

Supplementary information for

Polyurethane-based nanocomposite film with thermal deicing capability and anti-erosion for wind turbine blades protection at extreme-environment

1. Supporting Figures

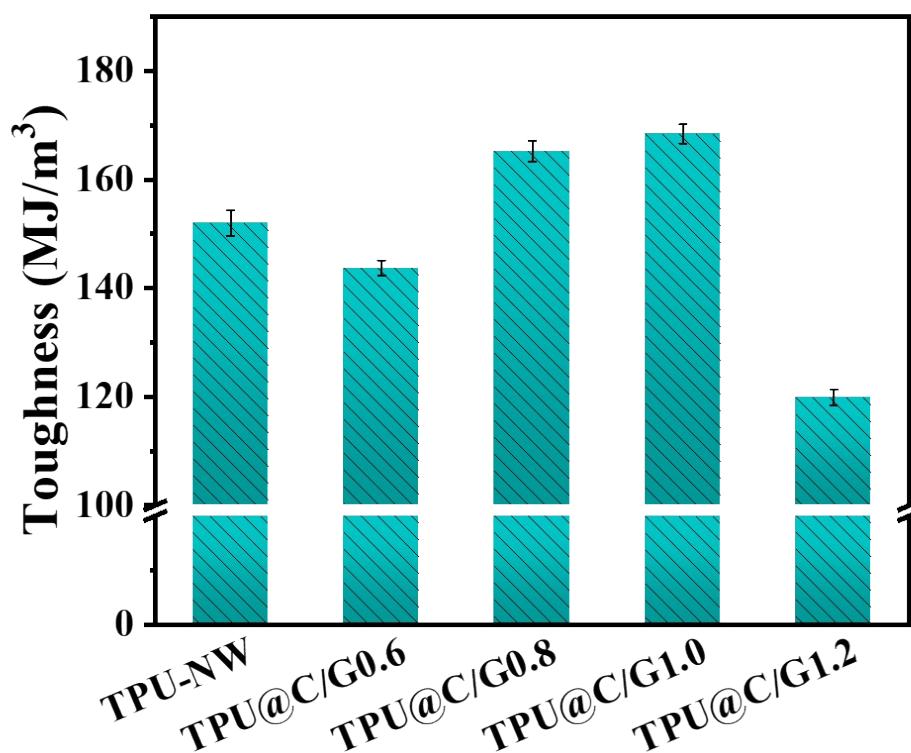


Fig S1. Toughness of as-prepared TPU-NW and its nanocomposite films.

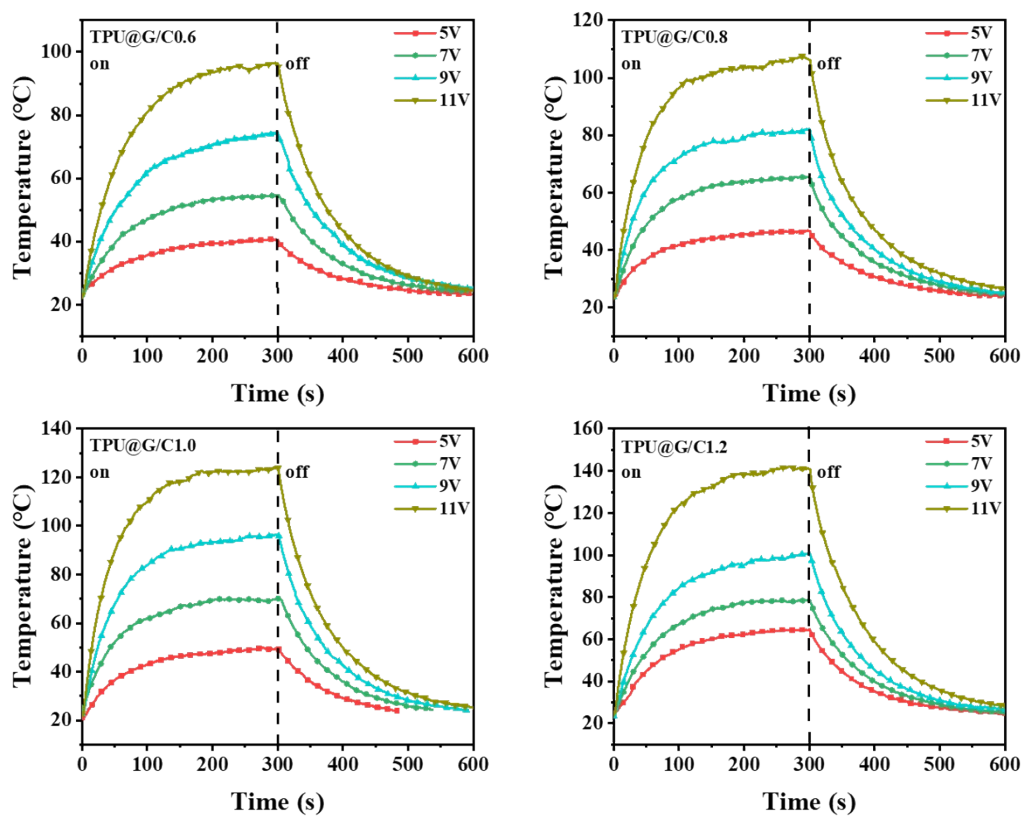


Fig S2. The real-time surface temperature of heaters under different DC voltages.

