Supporting Information for

Ionic Liquid-Enhanced Assembly of Nanomaterials for Highly Stable Flexible Transparent Electrodes

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Supplementary Figures and Tables

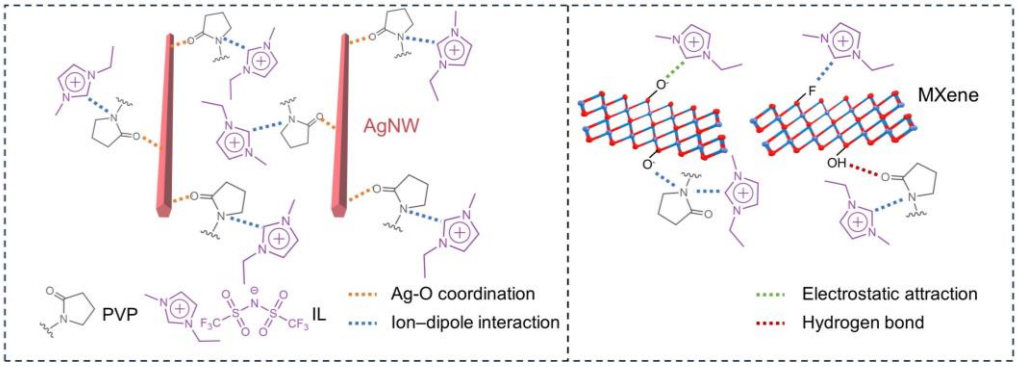

Fig. S1 Schematic illustration of the mechanism of IL-enhanced assembly of NMs (AgNWs and MXene)

