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Supporting Information

A multi-model, large range and anti-freezing sensor based on multi-crosslinked poly(vinyl alcohol) hydrogel for human-motion monitoring

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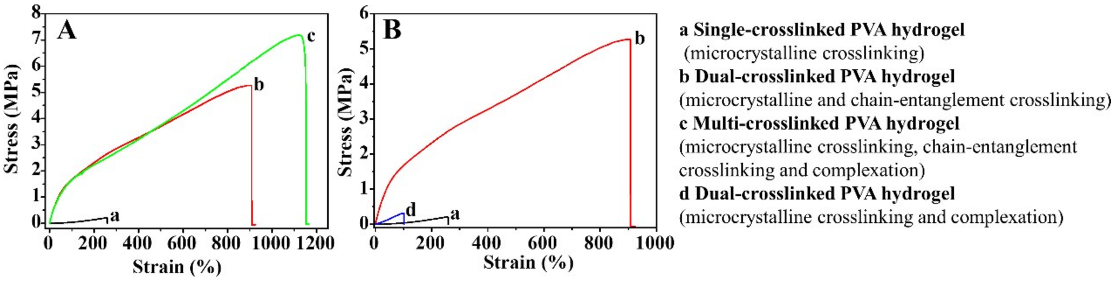

Fig. S1 Tensile stress-strain curves of various PVA hydrogels, wherein the (b) dual-crosslinked PVA (D-PVA) hydrogel was prepared by immersing PVA microcrystalline hydrogel into Na_2SO_4 solution and the (d) D-PVA hydrogel was prepared via altering the sequence of F-T cycles and immersion treatment in $Fe_2(SO_4)_3$ solution.

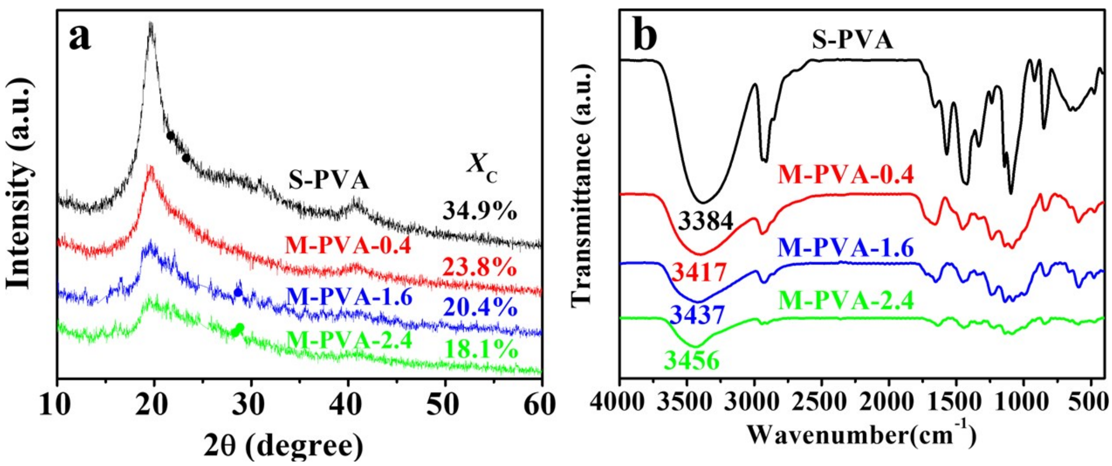

Fig. S2 (a) X-ray diffraction profiles and (b) Fourier transform infrared spectra of S-PVA and M-PVA hydrogels.