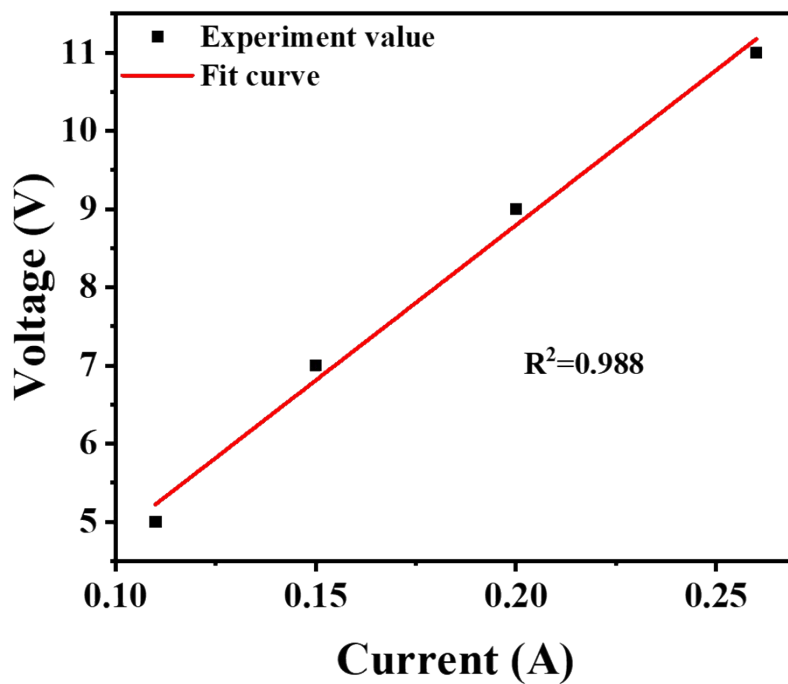


Fig S3. Voltage basically is directly proportional to current for the TPU@G/C1.0. (Joule law)

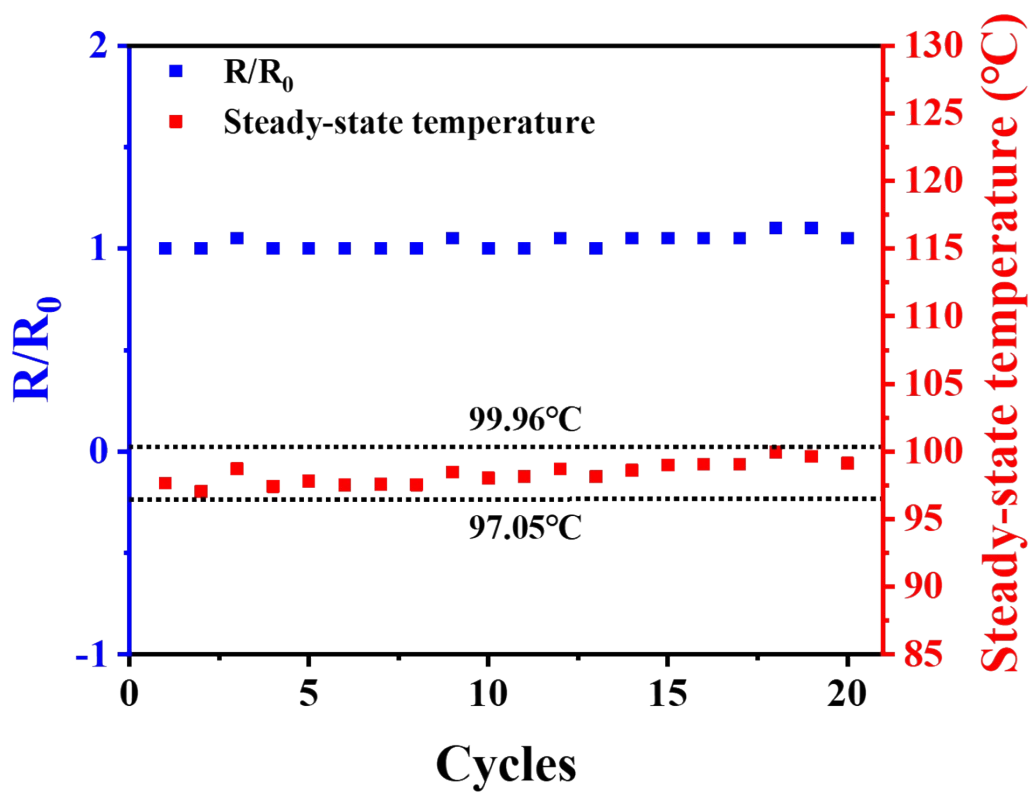


Fig S4. Steady-state temperature and resistance fluctuations of TPU@G/C1.0 during 20 heating and cooling cycles at 9 V. (R₀ is the initial resistance. R is the real-time resistance.)

