Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Cathode DoE

Table S1. Test Matrix and Sample Identification (Cathode DoE)

Order			Coating ID	Comma bar	Coating ratio	Web speed
Standard	Run	Actual		Gap / um	/ %	/ m min^{-1}
10	12	1	NEX_CAT5_12	140	130	1.0
6	1	10	NEX_CAT6_01	128	142	0.7
8	19	8	NEX_CAT5_19	128	142	1.3
2	6	15	NEX_CAT6_06	128	118	0.7
4	17	6	NEX_CAT5_17	128	118	1.3
14	15	4	NEX_CAT5_15	110	150	1.0
12	4	13	NEX_CAT6_04	110	130	1.5
18	2	11	NEX_CAT6_02	110	130	1.0
16	9	18	NEX_CAT6_09	110	130	1.0
17	11	20	NEX_CAT5_11	110	130	1.0
20	13	2	NEX_CAT5_13	110	130	1.0
19	16	5	NEX_CAT5_16	110	130	1.0
15	20	9	NEX_CAT5_20	110	130	1.0
11	18	7	NEX_CAT5_18	110	130	0.5
13	5	14	NEX_CAT6_05	110	110	1.0
7	7	16	NEX_CAT6_07	92	142	1.3
5	8	17	NEX_CAT6_08	92	142	0.7
1	10	19	NEX_CAT6_10	92	118	0.7
3	14	3	NEX_CAT5_14	92	118	1.3
9	3	12	NEX_CAT6_03	80	130	1.0

Table S2. Repeat Spatial Autocorrelation Measurements On Cathode DoE Samples

Coating	Join Counting				Moran I Score			
	Carbon		Fluorine		Carbon		Fluorine	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Uncal.	86.3	5.1	44.8	4.4	0.551	0.014	0.373	0.009
Cal.	82.3	16.6	38.2	3.0	0.553	0.059	0.348	0.021

NB. The repeats were coatings prepared with a blade gap of 110 um, a coating ratio of 130 %, and a coating speed of 1 m min^{-1}, i.e. #02, #09, #11, #13, #16 and #20.

Table S3. Summary Of Results From Electrochemical Tests (Cathode DoE)

Coating ID	Coat Weight / gsm	ASI Resistance / Ω cm	Ratio 5 C : 0.2 C / %
NEX_CAT6_01	227	53.0	9.4
NEX_CAT6_02	183	41.7	29.1
NEX_CAT6_03	141	45.8	67.4
NEX_CAT6_04	173	32.0	27.4
NEX_CAT6_05	148	54.5	61.5
NEX_CAT6_06	185	61.5	33.7
NEX_CAT6_07	174	46.8	37.7
NEX_CAT6_08	174	48.8	45.1
NEX_CAT6_09	178	47.1	32.3
NEX_CAT6_10	144	62.5	69.9
NEX_CAT5_11	182	34.9	34.9
NEX_CAT5_12	218	46.7	16.9
NEX_CAT5_13	180	48.4	48.6
NEX_CAT5_14	143	49.5	64.4
NEX_CAT5_15	230	44.0	7.2
NEX_CAT5_16	180	47.0	45.7
NEX_CAT5_17	187	37.6	40.1
NEX_CAT5_18	182	42.0	35.0
NEX_CAT5_19	220	28.9	11.9
NEX_CAT5_20	177	36.3	31.5

Table S4. Correlation Coefficients From Linear Regression (Cathode DoE)

Figure	X Parameter	Y Parameter	R^2 (carbon)	R^2 (fluorine)
4A	Comma Bar Gap	Join Count $Z_{1\text{-}1}$	0.032	0.0005
4B	Coating Speed	Join Count $Z_{1\text{-}1}$	0.110	0.0593
4C	Coat Weight	Join Count $Z_{1\text{-}1}$	0.095	0.0008
5A	ASI	Join Count $Z_{1\text{-}1}$	0.132	0.0274
5B	Ratio 5C : 0.2C	Join Count $Z_{1\text{-}1}$	0.034	0.0063
5C	ASI	Moran I Score	0.092	0.1750
			R^2 (uncalendered)	R^2 (calendered)
6C	Moran (Carbon)	Moran (Fluorine)	0.450	0.775

Table S5. Join Count Analysis Of Carbon EDS Maps (Cathode DoE, Uncalendered)

Carbon	Coverage	Experiment / %			Join Count Z Score		
	Proportion / %	1 – 1	0 – 1	0 - 0	1 – 1	0 – 1	0 - 0
CAT6_01A	10.20	4.5	11.3	84.2	92.9	-44.8	22.2
CAT6_02A	10.12	4.5	11.3	84.2	91.4	-44.8	22.5
CAT6_03A	9.90	4.6	10.6	84.8	94.5	-49.6	26.8
CAT6_04A	10.03	4.8	10.4	84.8	99.1	-50.3	26.3
CAT6_05A	10.05	5.1	9.9	85.1	106.4	-54.2	28.4
CAT6_06B	9.82	3.8	12.0	84.2	72.9	-39.8	22.2
CAT6_07A	10.30	4.4	11.7	83.9	90.0	-41.9	20.0
CAT6_08B	10.01	4.2	11.5	84.3	84.2	-43.3	23.0
CAT6_09A	9.85	4.2	11.1	84.7	84.8	-46.1	25.7
CAT6_10B	10.12	4.7	10.8	84.5	96.7	-47.8	24.3
CAT5_11B	10.31	4.5	11.7	83.9	90.4	-42.3	20.2
CAT5_12B	10.12	4.4	11.5	84.1	89.2	-43.6	21.9
CAT5_13A	10.00	4.4	11.2	84.4	89.9	-45.5	23.7
CAT5_14B	9.80	4.0	11.6	84.4	79.6	-42.8	23.7
CAT5_16B	10.02	4.2	11.5	84.3	84.9	-43.6	23.1
CAT5_17A	9.85	4.3	11.0	84.7	85.8	-46.6	25.9
CAT5_18C	9.89	5.5	8.7	85.8	117.8	-61.9	33.5
CAT5_19B	9.92	4.1	11.6	84.3	82.3	-42.9	23.0
CAT5_20A	9.66	3.9	11.4	84.7	76.5	-44.0	25.7

Table S6. Join Count Analysis Of Fluorine EDS Maps (Cathode DoE, Uncalendered)

Fluorine	Coverage	Experiment / %			Join Count Z Score		
	Proportion / %	1 – 1	0 – 1	0 - 0	1 – 1	0 – 1	0 - 0
CAT6_01A	9.86	2.7	14.4	82.9	43.6	-24.1	13.6
CAT6_02A	10.14	2.8	14.7	82.5	47.7	-21.9	10.3
CAT6_03A	10.06	2.6	14.9	82.5	41.6	-20.5	10.4
CAT6_04A	9.97	2.9	14.1	83.0	50.2	-25.9	13.7
CAT6_05A	9.86	2.6	14.4	82.9	43.0	-23.8	13.5
CAT6_06B	10.05	2.4	15.3	82.3	36.7	-18.4	9.5
CAT6_07A	10.12	2.7	14.7	82.5	45.8	-21.9	10.7
CAT6_08B	10.15	2.6	15.0	82.4	43.0	-20.3	9.8
CAT6_09A	10.12	2.7	14.8	82.5	44.8	-21.3	10.4
CAT6_10B	10.01	3.2	13.7	83.1	57.4	-28.9	15.0
CAT5_11B	10.08	2.8	14.5	82.7	47.6	-23.4	11.9
CAT5_12B	10.09	2.8	14.7	82.5	46.4	-22.1	10.8
CAT5_13A	9.93	2.5	14.9	82.6	39.2	-20.6	11.1
CAT5_14B	10.08	2.6	15.0	82.4	41.3	-19.8	9.8
CAT5_16B	10.03	2.5	15.0	82.5	38.8	-19.8	10.4
CAT5_17A	9.99	2.8	14.4	82.8	47.0	-24.2	12.8
CAT5_18C	10.10	3.3	13.6	83.1	60.4	-29.6	14.9
CAT5_19B	10.18	2.7	15.0	82.3	43.5	-19.8	9.2
CAT5_20A	9.99	2.9	14.2	82.9	50.4	-25.5	13.3

Table S7. Moran Analysis Of EDS Maps For Cathode DoE (Uncalendered)

Sample	Carbon			Fluorine		
	Threshold	Mean	Moran	Threshold	Mean	Moran
CAT6_01A	42	14.4	0.567	51	13.8	0.388
CAT6_02A	36	11.5	0.548	39	10.2	0.372
CAT6_03A	38	12.1	0.581	46	12.3	0.374
CAT6_04A	51	17.7	0.598	55	15.7	0.413
CAT6_05A	37	12.8	0.651	44	11.5	0.380
CAT6_06B	33	10.6	0.549	43	11.3	0.340
CAT6_07A	23	7.8	0.549	41	10.7	0.372
CAT6_08B	37	11.9	0.535	46	12.4	0.369
CAT6_09A	35	11.0	0.552	42	11.1	0.369
CAT6_10B	32	9.7	0.609	35	9.0	0.411
CAT5_11B	22	7.4	0.534	20	5.2	0.382
CAT5_12B	40	13.4	0.552	45	11.9	0.386
CAT5_13A	44	14.3	0.568	24	6.5	0.376
CAT5_14B	42	14.2	0.533	47	12.8	0.372
CAT5_16B	22	7.2	0.570	44	11.8	0.356
CAT5_17A	43	14.2	0.553	29	7.7	0.394
CAT5_18C	29	9.7	0.680	46	12.3	0.448
CAT5_19B	41	13.8	0.540	50	14.0	0.376
CAT5_20A	20	6.0	0.536	36	9.3	0.384

Table S8. Join Count Analysis Of Carbon EDS Maps (Cathode DoE, Calendered)

Carbon	Coverage	Experiment / %			Join Count Z Score		
	Proportion / %	1 – 1	0 – 1	0 - 0	1 – 1	0 – 1	0 - 0
CAT6_01A	9.80	4.6	10.3	85.1	95.2	-51.6	28.7
CAT6_02B	10.06	5.1	9.7	85.1	108.5	-55.2	28.9
CAT6_03C	10.09	4.9	10.3	84.8	102.0	-51.6	26.9
CAT6_04B	9.87	4.3	11.1	84.6	86.5	-46.1	25.2
CAT6_05A	10.18	4.7	11.1	84.3	96.5	-46.3	22.8
CAT6_06B	10.03	4.6	10.6	84.8	95.2	-49.4	26.3
CAT6_07B	9.84	4.9	9.9	85.2	101.5	-54.0	29.6
CAT6_08A	9.88	4.1	11.6	84.3	81.1	-42.9	23.3
CAT6_09B	9.93	4.9	10.1	85.0	101.9	-52.7	28.1
CAT6_10B	9.99	4.4	11.1	84.5	88.3	-45.9	24.6
CAT5_11A	9.95	3.7	12.3	83.9	71.8	-37.8	20.5
CAT5_12A	9.80	4.0	11.6	84.4	77.9	-42.7	24.0
CAT5_13A	10.17	3.9	12.4	83.7	76.8	-37.4	18.8
CAT5_14A	10.08	4.1	11.9	84.0	81.3	-40.8	21.1
CAT5_15B	10.04	3.7	12.8	83.5	69.8	-34.6	17.7
CAT5_16A	10.00	4.3	11.5	84.2	85.6	-43.3	22.6
CAT5_17B	10.30	3.9	12.7	83.4	75.0	-35.2	16.9
CAT5_18B	10.21	4.4	11.5	84.1	88.6	-43.5	22.0
CAT5_19A	10.26	4.1	12.3	83.6	80.7	-37.9	18.2
CAT5_20A	10.29	3.5	13.6	82.9	65.2	-29.5	13.6

Table S9. Join Count Analysis Of Fluorine EDS Maps (Cathode DoE, Calendered)

Fluorine	Coverage	Experiment / %			Join Count Z Score		
	Proportion / %	1 – 1	0 – 1	0 - 0	1 – 1	0 – 1	0 – 0
CAT6_01A	10.04	2.7	14.6	82.7	45.2	-22.9	12.0
CAT6_02B	10.06	2.5	15.1	82.4	39.8	-19.5	9.8
CAT6_03C	10.27	2.8	14.8	82.3	48.3	-21.4	9.5
CAT6_04B	9.88	2.4	15.0	82.6	36.8	-20.2	11.3
CAT6_05A	9.86	2.4	15.0	82.6	36.1	-20.0	11.3
CAT6_06B	9.89	2.6	14.7	82.8	40.7	-22.4	12.6
CAT6_07B	9.97	2.8	14.4	82.8	46.1	-24.0	12.9
CAT6_08A	9.96	2.5	15.0	82.6	38.5	-20.4	11.1
CAT6_09B	9.78	2.6	14.5	82.9	41.6	-23.4	13.4
CAT6_10B	9.87	2.5	14.8	82.8	38.9	-21.7	12.4
CAT5_11A	9.96	2.6	14.8	82.6	40.6	-21.3	11.5
CAT5_12A	9.95	2.5	14.9	82.6	38.9	-20.5	11.1
CAT5_13A	9.94	2.3	15.3	82.4	33.2	-17.8	9.8
CAT5_14A	10.07	2.2	15.7	82.1	31.7	-15.2	7.5
CAT5_15B	9.99	2.3	15.4	82.3	35.3	-17.7	9.1
CAT5_16A	9.99	2.3	15.5	82.3	33.3	-17.0	8.9
CAT5_17B	10.07	2.3	15.7	82.1	33.0	-15.5	7.5
CAT5_18B	10.03	2.4	15.2	82.4	37.2	-18.8	9.8
CAT5_19A	9.96	2.4	15.2	82.4	36.1	-18.8	10.1
CAT5_20A	9.86	2.5	14.8	82.7	38.6	-21.4	12.1

Table S10. Moran Analysis Of EDS Maps For Cathode DoE (Calendered)

Sample	Carbon			Fluorine		
	Threshold	Mean	Moran	Threshold	Mean	Moran
CAT6_01A	40	12.9	0.604	31	8.3	0.384
CAT6_02B	64	22.5	0.642	49	13.6	0.364
CAT6_03C	56	19.2	0.629	25	7.1	0.402
CAT6_04B	37	12.5	0.542	44	11.7	0.350
CAT6_05A	23	7.5	0.565	48	12.9	0.349
CAT6_06B	40	13.1	0.579	48	12.8	0.376
CAT6_07B	47	15.5	0.615	50	13.5	0.400
CAT6_08A	42	14.2	0.535	50	13.7	0.362
CAT6_09B	60	20.8	0.623	27	7.7	0.384
CAT6_10B	36	11.9	0.577	46	12.1	0.365
CAT5_11A	55	16.4	0.537	37	9.6	0.349
CAT5_12A	34	10.7	0.516	38	9.9	0.340
CAT5_13A	39	13.4	0.488	47	12.8	0.333
CAT5_14A	36	11.9	0.519	43	11.7	0.319
CAT5_15B	31	9.7	0.496	42	11.2	0.337
CAT5_16A	43	14.9	0.528	50	13.9	0.335
CAT5_17B	33	10.6	0.486	43	11.8	0.317
CAT5_18B	36	11.8	0.541	44	11.8	0.347
CAT5_19A	31	9.6	0.530	36	9.3	0.318
CAT5_20A	22	6.0	0.500	31	8.1	0.321

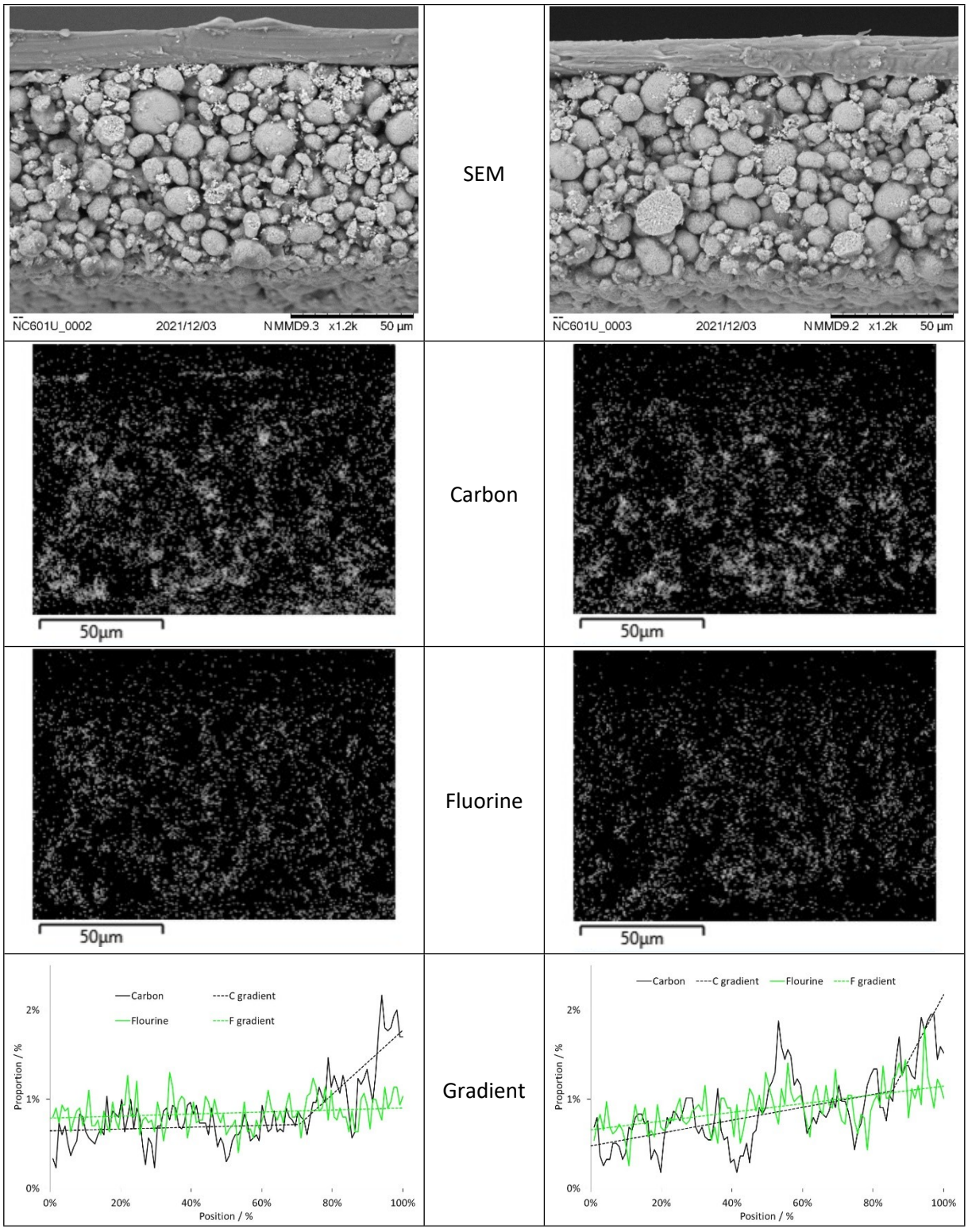


Figure S1. SEM Images And EDS Maps (601UA And 601UB)

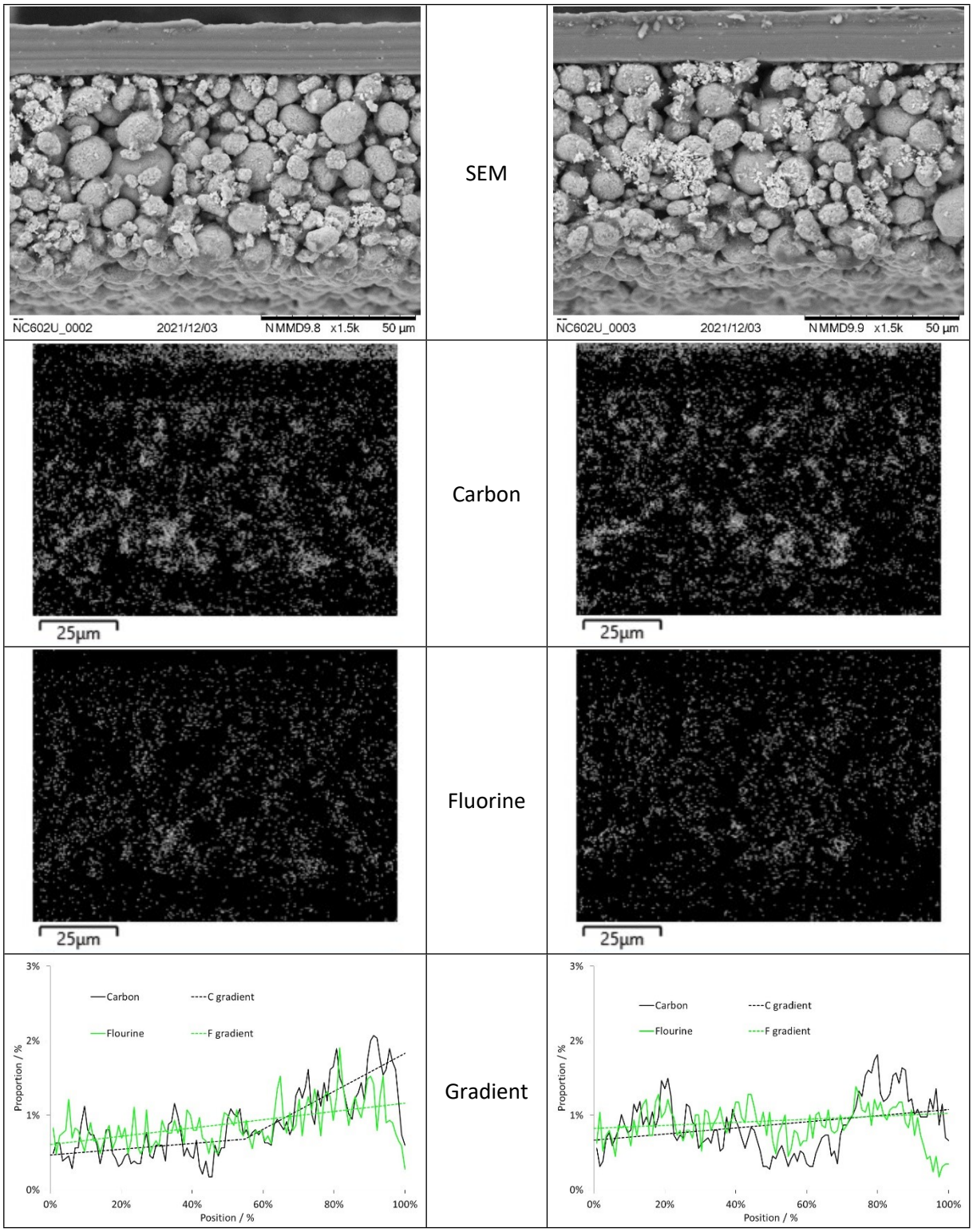


Figure S2. SEM Images And EDS Maps (602UA And 602UB)

