Supporting Information

Itaconic acid-enhanced robust ionic conductive elastomers for strain/pressure sensors

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Table S1 Detailed ratios for the preparation of ionically conductive elastomers

Sample	Molar ratio		PEGDA	Photo-initiator 1173
P(IA/AA/DMA)-1	(AA: ChCl: DMA=2:1:0.75)	IA: AA=1:5	0.5% to PDES	1% to PDES
P(IA/AA/DMA)-2		IA: AA=1:15		
P(IA/AA/DMA)-3		IA: AA=1:25		
P(AA/DMA)	AA: ChCl: DMA=2:1:0.75			
P(IA/DMA)	IA: ChCl: DMA=1:1:0.2			
P(IA/AA)	IA: AA: ChCl =10:1:6			

Fig. S1 Optical photo of IA/AA/ChCl-type PDES.

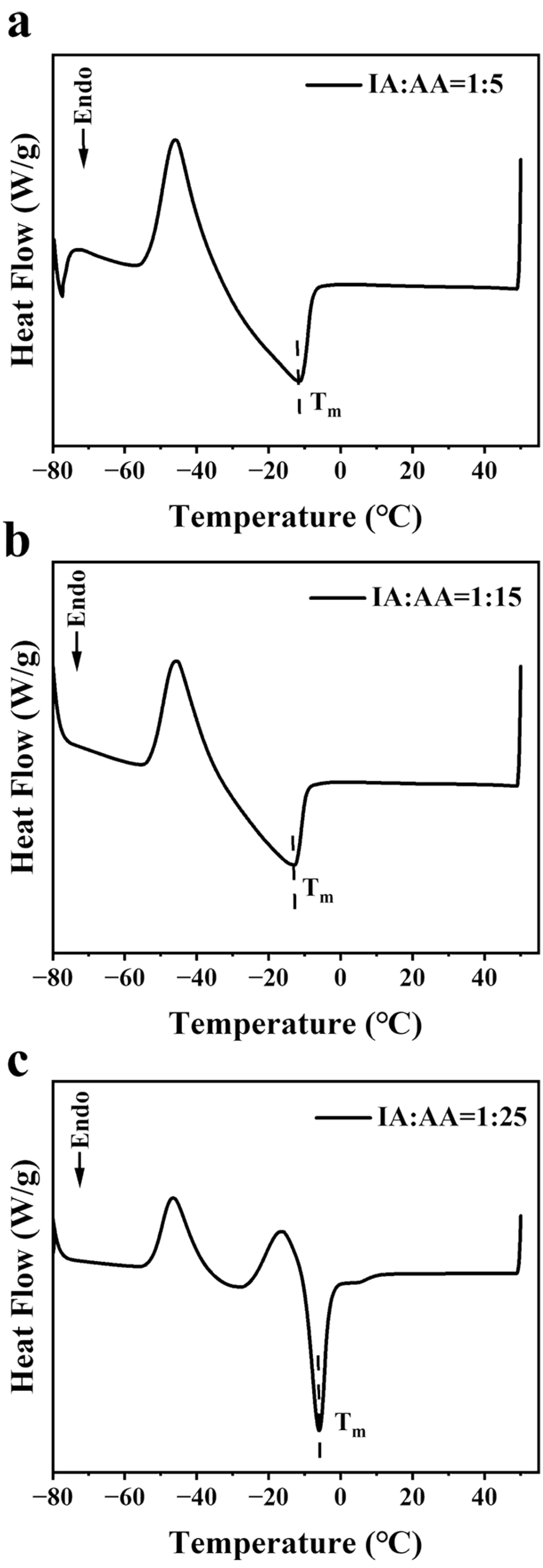

Fig. S2 Differential scanning calorimetry (DSC) curves of IA/AA/ChCl-type PDES with different IA contents.

