Supporting Information

A wearable high capacitance performance PLA cable supercapacitor with high loading PPy

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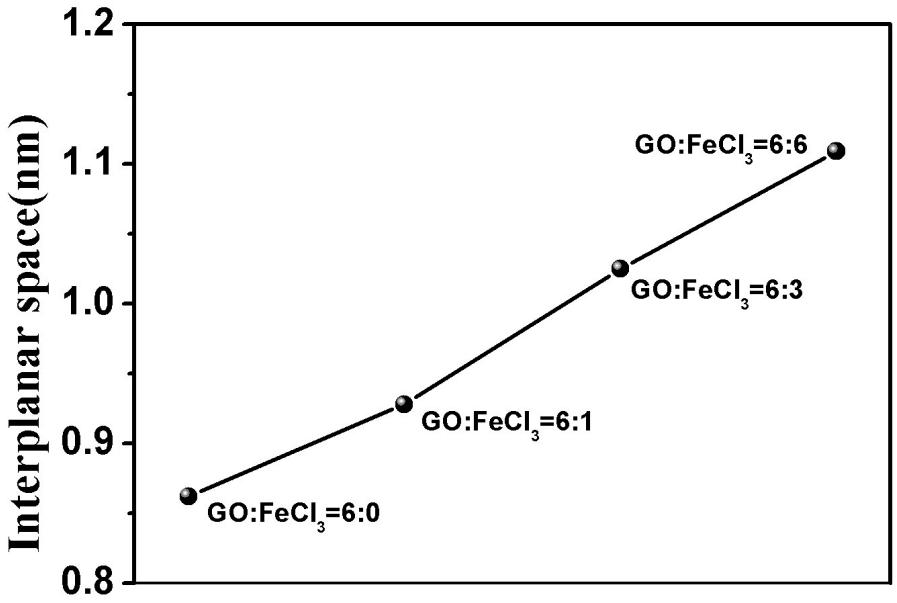

Figure S1. The interplanar spacing of the intercalated complex with different mass rate of $FeCl_3$.

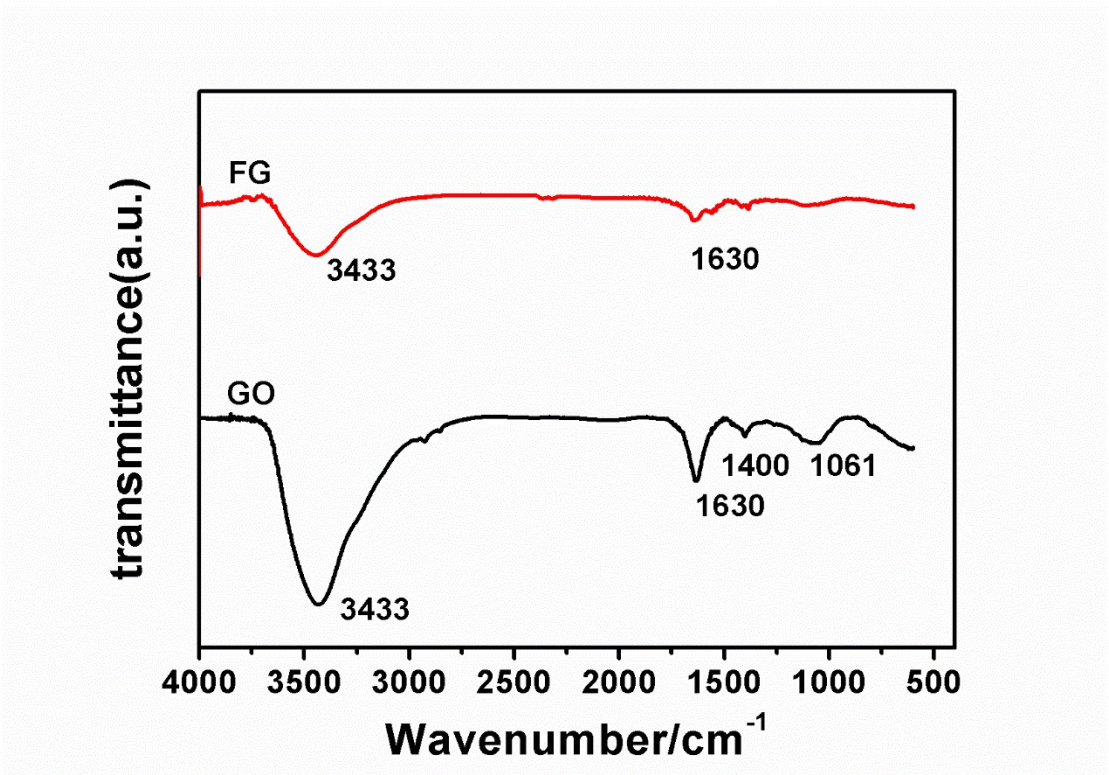

Figure S2. FTIR spectra of FG and GO.

