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Supporting Information

Kirigami Electrodes of Conducting Polymer Nanofibers for Wearable Humidity Dosimeters and Stretchable Supercapacitors

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Keywords: Kirigami, Conducting polymers, Stretchable supercapacitor, Nanofibers, Wearable sensors.

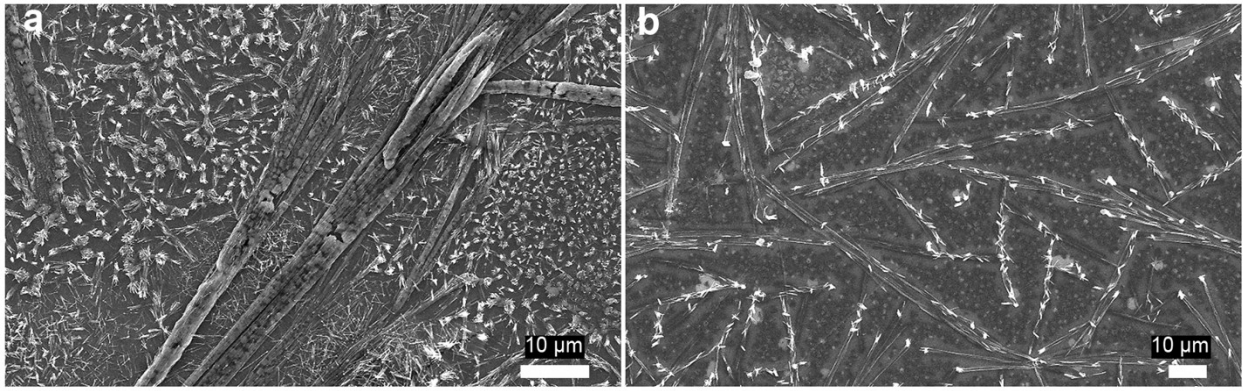

Fig S1. SEM images of ferrous chloride crystals and granular morphology of PEDOT.

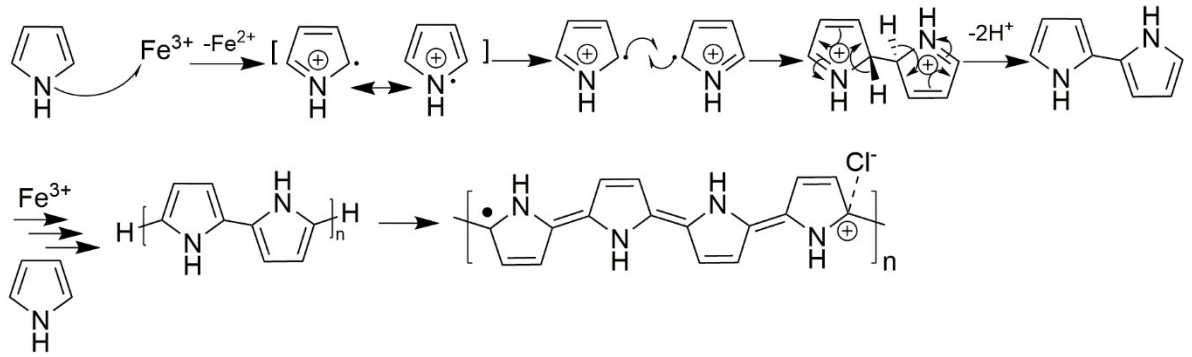

Fig S2. Step growth mechanism for PPy via oxidative radical polymerization.

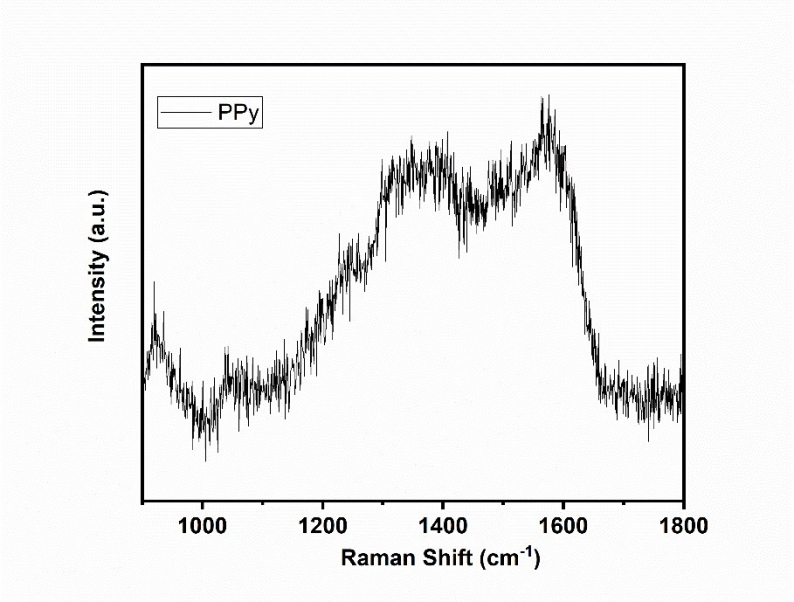

Fig S3. Raman spectra of the oxidized conjugated backbone of PPy.

