

Supporting Information

Self-assembled molecularly triboelectronegative cellulose nanofiber material with ultrahigh contact triboelectrification for design of green triboelectric nanogenerators

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Supplementary Figures

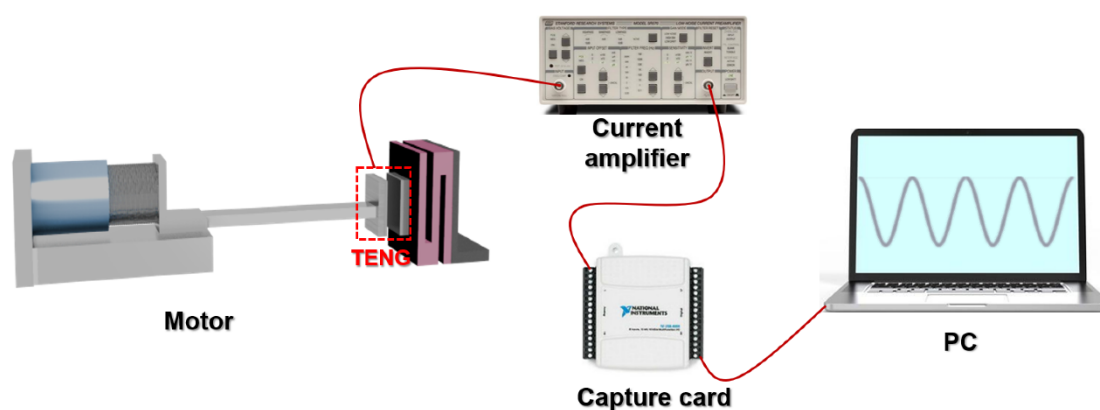


Fig. S1 Schematic diagram of TENG test.

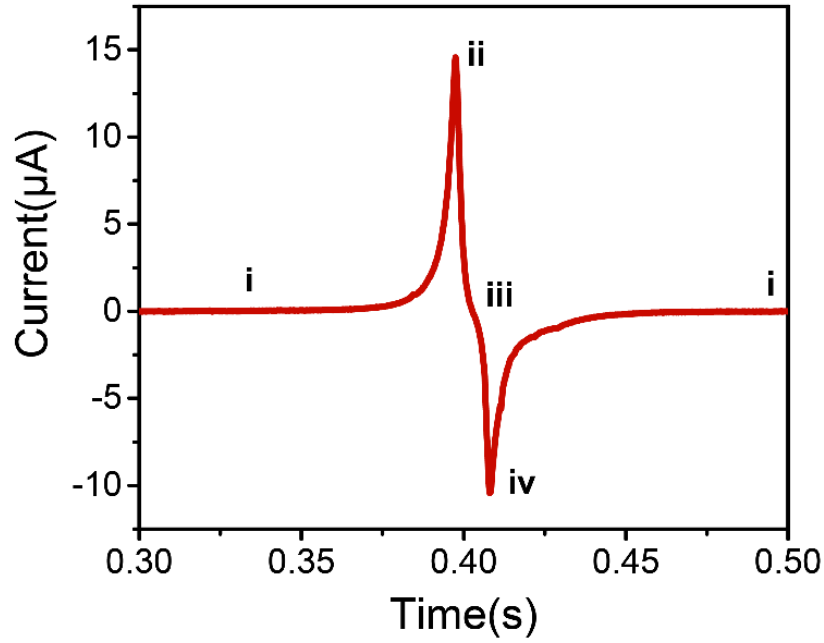


Fig. S2 Corresponding electrical signals during the contact-separation process of the TENG's tribolayers.

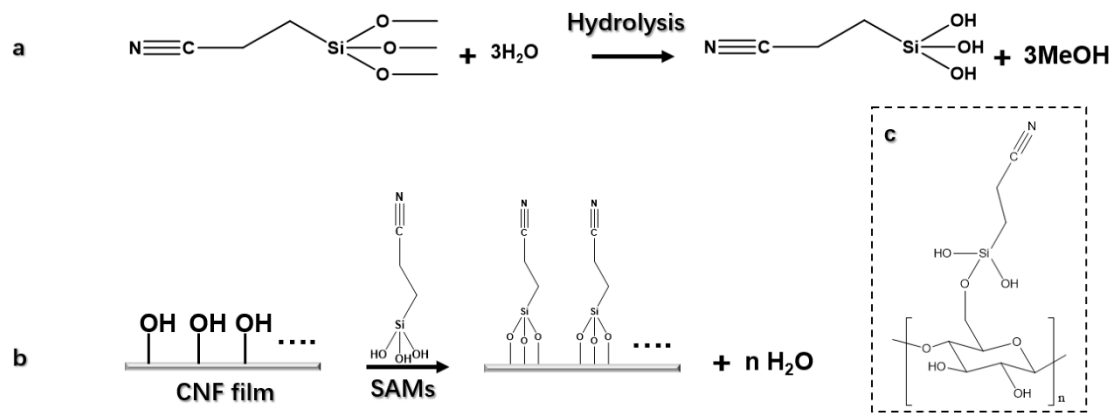


Fig. S3 Schematic diagram of the preparation process of TESP@CNF film. (a) Hydrolysis of TESP. (b) Self-assembly process of TESP on the surface of hydroxyl-rich CNF film. (c) Schematic diagram of the molecular structure of TESP@CNF.