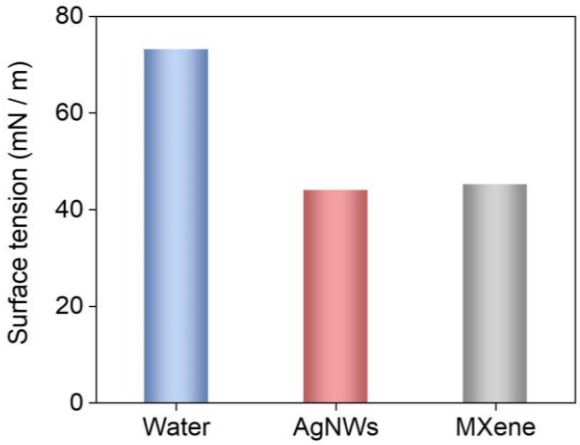

Fig. S2 The surface tensions of the water, AgNWs and MXene

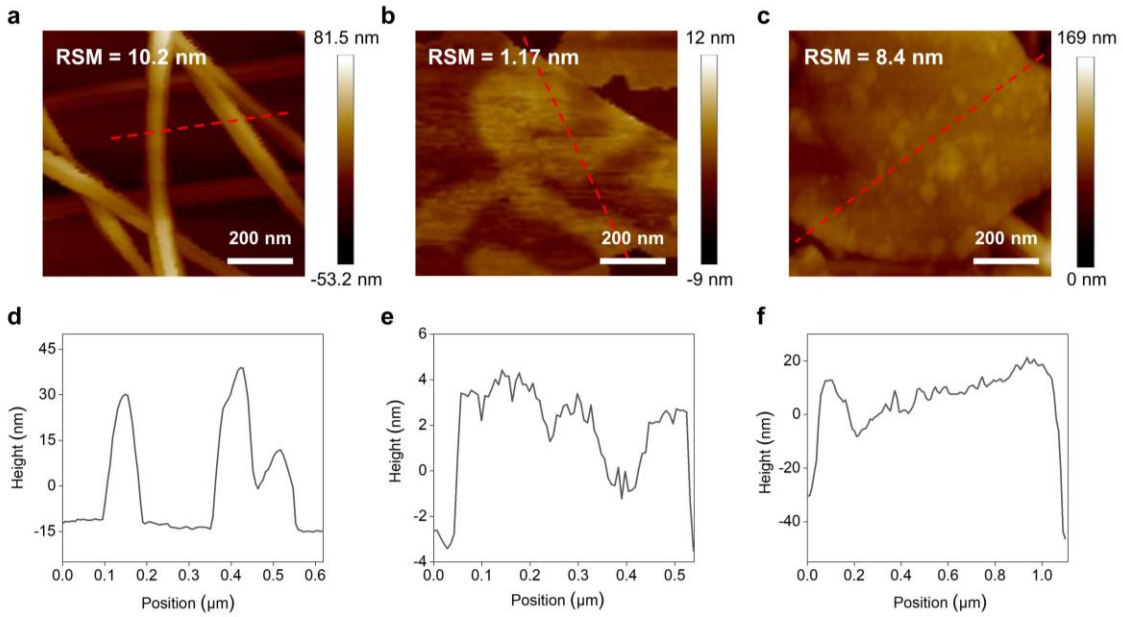

Fig. S3 AFM images of the AgNWs, MXene, and AgNWs-MXene films **a-c**, and the crresponding hight profiles **d-f**

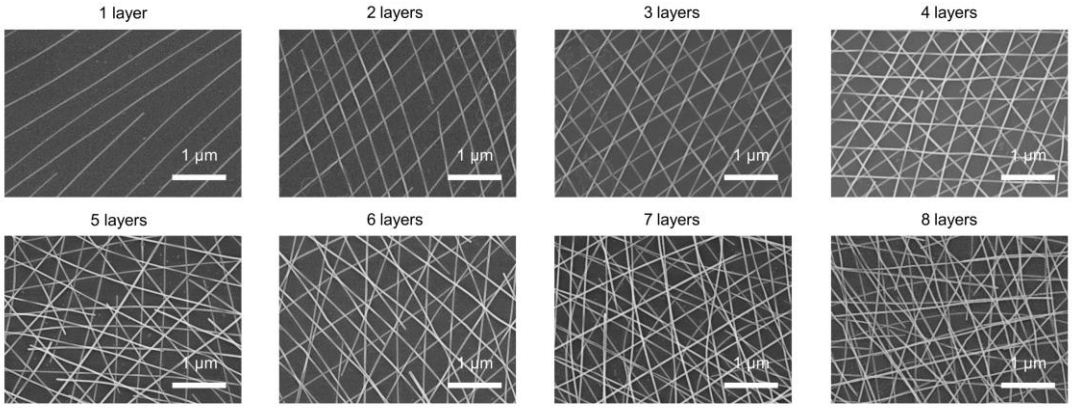

Fig. S4 SEM images of the ordered AgNW networks with different layers

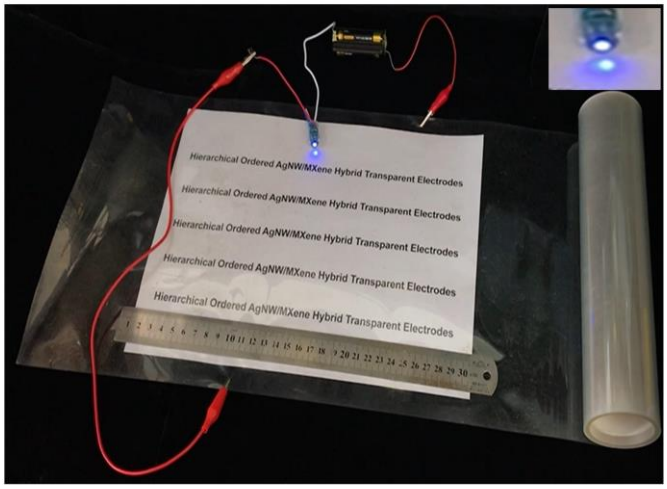

Fig. S5 A photograph of a 20 cm-wide roll of transparent AgNW-MXene electrode on PET substrate, which can light a blue LED lamp stably