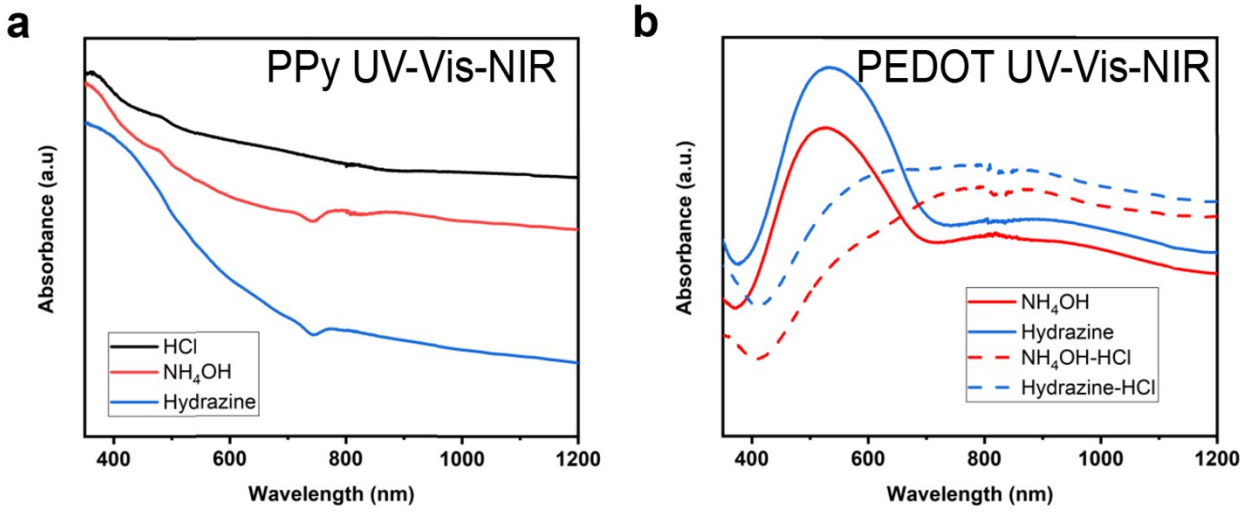

Fig S4. (a) UV-Vis-NIR spectra of PPy doped by HCl and dedoped by NH_4OH and hydrazine. (b) UV-Vis-NIR spectra of PEDOT dedoped by NH_4OH and hydrazine and subsequently re-doped by HCl.

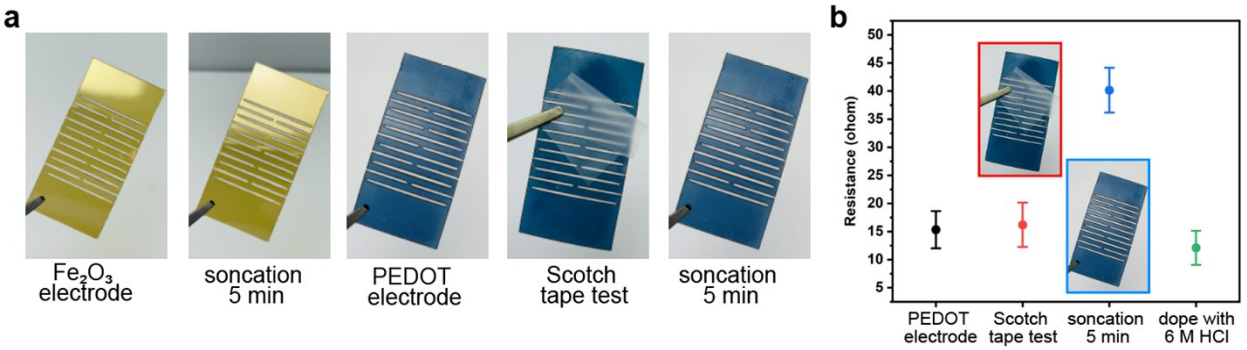

Fig S5. (a) Adhesion strength of PEDOT electrode demonstrated after sonication, scotch tape tests and via (b) resistance characterization.