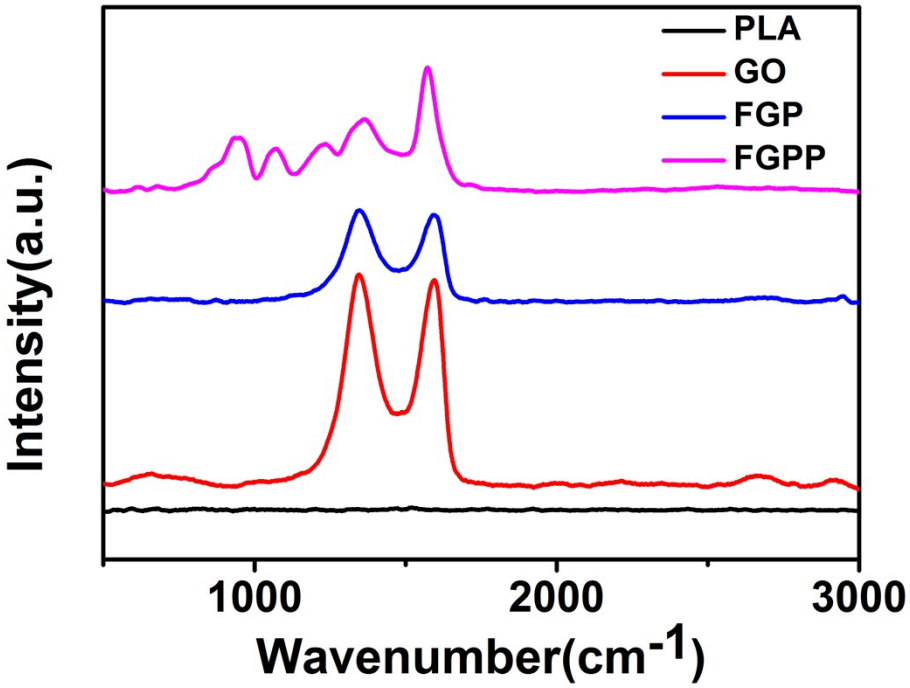

Figure S3. Raman spectrums of PLA, GO, FGP and FGPP.

