

Supplementary Materials: Extrusion Coating of Paper with Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV)—Packaging Related Functional Properties

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Table S1. Results for the elastic modulus.

Plasticiser Concentration		Elastic Modulus / (N/mm ²)						
Wt.%	TEC, T = const.	STABW	PEG, T = const	STABW	TEC, MFR = const	STABW	PEG, MFR = const.	STABW
0	3010	463.105	3010	463.105	3010	463.105	3010	463.105
2	3155	408.092	3300	429.909	2816	162.972	3121	156320
5	2260	328.362	2755	500.338	2540	214.838	2435	267.799
10	1952	211.859	2155	609.795	1769	169.735	2046	149.164
15	1482	194.010	1611	203.712	1227	268.430	1588	470.277

Table S2. Results for the elongation at break.

Plasticiser Concentration		Elongation at break / length-%						
Wt.%	TEC, T = const.	STABW	PEG, T = const	STABW	TEC, MFR = const	STABW	PEG, MFR = const.	STABW
0	0.92	0.18	0.92	0.18	0.92	0.18	0.92	0.18
2	1.24	0.22	0.98	0.25	1.31	0.23	1.48	0.10
5	1.07	0.07	0.79	0.17	1.03	0.12	1.59	0.19
10	1.52	0.19	0.66	0.17	1.33	0.25	2.01	0.25
15	2.39	0.46	1.54	0.82	1.87	0.39	1.01	0.24

Table S3. Results for the tensile strength.

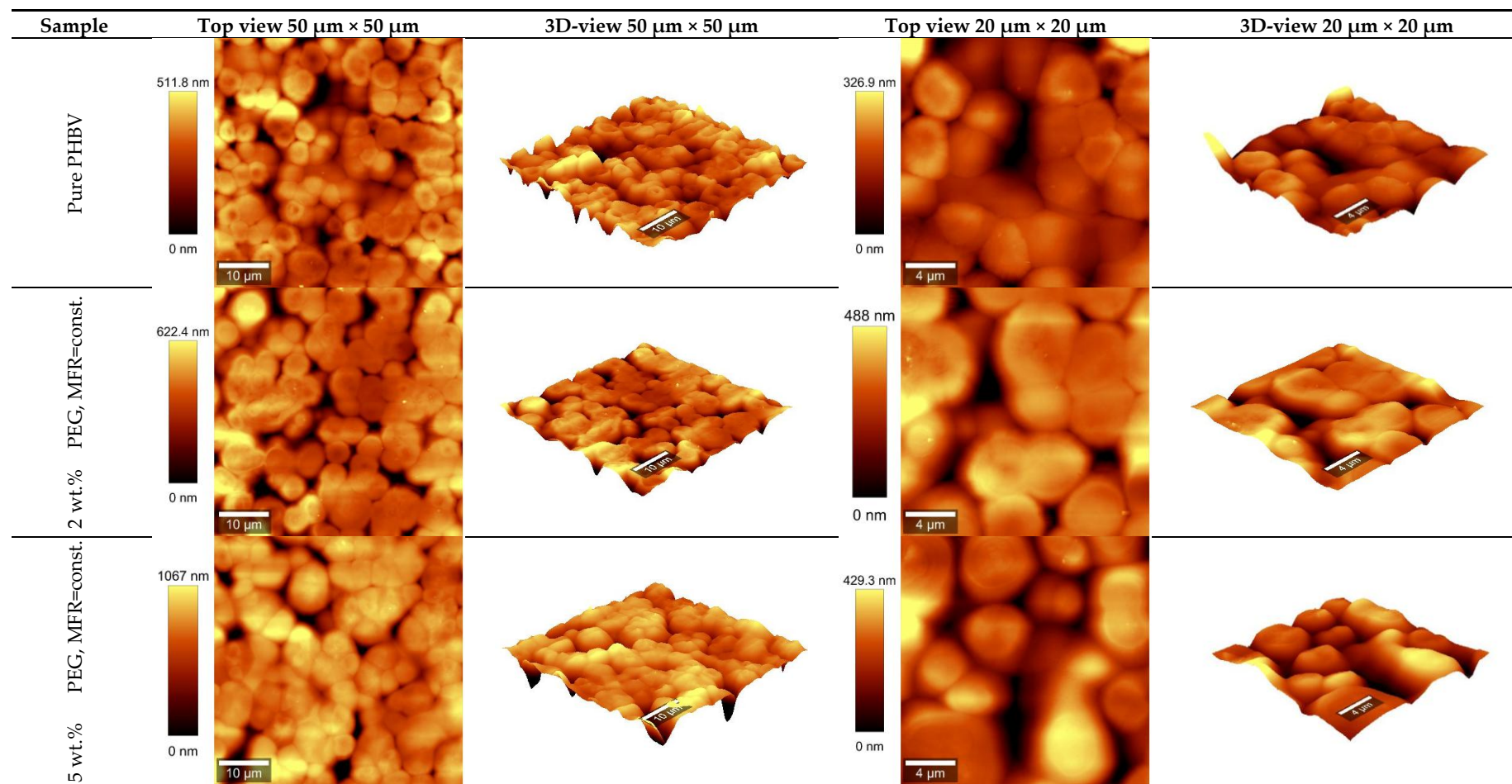
Plasticiser Concentration		Tensile strength / (N/mm ²)						
Wt.%	TEC, T = const.	STABW	PEG, T = const	STABW	TEC, MFR = const	STABW	PEG, MFR = const.	STABW
0	18.52	3.875	18.52	3.875	18.52	3.875	18.52	3.875
2	20.51	2.056	18.85	2.634	18.90	0.669	22.97	1.329
5	16.77	2.174	16.20	3.214	20.24	1.32	20.13	0.821
10	17.71	2.084	12.07	3.719	16.72	1.961	18.17	2.113
15	16.23	1.952	10.31	1.623	16.47	2.930	11.39	2.588