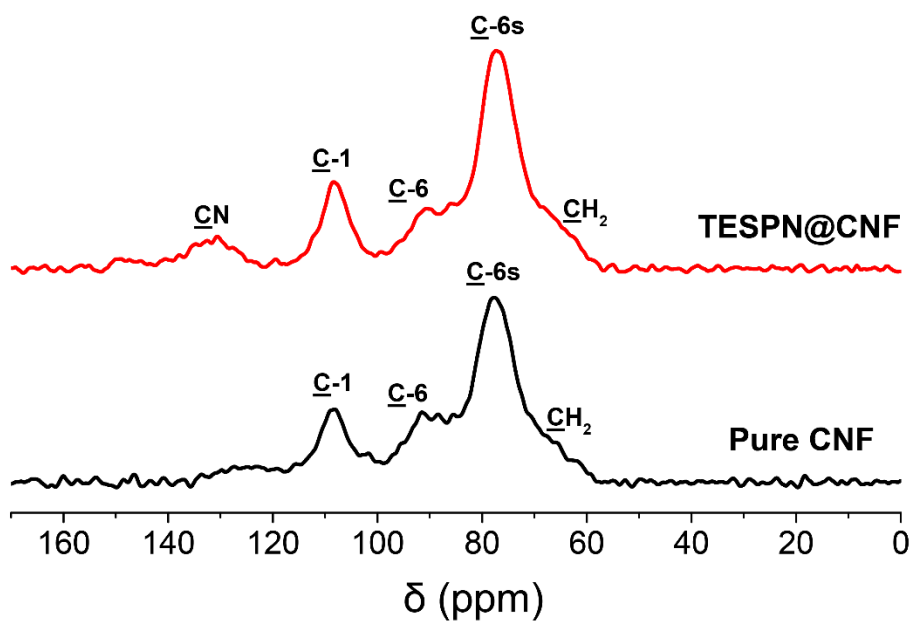


Fig. S4 ^{13}C solid-state NMR comparison of pure CNF and TESP@CNF.

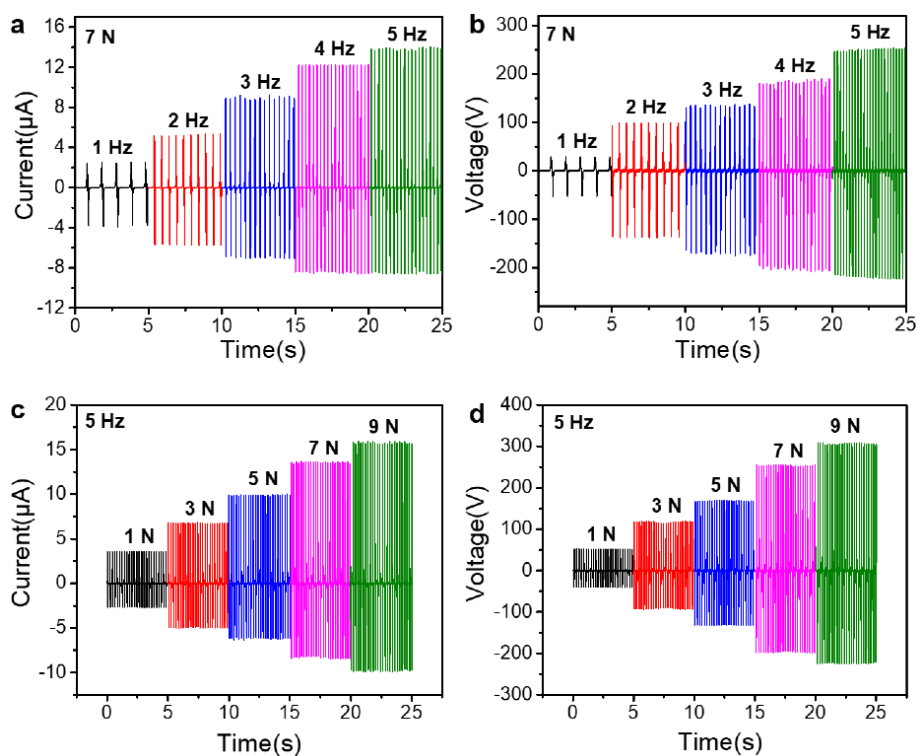


Fig. S5 Comparison of (a) output current and (b) output voltage of TESP@CNF-based TENG at different frequencies. (c) Output current and (d) output voltage of TESP@CNF-based TENG under different impact forces.