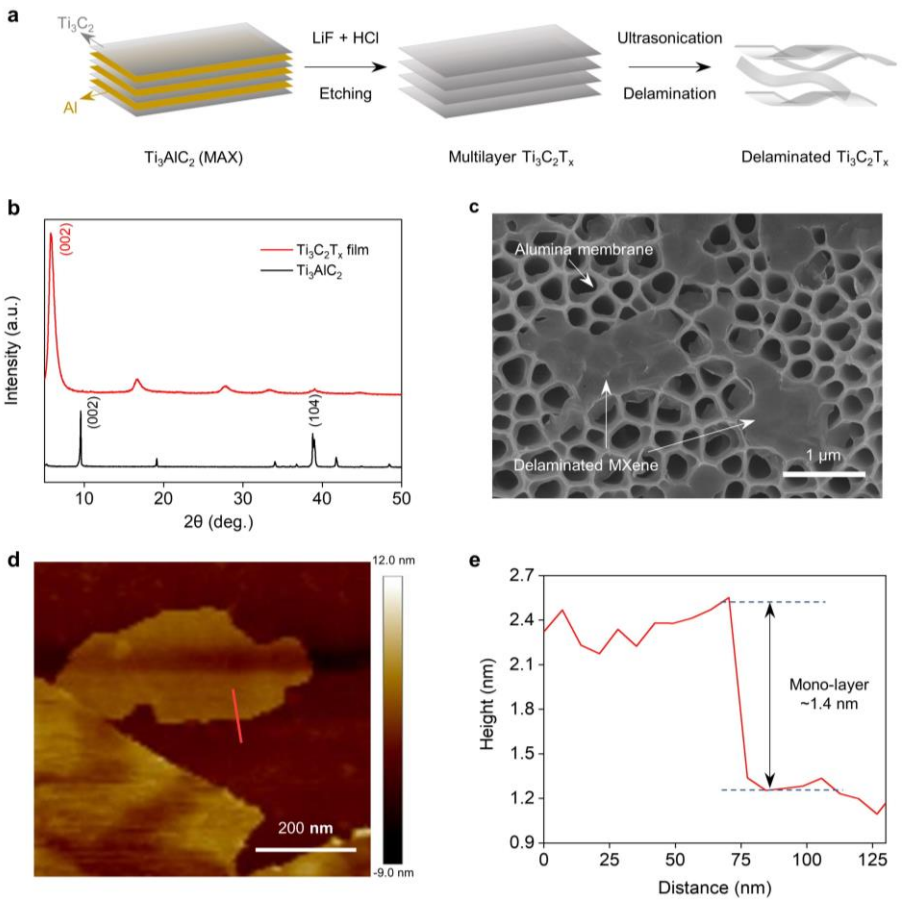

Fig. S6 a Schematic of the fabrication process of the delaminated MXene-$Ti_3C_2T_x$. **b** XRD patterns of the raw Ti_3AlC_2 and delaminated $Ti_3C_2T_x$ film. **c** SEM image of the prepared MXene nanosheet with the diameter of 1-2 μm. **d, e** AFM image and AFM section analysis of the prepared MXene nanosheet

