Supporting Information

Synergism between LDLB and True CD to Achieve Angle-Dependent Chiroptical Inversion and Switchable Polarized Luminescence Emission in Nonreciprocal Nanofibrous Films

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Contents

(The following contents are presented in the order of their appearing sequence in the main text.)

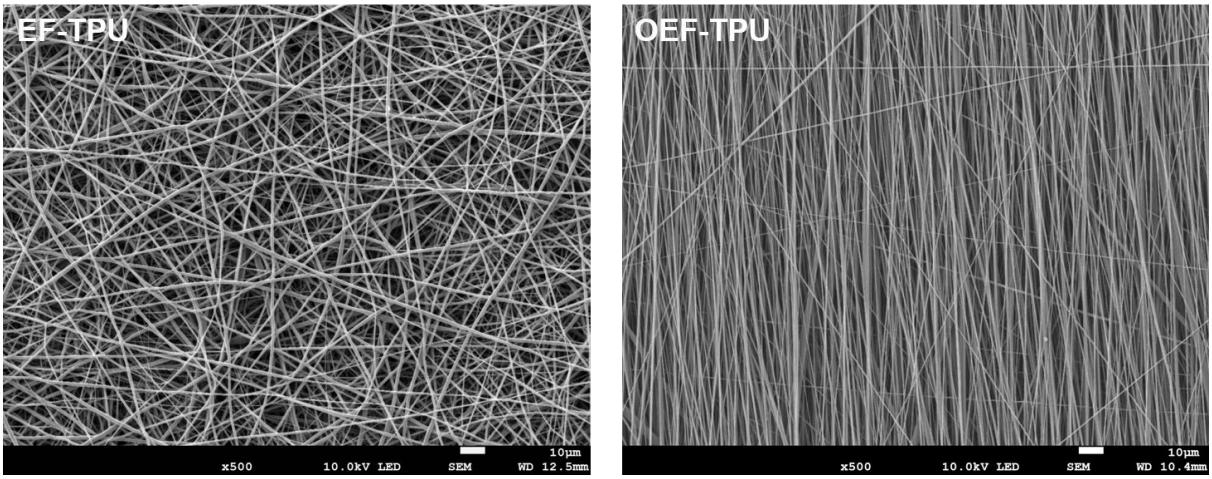

Figure S1. SEM images of EF-TPU and OEF-TPU electrospun nanofibers.

Table S1. Electrospinning parameters under stable spinning state[a]

Uniaxial electrospun products	Concentration (mg/mL)	Voltage +(kV)	Voltage –(kV)	Spinning speed (mL/min)	Drum speed (r/min)
EF-TPU	160	5~6	2	0.004	—
EF-PFA	1200	9~10	2	0.004	—
EF-TPU-PSA$_x$	PSA: 160 × x% TPU: 160	6~7	2	0.004	—
OEF-TPU	160	8~9	2	0.006	4000
OEF-PFA	1200	8~9	2	0.006	4000
OEF-TPU-PSA$_x$	PSA: 160 × x% TPU: 160	8~9	2	0.006	4000
EF-PAN	100	7~8	2	0.004	—
EF-PVP	180	6~7	2	0.004	—

[a]Temperature 30 °C, 35% RH, stainless steel needle (i.d.: 0.5mm), plastic syringe (2.5 mL). The collection distance between the needle and the receiving plate (or receiving roller) was fixed at around 16cm.

Under the electrostatic traction of the above high-voltage electrostatic feld, a stable Taylor Cone was formed and the jet becomes extremely fine due to stretching and splitting. After the solvent volatilizes, solidifed nanofbers can be obtained.

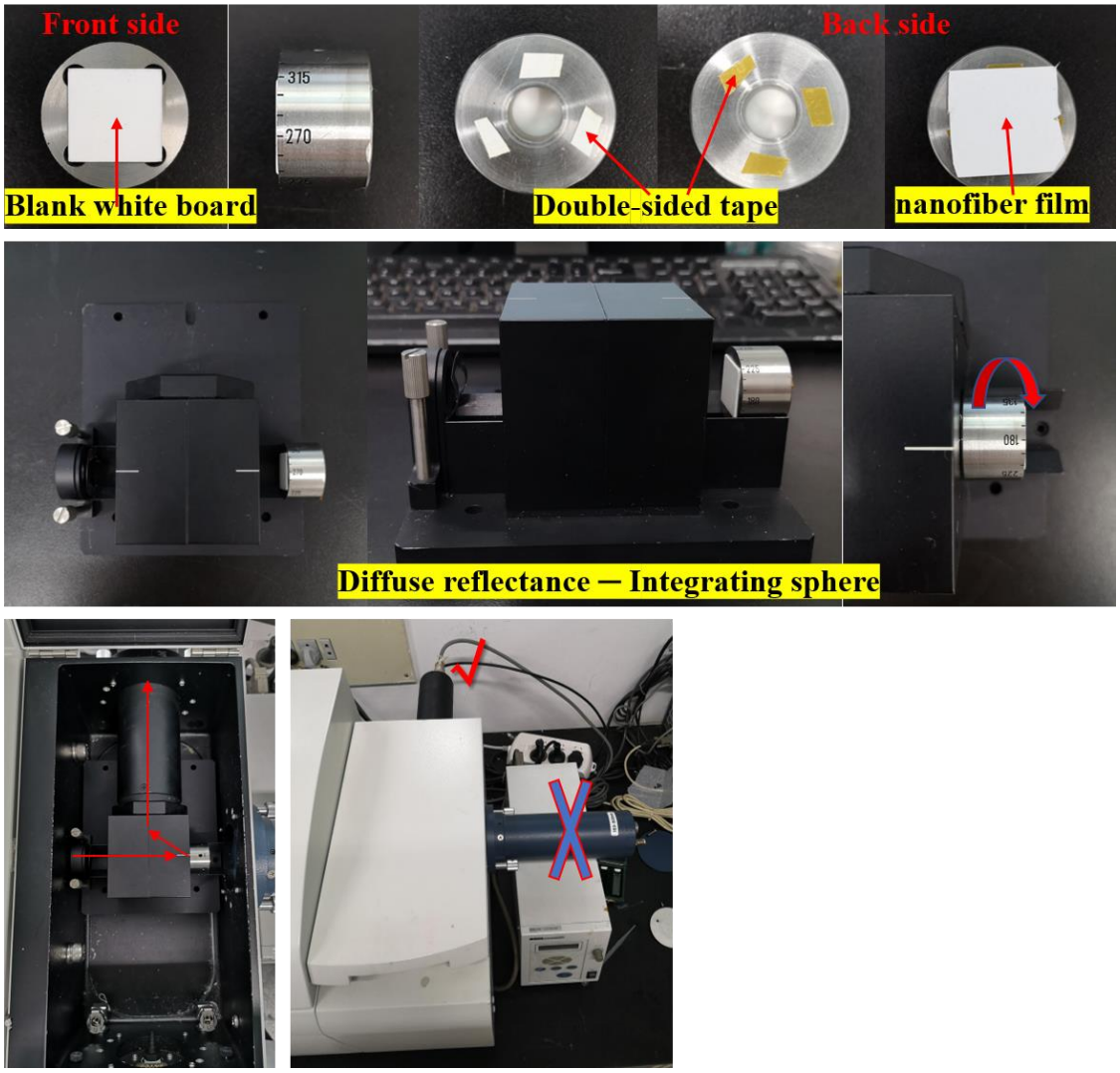

Figure S2. Brief description of diffuse reflection CD method (DRCD).

