Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Enhancement of triboelectricity based on fully organic composite films with conducting polymer

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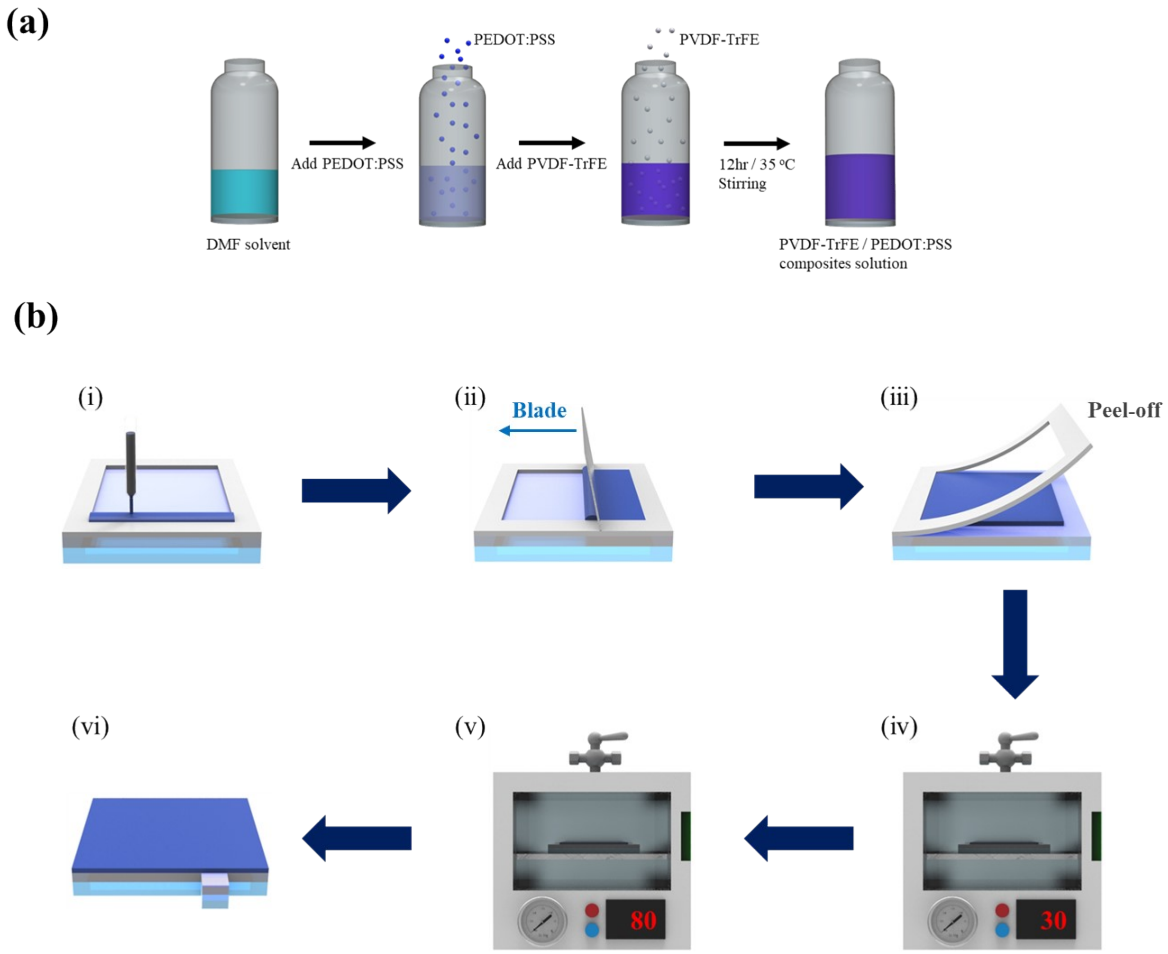

Fig. S1 (a) Preparation of PVDF-TrFE/PEDOT:PSS composite solutions. (b) Illustration of the fabrication of PVDF-TrFE/PEDOT:PSS composite films. (i) Attached the silicone rubber mold (4 x 4 cm^2) on ITO/PET substrate. And PVDF-TrFE/PEDOT:PSS composite solutions were dropped 0.3 ml inner silicone rubber mold (3 x 3 cm^2). (ii) The blade coating the solution. (iii) Peel off the silicone rubber mold. (iv) Vacuum process at 30 °C for 1 h to enhance interfaces between electrode and composite films. (v) The composite films were annealed at 80 °C for 3h. (vi) The composite film cropped except for the part where a copper wire was connected.