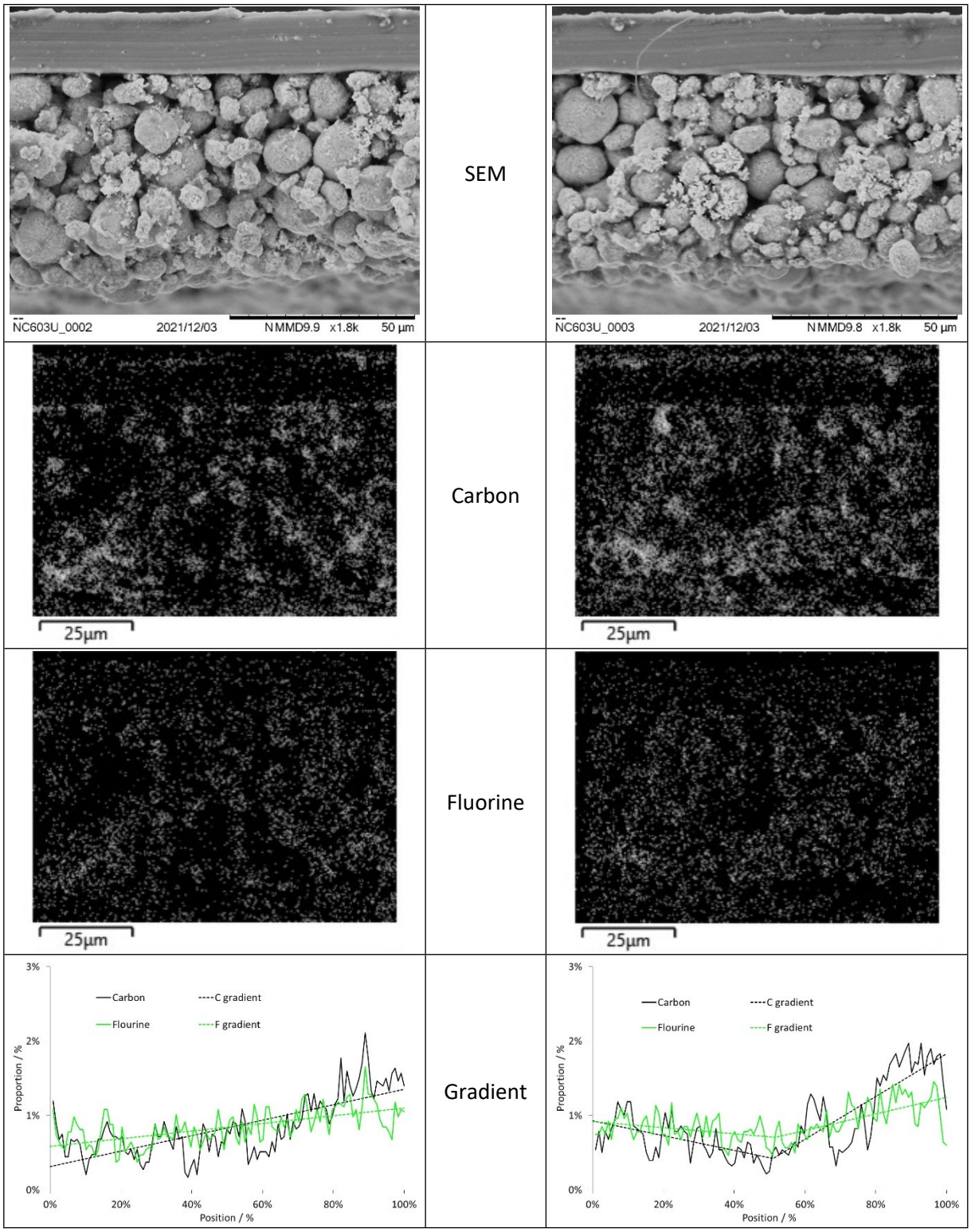


Figure S3. SEM Images And EDS Maps (603UA And 603UB)

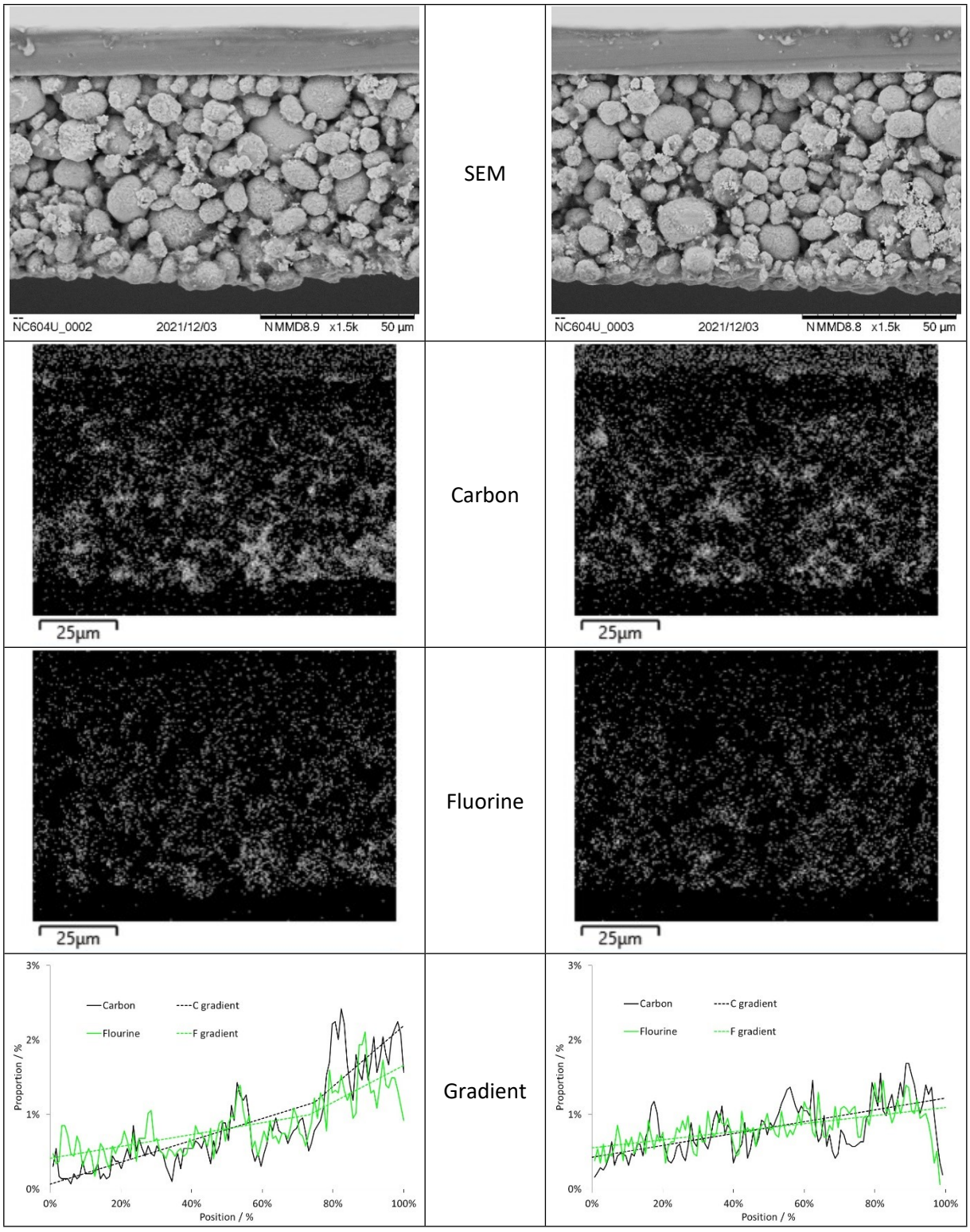


Figure S4. SEM Images And EDS Maps (604UA And 604UB)

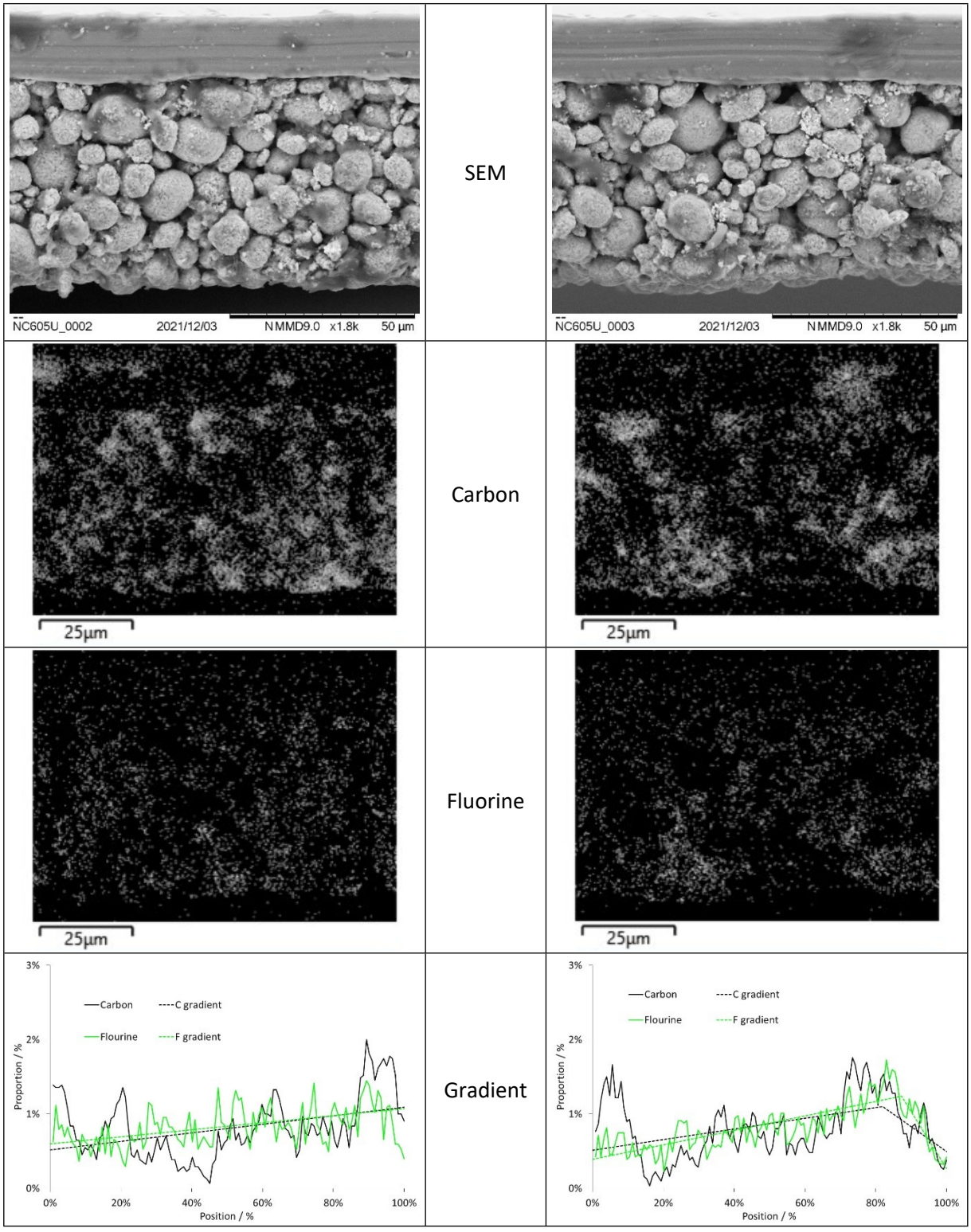


Figure S5. SEM Images And EDS Maps (605UA And 605UB)

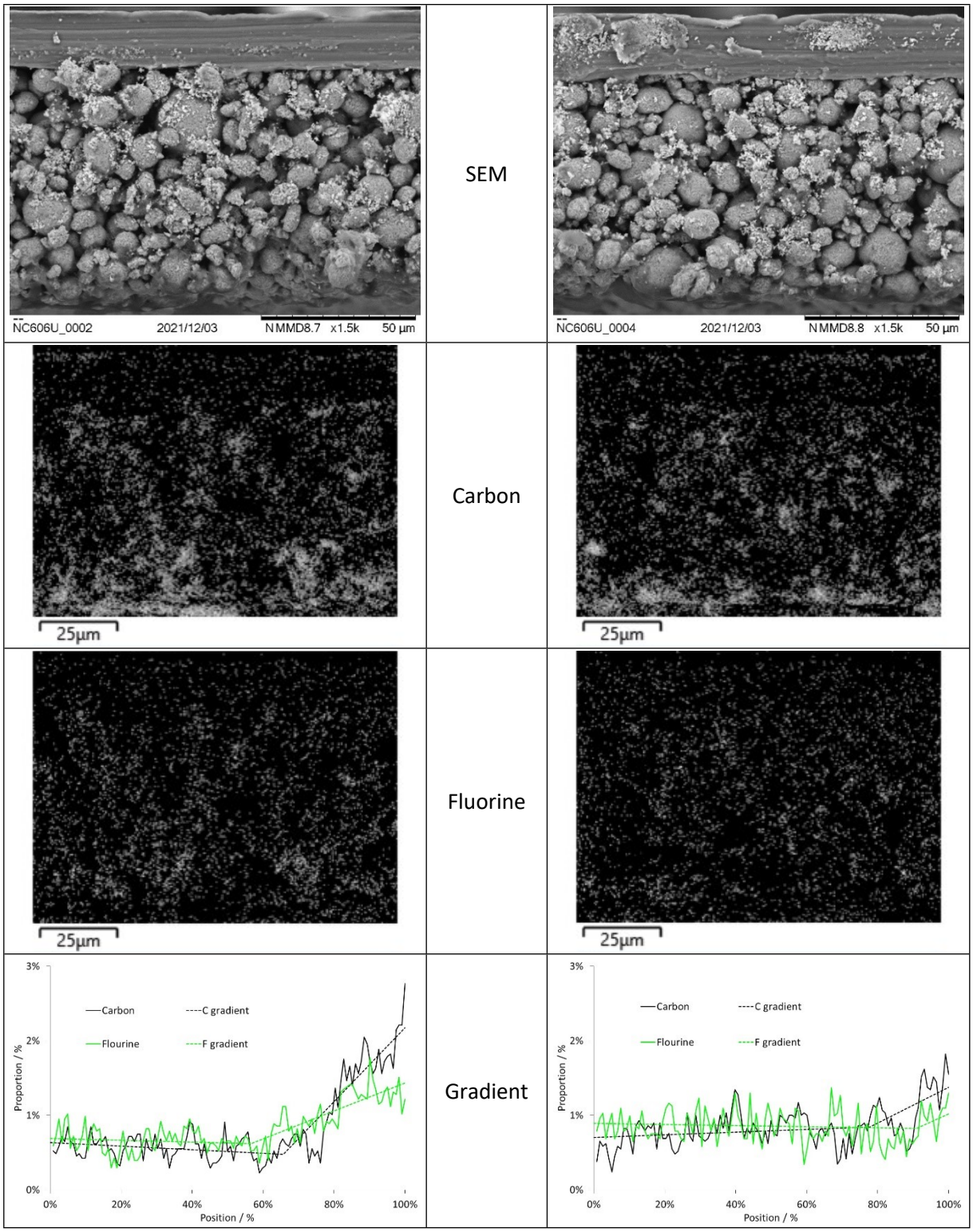


Figure S6. SEM Images And EDS Maps (606UA And 606UB)

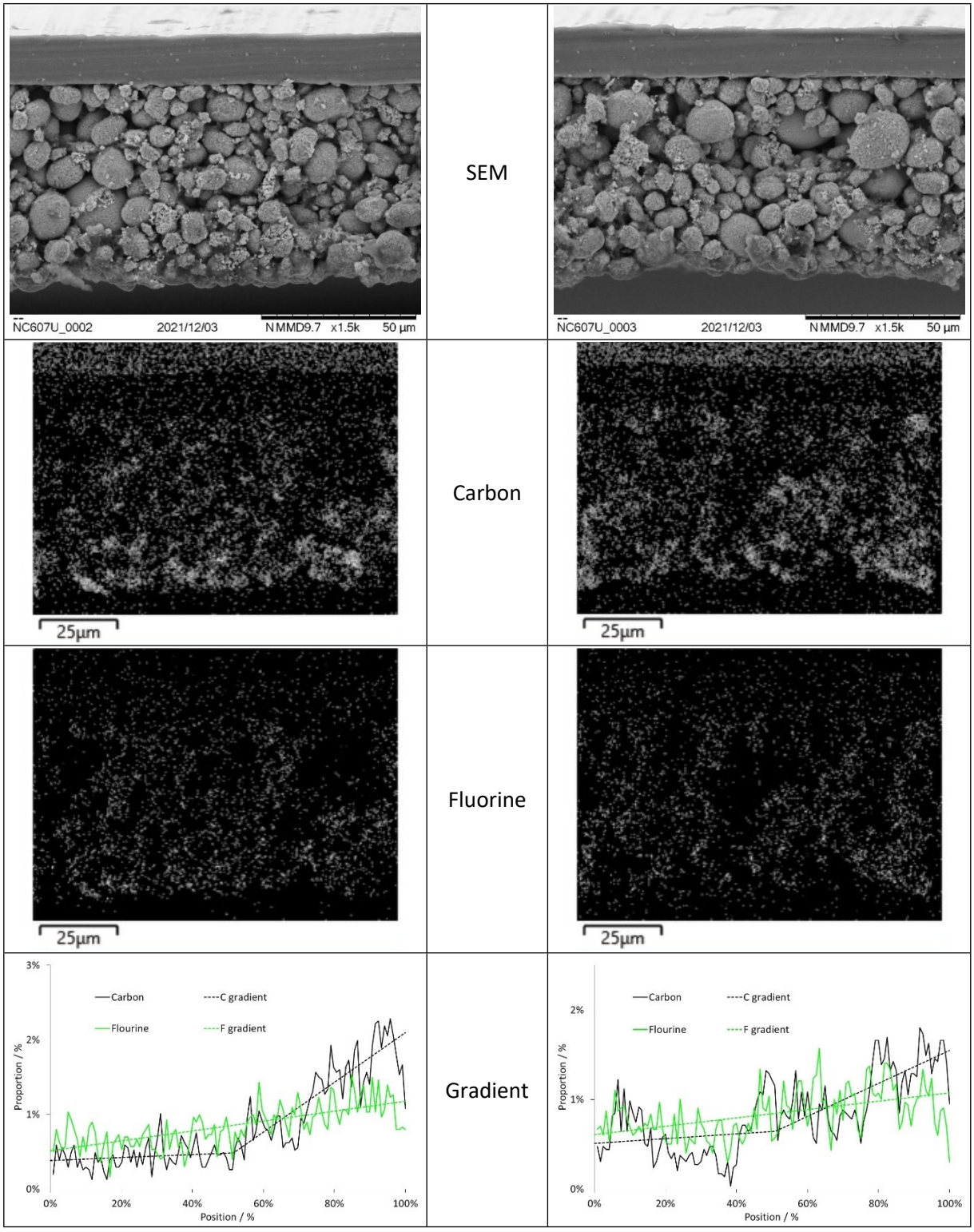


Figure S7. SEM Images And EDS Maps (607UA And 607UB)

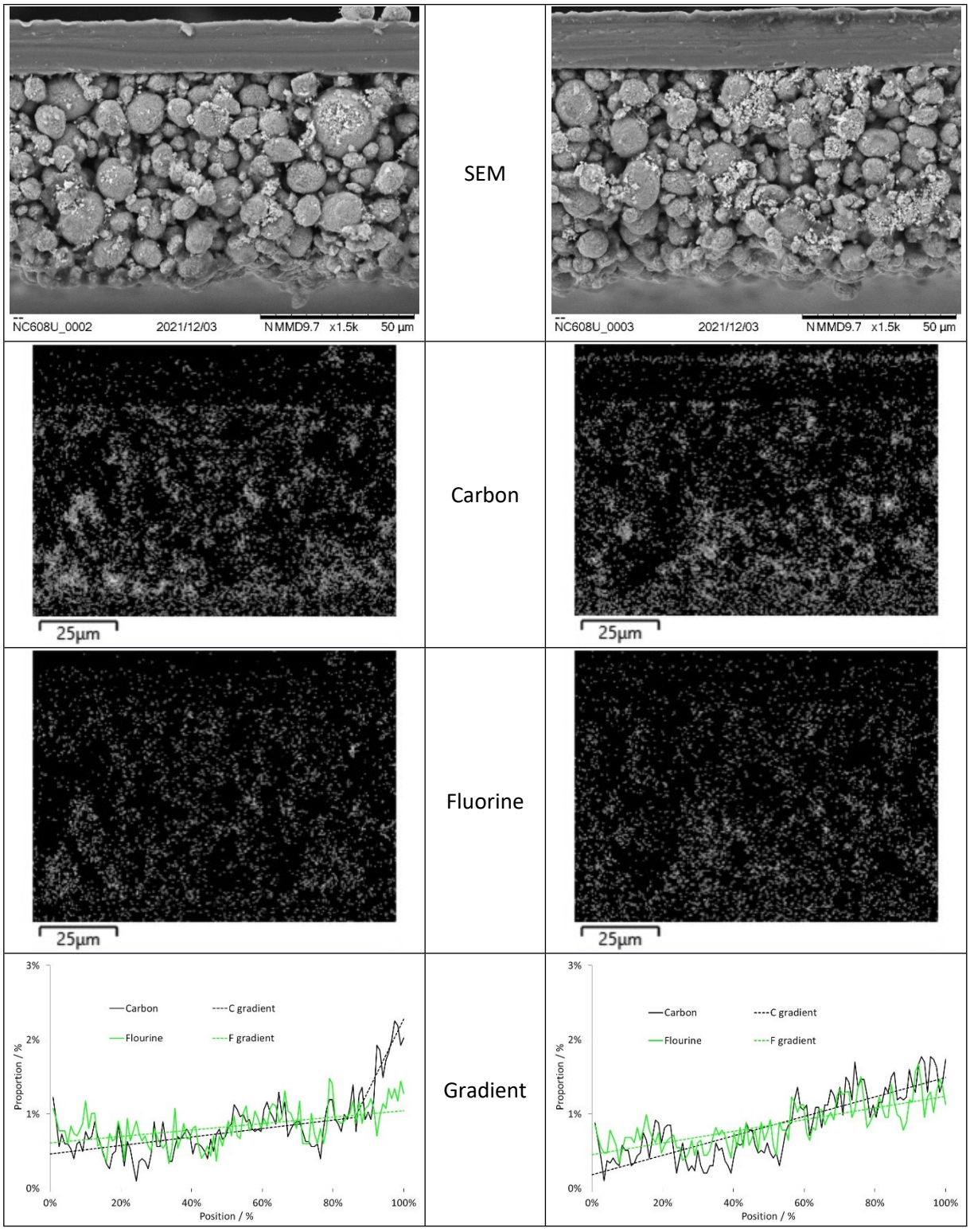


Figure S8. SEM Images And EDS Maps (608UA And 608UB)

