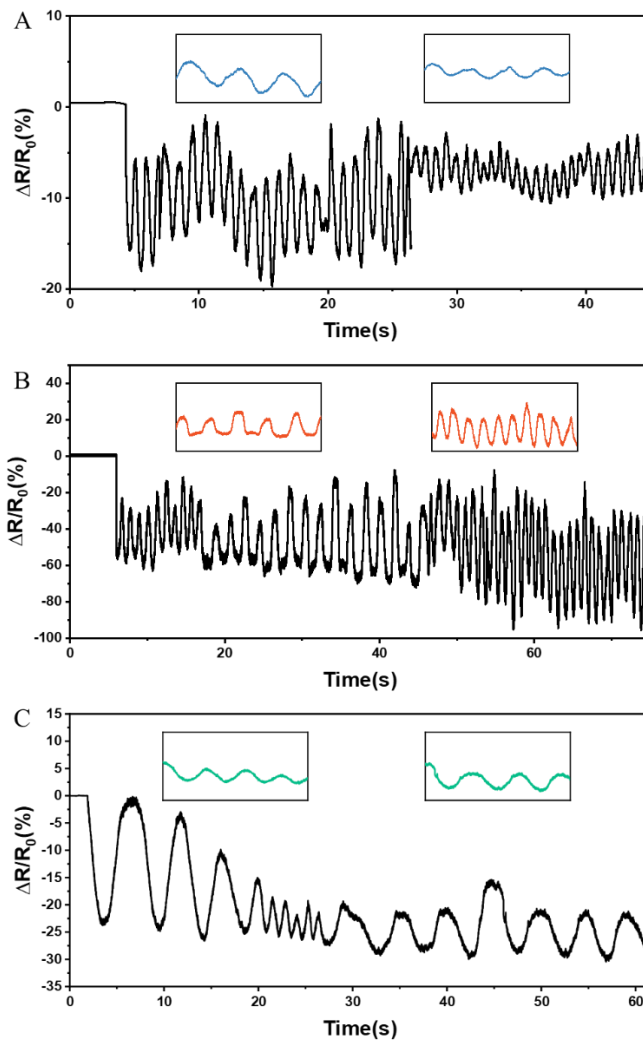


Figure S8. Relative resistance changes of PVA/Br-IL film during finger joint bending under different ambient temperatures. (A) 30°C. (B) 40°C. (C) 50°C.

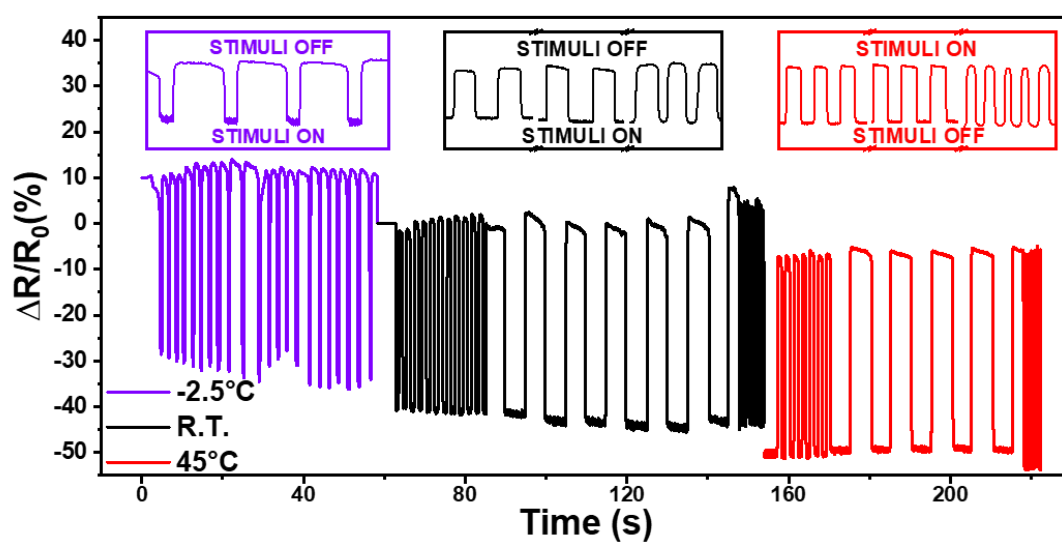


Figure S9. Relative resistance response to short-term temperature stimulations of PVA/Br-IL film under different ambient temperatures (-2.5°C, R.T. and 45 °C).

