Supporting Information

for

Electrospun Rhodamine@MOF/Polymer Luminescent Fibers with a Quantum Yield of Over 90%

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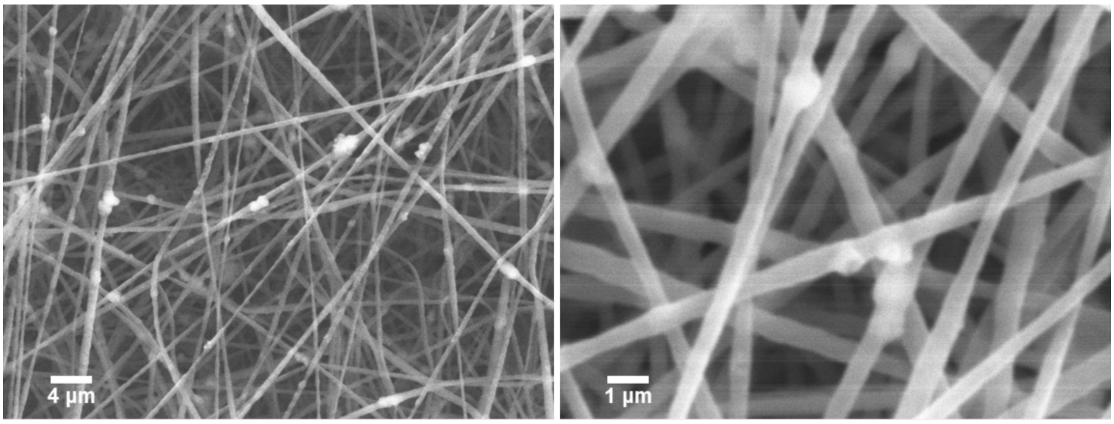
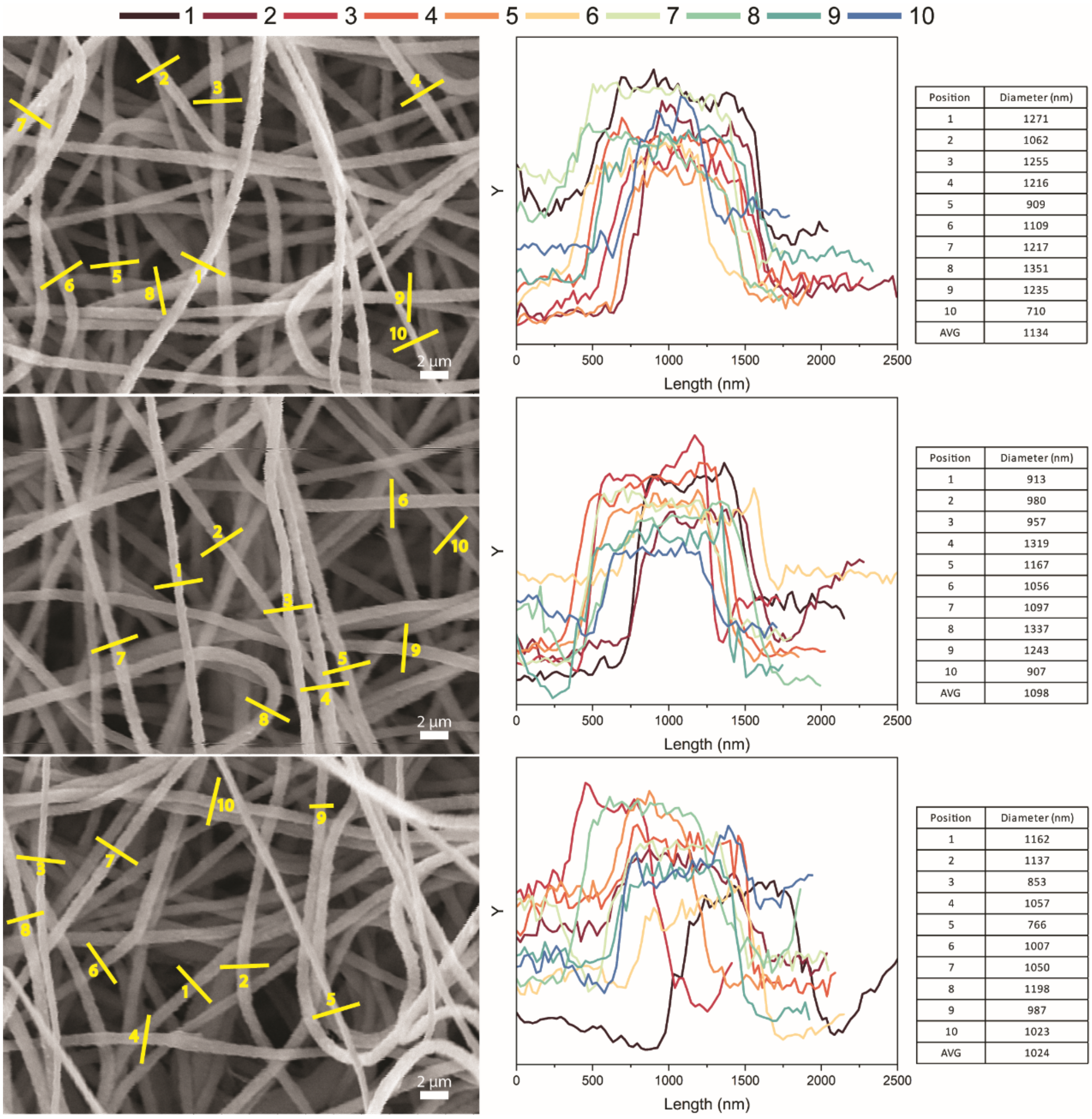