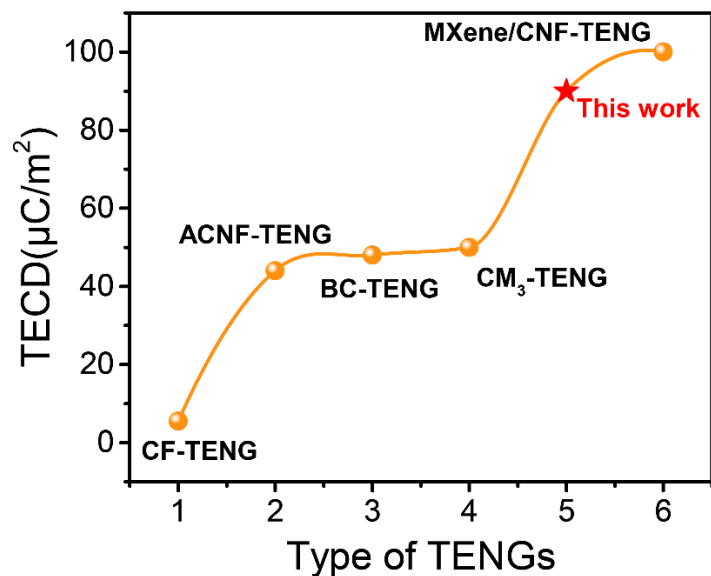


Fig. S6 TECD comparison of CNF-based TENG reported in recent years.

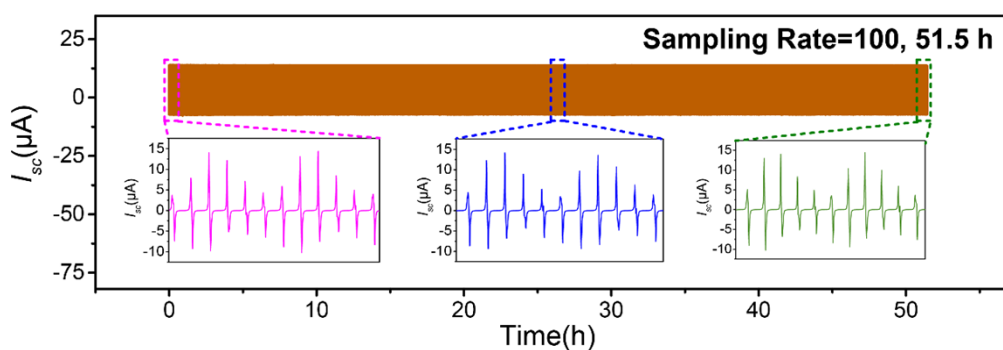


Fig. S7 Durability testing of TESP@CNF-based TENG.

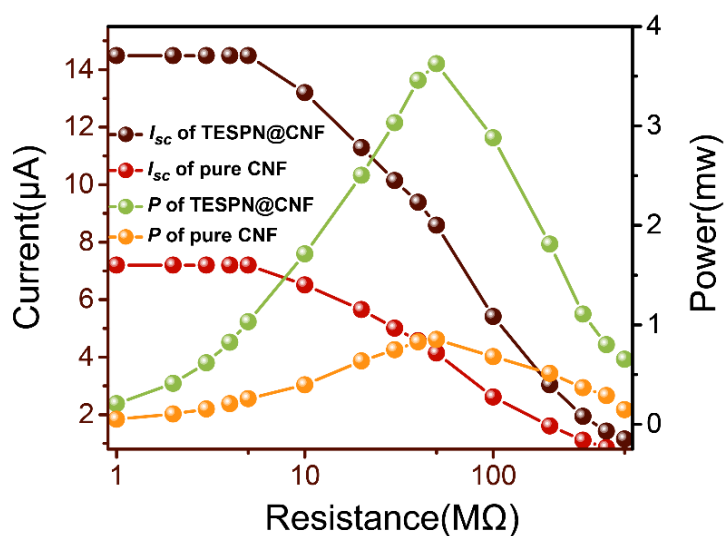


Fig. S8 Dependence of the I_{sc} and the corresponding power on the external loading resistance of CNF-SO₃Na-PTFE based TENG.

