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APPENDICES

Appendix A Effect of applied electrical field strength (i.e. 1:1, 2:1, and 3:1) on the fiber diameter and electrospinnability. Under positive polarity emitting electrode

Table A1 Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
10	DCE	7	7	0.82 ± 0.22	47.64
10	DCE	14	7	0.90 ± 0.26	44.47
10	DCE	21	7	1.07 ± 0.24	40.22
10	DCE	25	25	1.15 ± 0.26	31.62
10	DCE	25	12.5	1.24 ± 0.24	51.95
10	DCE	25	8.3	1.42 ± 0.29	55.55
20	DCE	7	7	-	-
20	DCE	14	7	-	-
20	DCE	21	7	5.16 ± 1.27	25.25
20	DCE	25	25	4.80 ± 2.38	29.09
20	DCE	25	12.5	5.08 ± 1.22	31.70
20	DCE	25	8.3	6.87 ± 1.74	35.09
30	DCE	7	7	2.50 ± 0.47	78.08
30	DCE	14	7	5.27 ± 0.61	65.77
30	DCE	21	7	6.70 ± 1.18	38.12
30	DCE	25	25	4.40 ± 1.06	26.57
30	DCE	25	12.5	5.08 ± 1.22	26.89
30	DCE	25	8.3	5.53 ± 1.87	36.17
10	DMF	7	7	1.25 ± 0.31	59.16
10	DMF	14	7	1.62 ± 0.37	54.51
10	DMF	21	7	2.02 ± 0.54	46.21
10	DMF	25	25	2.19 ± 0.52	21.62
10	DMF	25	12.5	2.35 ± 0.58	62.24
10	DMF	25	8.3	2.47 ± 0.51	69.18

Table A1 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
20	DMF	7	7	2.50 ± 0.47	59.90
20	DMF	14	7	3.22 ± 0.71	58.41
20	DMF	21	7	4.29 ± 0.66	57.72
20	DMF	25	25	3.01 ± 0.37	71.97
20	DMF	25	12.5	3.28 ± 0.64	74.13
20	DMF	25	8.3	4.78 ± 0.50	66.21
30	DMF	7	7	5.74 ± 0.74	53.82
30	DMF	14	7	8.47 ± 0.60	60.62
30	DMF	21	7	11.50 ± 1.77	44.70
30	DMF	25	25	7.93 ± 0.63	62.84
30	DMF	25	12.5	8.29 ± 1.32	62.23
30	DMF	25	8.3	15.70 ± 1.69	67.12
10	EA	7	7	-	-
10	EA	14	7	0.64 ± 0.16	20.55
10	EA	21	7	1.34 ± 0.33	23.02
10	EA	25	25	0.77 ± 0.25	28.73
10	EA	25	12.5	1.04 ± 0.26	30.61
10	EA	25	8.3	1.13 ± 0.29	36.17
20	EA	7	7	3.49 ± 0.15	38.54
20	EA	14	7	6.92 ± 1.47	39.36
20	EA	21	7	7.42 ± 1.08	34.87
20	EA	25	25	8.90 ± 2.83	24.64
20	EA	25	12.5	9.70 ± 1.65	27.03
20	EA	25	8.3	21.60 ± 8.47	59.73

Tabie A1 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
30	EA	7	7	3.53 ± 0.53	47.20
30	EA	14	7	8.21 ± 1.59	42.70
30	EA	21	7	15.21 ± 2.25	26.74
30	EA	25	25	13.20 ± 3.35	42.62
30	EA	25	12.5	21.00 ± 2.89	48.51
30	EA	25	8.3	23.90 ± 3.95	54.19
10	MEK	7	7	0.96 ± 0.24	41.20
10	MEK	14	7	1.26 ± 0.28	46.25
10	MEK	21	7	1.28 ± 0.27	52.28
10	MEK	25	25	1.25 ± 0.25	29.72
10	MEK	25	12.5	1.32 ± 0.26	27.22
10	MEK	25	8.3	1.44 ± 0.23	29.63
20	MEK	7	7	3.51 ± 0.52	45.73
20	MEK	14	7	7.20 ± 2.27	51.20
20	MEK	21	7	8.23 ± 1.88	34.31
20	MEK	25	25	4.78 ± 0.85	48.83
20	MEK	25	12.5	6.36 ± 1.10	50.83
20	MEK	25	8.3	7.30 ± 1.74	50.38
30	MEK	7	7	9.78 ± 0.97	65.63
30	MEK	14	7	11.49 ± 1.06	59.98
30	MEK	21	7	13.59 ± 2.08	50.29
30	MEK	25	25	8.85 ± 1.47	55.12
30	MEK	25	12.5	9.23 ± 0.98	48.42
30	MEK	25	8.3	11.50 ± 3.49	54.88

Appendix B Effect of applied electrical field strength (i.e. 1:1, 2:1, and 3:1) on the fiber diameter and electrospinnability. Under negative polarity emitting electrode

Table B1 Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
10	DCE	7	7	-	-
10	DCE	14	7	0.87 ± 0.17	32.84
10	DCE	21	7	0.92 ± 0.22	38.90
10	DCE	25	25	0.68 ± 0.18	15.70
10	DCE	25	12.5	1.00 ± 0.26	46.06
10	DCE	25	8.3	1.15 ± 0.23	57.17
20	DCE	7	7	1.10 ± 0.22	12.78
20	DCE	14	7	2.87 ± 0.48	49.46
20	DCE	21	7	3.27 ± 0.44	66.44
20	DCE	25	25	3.09 ± 0.65	45.07
20	DCE	25	12.5	3.12 ± 1.02	60.65
20	DCE	25	8.3	4.18 ± 0.79	65.56
30	DCE	7	7	-	-
30	DCE	14	7	-	-
30	DCE	21	7	4.00 ± 0.44	45.17
30	DCE	25	25	5.92 ± 1.30	20.85
30	DCE	25	12.5	11.30 ± 1.83	52.62
30	DCE	25	8.3	12.10 ± 2.45	52.74
10	DMF	7	7	-	-
10	DMF	14	7	1.28 ± 0.24	32.70
10	DMF	21	7	1.31 ± 0.23	27.34
10	DMF	25	25	1.32 ± 0.37	42.21
10	DMF	25	12.5	1.93 ± 0.35	70.43
10	DMF	25	8.3	3.62 ± 0.67	64.51

Table B1 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
20	DMF	7	7	1.93 ± 0.58	29.75
20	DMF	14	7	5.90 ± 2.20	23.35
20	DMF	21	7	7.46 ± 1.19	34.55
20	DMF	25	25	8.39 ± 1.60	62.90
20	DMF	25	12.5	8.60 ± 1.66	65.25
20	DMF	25	8.3	9.10 ± 1.96	74.64
30	DMF	7	7	2.12 ± 0.30	66.05
30	DMF	14	7	5.71 ± 0.74	57.04
30	DMF	21	7	9.56 ± 1.93	50.78
30	DMF	25	25	-	-
30	DMF	25	12.5	7.29 ± 1.21	34.51
30	DMF	25	8.3	8.55 ± 1.52	36.06
10	EA	7	7	-	-
10	EA	14	7	1.04 ± 0.27	29.02
10	EA	21	7	1.16 ± 0.39	30.29
10	EA	25	25	0.75 ± 0.18	42.82
10	EA	25	12.5	1.24 ± 0.29	41.58
10	EA	25	8.3	-	-
20	EA	7	7	-	-
20	EA	14	7	-	-
20	EA	21	7	-	-
20	EA	25	25	2.73 ± 0.81	6.10
20	EA	25	12.5	7.52 ± 1.91	32.55
20	EA	25	8.3	-	-

Table B1 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
30	EA	7	7	-	-
30	EA	14	7	-	-
30	EA	21	7	26.80 ± 3.54	55.90
30	EA	25	25	16.50 ± 6.65	62.29
30	EA	25	12.5	31.40 ± 3.06	82.60
30	EA	25	8.3	55.50 ± 9.60	35.25
10	MEK	7	7	-	-
10	MEK	14	7	-	-
10	MEK	21	7	1.50 ± 0.32	29.55
10	MEK	25	25	1.08 ± 0.26	17.43
10	MEK	25	12.5	1.66 ± 0.38	33.30
10	MEK	25	8.3	-	-
20	MEK	7	7	4.19 ± 1.03	34.71
20	MEK	14	7	5.76 ± 1.85	43.02
20	MEK	21	7	6.06 ± 0.90	71.14
20	MEK	25	25	5.52 ± 1.61	38.57
20	MEK	25	12.5	6.04 ± 1.29	10.38
20	MEK	25	8.3	6.19 ± 1.65	62.29
30	MEK	7	7	-	-
30	MEK	14	7	4.10 ± 3.31	55.31
30	MEK	21	7	15.10 ± 2.31	31.92
30	MEK	25	25	3.00 ± 0.53	19.29
30	MEK	25	12.5	3.10 ± 0.82	29.82
30	MEK	25	8.3	4.69 ± 0.88	52.66

Appendix C Effect of applied electrical field strength (i.e. 15 kV/10 cm, 20 kV/10 cm, and 25 kV/10 cm) on the fiber diameter and electrospinnability. Under positive polarity emitting electrode

Table C1 Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
10	DCE	20	7	-	-
10	DCE	20	10	-	-
10	DCE	20	15	0.63 ± 0.18	49.11
10	DCE	15	10	-	-
10	DCE	20	10	-	-
10	DCE	25	10	-	-
20	DCE	20	7	5.82 ± 0.89	43.65
20	DCE	20	10	10.45 ± 1.73	39.80
20	DCE	20	15	15.7 ± 3.47	50.20
20	DCE	15	10	8.3 ± 1.62	54.50
20	DCE	20	10	10.45 ± 1.73	39.80
20	DCE	25	10	20.9 ± 4.87	32.66
30	DCE	20	7	25.5 ± 3.94	55.36
30	DCE	20	10	25.1 ± 4.08	48.25
30	DCE	20	15	13.7 ± 2.44	39.39
30	DCE	15	10	21.0 ± 3.53	55.15
30	DCE	20	10	25.1 ± 4.08	48.30
30	DCE	25	10	35.4 ± 7.12	47.03
10	DMF	20	7	2.44 ± 0.48	42.58
10	DMF	20	10	2.39 ± 0.83	38.23
10	DMF	20	15	2.15 ± 0.41	17.51
10	DMF	15	10	2.09 ± 0.42	39.33
10	DMF	20	10	2.39 ± 0.85	38.23
10	DMF	25	10	2.77 ± 0.46	23.46

Table C1 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
20	DMF	20	7	17.20 ± 4.69	41.4
20	DMF	20	10	17.00 ± 3.71	38.28
20	DMF	20	15	16.60 ± 3.06	42.73
20	DMF	15	10	9.17 ± 2.87	37.29
20	DMF	20	10	17.00 ± 3.71	38.28
20	DMF	25	10	18.70 ± 4.97	51.98
30	DMF	20	7	46.50 ± 11.97	56.75
30	DMF	20	10	28.90 ± 7.21	52.58
30	DMF	20	15	22.60 ± 4.14	50.80
30	DMF	15	10	24.20 ± 3.52	65.57
30	DMF	20	10	28.90 ± 7.21	52.58
30	DMF	25	10	30.20 ± 4.63	52.12
10	EA	20	7	1.96 ± 0.45	27.41
10	EA	20	10	1.19 ± 0.31	25.78
10	EA	20	15	1.09 ± 0.34	24.57
10	EA	15	10	0.85 ± 0.16	27.17
10	EA	20	10	1.19 ± 0.31	25.78
10	EA	25	10	1.39 ± 0.25	25.29
20	EA	20	7	6.40 ± 1.60	48.33
20	EA	20	10	5.31 ± 1.04	33.74
20	EA	20	15	5.00 ± 1.80	29.73
20	EA	15	10	4.99 ± 1.59	44.52
20	EA	20	10	5.31 ± 1.04	33.74
20	EA	25	10	8.23 ± 1.53	38.92

Table C1 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	Solvent	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
30	EA	20	7	9.90 ± 2.27	42.03
30	EA	20	10	9.78 ± 1.79	37.83
30	EA	20	15	8.52 ± 0.88	27.72
30	EA	15	10	9.24 ± 2.44	60.45
30	EA	20	10	9.78 ± 1.79	37.83
30	EA	25	10	17.40 ± 3.00	29.68
10	MEK	20	7	-	-
10	MEK	20	10	-	-
10	MEK	20	15	-	-
10	MEK	15	10	-	-
10	MEK	20	10	-	-
10	MEK	25	10	4.40 ± 3.39	55.81
20	MEK	20	7	11.20 ± 2.57	63.99
20	MEK	20	10	8.00 ± 2.31	59.47
20	MEK	20	15	6.98 ± 1.88	51.22
20	MEK	15	10	7.61 ± 2.60	50.28
20	MEK	20	10	8.00 ± 2.31	59.47
20	MEK	25	10	10.72 ± 1.76	50.13
30	MEK	20	7	25.10 ± 3.76	41.40
30	MEK	20	10	18.90 ± 6.21	40.64
30	MEK	20	15	5.68 ± 1.16	18.61
30	MEK	15	10	7.71 ± 0.55	48.69
30	MEK	20	10	18.90 ± 6.21	40.64
30	MEK	25	10	23.90 ± 4.56	36.26

Appendix D Effect of applied electrical field strength (i.e. 15 kV/10 cm, 20 kV/10 cm, and 25 kV/10 cm) on the fiber diameter and electrospinnability in mixed solvent systems. Under positive polarity emitting electrode

Table D1 Fiber diameter and electrospinnability of as-spun PS fibers in DMF/DCE

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	DMF/DCE (%v/v)	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
10	75/25	20	7	2.21 ± 0.63	30.42
10	75/25	20	10	1.12 ± 0.39	29.53
10	75/25	20	15	0.85 ± 0.21	26.84
10	75/25	15	10	0.79 ± 0.22	22.78
10	75/25	20	10	1.12 ± 0.39	29.53
10	75/25	25	10	1.90 ± 0.42	39.21
20	75/25	20	7	8.10 ± 0.90	68.42
20	75/25	20	10	7.64 ± 1.54	53.68
20	75/25	20	15	7.19 ± 1.40	47.43
20	75/25	15	10	5.68 ± 1.00	66.24
20	75/25	20	10	7.64 ± 1.54	53.68
20	75/25	25	10	9.32 ± 3.09	42.86
30	75/25	20	7	19.37 ± 2.66	74.04
30	75/25	20	10	14.82 ± 3.51	45.65
30	75/25	20	15	13.17 ± 1.55	50.00
30	75/25	15	10	13.88 ± 1.95	47.69
30	75/25	20	10	14.82 ± 3.51	45.65
30	75/25	25	10	17.65 ± 3.59	36.52
10	50/50	20	7	1.59 ± 0.42	53.02
10	50/50	20	10	1.48 ± 0.52	32.07
10	50/50	20	15	1.26 ± 0.40	28.80
10	50/50	15	10	1.06 ± 0.31	36.61
10	50/50	20	10	1.48 ± 0.52	32.07
10	50/50	25	10	1.51 ± 0.42	31.67

Table D1 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers in DMF/DCE

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	DMF/DCE (%v/v)	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
20	50/50	20	7	7.95 ± 1.57	57.68
20	50/50	20	10	2.81 ± 1.20	49.96
20	50/50	20	15	2.50 ± 1.06	46.66
20	50/50	15	10	2.62 ± 0.87	54.59
20	50/50	20	10	2.81 ± 1.20	49.96
20	50/50	25	10	3.45 ± 1.94	45.72
30	50/50	20	7	6.08 ± 1.65	40.65
30	50/50	20	10	3.98 ± 1.22	38.88
30	50/50	20	15	3.86 ± 1.07	38.93
30	50/50	15	10	3.92 ± 1.21	45.74
30	50/50	20	10	3.98 ± 1.22	38.88
30	50/50	25	10	6.20 ± 1.46	32.19
10	25/75	20	7	1.43 ± 0.36	43.43
10	25/75	20	10	1.19 ± 0.24	24.42
10	25/75	20	15	1.11 ± 0.29	23.99
10	25/75	15	10	1.18 ± 0.36	12.78
10	25/75	20	10	1.19 ± 0.24	24.42
10	25/75	25	10	1.68 ± 0.37	41.92
20	25/75	20	7	8.76 ± 2.66	46.05
20	25/75	20	10	5.26 ± 1.89	45.79
20	25/75	20	15	2.84 ± 1.01	48.45
20	25/75	15	10	4.06 ± 1.69	35.74
20	25/75	20	10	5.26 ± 1.89	45.79
20	25/75	25	10	8.65 ± 2.96	41.81
30	25/75	20	7	20.81 ± 4.32	52.16
30	25/75	20	10	6.27 ± 1.01	64.98
30	25/75	20	15	5.24 ± 1.06	49.40
30	25/75	15	10	5.06 ± 0.94	82.89
30	25/75	20	10	6.27 ± 1.01	64.98
30	25/75	25	10	7.61 ± 1.23	58.06

Table D2 Fiber diameter and electrospinnability of as-spun PS fibers in DMF/EA

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	DMF/EA (%v/v)	applied voltage (kV)	collection distance (cm)	fiber diameter (μm)	Electro-spinnability (%)
10	75/25	20	7	1.72 ± 0.50	61.92
10	75/25	20	10	1.55 ± 0.35	52.14
10	75/25	20	15	1.40 ± 0.29	26.84
10	75/25	15	10	1.45 ± 0.36	44.09
10	75/25	20	10	1.55 ± 0.35	52.14
10	75/25	25	10	1.85 ± 0.27	42.66
20	75/25	20	7	10.80 ± 1.74	23.48
20	75/25	20	10	8.03 ± 1.67	37.27
20	75/25	20	15	5.03 ± 1.14	58.38
20	75/25	15	10	6.32 ± 1.16	55.31
20	75/25	20	10	8.03 ± 1.67	37.27
20	75/25	25	10	8.27 ± 1.42	54.47
30	75/25	20	7	14.20 ± 2.49	67.43
30	75/25	20	10	10.10 ± 1.77	52.67
30	75/25	20	15	4.61 ± 0.76	57.34
30	75/25	15	10	4.82 ± 1.27	79.59
30	75/25	20	10	10.10 ± 1.77	52.67
30	75/25	25	10	12.13 ± 0.76	51.27
10	50/50	20	7	2.00 ± 0.40	20.96
10	50/50	20	10	1.65 ± 0.27	27.60
10	50/50	20	15	1.42 ± 0.28	23.51
10	50/50	15	10	1.37 ± 0.43	42.28
10	50/50	20	10	1.65 ± 0.27	27.60
10	50/50	25	10	1.71 ± 0.37	35.95

Table D2 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers in DMF/EA

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	DMF/EA (%v/v)	applied voltage (kV)	collection distance (cm)	fiber diameter (μm)	Electro-spinnability (%)
20	50/50	20	7	1.64 ± 0.42	38.34
20	50/50	20	10	1.51 ± 0.30	46.44
20	50/50	20	15	1.45 ± 0.31	31.60
20	50/50	15	10	1.47 ± 0.34	45.71
20	50/50	20	10	1.51 ± 0.30	46.44
20	50/50	25	10	1.62 ± 0.28	41.59
30	50/50	20	7	10.10 ± 4.70	57.68
30	50/50	20	10	8.50 ± 2.58	59.31
30	50/50	20	15	7.56 ± 2.07	52.05
30	50/50	15	10	6.41 ± 1.85	57.10
30	50/50	20	10	8.50 ± 2.58	59.31
30	50/50	25	10	17.4 ± 3.20	45.52
10	25/75	20	7	32.80 ± 5.22	50.95
10	25/75	20	10	24.50 ± 5.28	50.00
10	25/75	20	15	3.67 ± 1.41	42.61
10	25/75	15	10	16.30 ± 7.16	58.31
10	25/75	20	10	24.50 ± 5.28	50.00
10	25/75	25	10	28.90 ± 2.91	61.73
20	25/75	20	7	8.76 ± 2.66	46.05
20	25/75	20	10	5.26 ± 1.89	45.79
20	25/75	20	15	2.84 ± 1.01	48.45
20	25/75	15	10	4.06 ± 1.69	35.74
20	25/75	20	10	5.26 ± 1.89	45.79
20	25/75	25	10	8.65 ± 2.96	41.81
30	25/75	20	7	20.81 ± 4.32	52.16
30	25/75	20	10	6.27 ± 1.01	64.98
30	25/75	20	15	5.24 ± 1.06	49.40
30	25/75	15	10	5.06 ± 0.94	82.89
30	25/75	20	10	6.27 ± 1.01	64.98
30	25/75	25	10	7.61 ± 1.23	58.06