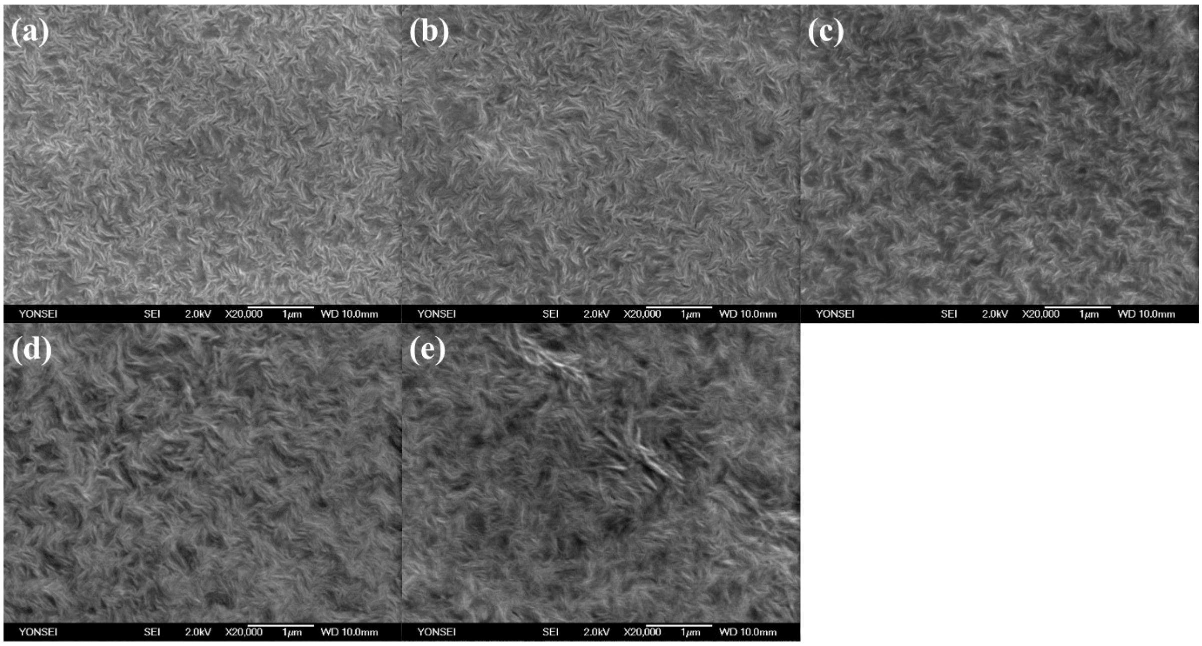

Fig. S2 FE-SEM images of the surface morphology of the PVDF-TrFE/PEDOT:PSS composite films with different PEDOT:PSS contents from 0% to 40%: (a) PVDF-TrFE films, (b) PVDF-TrFE/ 10 wt% PEDOT:PSS, (c) PVDF-TrFE/ 20 wt% PEDOT:PSS, (d) PVDF-TrFE/ 30 wt% PEDOT:PSS and (e) PVDF-TrFE/ 40 wt% PEDOT:PSS