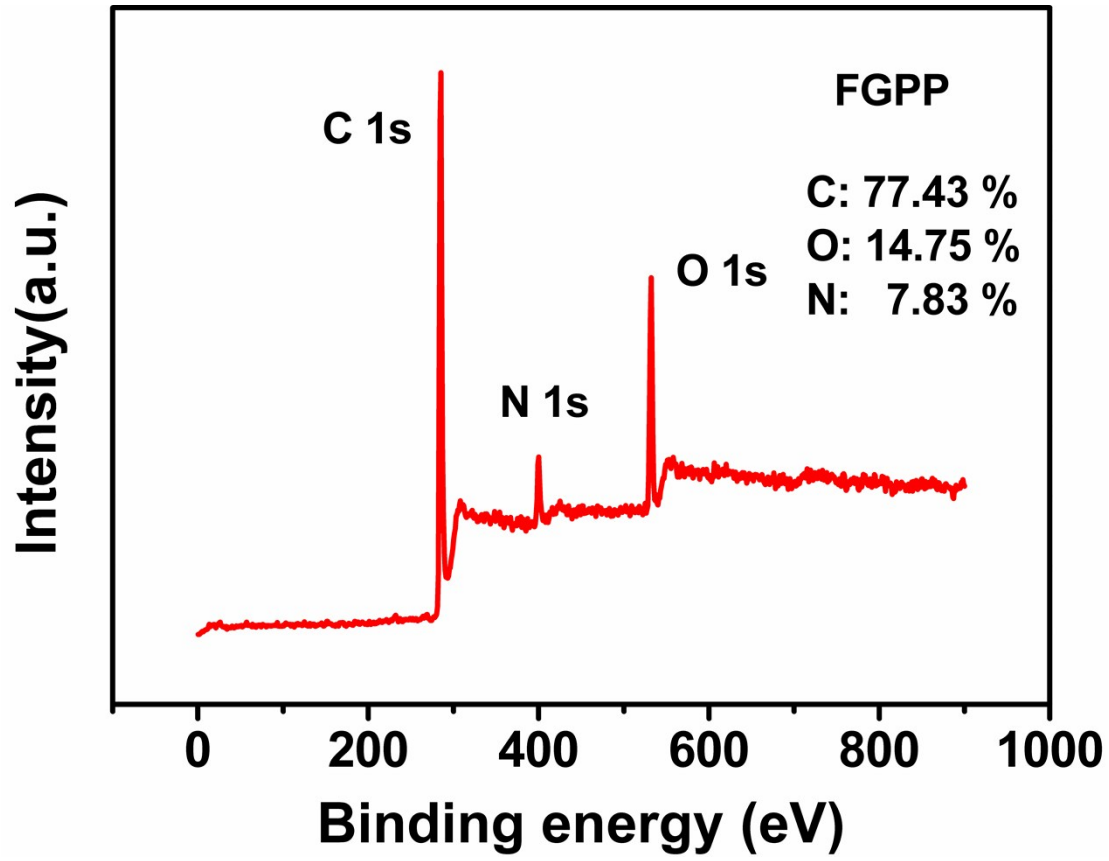

Figure S4. XPS spectrum of FGPP

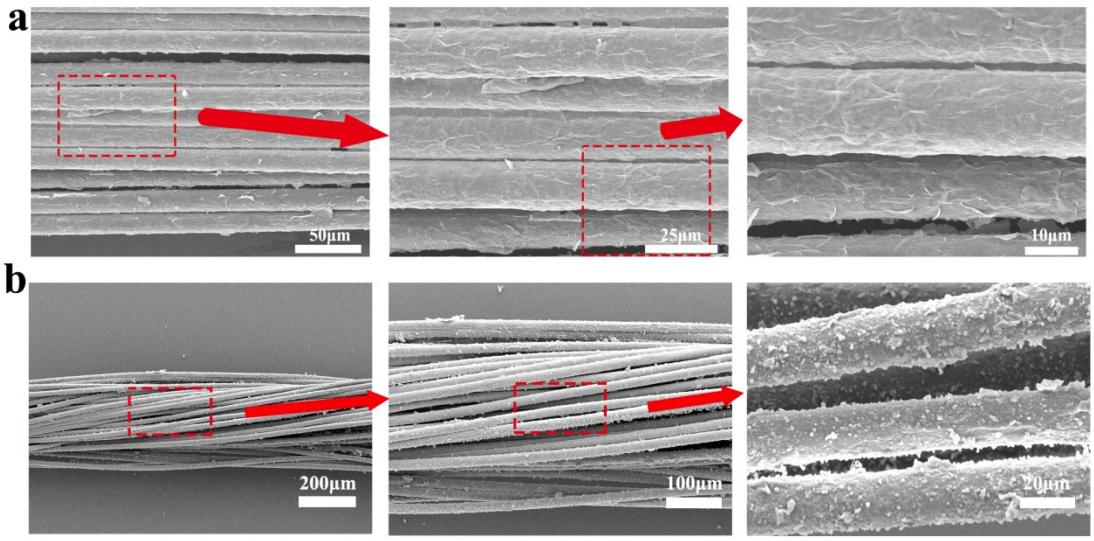

Figure S5. The SEM of the fibers with different magnification. (a) SEM of FG; (b) SEM of FGPP filaments

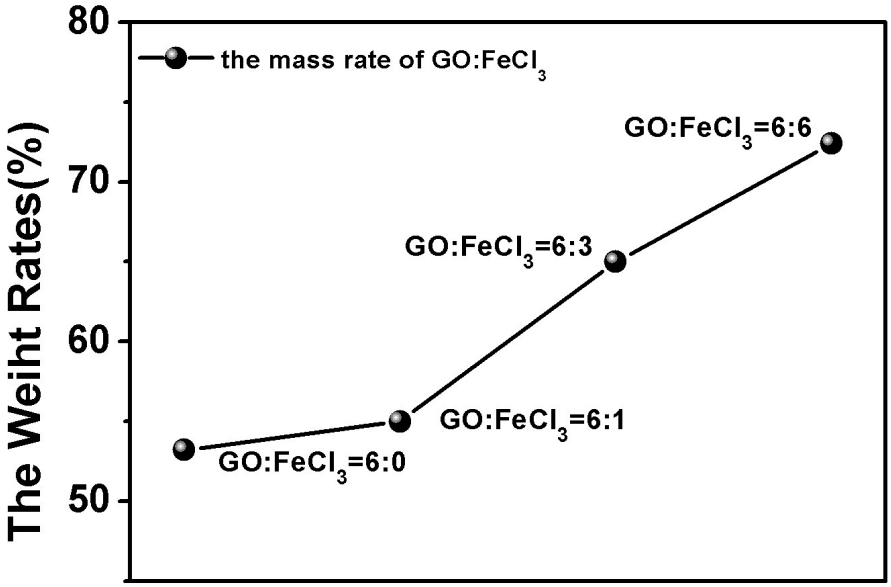

Figure S6. The weight rate of the composite filaments electrode with different $FeCl_3$ mass rate.