Table D3 Fiber diameter and electrospinnability of as-spun PS fibers in DMF/MEK

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	DMF/MEK (%v/v)	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
10	75/25	20	7	8.69 ± 2.13	30.70
10	75/25	20	10	6.36 ± 2.62	52.22
10	75/25	20	15	6.00 ± 1.75	24.00
10	75/25	15	10	4.11 ± 0.99	64.33
10	75/25	20	10	6.36 ± 2.62	52.22
10	75/25	25	10	7.54 ± 1.24	67.59
20	75/25	20	7	4.73 ± 0.91	43.96
20	75/25	20	10	4.71 ± 0.94	54.39
20	75/25	20	15	4.47 ± 0.81	56.14
20	75/25	15	10	4.03 ± 0.72	64.66
20	75/25	20	10	4.71 ± 0.94	54.39
20	75/25	25	10	4.95 ± 1.16	52.52
30	75/25	20	7	10.04 ± 3.84	73.76
30	75/25	20	10	5.62 ± 0.64	56.77
30	75/25	20	15	4.99 ± 1.07	50.00
30	75/25	15	10	5.33 ± 0.84	47.95
30	75/25	20	10	5.62 ± 0.64	56.77
30	75/25	25	10	10.23 ± 2.15	58.66
10	50/50	20	7	7.07 ± 1.46	72.44
10	50/50	20	10	4.90 ± 1.41	40.32
10	50/50	20	15	3.50 ± 0.74	43.01
10	50/50	15	10	4.44 ± 1.32	41.52
10	50/50	20	10	4.90 ± 1.41	40.32
10	50/50	25	10	7.60 ± 1.97	38.93

Table D3 (cont.) Fiber diameter and electrospinnability of as-spun PS fibers in DMF/MEK

Solution conditions		Processing conditions		Results	
PS concentration (%w/v)	DMF/MEK (%v/v)	applied voltage (kV)	collection distance (cm)	Fiber diameter (μm)	Electro-spinnability (%)
20	50/50	20	7	3.09 ± 0.91	80.63
20	50/50	20	10	2.80 ± 0.52	58.92
20	50/50	20	15	2.49 ± 0.51	61.76
20	50/50	15	10	3.05 ± 0.92	13.37
20	50/50	20	10	2.80 ± 0.52	58.92
20	50/50	25	10	4.46 ± 0.81	56.11
30	50/50	20	7	34.77 ± 7.09	60.52
30	50/50	20	10	18.09 ± 3.27	50.38
30	50/50	20	15	13.81 ± 4.12	43.85
30	50/50	15	10	17.10 ± 3.86	51.23
30	50/50	20	10	18.09 ± 3.27	50.38
30	50/50	25	10	21.19 ± 4.97	49.88
10	25/75	20	7	5.12 ± 1.29	56.82
10	25/75	20	10	3.99 ± 1.04	54.71
10	25/75	20	15	3.19 ± 0.67	33.40
10	25/75	15	10	4.14 ± 0.79	48.64
10	25/75	20	10	4.27 ± 2.91	54.71
10	25/75	25	10	5.30 ± 1.58	63.17
20	25/75	20	7	2.70 ± 0.69	49.46
20	25/75	20	10	2.63 ± 0.61	66.15
20	25/75	20	15	2.30 ± 0.47	50.81
20	25/75	15	10	2.46 ± 0.59	60.19
20	25/75	20	10	2.63 ± 0.61	66.15
20	25/75	25	10	2.86 ± 0.51	47.24
30	25/75	20	7	20.50 ± 5.01	44.68
30	25/75	20	10	16.10 ± 1.99	32.92
30	25/75	20	15	12.55 ± 1.63	25.06
30	25/75	15	10	15.72 ± 5.02	31.69
30	25/75	20	10	16.10 ± 1.99	32.92
30	25/75	25	10	18.68 ± 3.20	27.37

Appendix E Effect of 1% (w/v) salt addition on the fiber diameter. The applied electrical field strength was 20 kV/15 cm

PS		Types of salt	fiber diameter (μm)
concentration (%w/v)	solvent (%v/v)		
30	DMF 100/0	LiCl	35.87 ± 14.11
		KCl	36.16 ± 3.15
30	DMF/DCE 75/25	LiCl	30.07 ± 11.96
		KCl	31.11 ± 3.16
30	DMF/EA 75/25	LiCl	34.49 ± 11.31
		KCl	35.02 ± 3.16
30	DMF/MEK 75/25	LiCl	30.09 ± 10.61
		KCl	34.48 ± 4.29

Appendix F SEM images

Figure F1 SEM images: Effect of applied electrical field strength (i.e. 1:1, 2:1, and 3:1) either by fixing the collection distance (i.e. 7 kV/7 cm, 14 kV/7 cm, and 21 kV/7 cm) or by fixing the applied voltage (i.e. 25 kV/25 cm, 25 kV/12.5 cm, and 25 kV/8.3 cm) on the fiber diameter. Under positive polarity of the emitting electrode.

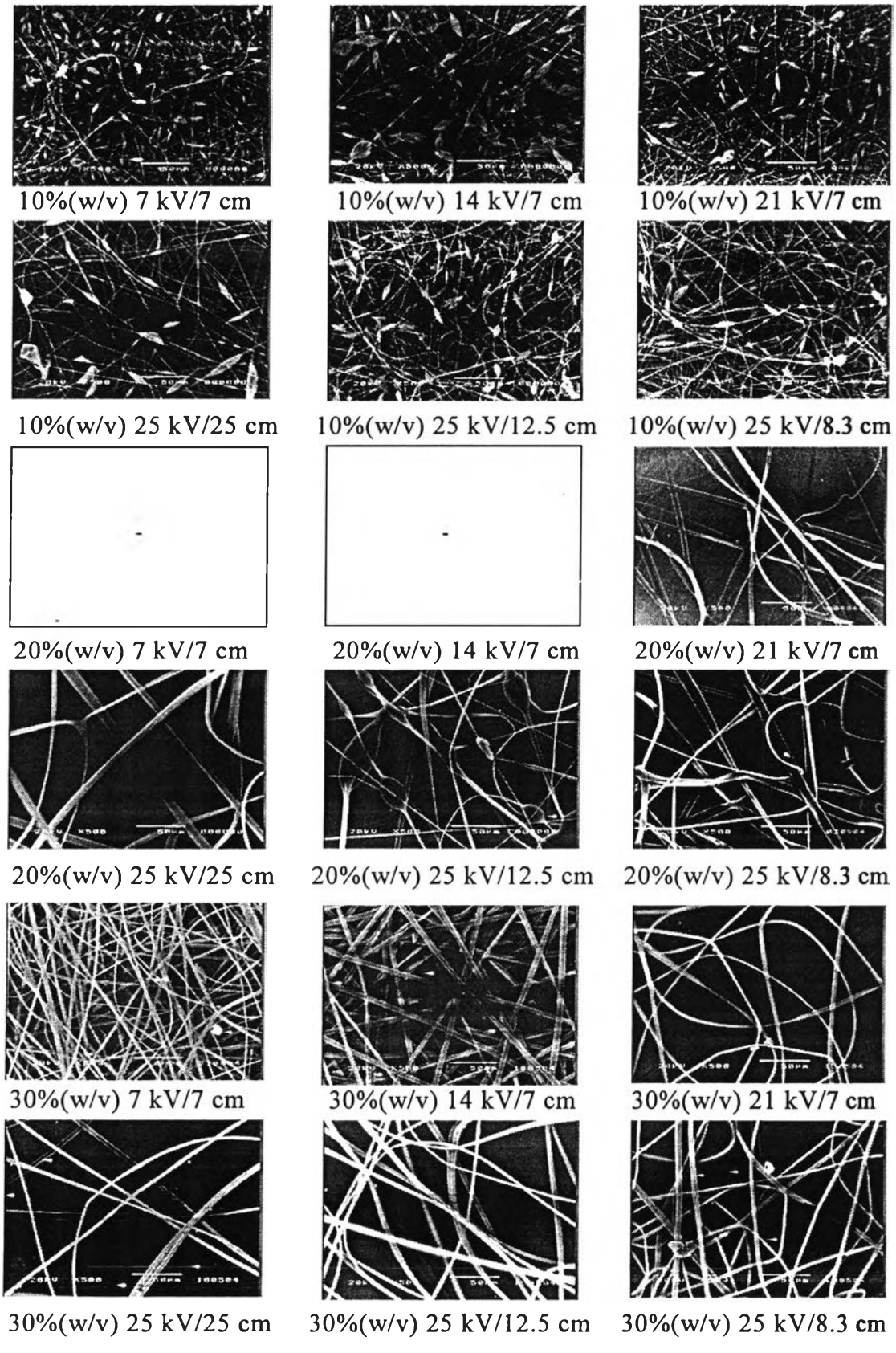

Figure F1.1 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DCE.

Remark – means jet has not been found under this condition

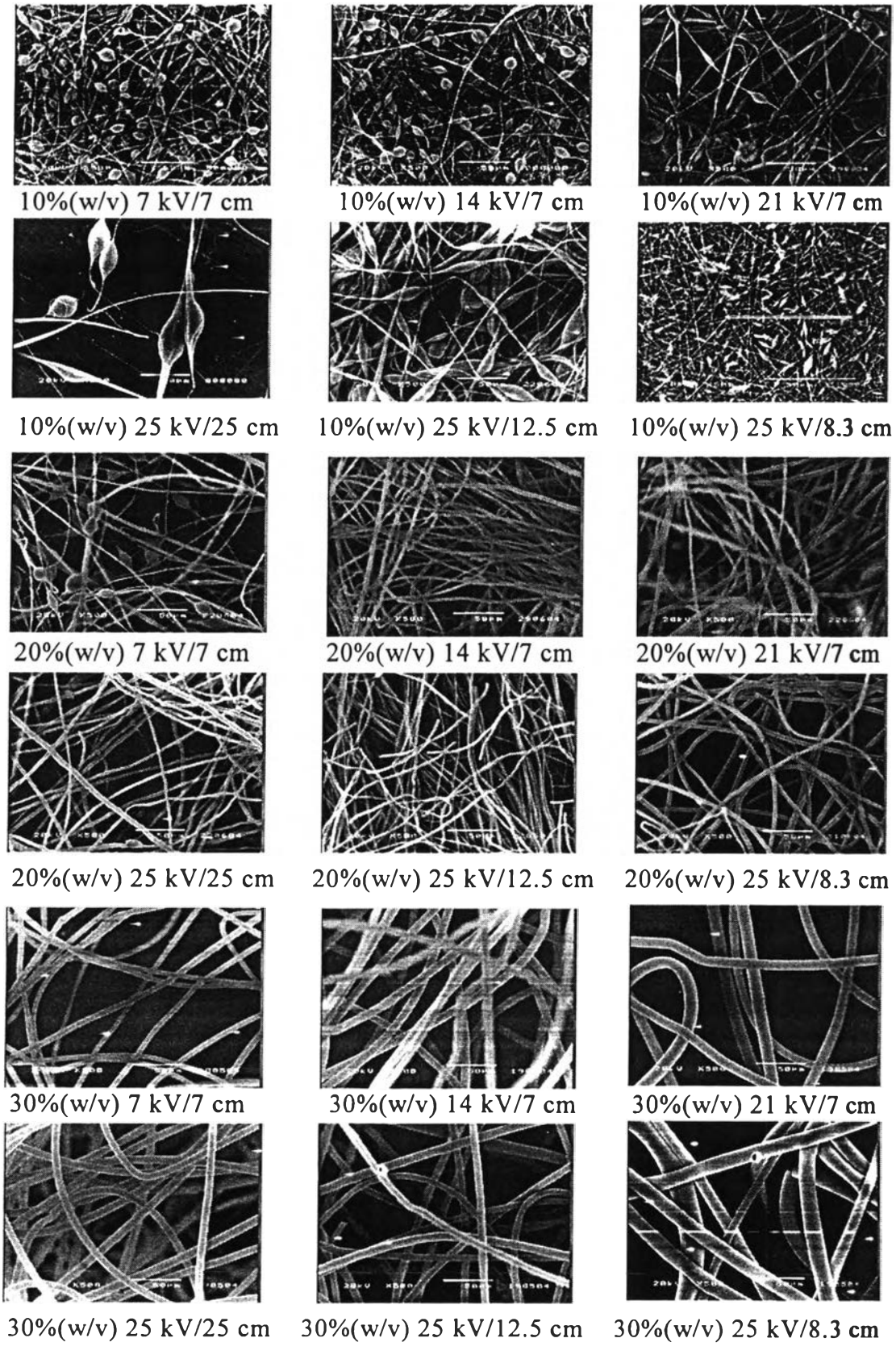

Figure F1.2 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF.

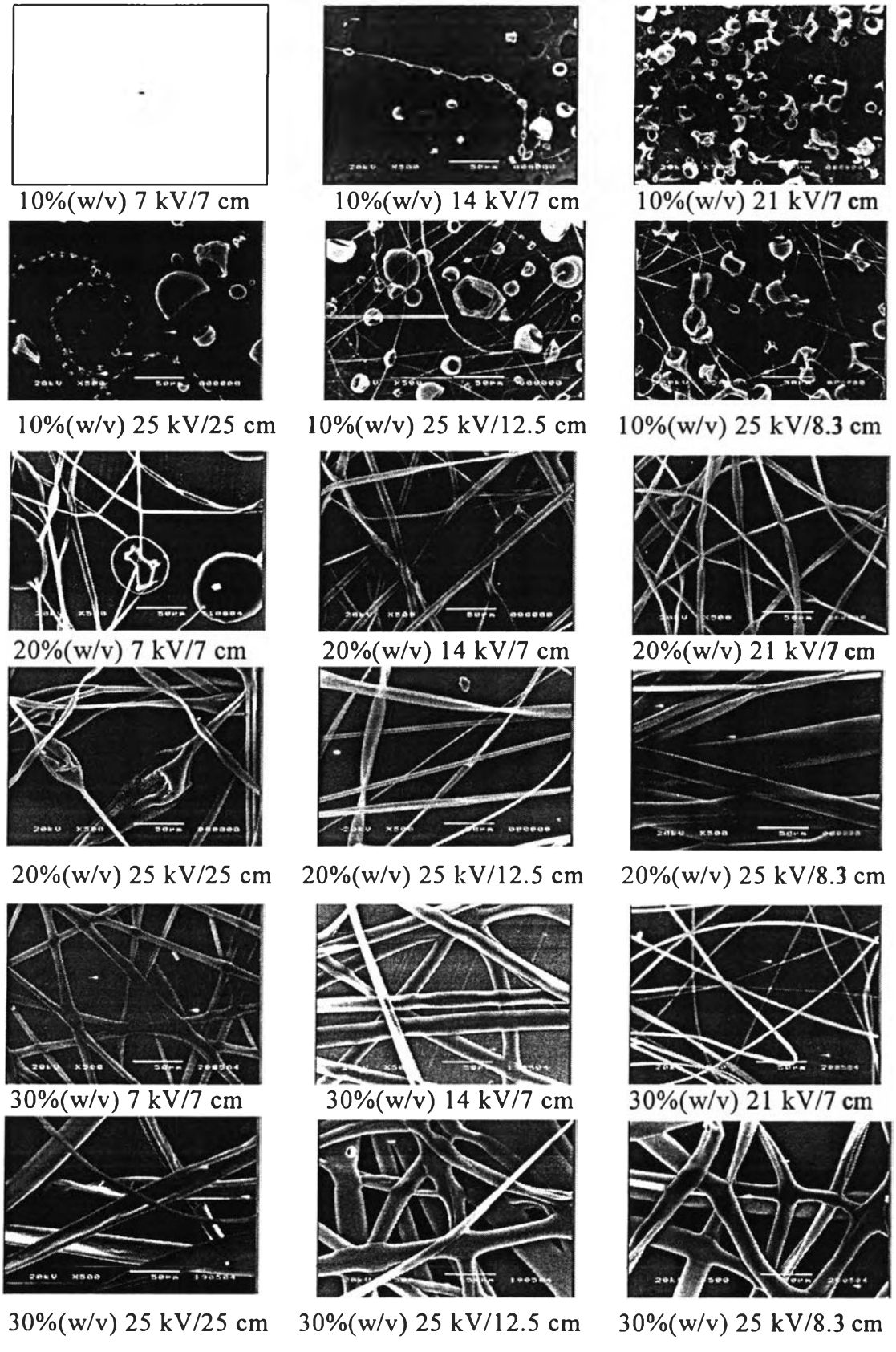

Figure F1.3 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in EA.

Remark – means jet has not been found under this condition

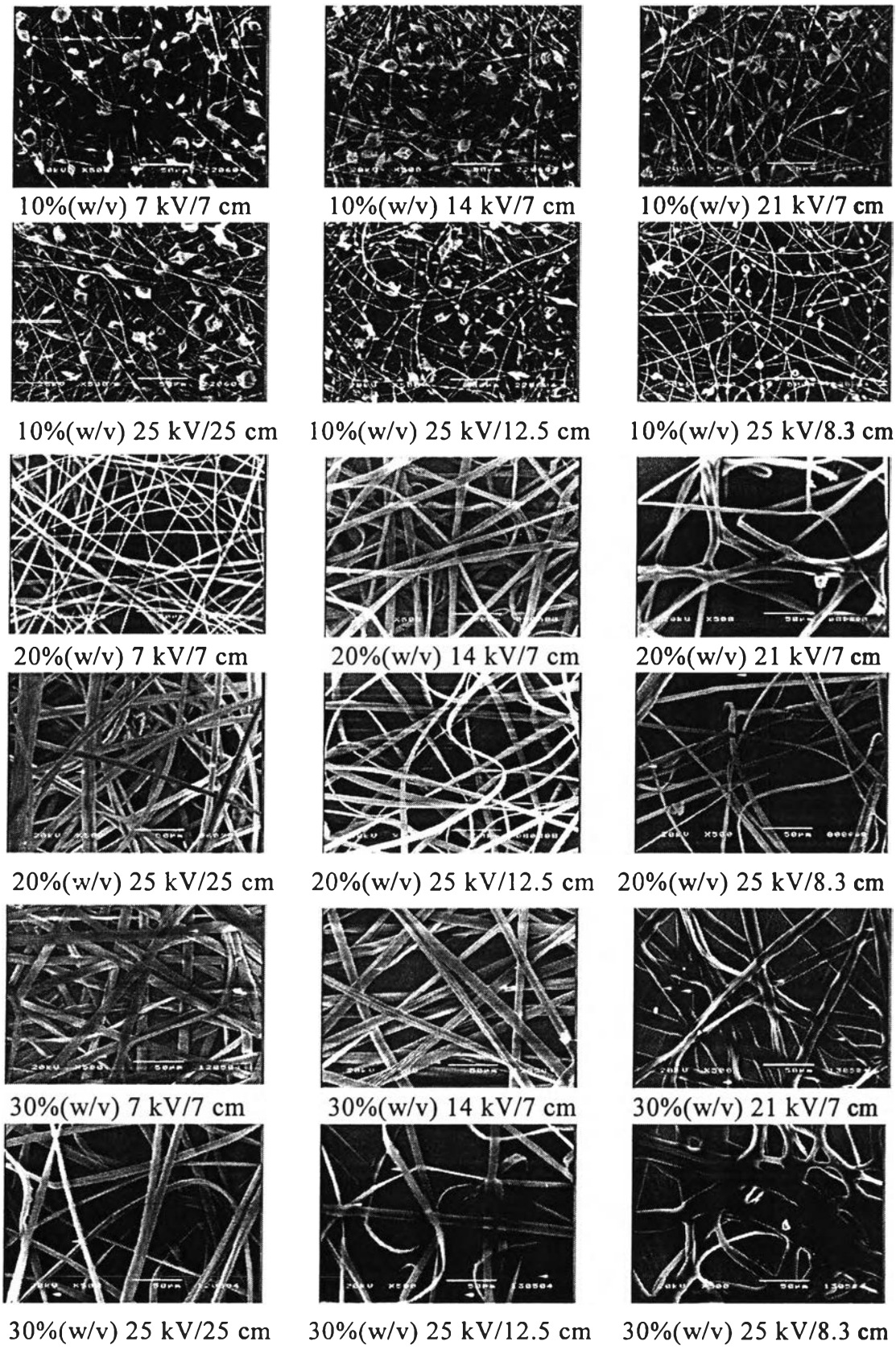

Figure F1.4 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in MEK.