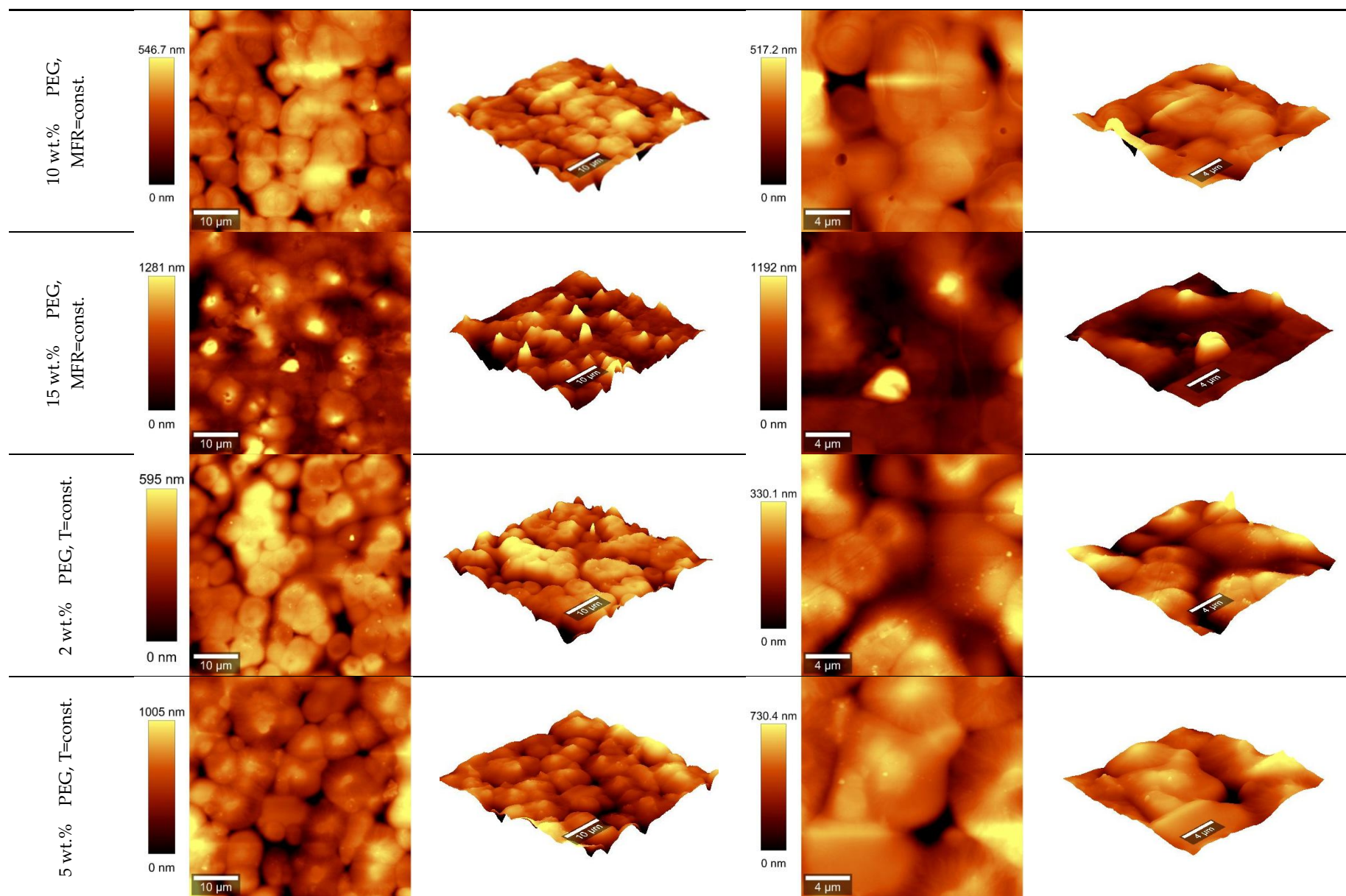
Table S4. Results of fat penetration (staining).