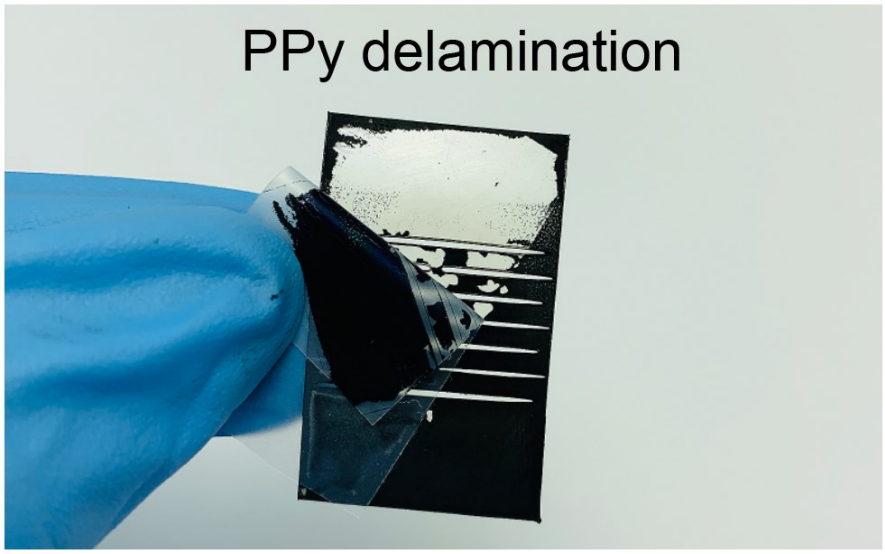

Fig S6. PPy film delaminate from Kirigami sheet.

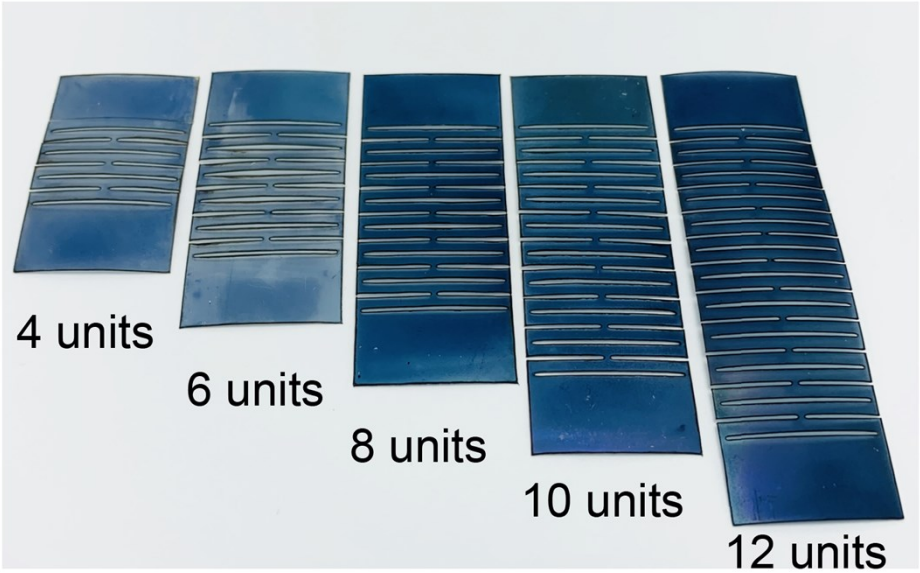

Fig S7. Nanofibrillar PEDOT Kirigami sheets with increasing number of unit cells.

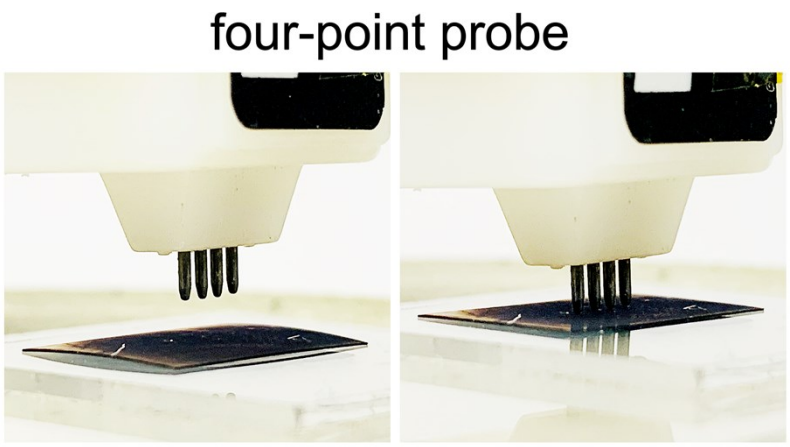

Fig S8. Conductivity measurement via four-point probe.