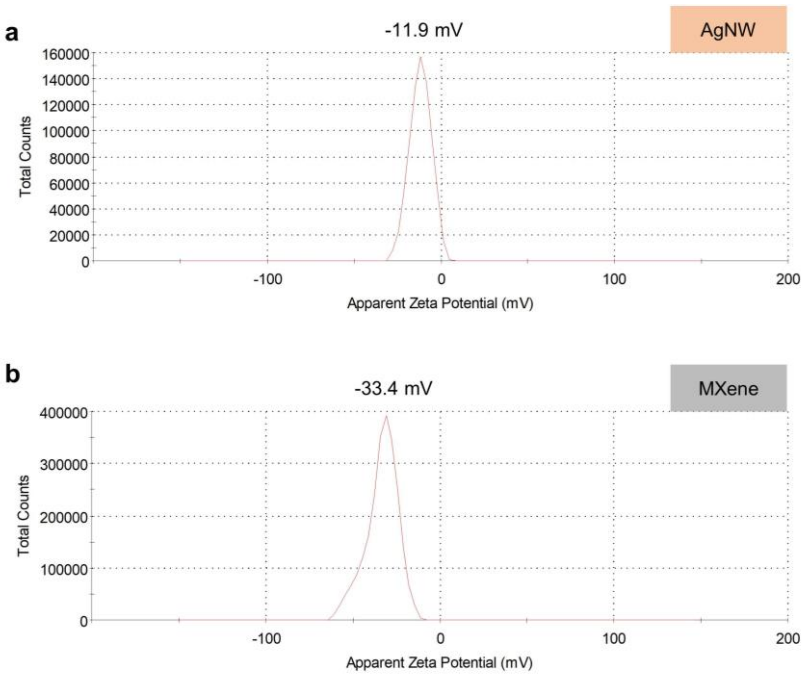

Fig. S7 Zeta-potentials of **a** the AgNW and **b** the $Ti_3C_2T_x$ MXene nanosheets

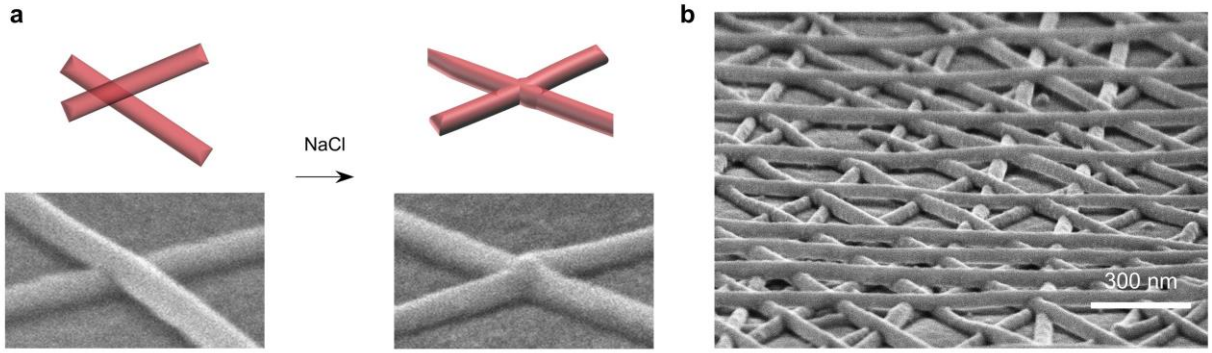

Fig. S8 a Welding of AgNWs network by NaCl solution treatment. **b** Tilted cross-sectional SEM image of the welded AgNW film with four layers