Figure S1. **SEM images of electrospun PVDF fibers incorporating RhB@ZIF-71 micron-sized crystals obtained from the conventional method (non-HCR) (Zhang et al., 2020), related to Figure 2.**

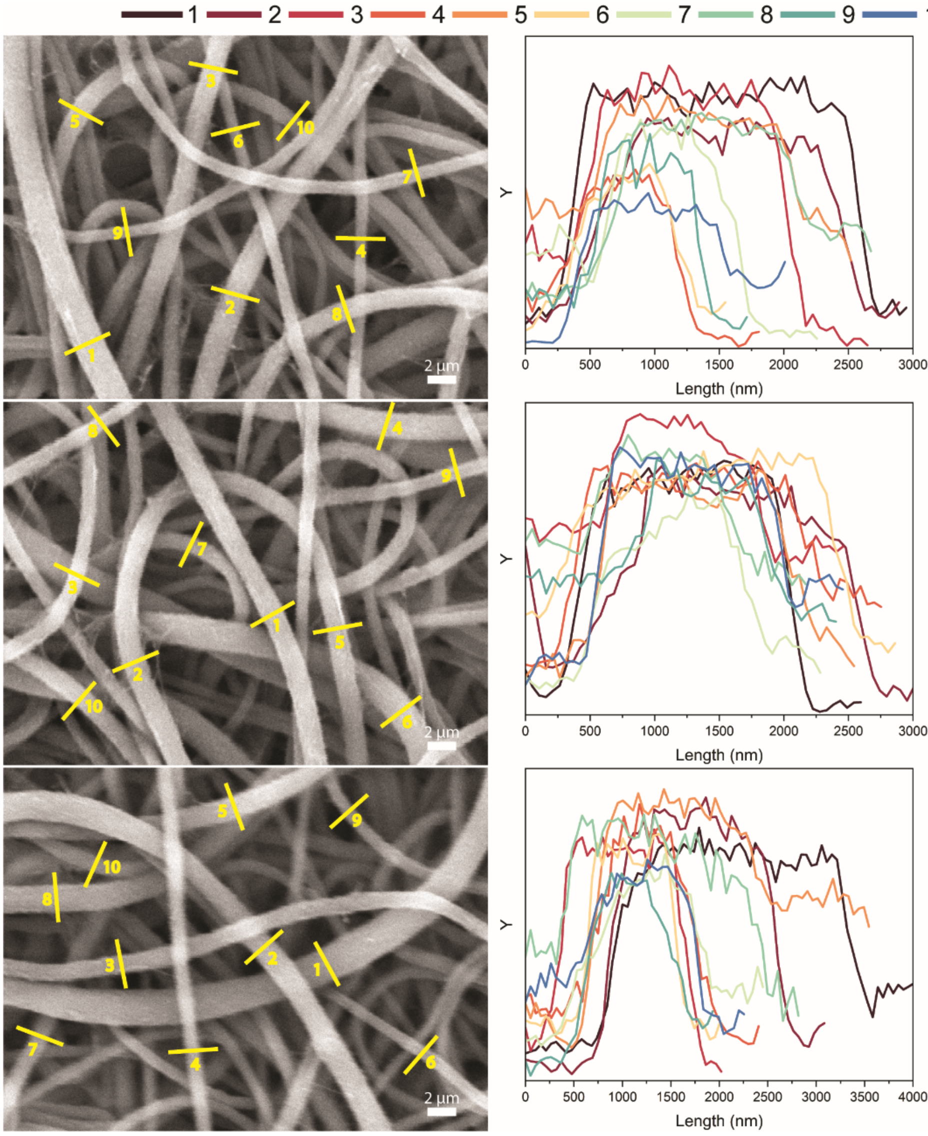


Position	Diameter (nm)
1	1271
2	1062
3	1255
4	1216
5	909
6	1109
7	1217
8	1351
9	1235
10	710
AVG	1134