Figure F2 SEM images: Effect of applied electrical field strength (i.e. 1:1, 2:1, and 3:1) either by fixing the collection distance (i.e. 7 kV/7 cm, 14 kV/7 cm, and 21 kV/7 cm) or by fixing the applied voltage (i.e. 25 kV/25 cm, 25 kV/12.5 cm, and 25 kV/8.3 cm) on the fiber diameter. Under negative polarity of the emitting electrode.

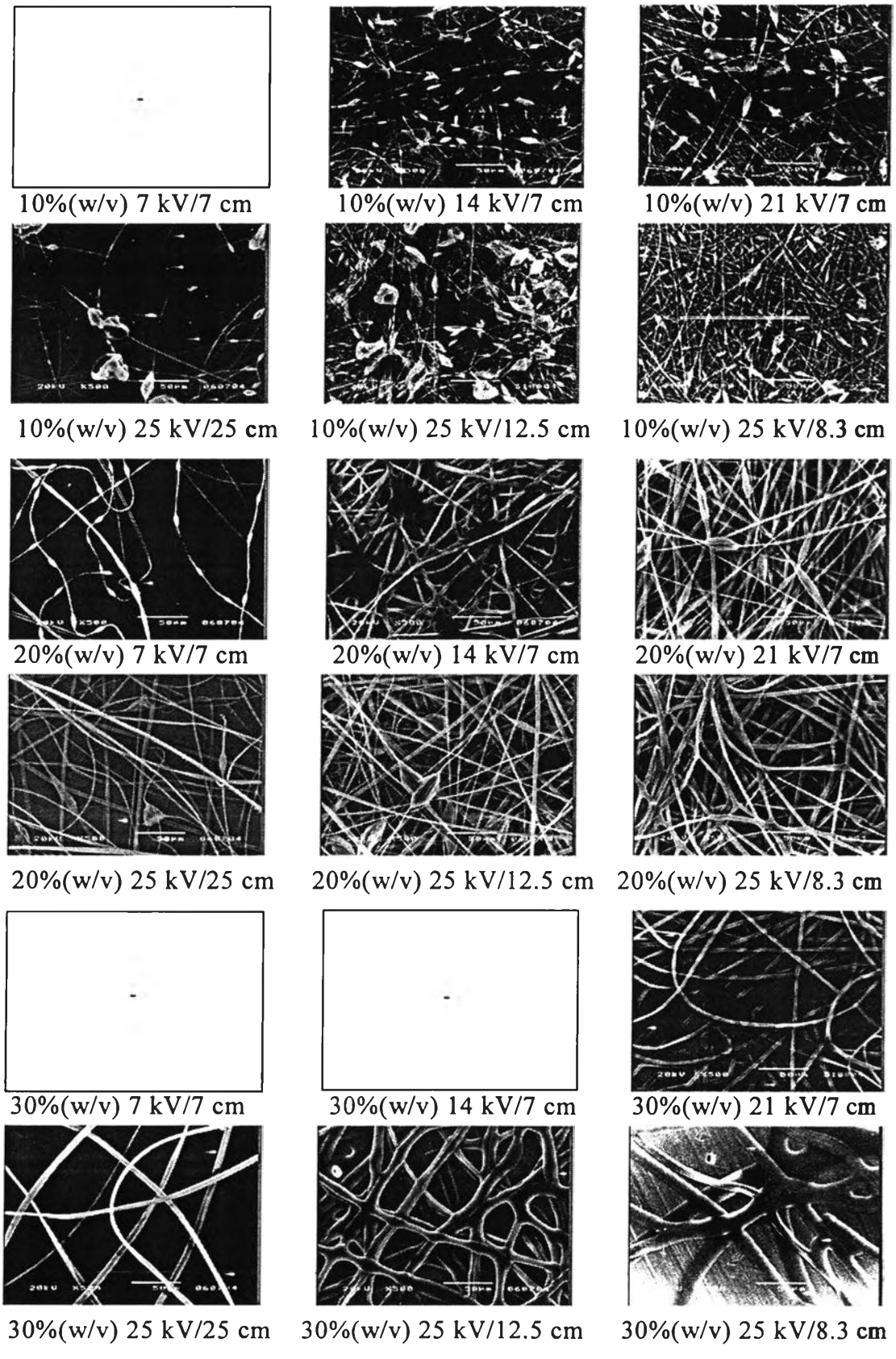

Figure F2.1 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DCE.

Remark – means jet has not been found under this condition

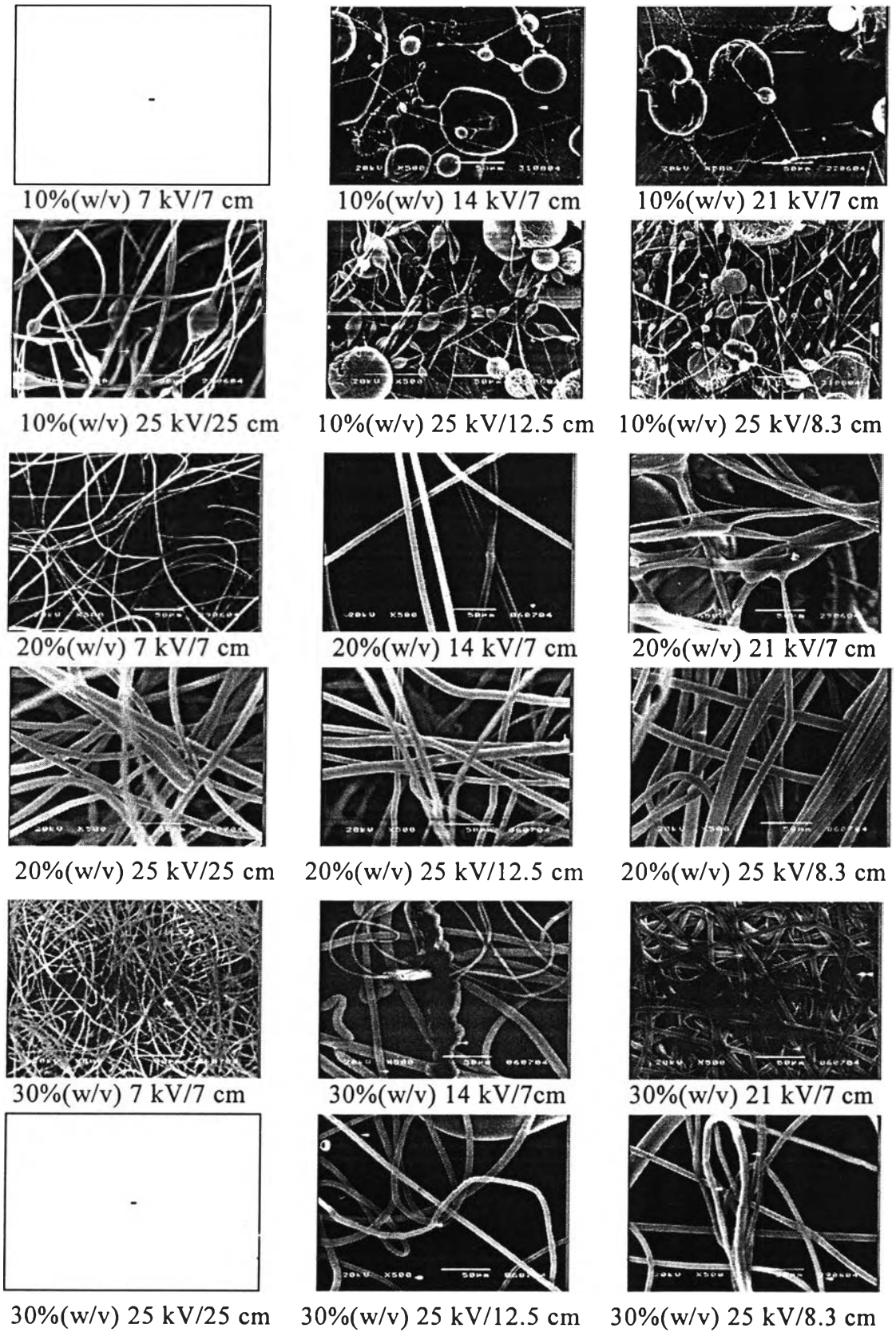

Figure F2.2 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF.

Remark – means jet has not been found under this condition

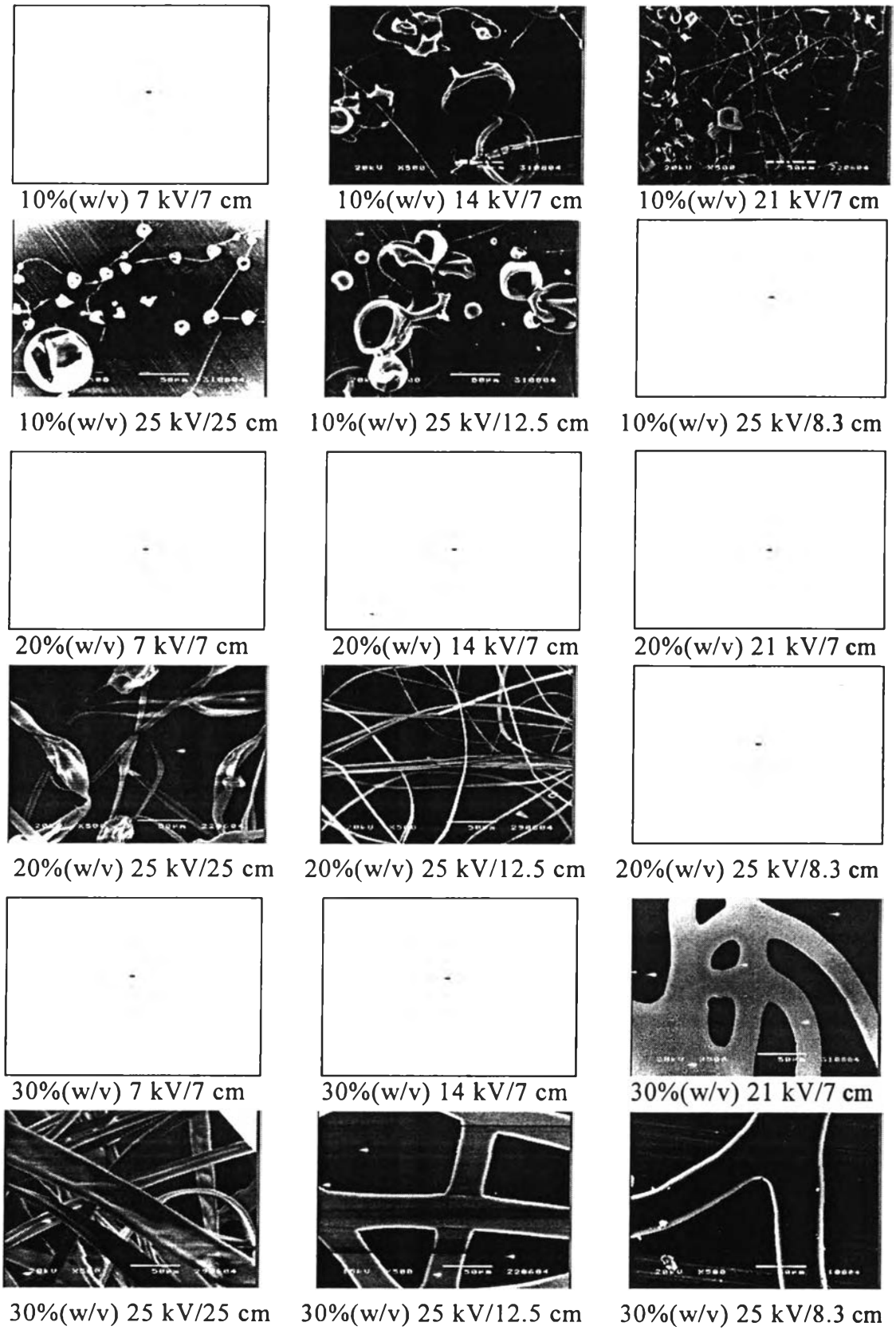

Figure F2.3 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in EA.

Remark – means jet has not been found under this condition

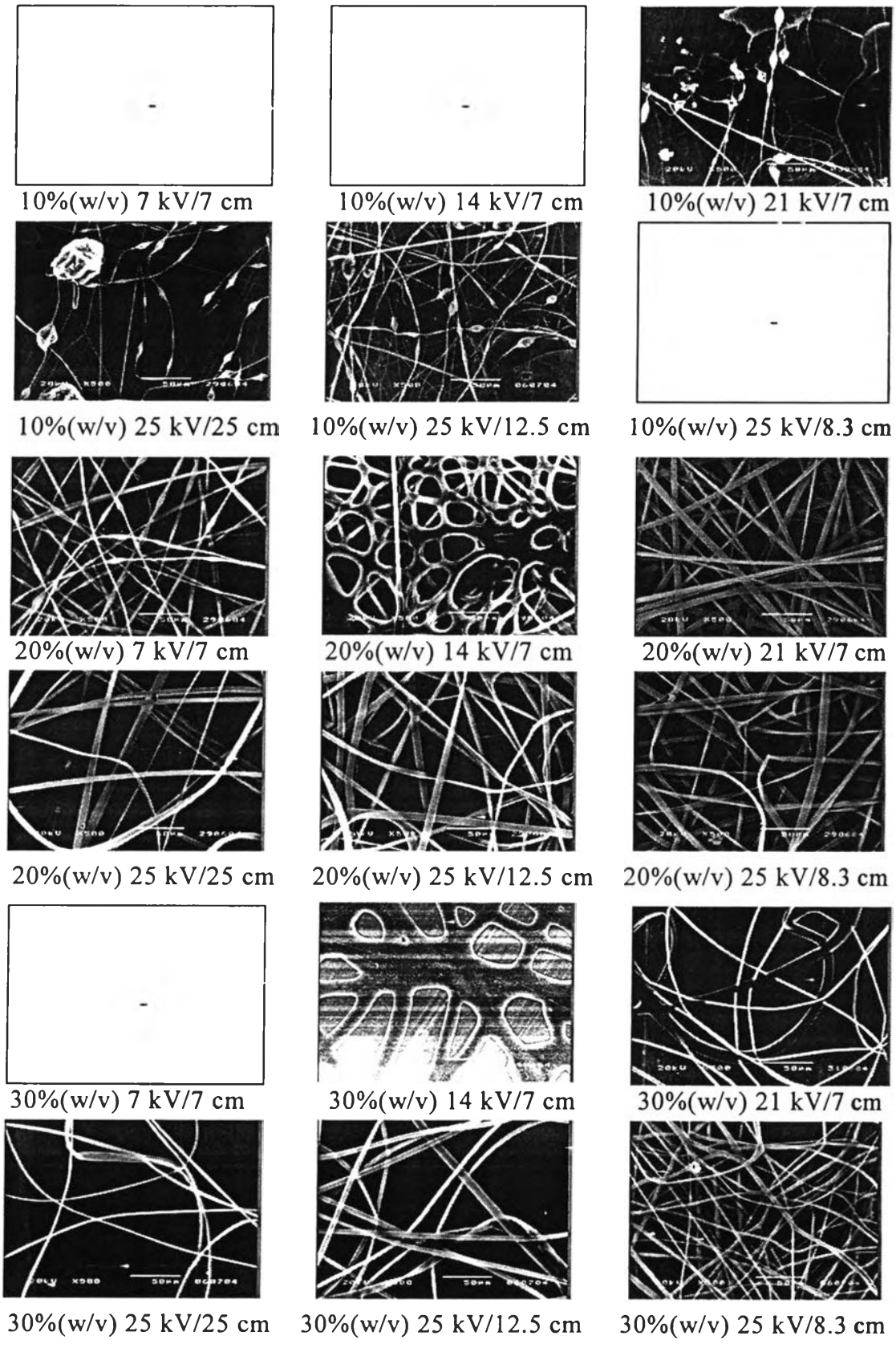

Figure F2.4 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in MEK.

Remark – means jet has not been found under this condition

Figure F3 SEM images: Effect of applied voltage by fixing the collection distance (i.e. 15 kV/10 cm, 20 kV/10 cm, and 25 kV/10 cm) and effect of collection distance by fixing the applied voltage (i.e. 20 kV/7 cm, 20 kV/10 cm, and 20 kV/15 cm) on the fiber diameter. Under positive polarity of the emitting electrode.

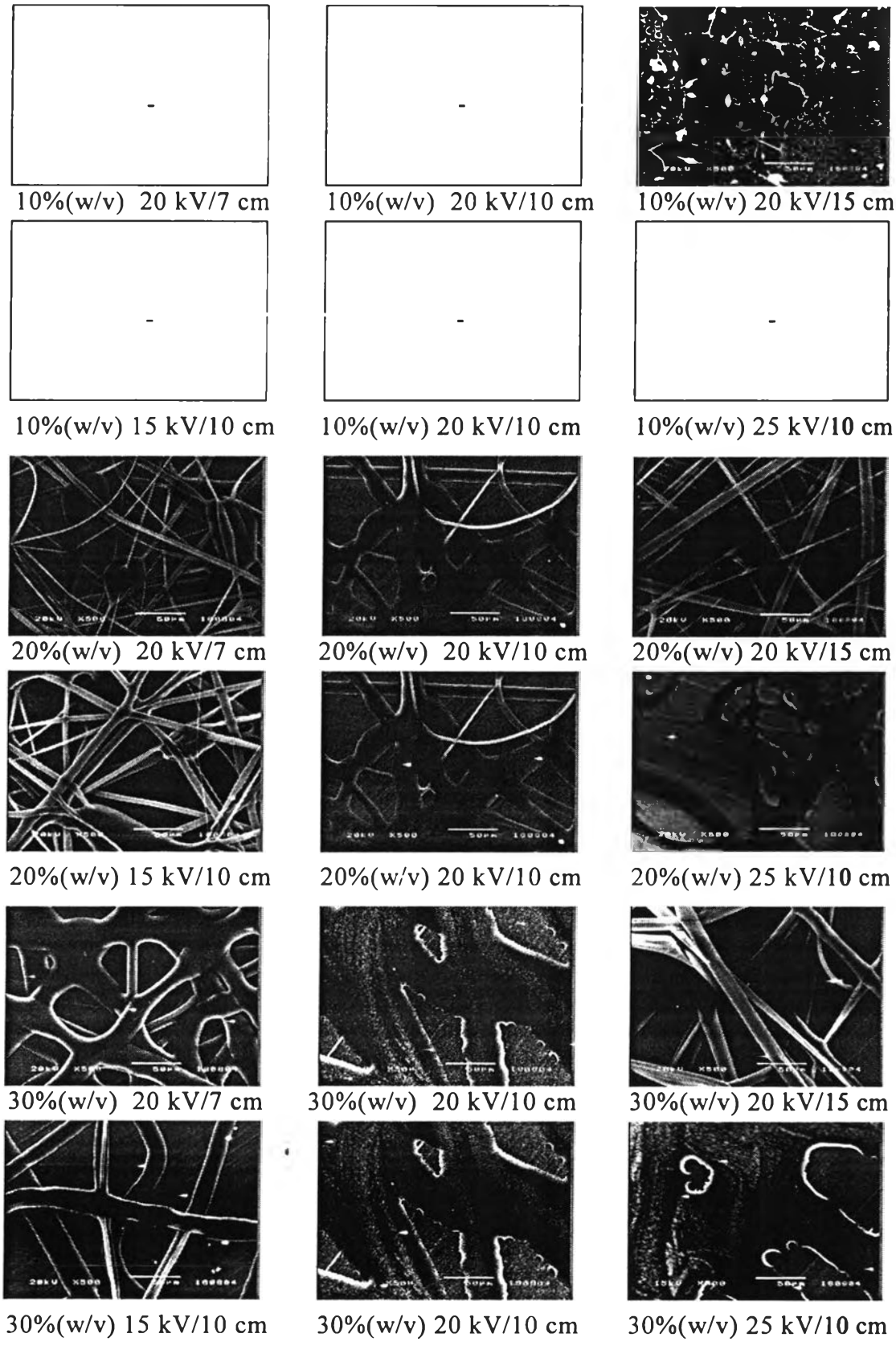

Figure F3.1a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DCE.

