Supporting information

Bistable molecular chain magnet in electrospun polymer fibers

Aleksandra Pacanowska[1], Gaja Wota[2], Małgorzata Jasiurkowska- Delaporte[1], Naveen Kumar Chogondahalli Muniraju[1], Wojciech Sas[1], Kamila Komędera[3], Wojciech Tabiś[3], Alexey Maximenko[4], Grzegorz Gazdowicz[4], Paweł Czaja[5], Marcin Perzanowski[1], Marzena Mitura-Nowak[1], Beata Nowicka[2]*, Magdalena Fitta[1]*

[1]Institute of Nuclear Physics Polish Academy of Sciences, Radzikowskiego 152, 31-342 Kraków, Poland
[2]Faculty of Chemistry, Jagiellonian University, Gronostajowa 2, 30-387 Kraków, Poland
[3]AGH University of Krakow, Faculty of Physics and Applied Computer Science, Krakow, 30-059, Poland
[4]SOLARIS National Synchrotron Radiation Centre, Jagiellonian University, ul. Czerwone Maki 98, 30-392 Kraków, Poland
[5]Institute of Metallurgy and Materials Science Polish Academy of Sciences, Reymonta 25, 30-059, Kraków, Poland

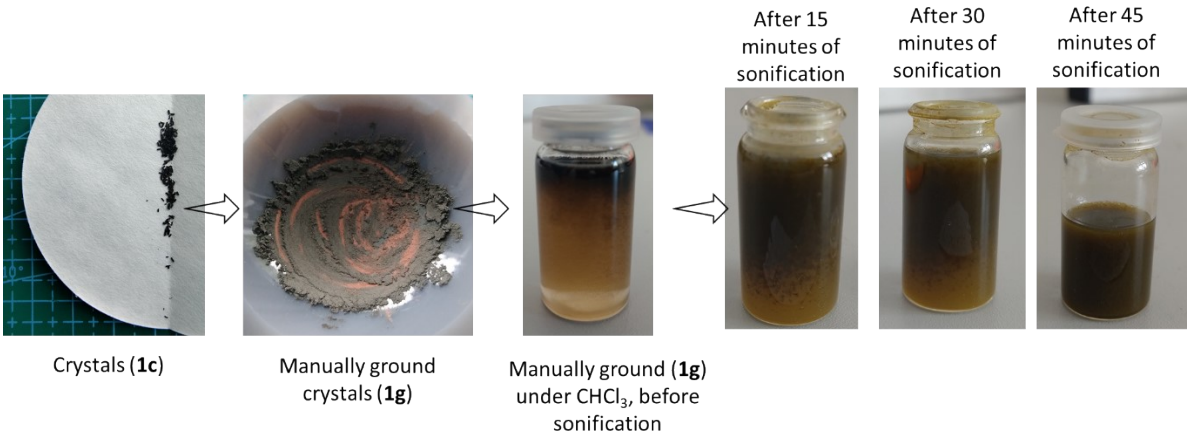

Figure S1. The scheme showing the process of particle size reduction of the coordination chain $\{NH_4[Ni(cyclam)][Fe(CN)_6]\cdot 5H_2O\}_n$ (**1**). The crystals (**1c**) were manually ground in an agate mortar. The resulting finely ground powder (**1g**) was transferred into a glass vial and covered with chloroform. The suspension was sonicated for 45 minutes in three intervals to give dispersed nono- sized particles (**1p**).

Table S1. Experimental details for the preparation of electrospinning solutions and **1p** content in composites.

Comp-osite	**1p** [mg]	$CHCl_3$: MeOH [ml : ml]	DMF [ml]	PCL [g]	P2VP-PS [g]	Amount of **1p** in fibers (wt. %)	
						from synthesis	from DVS
2	180	6 : 2	-	1.096	-	14.1	7.4
	135	6 : 2	-	1.127	-	10.7	5.4
	90	6 : 2	-	1.094	-	7.6	4.3
3	160	6 : 2	-	-	1.200	11.8	10.9
	70	6 : 2	-	-	1.187	5.4	7.6
3d	180	-	4	-	1.117	13.9	12.3

Table S2. Structural parameters obtained from powder X-ray diffraction data for samples prepared by manual grinding (**1g**) and by sonication (**1p**) in comparison to single-crystal data from ref. 42. All measurements at 295 K.