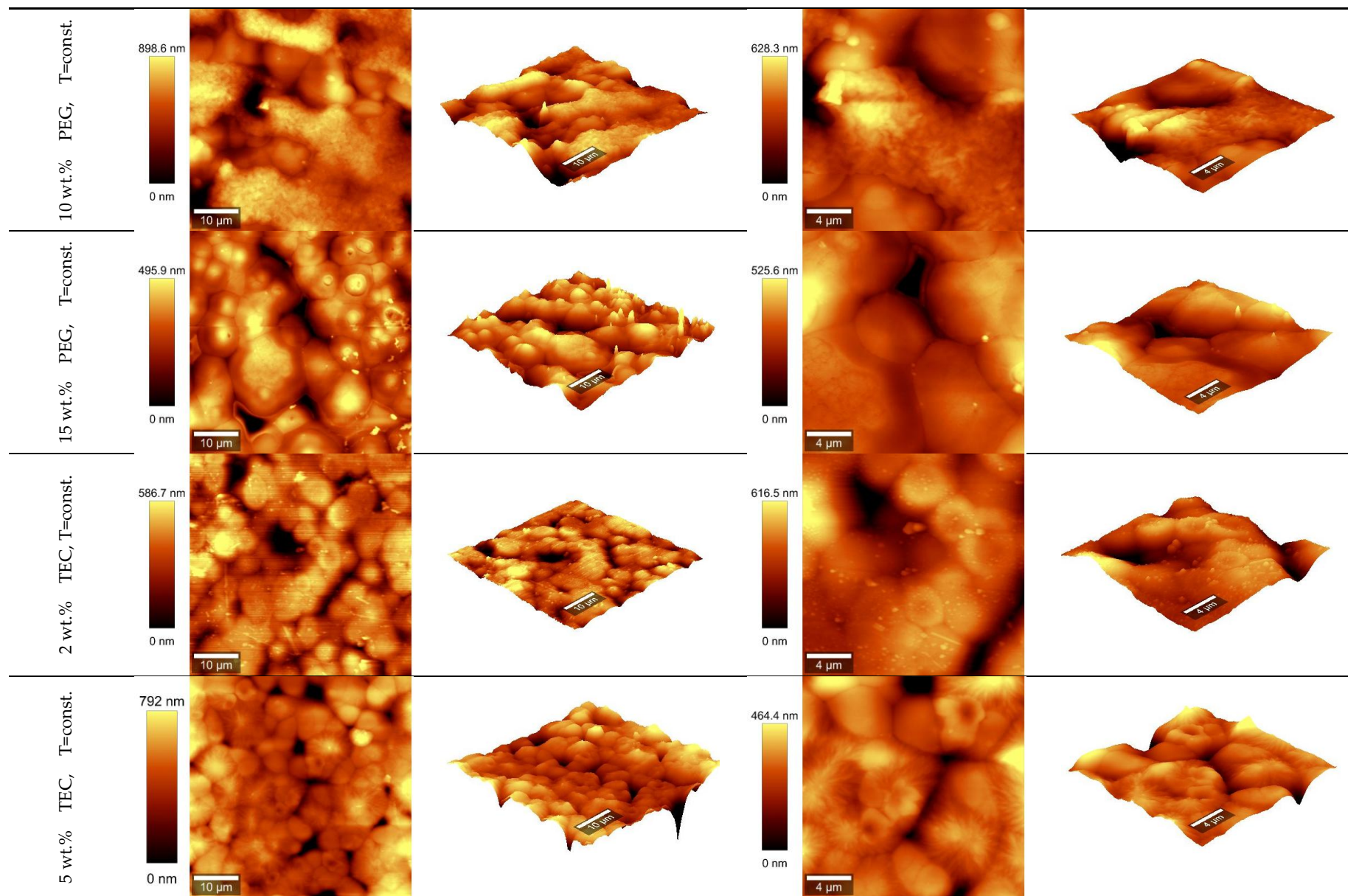
Sample	Plasticiser Concentration	Thickness	Staining	STABW
	wt. %	μm	%	
Pure PHBV	0	102.13	0.48	0.46
		73.13	0.40	0.48
		66.28	2.14	1.52
		52.37	7.14	5.34
		40.42	15.24	9.26
		37.27	15.96	12.64
		29.67	14.76	6.16
PEG, T=const.	2	71.10	0.13	0.15
		64.74	2.64	2.08
		50.00	0.75	0.52
		38.58	4.62	3.71
		37.25	0.73	0.62
		28.91	2.88	0.57
		27.47	3.08	1.02
PEG, T=const.	5	67.31	3.74	5.01
		63.05	10.22	11.49
		46.49	26.34	25.99
		56.84	42.10	24.96
		40.43	39.68	13.24
		43.43	51.44	23.52
		27.36	33.76	24.99
PEG, T=const.	10	75.28	2.52	3.21
		61.50	6.85	4.42
		51.98	36.04	18.46
		39.90	47.80	28.29
		50.60	46.90	35.56
PEG, T=const.	15	78.77	0.30	0.54
		45.40	4.40	2.44
		52.19	42.48	36.64
		49.03	26.46	14.31
		48.93	43.54	21.68
TEC, T=const.	2	76.59	0.45	0.61
		59.17	1.22	1.58
		52.30	9.40	3.74
		44.62	11.88	9.57
		36.96	8.86	4.80
		32.12	13.14	3.42
		28.01	18.34	9.79
TEC, T=const.	5	120.02	0.04	0.05
		100.48	0.82	0.89
		81.68	2.52	2.46
		66.33	6.38	5.42
		62.12	2.98	3.10
		54.37	8.80	6.00
		43.92	8.72	6.07
		43.72	10.16	7.25
		40.80	5.00	4.98
		40.68	11.20	10.41
		38.69	23.66	11.15
TEC, T=const.	10	77.87	1.80	2.47
		70.53	2.03	1.09
		55.63	6.06	4.43
		43.93	54.16	41.13
		41.29	39.90	23.76
		37.61	31.36	19.06
		32.28	37.26	35.79
TEC, T=const.	15	114.63	0.45	0.44
		94.52	0.64	0.30
		84.81	0.78	0.59
		84.44	2.40	1.96
		81.33	1.20	1.34
		64.85	1.95	2.08
		53.69	6.36	6.57
PEG, MFR=const.	2	74.92	0.00	0.00
		56.82	1.02	0.95

		49.26	4.28	4.59
		45.93	3.10	4.11
		39.77	5.08	3.75
		35.83	3.22	2.60
		29.39	5.74	1.78
PEG, MFR=const.	5	80.51	0.08	0.08
		65.47	0.96	0.78
		56.10	0.88	0.69
		48.19	3.22	3.67
		36.31	7.16	5.13
		33.48	3.08	2.05
		27.69	14.36	8.78
PEG, MFR=const.	10	81.58	0.06	0.05
		64.71	0.30	0.08
		51.72	1.43	0.92
		42.10	4.40	1.84
		35.72	22.76	11.69
		33.44	2.86	1.42
		32.05	10.34	10.03
PEG, MFR=const.	15	73.28	0.54	0.61
		54.93	1.24	1.83
		51.35	2.25	2.22
		48.88	3.60	2.77
PEG, MFR=const.	2	60.47	0.84	0.83
		50.97	1.26	1.54
		43.02	2.78	2.44
		35.34	5.70	3.80
		32.99	5.62	3.55
		28.30	5.08	2.83
		27.33	13.64	3.94
TEC, MFR=const.	5	61.97	0.86	0.93
		50.93	0.93	0.92
		44.74	1.78	1.55
		38.37	1.90	1.10
		31.03	9.04	5.37
		27.46	9.56	11.34
		30.34	7.16	4.61
TEC, MFR=const.	10	75.89	2.42	3.41
		61.21	2.46	3.29
		47.26	1.73	2.22
		40.30	8.14	7.24
		37.73	8.34	6.86
		26.81	24.86	35.65
		23.19	3.60	3.06
TEC, MFR=const.	15	63.78	0.70	0.53
		51.27	0.08	0.15
		39.28	0.90	1.60
		37.59	8.56	10.32

Table S5. Results for AFM measurements.







