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Supplementary information File for

Fluorescent Aggregation-Induced Emission (AIE)-Based Thermosetting Electrospun Nanofibers: Fabrication, Properties and Applications

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S1 Experimental

S1.0 Materials

The fluorescent resin TPE-Epoxy-X(X: epoxy value) used in this study was synthesized according to our previous work.[1] The curing agent polyamide 650 was supplied by Danbao Resin Co., Ltd. N'N-dimethylformamide (DMF), acetone, dichloromethane (DCM), tetrahydrofuran (THF), nitrobenzene and petroleum ether were all purchased from China National Medicines Co., Ltd.

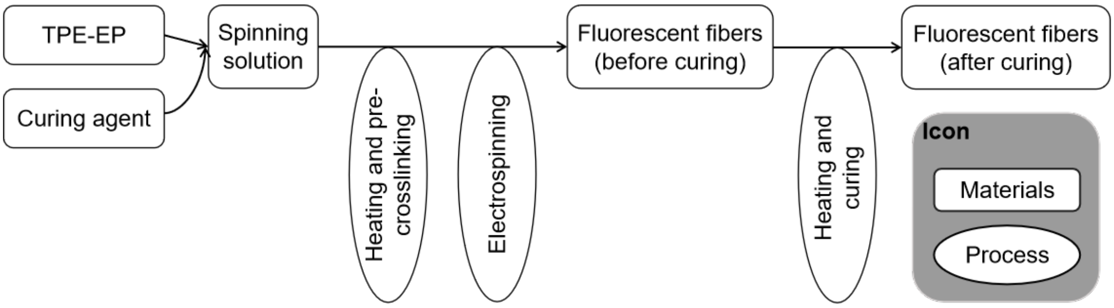
S1.1 Sample preparation

At first, spinning solutions were obtained by dissolving the different fluorescent resin into a series mixed solvents (DMF:Acetone=10:90~70:30,w/w), detailed information are listed in Table S1. After the fluorescent resins were dissolved completely, the spinning solutions were precured at 40°C for 1~4h. The obtained fluorescent nanofibers were named as FNF-*x* (*x*: 1, 2, 3, 4…)

Table S1. The spinning solutions under different parameters

Sample	Types of fluorescent resin	Solvent ratio （DMF:Acetone，w/w）	Concentration	Pre-crosslinking time at 40 C
FNF-1	TPE-Epoxy-20	10:90	60%wt	1h
FNF-2	TPE-Epoxy-20	10:90	60%wt	2h
FNF-3	TPE-Epoxy-20	10:90	60%wt	3h
FNF-4	TPE-Epoxy-20	10:90	60%wt	4h
FNF-5	TPE-Epoxy-20	10:90	50%wt	2h
FNF-6	TPE-Epoxy-20	10:90	55%wt	2h
FNF-7	TPE-Epoxy-20	10:90	65%wt	2h
FNF-8	TPE-Epoxy-51	10:90	60%wt	2h
FNF-9	TPE-Epoxy-12	10:90	60%wt	2h
FNF-10	TPE-Epoxy-20	30:70	60%wt	2h
FNF-11	TPE-Epoxy-20	50:50	60%wt	2h
FNF-12	TPE-Epoxy-20	70:30	60%wt	2h

Electrospinning process was operated with JDF05 electrospinning apparatus, which was supplied by Changsha Nayi Instrument Technology Co., Ltd. (Changsha, China). The nanofibers were collected by a metal cylinder collector wrapped with aluminum foil, kept at a fixed distance of 15 cm away from the needle tip of the spinneret. The spinneret had an inner diameter (ID) of 0.90 mm and an outer diameter (OD) of 1.20 mm. The spinning voltage was adjusted to 10 kV and the spinning fluid flow rate was adjusted to 1 mL/h. The obtained FNF membranes were then dried in a vacuum oven at 60 ℃ for another 3 hr to ensure completely volatilizing of solvent and crosslinking of components. For comparison, a flat coating of the same materials was prepared by spinning coating method was also dried with the same process. A diagrammatic sketch of the strategy for preparing FNF membranes is shown in **Scheme S1**.