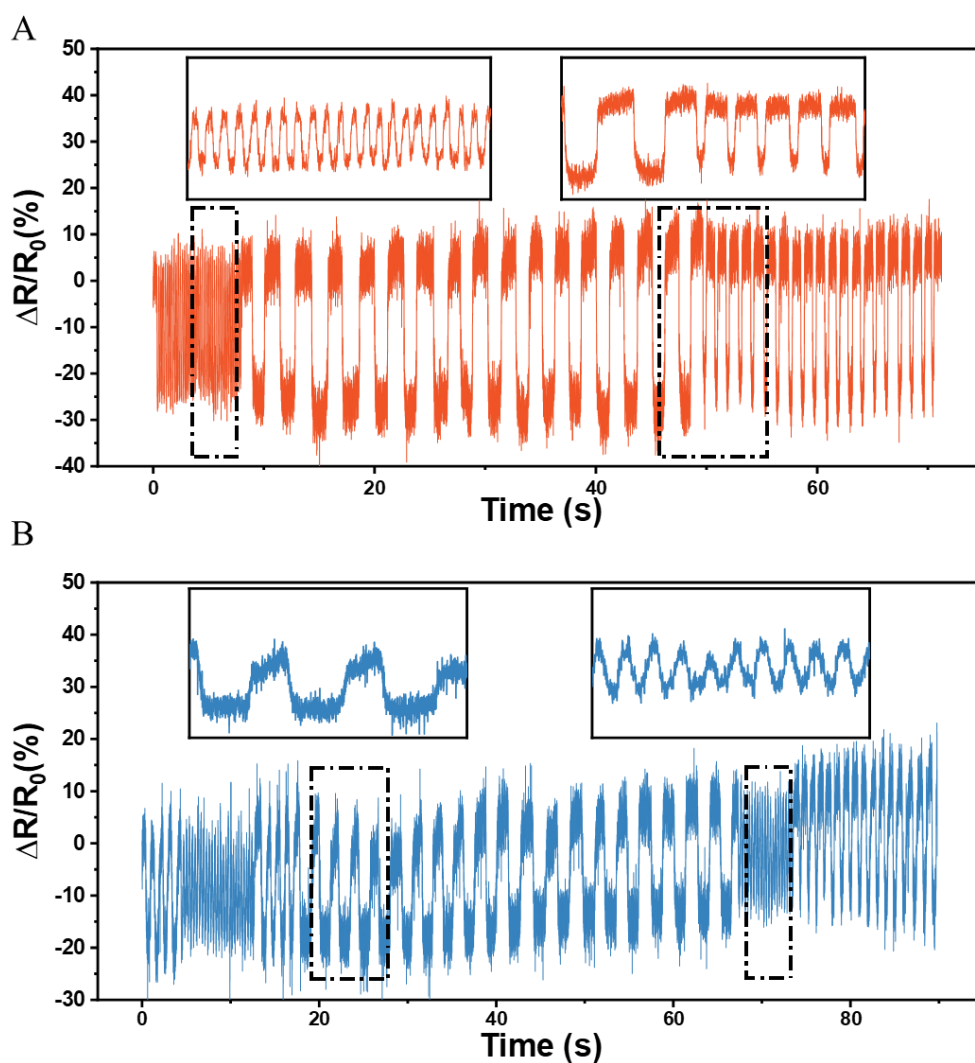


Figure S10. Relative resistance response to short-term temperature stimulations of PVA/Br-IL film under different ambient humidity. (A) 30% R.H. (B) 70% R.H.