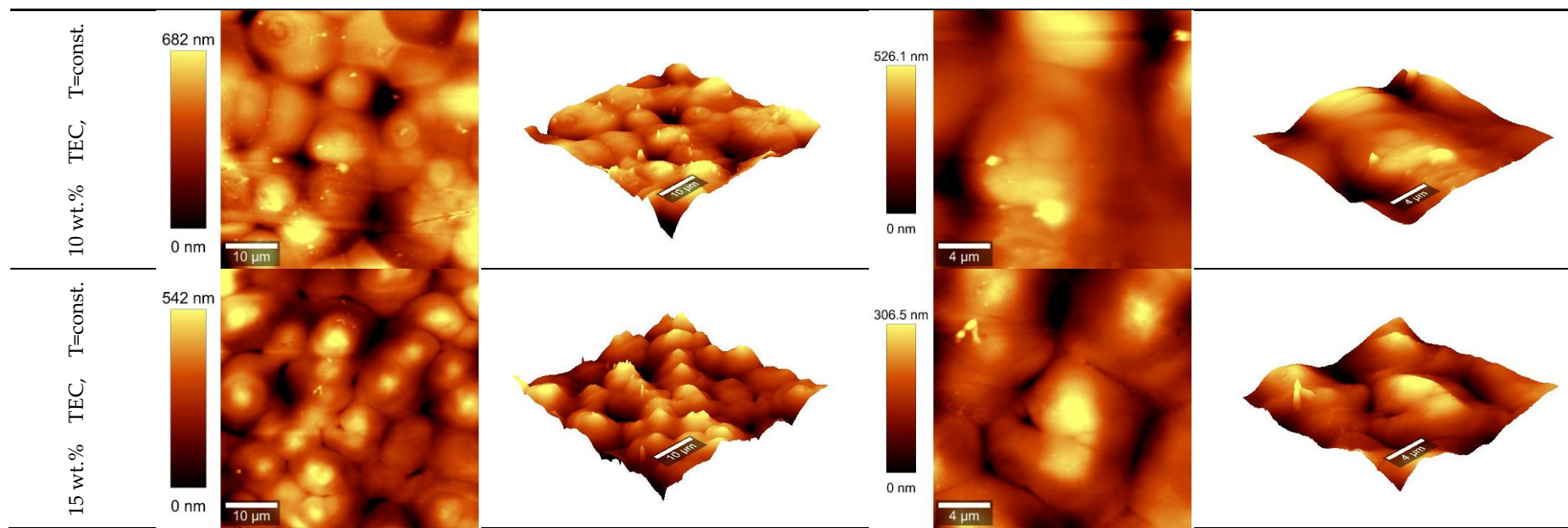
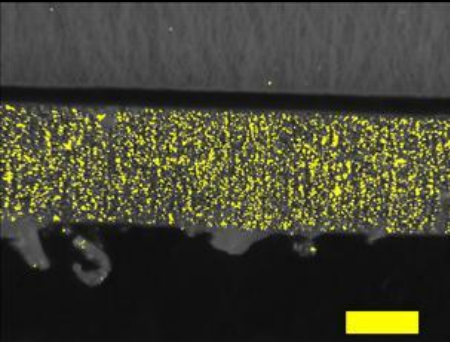
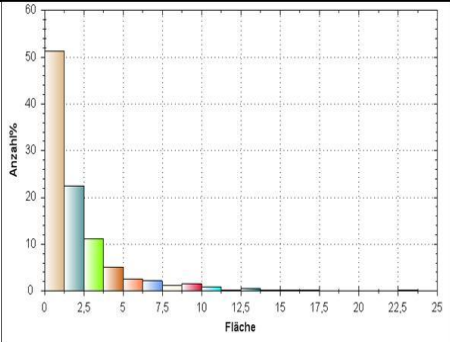
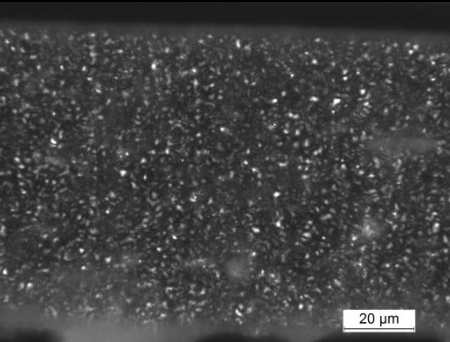