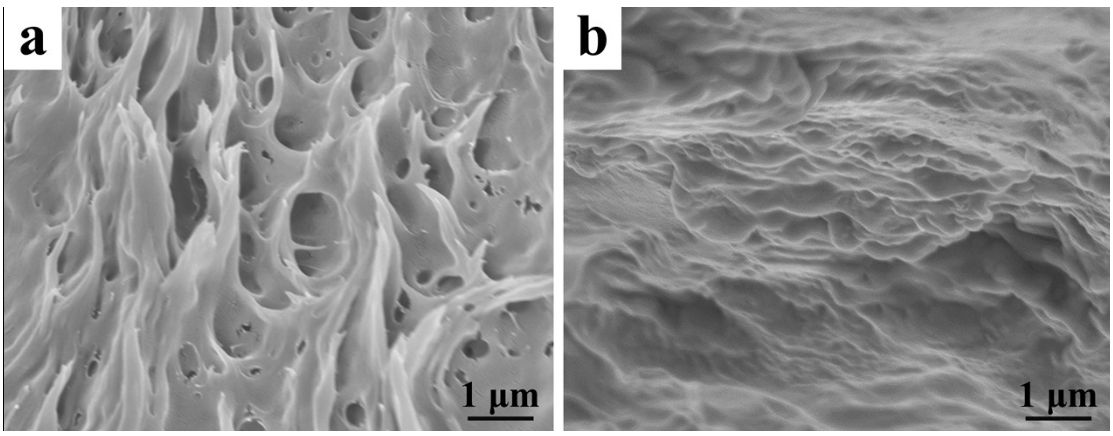

Fig. S3 Scanning electron microscopy of (a) S-PVA and (b) M-PVA-1.6 hydrogels.

Table S1. The water contents of PVA hydrogels.

Samples	Water Contents（wt%）
S-PVA	86.1
M-PVA-0.4	75.5
M-PVA-0.8	61.3
M-PVA-1.2	45.5
M-PVA-1.6	36.9
M-PVA-2.0	25.3
M-PVA-2.4	19.3

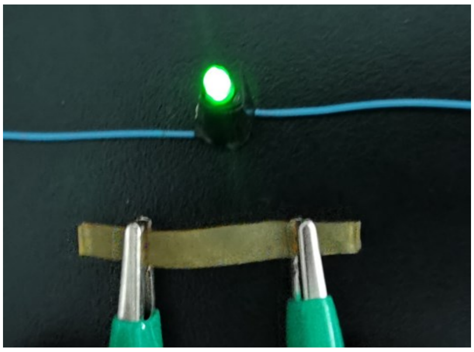

Fig. S4 The M-PVA-1.6 hydrogel can be employed as an ionic conductor in a closed circuit to lit a light-emitting diode indicator.

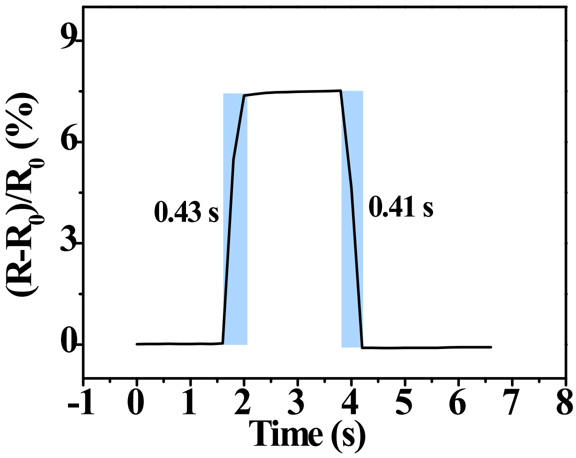

Fig. S5 Response time of the M-PVA-1.6 hydrogel sensor during loading and unloading process at tensile strain of 5%.

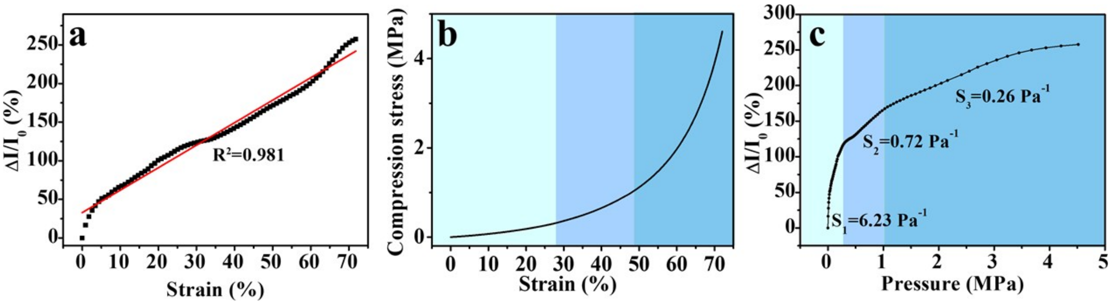

Fig. S6 Illustration of underlying reason for three different sensitivity regions of M-PVA hydrogel pressure sensor. (a) The relative current change of hydrogel sensor was approximately linearly dependent on the strain ranged from 0 to 70%. (b) Compressive stress-strain curves of M-PVA-1.6 hydrogel in the range of 0-70%. (c) The sensitivity of M-PVA hydrogel pressure sensor.