Remark – means jet has not been found under this condition

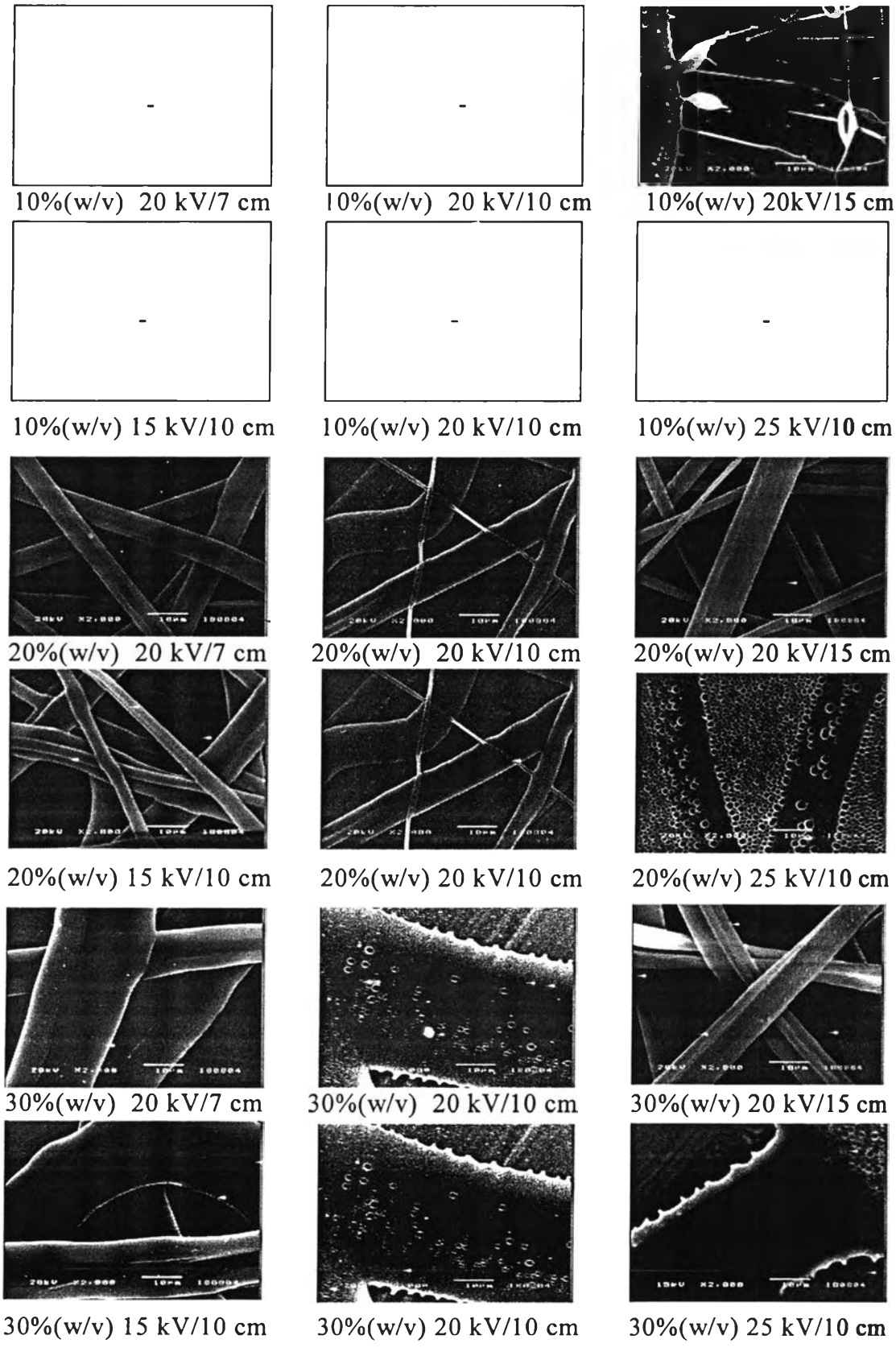

Figure F3.1b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DCE.

Remark – means jet has not been found under this condition

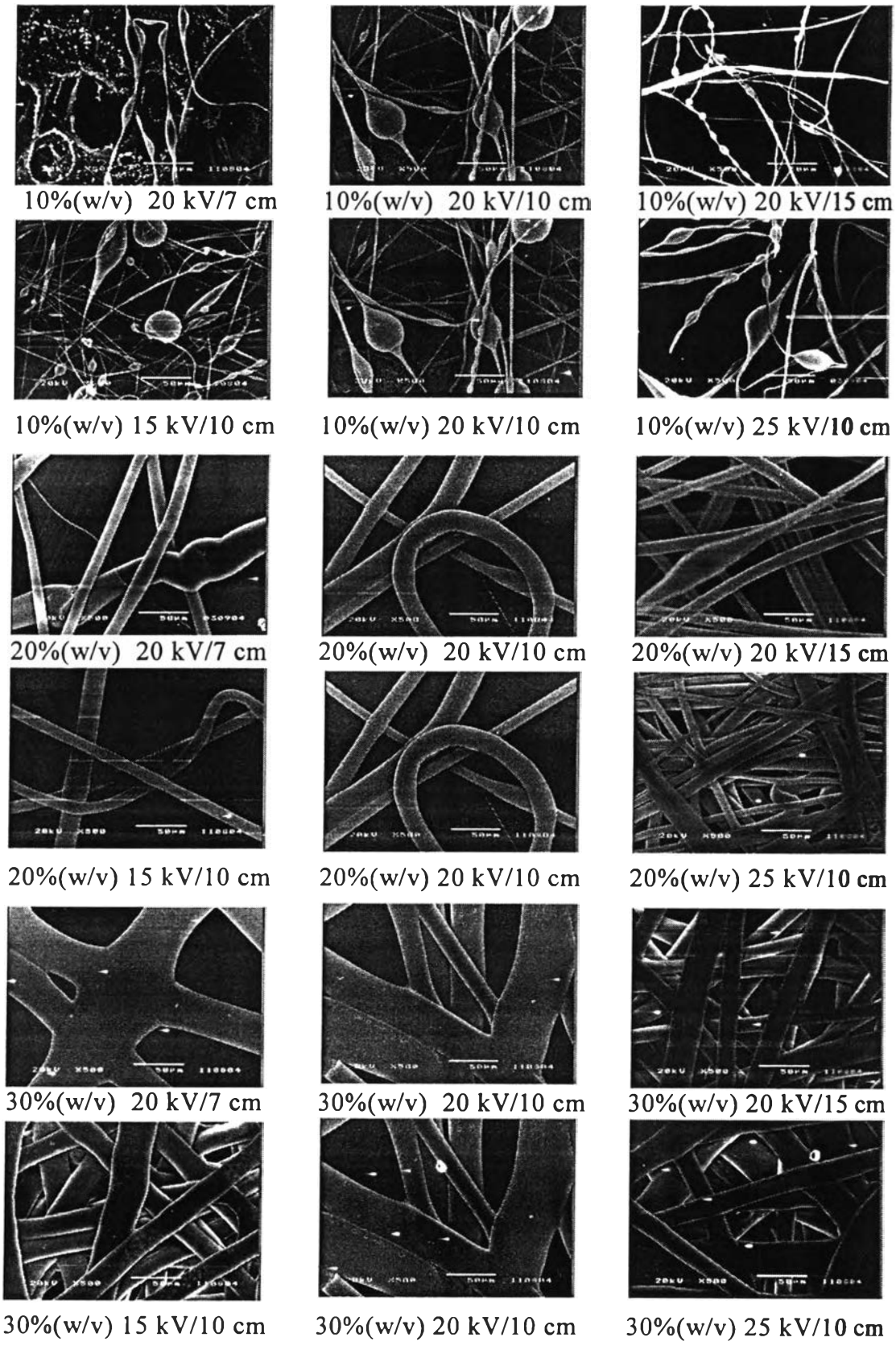

Figure F3.2a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF.

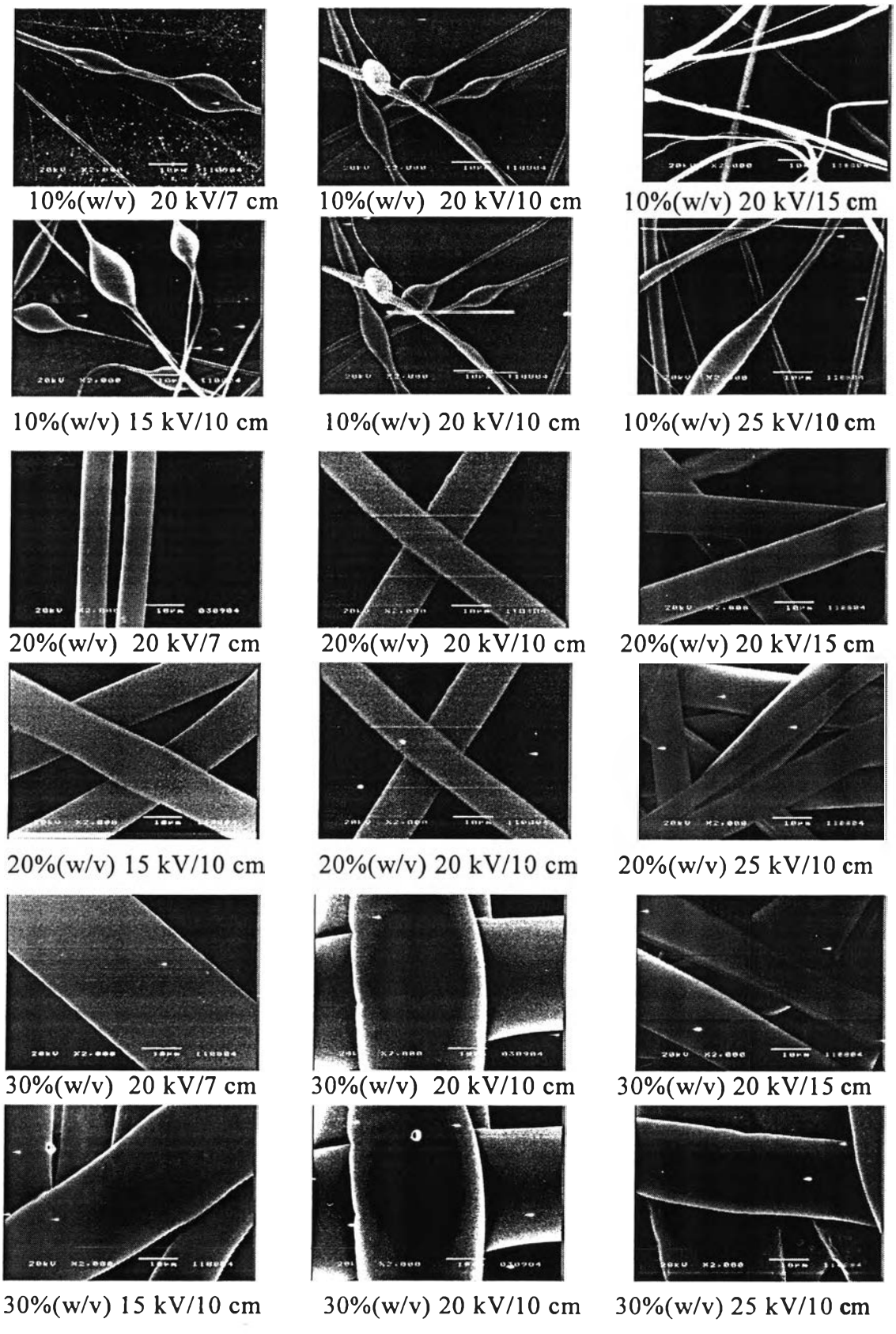

Figure F3.2b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF.

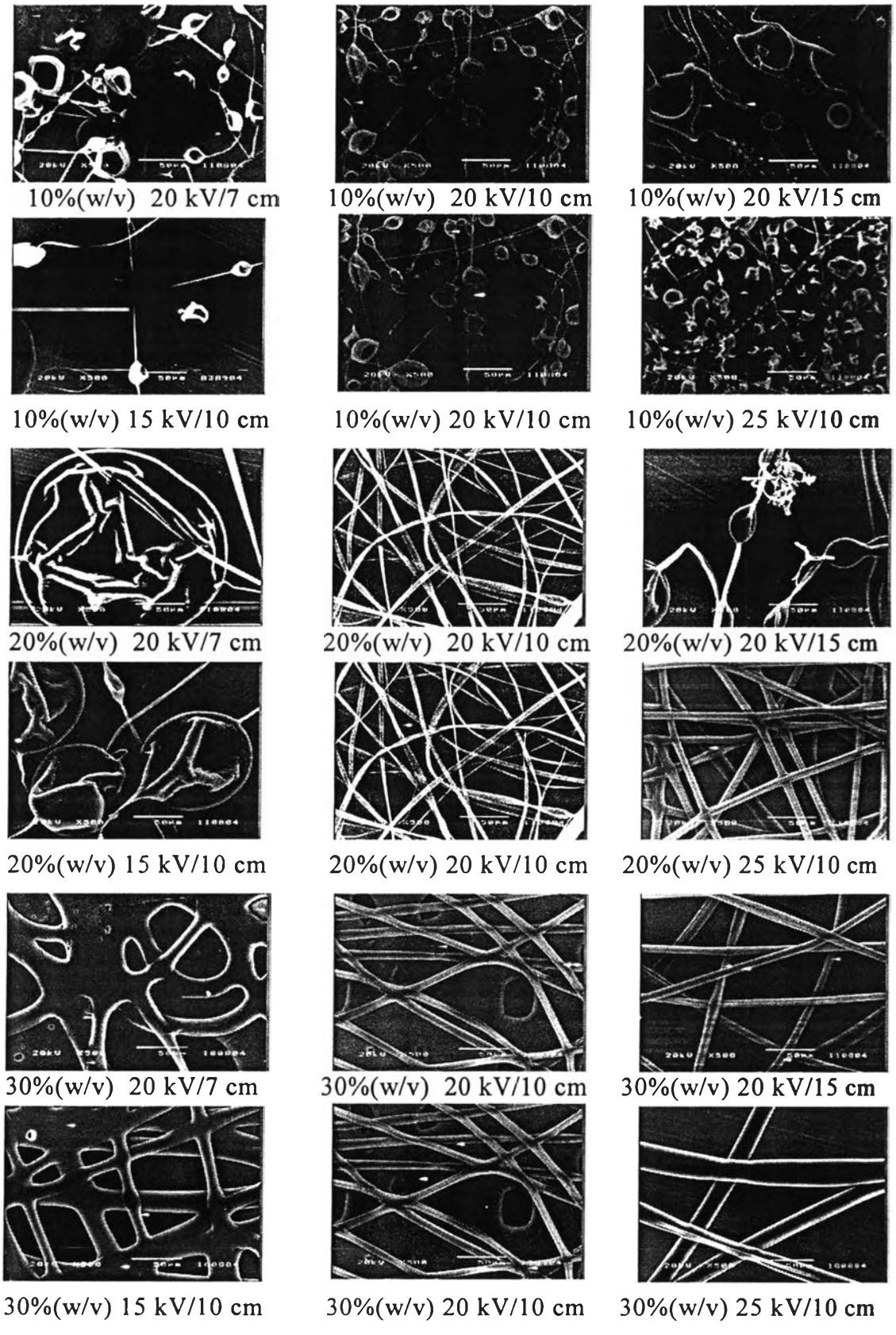

Figure F3.3a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in EA.

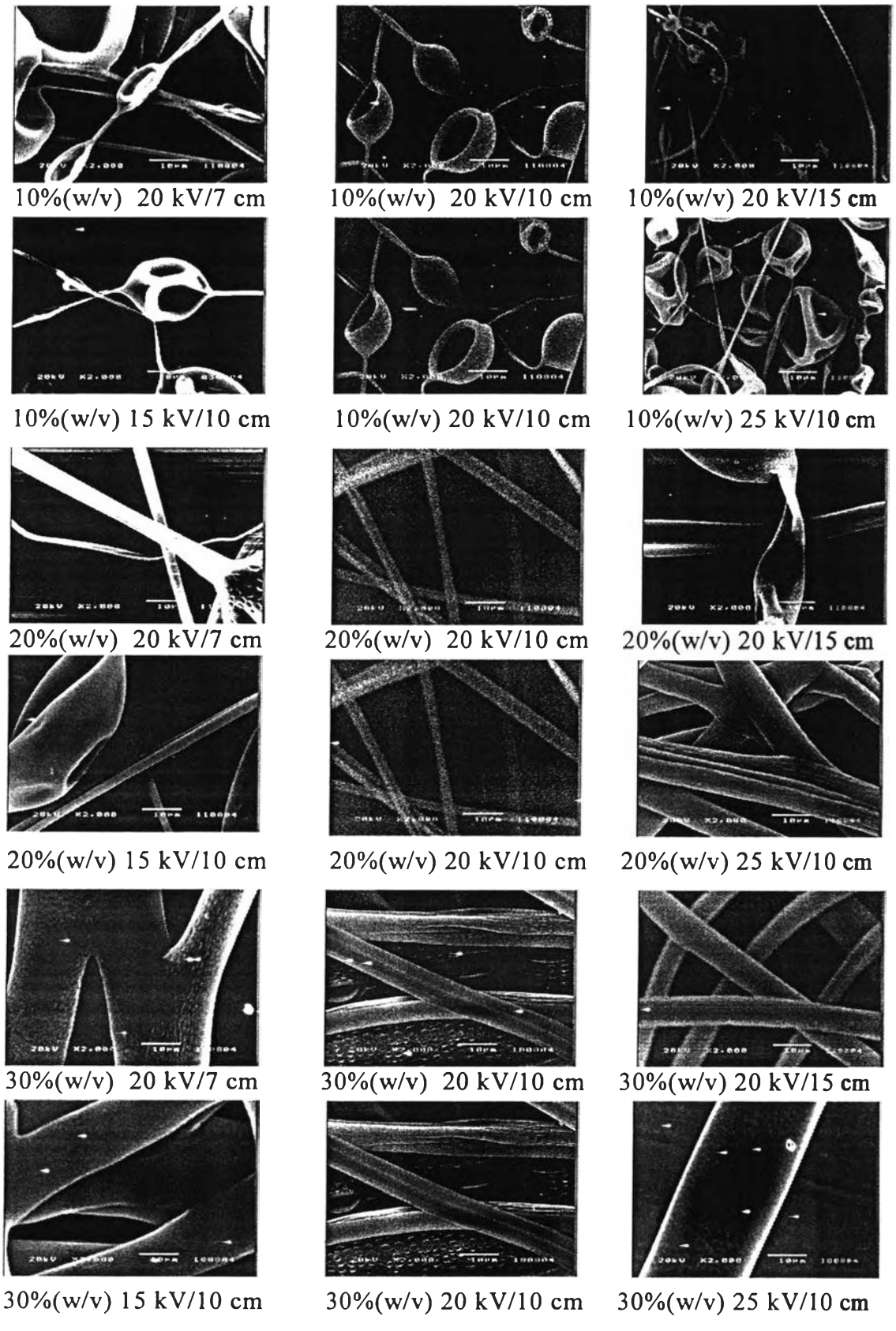

Figure F3.3b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in EA.