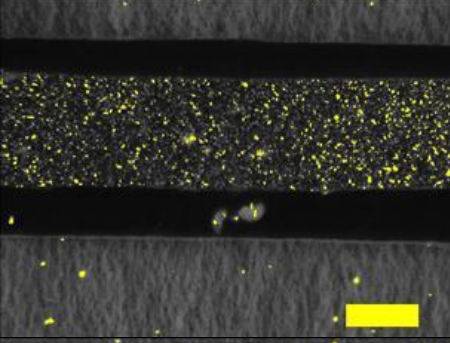
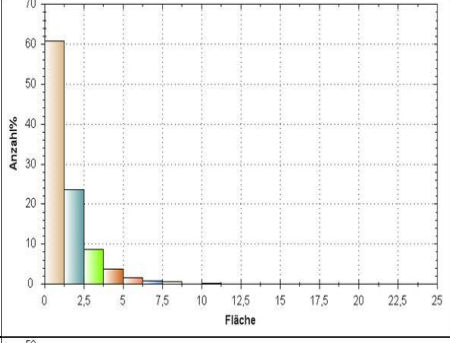
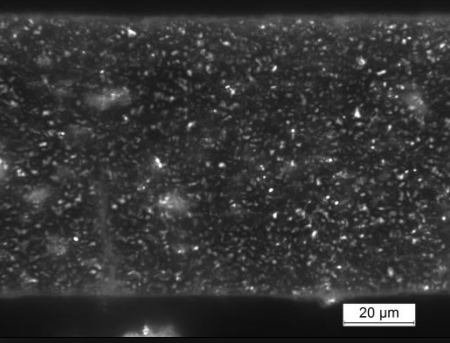
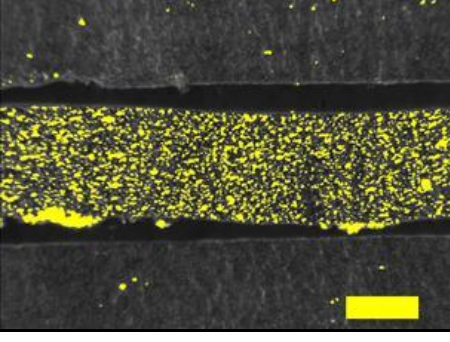
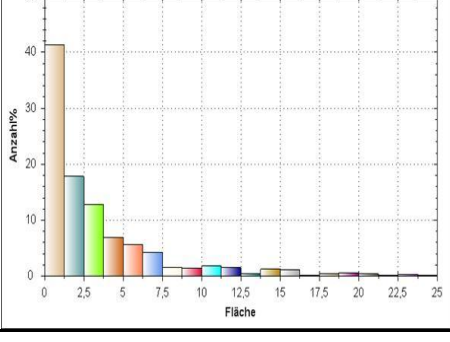