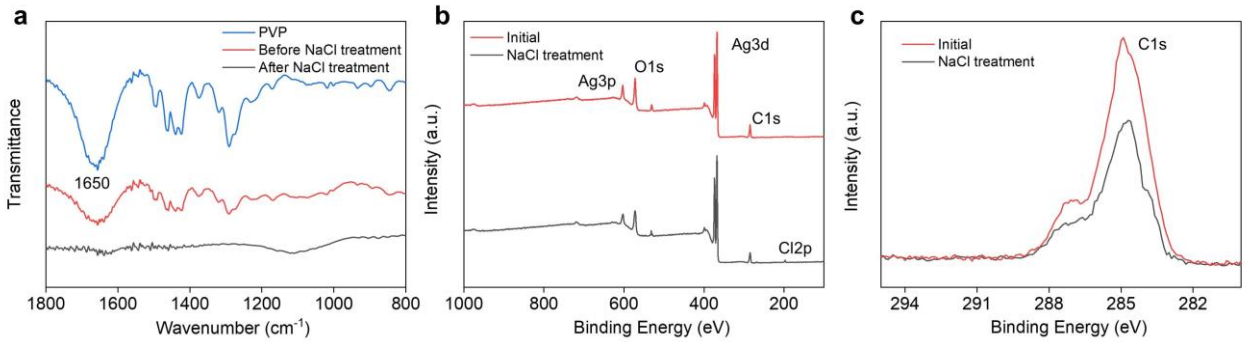

Fig. S9 a IR spectras of PVP and AgNW film before and after NaCl treatment. XPS survey **b** and C1s spectrum **c** of the AgNW film in initial state and after NaCl treatment

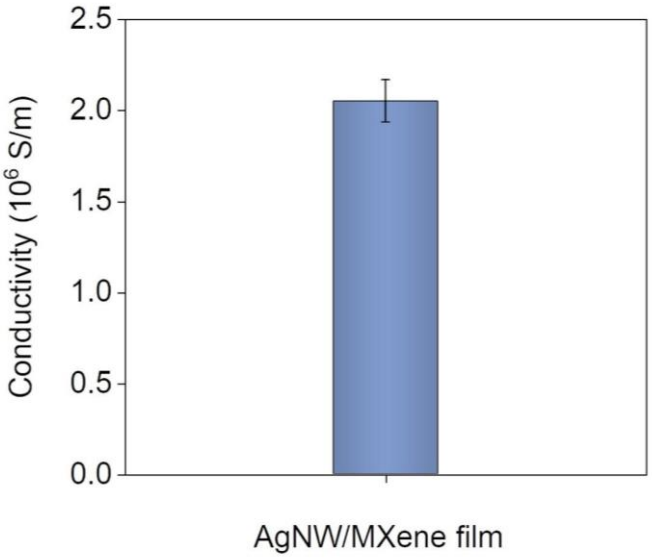

Fig. S10 The electrical conductivity of the AgNW/MXene composite electrode with four layers of AgNW

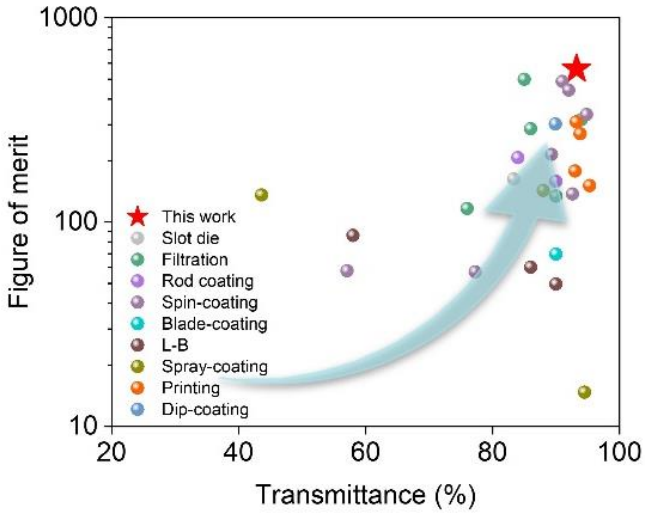

Fig. S11 Transmittance versus FoM for our AgNW-MXene FTEs with previously reported AgNW-based FTEs prepared by different methods (slot die, filtration, rod coating, spin-coating, blade-coating, L-B, spray-coating, printing and dip-coating) for comparison [S1-S28]