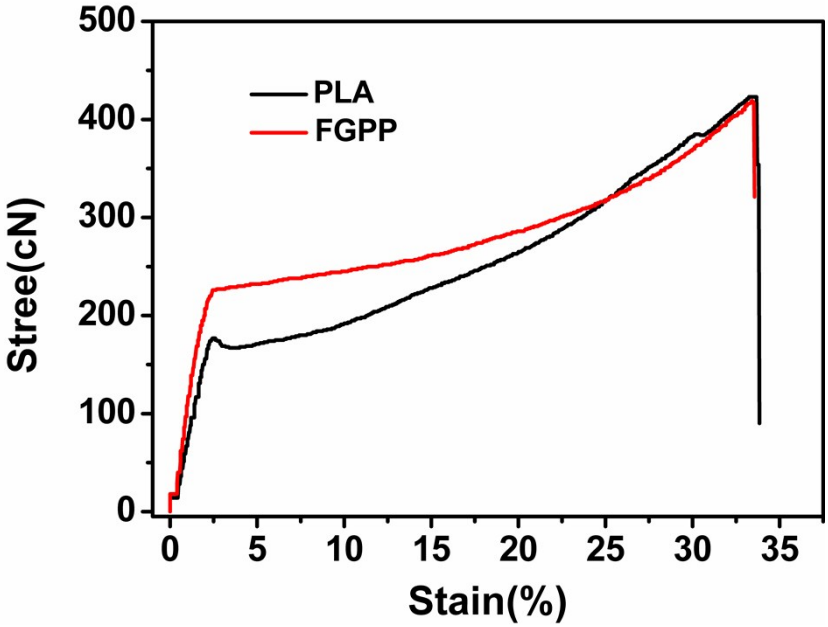

Figure S7. Tensile properties of the PLA and FGPP

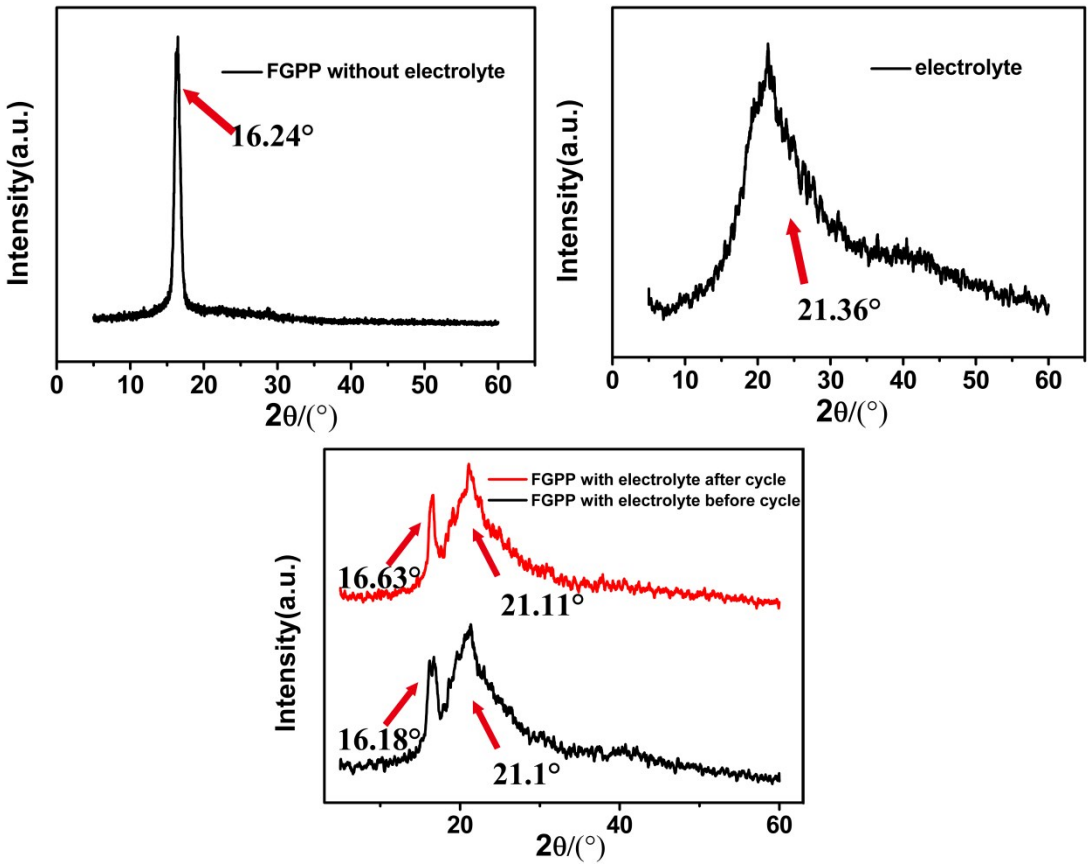

Figure S8. The XRD patterns of fibers before and after cycles.

Table S1. Compare to the different fiber supercapacitor in specific capacitance, energy density, power density.

Material	Specific capacitance	Energy density	Power density	Ref.
Graphene fiber	1.7 mF/cm^2	0.17 μWh/cm^2	0.1 mW/cm^2	[1]
CNT/Pt fiber	2.0 mF/cm^2	0.15 μWh/cm^2	~	[2]
ZnO/MnO_2 fiber	2.0 mF/cm^2	0.27 μWh/cm^2	1.4 μW/cm^2	[3]
Pen Ink fiber	19.5 mF/cm^2	0.27 μWh/cm^2	9 mW/cm^2	[4]
CNT/RGO fiber	38 mF/cm^2	0.84 μWh/cm^2		[5]
CNT/OMC fiber	39.7 mF/cm^2	0.86 μWh/cm^2	0.04 mW/cm^2	[6]
RGO/SWCNT/fiber	41 mF/cm^2	0.96 μWh/cm^2		[7]
SWCNT/PANI Yarn	52.6mF/cm^2	1.1 μWh/cm^2		[8]
CNT/Co_3O_4 yarn	52.6 mF/cm^2	1.1 μWh/cm^2	0.01 mW/cm^2	[9]
PEDOT	69.3 mF/cm^2	1.5 μWh/cm^2		[10]
Ink/stainless steel	3.18 mF/cm^2	~	~	[11]
RGO/CNT/cotton	3.79 mF/cm^3	0.08 μWh/cm^3	35.3 μW/cm^3	[12]
$NiCo_2O_4$/Ni wire	10.3 F/cm^3	1.44 mWh/cm^3	17 W/cm^3	[13]
This work	158.8 mF/cm^2	3.5 μWh/cm^2	0.032 mW/cm^2	

References for the Supporting Information