Position	Diameter (nm)
1	913
2	980
3	957
4	1319
5	1167
6	1056
7	1097
8	1337
9	1243
10	907
AVG	1098

Position	Diameter (nm)
1	1162
2	1137
3	853
4	1057
5	766
6	1007
7	1050
8	1198
9	987
10	1023
AVG	1024

Figure S2. **SEM images and sampling to determine the diameters of 1 wt% RhB@ZIF-71/PVDF fibers prepared under 8 μL/min flow rate in electrospinning, related to Figure 4.**

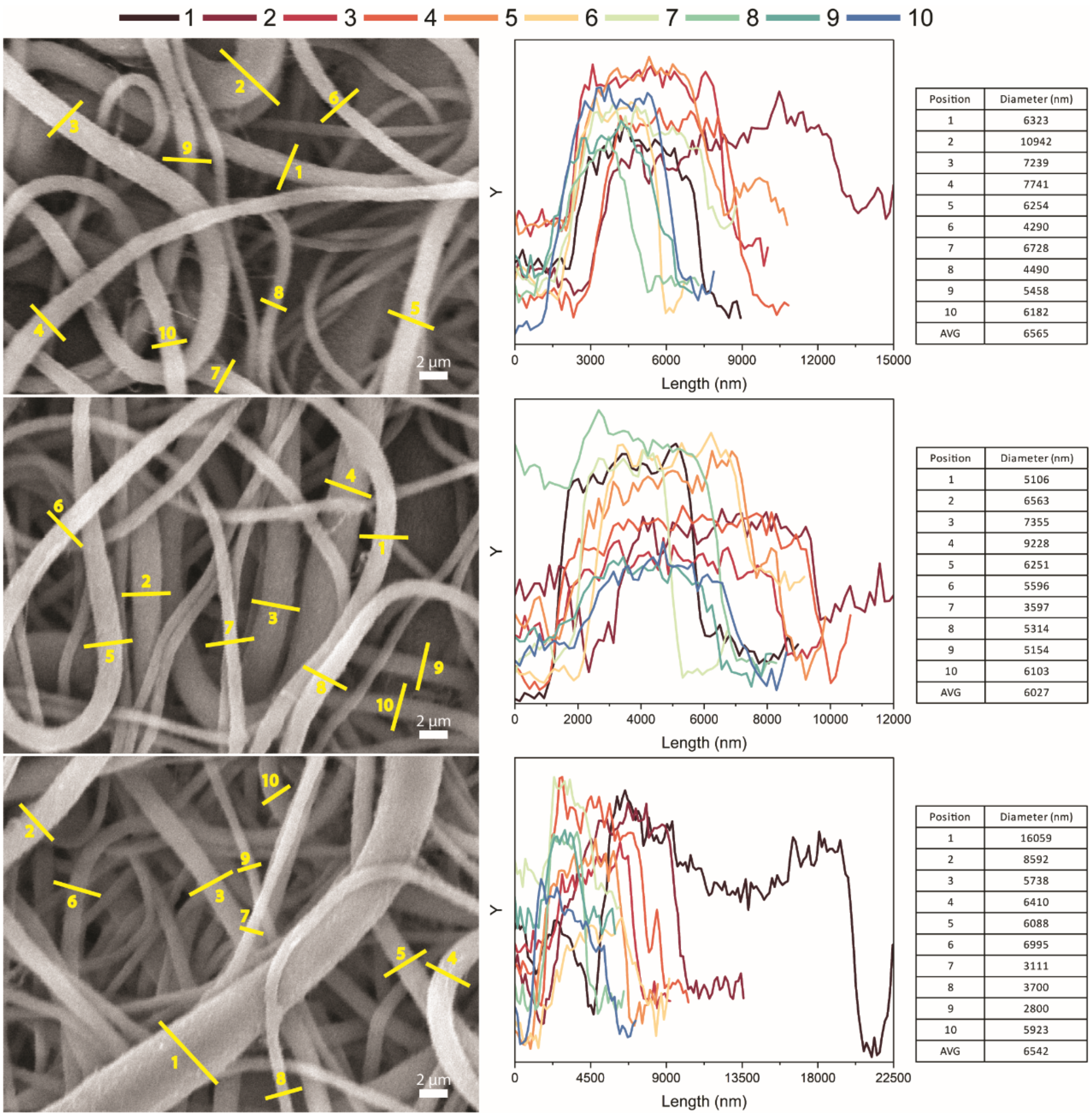


Position	Diameter (nm)
1	2576
2	2314
3	1851
4	1169
5	1619
6	1013
7	1363
8	1887
9	1071
10	1322
AVG	1619

