Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

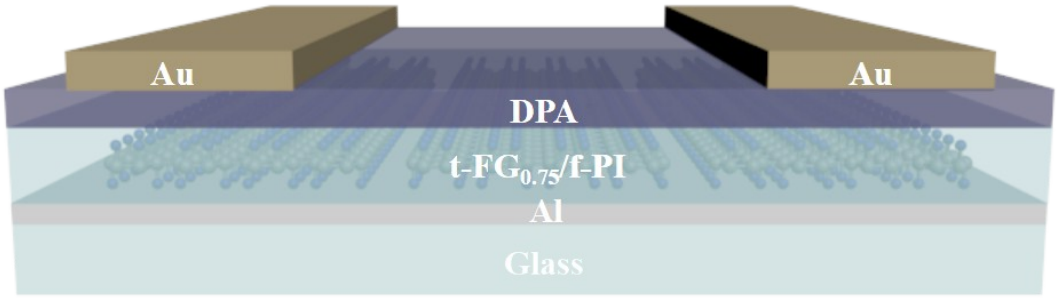

Fig. S1 The structure of OTFT with t-$FG_{0.75}$/f-PI composite film as a dielectric layer (the thickness of dielectric layer and DPA layer are 180 nm and 40 nm respectively)

Table S1 Chemical position of t-FG exfoliated by the solvothermal intercalation at 80 °C, 90 °C, 100 °C

T (°C)	Chemical position		
	C (at%)	F (at%)	N (at%)
80	55.91	42.21	1.88
90	56.75	41.87	1.38
100	63.12	35.52	1.36

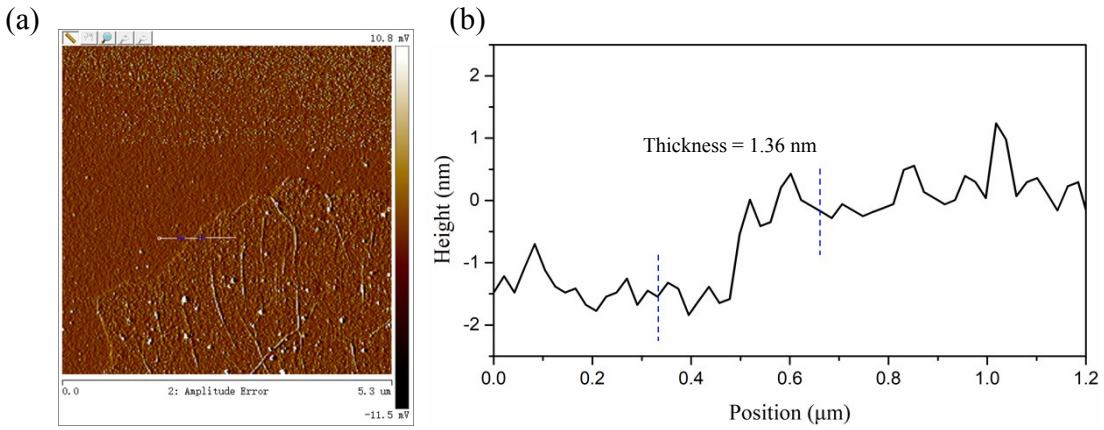

Fig. S2 (a) The AFM image and (b) height of cross-section of t-FG.