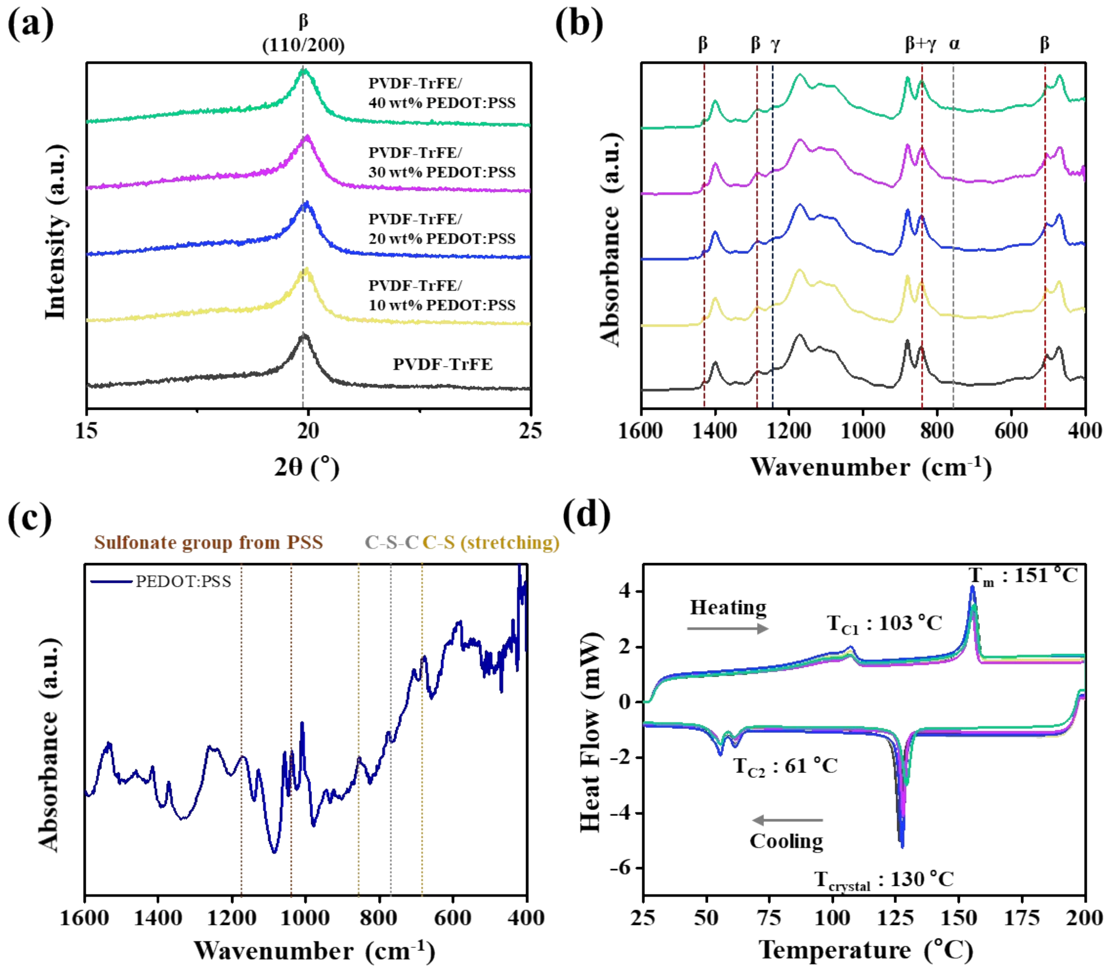

Fig. S3 The PVDF-TrFE/PEDOT:PSS composite films with different PEDOT:PSS contents from 0% to 40%: (a) XRD analysis, (b) FT-IR spectra from 400 cm^{-1} to 1600 cm^{-1} and (c) FT-IR spectra of the PEDOT:PSS films from 400cm^{-1} to 1600 cm^{-1}. (d) DSC heat flow vs. temperature during heating and cooling

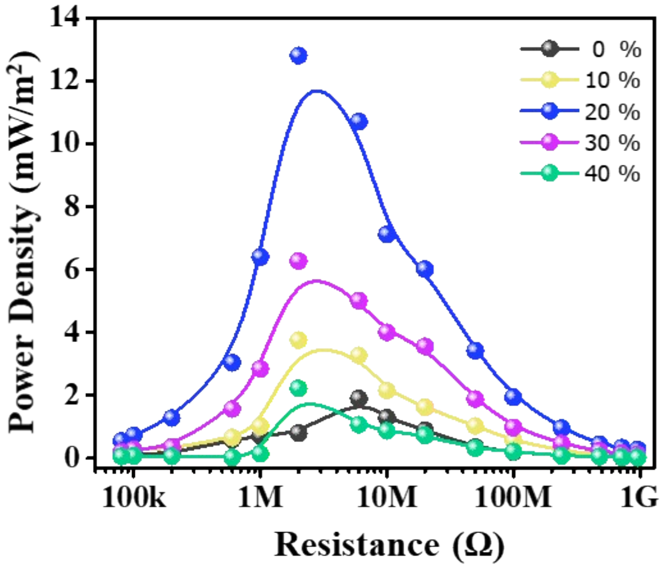

Fig. S4 Power density of PVDF-TrFE/PEDOT:PSS composite films with different PEDOT:PSS contents from 0% to 40% under changing external load resistance.