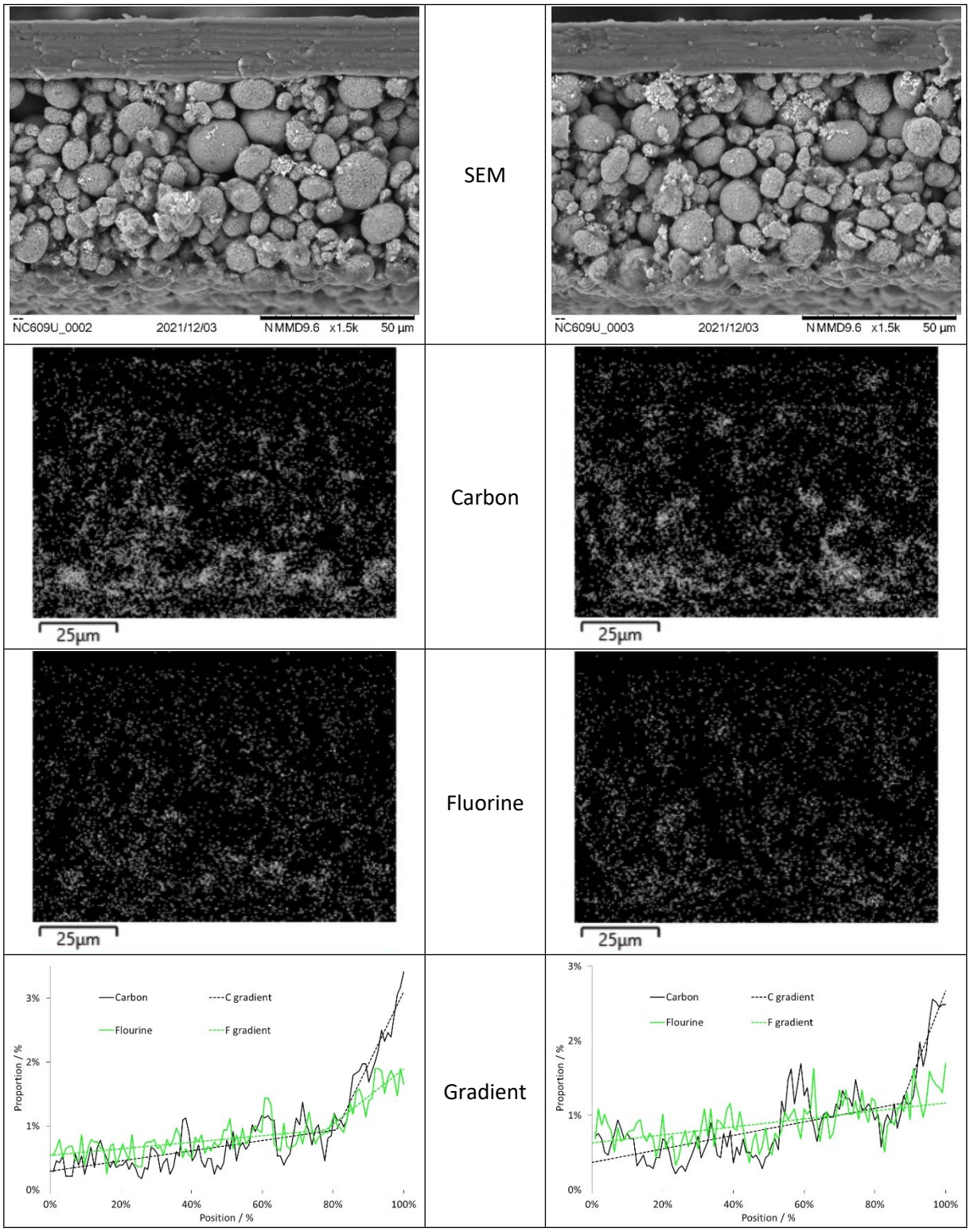


Figure S9. SEM Images And EDS Maps (609UA And 609UB)

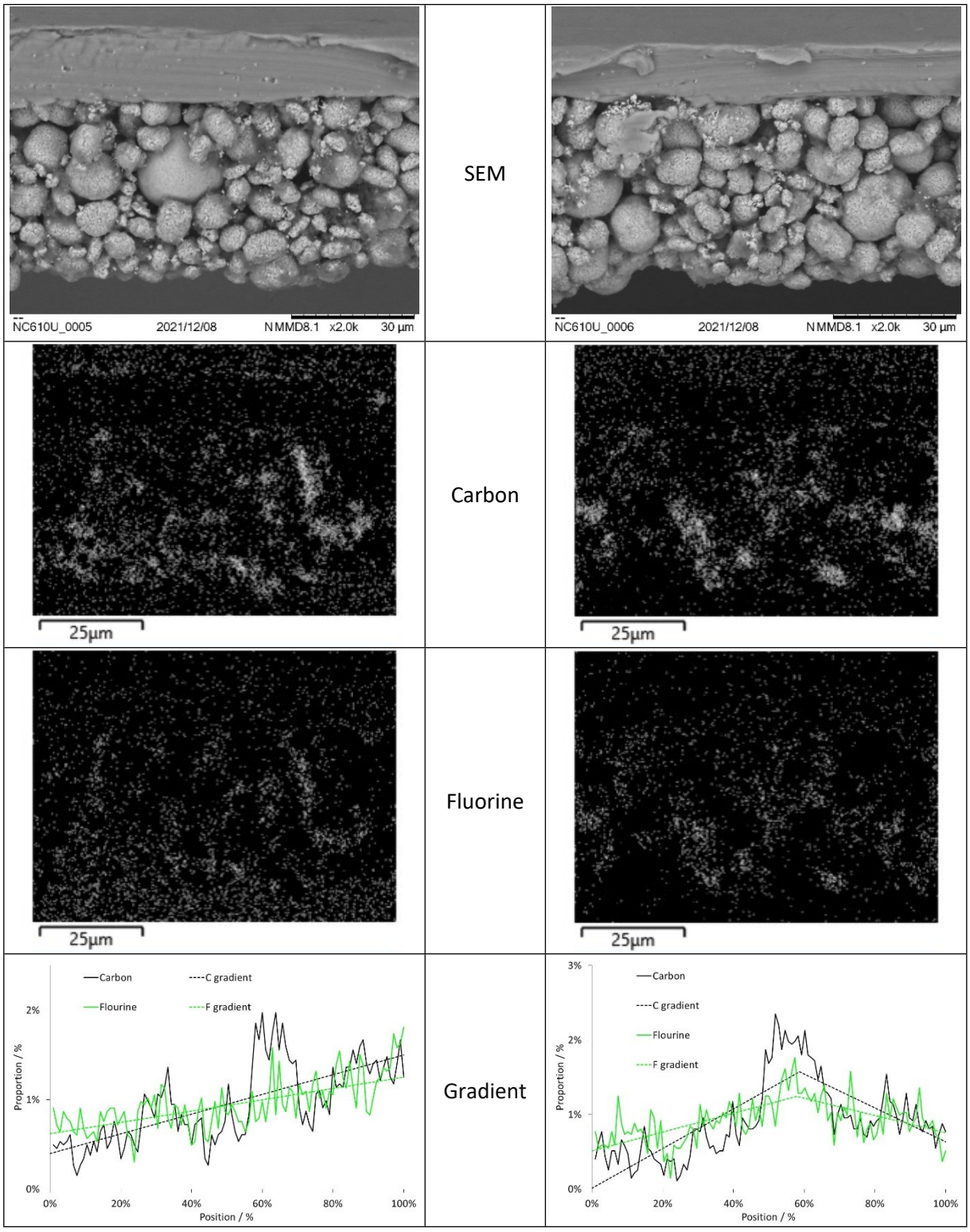


Figure S10. SEM Images And EDS Maps (610UA And 610UB repeat)

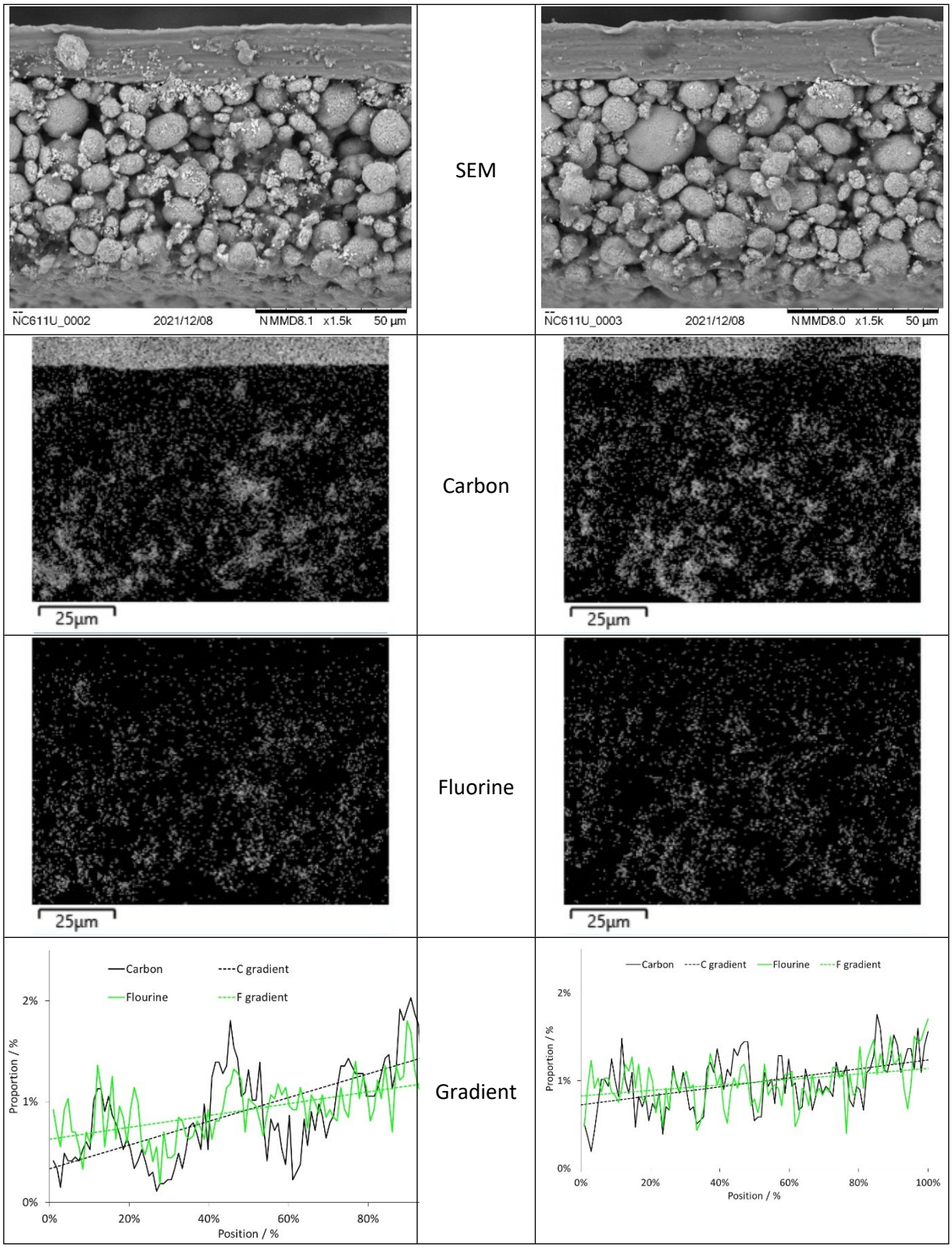


Figure S11. SEM Images And EDS Maps (611UA And 611UB)

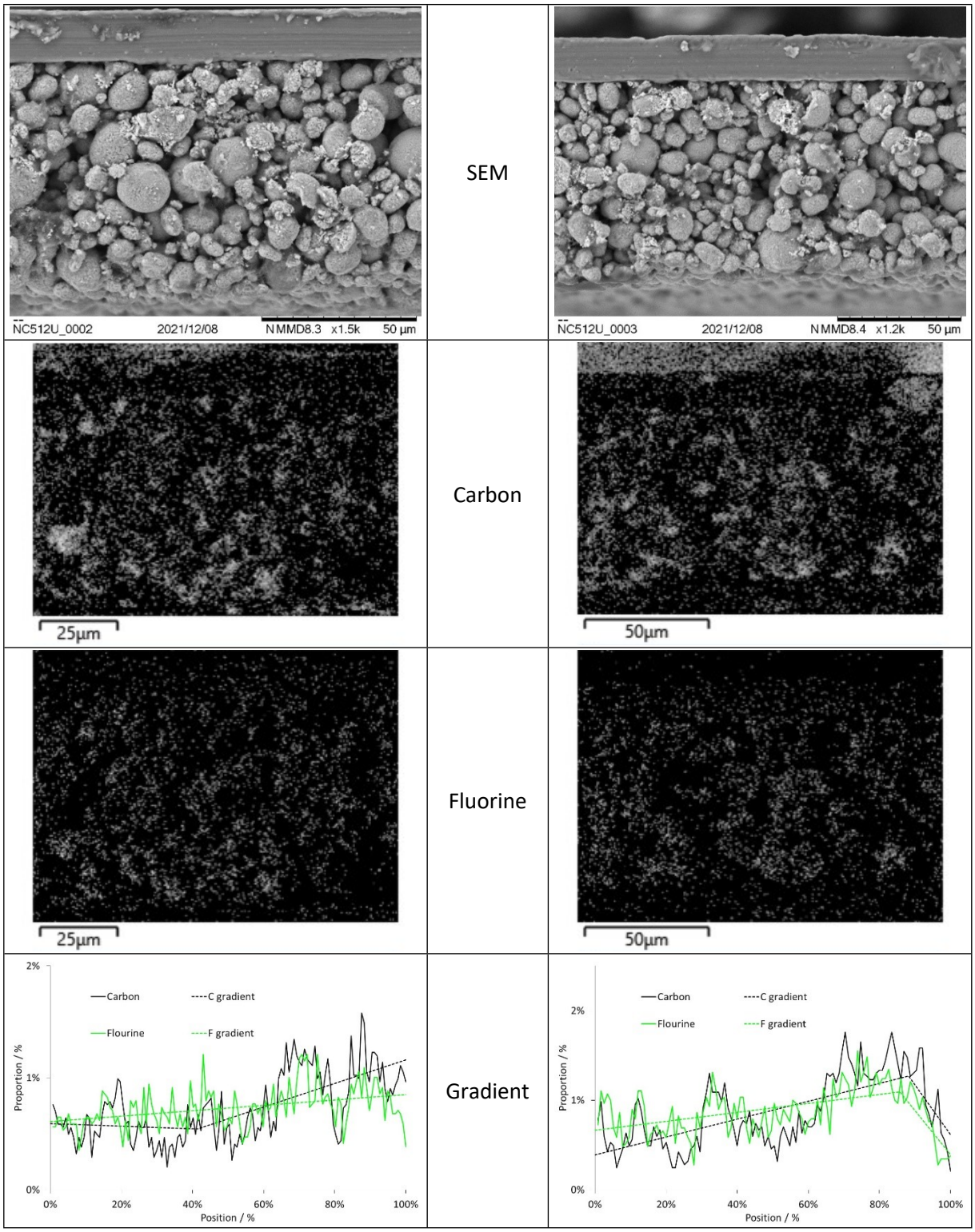


Figure S12. SEM Images And EDS Maps (512UA And 512UB)

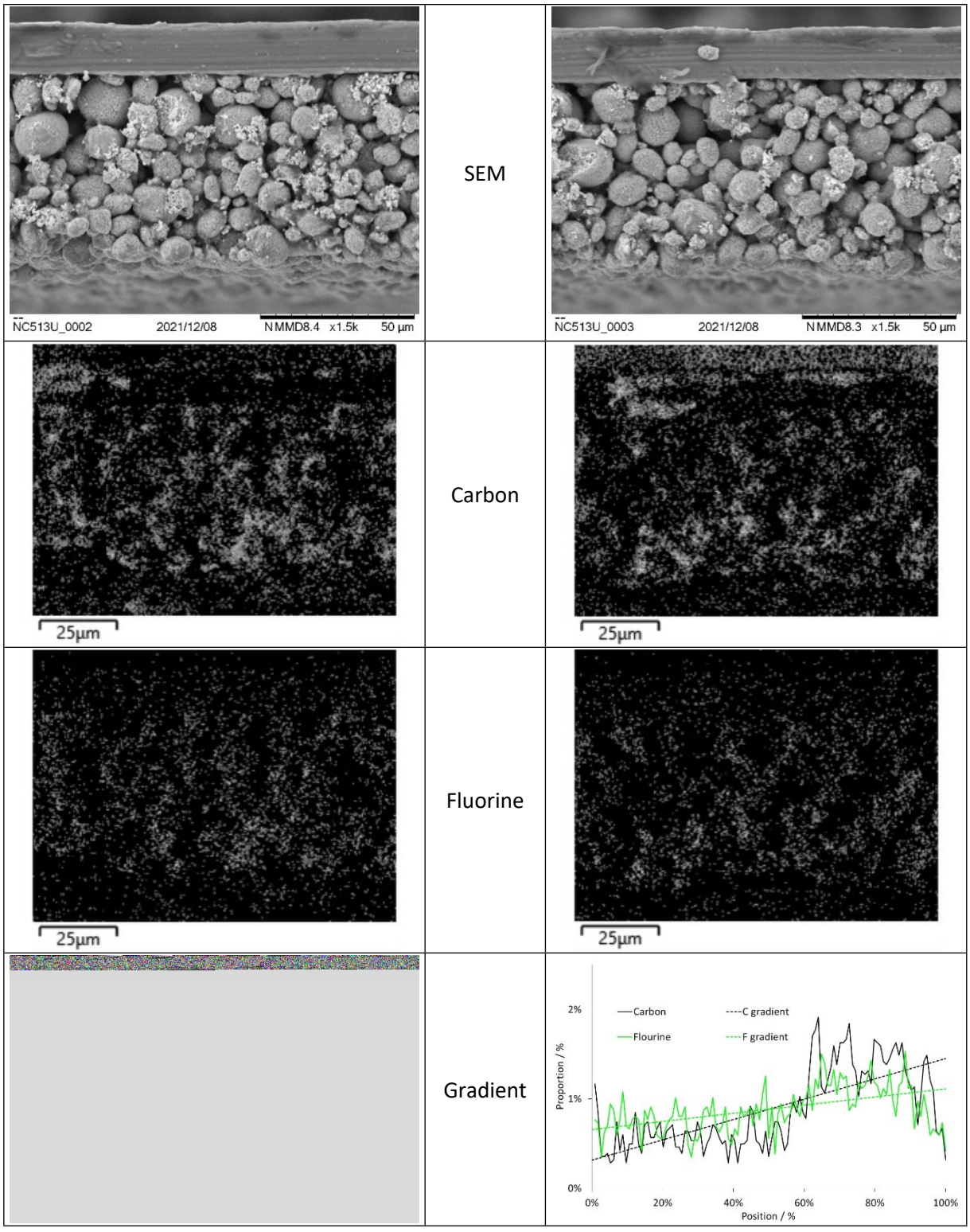


Figure S13. SEM Images And EDS Maps (513UA And 513UB)