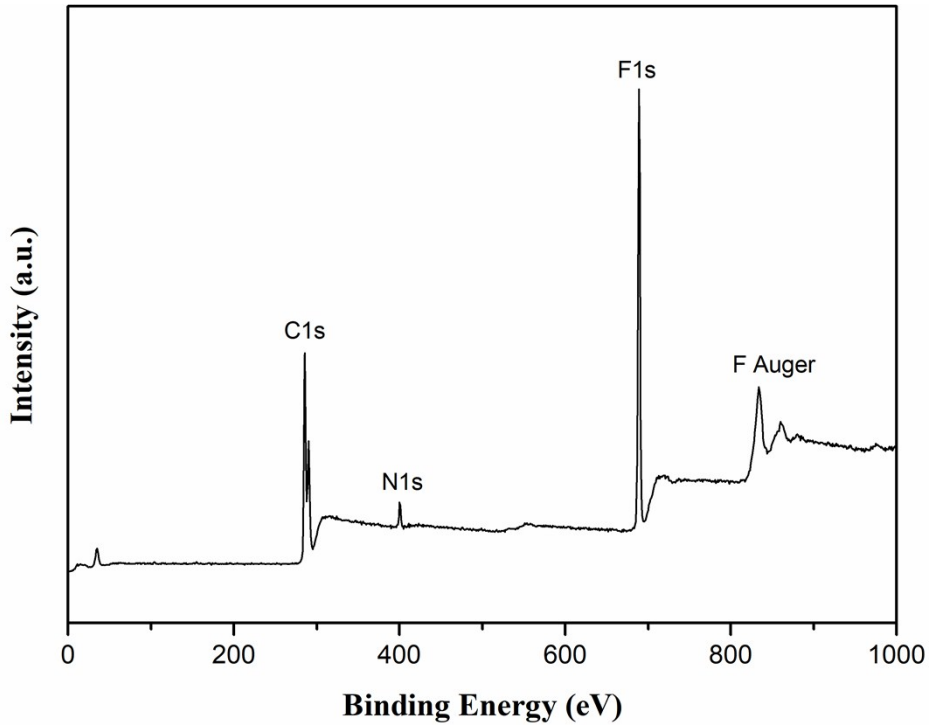

Fig. S3 XPS survey spectra of t-FG nanosheets

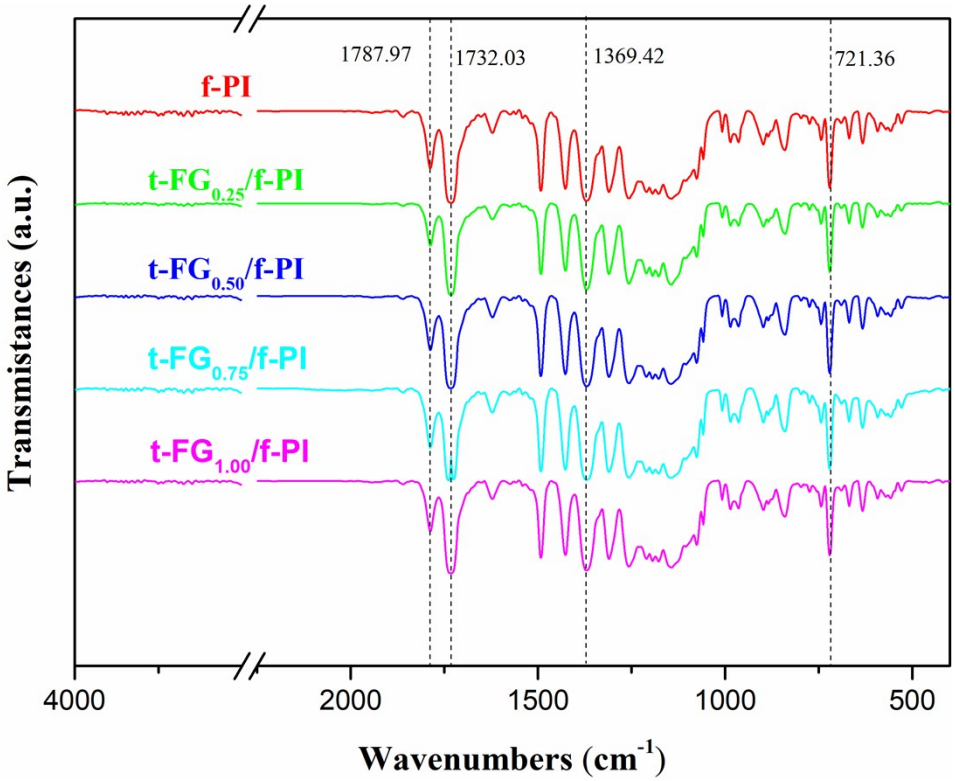

Fig. S4 FT-IR spectra of f-PI and t-FG/f-PI composite films

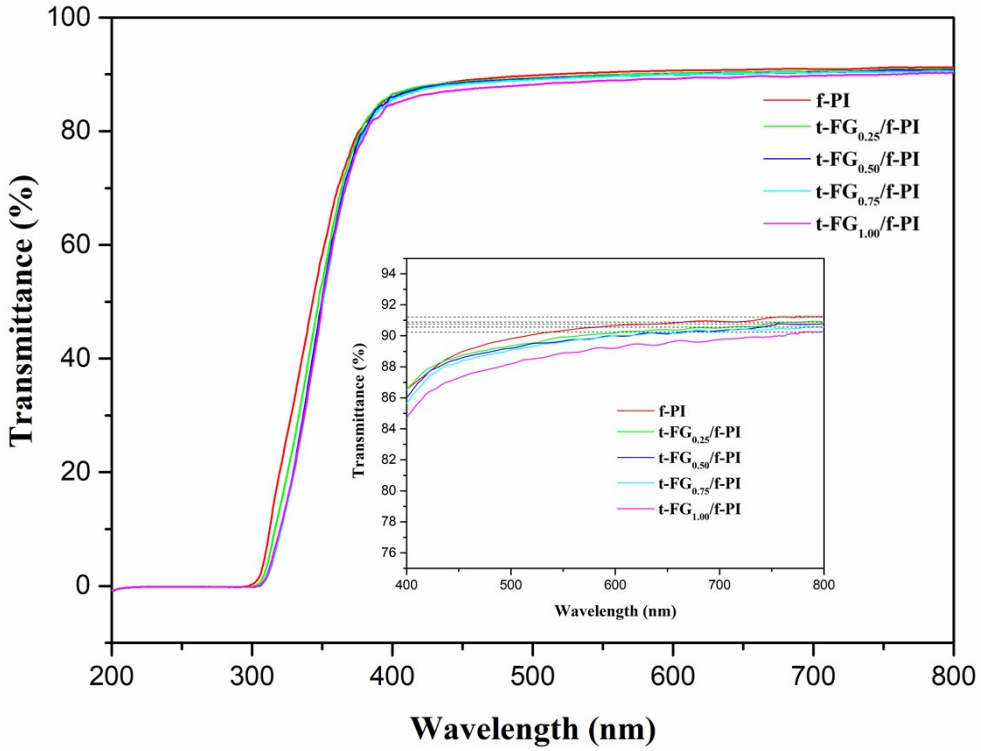

Fig. S5 Optical transmission spectra of f-PI and t-FG/f-PI composite films (thinkness: 3 ± 0.25 μm). The inset figures show the transmission spectra at a 400–800 nm wavelength

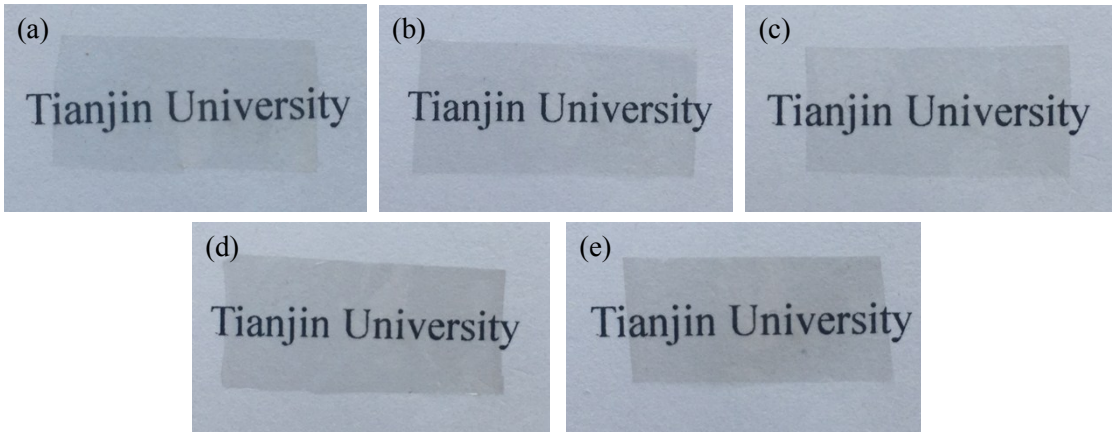

Fig. S6 The optical photographs of (a) pure f-PI, (b) t-$FG_{0.25}$/f-PI, (c) t-$FG_{0.50}$/f-PI, (d) t-$FG_{0.75}$/f-PI, (e) t-$FG_{1.00}$/f-PI composite films