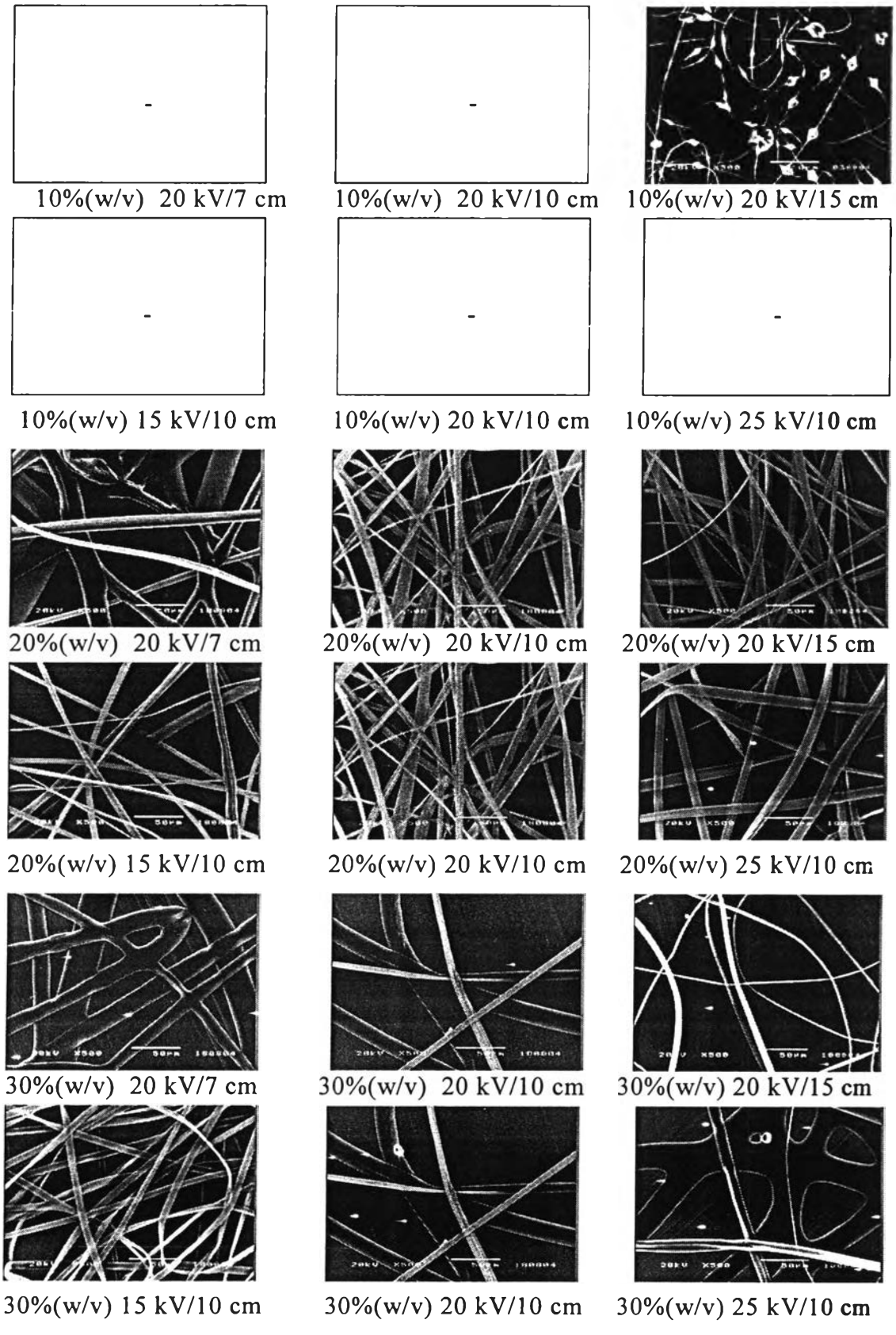

Figure F3.4a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in MEK.

Remark – means jet has not been found under this condition

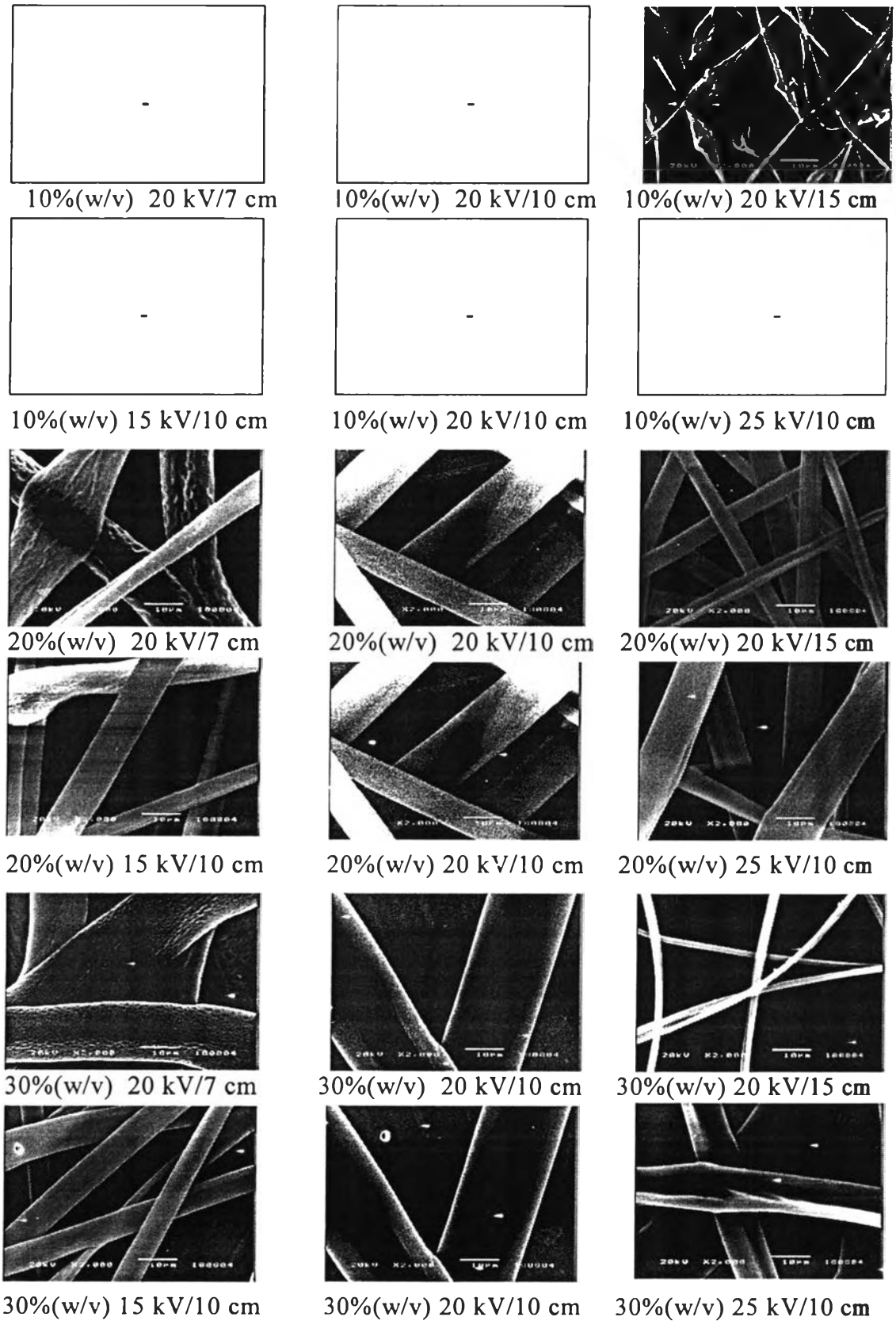

Figure F3.4b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in MEK.

Remark – means jet has not been found under this condition

Figure F4 SEM images: SEM images; Effect of applied voltage by fixing the collection distance (i.e. 15 kV/10 cm, 20 kV/10 cm, and 25 kV/10 cm) and effect of collection distance by fixing the applied voltage (i.e. 20 kV/7 cm, 20 kV/10 cm, and 20 kV/15 cm) on the fiber diameter in mixed solvent systems. Under positive polarity of the emitting electrode.

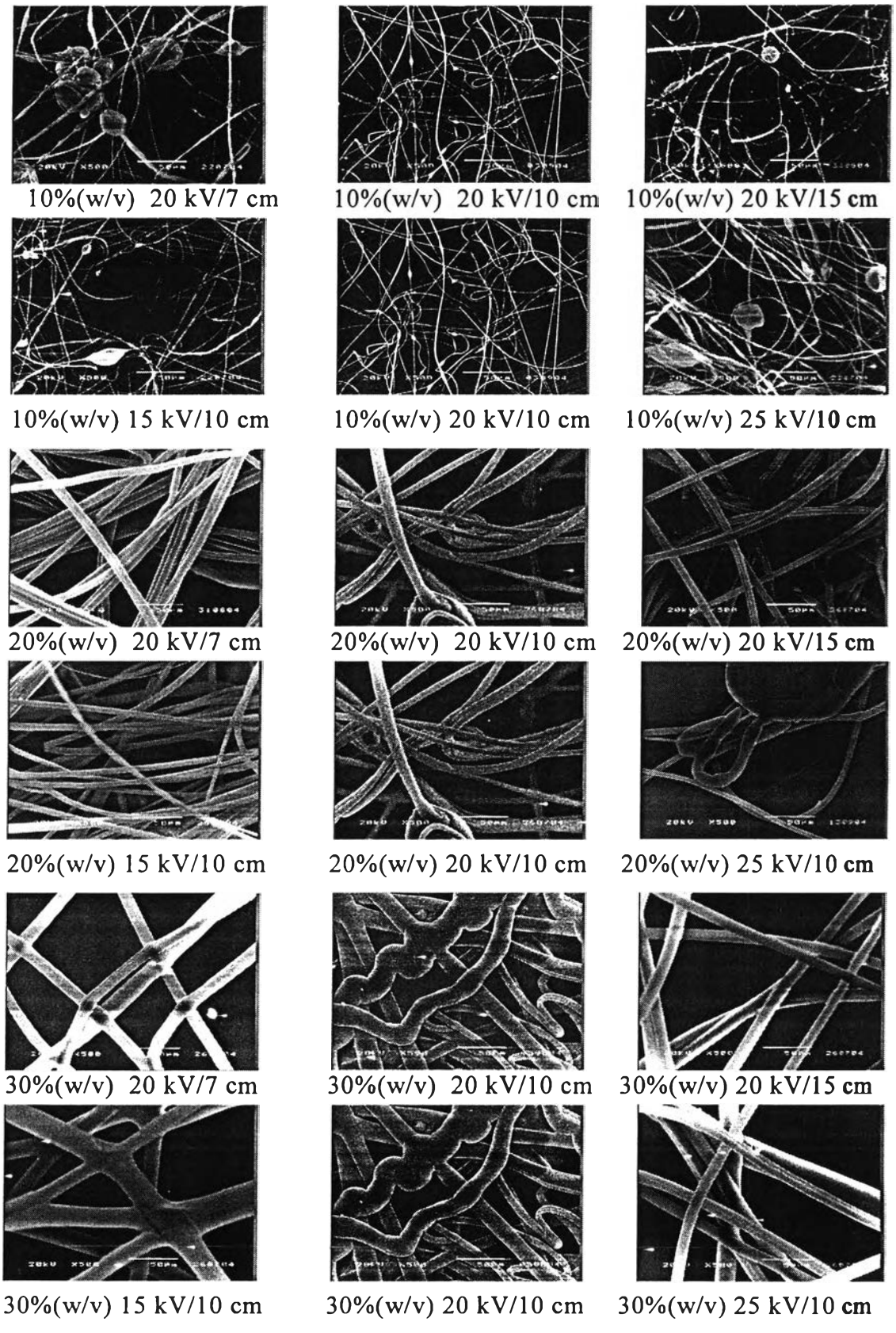

Figure F4.1a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/DCE as 75/25 ratio.

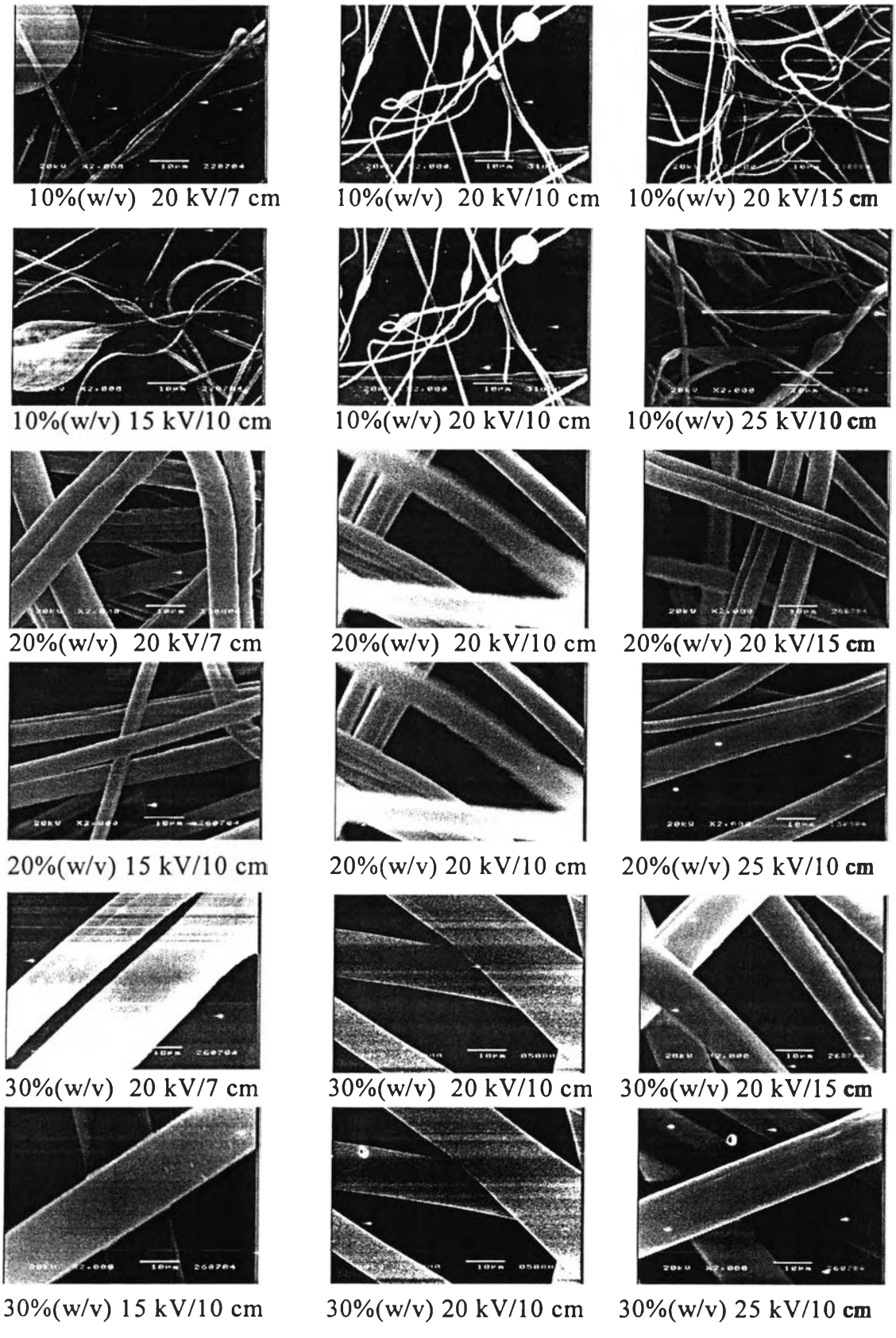

Figure F4.1b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/DCE as 75/25 ratio.

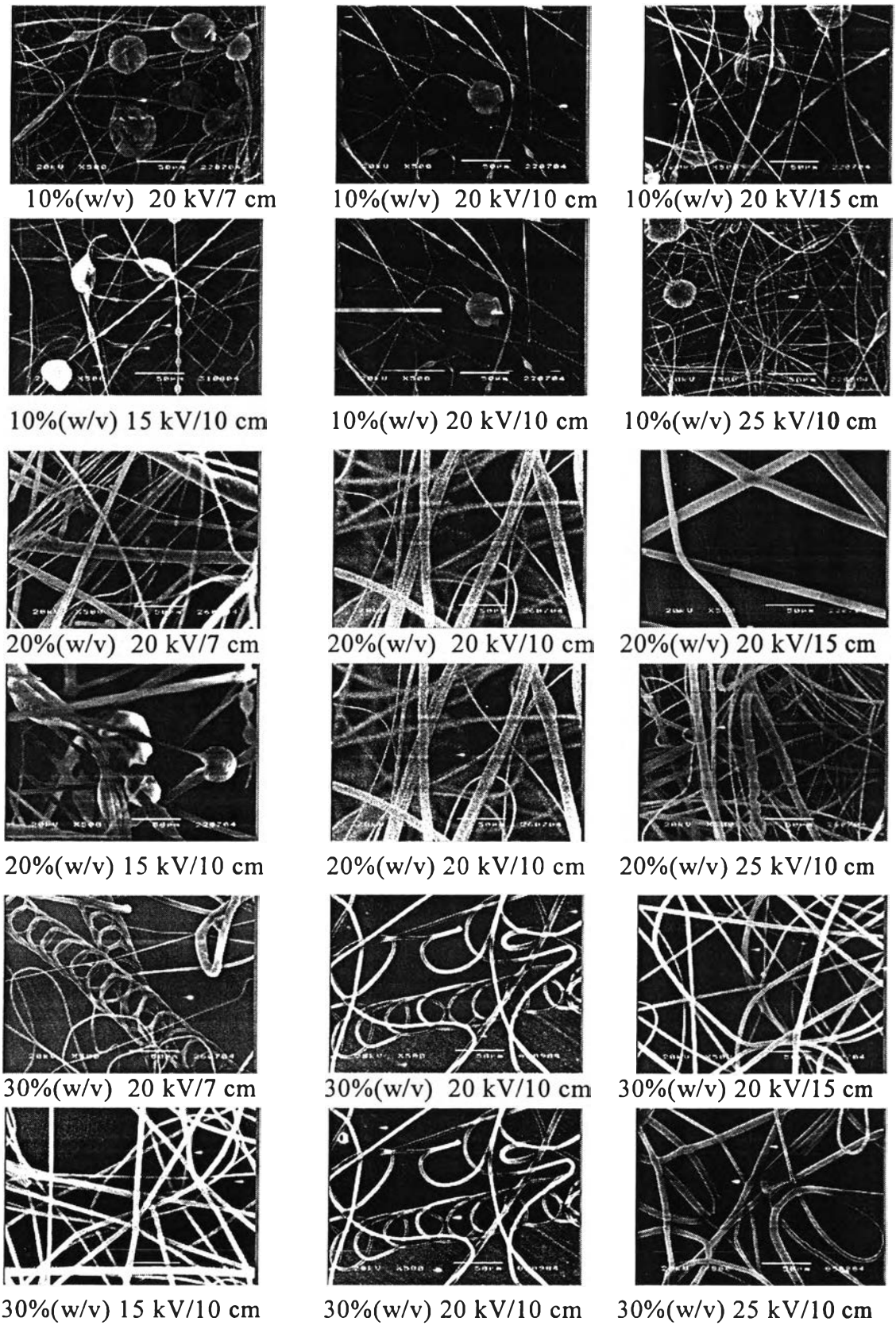

Figure F4.2a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/DCE as 50/50 ratio.