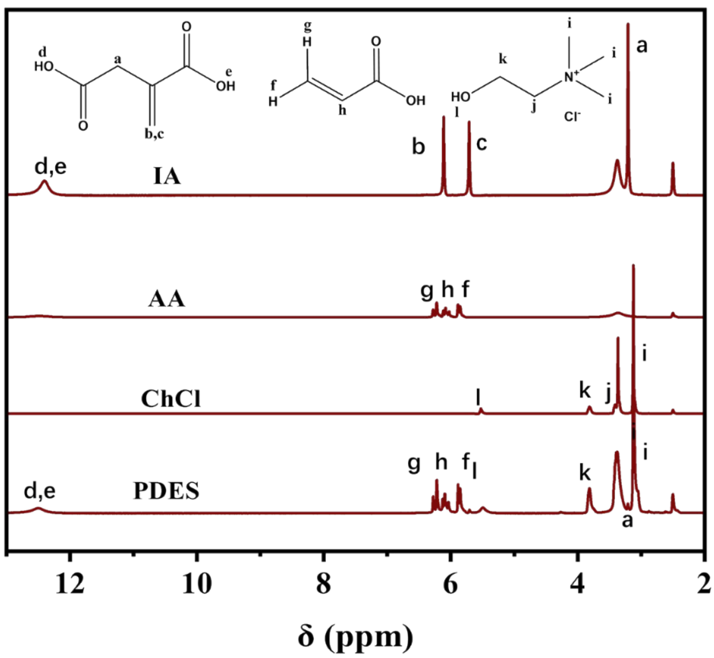

Fig. S3 ^{1}H-NMR spectra of IA, AA, ChCl and IA/AA/ChCl-type PDES (solvent DMSO-d6).

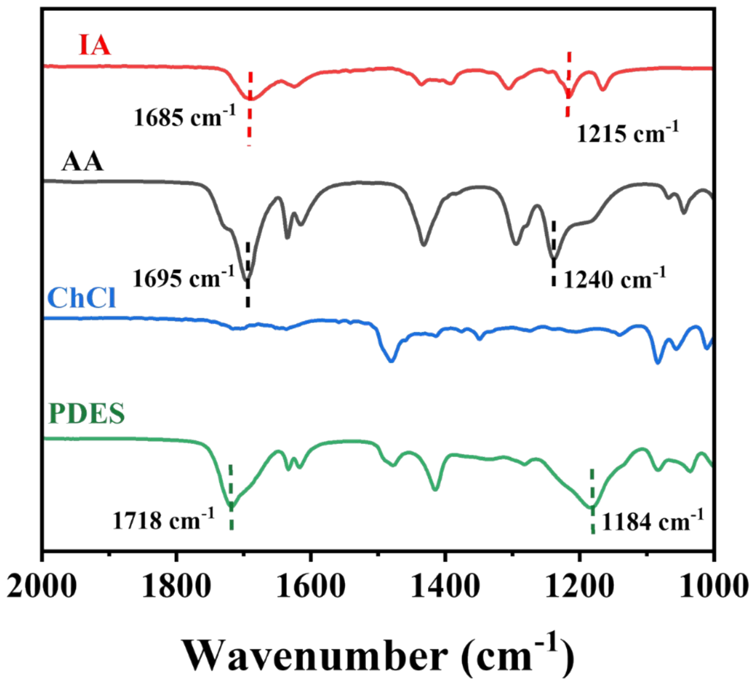

Fig. S4 FT-IR spectra of IA, AA, ChCl and IA/AA/ChCl-type PDES.

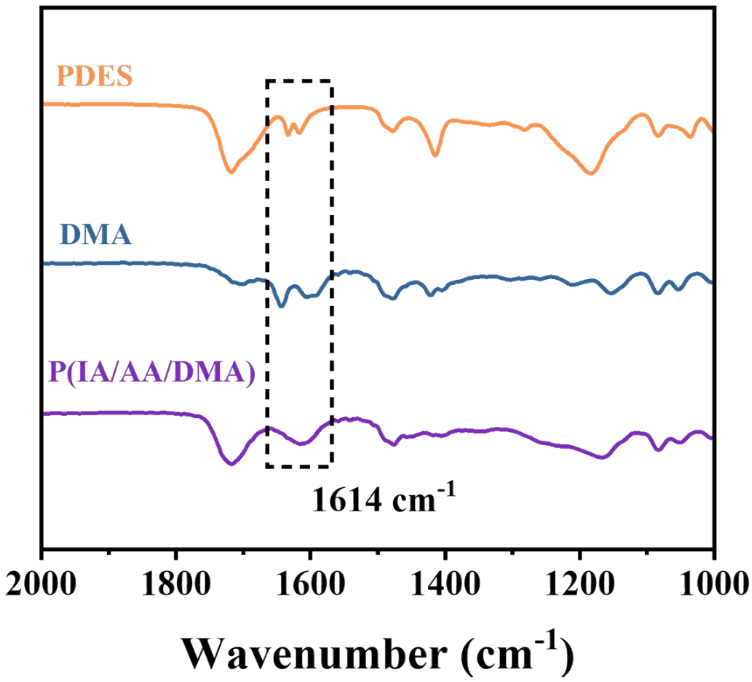

Fig. S5 FT-IR spectra of PDES, DMA and polymerized P (IA/AA/DMA) elastomers.