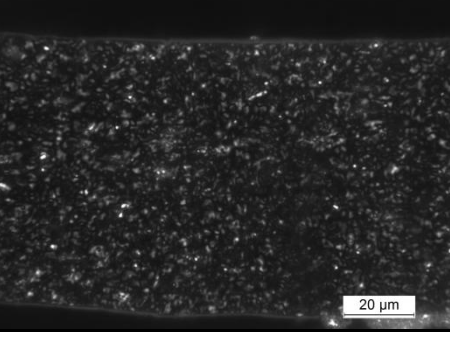
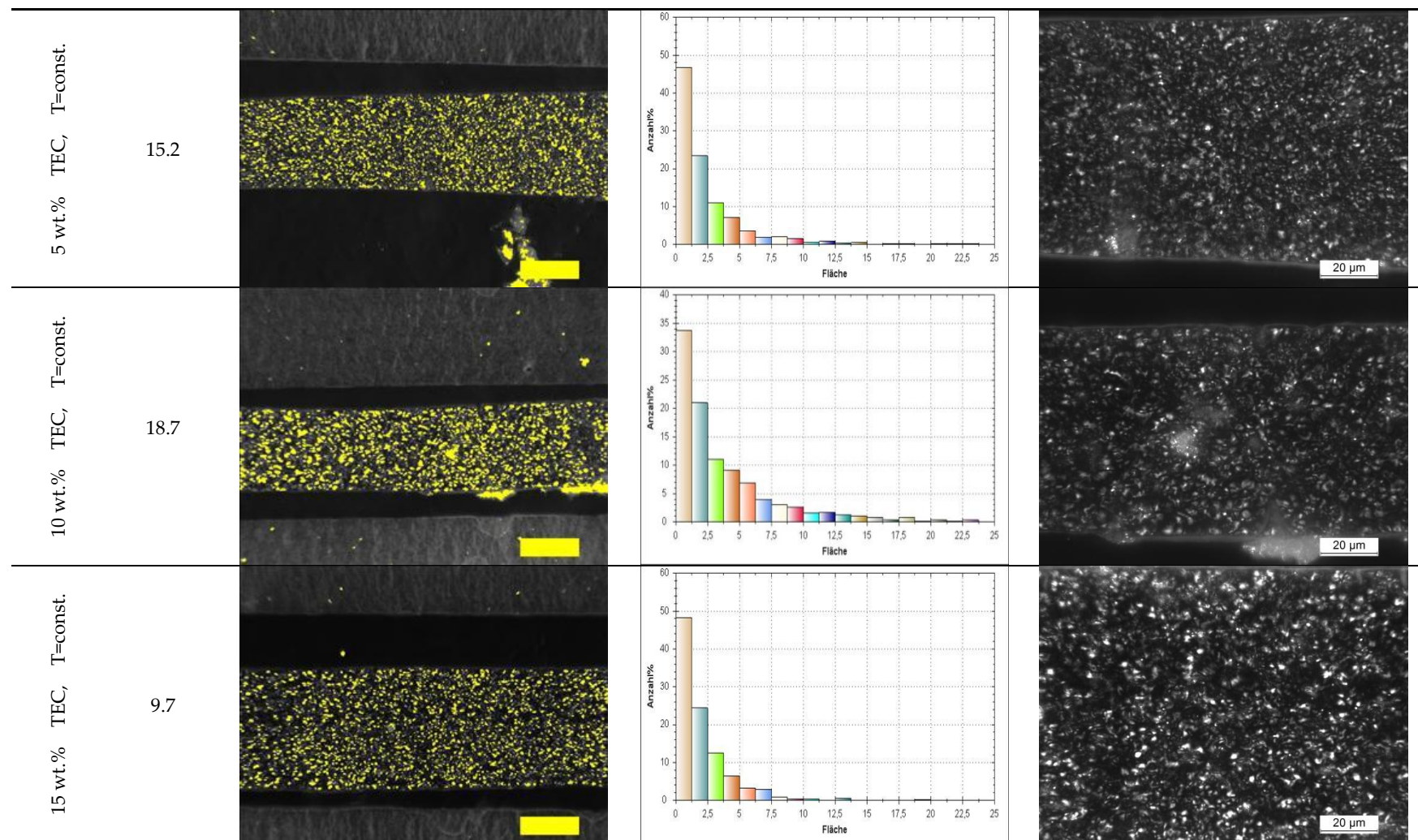
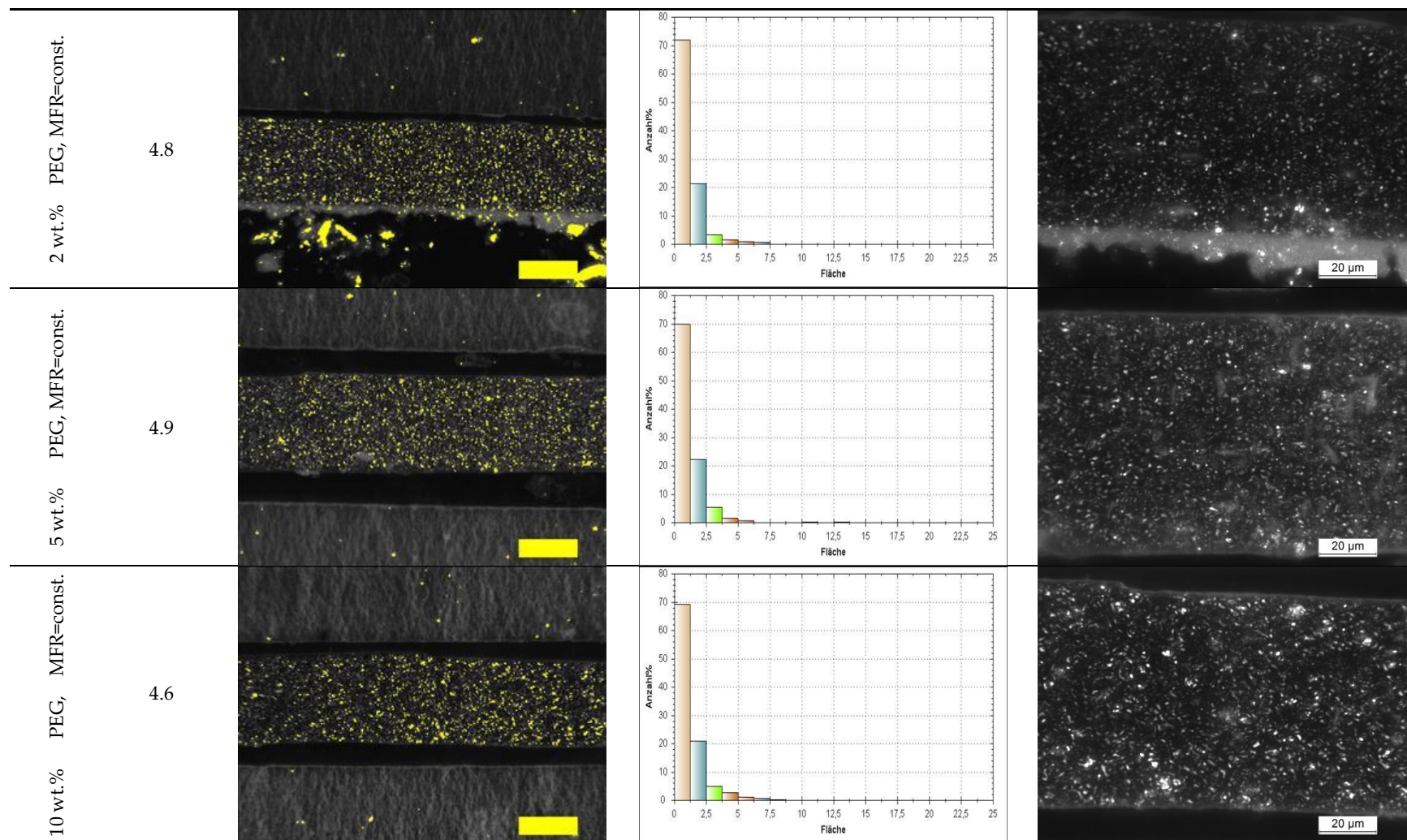
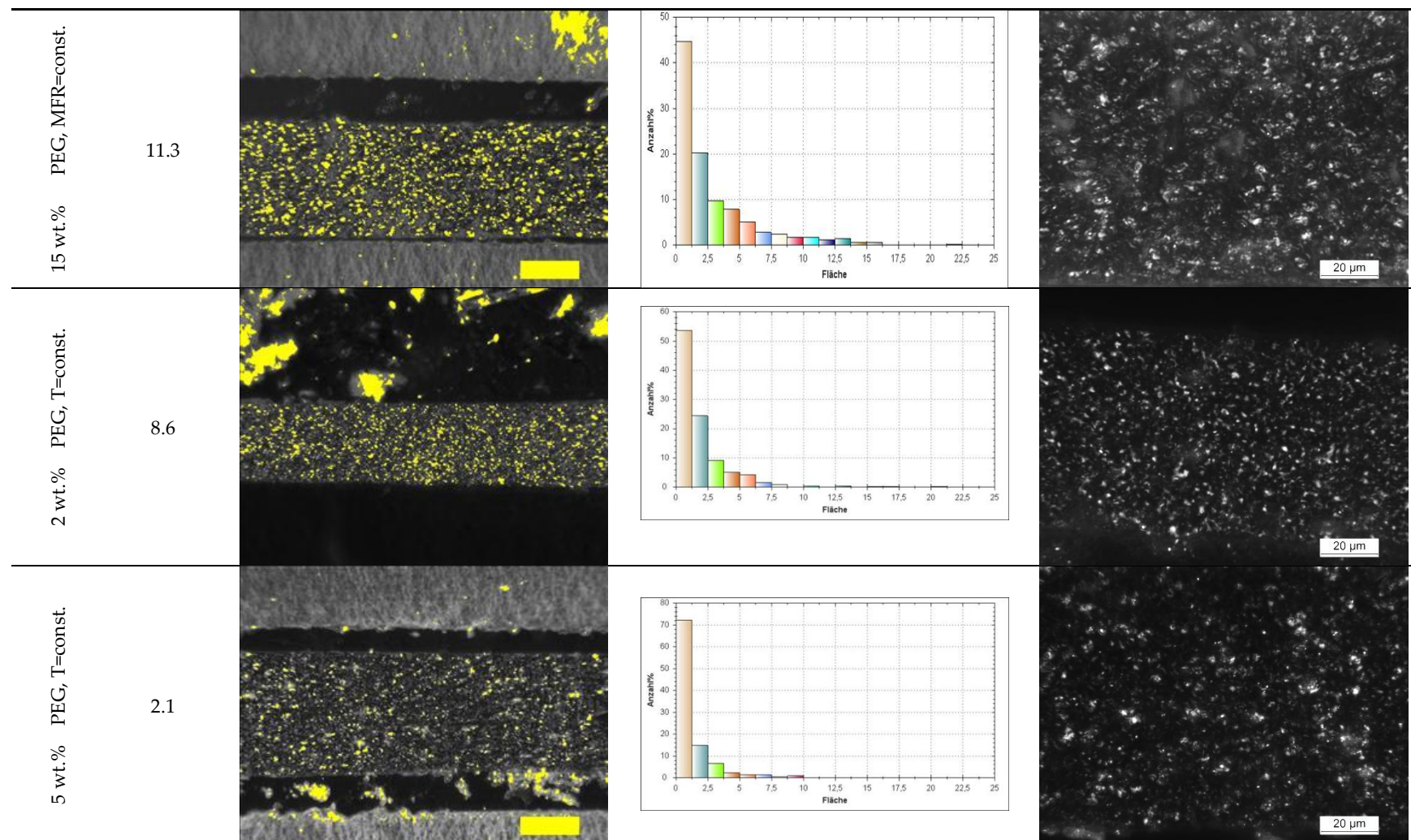