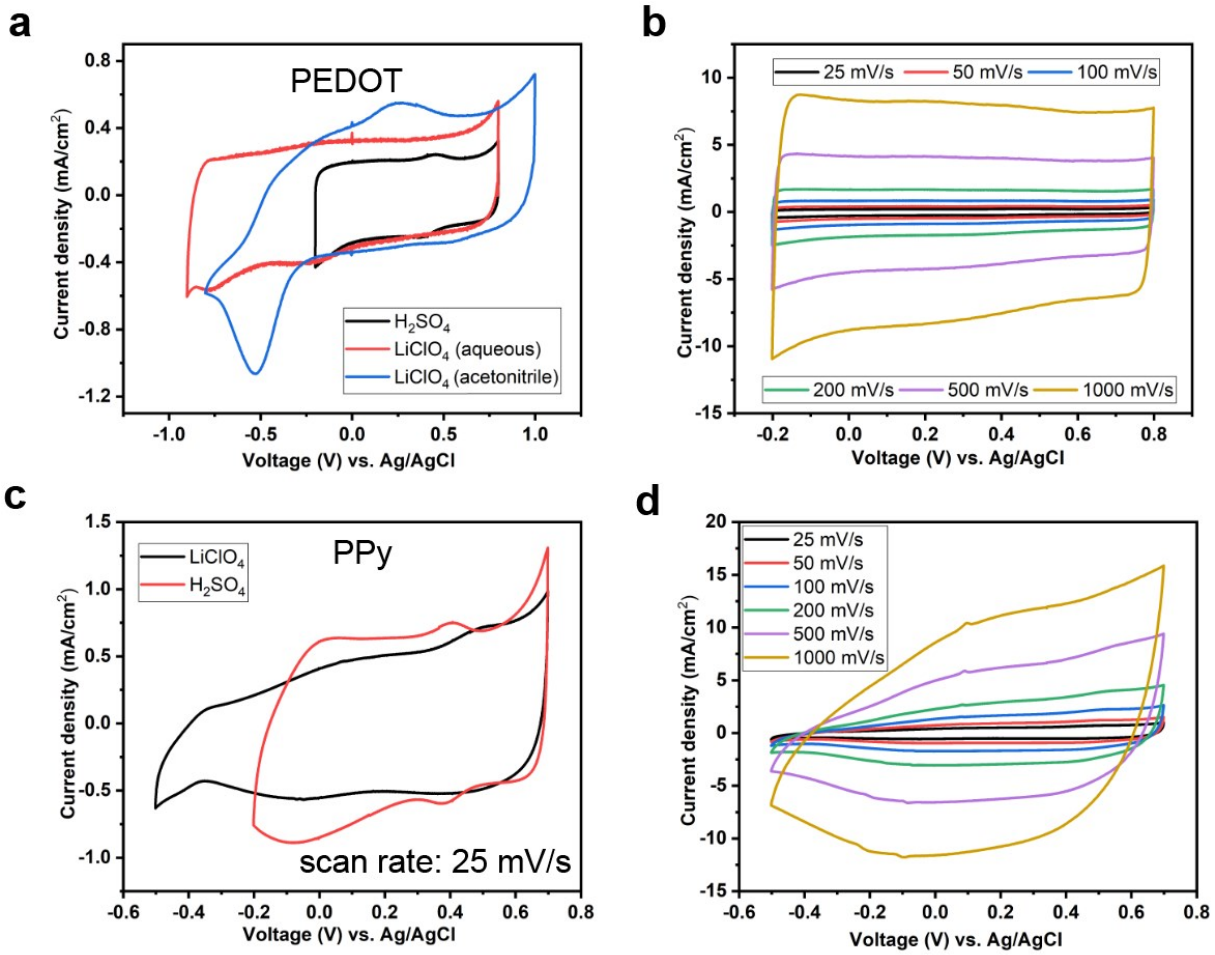

Fig S9. (a) CV scans of PEDOT in 1M H_2SO_4, 1M aqueous $LiClO_4$ and 1M $LiClO_4$ in acetonitrile. (b) Rectangular CV response of PEDOT in 1M H_2SO_4 electrolyte under scan rates ranging from

25 to 1000 mV/s. (c) CV scans of PPy in $LiClO_4$ and H_2SO_4 aqueous electrolyte. (d) CV response of PPy in 1M $LiClO_4$ aqueous electrolyte under scan rates ranging from 25 to 1000 mV/s.