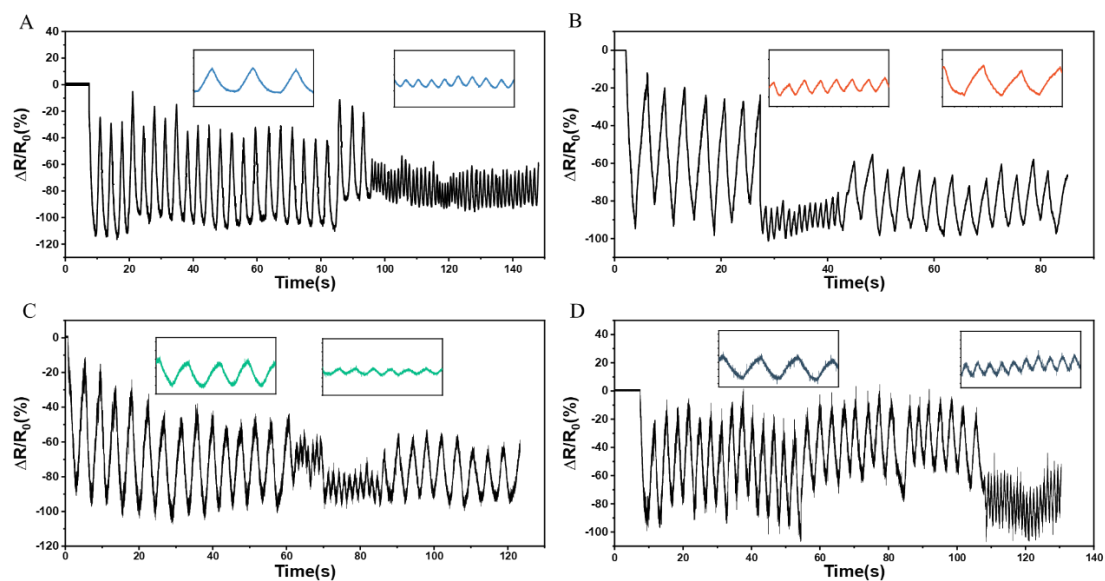


Figure S11. Relative resistance response to human nose breathes of PVA/Br-IL film under different sample temperatures. (A) -5°C . (B) 30°C . (C) 40°C . (D) 50°C .