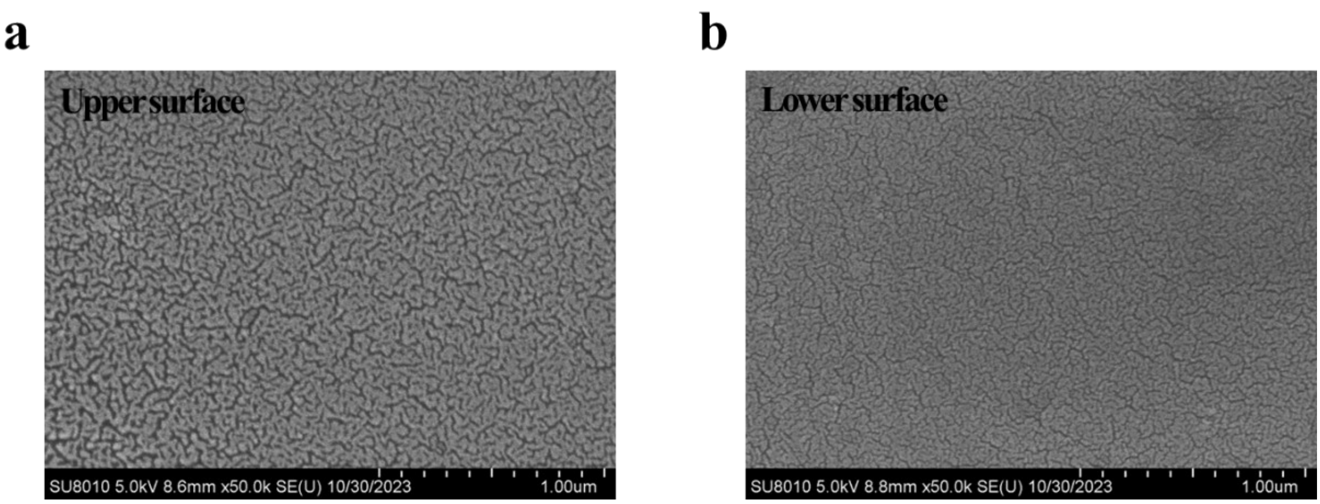

Fig. S6 SEM images of the P(IA/AA/DMA) elastomers.

Table S2 Conductivity of some reported PDES-based ionic conductive elastomers

Materials	Conductivity(S/m)	Ref.
AA/MAH/ChCl-EAN	0.00963	[1]
ChCl/urea/MCCM/AA	0.00219	[2]
ChCl/AA-AMPS	0.002	[3]
ChCl/AA-IM	0.00032	[4]
LA/ChCl-CNF-GMA	0.008	[5]
AA/ChCl-TA-CNC	0.0042	[6]
AAm/ChCl-MA/ChCl	0.013	[7]
AA/ChCl-PAAM	0.021	[8]
AA/ChCl-CMFs	0.09	[9]
AA/ChCl-MXene	0.01	[10]
P(IA/AA/DMA)	0.024	This work