Position	Diameter (nm)
1	2065
2	2429
3	1359
4	2172
5	1854
6	2489
7	1539
8	1375
9	1389
10	1672
AVG	1834

Position	Diameter (nm)
1	2899
2	2234
3	1701
4	1618
5	2222
6	1321
7	1757
8	2232
9	1462
10	1626
AVG	1907

Figure S3. **SEM images and sampling to determine the diameter of 1 wt% RhB@ZIF-71/PVDF fibers prepared under 12 μL/min flow rate in electrospinning, related to Figure 4.**



Position	Diameter (nm)
1	6323
2	10942
3	7239
4	7741
5	6254
6	4290
7	6728
8	4490
9	5458
10	6182
AVG	6565

Position	Diameter (nm)
1	5106
2	6563
3	7355
4	9228
5	6251
6	5596
7	3597
8	5314
9	5154
10	6103
AVG	6027

Position	Diameter (nm)
1	16059
2	8592
3	5738
4	6410
5	6088
6	6995
7	3111
8	3700
9	2800
10	5923
AVG	6542

Figure S4. **SEM images and sampling to determine the diameters of 1 wt% RhB@ZIF-71/PVDF fibers prepared under 20 μL/min flow rate in electrospinning, related to Figure 4.**

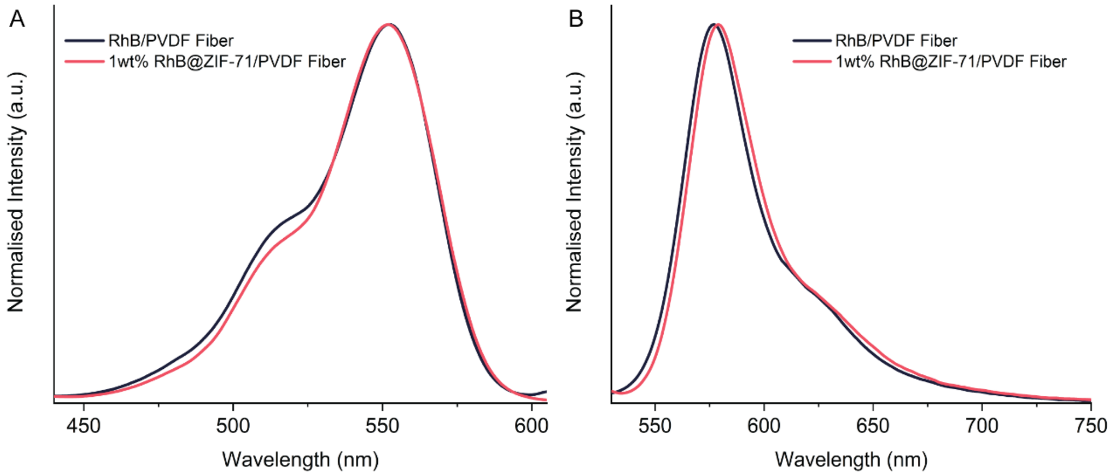


Figure S5. **Excitation and emission spectra of RhB/PVDF fibers and RhB@ZIF-71/PVDF fibers, related to Figure 6.**