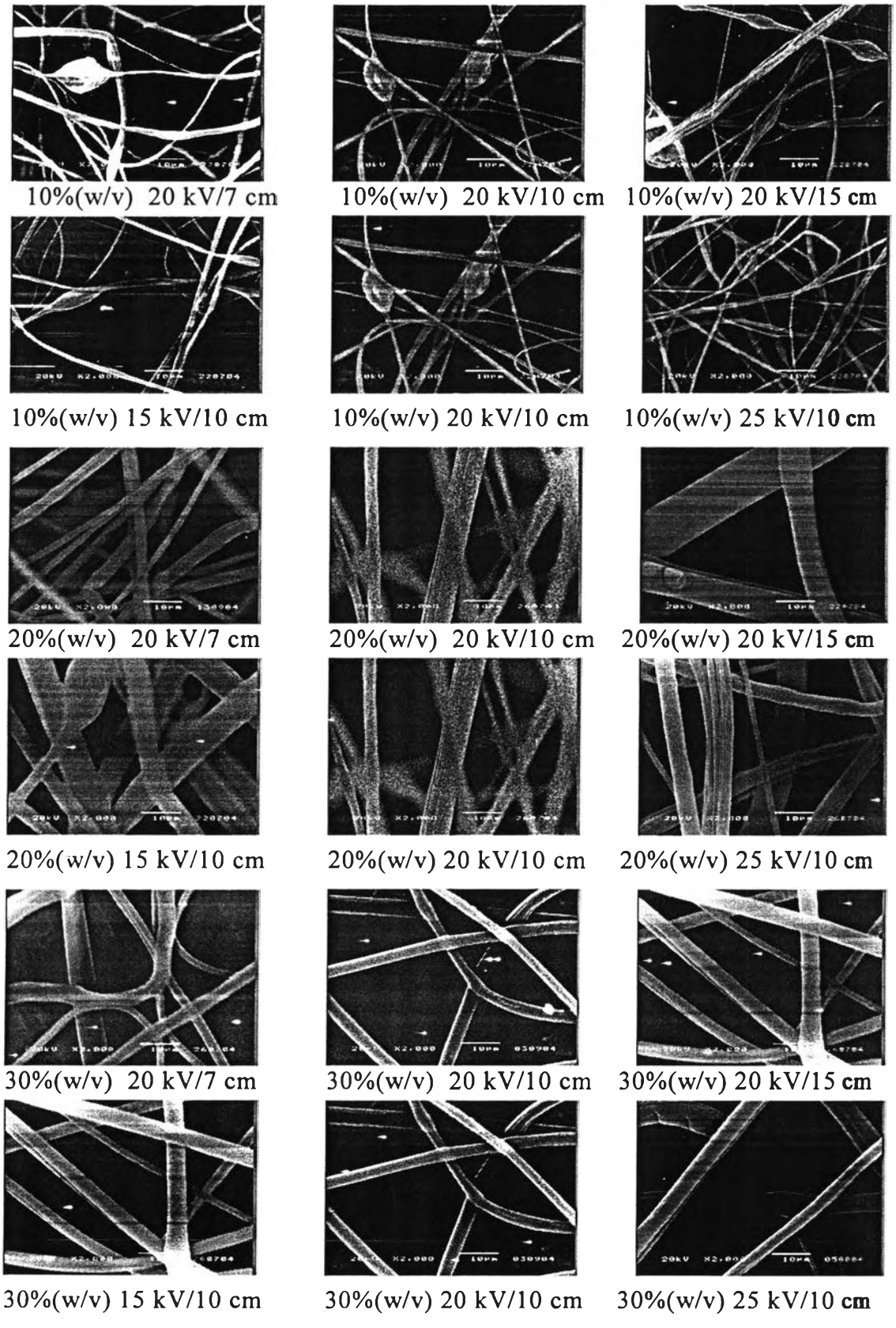

Figure F4.2b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/DCE as 50/50 ratio.

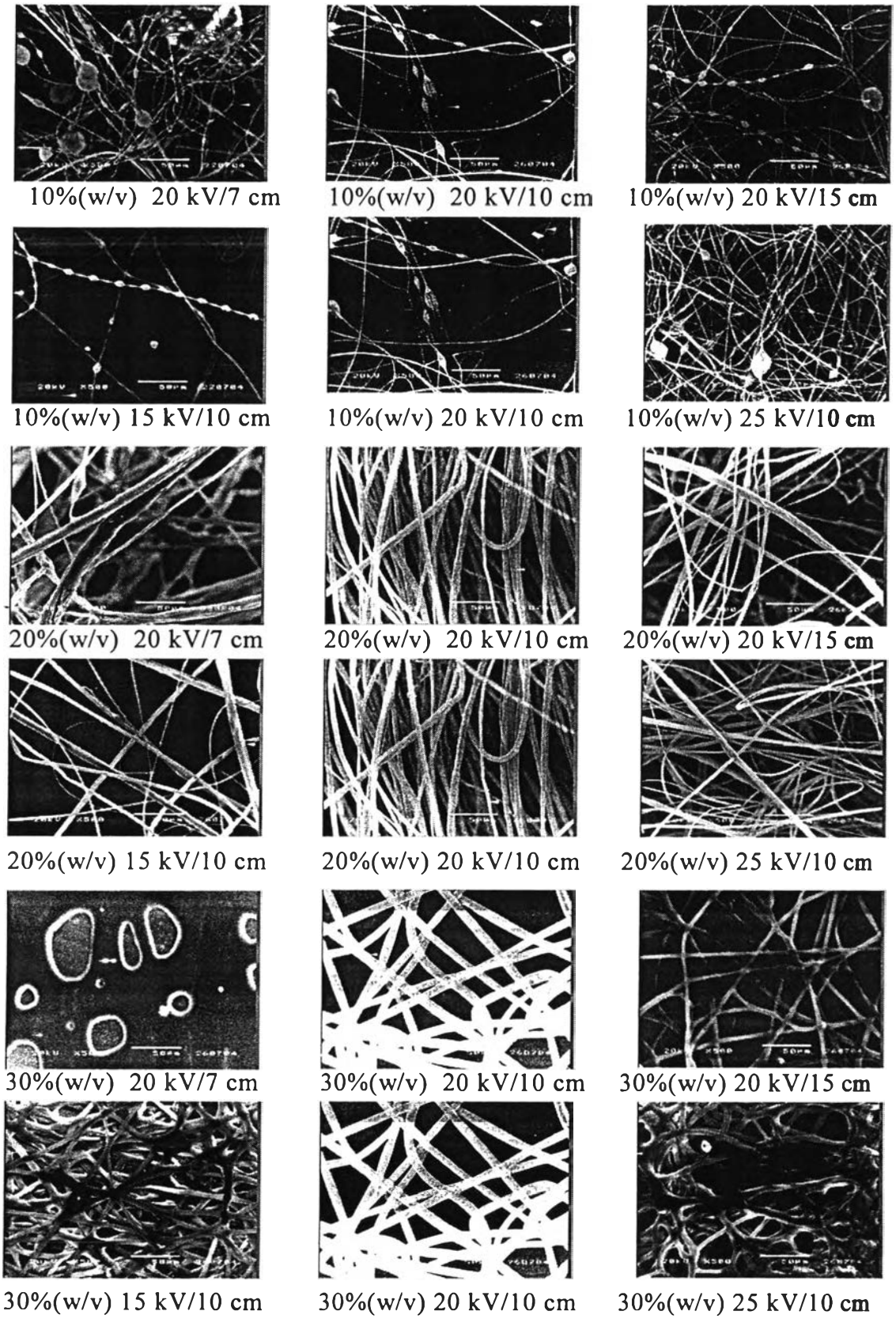

Figure F4.3a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/DCE as 25/75 ratio.

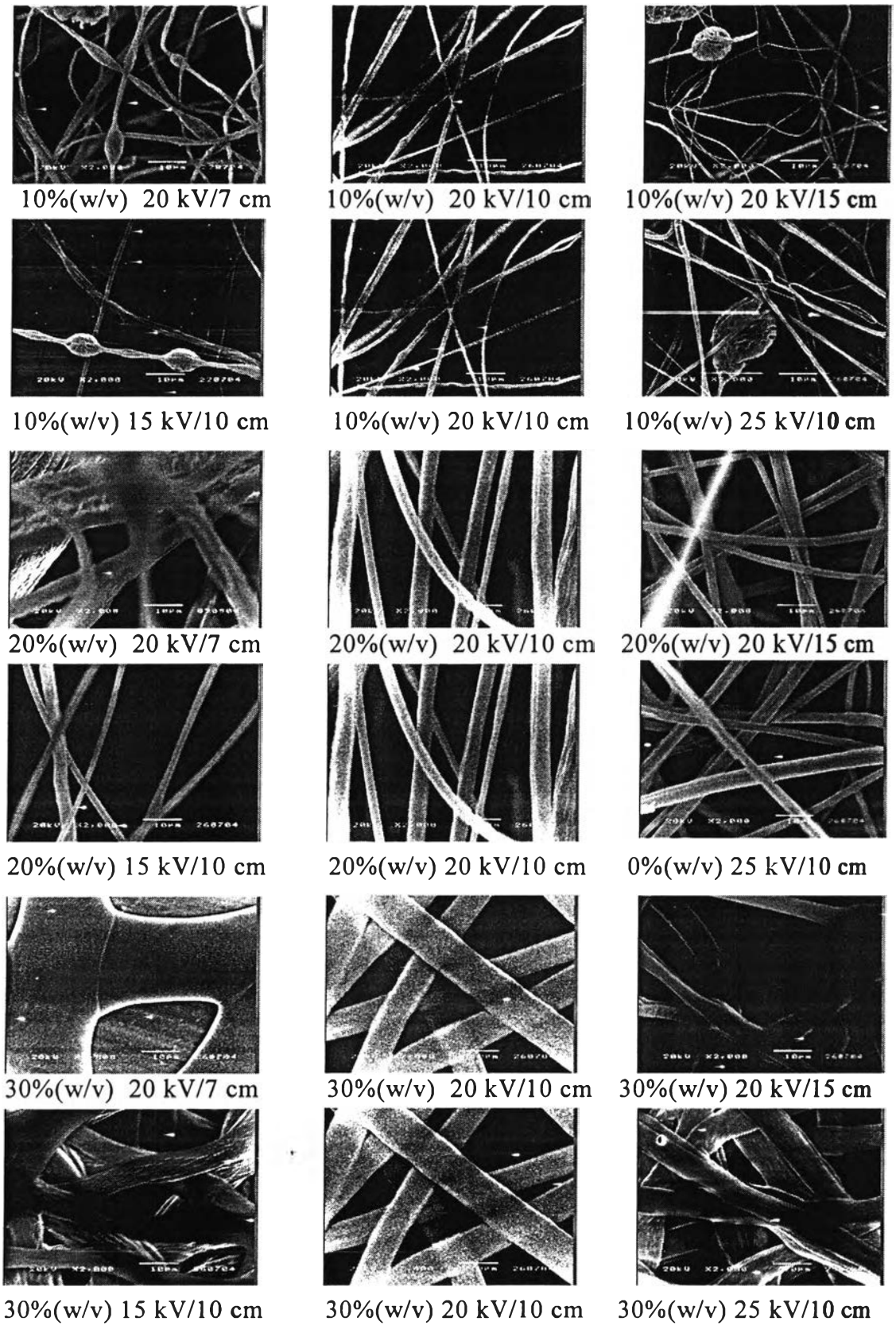

Figure F4.3b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/DCE as 25/75 ratio.

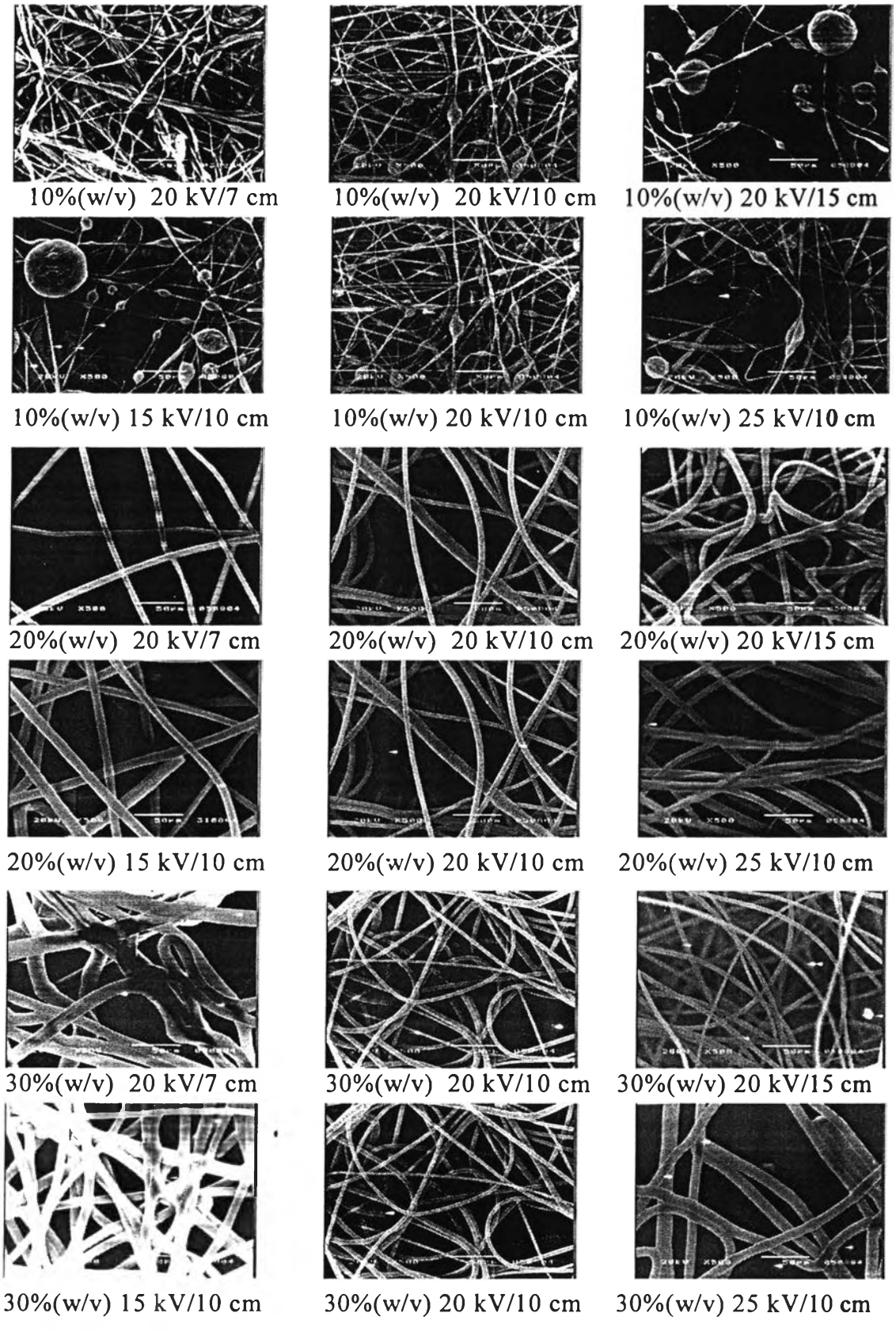

Figure F4.4a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/EA as 75/25 ratio.

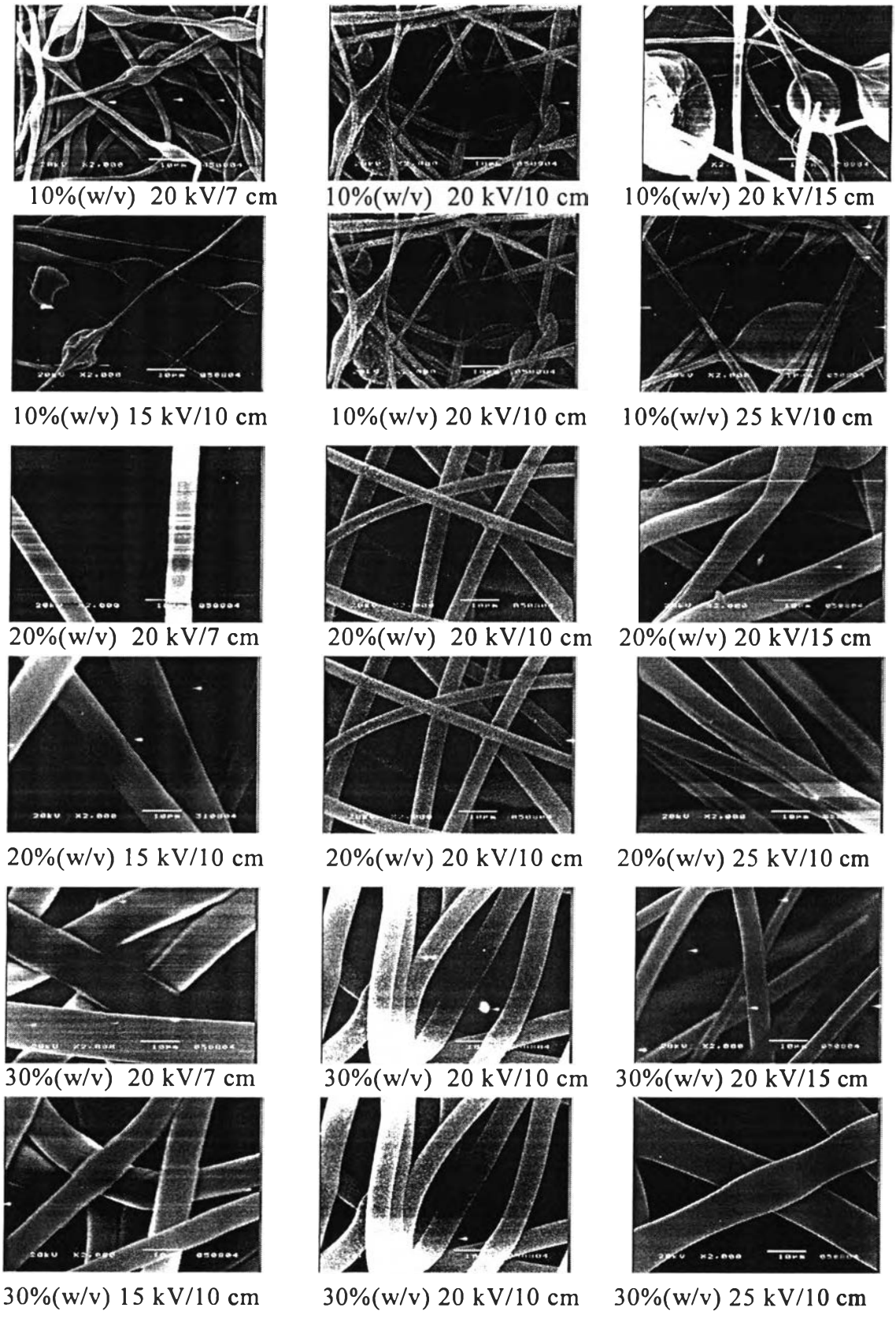

Figure F4.4b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/EA as 75/25 ratio.

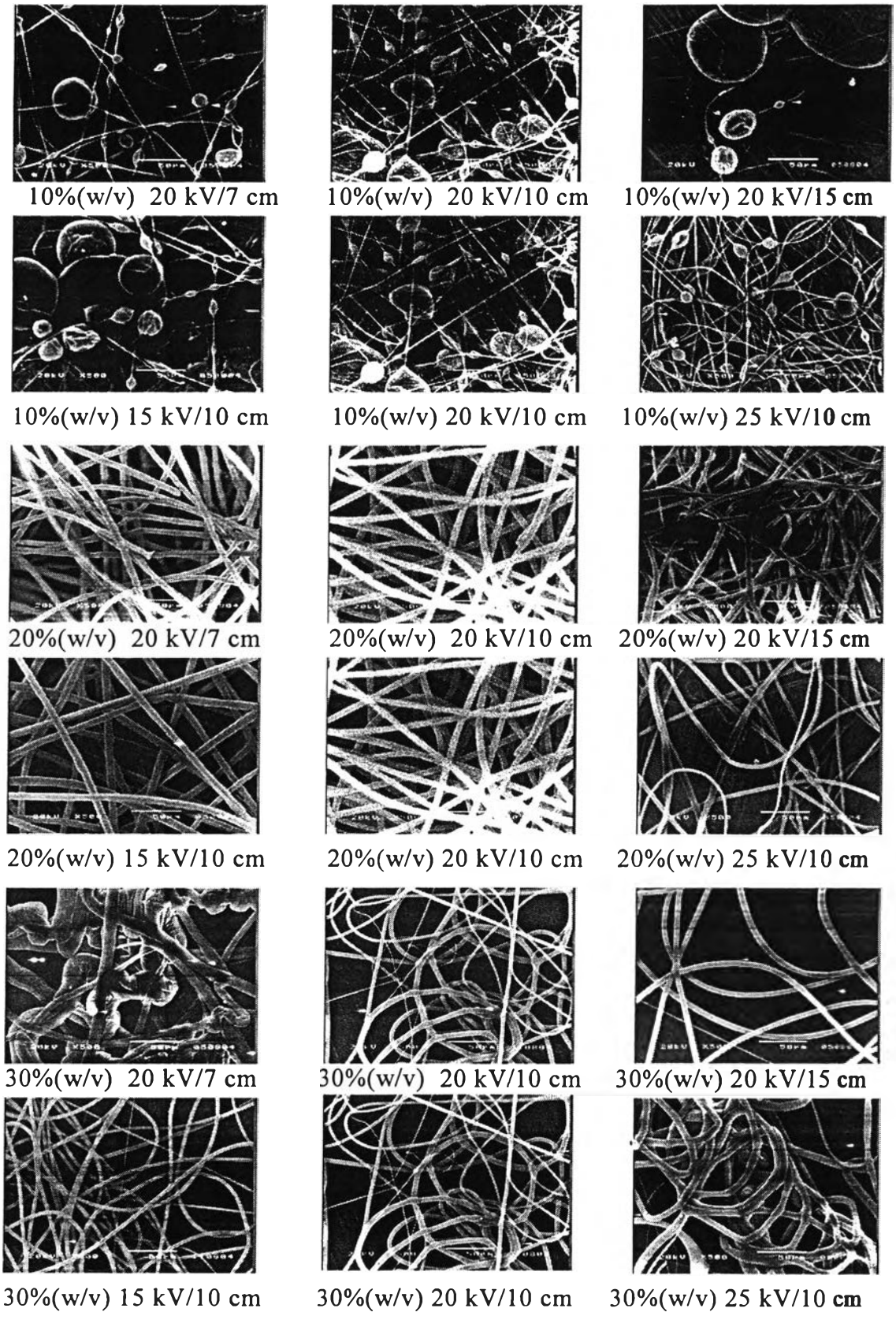

Figure F4.5a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/EA as 50/50 ratio.

