

## Supplementary Information

### **Flexible active dual-parameter sensor for sensitive temperature and physiological signal monitoring via integrating thermoelectric and piezoelectric conversion**

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To exclude the triboelectric effect in TSPD, we compared these effects by fabricating a device that has triboelectric effect. We added a PI film on top of the TSPD without tight connection as shown in Fig. S1(a). Periodically repeated force of 45 N was loaded onto PI film, the output signals were recorded in Fig. S1(b). The output voltage was as high as 80 V with response time 10 ms. When a single triboelectric signal [see Fig. S1(c)] is compared with a piezoelectric signal from the TSPD [see Fig. S1(d)], it is clearly seen that there are intrinsic differences between these two types of signal. Triboelectric one has long response time and tens of magnitude higher output voltage. Thus, the triboelectric effect could be excluded from the device reported here.

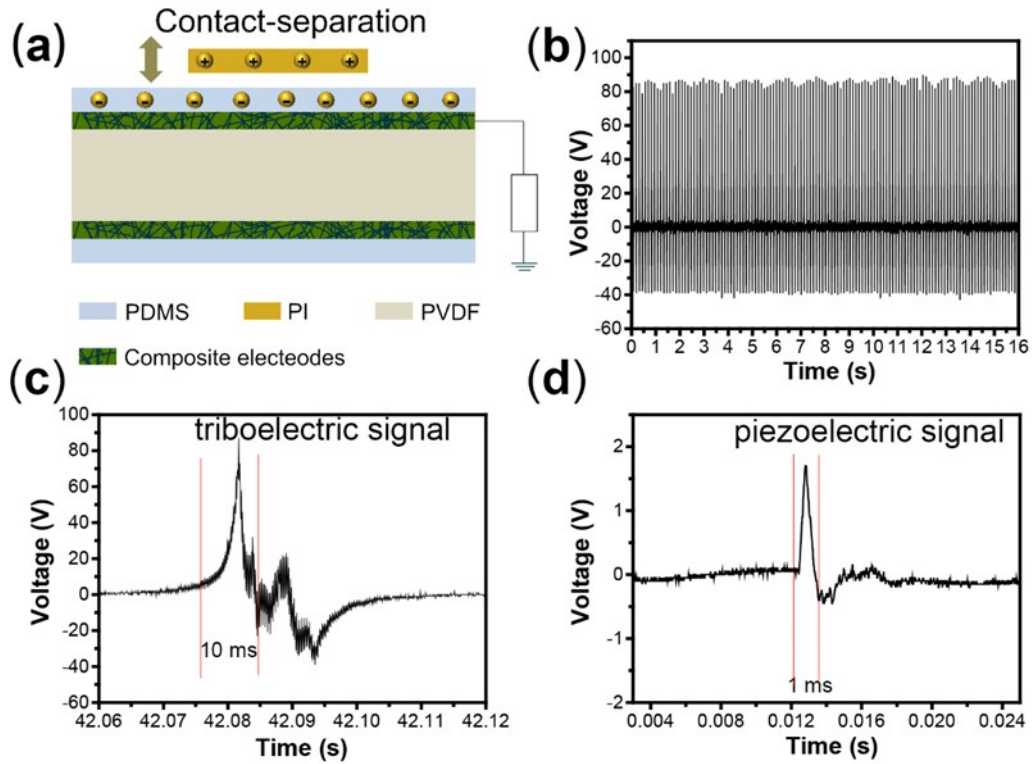


Fig.S1 Comparison between signals generated via triboelectric effect from the device with additional PI layer and signals traced from this study. (a) Configuration of the device with PI layer. (b) Output voltages of the device when subjected to periodically repeated force of 45 N. A signal period of (c) triboelectric signal and (d) piezoelectric signal.

The cross-sectional SEM image of commercial Ag coated PVDF film is shown in Fig. S2 for comparison. As seen, the thickness of Ag electrodes is around 12  $\mu\text{m}$ , which is close to the thickness of composite electrodes ( $\sim 10 \mu\text{m}$ ).

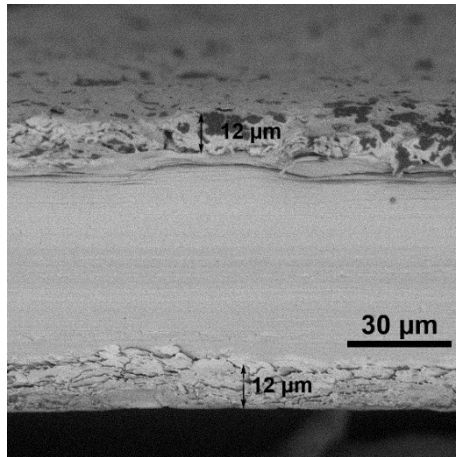


Fig. S2. The cross-sectional SEM image of commercial Ag electrode coated PVDF film.