Parameter	**1g**	**1p**	**Single crystal**	**1g**	**1p**	**Single crystal**
	HT Phase			**LT Phase**		
a (Å)	14.271(1)	14.273(1)	14.2585	13.864(1)	13.865(2)	13.8058
b (Å)	12.965(2)	12.957(1)	12.9512	12.558(2)	12.554(1)	12.4374
c (Å)	10.220(2)	10.220(1)	10.2150	10.064(2)	10.062(2)	10.0431
α, γ (º)	90	90	90	90	90	90
β (º)	133.38(2)	133.42(4)	133.39	132.91(2)	132.93(1)	132.829
Unit cell volume ($Å^3$)	1374.33(7)	1374.62(5)	1370.80	1283.17(9)	1282.50(7)	1264.71

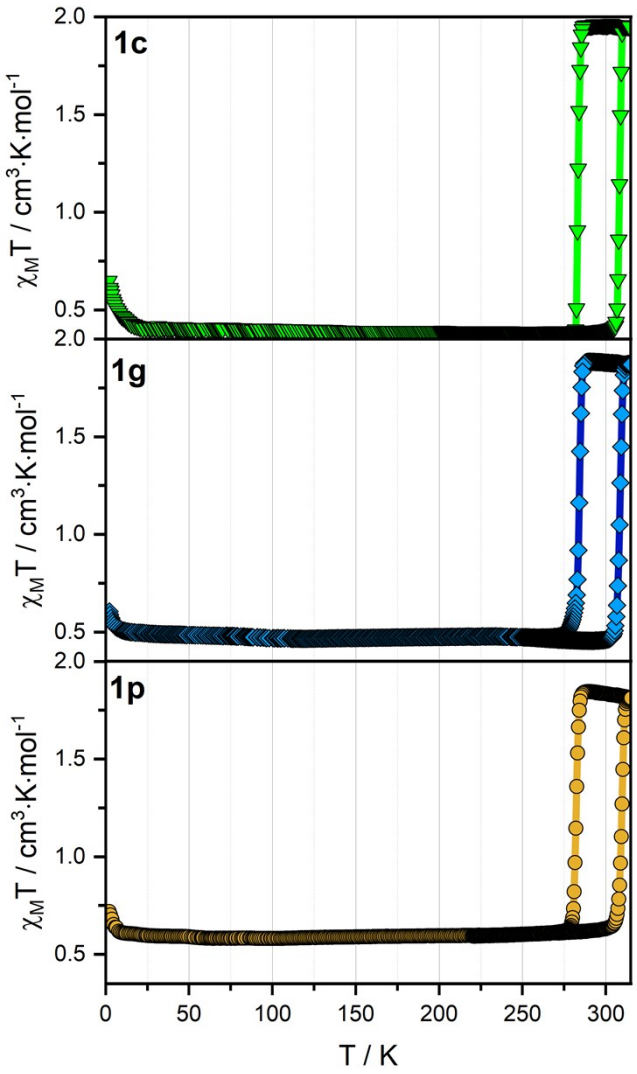

Figure S2. Temperature dependence of χT of **1c, 1g**, and **1p** in the temperature range 2 – 315 K measured under an applied magnetic field of 1 kOe.