(A) excitation spectra

(B) emission spectra

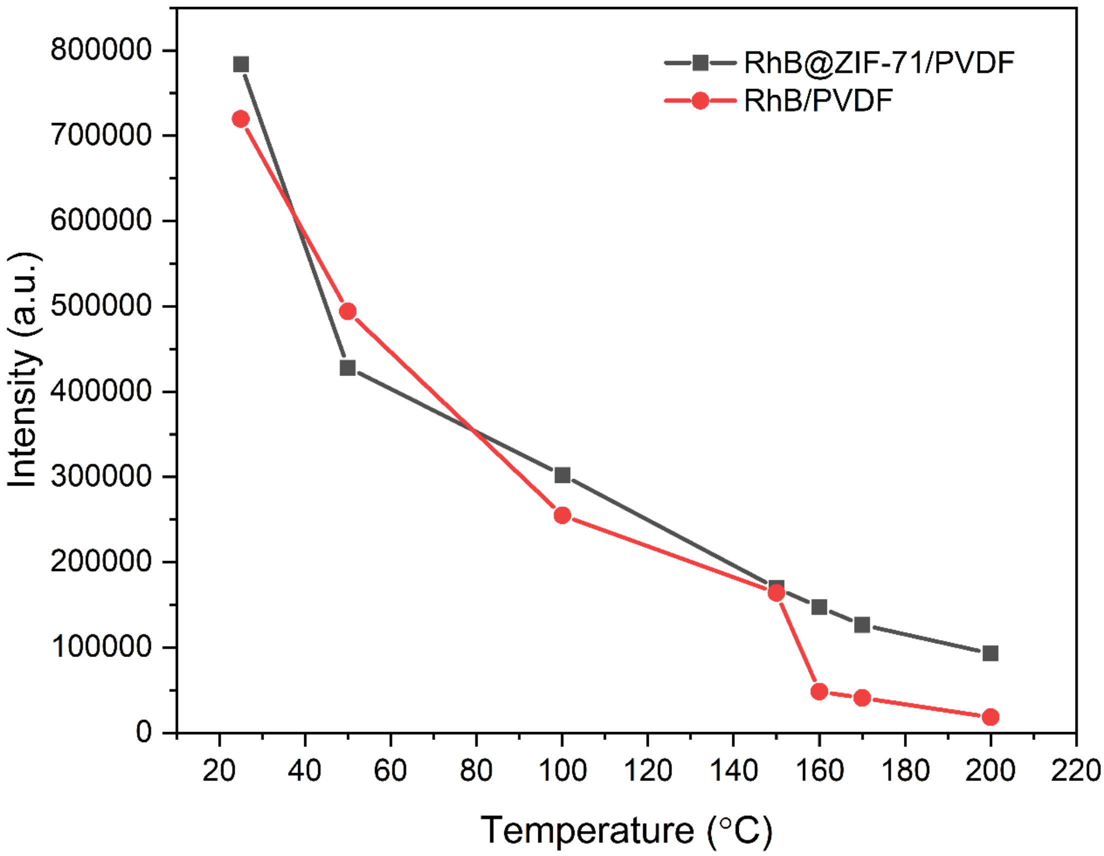


Figure S6. **Peak intensity changing during heat treatment of 1 wt% RhB@ZIF-71/PVDF fibers, and RhB/PVDF fibers at different temperatures, related to Figure 6.**

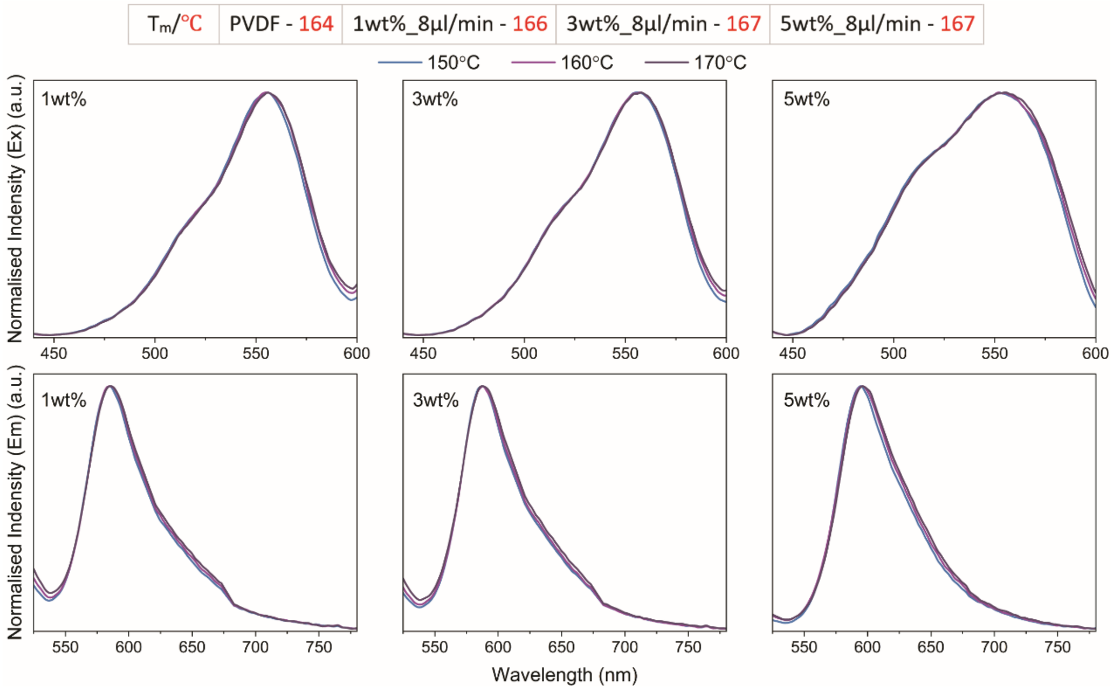


Figure S7. Characterization of PVDF and RhB@ZIF-71/PVDF fibers at temperatures close to the T_m of PVDF, related to Figure 6.