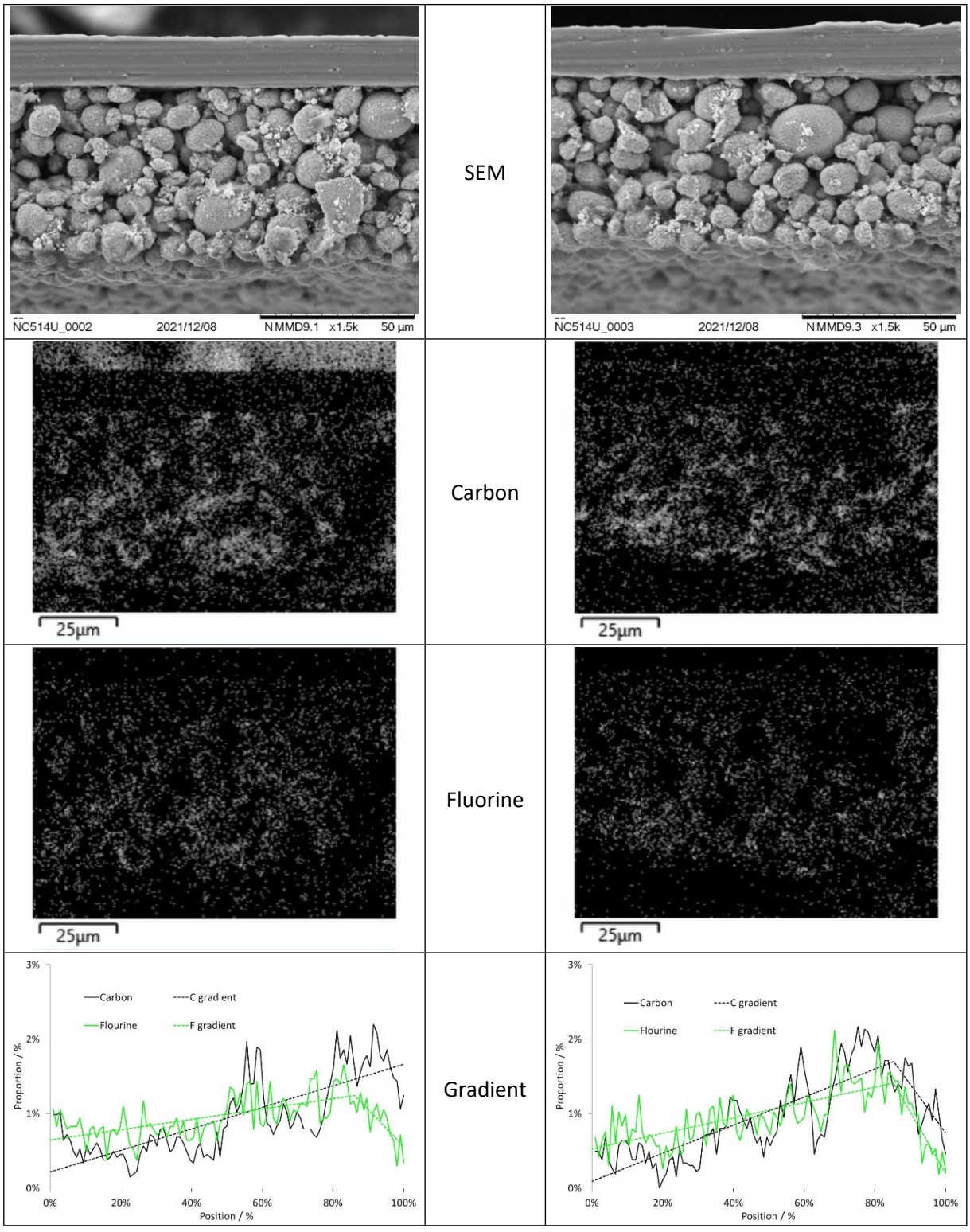


Figure S14. SEM Images And EDS Maps (514UA And 514UB)

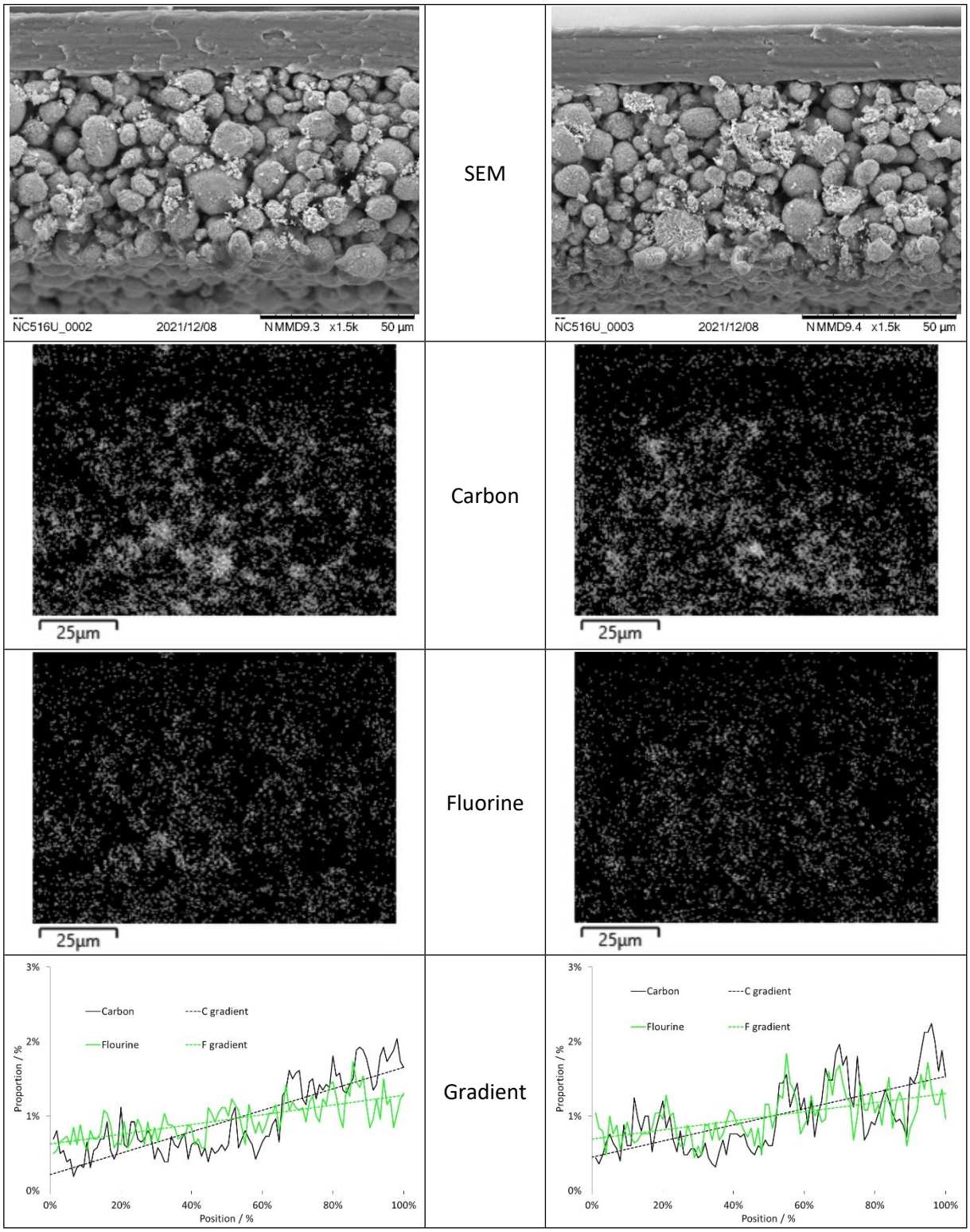


Figure S15. SEM Images And EDS Maps (516UA And 516UB)

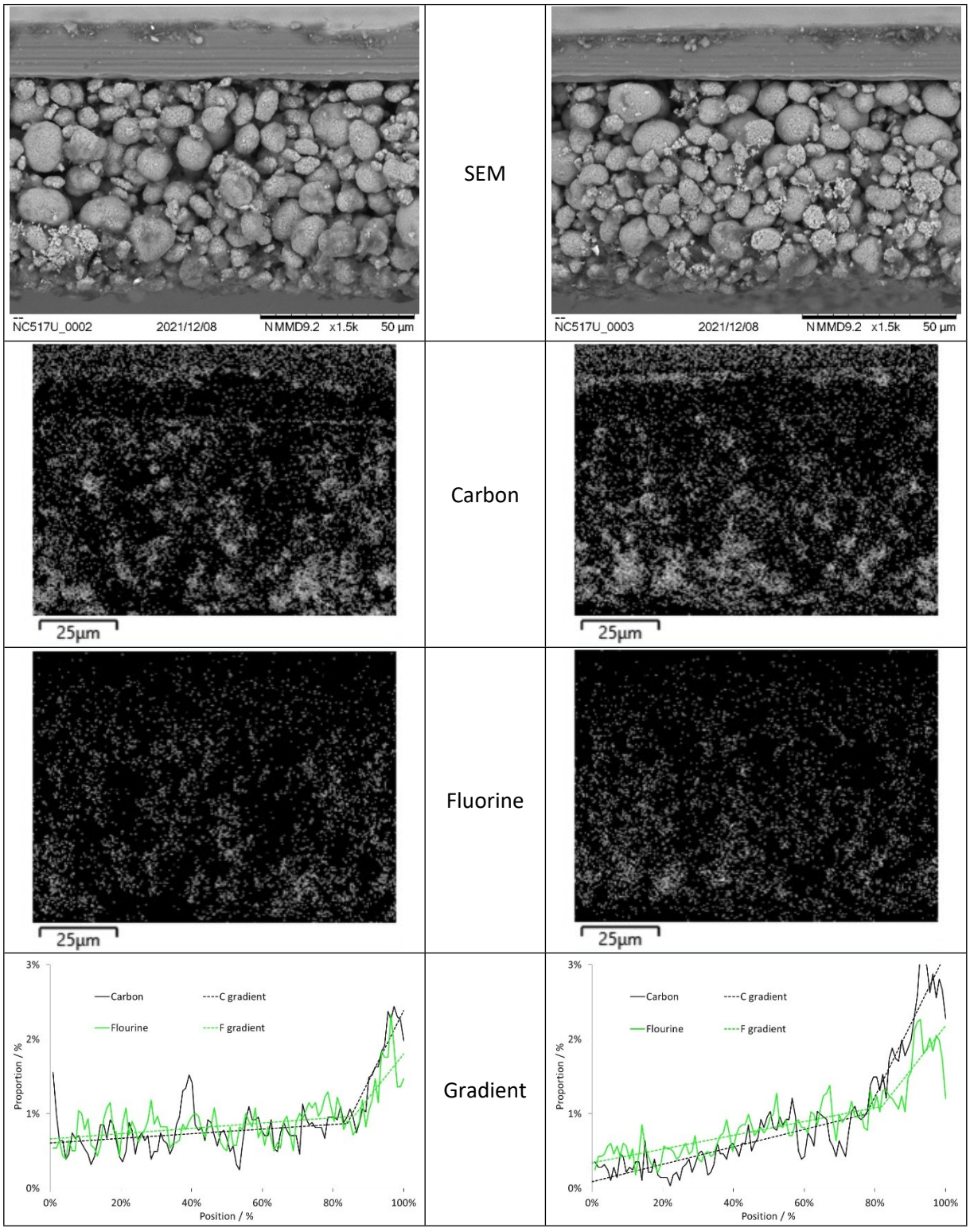


Figure S16. SEM Images And EDS Maps (517UA And 517UB)

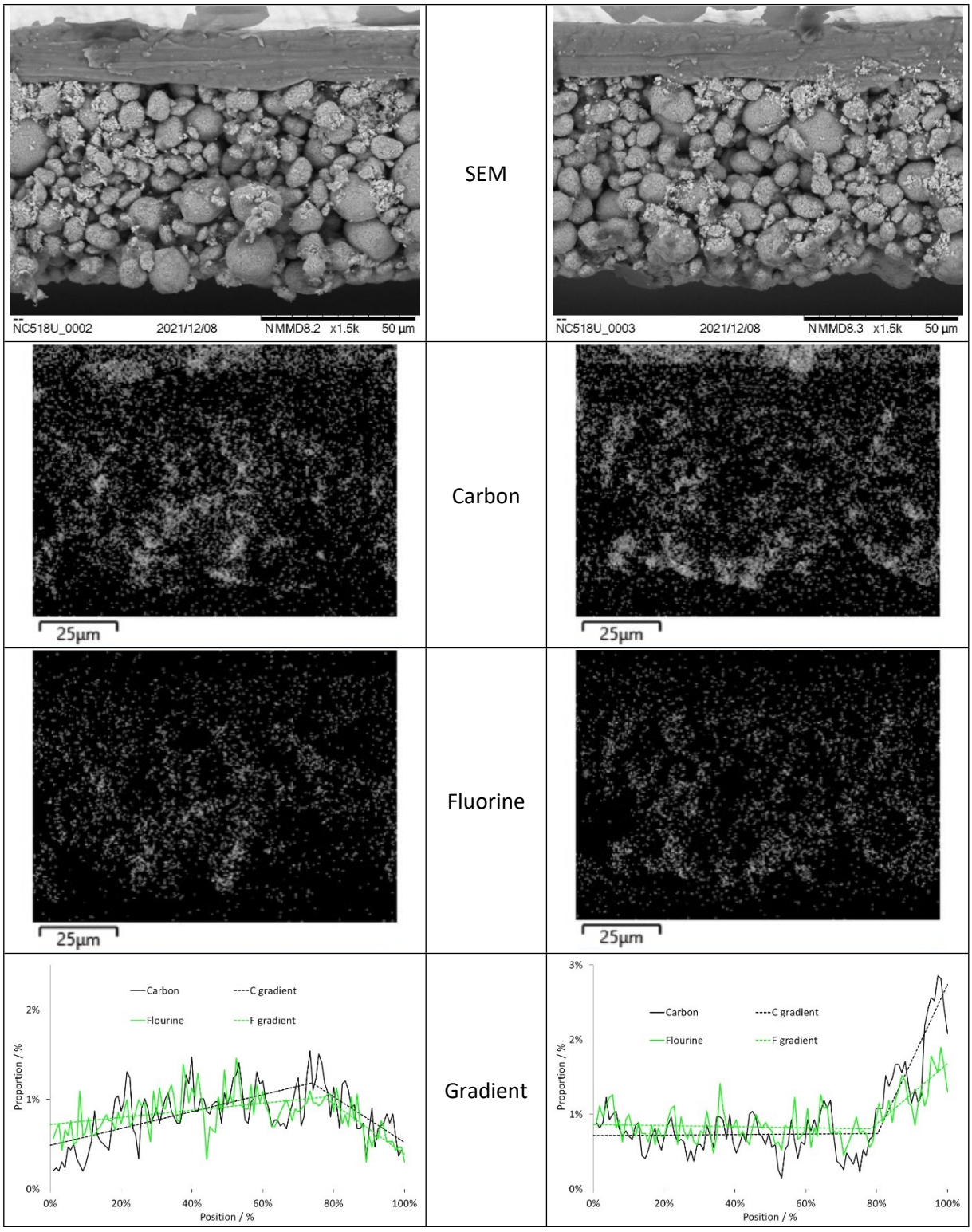


Figure S17. SEM Images And EDS Maps (518UA And 518UB)

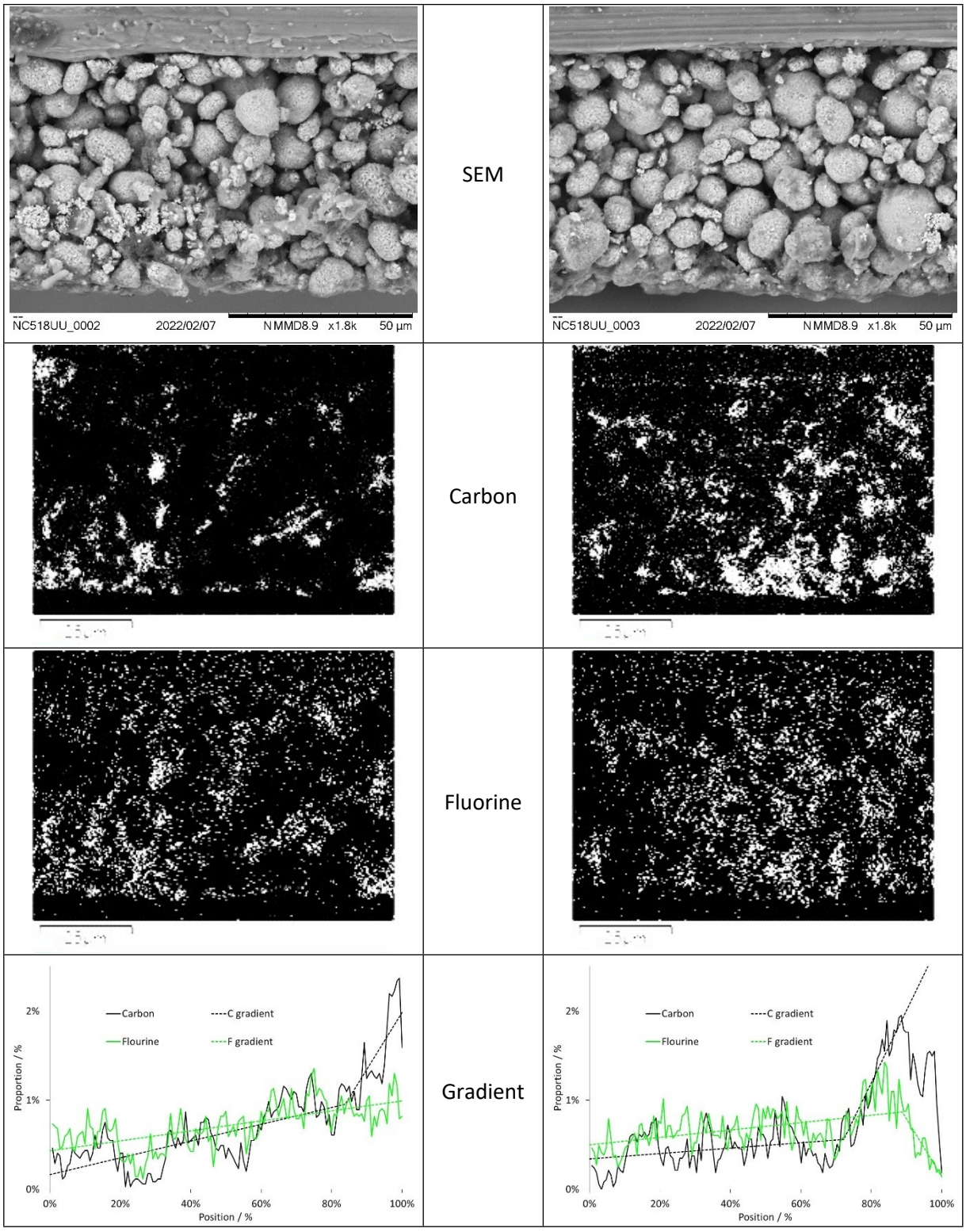


Figure S18. SEM Images And EDS Maps (518UC And 518UD)

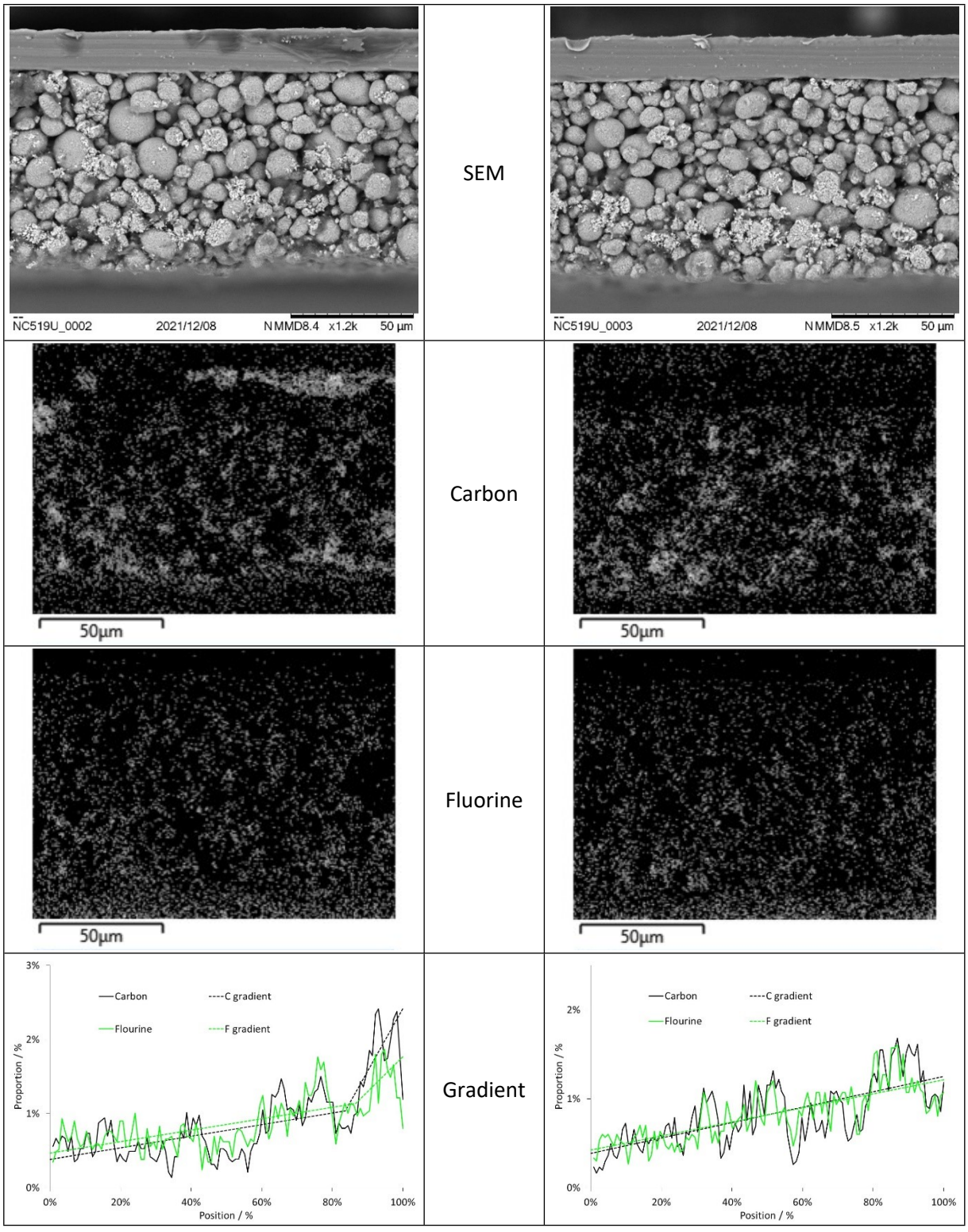


Figure S19. SEM Images And EDS Maps (519UA And 519UB)