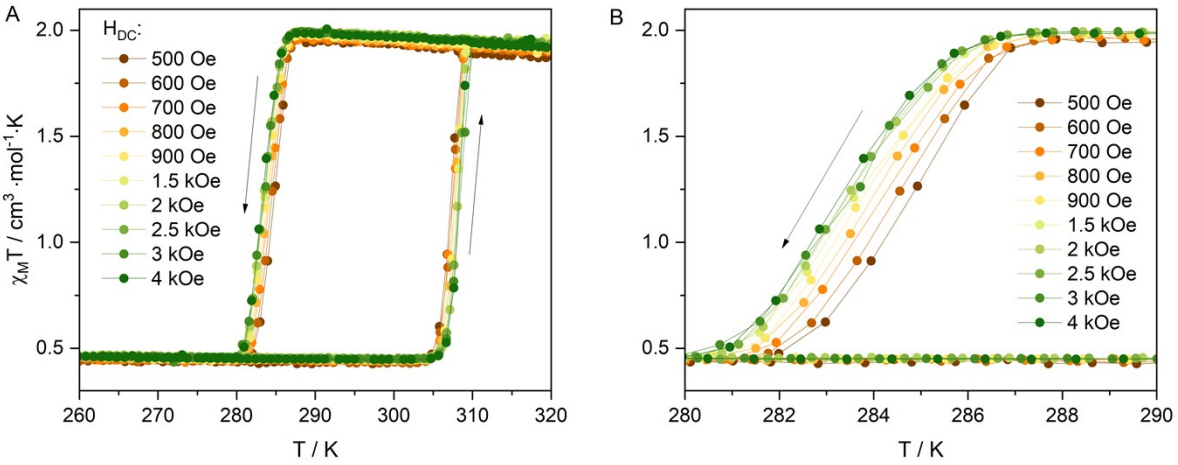

Figure S3. Temperature dependence of χT of **1c** in the temperature range 260 – 315 K measured under an applied magnetic field in the range 500 Oe-4kOe.

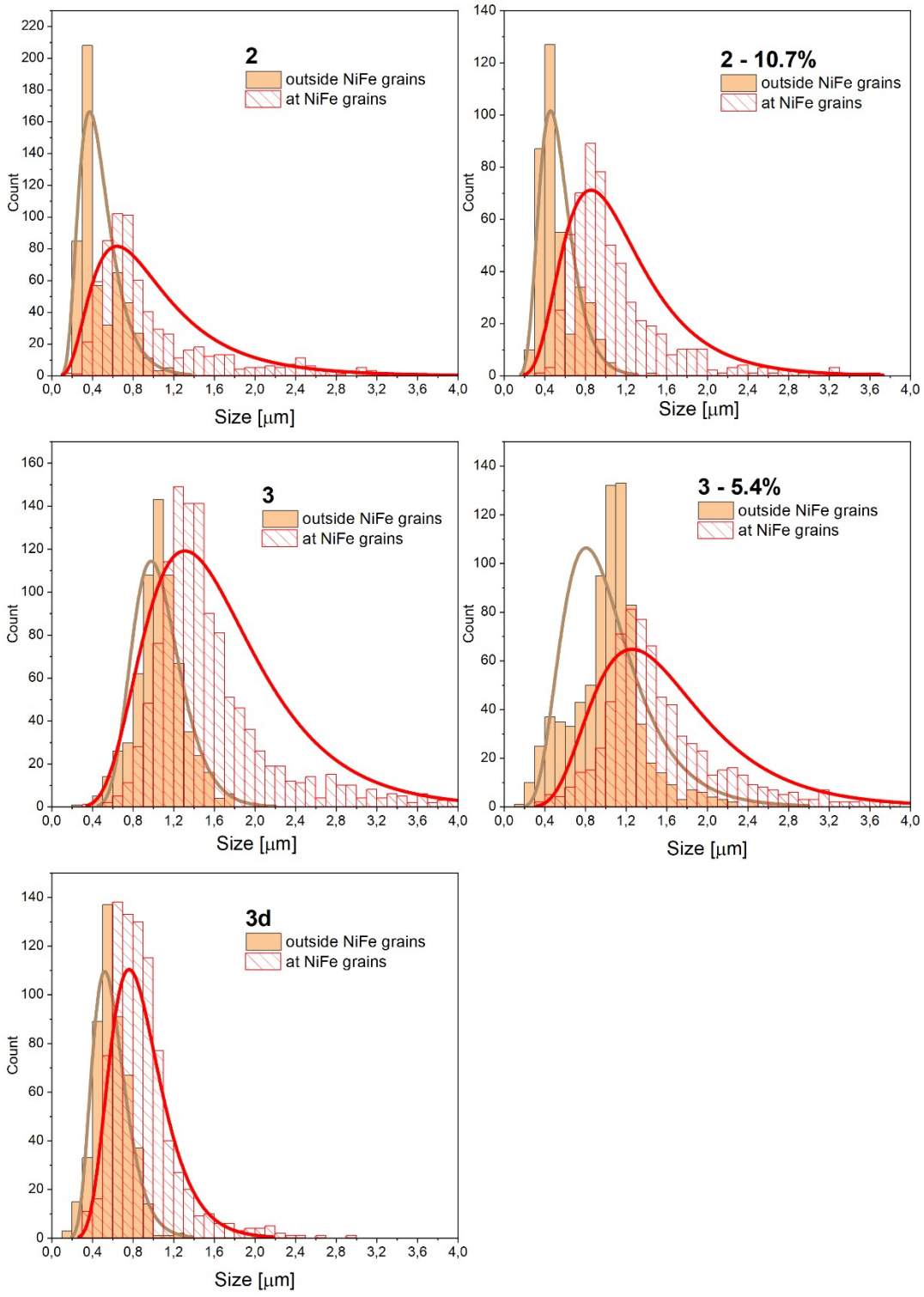

Figure S4. Histograms of the fiber size distribution in electrospun composite mats **2**, **3**, and **3d** with different content of **1p**.