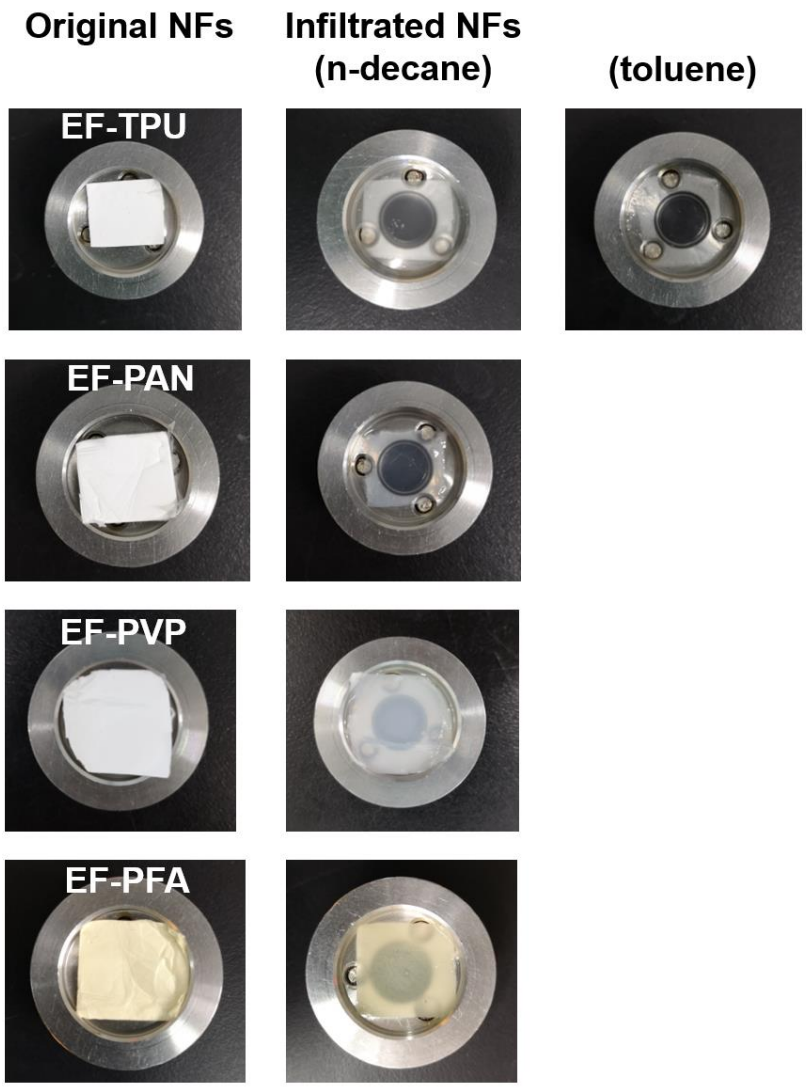

Figure S3. Digital photos of nanofiber films before and after being infiltrated with poor solvents.

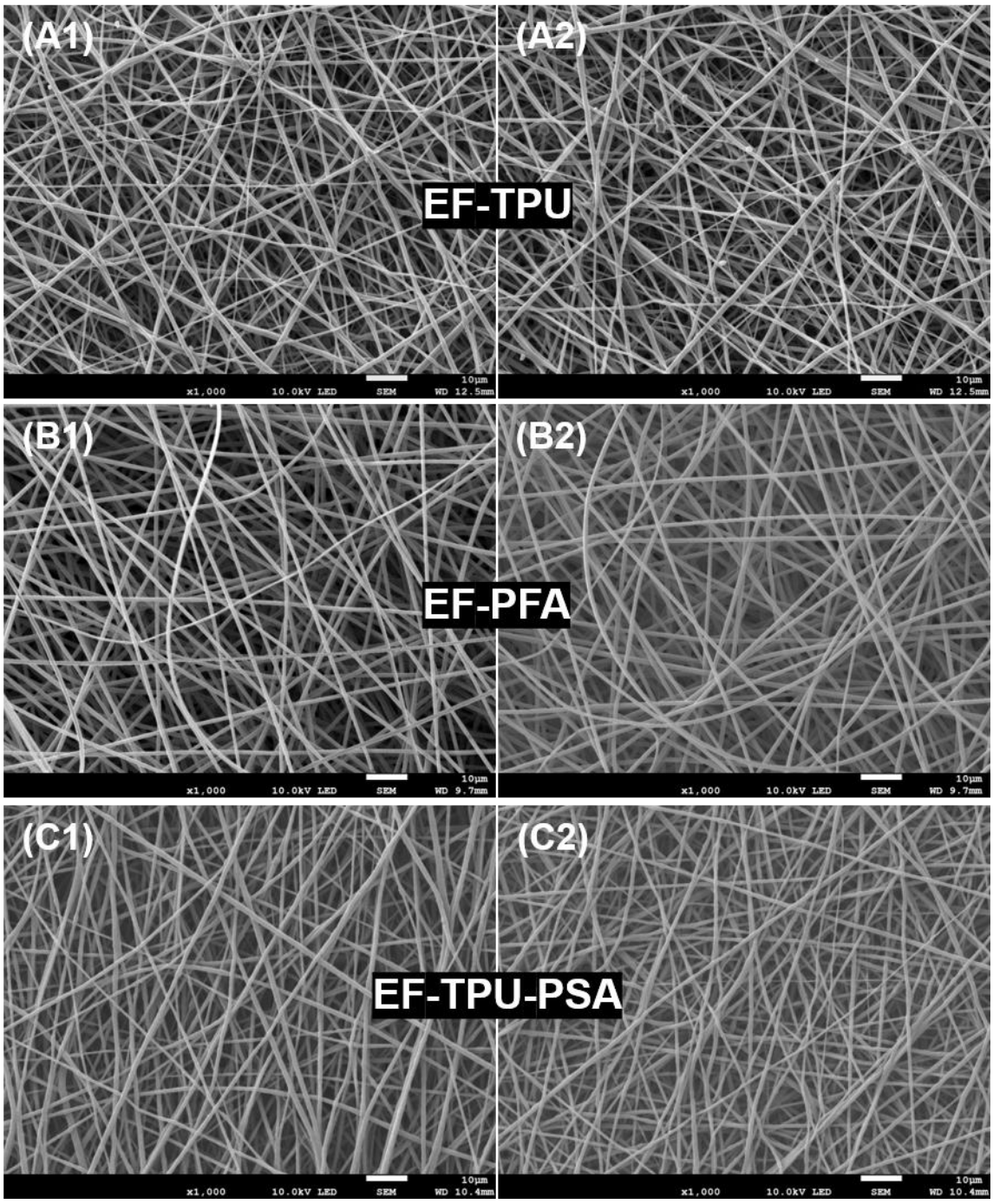

Figure S4. SEM images of fibrous samples before (A1, B1, C1) and after (A2, B2, C2) infiltration CD testing. (Test method: poor solvent was dropped on the fibrous sample; the fibrous sample became transparent; and then the CD test was performed on a quartz plate; the fibrous sample was restored to its original appearance after evaporation of poor solvent.)