Melting temperature (T_m) of PVDF and RhB@ZIF-71/PVDF fibers with different loading wt.%. Excitation and emission changing during heat treatment of RhB@ZIF-71/PVDF fibers at temperatures close to the T_m of PVDF.

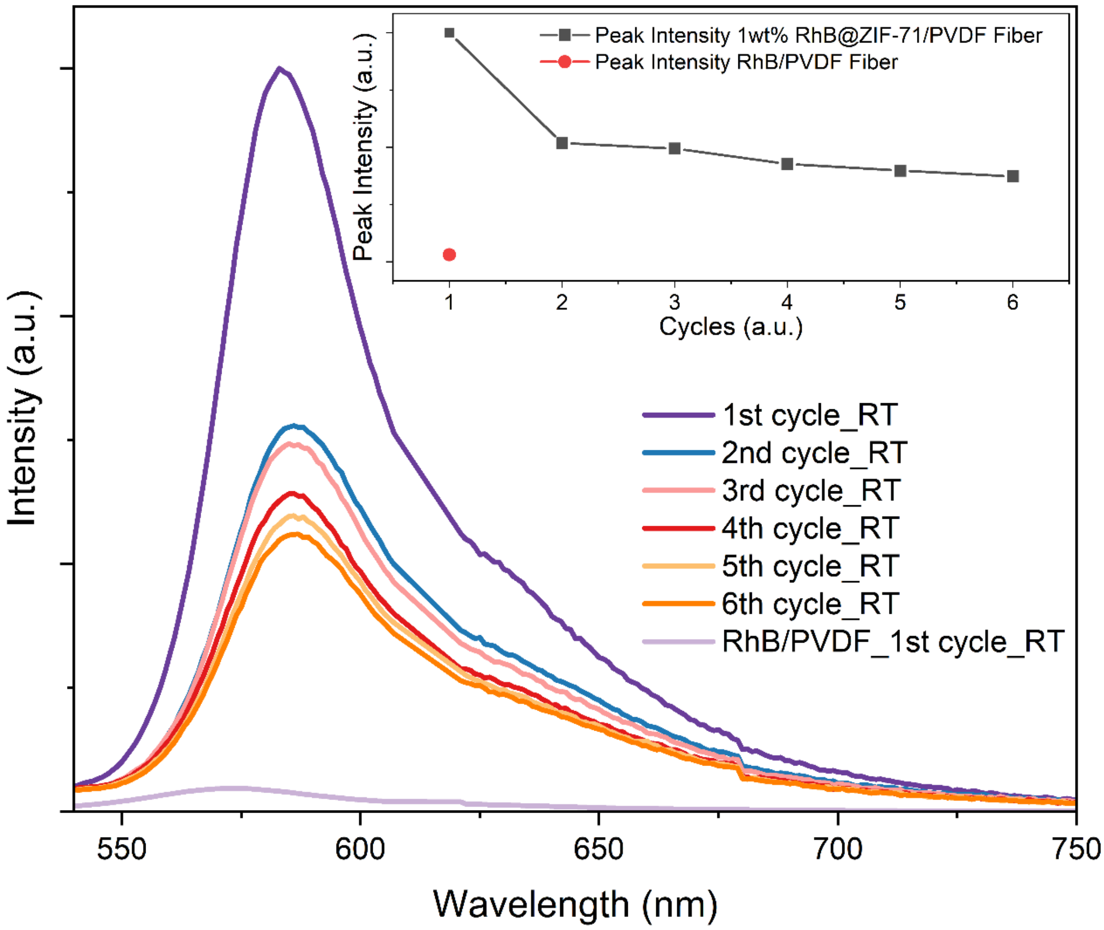


Figure S8. Emission property of RhB@ZIF-71/PVDF fibers after repeated heating, related to Figure 6.

Emission spectra of RhB@ZIF-71/PVDF fibers (1 wt%, 8 μL/min) determined at room temperature (RT) after being subjected to repeated heating tests to 200 °C (denoted by the cycle number, RhB/PVDF fiber is shown for contrast)