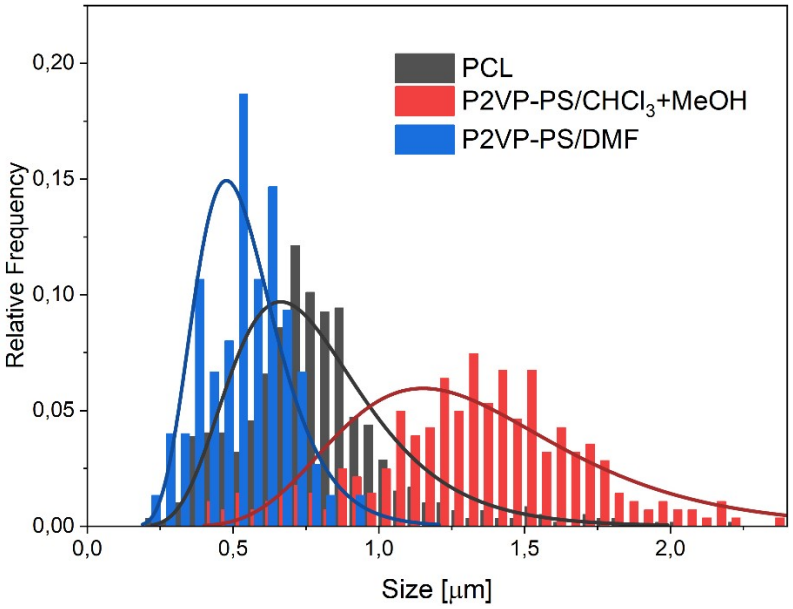

Figure S5. Histograms of the fiber size distribution of pure PCL and P2VP-PS electrospun mats.

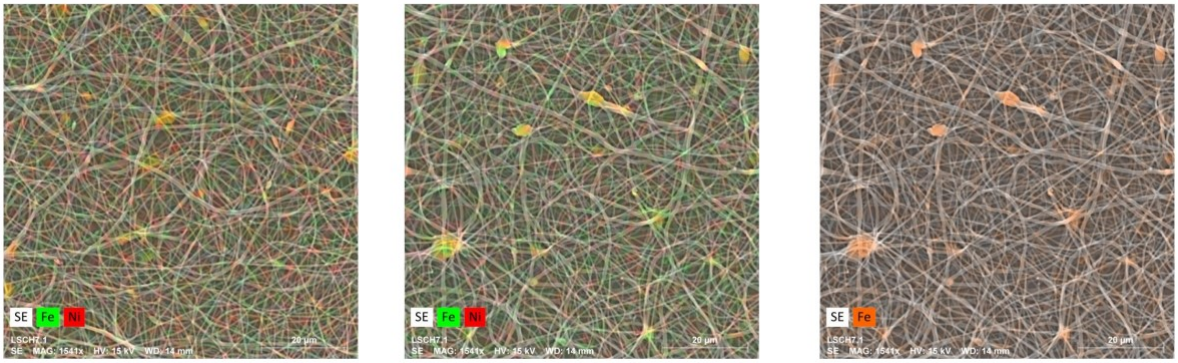

Figure S6. Elemental mapping of **2** composite fibers.