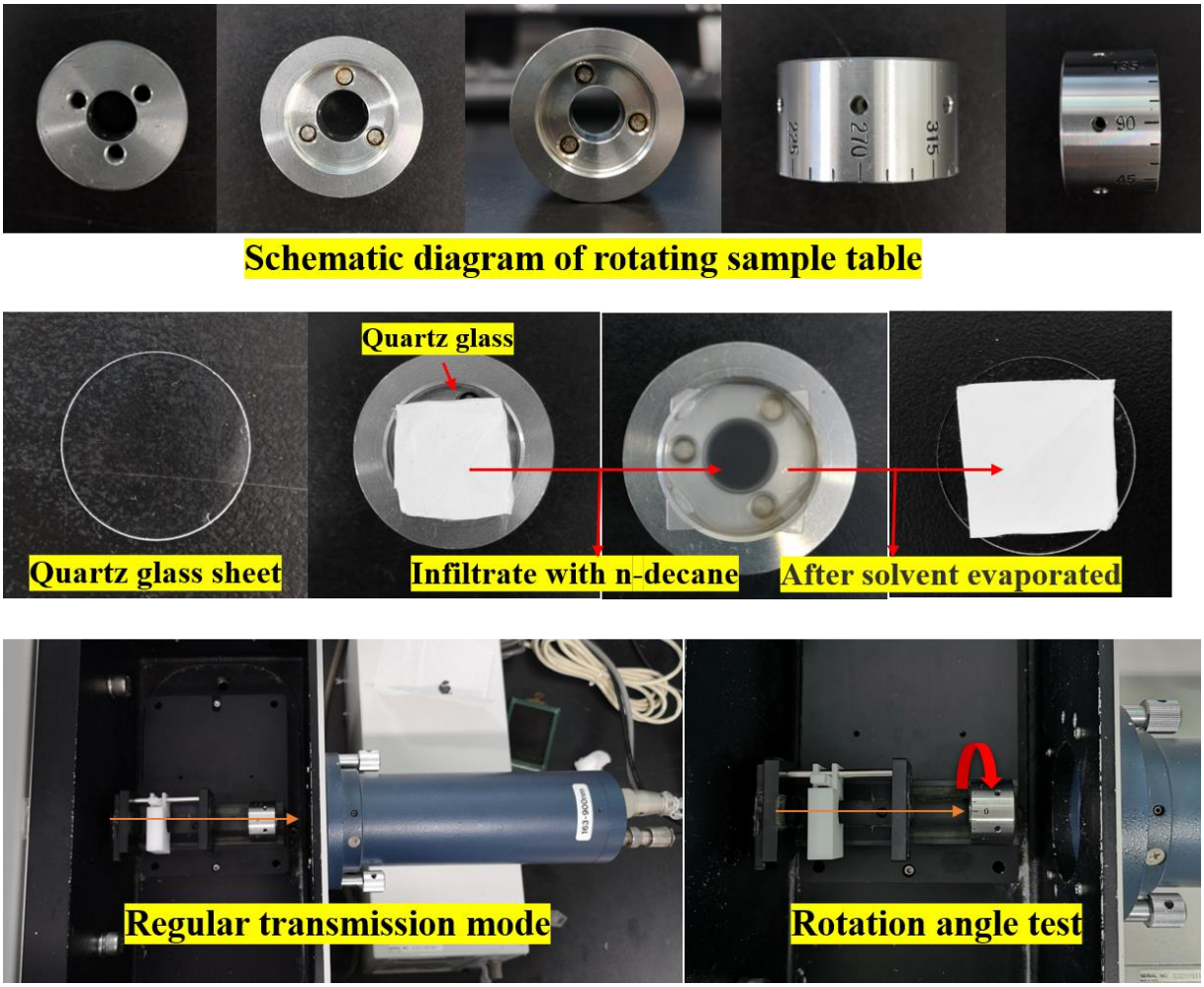

Figure S5. Brief description of infiltration CD method (ICD). In this case, n-decane (a poor solvent for TPU matrix) was added dropwise on the fibrous samples to make them transparent or translucent, and then the infiltrated fibrous samples were adhered closely onto a quartz plate for CD measurement. After the solvent evaporates, the nanofibers return to their original appearance.

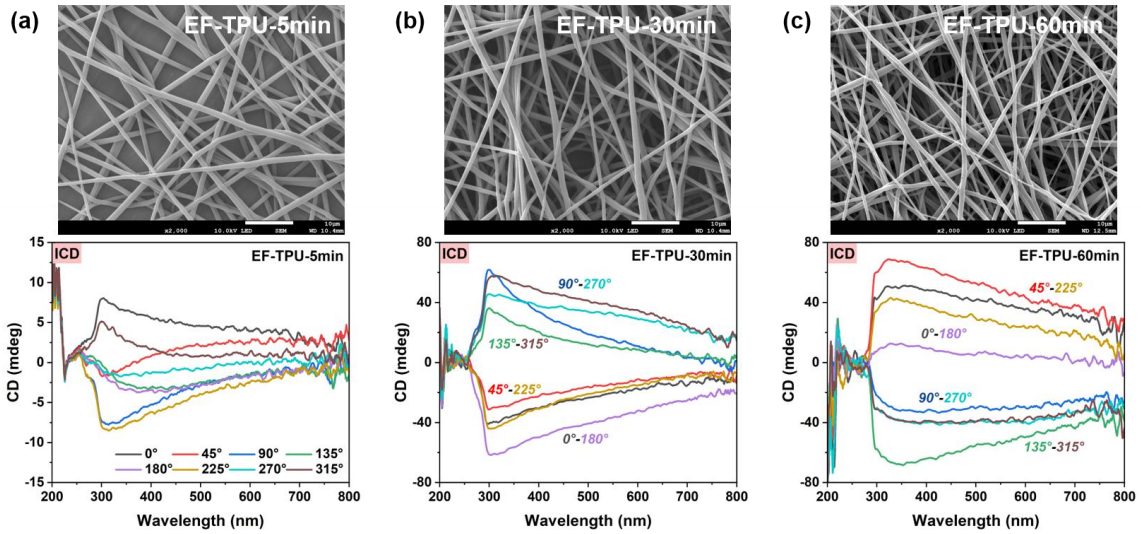

Figure S6. SEM images and CD spectra recorded in electrospun nanofibers (EF-TPU) with different electrospinning times. The electrospun nanofibrous films were infiltrated with poor solvent (n-decane) to make them transparent or translucent and then subjected to CD test (infiltration CD method, ICD). The CD spectra were recorded at room temperature.

