Supplementary information

Flexible triboelectric nanogenerator based on a super-stretchable and self-healable hydrogel as the electrode

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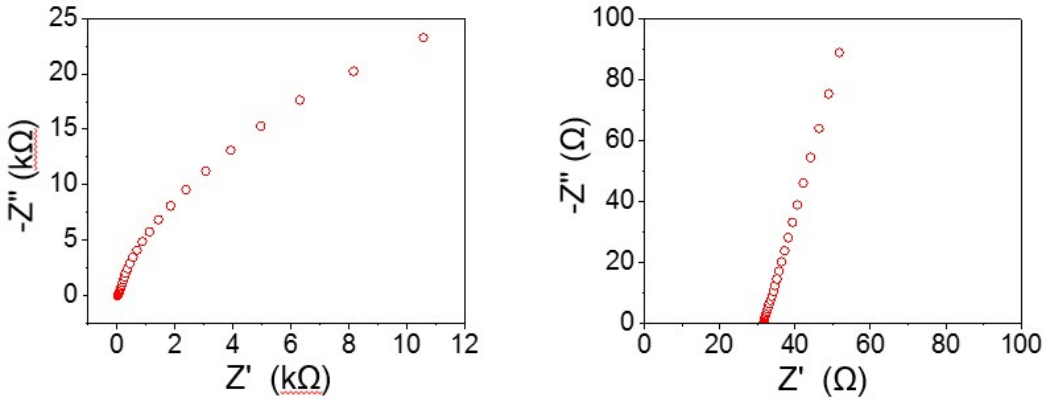

Fig. S1 Measurement of the conductivity of the PDA-PAM hydrogel.

The diameter (R) of the PDA-PAM hydrogel electrode was 1.55cm, and its thickness (d) was 0.42 cm. Consequently, the area (A) could be calculated as:

$$A = 3.14\times(1.55/2)^2 = 3.14\times0.775\times0.775 \text{ cm}^{-2}$$

The conductivity could be calculated according to the following equation:

$$S = \frac{d}{R0 \times A}$$

$$= \frac{0.42}{31.72 \times 3.14 \times 0.775 \times 0.775} = 7.0 \times 10^{-3} \text{ S cm}^{-1}$$

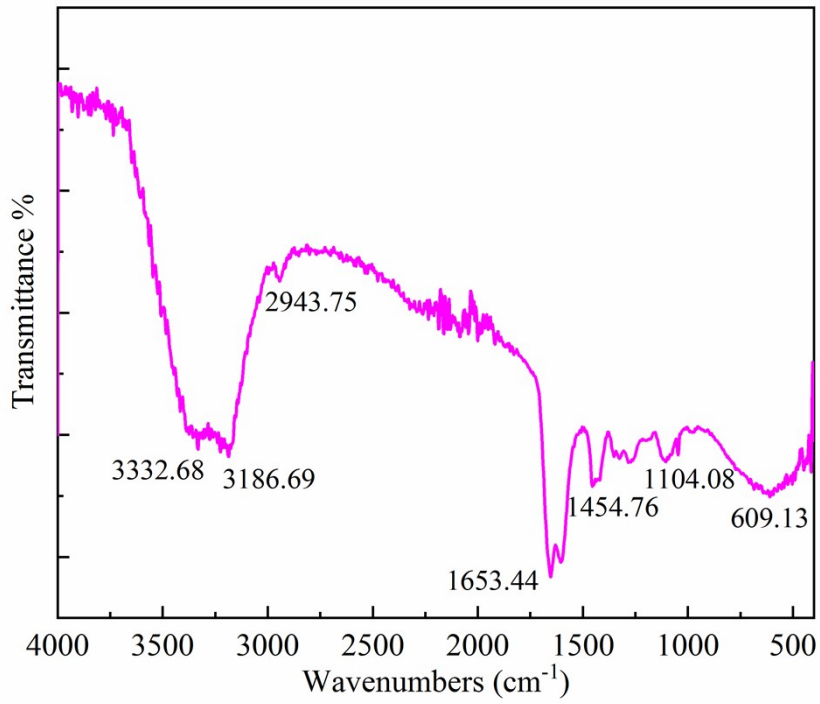

Fig. S2 FT-IR spectrum of the PDA-PAM hydrogel.

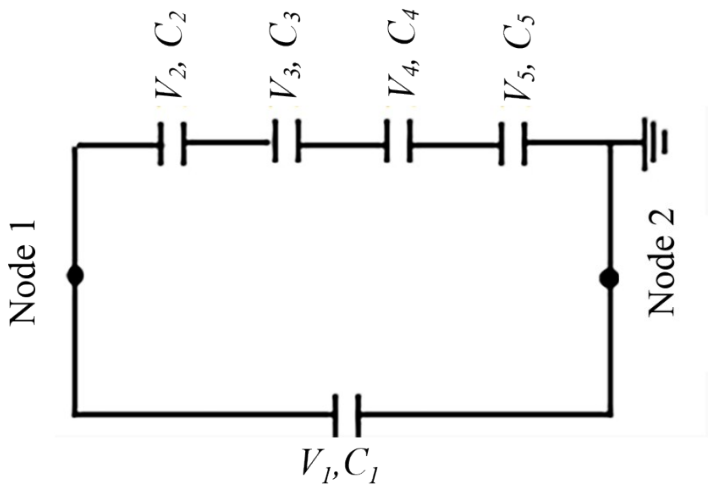

Fig. S3 The equivalent circuit of the single-electrode mode TENGs.