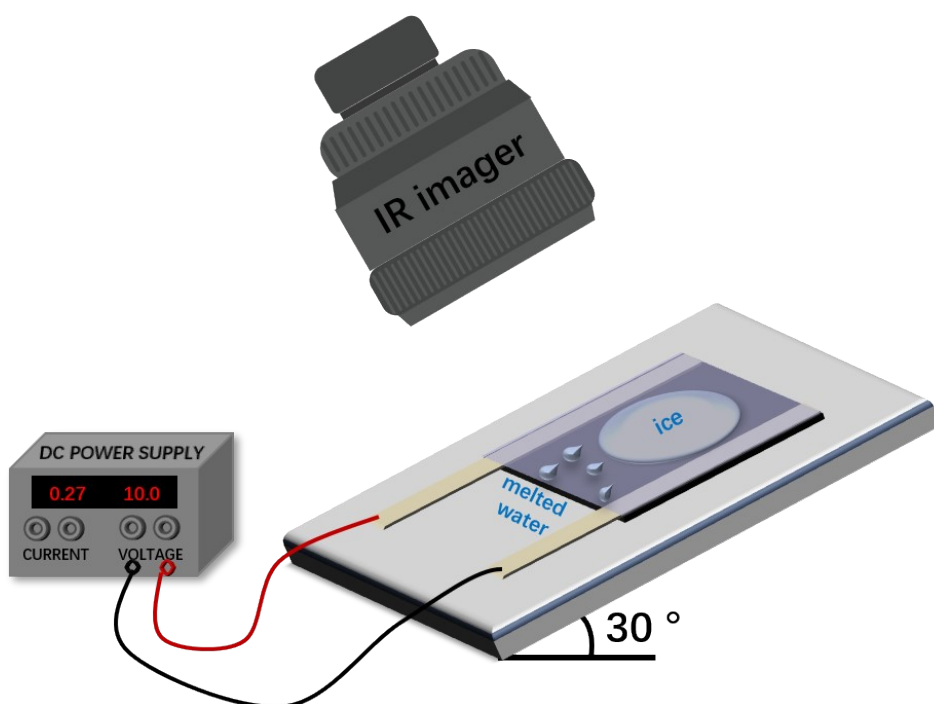


Fig S5. Equipment of the electrothermal deicing test

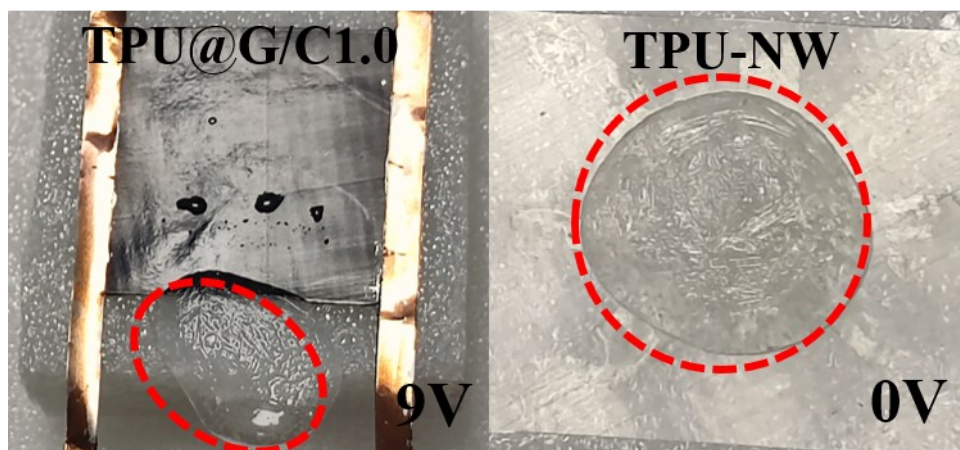


Fig S6. The actual comparison images after 150 s deicing test.

2. Supporting Table

Table S1. Content of G/C in nanocomposite films.

Samples	content of G/C(wt%)
TPU-NW	0
TPU@C/G0.6	1.35
TPU@C/G0.8	1.69
TPU@C/G1.0	2.02
TPU@C/G1.2	2.34

Table S2. square resistance (R), conductivity (σ) and resistivity (ρ) of the heaters.

Sample	R/ Ω	$\sigma/S \cdot m^{-1}$	$\rho/\Omega \cdot cm$
TPU-NW	∞	0	--
TPU@G/C0.6	62.31	161.29	0.62
TPU@G/C0.8	41.40	243.90	0.41
TPU@G/C1.0	34.59	294.12	0.34
TPU@G/C1.2	32.10	312.50	0.32