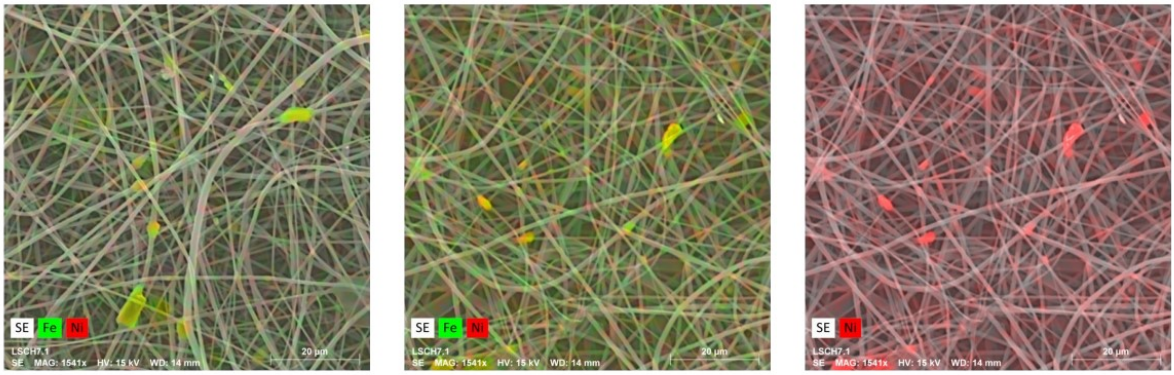

Figure S7. Elemental mapping of **3** composite fibers.

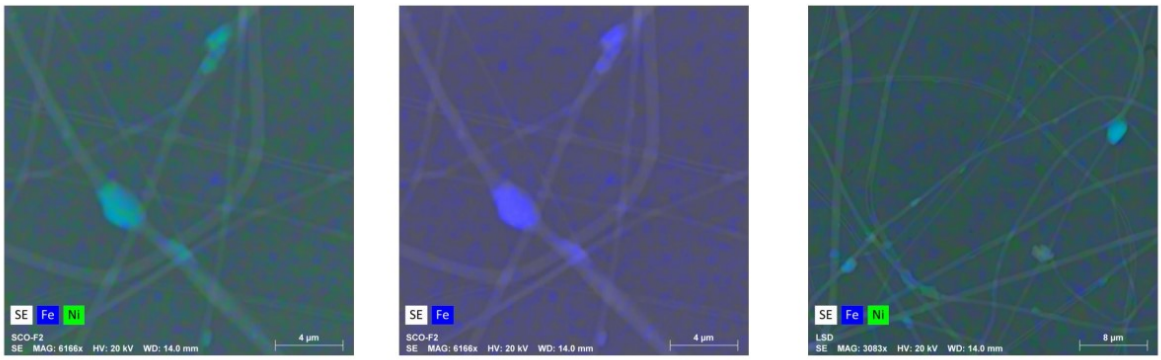

Figure S8. Elemental mapping of **3d** composite fibers.