Where C_1 ,C_2, C_3, C_4, C_5 is:

C_1 represents the capacitance between the dielectric layer and the reference electrode;

C_2 represents the capacitance between the dielectric layer and the electrification layer;

C_3 represents the capacitance between the electrification layer and the PDA-PAM hydrogel,

C_4 represents the electrical double layer (EDL) capacitance between the PDA-PAM hydrogel and the surface of the copper wire.

C_5 represents the capacitance between the copper wire and the reference electrode.

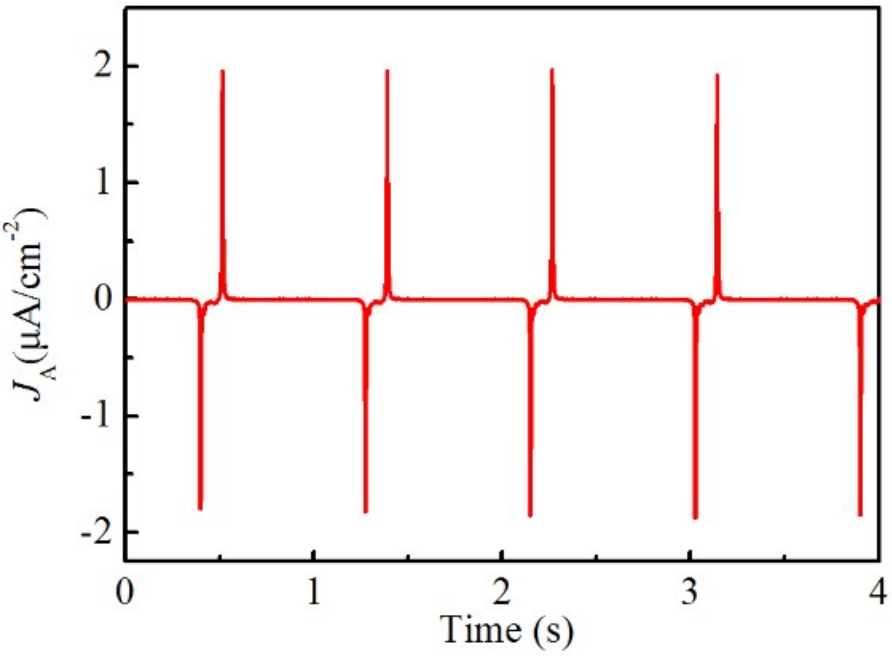

Fig. S4 The current density of the PP-TENGs.

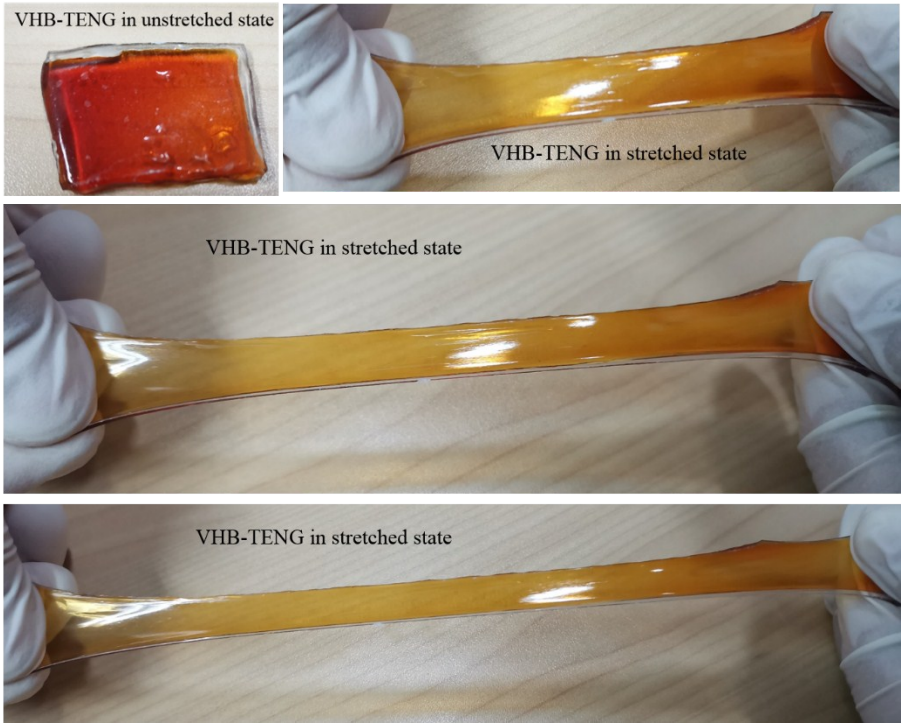

Fig. S5 The images showing the stretchability of the VHB-TENGs.