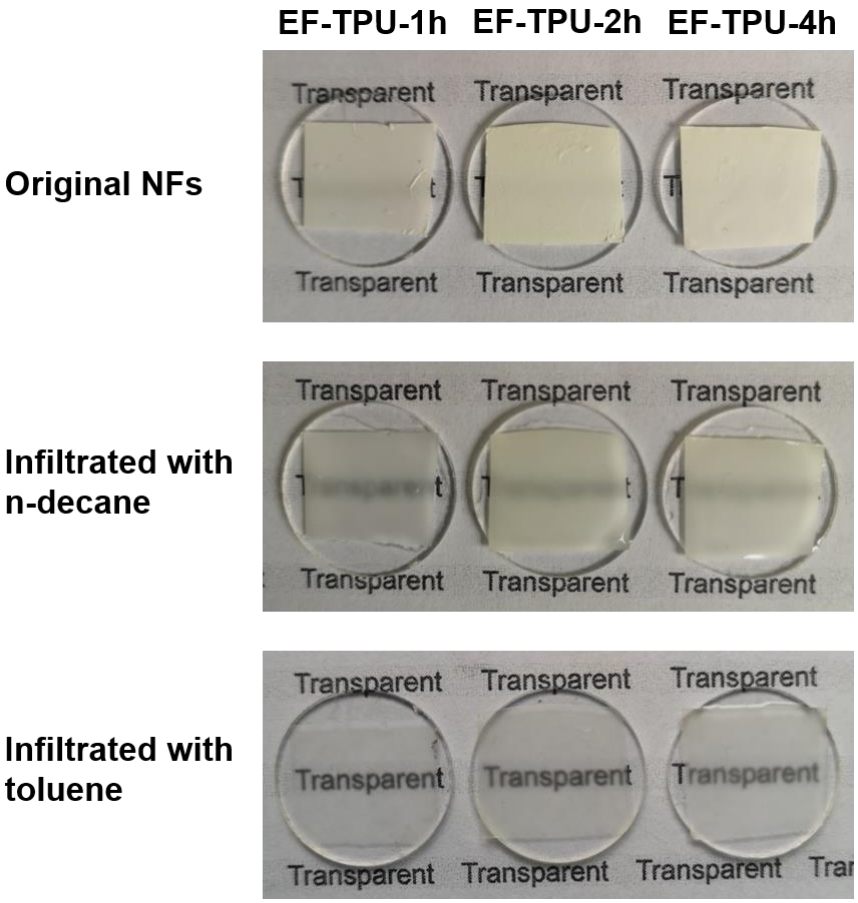

Figure S7. Digital photos of TPU nanofiber films prepared at different spinning times (1h, 2h, 4h) in the presence of n-decane or toluene respectively.

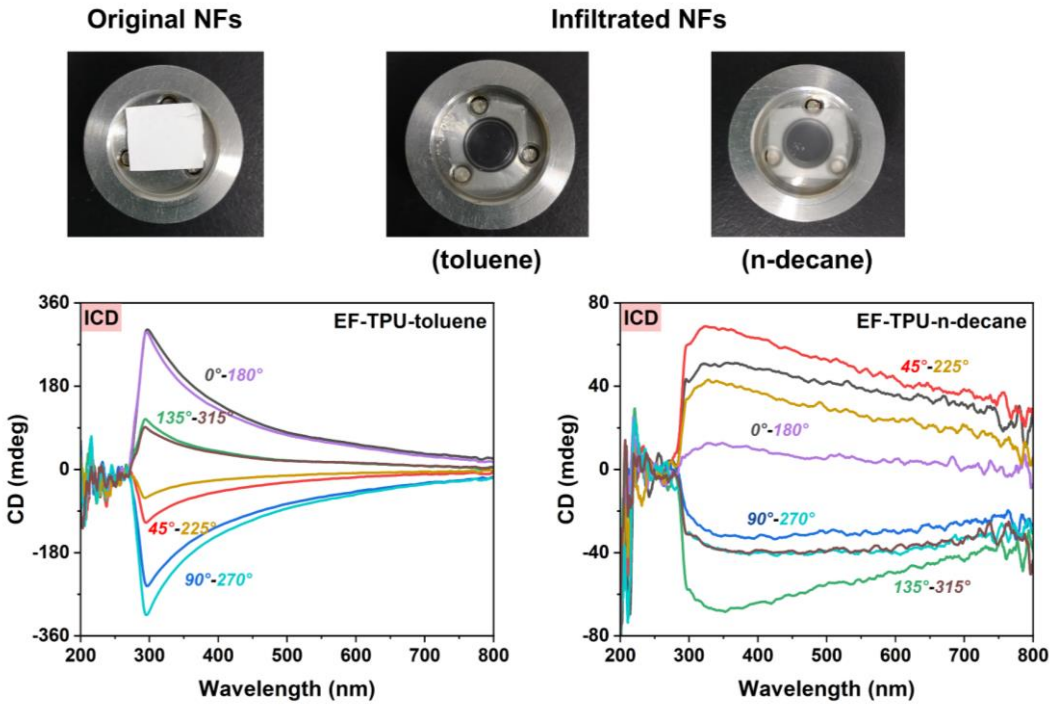

Figure S8. The EF-TPU samples were infiltrated with poor solvent (toluene or n-decane) to make them transparent or translucent and then subjected to CD test (infiltration CD method, ICD). The CD spectra were recorded at room temperature.

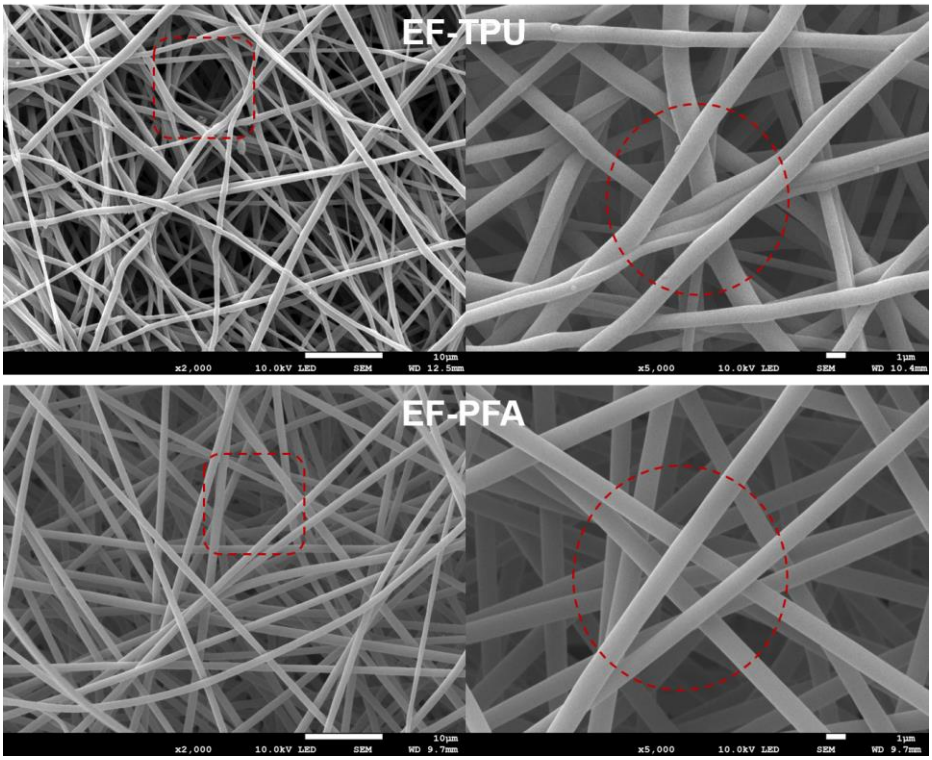

Figure S9. SEM images of nanofibrous intersection points. There are numerous nanofibrous intersections in NFs, which are the basis for the formation of nanofibrous channels.