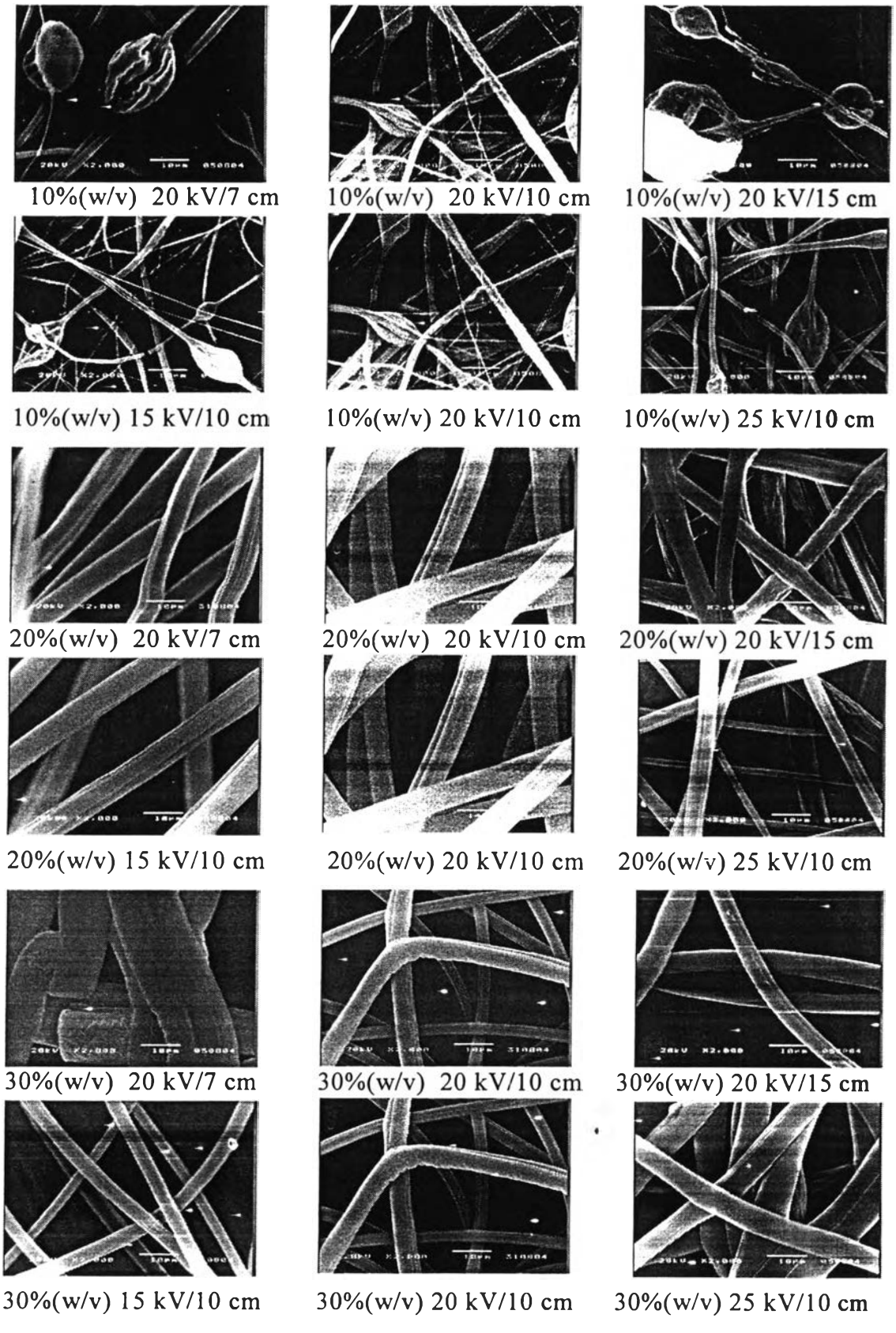

Figure F4.5b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/EA as 50/50 ratio.

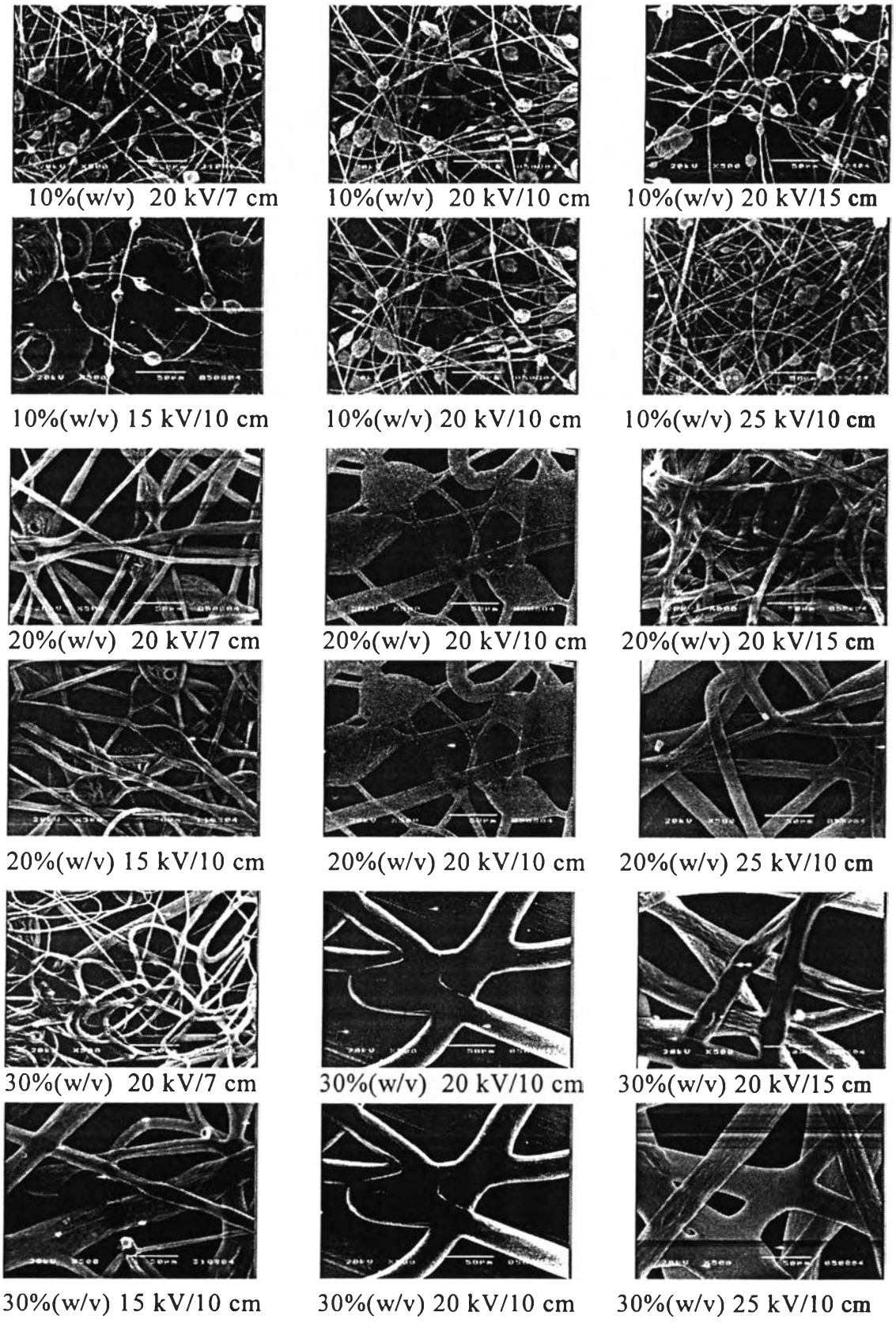

Figure F4.6a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/EA as 25/75 ratio.

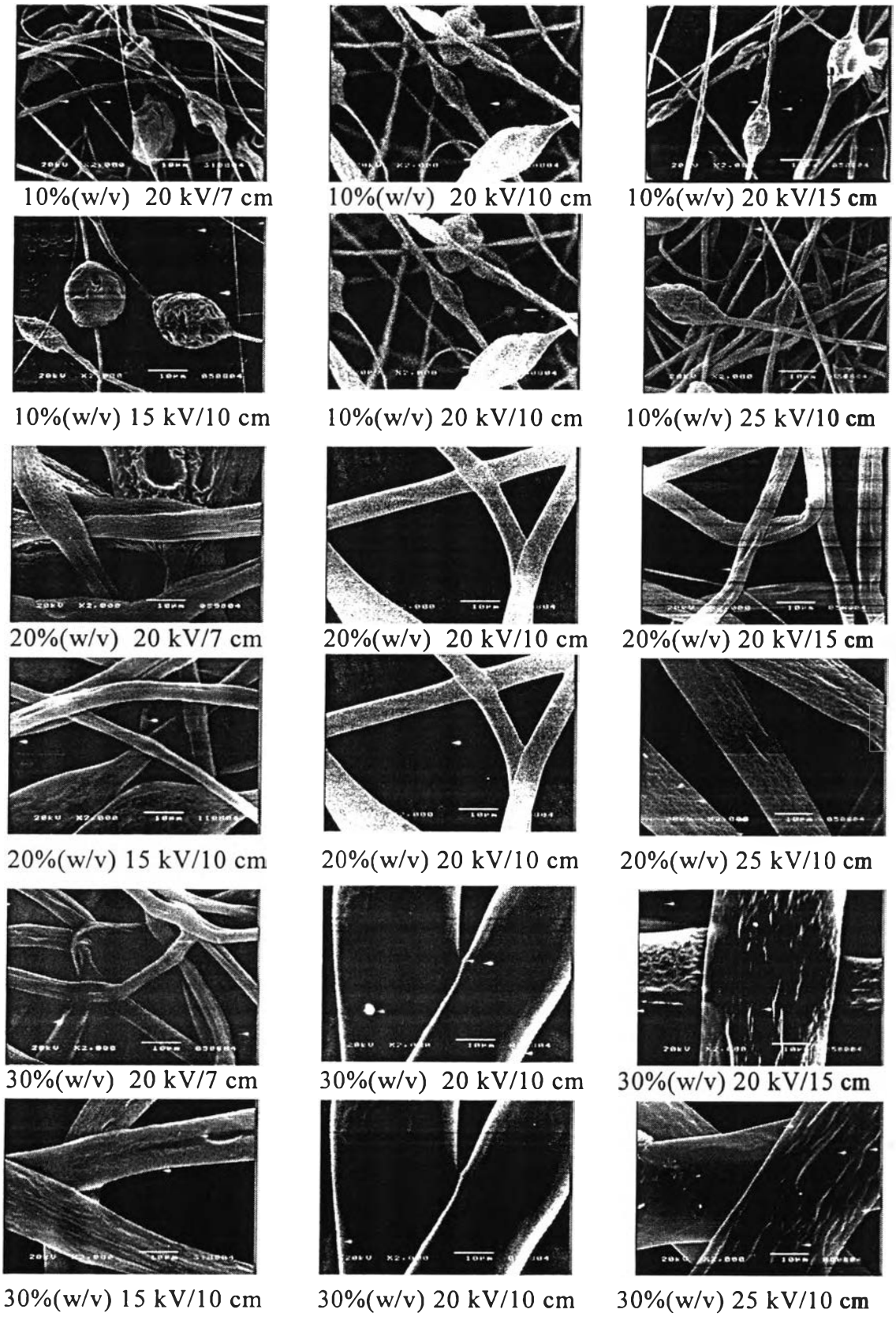

Figure F4.6b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/EA as 25/75 ratio.

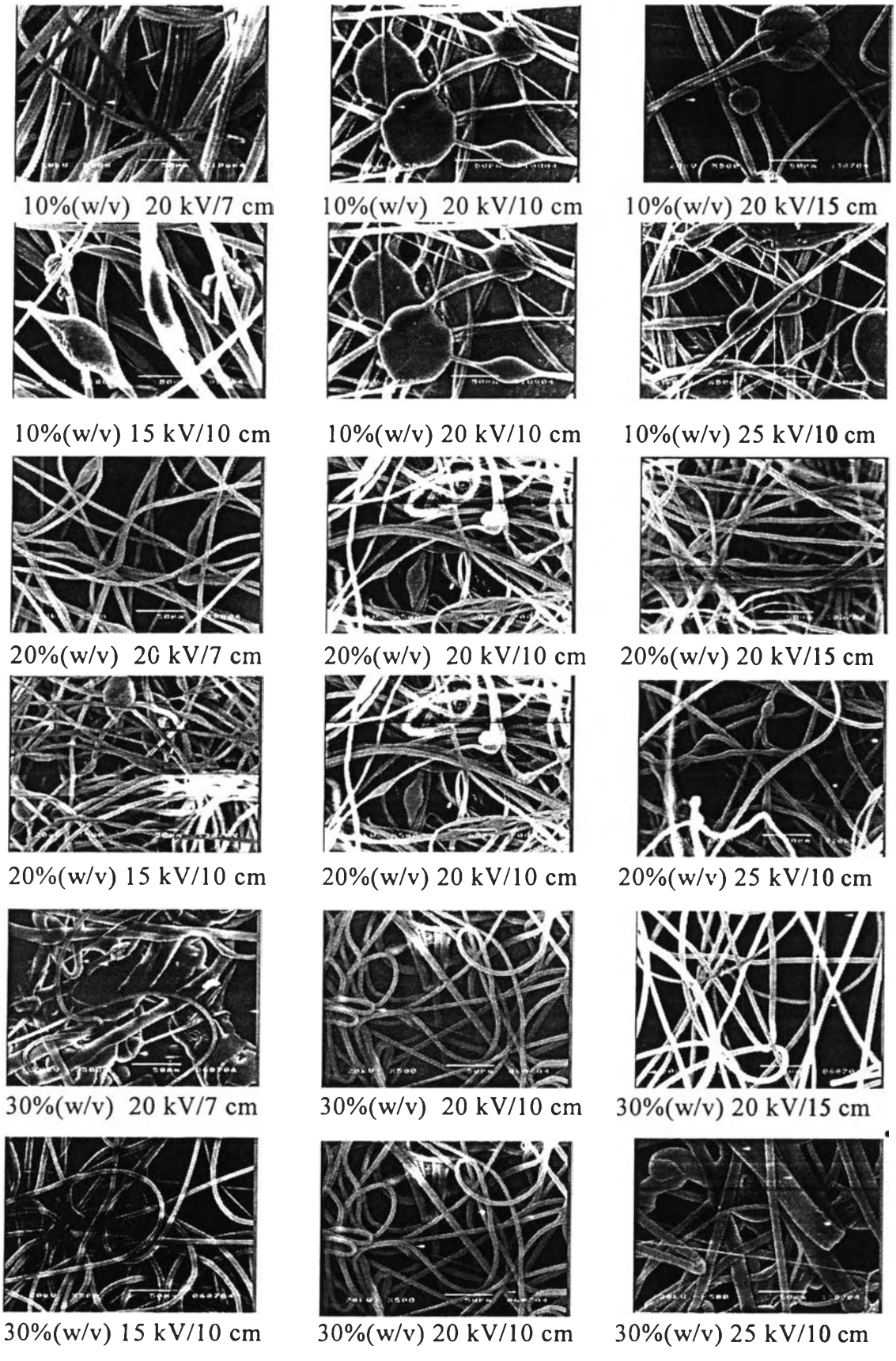

Figure F4.7a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/MEK as 75/25 ratio.

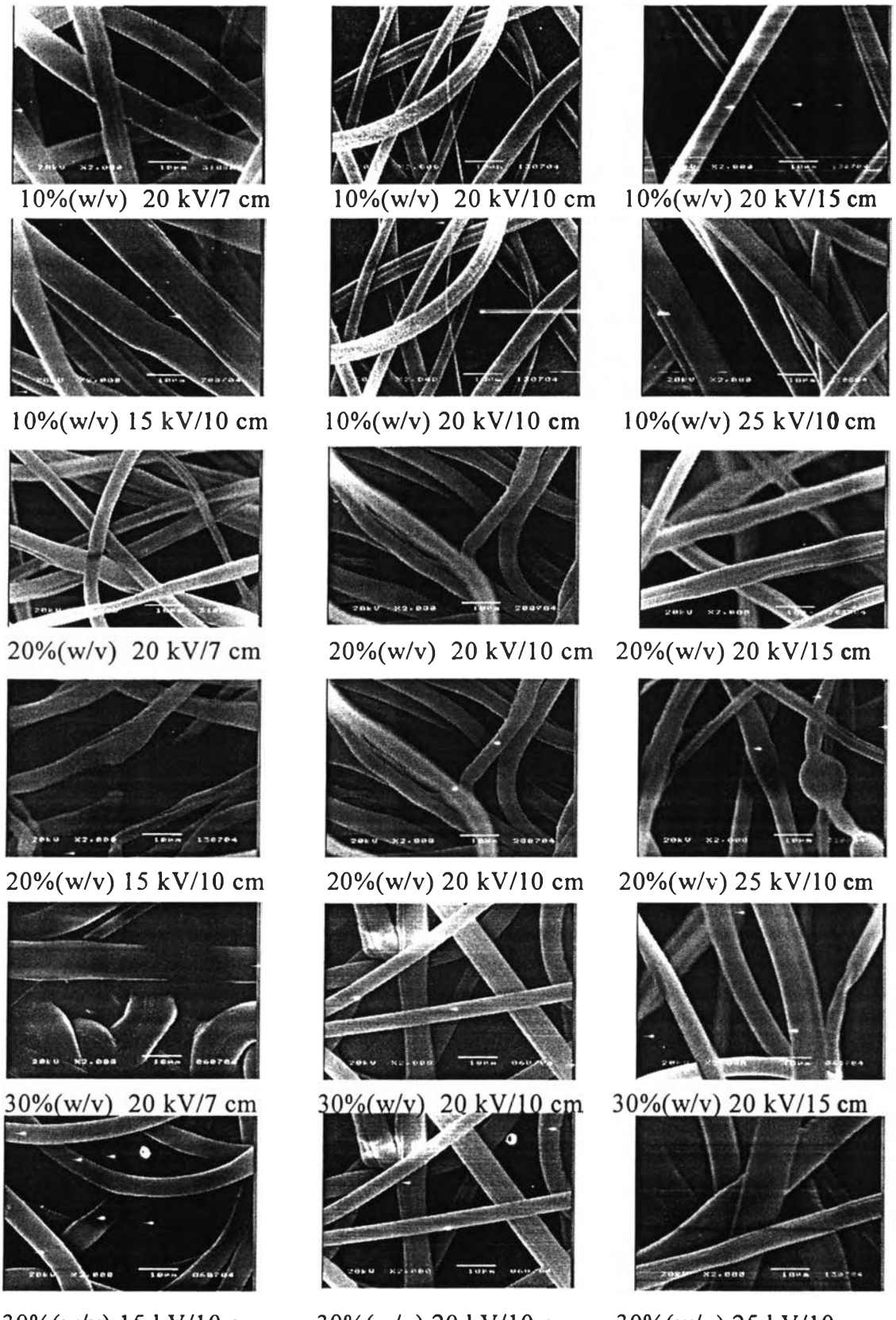

Figure F4.7b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/MEK as 75/25 ratio.