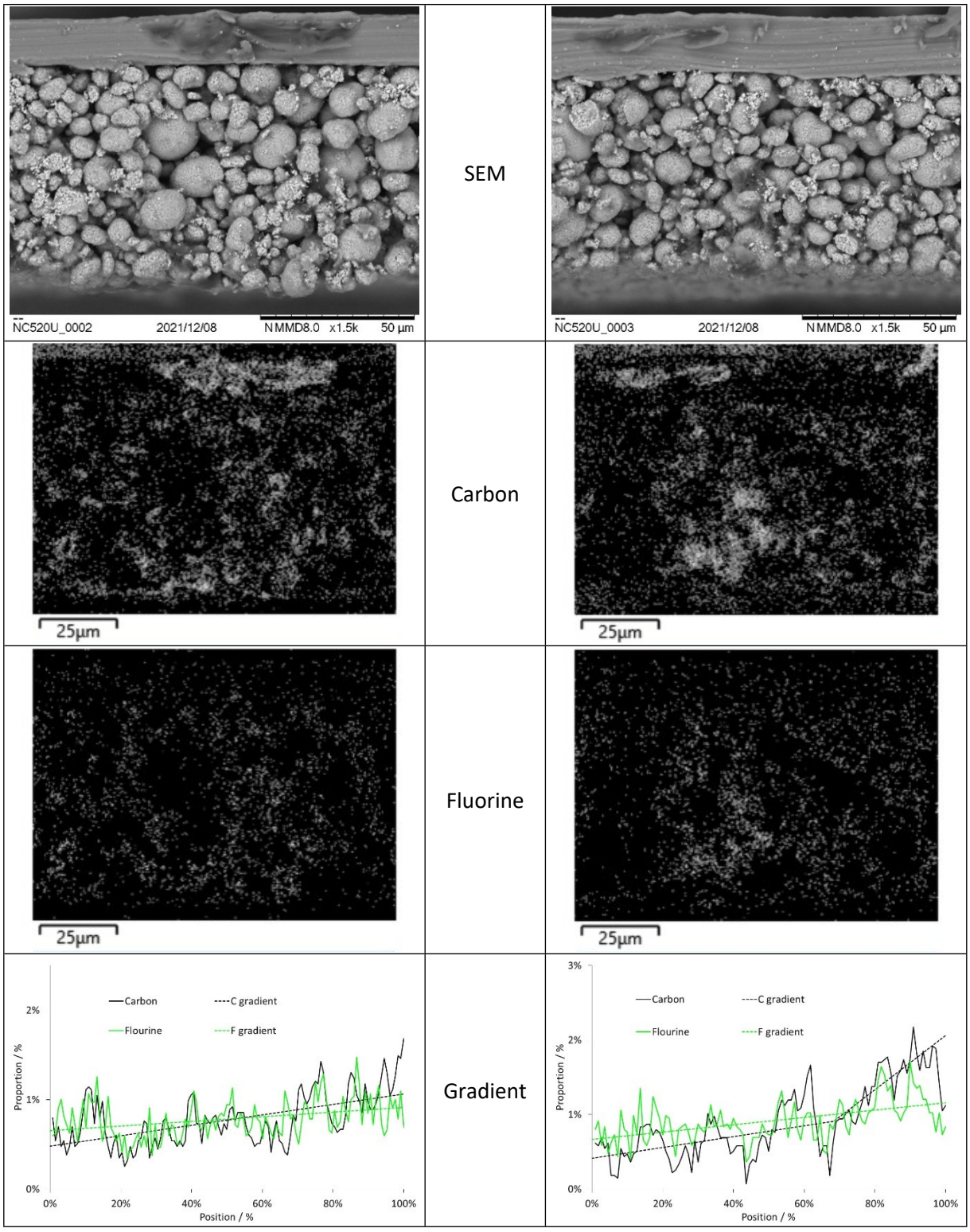


Figure S20. SEM Images And EDS Maps (520UA And 520UB)

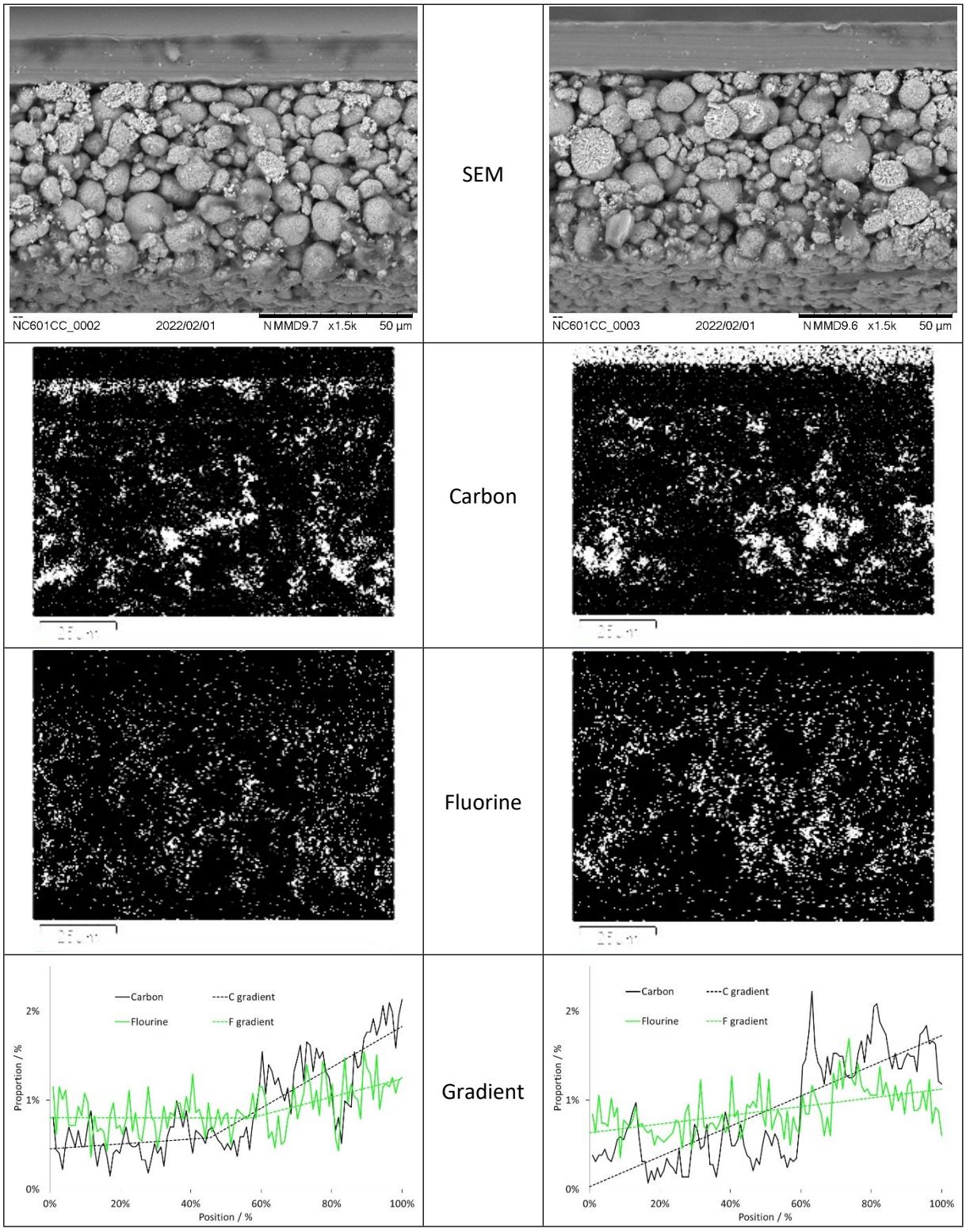


Figure S21. SEM Images And EDS Maps (601CCA And 601CCB)

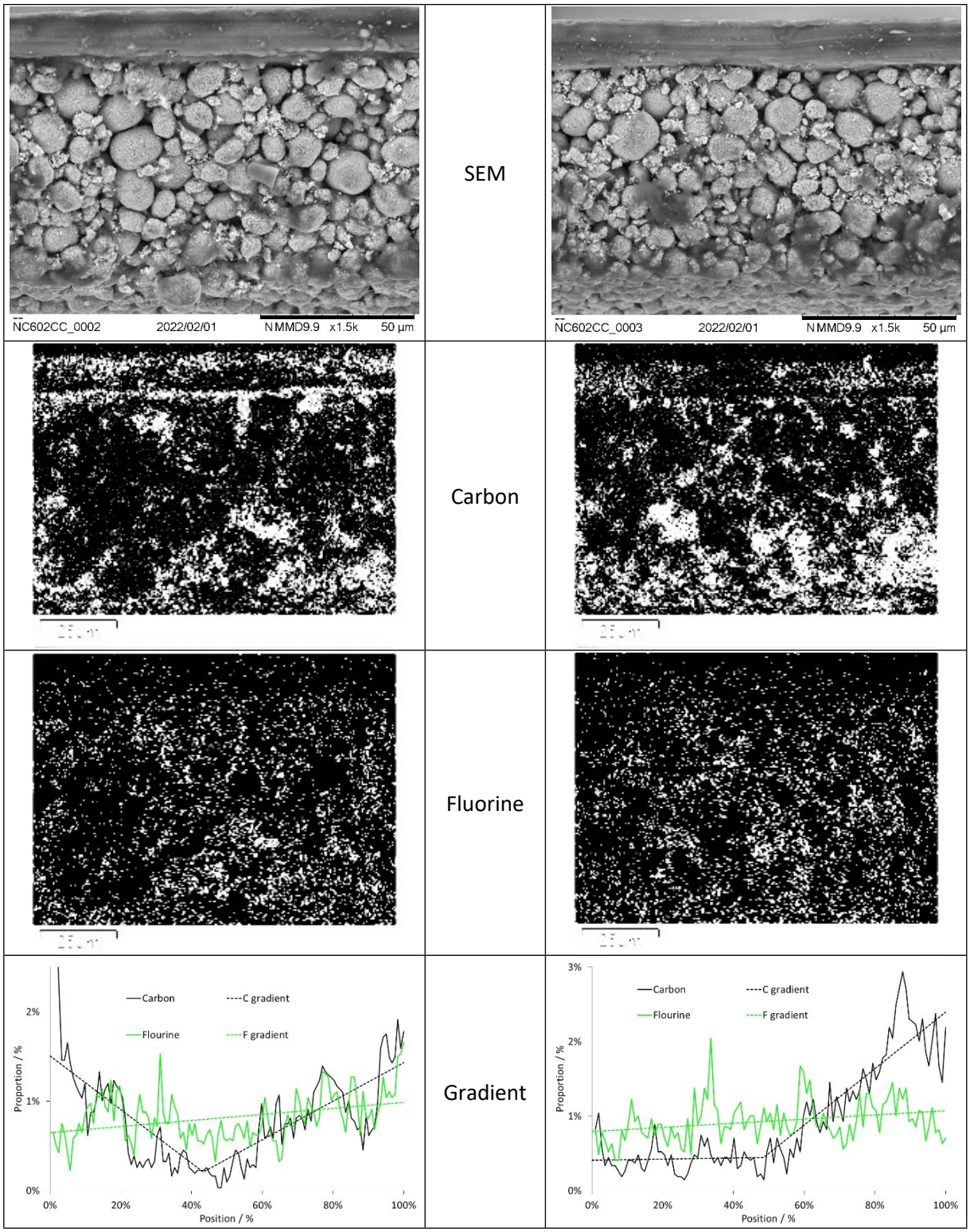


Figure S22. SEM Images And EDS Maps (602CCA And 602CCB)

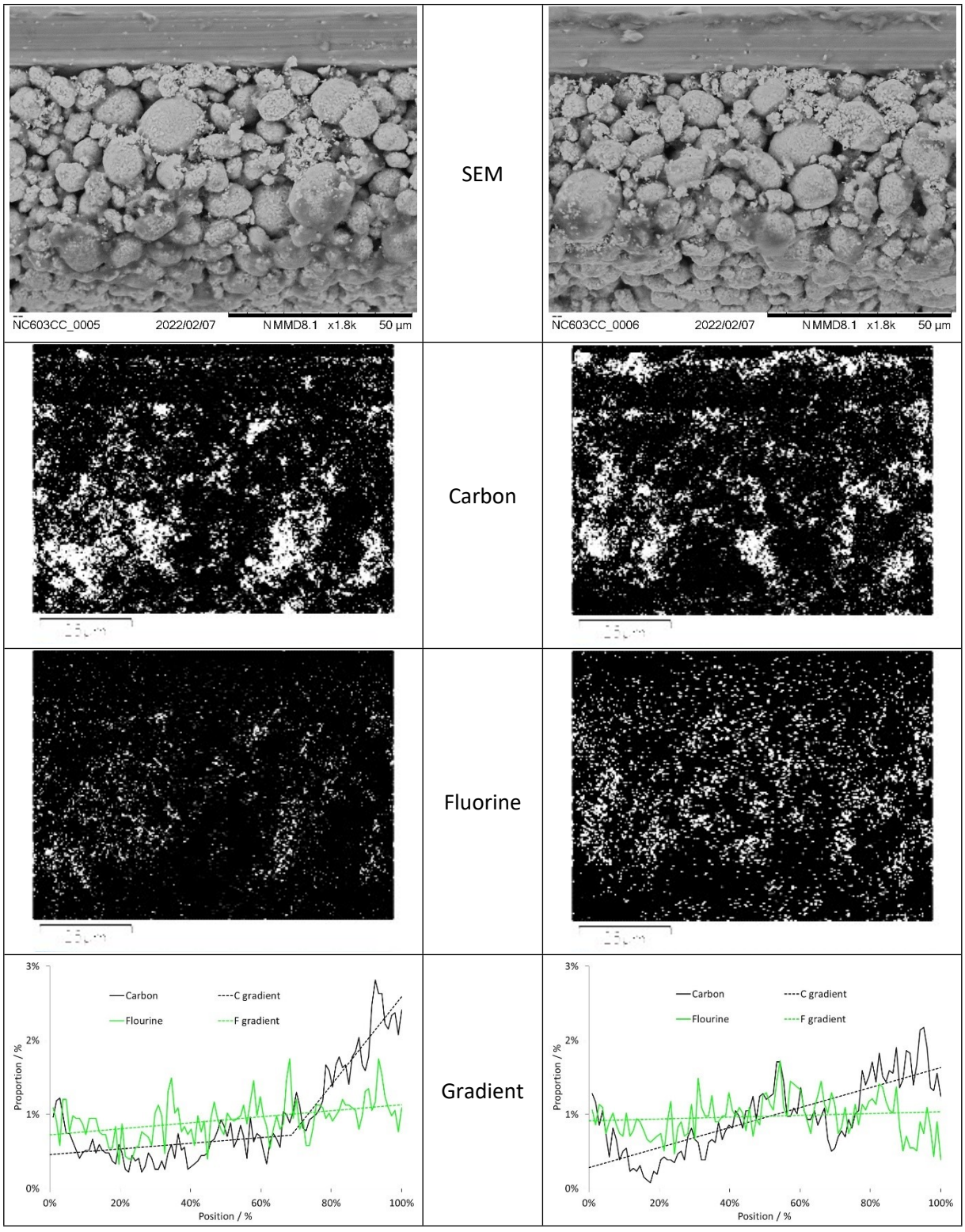


Figure S23. SEM Images And EDS Maps (603CCC And 603CCD)

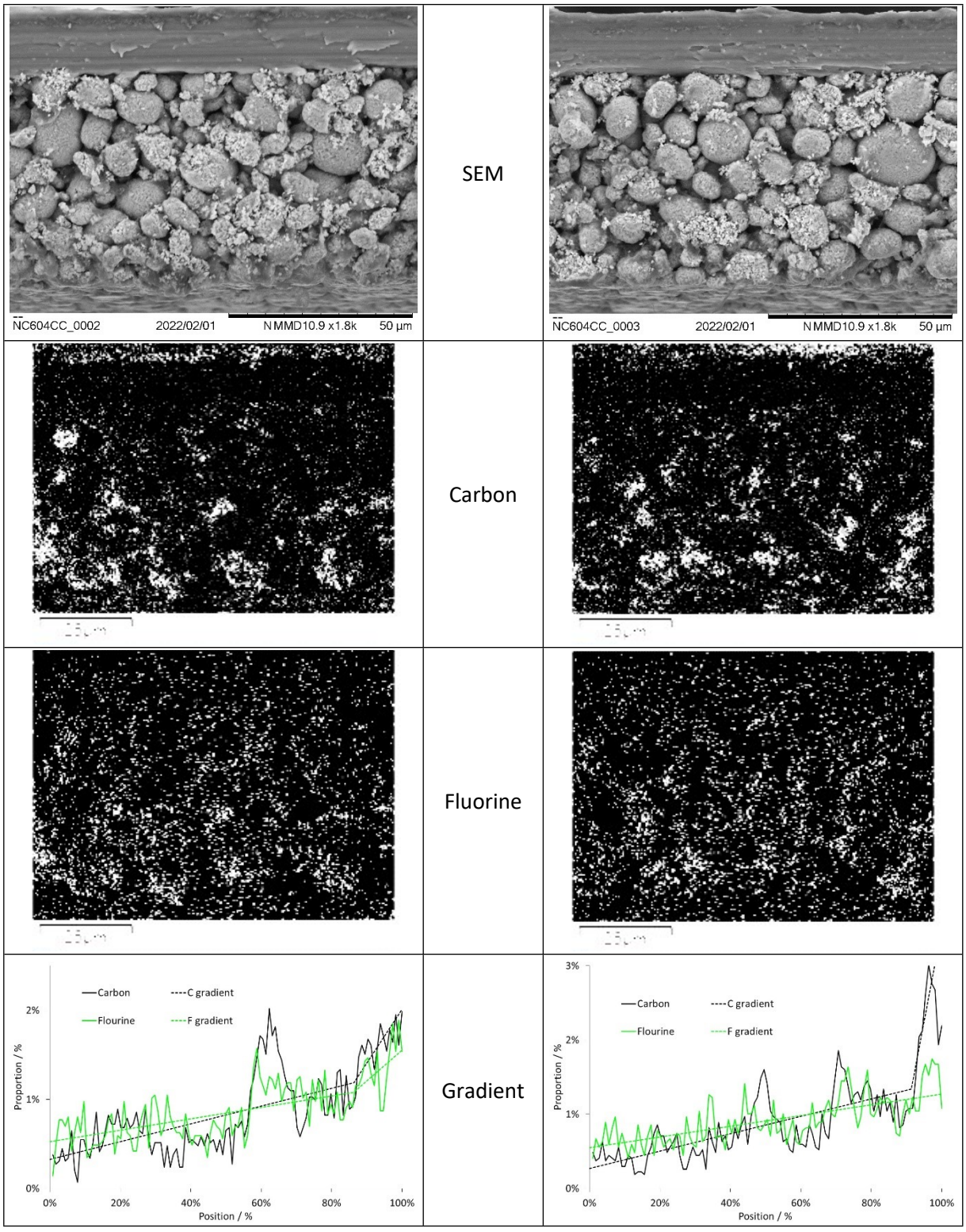


Figure 1. SEM Images And EDS Maps (604CCA And 604CCB)

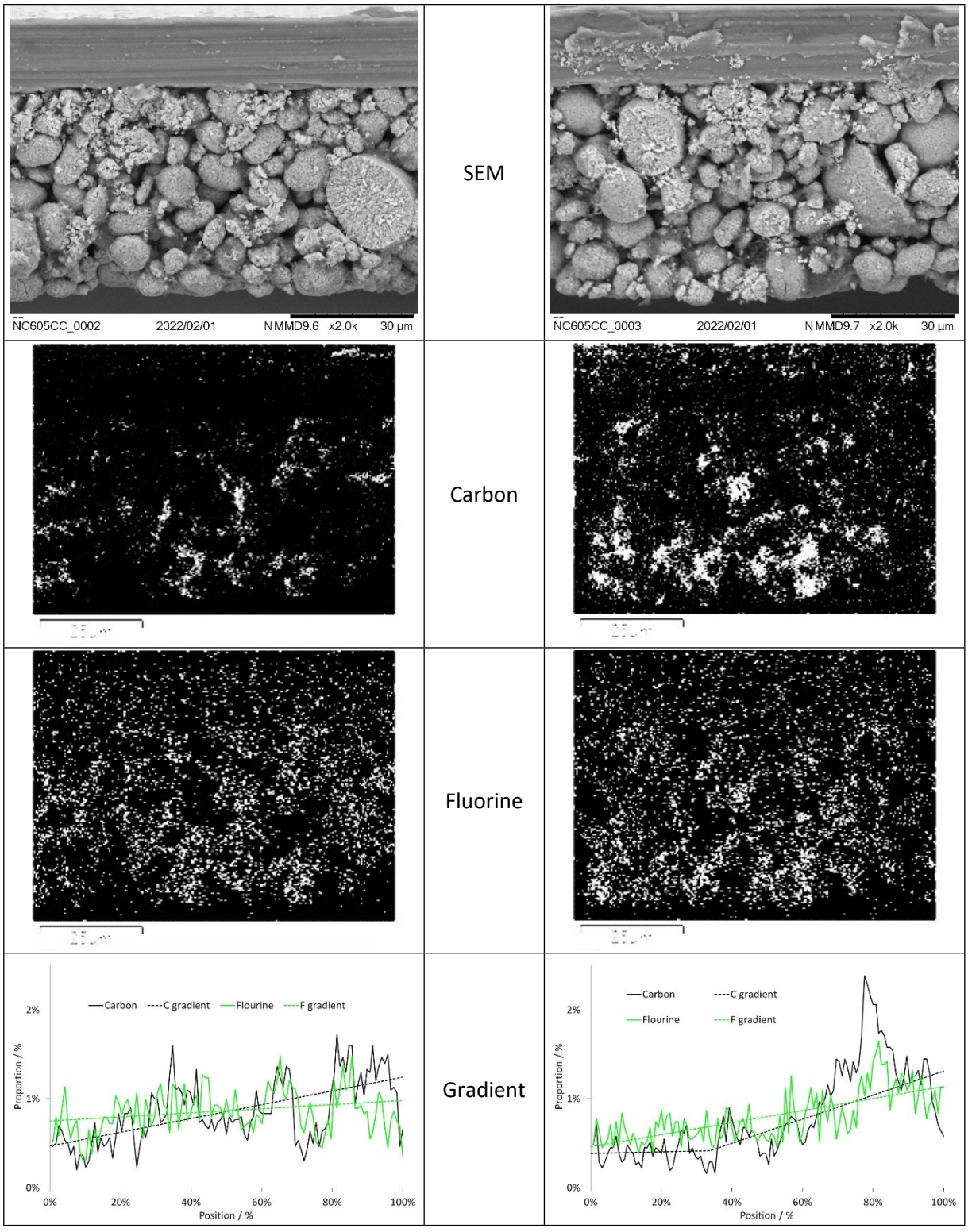


Figure S25. SEM Images And EDS Maps (605CCA And 605CCB)

