Electronic Supporting Information

Stretchable alternating current electroluminescent fiber based on transparent and highly conductive dual-network imidazolium chloride ion-gel electrodes for wearable display applications

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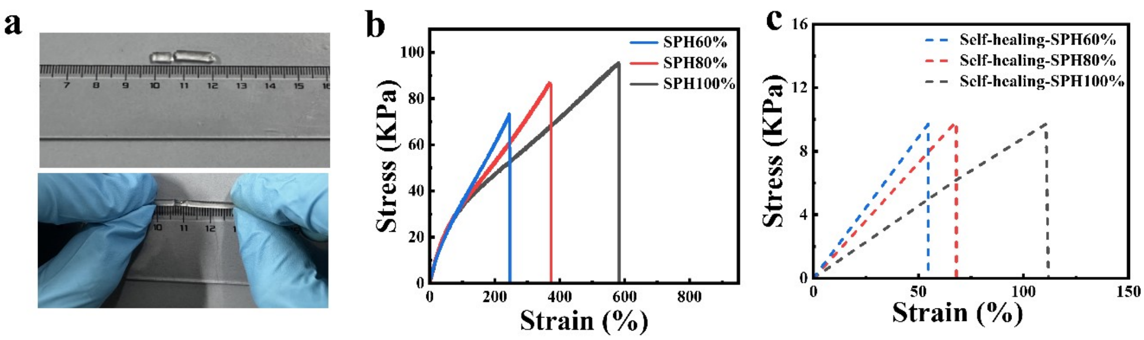
1. Supplementary Data

Fig. S1. Photographs of continuous gel fibers (approximately 50 cm in length)

Fig. S2. Digital photographs showing that SPOH80% can be stretched and restored to its original size.

Fig. S3. Self-healing test of ionic gel fibers

As shown in S3(a), we tested the self-healing of ionogel fibers with a length of 2 cm, which can stretch to 50% of their length. This can also be demonstrated in S3(b) and (c), where the mechanical properties of the self-healed ionic gel fibers decreased. In addition, the self-healing properties of the gel fibers also increased with the increase in EmimCl content. This is because EmimCl reduces the stiffness of the polymer chains and enhances the chain mobility.



S3. (a) Digital photographs of SPH80% ionogel fibers after cutting (upper panel) and stretching after self-healing (lower panel). (b) Stress-strain curves of SPH60%, SPH80% and SPH100% ionogel fibers before cutting. (c) Stress-strain curves of SPH60%, SPH80% and SPH100% ionogel fibers after cutting and self-healing.

Fig. S4. LED photographs of hydrogel fibers when working in hydrogel fibers without and with glycerol. (fibers stored for half a year, top image; fibers stored for three days, bottom image). (All images are 1 cm).

Fig. S5. The variation of the brightness (L/L_0) of luminous pixels with strain.

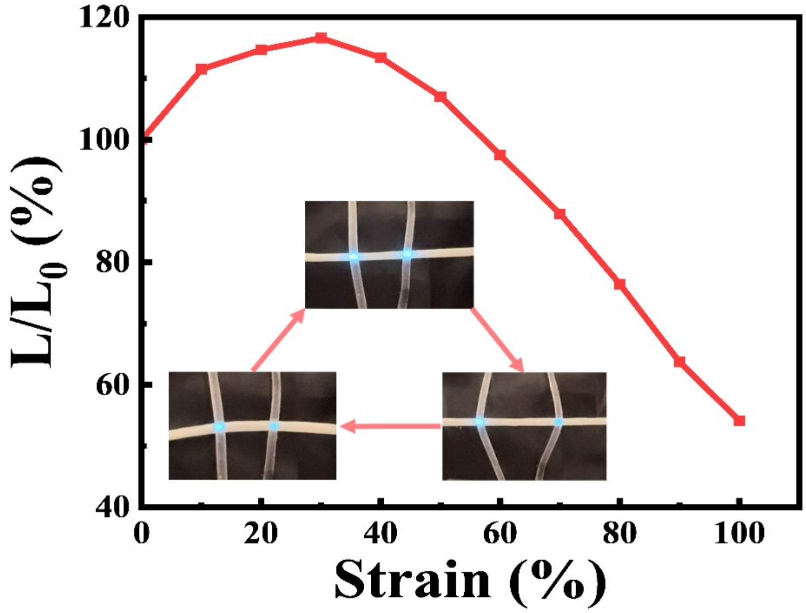


Fig. S6. The variation in EL intensity of ACEL fibers at different temperatures ranging from -20°C to 60°C.