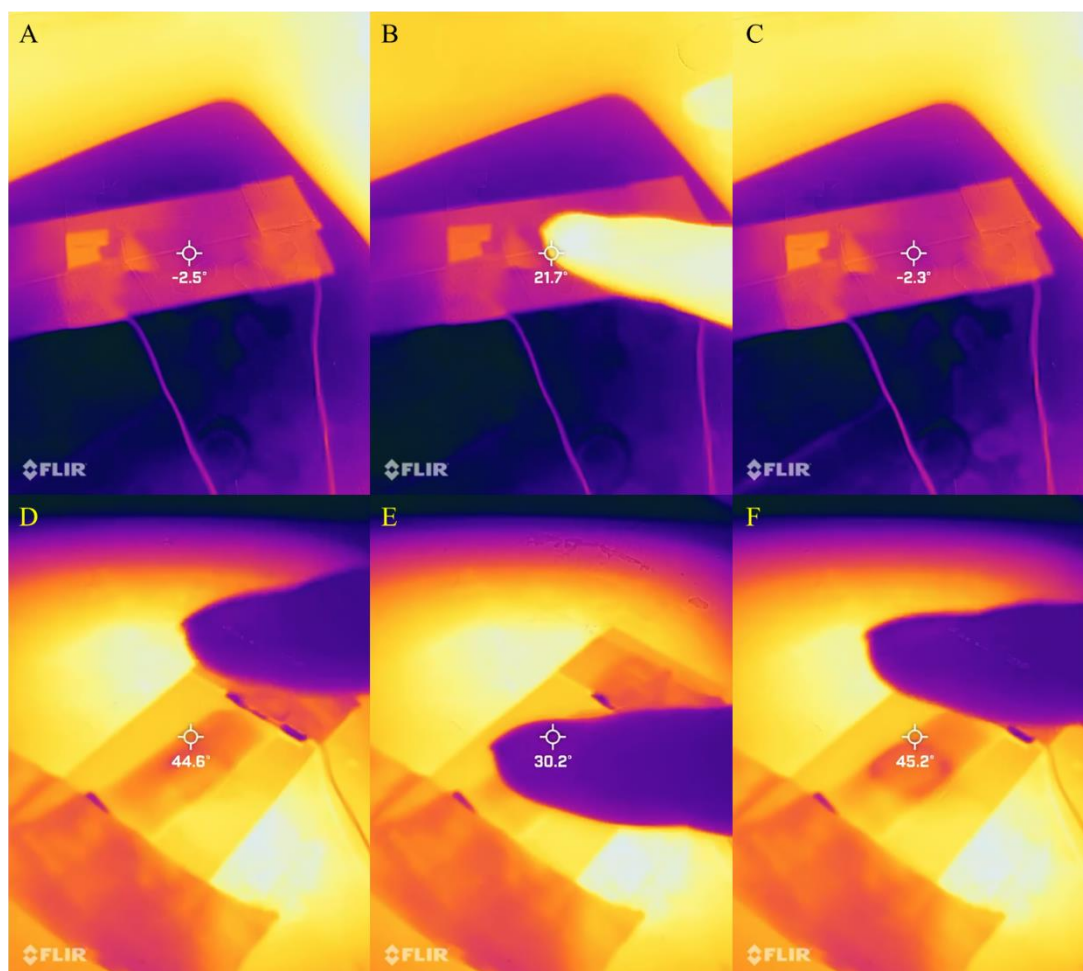
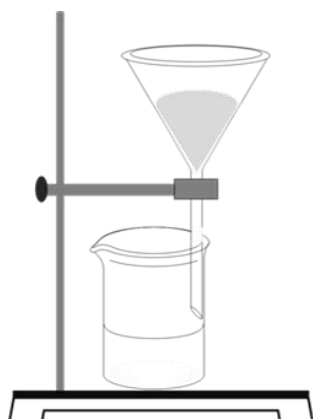


Figure S12. Thermal imaging figures of short-term temperature stimulations of PVA/Br-IL film captured by FLIR One Pro LT iOS Pro-Grade Thermal Camera. (A-C) Sample Temperatures -2.5°C . (D-F) Sample Temperatures 45°C .

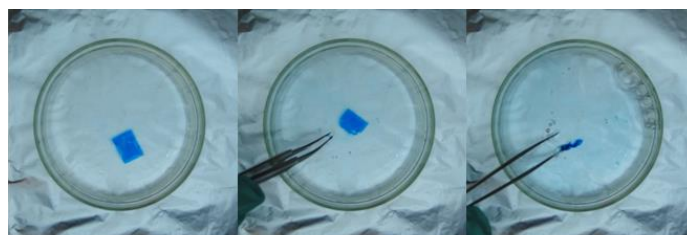


Contaminated
PVA/Br-IL Solution

Filtration

Pure
PVA/Br-IL Solution

Figure S13. Photographs of dissolving contaminated PVA/Br-IL film into hot water and after simple filtration, the solid undissolvable contamination was separated from PVA/Br-IL solution.



START

15 Seconds

30 Seconds



40 Seconds

50 Seconds

60 Seconds



70 Seconds

80 Seconds

90 Seconds

Figure S14. Photographs of dissolving PVA/Br-IL film into hot DI water within 90 seconds.