Table S6. Results of the polarisation microscopic analysis.

Sample	Area / %	200x	histogram	500x
Pure PHBV	18.3			
2 wt.% TEC, T=const.	4.0			
2 wt.% TEC, T=const.	22.9			







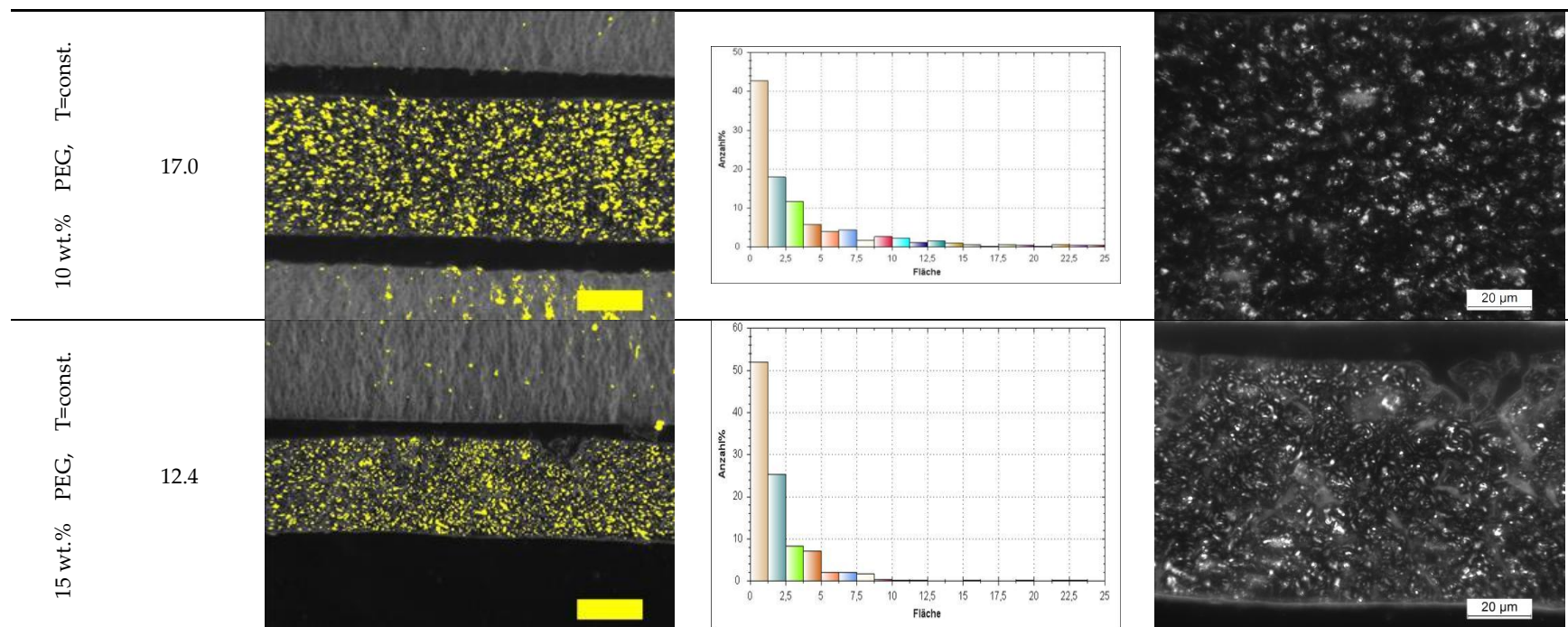


Table S7: SEM pictures

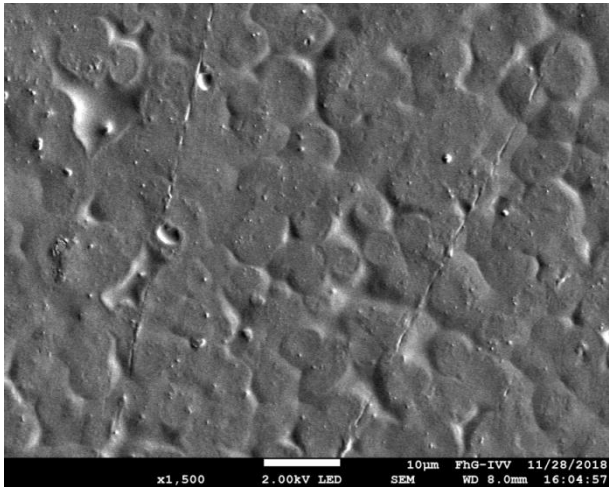