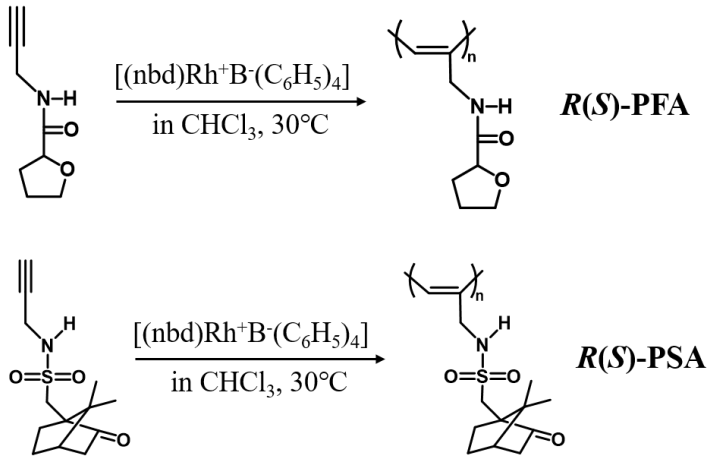

Figure S10. The synthesis of chiral helical polymer PFA and PSA.

Table S2. GPC of chiral helical polymers *R*- or *S*-PFA and *R*- or *S*-PSA.

Polymer[a]	Mn	Mw/Mn
R-PFA	4800[b]	1.83
S-PFA	5000[b]	1.85
R-PSA	26000[c]	1.24
S-PSA	24000[c]	1.28

[a]With (nbd)$Rh^+B^-(C_6H_5)_4$ catalyst in $CHCl_3$ at 30 ℃ for 6 h; [M] = 0.10 mol L^{-1}; [M]/[Rh] = 100 (in mol). [b]Measured by GPC (polystyrene as standards; THF as eluent). [c]Measured by GPC (polystyrene as standards; DMF as eluent).

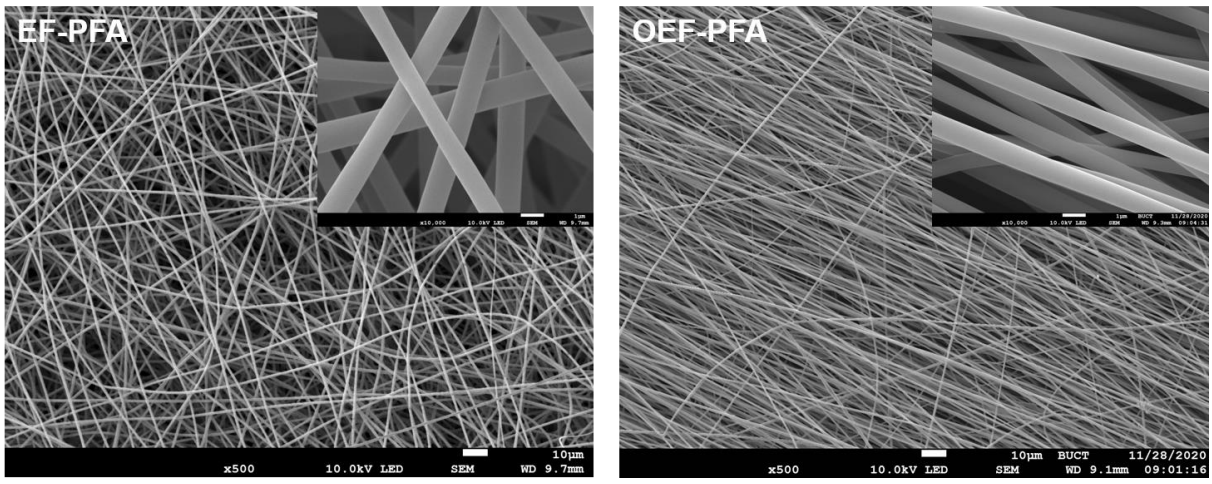

Figure S11. SEM images of EF-PFA and OEF-PFA electrospun nanofibers.

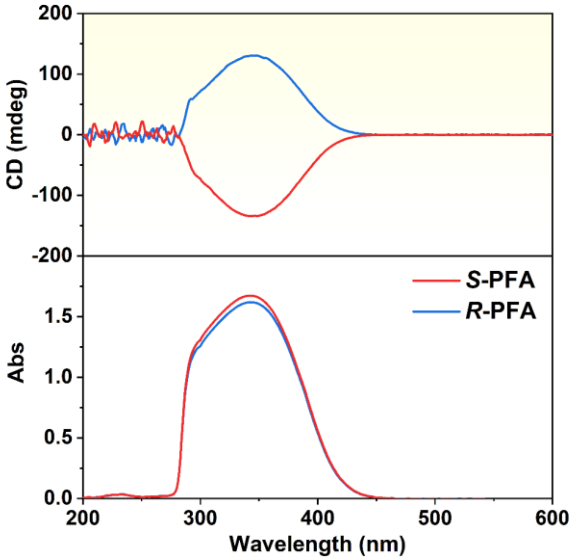

Figure S12. CD and UV-Vis absorption spectra recorded in chiral polymer R- or S-PFA $CHCl_3$ solution.