Scheme. S1| Diagrammatic sketch of the strategy for nanofibers preparation

S2. Characterization

The viscosity of spinning solution was measured by NDJ-8S Digital Viscometer (Bangxi Instrument Technology Co., Ltd.,Shanghai) using No. 2 rotor. The conductivity of spinning solution was measured by DDS-11A desktop precision conductivity meter (Qiwei Instrument Co., Ltd., Hangzhou). The surface morphologies of FNF membranes were assessed using a JSM-6480 tungsten filament scanning electron microscopy (SEM, JEOL Ltd). The average size was determined by measuring the diameters of over 100 places from SEM images using Image pro plus software. The cross-sectional morphologies of FNF membranes, prepared by placing them into liquid nitrogen for over 15 min before manual breaking, were assessed using a S-4800II field emission scanning electron microscopy (FESEM, Hitachi High-Technologies Corporation, Japan). The water contact angle of FNF membranes were measured by DSA25S contact angle measuring instrument (KRÜSS GmbH, Germany). The fluorescence properties of the FNF membranes were characterized by FS5 fluorescence spectrometer (Edinburgh Instruments, UK).

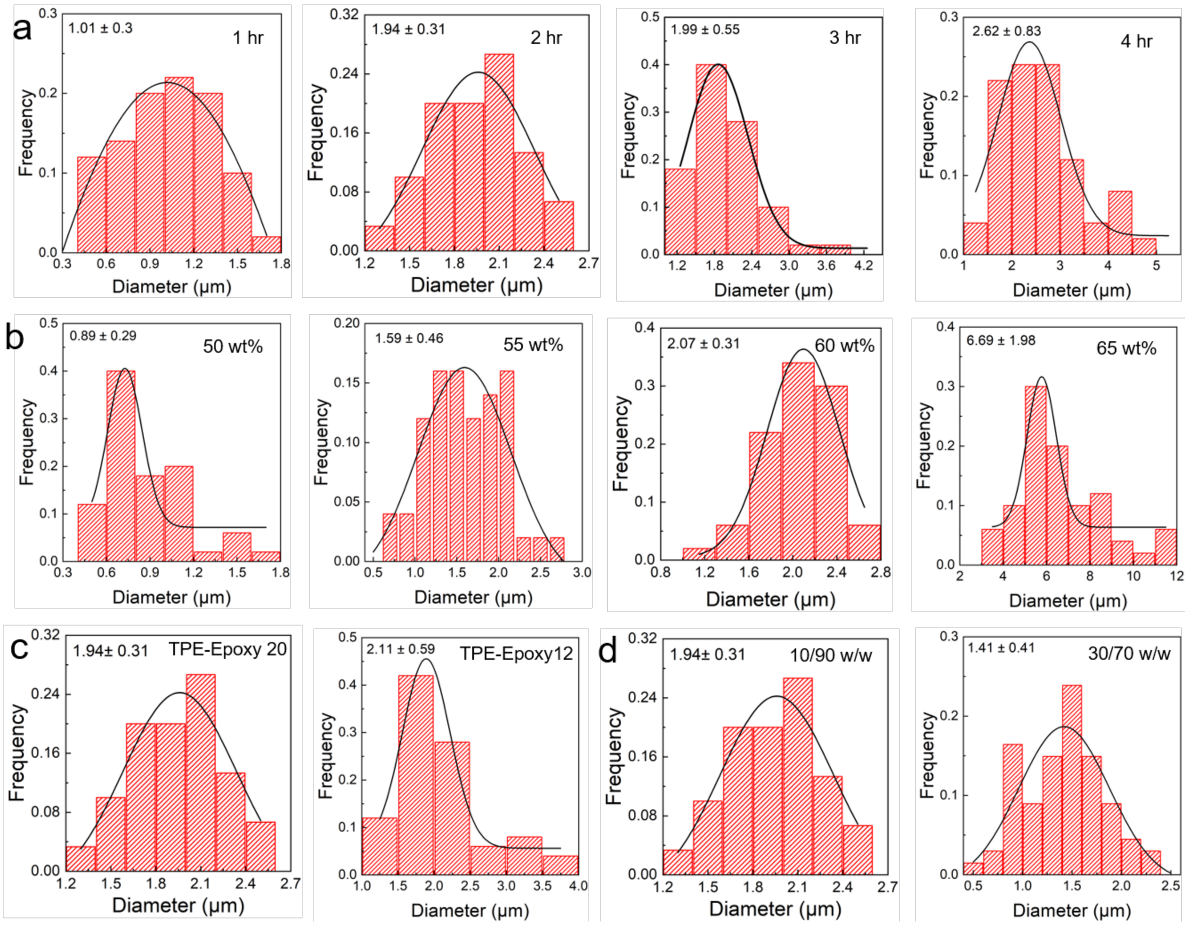


Figure. S1| Statistical diameter distributions of the fibers in shown in **Figure 1** in the main manuscript. (a) Distribution for SEM images in **Figure. 1b**. (b) distribution for SEM images in **Figure. 1d**. (c) Distribution for SEM images in **Figure. 1f**. and (d) distribution for SEM images in **Figure. 1h**.

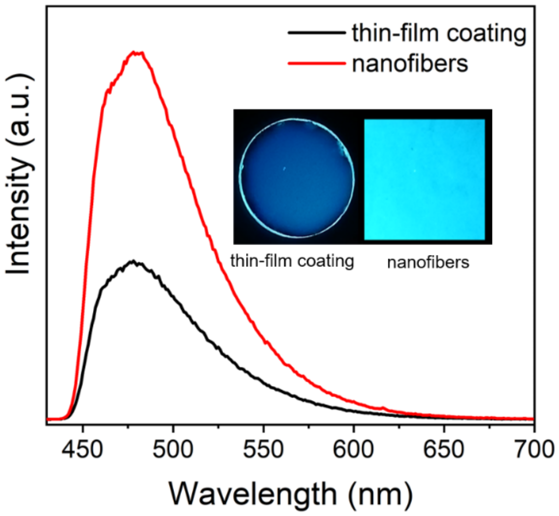


Figure. S2| The comparison between the optical properties of nanofibers-based TPE-Epoxy-20 and the corresponding thin film coating with same concentration. The PL Quantum yield of the nanofibers was 17.96% and thin film was 5.51%.

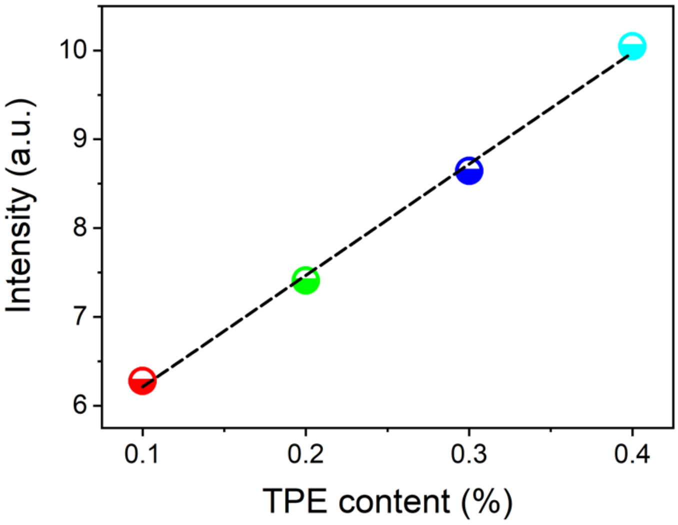


Figure. S3| TPE-2CH2Br Linear PL change as a function of TPE content concentration. Data analysed from in Figure. 3c of the main manuscript