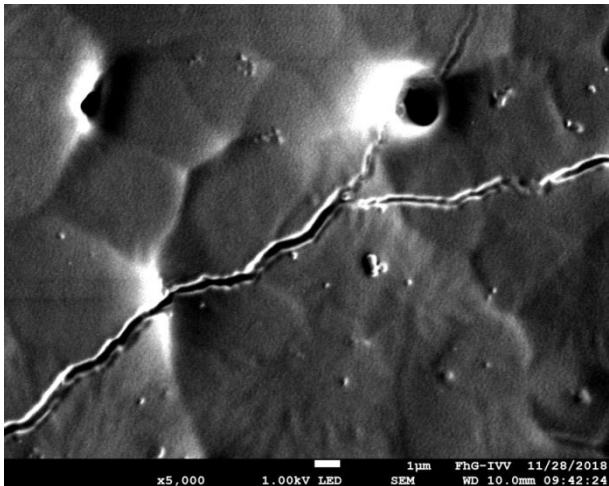
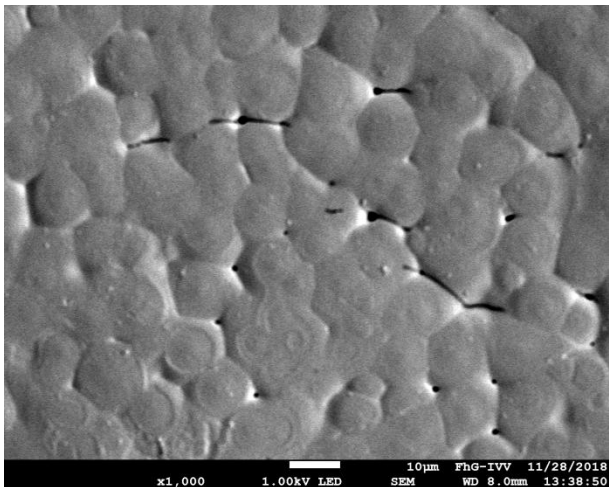
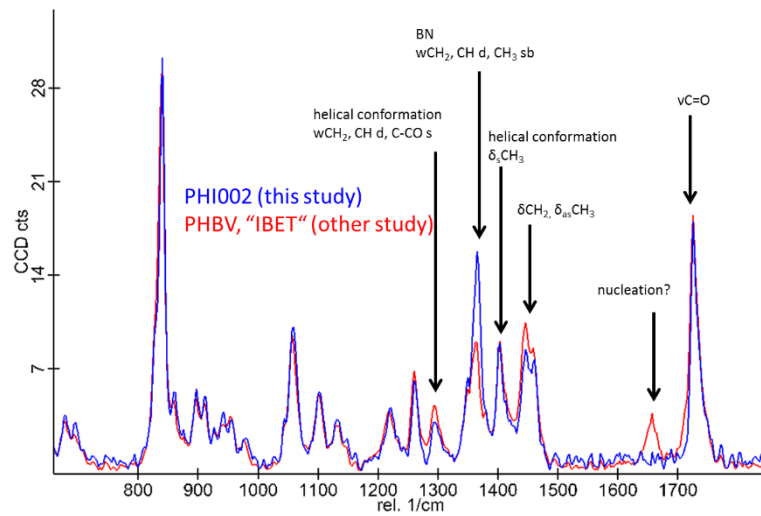
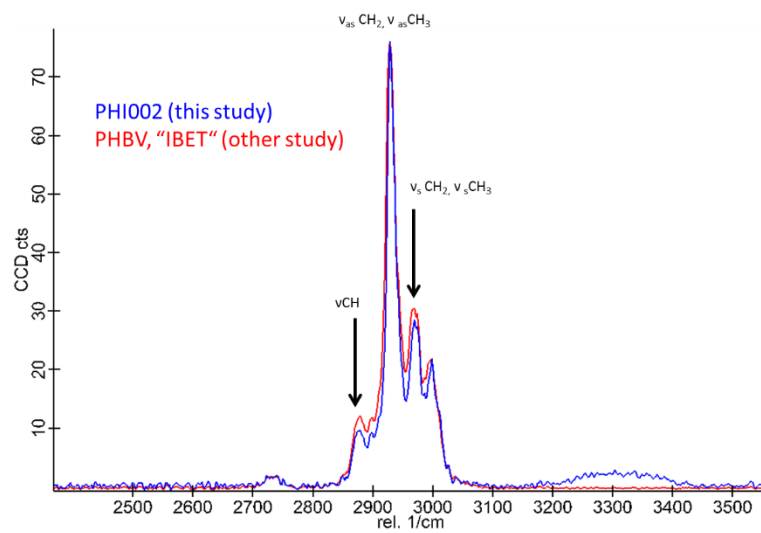
Sample	Magnification	Picture
Pure PHBV	x1500	
2 wt.% TEC	x5000	
10 wt.% TEC	x1000	

Figure S1. RAMAN-spectrum of PHBV.



(a)



(b)