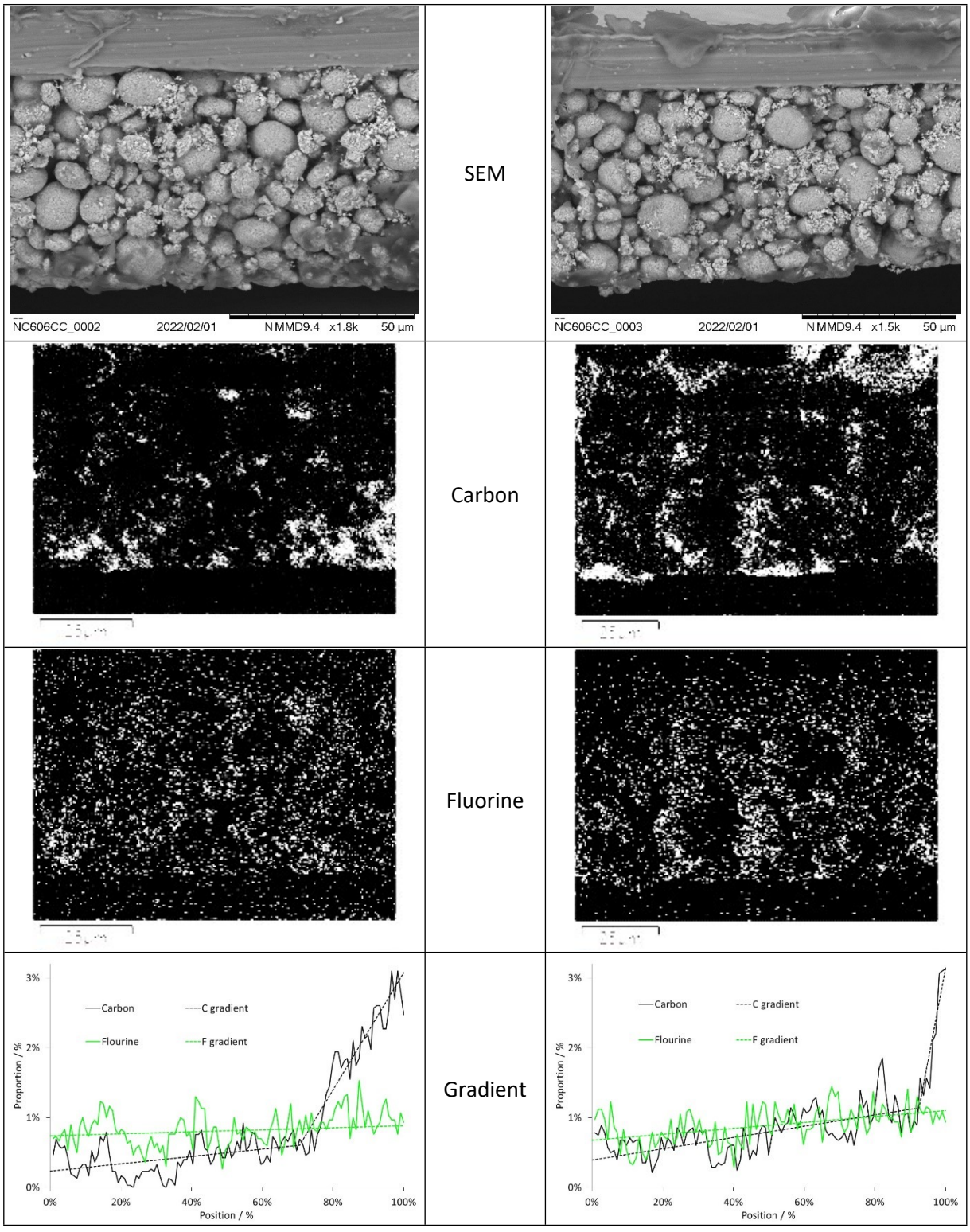


Figure S26. SEM Images And EDS Maps (606CCA And 606CCB)

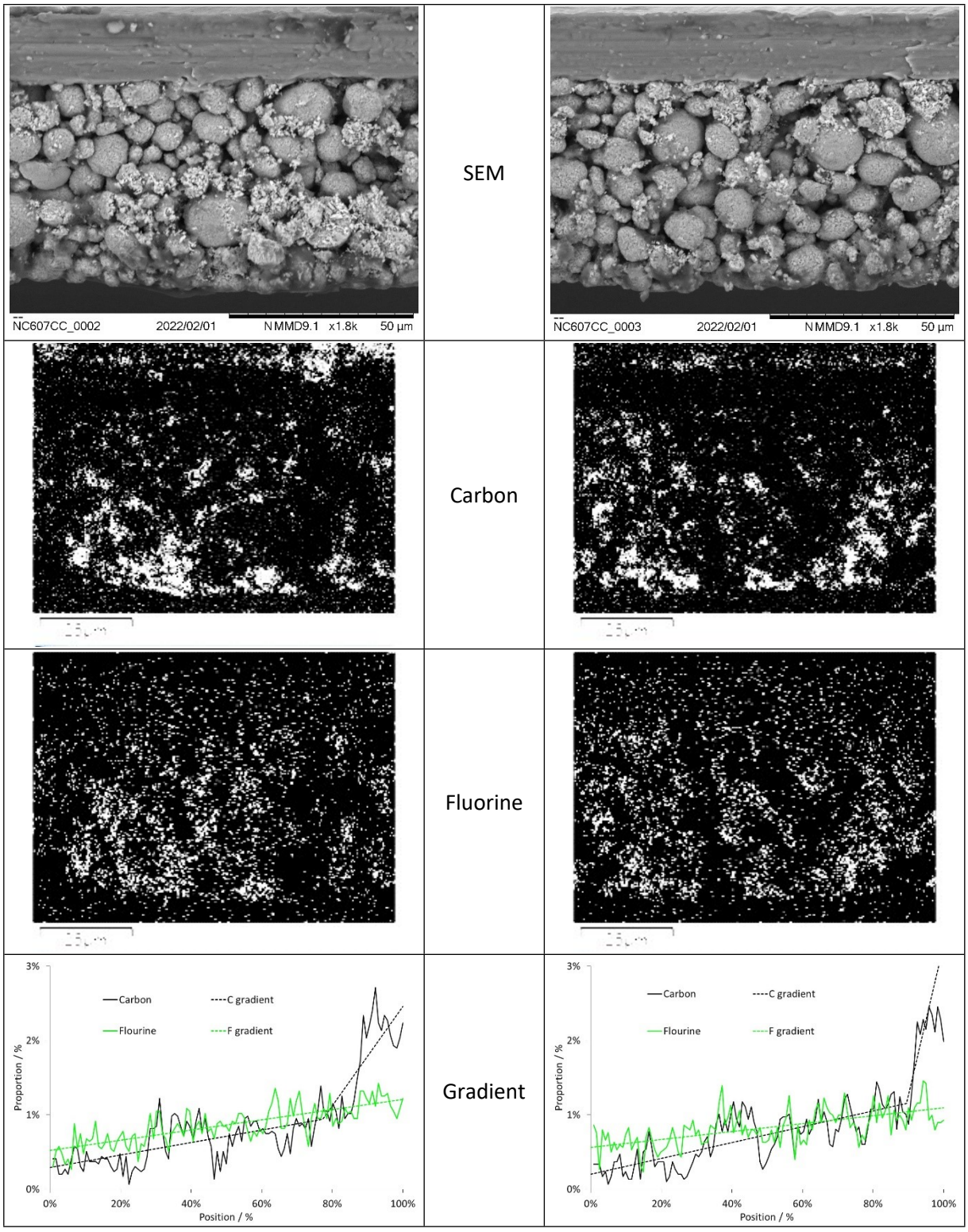


Figure S27. SEM Images And EDS Maps (607CCA And 607CCB)

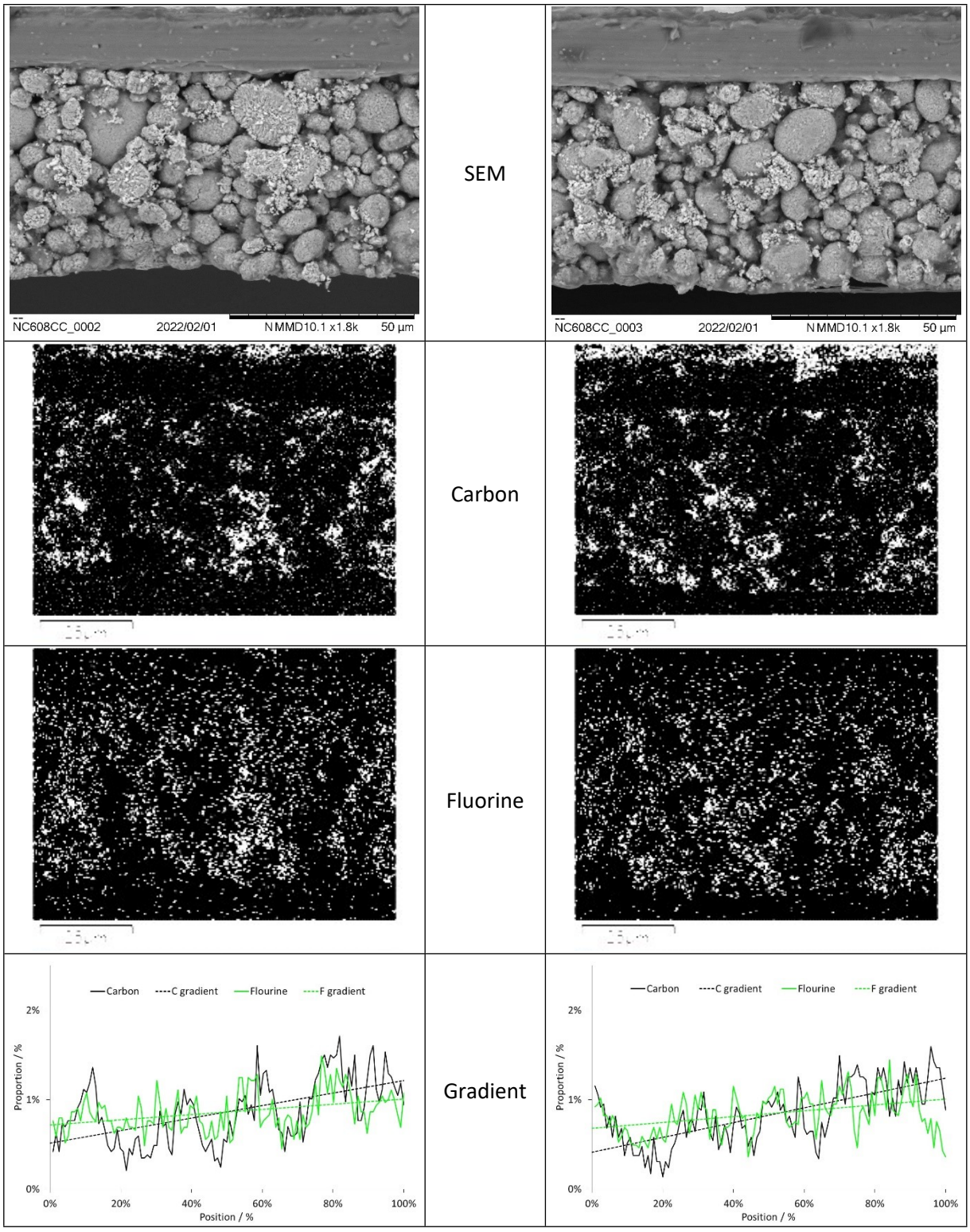


Figure S28. SEM Images And EDS Maps (608CCA And 608CCB)

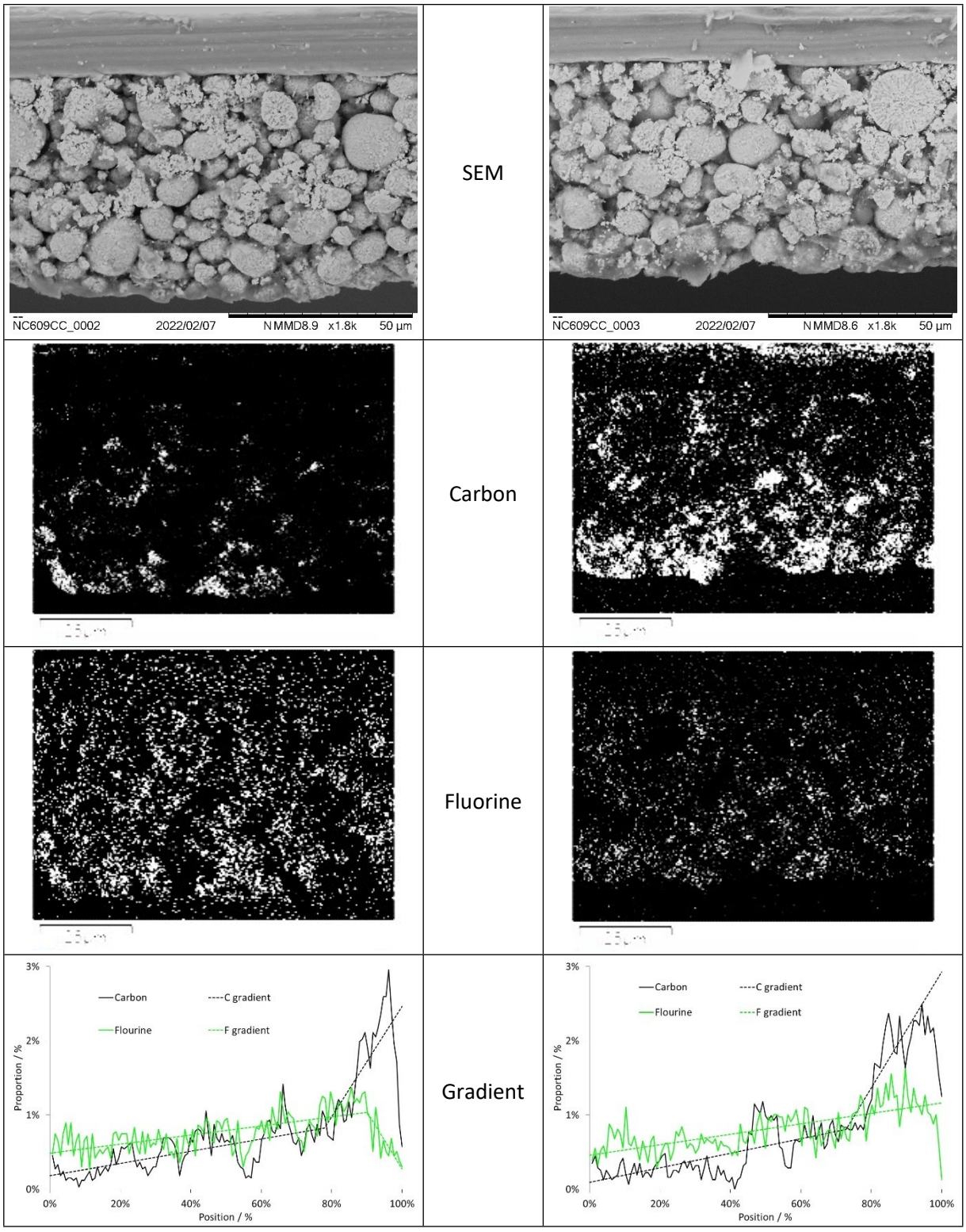


Figure S29. SEM Images And EDS Maps (609CCA And 609CCB)

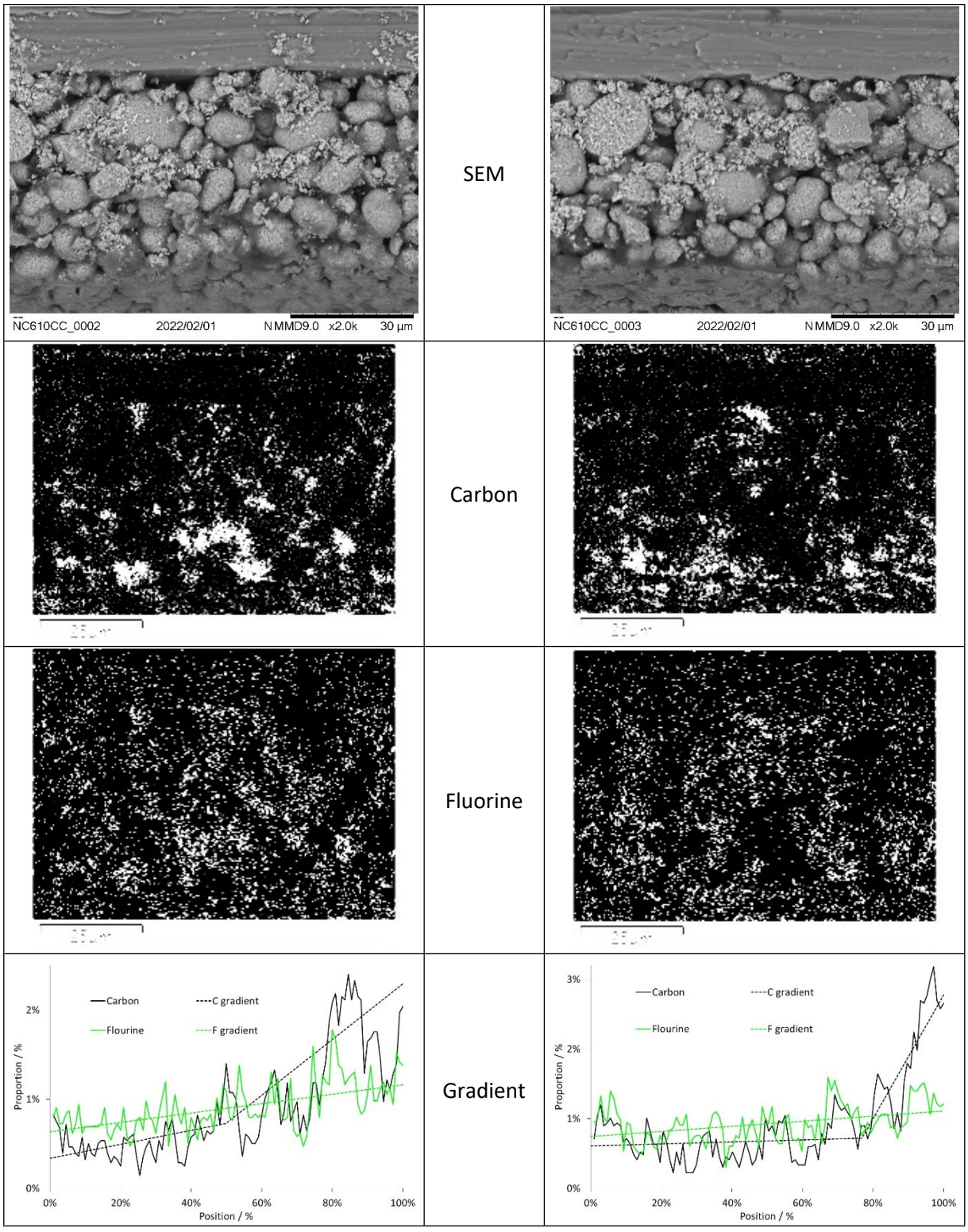


Figure S30. SEM Images And EDS Maps (610CCA And 610CCB)

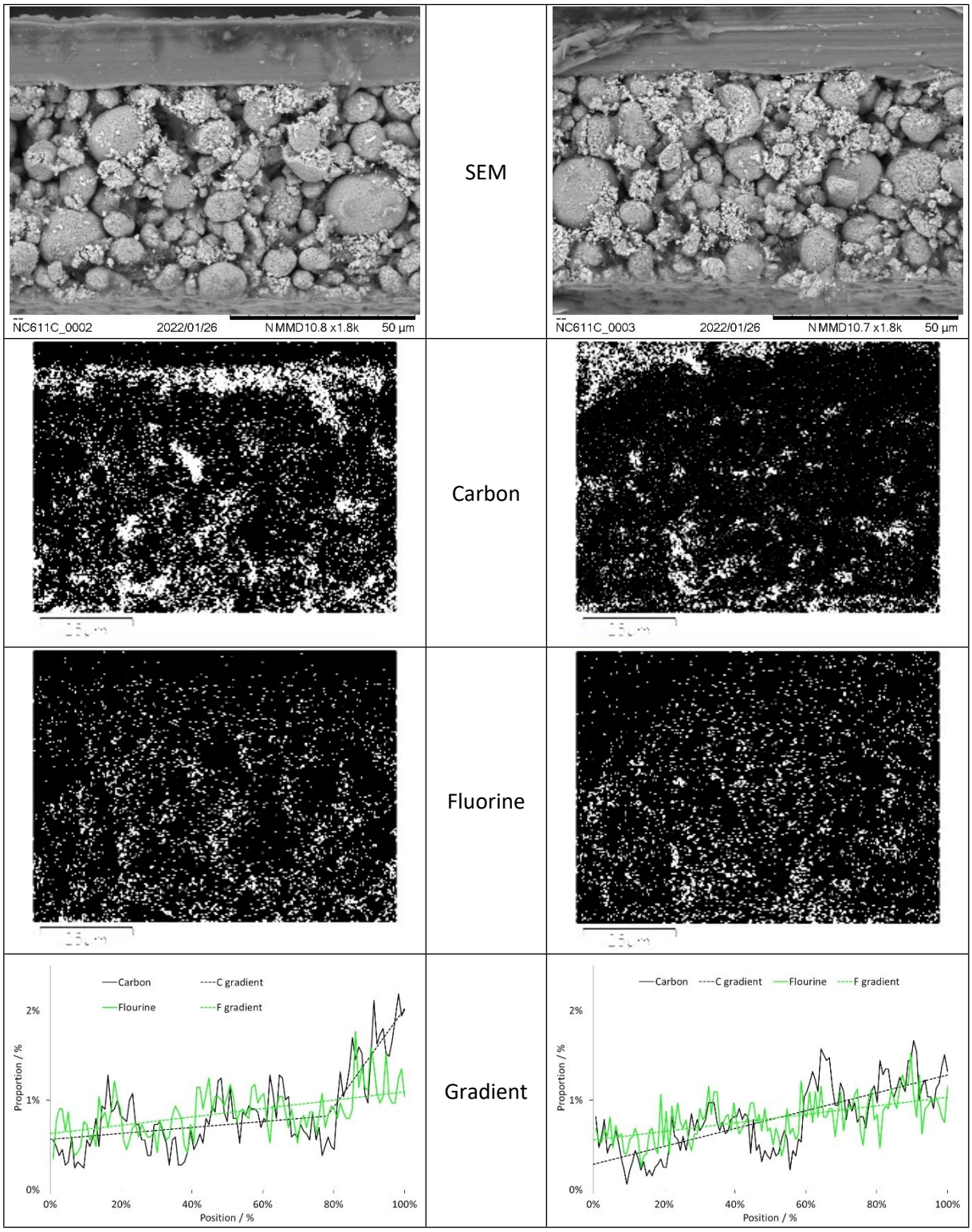


Figure S31. SEM Images And EDS Maps (611CA And 611CB)