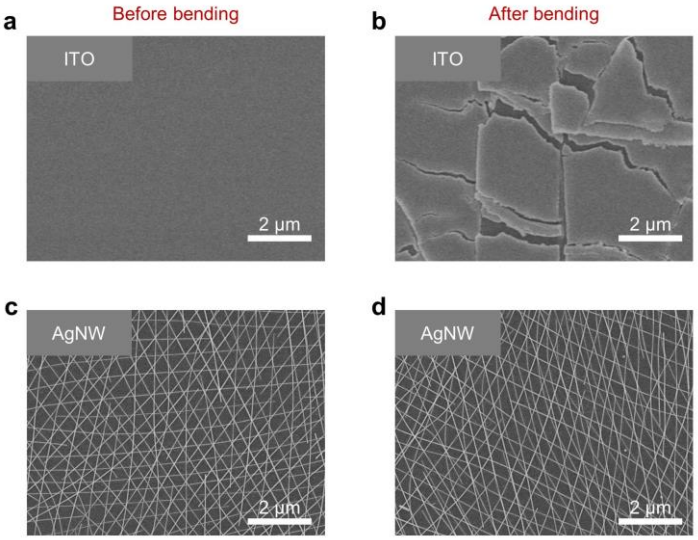

Fig. S12 SEM images of the ITO film **a, b** and AgNW film **c, d** before and after bending deformations

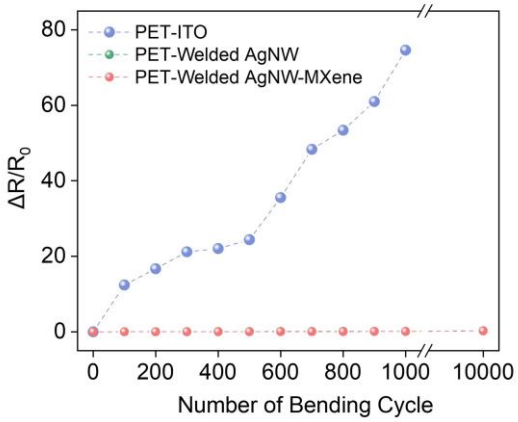

Fig. S13 Variation in ΔR/R0 versus the number of bending inward cycles from a diameter of 25 mm to 5 mm for the ITO, welded AgNW and welded AgNW-MXene film

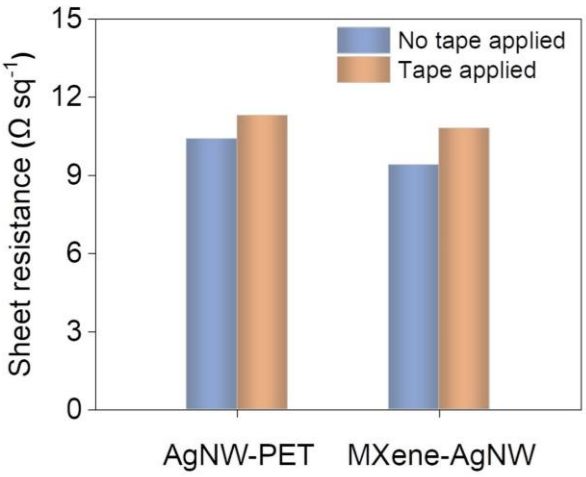

Fig. S14 The effect of the scotch tape test on the sheet resistance of the AgNW/PET and MXene/AgNW films