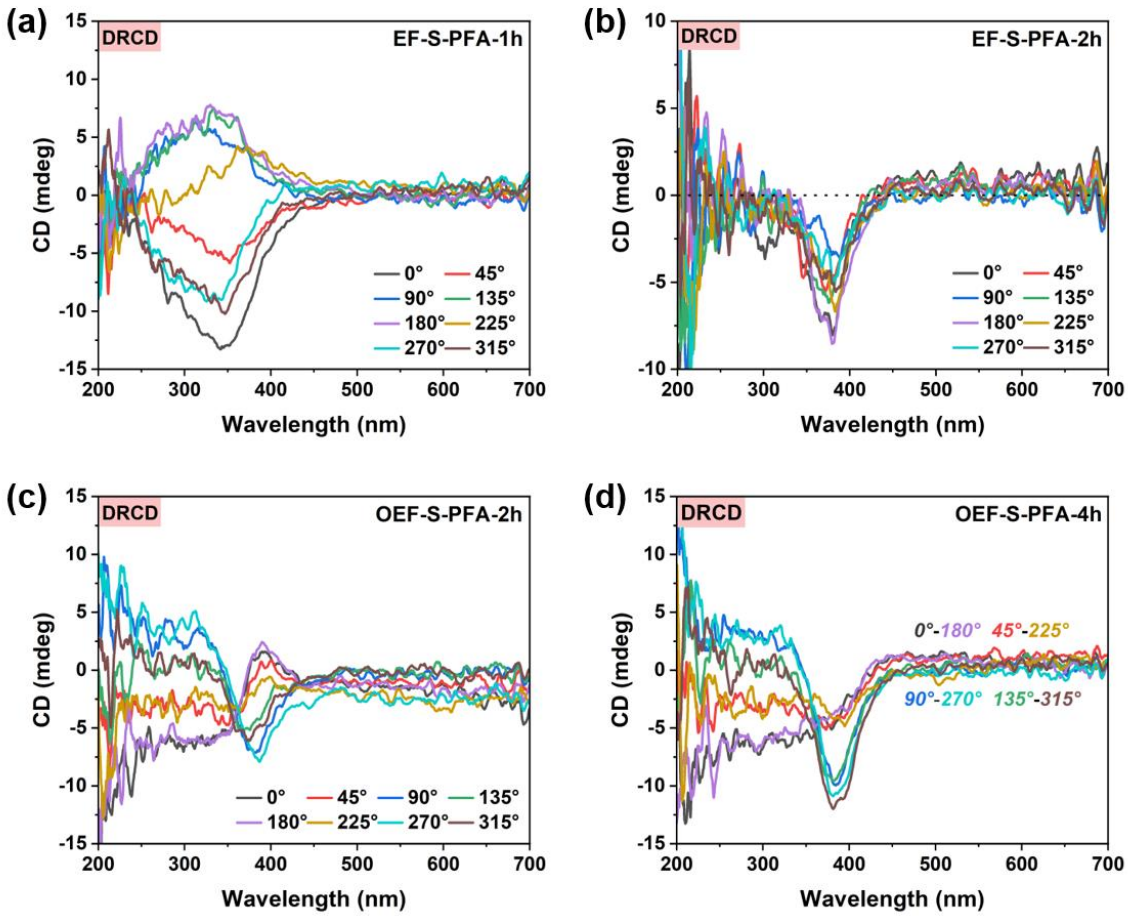

Figure S13. CD spectra recorded in electrospun nanofibers (a,b) EF-PFA and (c,d) OEF-PFA with different electrospinning times, using diffuse reflection CD method. The CD spectra were recorded at room temperature.

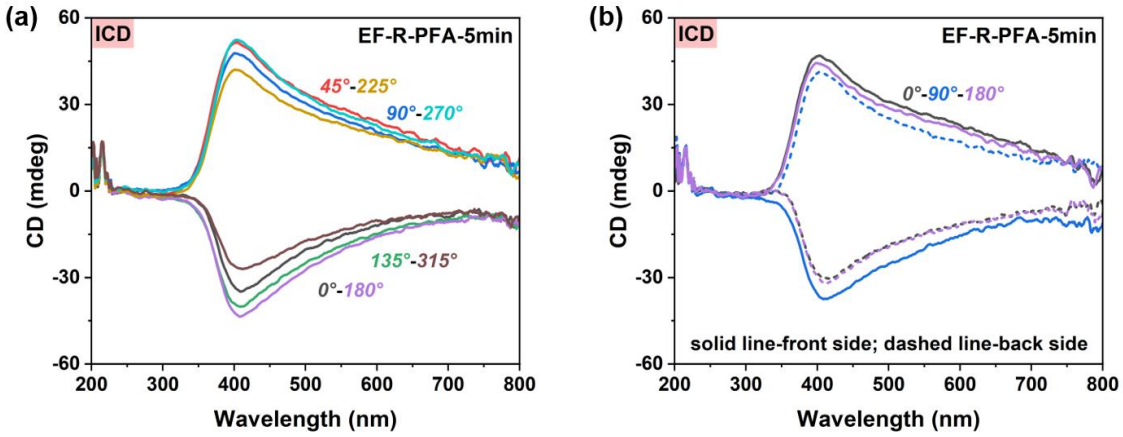

Figure S14. (a) CD spectra of EF-R-PFA prepared by electrospinning for 5 minutes, using fiber samples infiltrated with n-decane for spectra measurement. (b) CD spectra recorded in front and back sides of EF-R-PFA-5min, using fiber samples infiltrated with n-decane for spectra measurement.

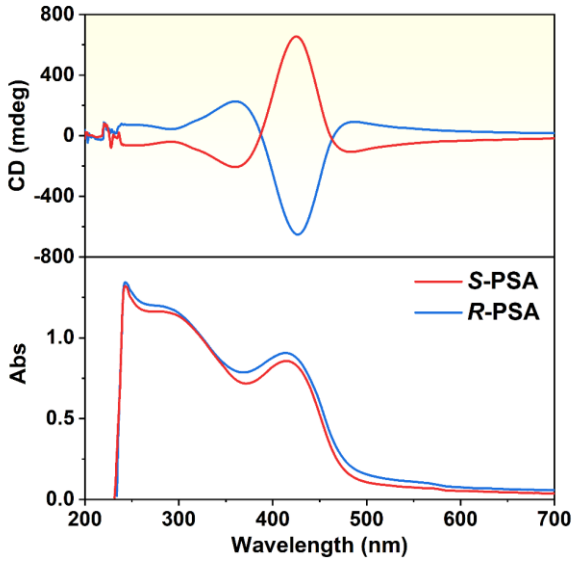

Figure S15. CD and UV-Vis absorption spectra recorded in chiral polymer R- or S-PSA $CHCl_3$ solution.

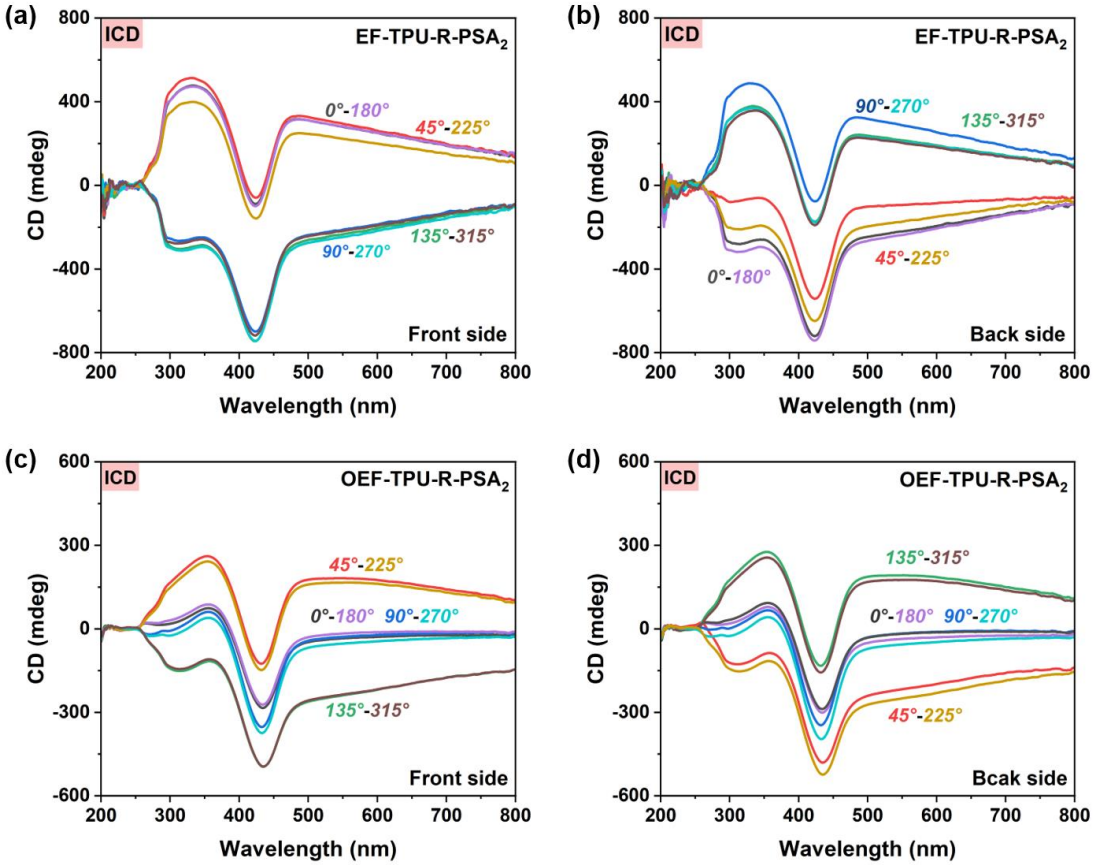

Figure S16. CD spectra recorded in front and back sides of (a, b) EF-TPU-R-PSA$_2$ and (c, d) OEF-TPU-R-PSA$_2$, using fiber samples infiltrated with n-decane.