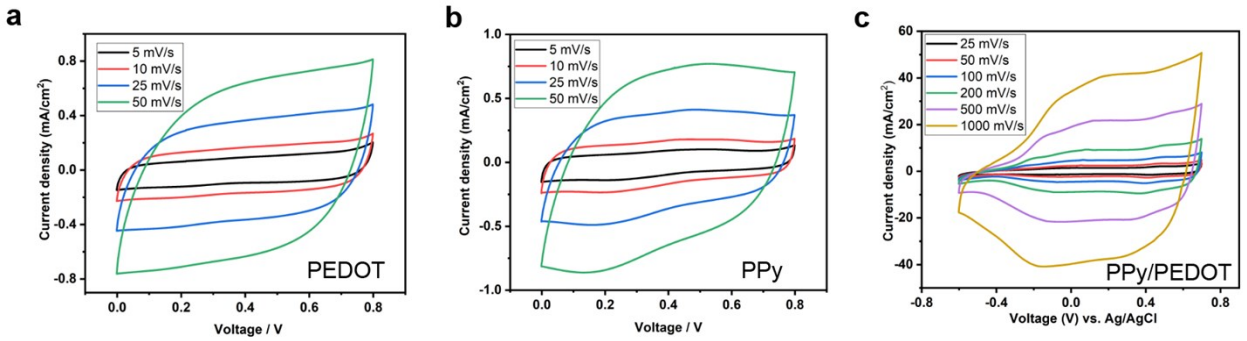

Fig S10. CV scans of (a) PEDOT, (b) PPy and (c) PPy/PEDOT in 1M $LiClO_4$ electrolyte under various scan rates.

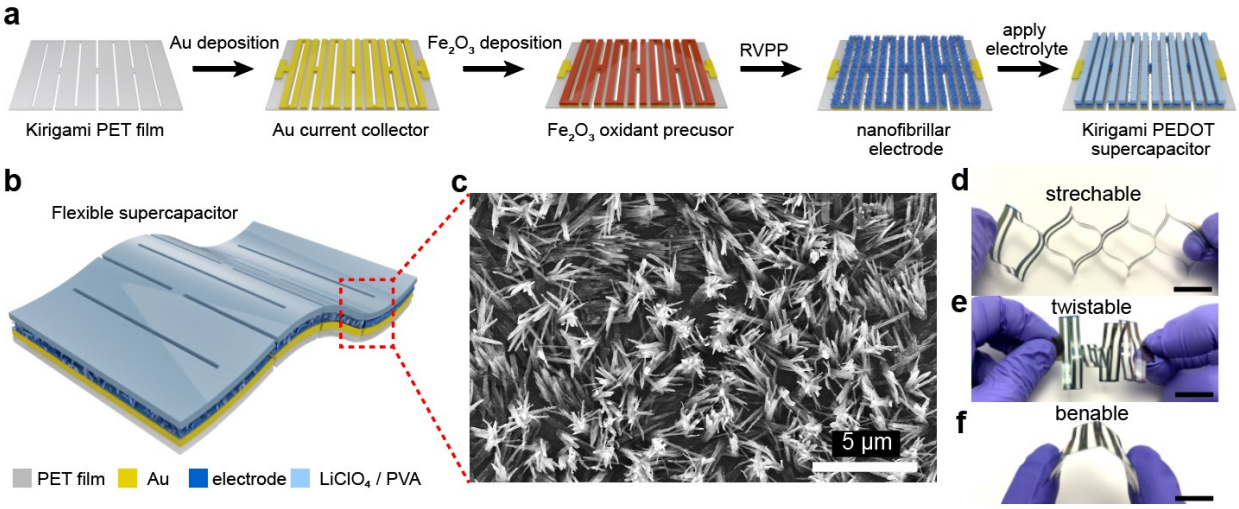

Fig S11. (a) Fabrication process of a nanofibrillar PEDOT Kirigami-based supercapacitor in a planar configuration. (b) Schematic diagram of flexible supercapacitor (c) possessing a high packing density of 1D nanostructures. The supercapacitor withstands complex deformation including (d) stretching, (e) twisting and (f) bending.