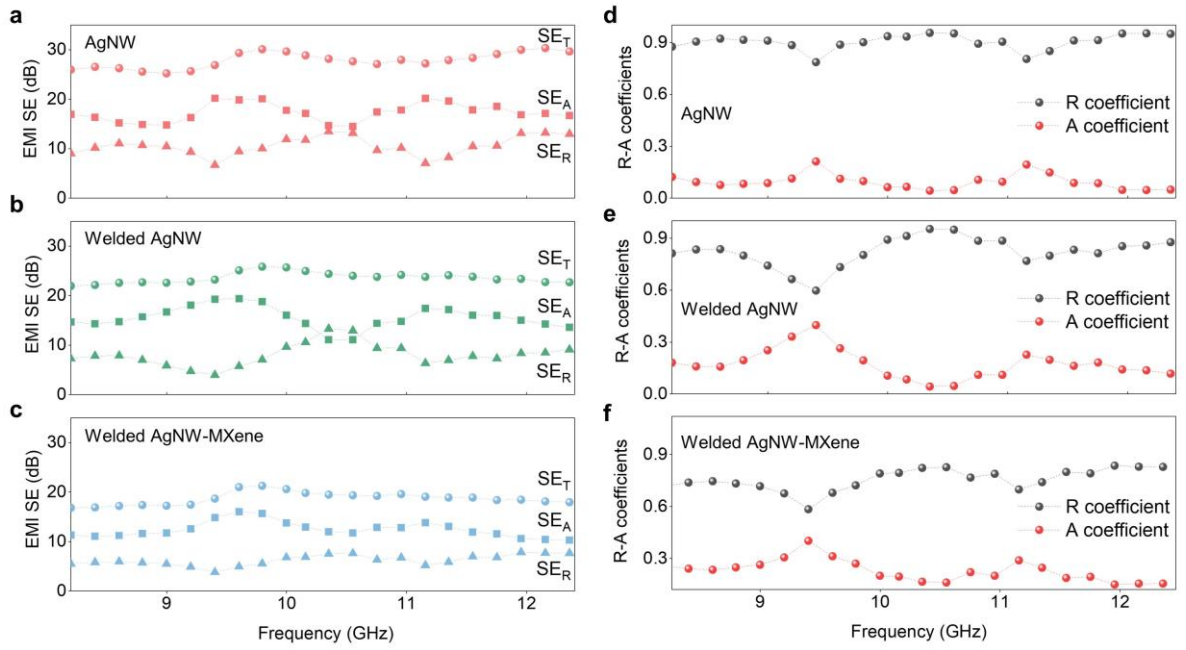

Fig. S15 Frequency dependence of the SER, SEA, SET values **a-c** and R-A coefficient **d-f** for the AgNW film, welded AgNW film and the welded AgNW-MXene film

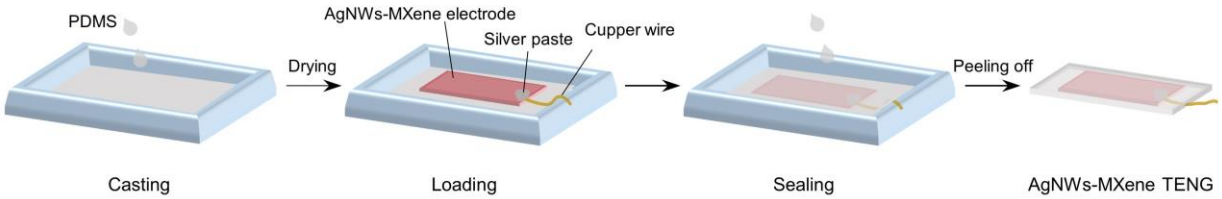

Fig. S16 Schematic illustration of fabrication process of AgNWs-MXene-based TENG

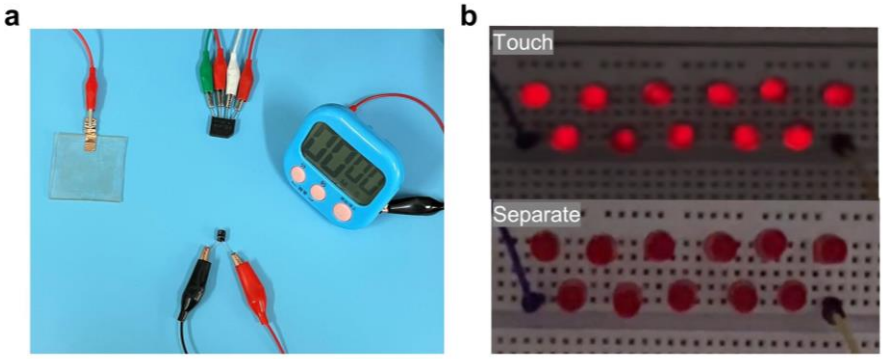

Fig. S17 Images of a time meter **a** and 11 red LEDs **b** powered by tapping the AM-TENG

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