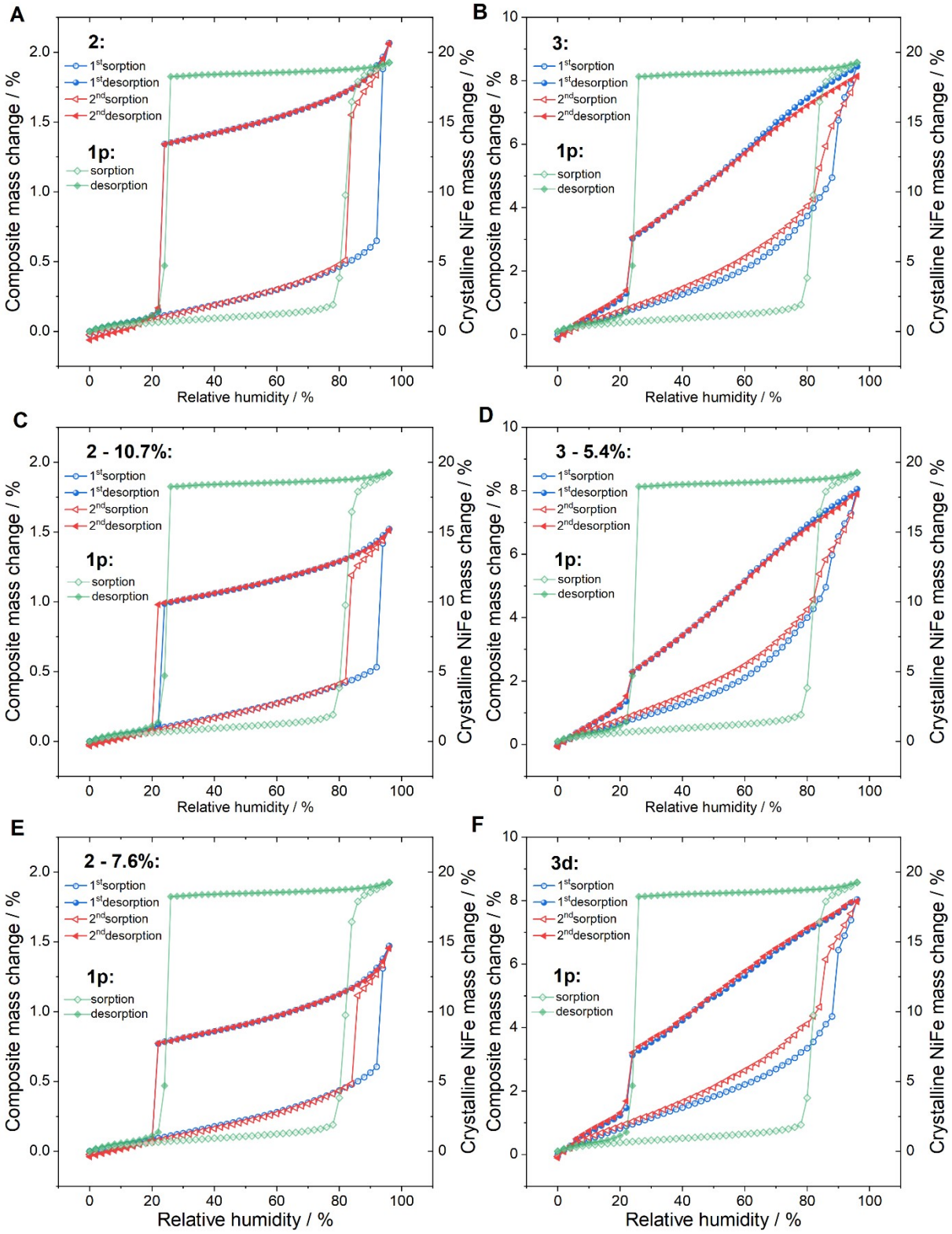

Figure S9. First and second cycle water sorption isotherms for composite mats **2**, **3**, and **3d** with different content of **1p**; sorption isotherms for **1p** shown for comparison.

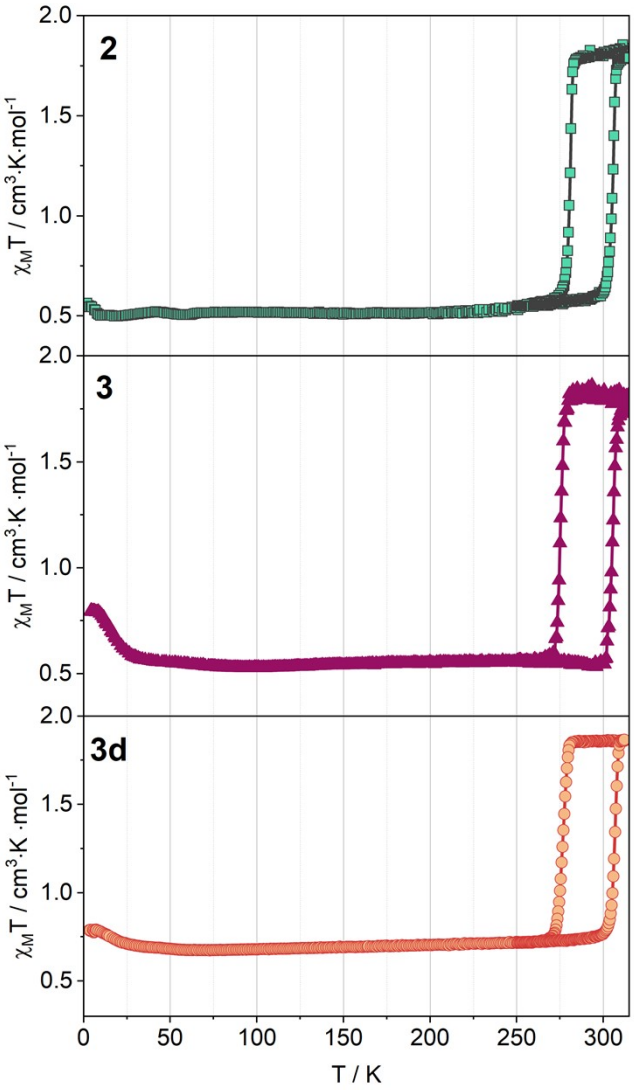

Figure S10 Comparison of the $\chi_M T(T)$ plot measured for the powder **1p** sample and electrospun composites **2**, **3**, and **3d**.