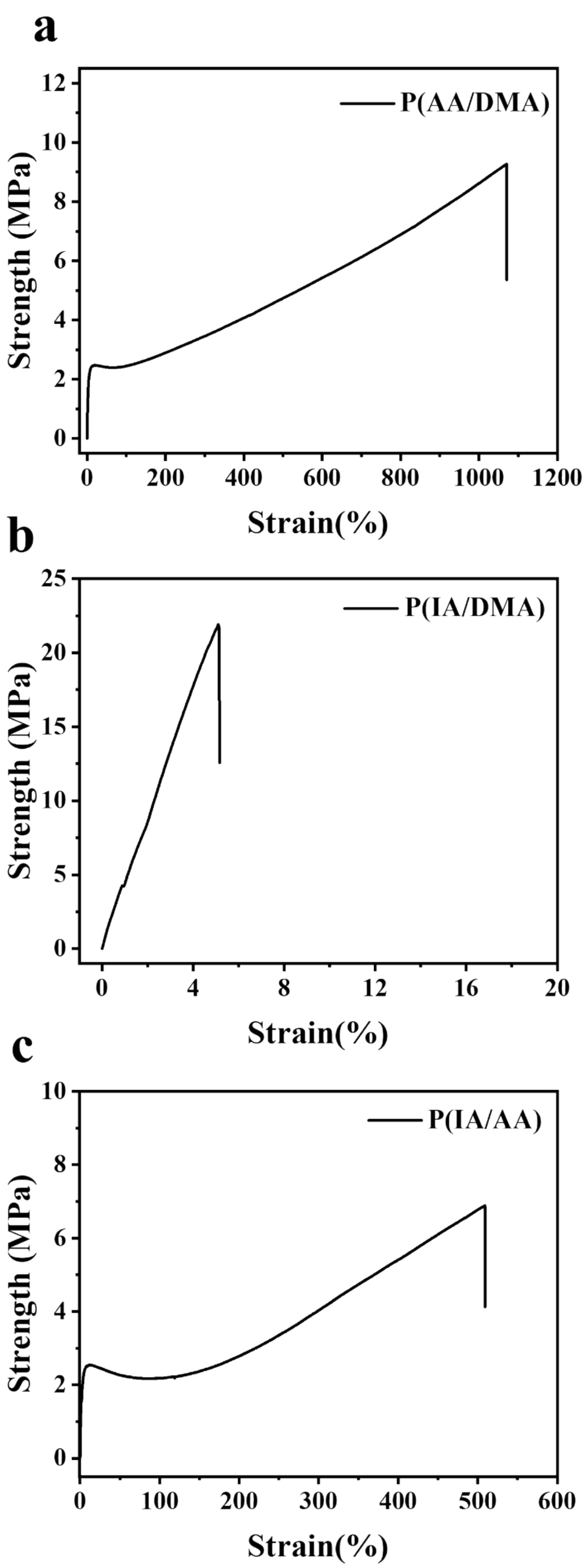

Fig. S7 Stress–strain curves of the control groups: (a) P(AA/DMA) sample; (b) P (IA/DMA) sample; (c) P (IA/AA) samples.

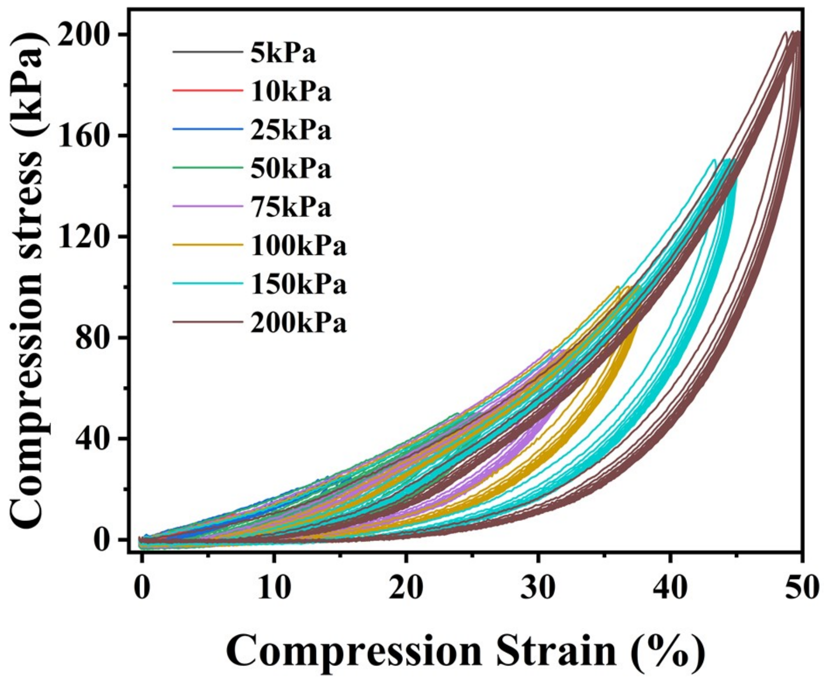

Fig. S8 Cyclic loading/unloading curves under different compressive stresses.