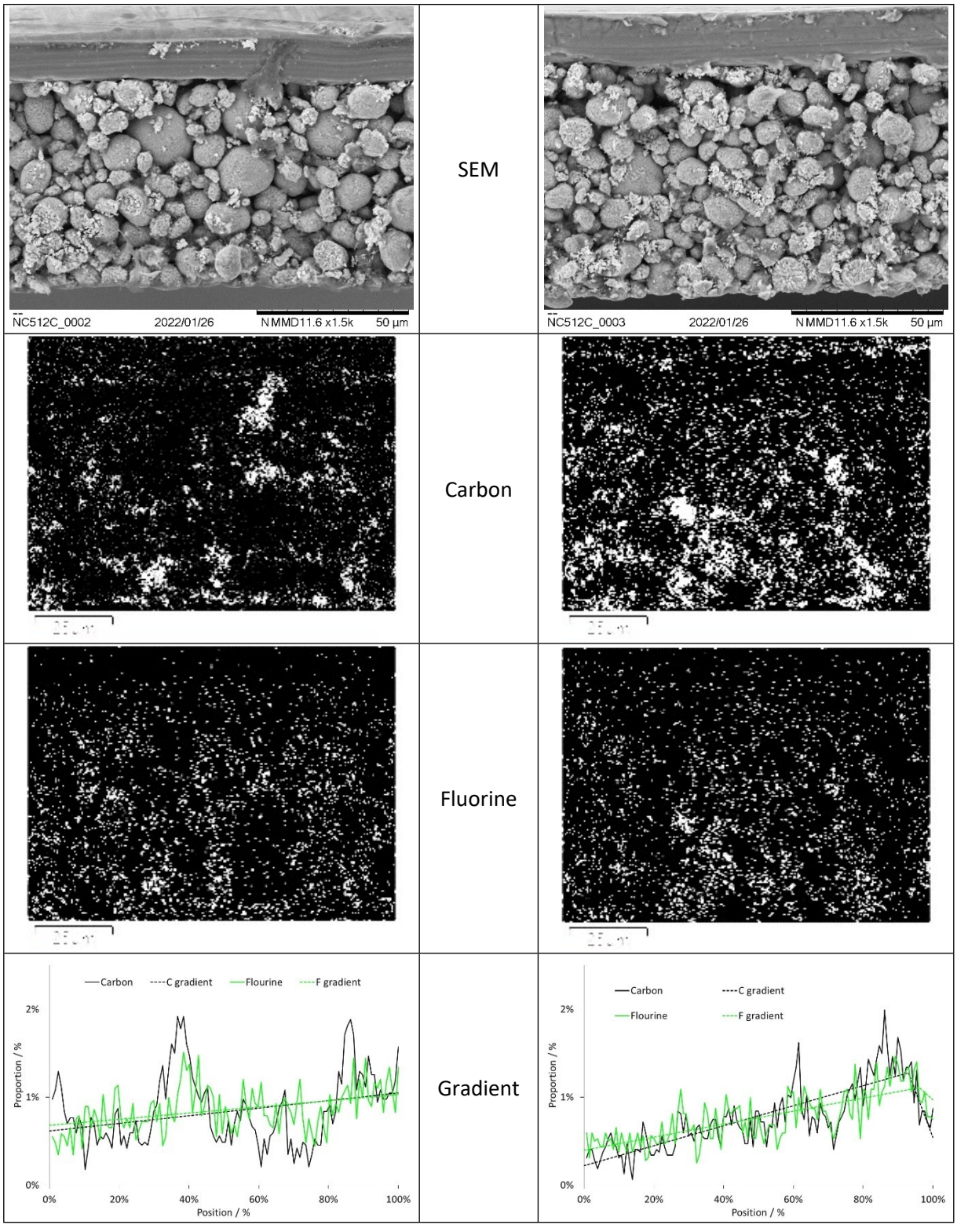


Figure S32. SEM Images And EDS Maps (512CA And 512CB)

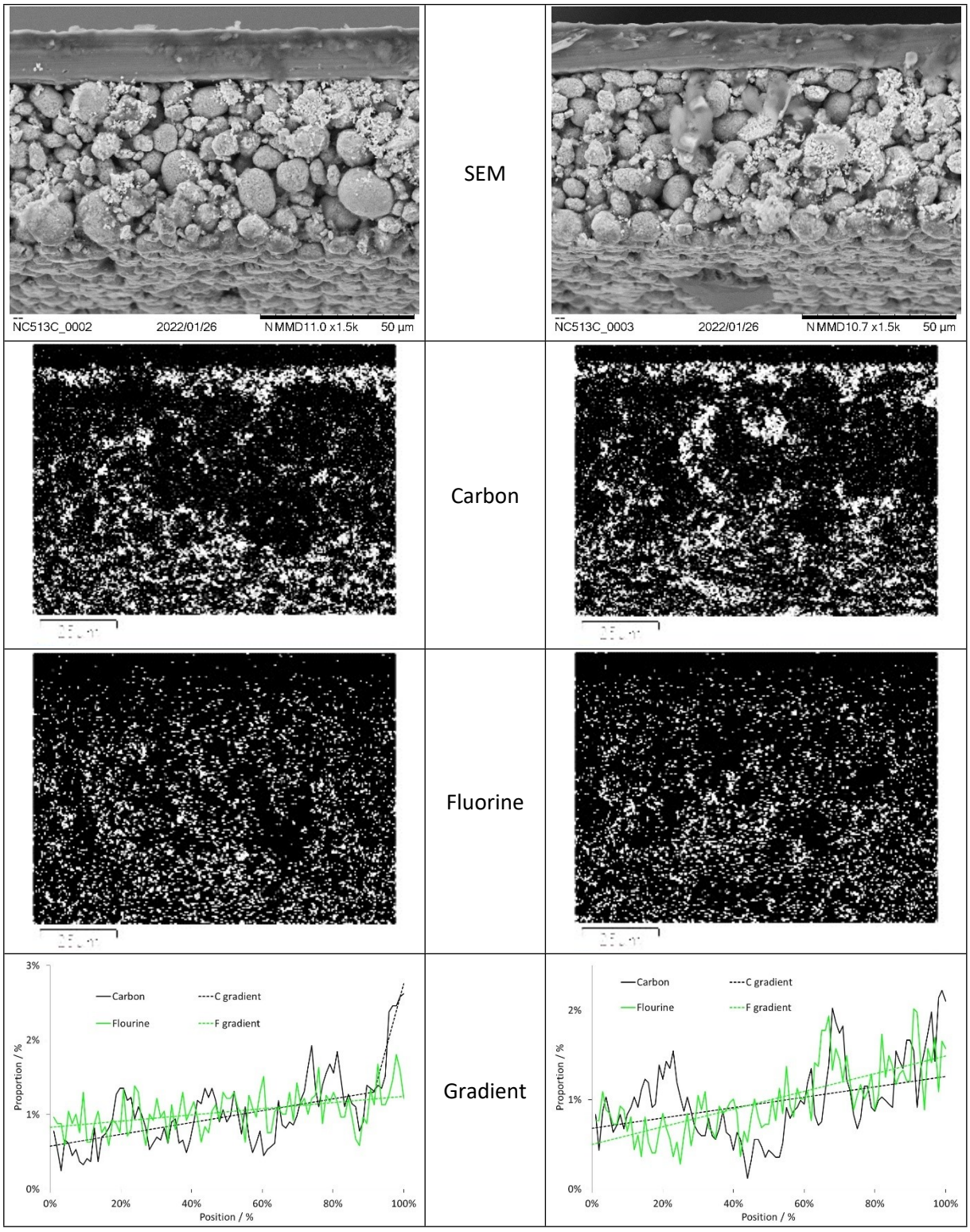


Figure S33. SEM Images And EDS Maps (513CA And 513CB)

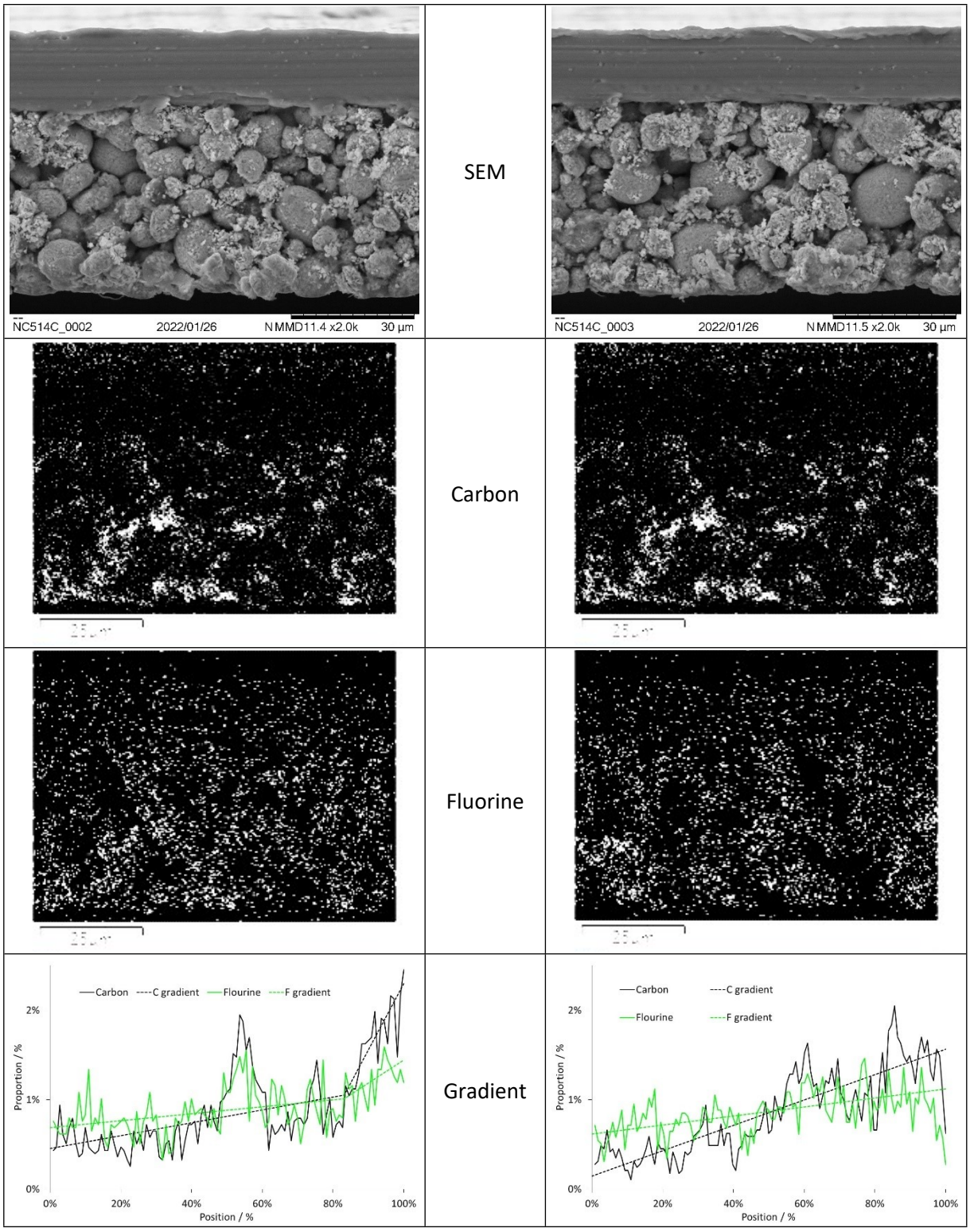


Figure S34. SEM Images And EDS Maps (514CA And 514CB)

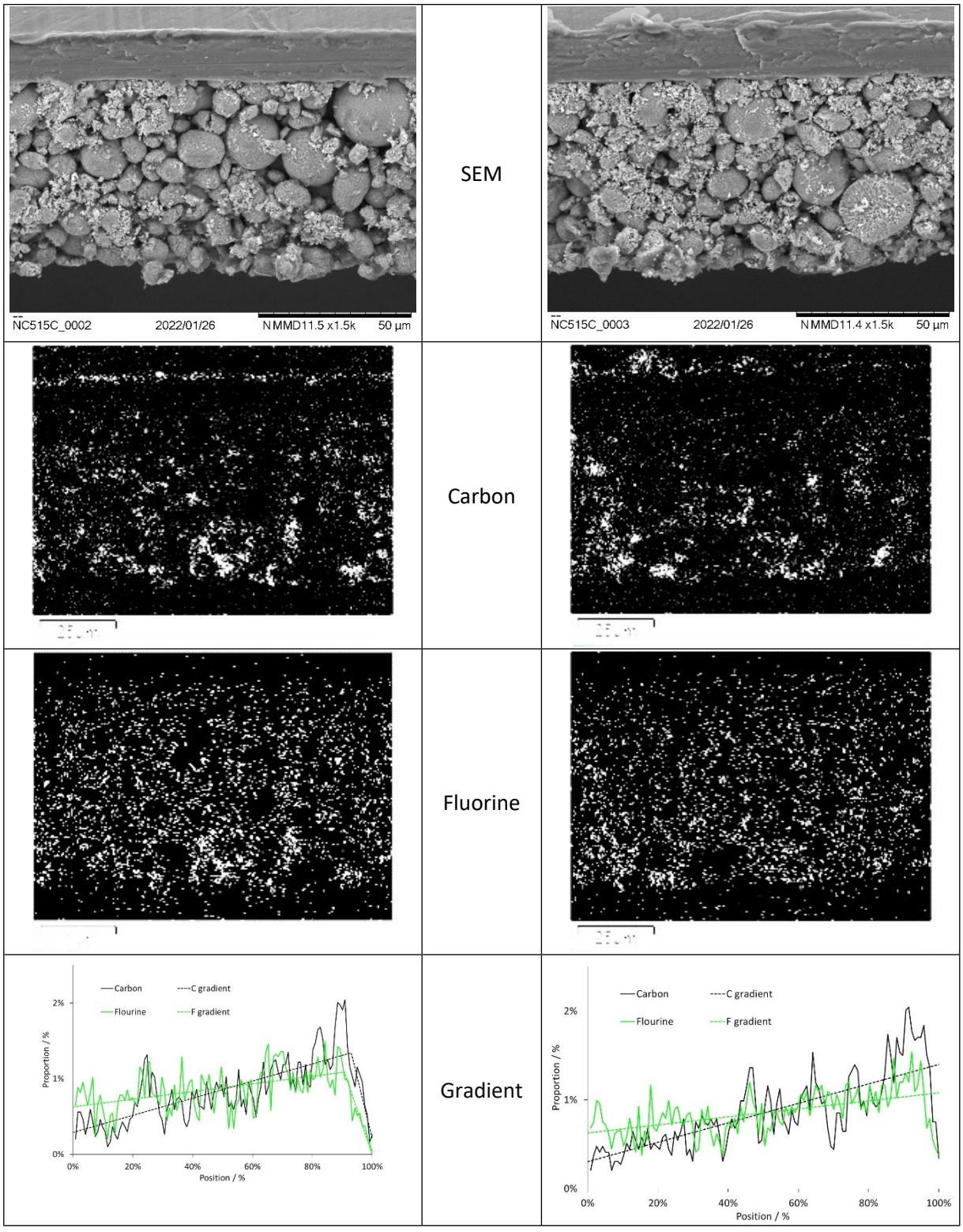


Figure S35. SEM Images And EDS Maps (515CA And 515CB)

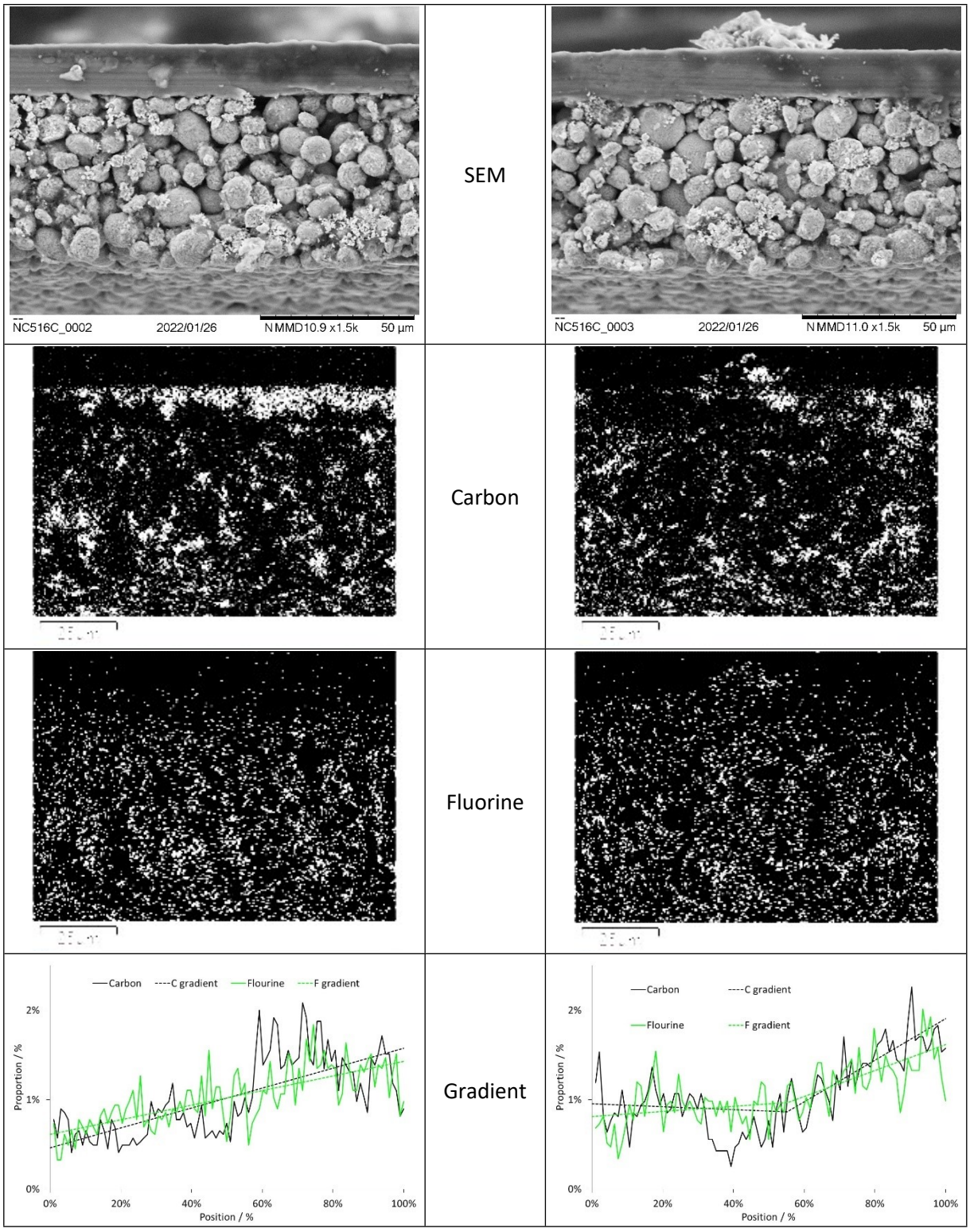


Figure S36. SEM Images And EDS Maps (516CA And 516CB)

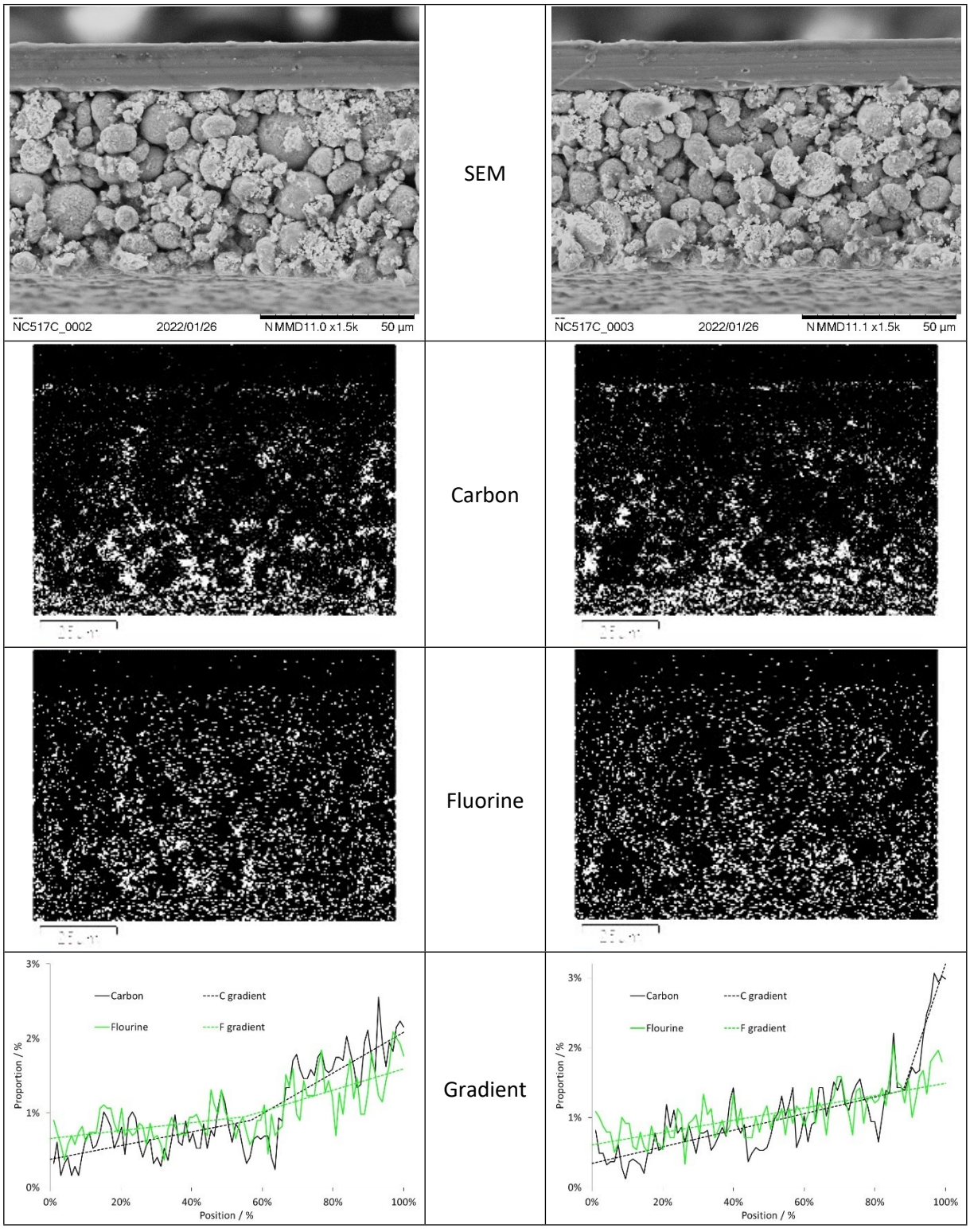


Figure S37. SEM Images And EDS Maps (517CA And 517CB)