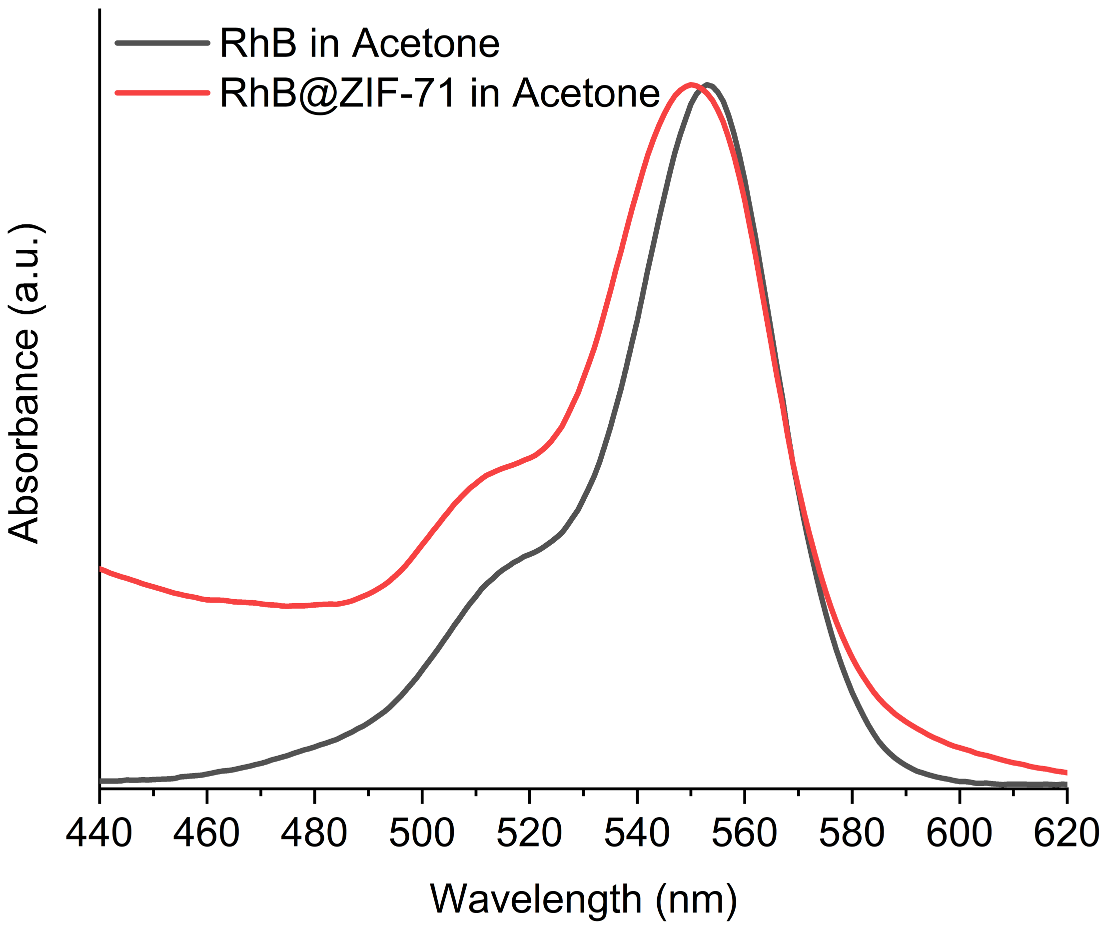


Figure S9. **Absorption spectra of RhB and RhB@ZIF-71 in an acetone solution, related to STAR Methods.**

Table S1. Lifetime results of RhB@ZIF-71 nanocrystals (powder sample) and its PVDF fiber composite with different weight percentage, related to Figure 5.
Values of time constants (τ_i), normalised pre-exponential factors (a_i), and fractional contributions ($c_i = \tau_i \cdot a_i$) of the emission decay of RhB@ZIF-71 nanocrystals (powder sample) and its PVDF fiber composite with different weight percentage upon excitation at 362.5 nm ($R_t = \Sigma a_i e^{(-t/\tau_i)}$, R_t is the quantity/counts at time *t*).

Sample	λ_{obs} [nm]	τ_1 [ns]	a_1	c_1 [%]	τ_2 [ns]	a_2	c_2 [%]	τ_3 [ns]	a_3	c_3 [%]	χ^2
Powder	579	0.60	19.7	5.21	2.15	54.5	50.66	4.00	25.8	44.13	1.060
	599	0.60	3.3	0.86	2.15	55.7	41.84	4.00	41.0	57.30	1.115
	619	0.60	8.3	1.75	2.15	36.7	25.88	4.00	55.0	72.37	1.133
1 wt% 8 μL/min Fiber	559	0.80	25.4	7.33	2.80	47.6	49.31	4.50	27.0	43.36	1.017
	579	0.80	15.3	4.23	2.80	55.9	52.85	4.50	28.8	42.92	1.002
	599	0.80	5.4	1.20	2.80	60.7	52.12	4.50	33.9	46.68	1.087
3 wt% 8 μL/min Fiber	561	0.80	31.8	10.76	2.66	54.5	62.96	4.50	13.6	26.28	1.086
	581	0.80	19.4	6.02	2.66	66.1	68.09	4.50	14.5	25.89	1.046
	601	0.80	8.6	2.40	2.66	74.1	69.38	4.50	17.2	28.22	1.097
5 wt% 8 μL/min Fiber	567	0.80	26.2	8.41	2.54	53.8	55.89	4.50	20.0	35.70	1.025
	587	0.80	16.4	4.82	2.54	62.3	58.28	4.50	21.3	36.90	1.006
	607	0.80	5.2	1.43	2.54	67.2	56.87	4.50	27.6	41.70	1.133