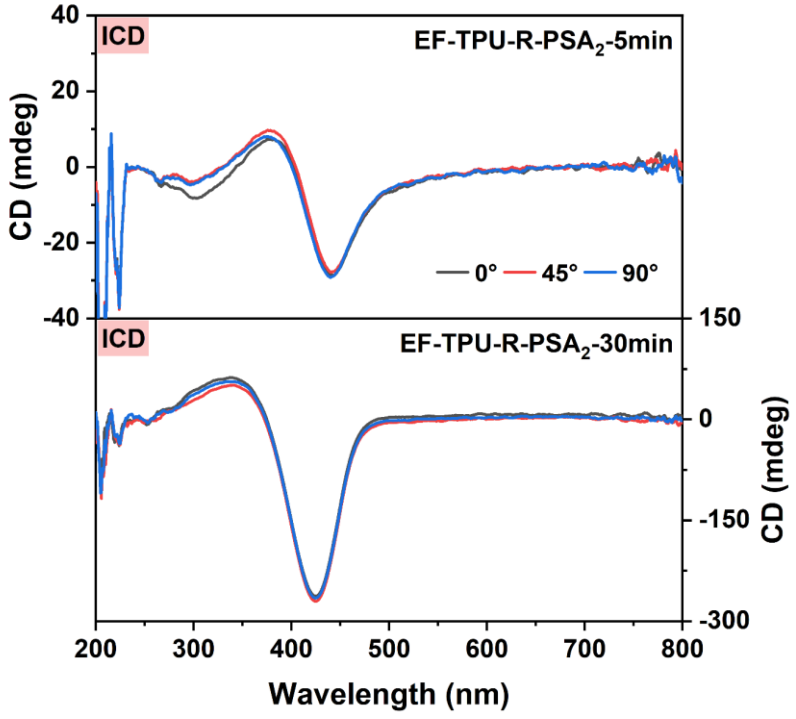

Figure S17. CD spectra recorded in chiral nanofibrous films EF-TPU-R-PSA$_2$-5min and EF-TPU-R-PSA$_2$-30min using fiber samples infiltrated with n-decane.

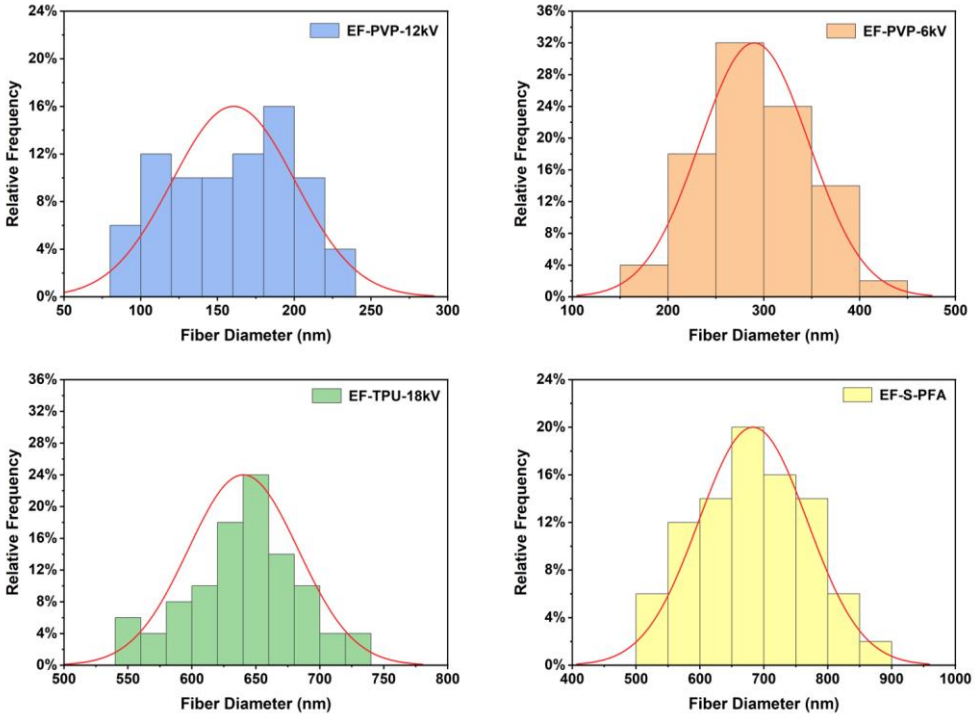

Figure S18. Diameter distribution of electrospun nanofibrous films with different fiber diameters.

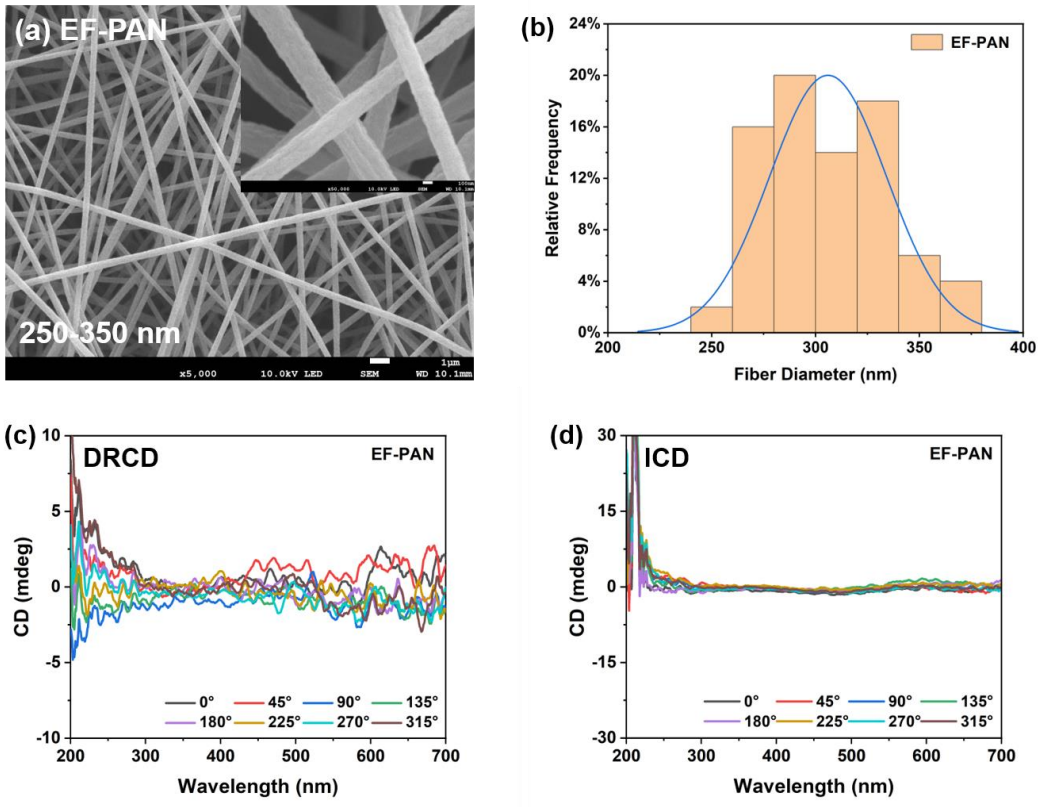

Figure S19. (a) SEM images of electrospun fiber film EF-PAN, and (b) fiber diameter distribution map. (c) CD spectra of EF-PAN prepared by electrospinning for 2 hours, using diffuse reflection CD method. (d) CD spectra of EF-PAN prepared by electrospinning for 2 hours, using fiber samples infiltrated with n-decane for spectra measurement.