Table S1. Power density of PVDF-TrFE/PEDOT:PSS composite films with different PEDOT:PSS contents from 0% to 40% under changing external load resistance.

	PVDF-TrFE	10 wt% PEDOT:PSS	20 wt% PEDOT:PSS	30 wt% PEDOT:PSS	40 wt% PEDOT:PSS
Resistance (Ω)	6M	2M	2M	2M	2M
Power density (mW/m^2)	1.89	3.75	12.8	6.27	2.22

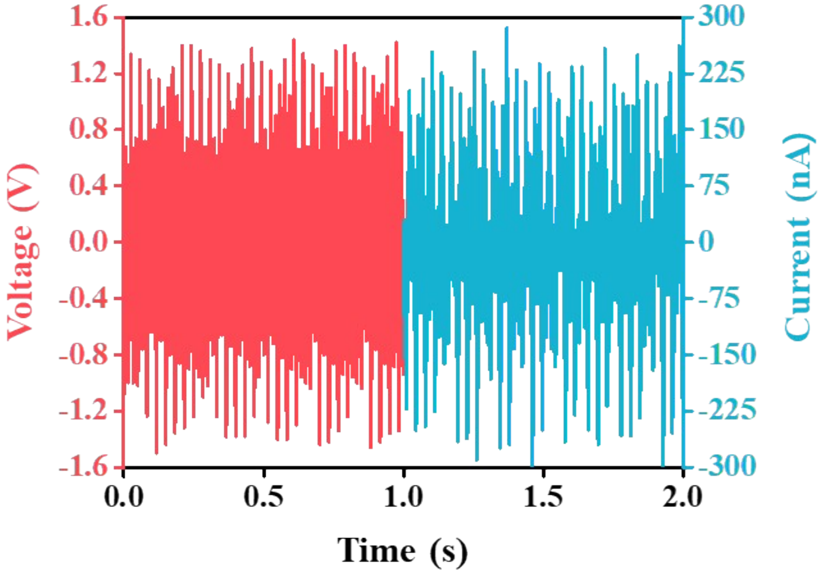

Fig. S5 The electrical output voltage and current of PVDF-TrFE films of FTENG by electric fan.

Table S2. Comparison of the TENGs systems based on PVDF composites with nanofiller.

Host Material	Nanofiller	Structure	Opposite Materials	V_o (V)	I_{sc}	Power Density	Input Condition	Refs.
PVDF-TrFE	MoS_2	Composite films	Nylon/MoS_2 composite films	145	350 μA	50 mW/cm^2 (@10MΩ)	0.25 MPa	13
PVDF	AgNW	Nanofibers	Nylon nanofiber	240	12 μA	-	5 N	17
PVDF-TrFE	$BaTiO_3$	Composite multilayer films	Al	44.5	1.77 $\mu A/cm^2$	29.4 $\mu W/cm^2$ (@100MΩ)	2 Hz	18
PVDF-TrFE	Polyaniline	Porous aerogel	-	246	122 μA	6.69 W/m^2 (@10MΩ)	30 Hz	28
PVDF-TrFE	ZrO_2	Composite films	Nylon/PMMA composite films	500	500 $\mu A/cm^2$	42 mW/cm^2 (@10MΩ)	10 Hz	29
PVDF	$Ti_3C_2T_x$	Composite films	Cu tape	220	18 μA	2.6 mW (@10MΩ)	4 Hz	30
PVDF-TrFE	PEDOT:PSS	Composite films	PI film	15	2.3 μA	12.8 mW/m^2 (@6MΩ)	1 Hz	This work

Video S1 FTENG acts according to flow rate of 6.5 m/s.

Video S2 Nine commercial green light-emitting diodes lit on by FTENG.