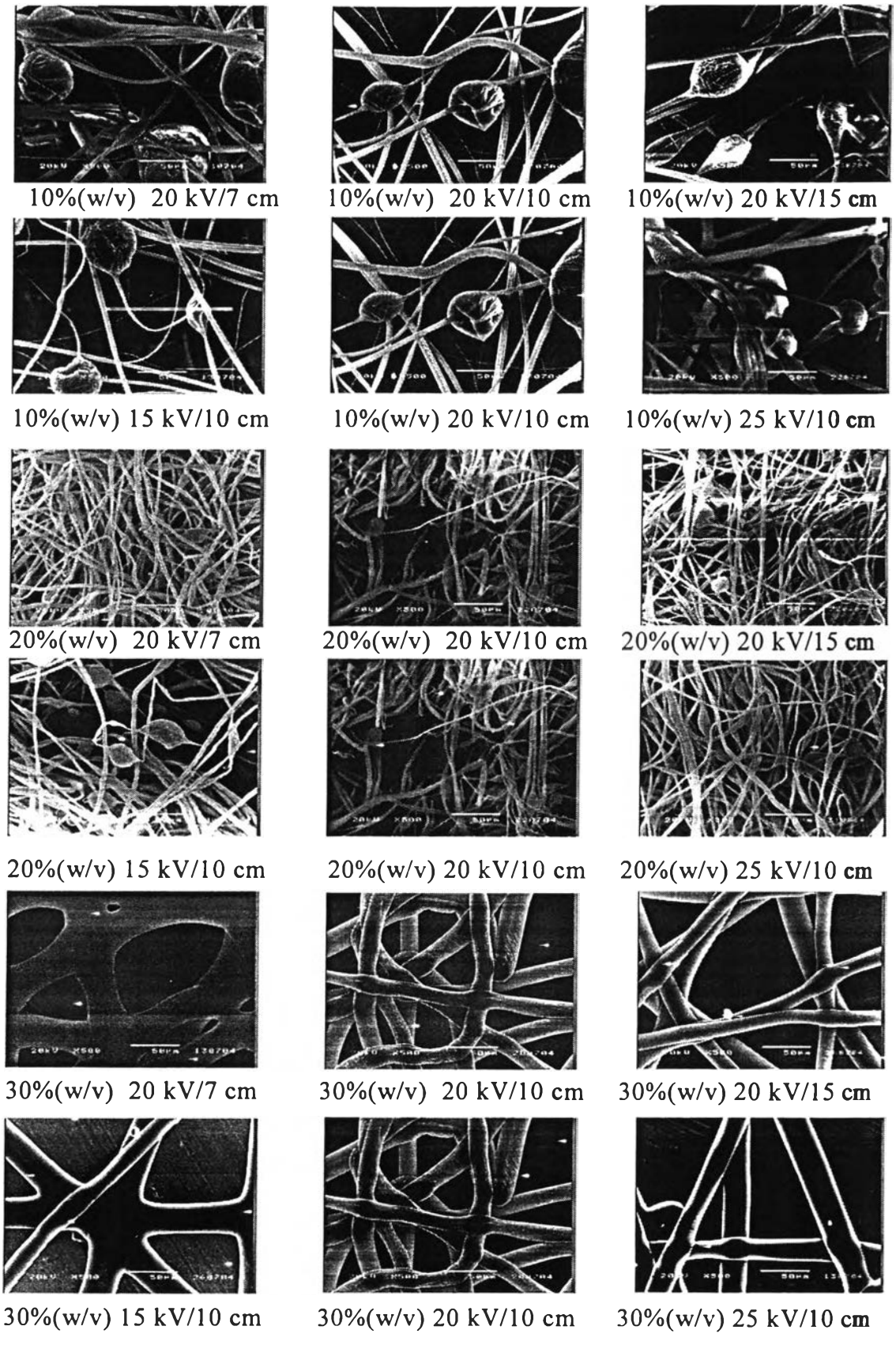

Figure F4.8a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/MEK as 50/50 ratio.

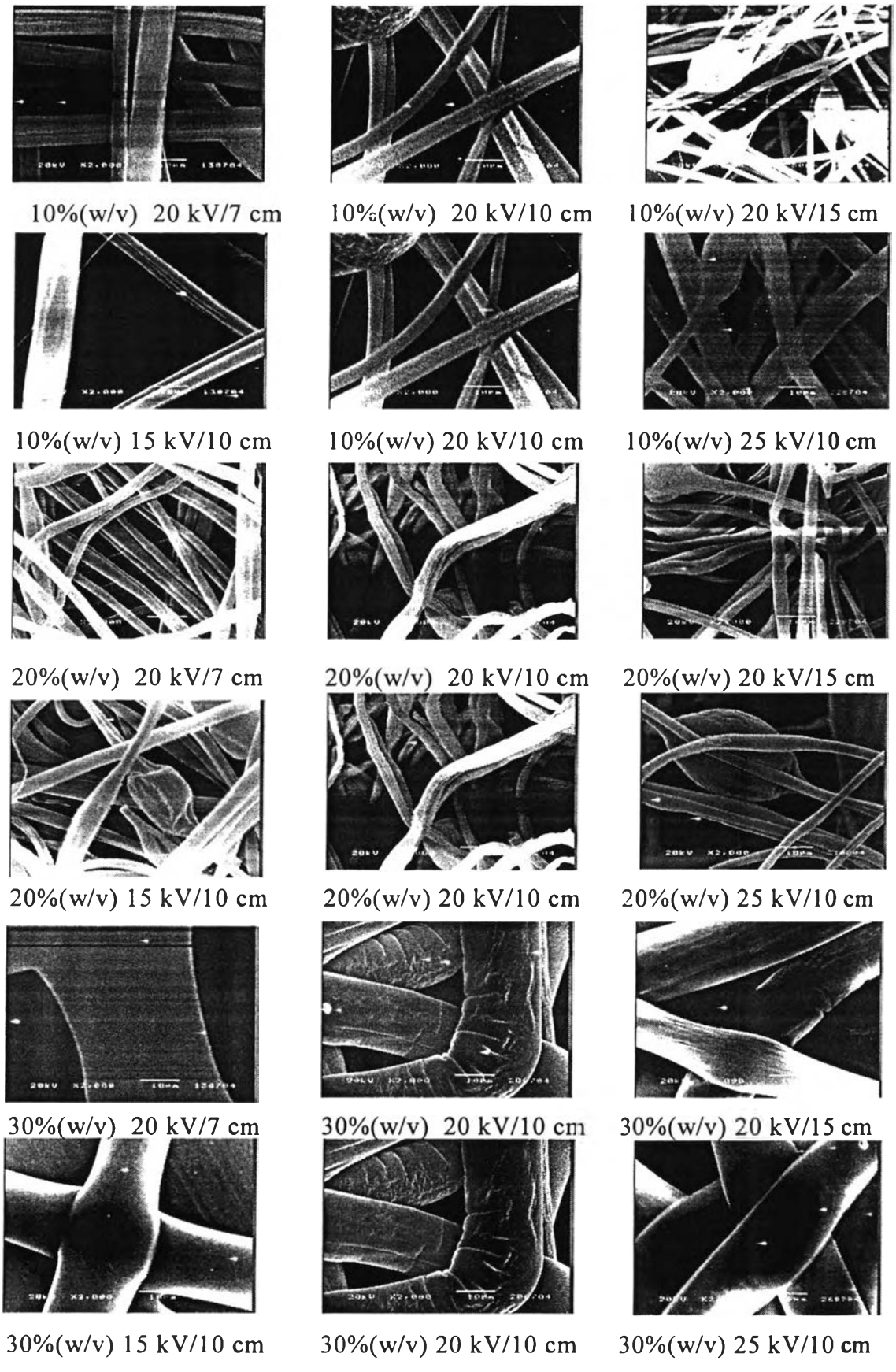

Figure F4.8b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/MEK as 50/50 ratio.

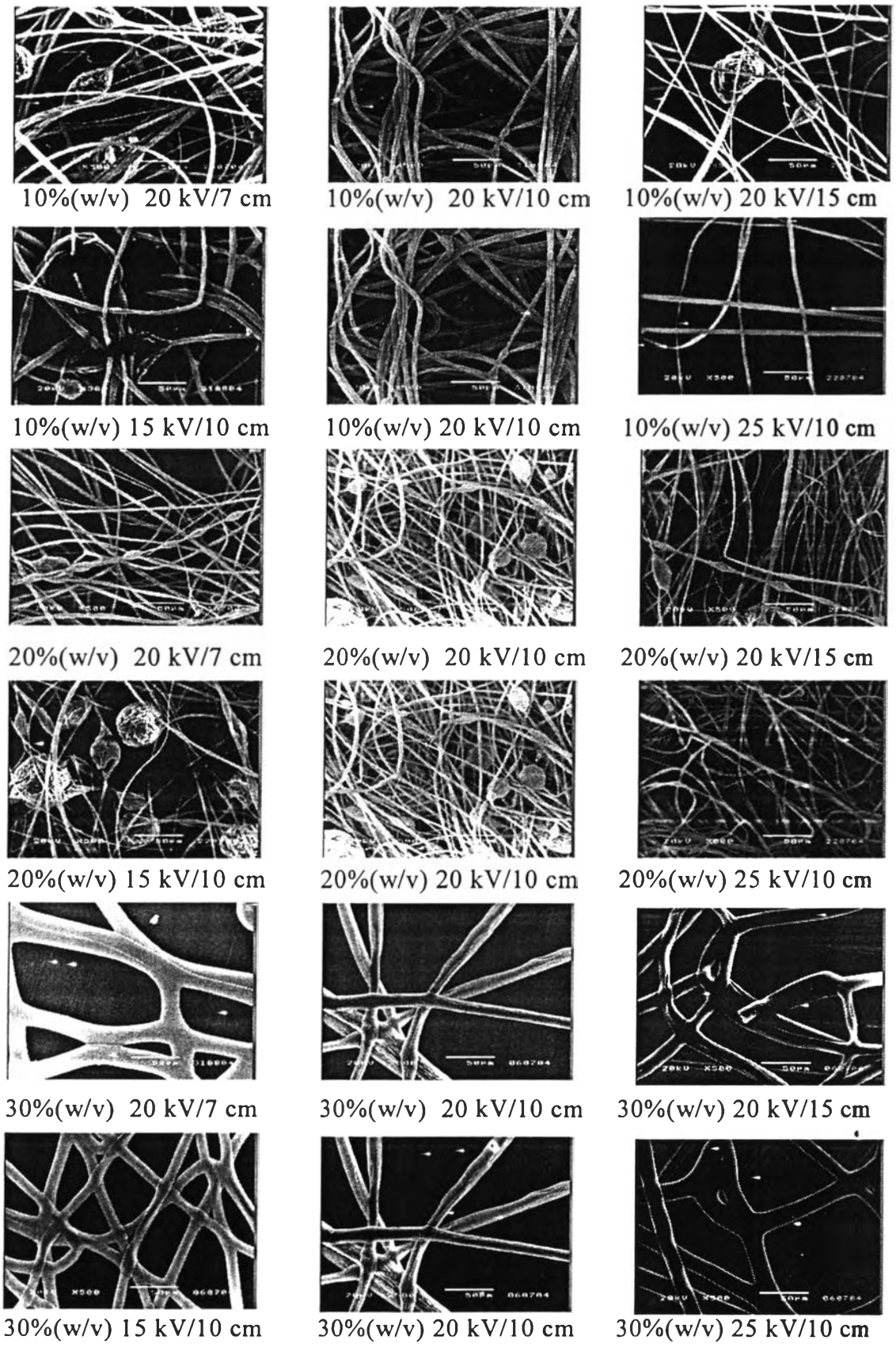

Figure F4.9a SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers in DMF/MEK as 25/75 ratio.

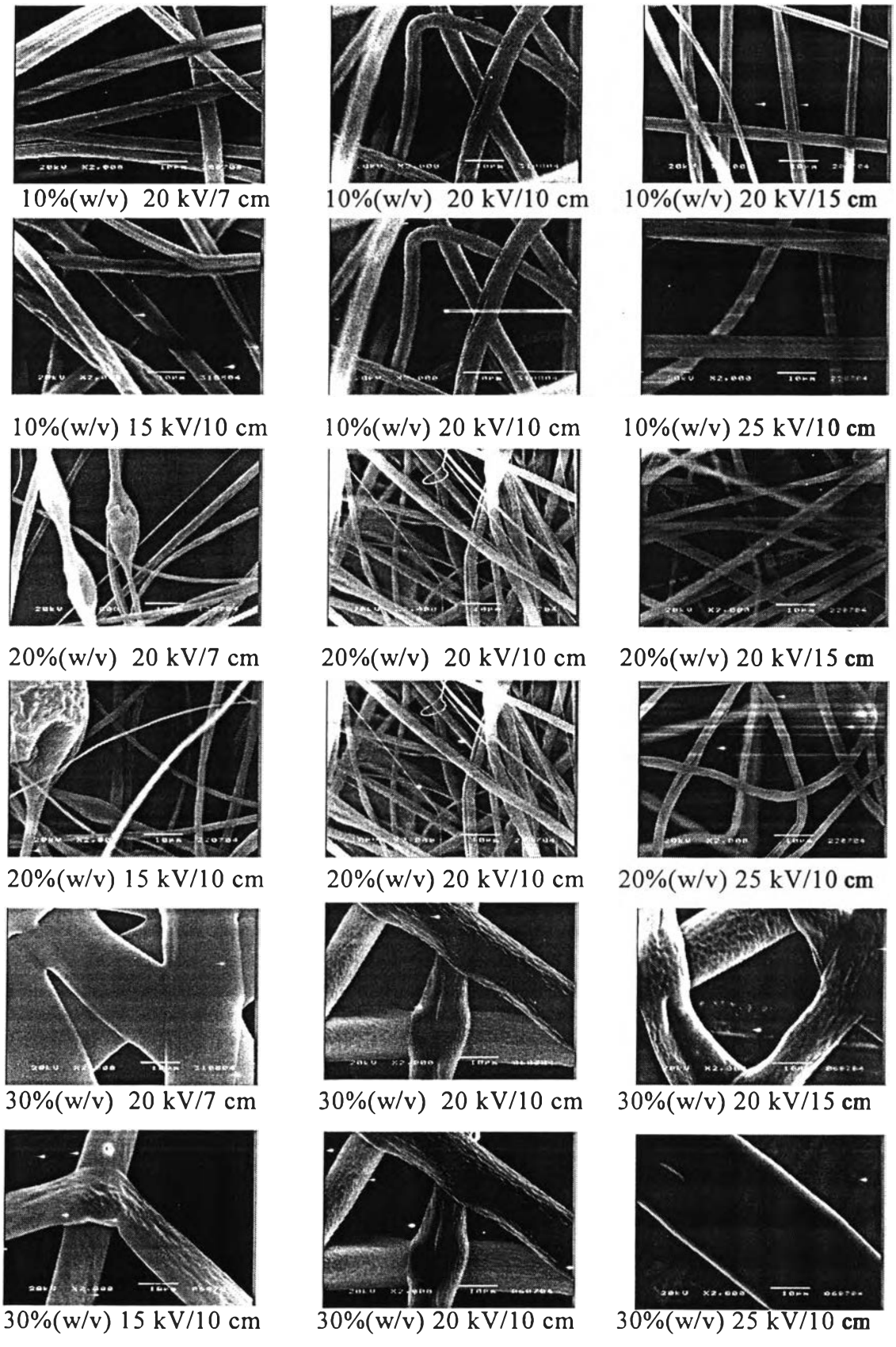

Figure F4.9b SEM images (at a magnification of 2,000 and the scale bar shown is for 10 μm) of as-spun PS fibers in DMF/MEK as 25/75 ratio.

Figure F5 SEM images: Effect of 1% (w/v) salt addition on the fiber diameter. The applied electrical field was 20 kV/15 cm.

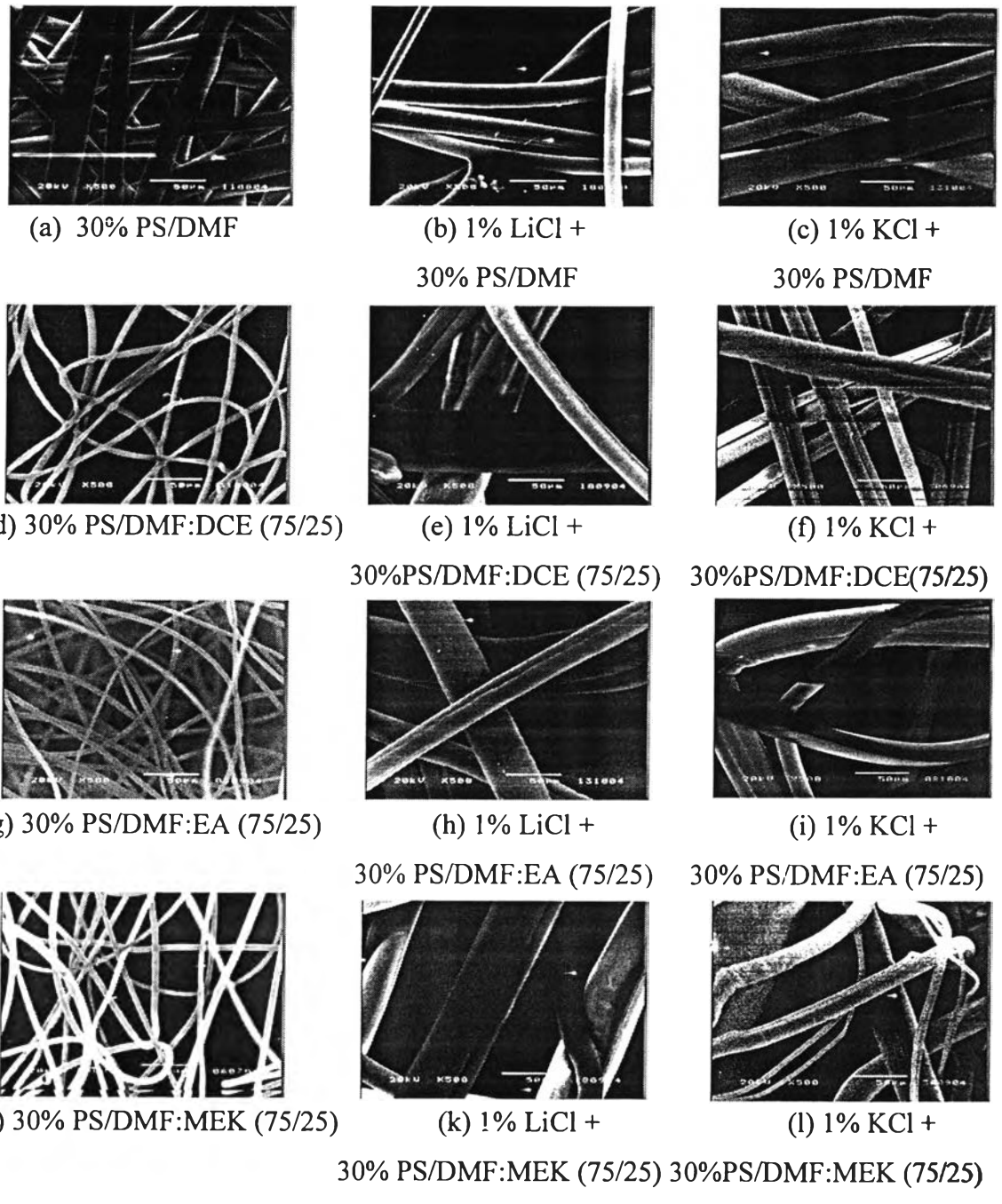

Figure F5.1 SEM images (at a magnification of 500 and the scale bar shown is for 50 μm) of as-spun PS fibers from PS solution in various solvent systems with 1% (w/v) LiCl or 1% (w/v) KCl.

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