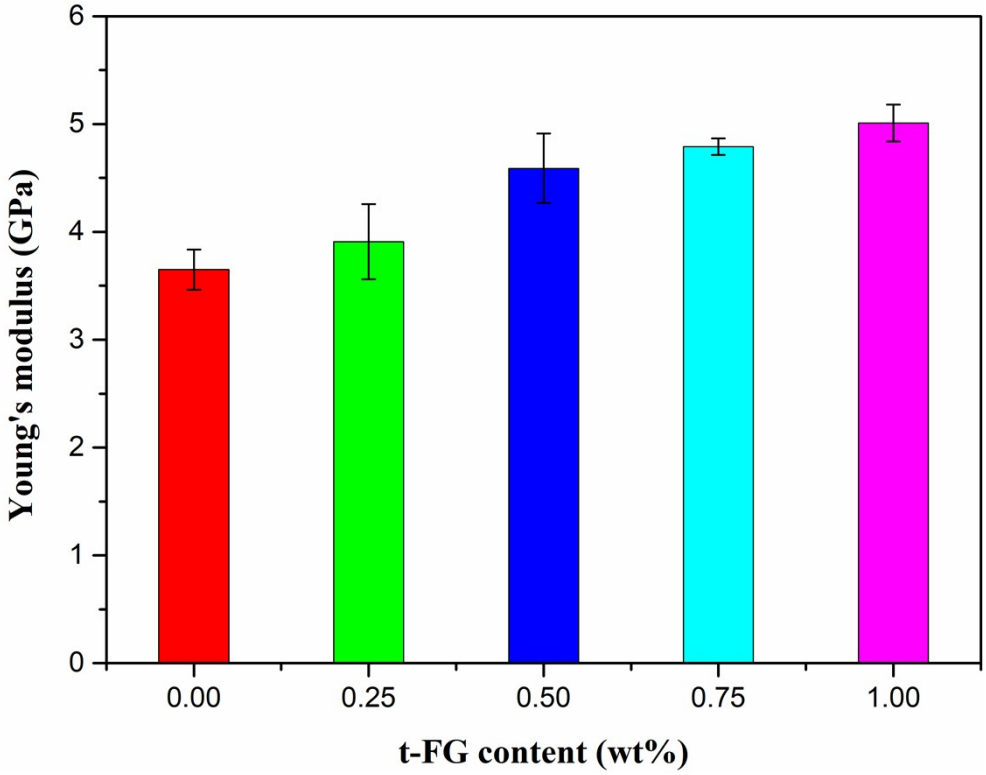

Fig. S7 Young's modulus of f-PI and t-FG/f-PI composite films

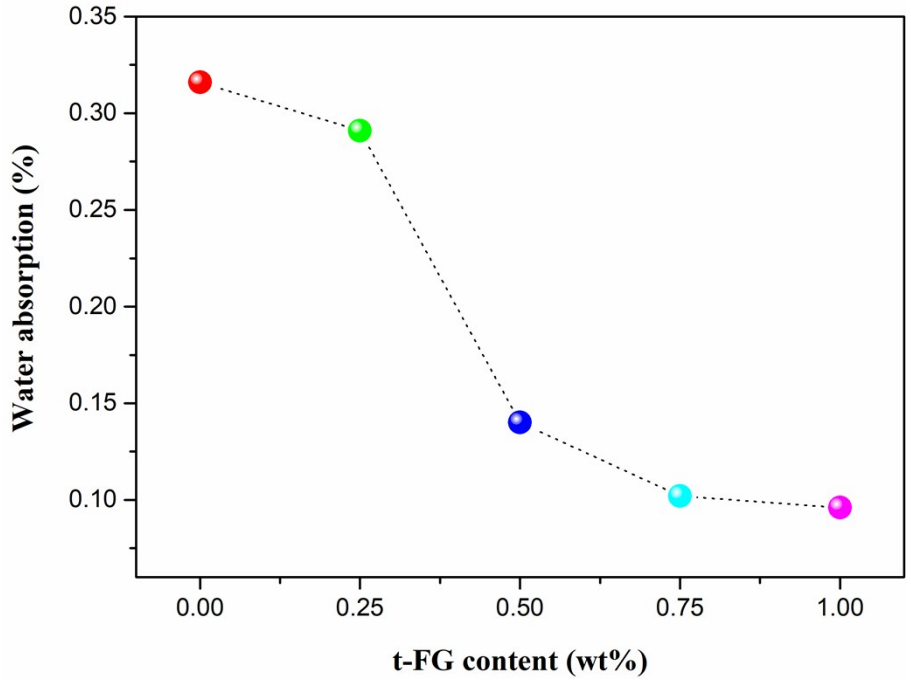

Fig. S8 Water absorption of f-PI and t-FG/f-PI composite films

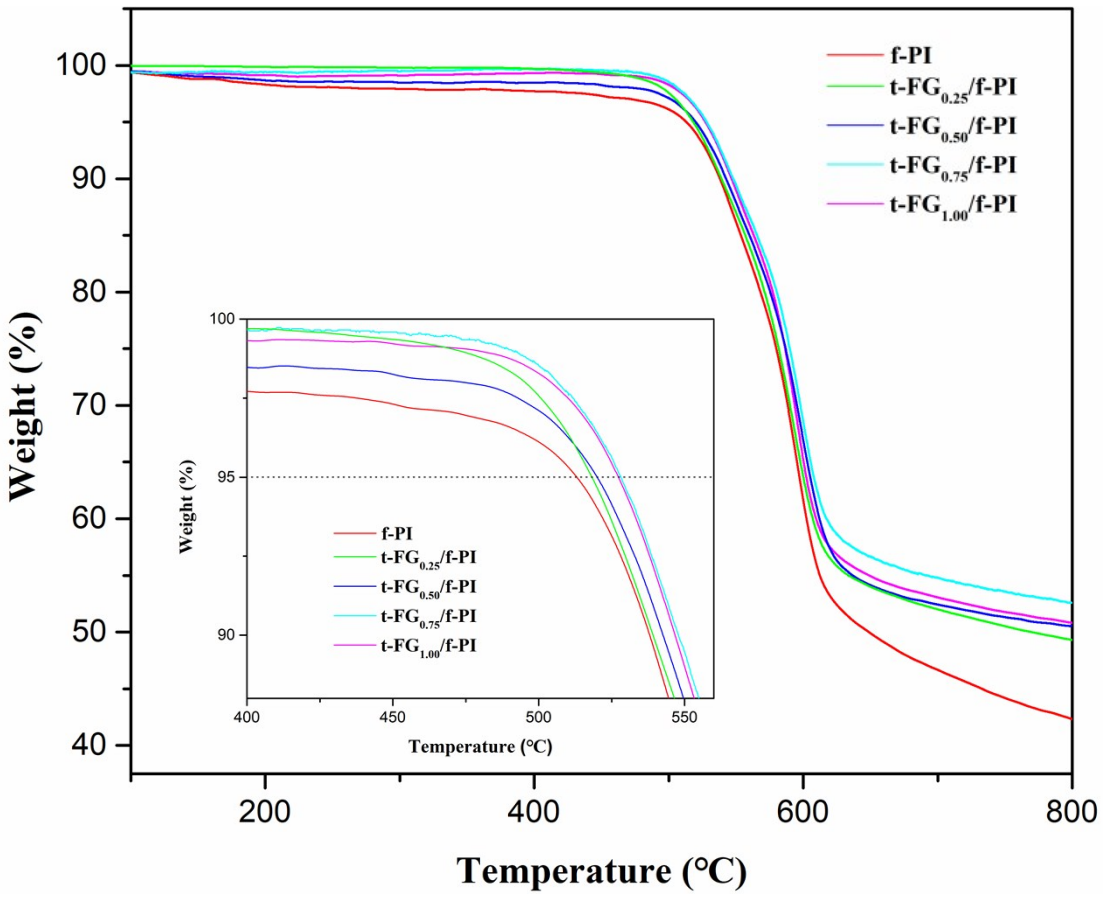

Fig. S9 TGA thermograms of f-PI and t-FG/f-PI composite films

Table S2 Thermal properties of f-PI and t-FG/f-PI composite films

Sample	Thermal properties		
	T_g[a] (°C)	$T_{d5\%}$[b] (°C)	CTE[c] (ppm/K)