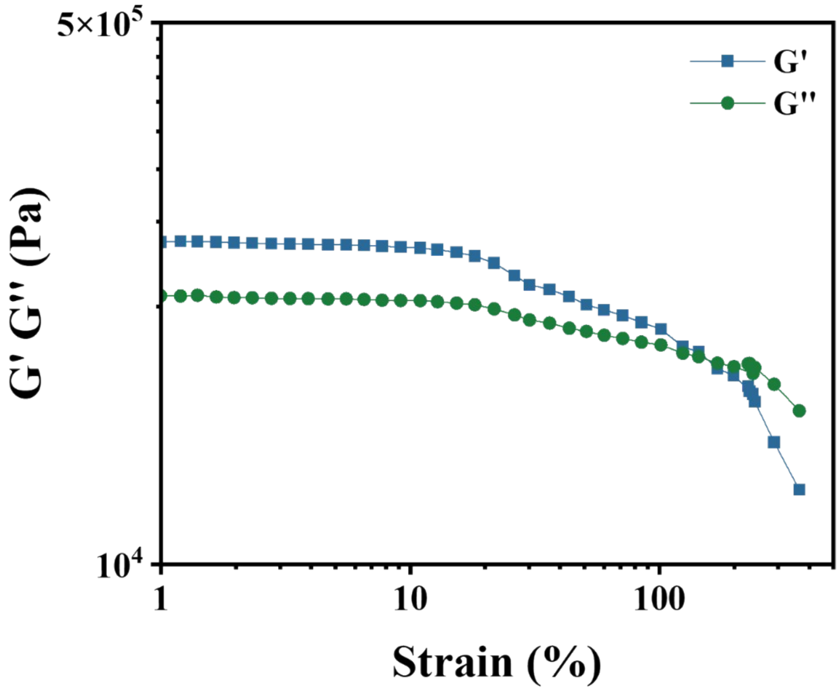

Fig. S9 Shear strain-scan rheological diagram of the P(IA/AA/DMA)-2 elastomer with a fixed angular frequency of 10 rad/s.

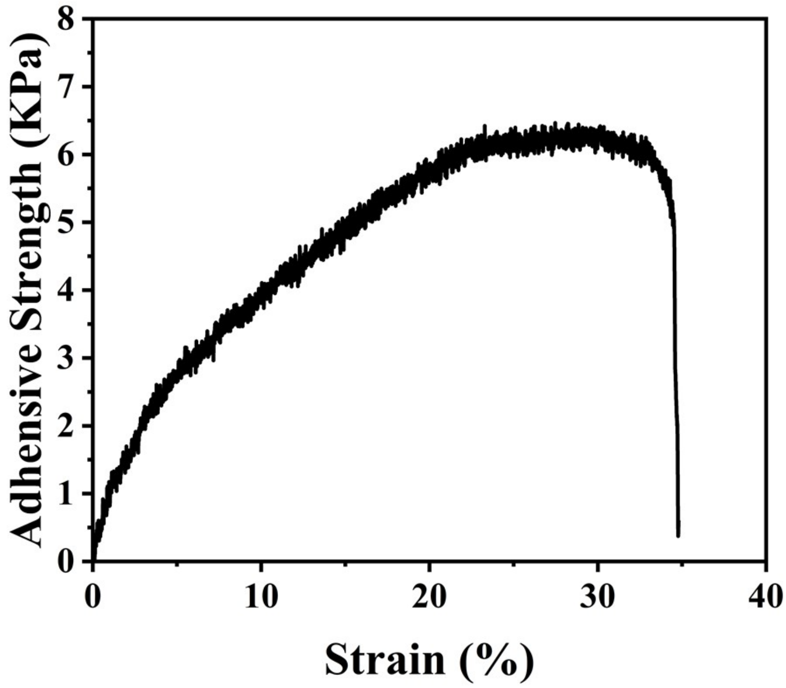

Fig. S10 Adhesion strength–strain curves of elastomers on skin (1.2 × 1.2 × 0.1 cm^3).