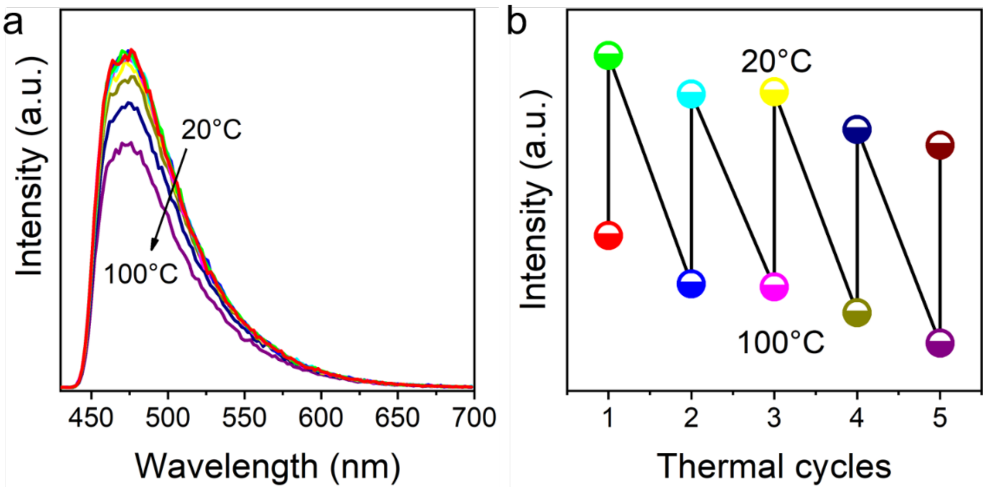


Figure. S4| Fluorescence responsiveness TPE-Epoxy-20 thin film. (a) PL intensity of the film exposed to different testing temperatures and (b) the PL recycling behaviors. Generally, the thin film showed similar trend when compared to FNF-2. The movement of polymer chain segments is an intrinsic characteristic of TPE. This explains why no matter the morphology of the materials presented, both the thin-film coatings and nanofiber membranes showed similar response to temperature.

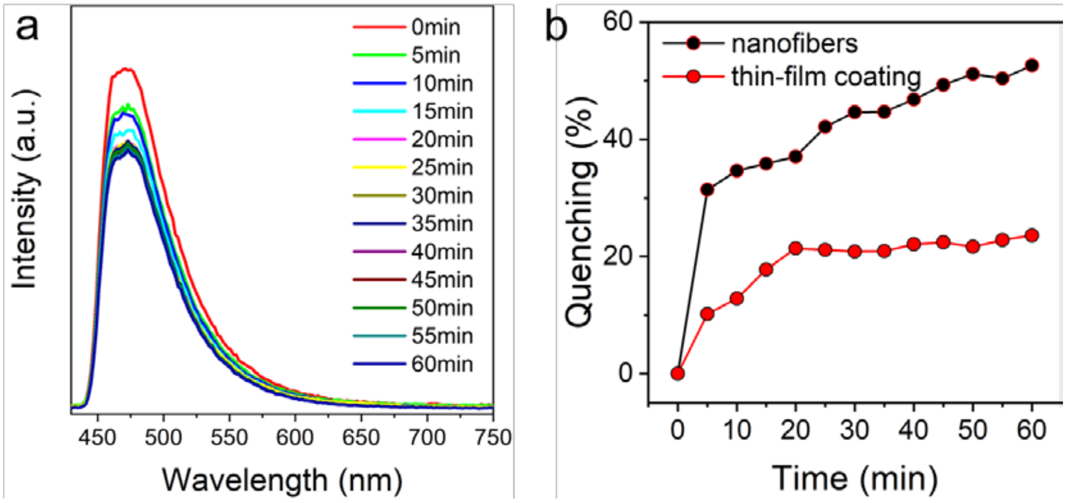


Figure. S5| (a) PL spectra intensity of TPE-Epoxy-20 coating in saturated DCM steam varied with soaking time. (b) The quenching degree of FNF-2 and the corresponding thin-film coating in DCM vapor

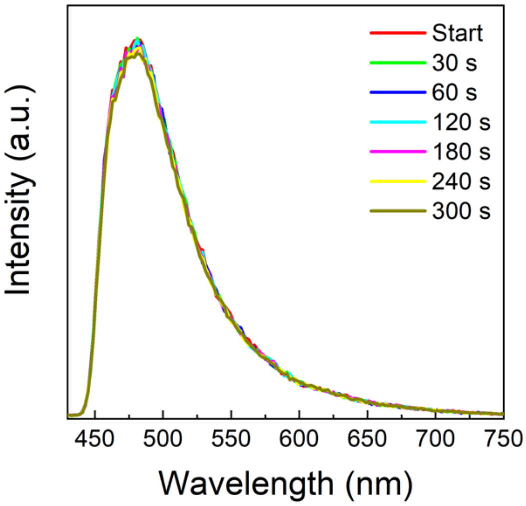


Figure. S6| PL spectra intensity of nanofibers soaked into PE varied with its soaking time

Supplementary information reference

1. W. Yao, M. Tebyetekerwa, X. Bian, W. Li, S. Yang, M. Zhu, R. Hu, Z. Wang, A. Qin and B. Z. Tang, *J. Mater. Chem. C*, 2018, **6**, 12849-12857.