f-PI	329	512	62.7
t-$FG_{0.25}$/f-PI	333	518	46.3
t-$FG_{0.50}$/f-PI	343	520	33.4
t-$FG_{0.75}$/f-PI	358	528	28.4
t-$FG_{1.00}$/f-PI	355	527	26.9

[a] Glass transition temperature measured by DSC. [b] Temperature at 5% weight loss occurred. [c] Coefficient of thermal expansion data were determined over a 50-200 °C range by tension mode.

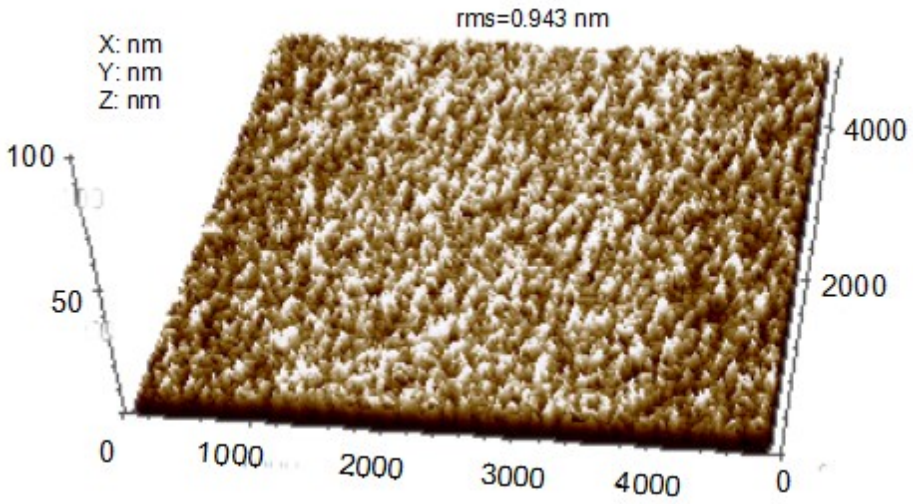

Fig. S10 AFM surface 3D image of t-$FG_{0.75}$/f-PI composite film