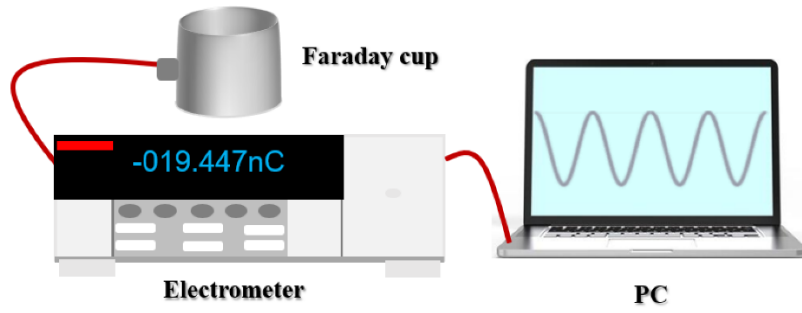


Fig. S9 Schematic of real-time charge tested by the Faraday cup.

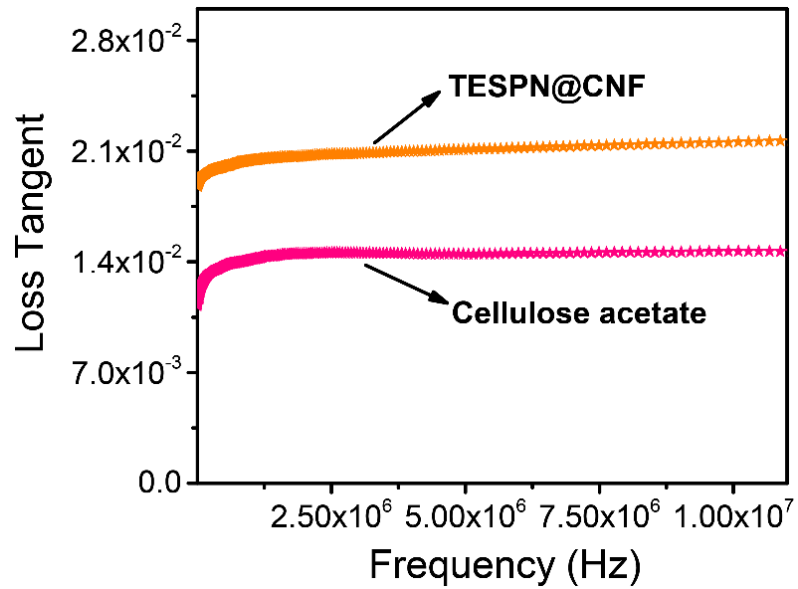


Fig. S10 Dielectric loss comparison of cellulose acetate and TESPN@CNF films.

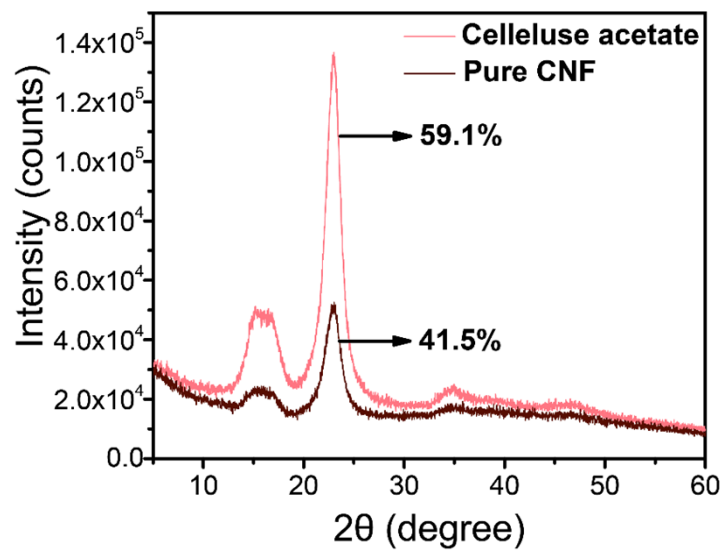


Fig. S11 XRD of cellulose acetate and TESPN@CNF films.

Table R1. The atomic content of N and Si in the TESPN@CNF film measured by XPS.

Name	Start BE	Peak BE	End BE	Height CPS	FWHM eV	Area (P) CPS.eV	Area (N) TPP-2M	Atomic %
C1s	297.98	285.03	279.18	94423.32	1.77	301994.9	4235.3	65.64
N1s	409.98	399.61	392.18	4971.7	2.5	12496.68	113.26	1.74
O1s	544.98	532.52	525.18	144443.04	2.21	349107.62	2026.24	31.4
Si2p	109.98	102.27	95.18	1374.14	2.42	4558.51	77.22	1.21

Supplementary Movies

Supplementary Video 1: Demonstration experiment of TESPN@CNF-based TENG powering 63 LEDs and electronic watch.

Supplementary Video 2: Demonstration experiment of joint state monitoring of TESPN@CNF-based TENG attached to the human body.