Table S2. Lifetime results of RhB@ZIF-71 nanocrystals (powder sample) and its PVDF fiber composite with different processing speed, related to Figure 5.

Values of time constants (τ_i), normalised pre-exponential factors (a_i), and fractional contributions ($c_i = \tau_i \cdot a_i$) of the emission decay of RhB@ZIF-71 nanocrystals (powder sample) and its PVDF fiber composite with different processing speed upon excitation at 362.5 nm.

Sample	λ_{obs} [nm]	τ_1 [ns]	a_1	c_1 [%]	τ_2 [ns]	a_2	c_2 [%]	τ_3 [ns]	a_3	c_3 [%]	χ^2
Powder	579	0.60	19.7	5.21	2.15	54.5	50.66	4.00	25.8	44.13	1.060
	599	0.60	3.3	0.86	2.15	55.7	41.84	4.00	41.0	57.30	1.115
	619	0.60	8.3	1.75	2.15	36.7	25.88	4.00	55.0	72.37	1.133
1 wt% 8 μL/min Fiber	559	0.80	25.4	7.33	2.80	47.6	49.31	4.50	27.0	43.36	1.017
	579	0.80	15.3	4.23	2.80	55.9	52.85	4.50	28.8	42.92	1.002
	599	0.80	5.4	1.20	2.80	60.7	52.12	4.50	33.9	46.68	1.087
1 wt% 12 μL/min Fiber	564	0.80	22.6	6.48	2.63	51.6	50.07	4.50	25.8	43.45	1.055
	584	0.80	15.0	4.03	2.63	56.7	51.49	4.50	28.3	44.47	1.171
	604	0.80	13.8	3.44	2.63	51.7	45.42	4.50	34.5	51.14	1.288
1 wt% 20 μL/min Fiber	566	0.80	5.3	1.64	2.55	68.4	58.16	4.50	26.3	40.20	1.119
	586	0.80	3.4	1.05	2.55	69.0	58.34	4.50	27.6	40.61	1.046
	606	0.80	0.0	0.21	2.55	69.1	55.05	4.50	30.9	44.74	1.212

Table S3. The quantum yield of RhB@ZIF-71 powder and its PVDF fiber with different weight percentage, related to Figure 5.

The standard deviation corresponds to 3 measurements.

Sample	QY (%)		
	Ex@485 nm	Ex@520 nm	Ex@525 nm
Powder	24.83±0.07	27.21±0.34	23.76±0.19
1 wt% 8 μL/min	92.11±0.51	70.35±0.07	66.17±0.14
3 wt% 8 μL/min	51.12±0.11	58.76±0.06	58.50±0.79
5 wt% 8 μL/min	57.80±0.40	53.46±0.08	49.98±0.07

Table S4. The quantum yield of RhB@ZIF-71 powder and its PVDF fiber with different processing speed, related to Figure 5.
The standard deviation corresponds to 3 measurements.

Sample	QY (%)		
	Ex@485 nm	Ex@520 nm	Ex@525 nm
Powder	24.83±0.07	27.21±0.34	23.76±0.19
1 wt% 8 μL/min	92.11±0.51	70.35±0.07	66.17±0.14
1 wt% 12 μL/min	70.37±0.10	65.81±0.13	64.86±0.06
1 wt% 20 μL/min	75.86±0.10	66.84±0.13	63.40±0.07

Table S5. The quantum yield (QY) of other RhB-based fluorescent materials in the literature compared with the results of the current study, related to Figure 5.
The standard deviation for theRhB@ZIF-71/PVDF electrospun fibers was determined from 3 measurements.

System	QY (%)	Ref
RhB/PVAc; RhB/PMMA	3.22 – 25.2	(Ahmed and Saif, 2013)
RhB@AuNP	1	(Stobiecka and Hepel, 2011)
RhB/sol-gel silica	37.4	(Khader, 2008)
RhB solutions	30 – 66	(Sagoo and Jockusch, 2011)
RhB@ZIF-71/PVDF electrospun fibers 1wt%, 8μL/min	92 ± 0.5	This work