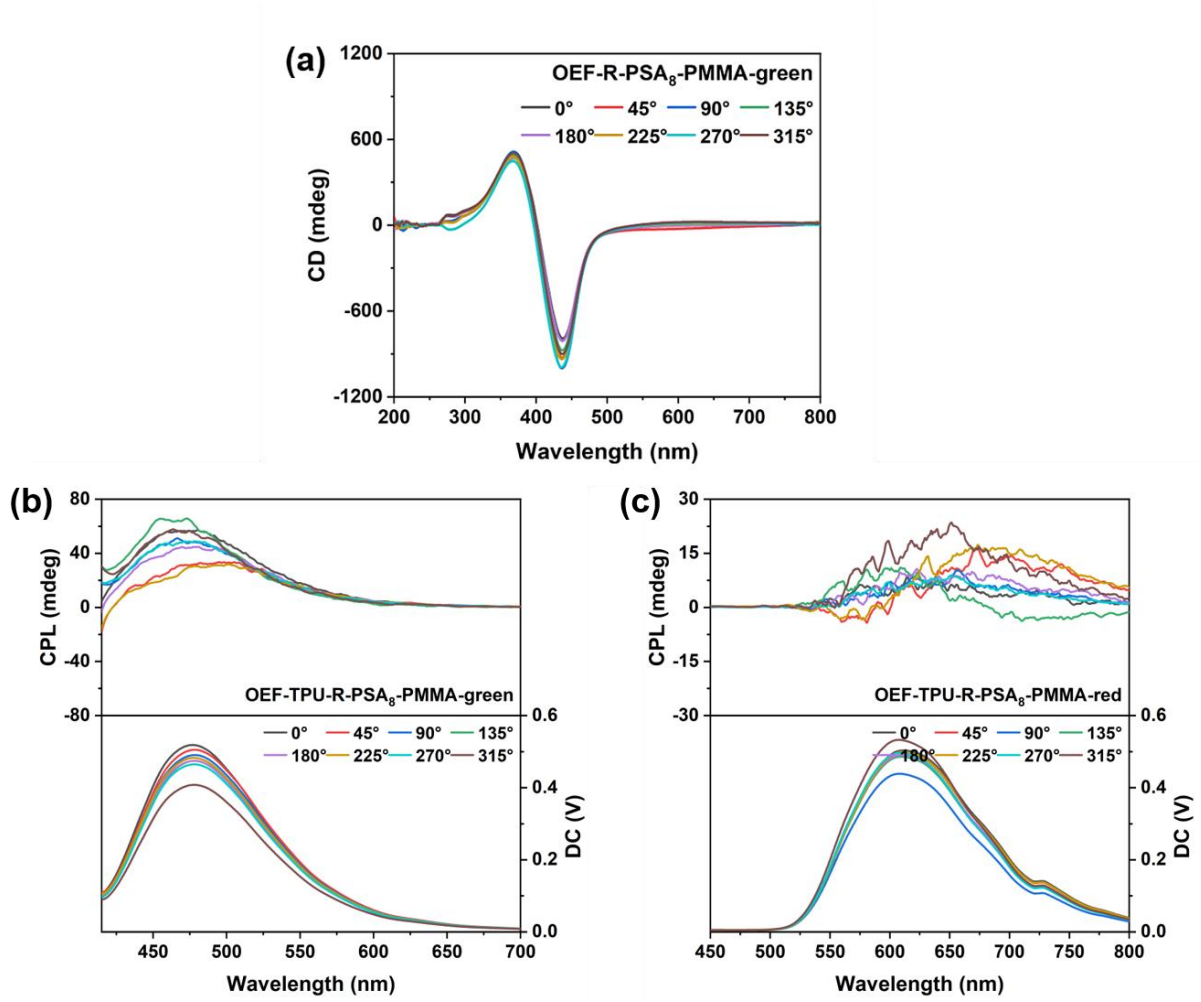

Figure S20. (a) CD spectra recorded in encapsulation device OEF-TPU-R-PSA$_8$-PMMA-green. (b,c) CPL spectra recorded in OEF-TPU-R-PSA$_8$-PMMA-green and OEF-TPU-R-PSA$_8$-PMMA-red.

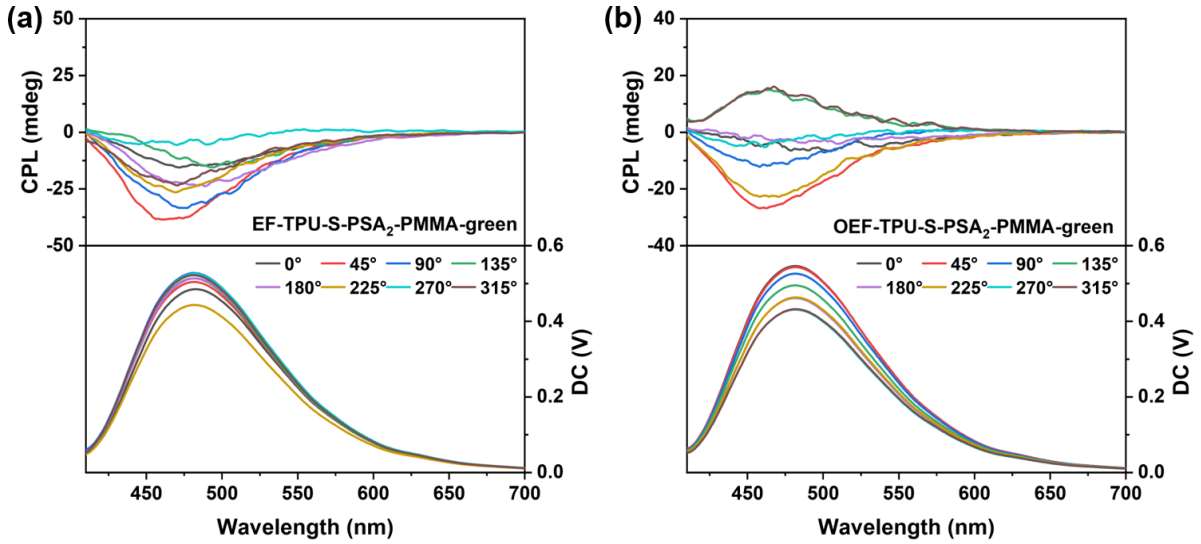

Figure S21. (a, b) CPL spectra recorded in EF-TPU-S-PSA$_2$-PMMA-green and EF-TPU-S-PSA$_2$-PMMA-red.