[S1] Meng Y, Zhao Y, Hu C, Cheng H, Hu Y, Zhang Z, Shi G, Qu L, *Adv. Mater.,* 2013, **25**, 2326-31.

[S2] Chen T, Qiu L, Yang Z, Cai Z, Ren J, Li H, Lin H, Sun X, Peng H, *Angew. Chem.*, 2012, **51**, 11977-80.

[S3] Bae J, Song MK, Park YJ, Kim JM, Liu M, Wang ZL, *Angew. Chem.,* 2011, **50**, 1683-7.

[S4] Fu Y, Cai X, Wu H, Lv Z, Hou S, Peng M, Yu X, Zou D, *Adv. Mater.,* 2012, **24**, 5713-8.

[S5] Ma Y W, Li P, Sedloff J W, Zhang X, Zhang H B, Liu J, *ACS Nano*, 2015, **9**, 1352-9.

[S6] Ren J, Bai W, Guan G, Zhang Y, Peng H, *Adv. Mater.*, 2013, **25**, 5965-70.

[S7] Yu D S, Goh K L, Zhang Q, Wei L, Wang H, Jiang W C, Chen Y, *Adv. Mater.,* 2014, **26**, 6790-7.

[S8] Meng QH, Wang K, Guo W, Fang J, Wei ZX, She XL, *Small*, 2014, **10**, 3187-93.

[S9] Su F H, Lv X M, Miao MH, *Small*, 2015, **11**, 854-61.

[S10] Liu R, Il Cho S, Lee SB, *Nanotechnology*, 2008, **19**, 8.

[S11] Harrison D, Qiu FL, Fyson J, Xu YM, Evans P, Southee DA, *Phys Chem Chem Phys*, 2013, **15**, 12215-9.

[S12] Ye XK, Zhou QL, Jia CY, Tang ZH, Wan ZQ, Wu XC, *Electrochim Acta*, 2016, **206**, 155-64.

[S13] Wang QF, Wang XF, Xu J, Ouyang X, Hou XJ, Chen D, Wang RM, Shen GZ, *Nano Energy*, 2014, **8**, 44-51.