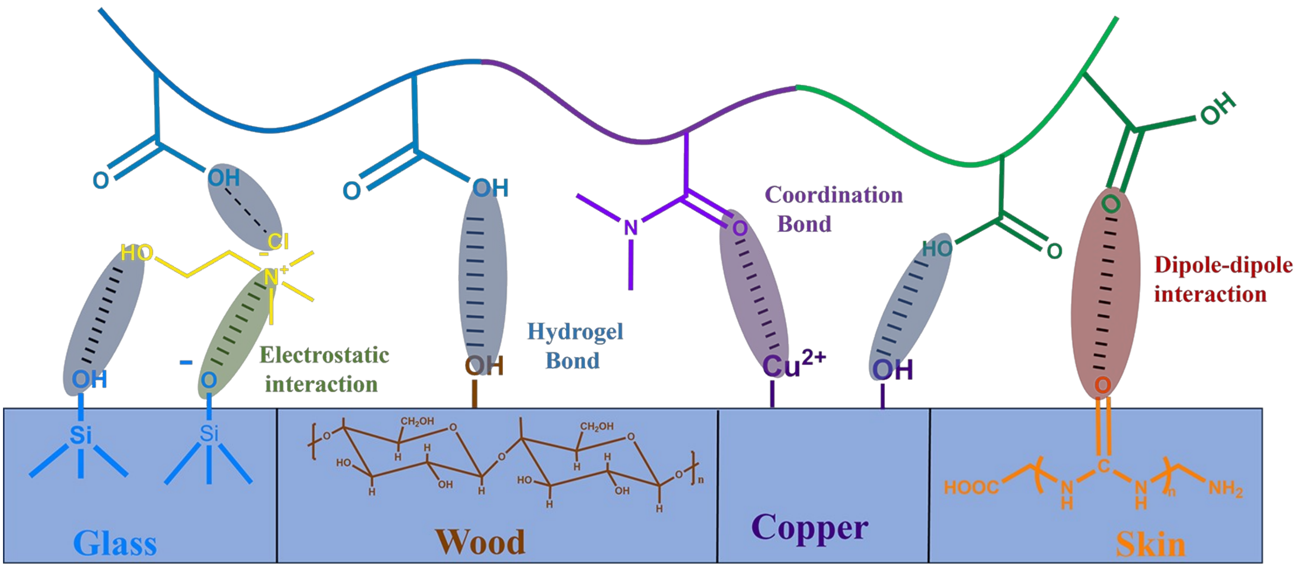

Fig. S11 Schematic diagram of the adhesion mechanism of the P(IA/AA/DMA)-2 elastomer.

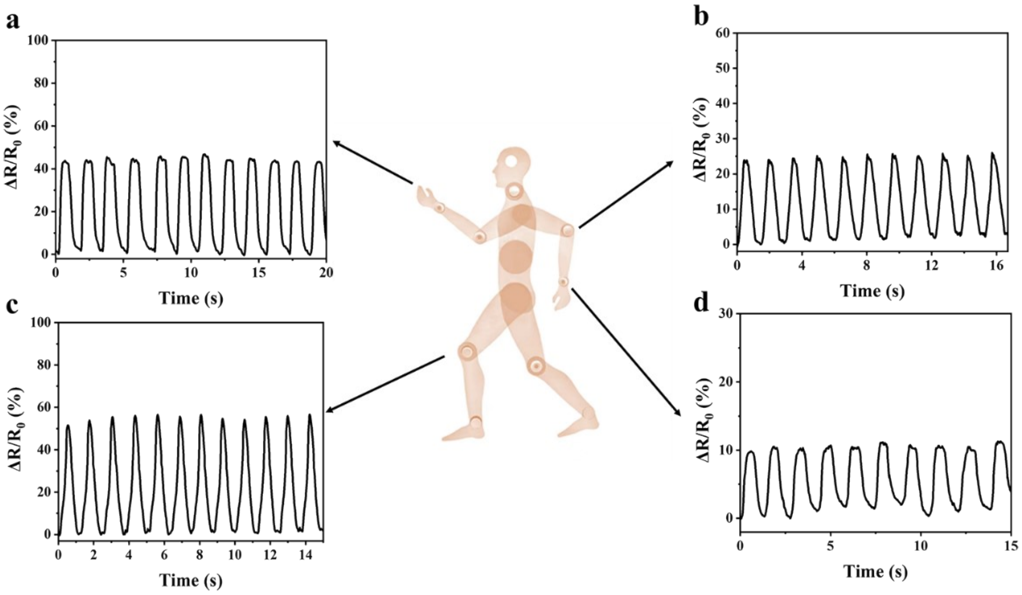

Fig. S12 P(IA/AA/DMA)-2 as strain sensors for monitoring electrical signals during movement of different body parts: (a) finger bending and straightener movements; (b) elbow movement; (c) knee exercises; (d) wrist exercises.

Reference

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