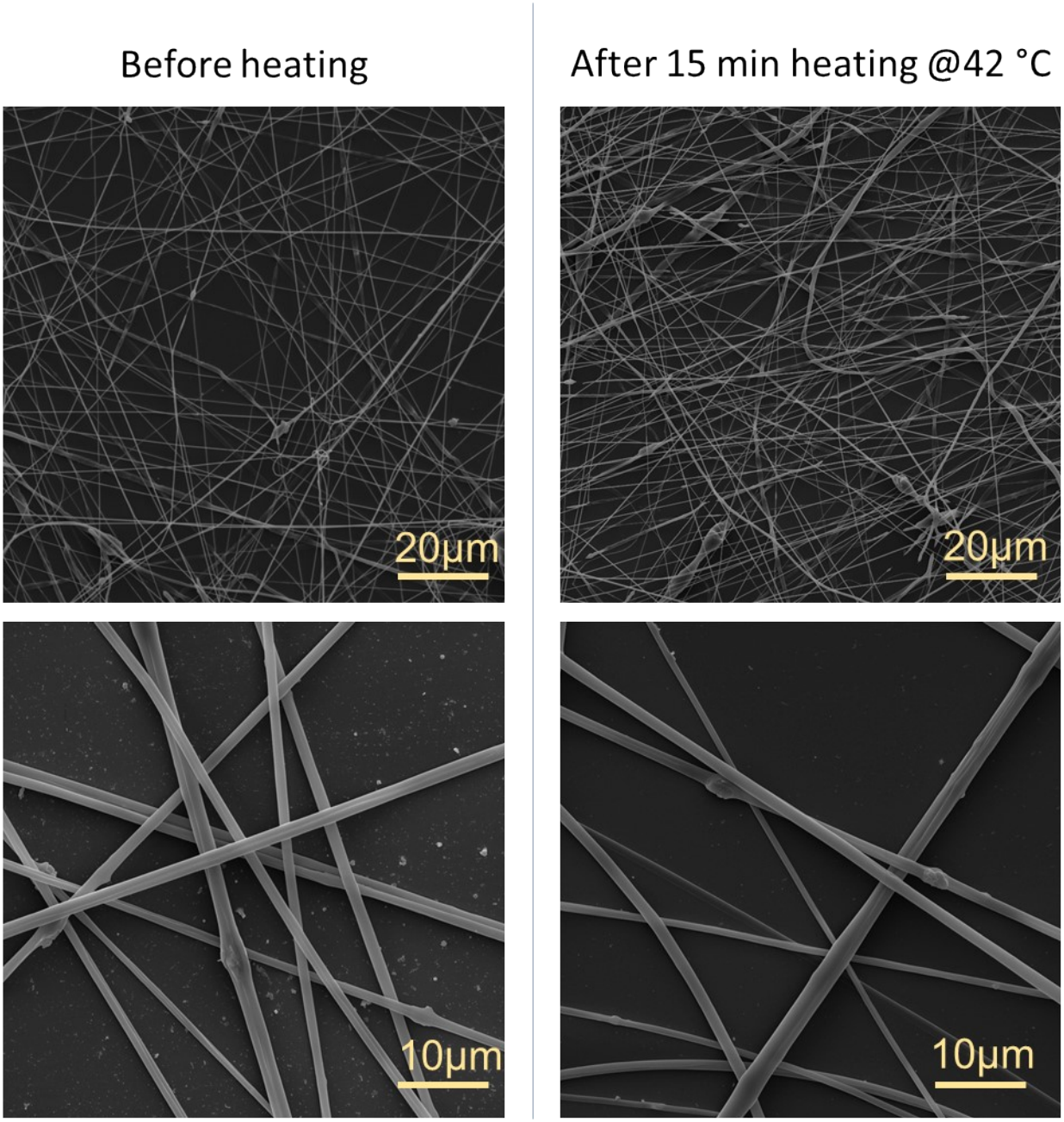

Figure S11. The comparison of SEM images taken for **2** before and after heating at 42 °C.