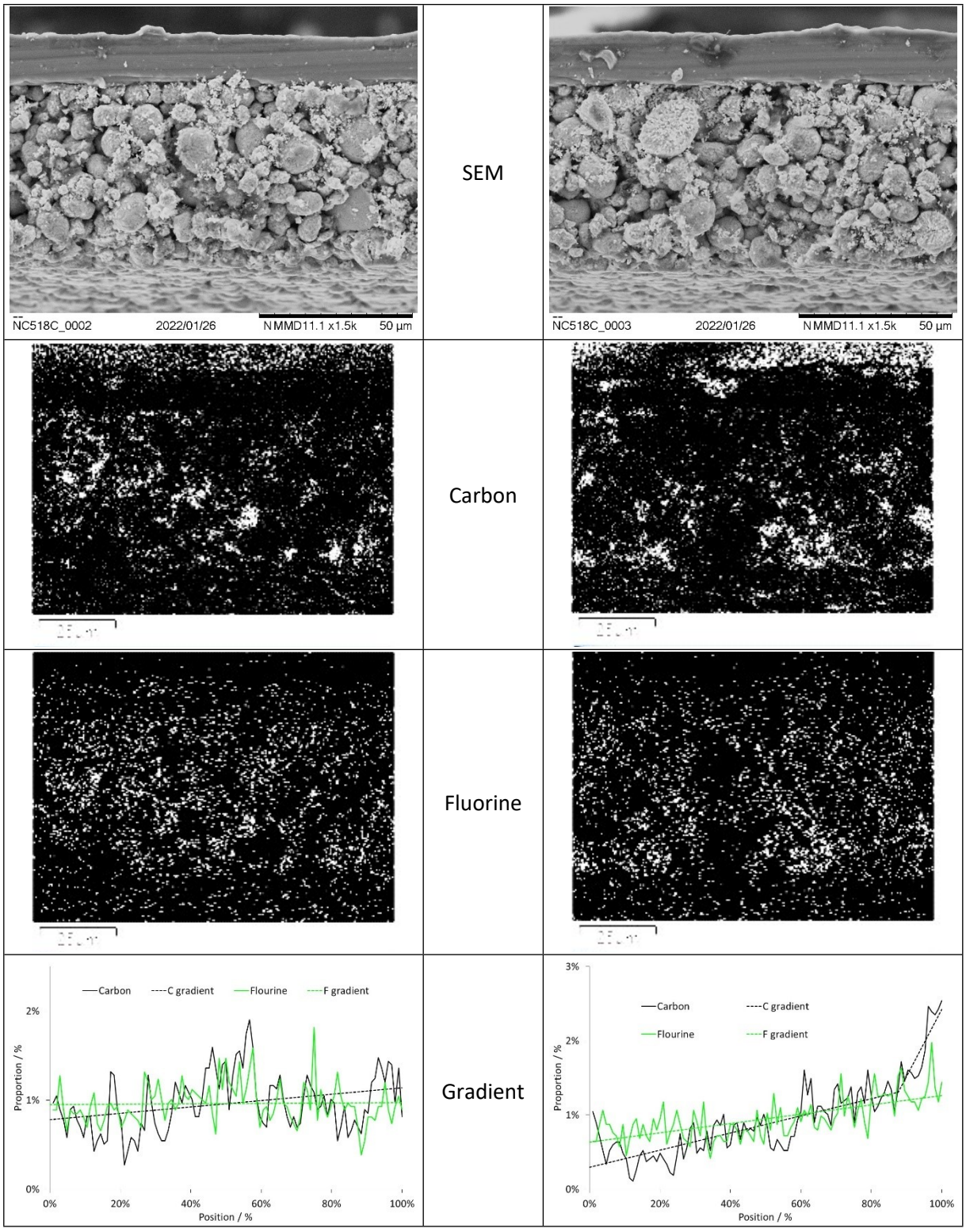


Figure S38. SEM Images And EDS Maps (518CA And 518CB)

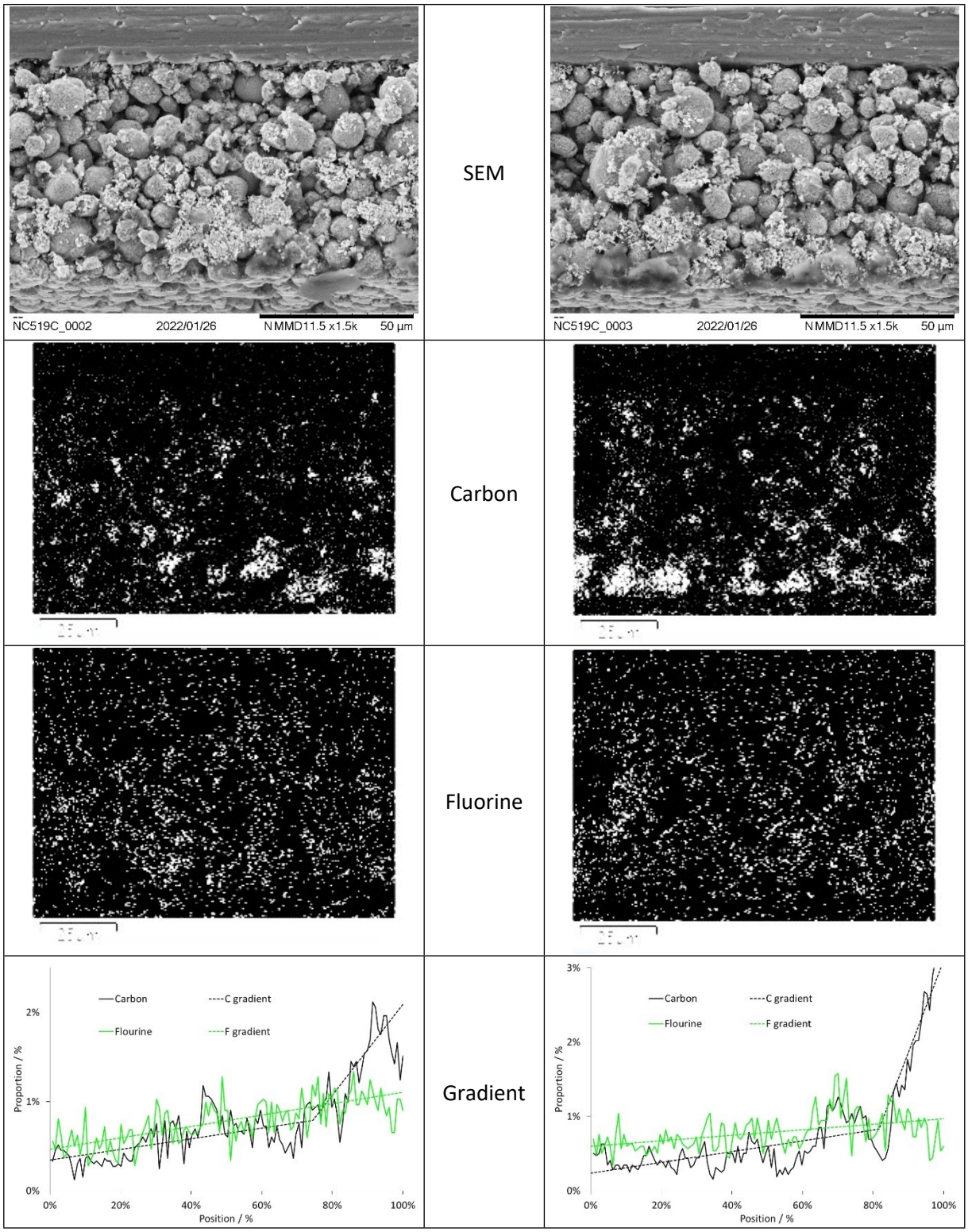


Figure S39. SEM Images And EDS Maps (519CA And 519CB)

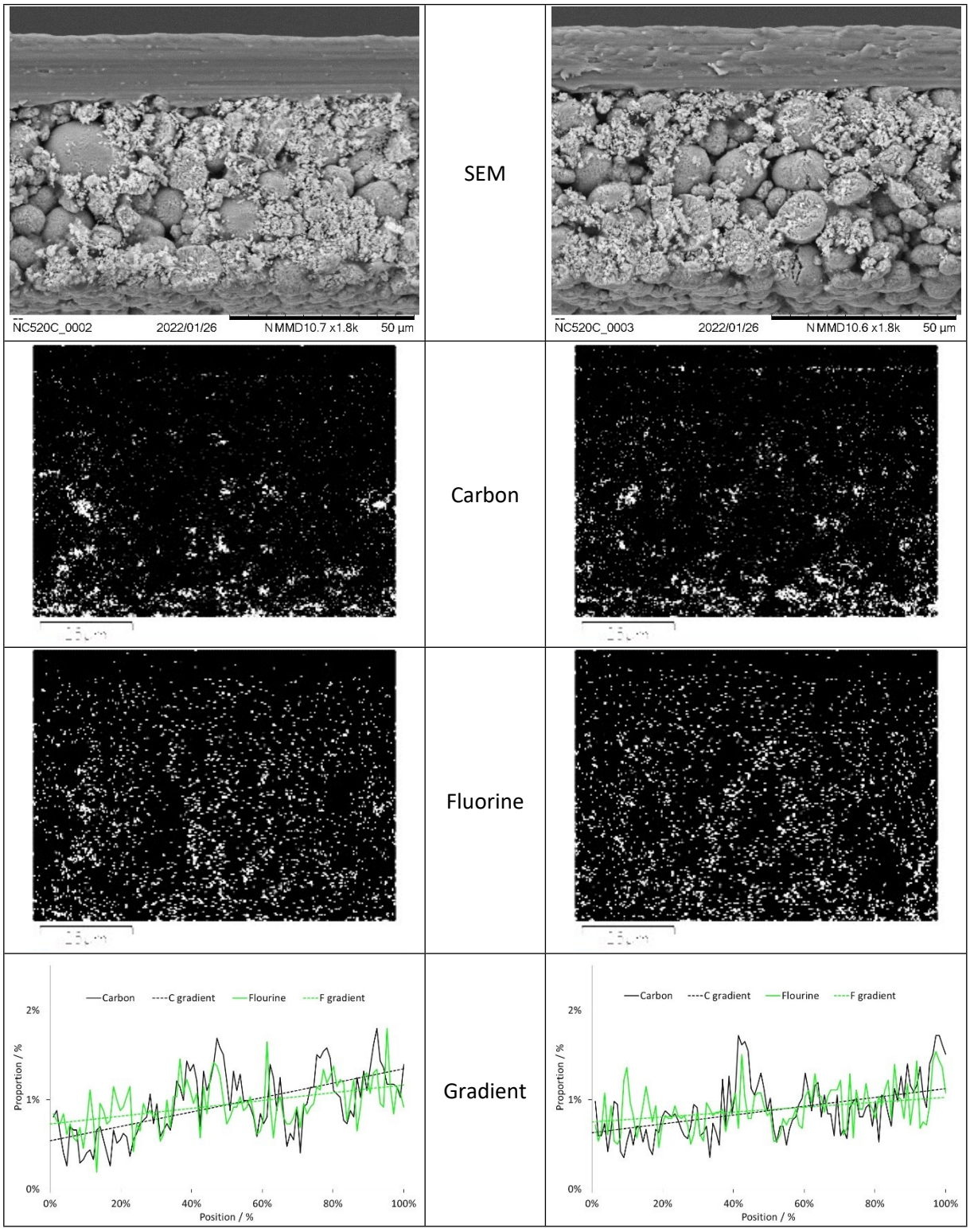


Figure S40. SEM Images And EDS Maps (520CA And 520CB)

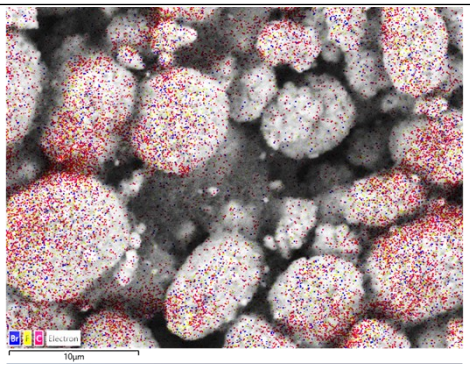
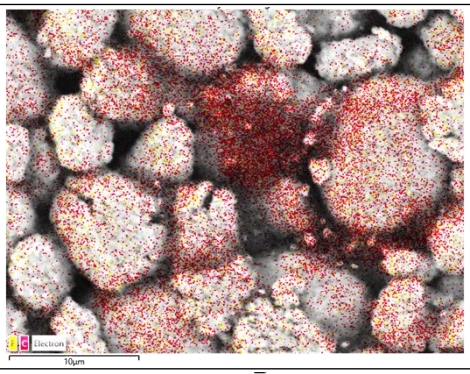
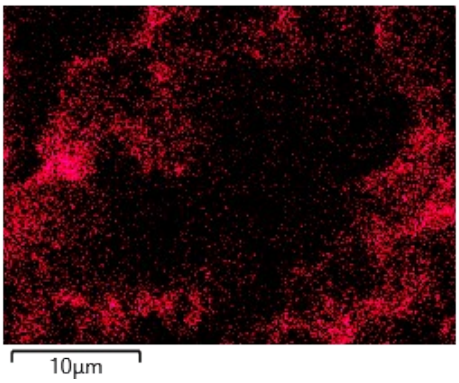
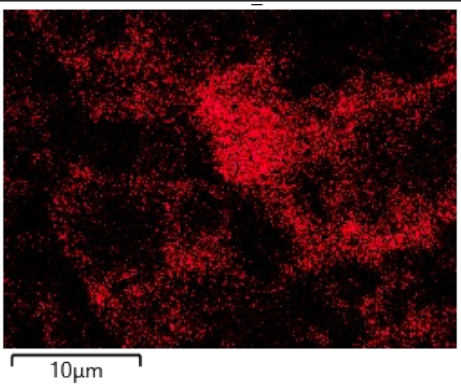
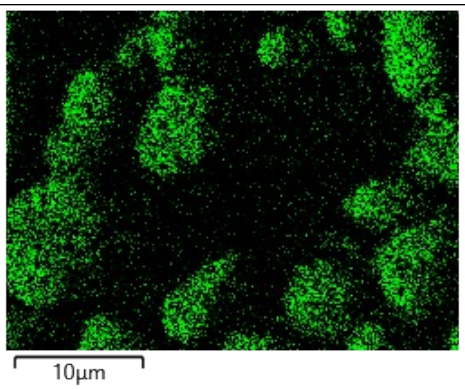
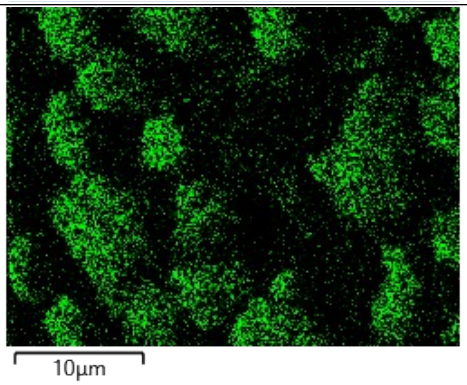
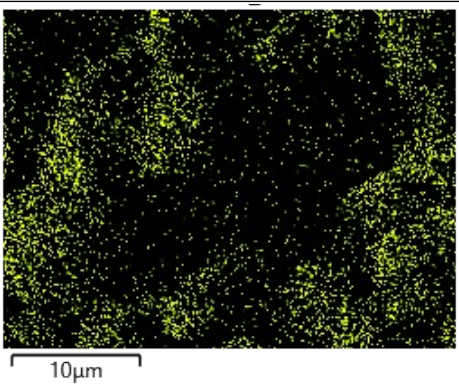
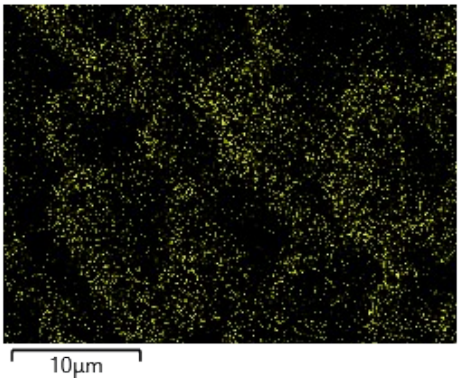
Uncalendered		Calendered
	SEM	
	Carbon	
	Oxygen	
	Fluorine	

Figure S41. SEM Images And EDS Maps (NC601 Surface)

NB. For the calendered sample, the conductive carbon region blocks the oxygen signal from the NMC. However, for the uncalendered sample, the carbon spot does not appear, because the conductive carbon clump is below the surface.

Anode DoE

Table S11. Test Matrix and Sample Identification (Anode DoE)

Coating No.	Coating I.D.	Comma bar gap / um	Coating ratio / %
6	ANO5_06	190	130
11	ANO5_11	177	144
8	ANO5_08	177	116
2	ANO5_02	145	150
1	ANO5_01	145	130
5	ANO5_05	145	130
7	ANO5_07	145	130
10	ANO5_10	145	130
12	ANO5_12	145	130
4	ANO5_04	145	110
3	ANO5_03	113	144
9	ANO5_09	113	116
13	ANO5_13	100	130

Table S12. Repeat Spatial Autocorrelation Measurements On Anode DoE Samples

Coating	Join Counting		Moran I Score	
	Mean	S. D.	Mean	S. D.
ANO5_01	35.5	4.6	0.293	0.005
ANO5_02	41.7	6.9	0.291	0.008
ANO5_06	42.6	5.5	0.287	0.004
Repeats	35.5	4.5	0.284	0.008

NB. The “repeat” measurements were for samples with a blade gap of 145 um and a coating ratio of 130 %.

Table S13. Summary Of Results From Electrochemical Tests (Anode DoE)

Coating ID	Coat Weight / gsm	ASI Resistance / Ω cm	Ratio 2C : 0.2C / %
ANO5_01	103	43.0	92.9
ANO5_02	115	62.4	103.1
ANO5_03	89	62.7	100.2
ANO5_04	87	47.0	96.8
ANO5_05	103	39.1	99.3
ANO5_06	131	39.5	99.5
ANO5_07	102	50.1	93.3
ANO5_08	107	36.4	96.2
ANO5_09	74	71.3	98.5
ANO5_10	102	42.9	100.5
ANO5_11	134	46.7	93.7
ANO5_12	101	53.4	98.2
ANO5_13	75	53.0	99.1

Table S14. Correlation Coefficients From Linear Regression (Anode DoE)

Figure	X Parameter	Y Parameter	R^2 (fluorine)
9A	Surface Coverage	Join Count $Z_{1\text{-}1}$	0.0476
9B	Coat Weight	Join Count $Z_{1\text{-}1}$	0.1983
9C	Minimum ASI	Join Count $Z_{1\text{-}1}$	0.0162
9D	Minimum ASI	Moran I Score	0.0463
9F	Comma Bar Gap x Coating Ratio	Sodium Gradient	0.0138

Table S15. Join Count Analysis Of Sodium EDS Maps (Anode DoE)

Sodium	Coverage	Experiment / %			Join Count Z Score		
	Proportion / %	1 – 1	0 – 1	0 – 0	1 – 1	0 – 1	0 - 0
ANO5_01A	3.95	0.46	7.0	92.5	28.0	-10.9	5.8
ANO5_01B	3.97	0.54	6.8	92.6	35.7	-13.4	7.0
ANO5_01C	3.05	0.32	5.4	94.2	40.4	-13.0	5.2
ANO5_01D	3.98	0.56	6.9	92.6	37.7	-13.1	6.4
ANO5_02	2.02	0.21	3.6	96.2	37.8	-10.2	4.4
ANO5_02A	1.96	0.23	3.5	96.3	40.3	-13.2	6.9
ANO5_02B	2.96	0.37	5.2	94.5	49.1	-22.2	13.2
ANO5_02C	2.99	0.38	5.2	94.4	49.6	-20.6	11.4
ANO5_02D	1.99	0.19	3.6	96.2	31.6	- 8.9	4.0
ANO5_03	3.97	0.54	6.8	92.7	35.8	-14.0	7.5
ANO5_04	3.98	0.53	6.8	92.7	34.7	-13.6	7.4
ANO5_05	3.97	0.49	6.9	92.6	30.9	-11.7	6.1
ANO5_06	2.98	0.36	5.2	94.4	46.8	-20.0	11.4
ANO5_06A	3.04	0.36	5.3	94.3	47.2	-16.4	7.4
ANO5_06B	3.03	0.36	5.4	94.3	47.1	-15.4	6.4
ANO5_06C	2.96	0.31	5.3	94.4	37.4	-17.5	10.7
ANO5_06D	3.94	0.53	6.8	92.7	34.7	-14.1	7.8
ANO5_07	4.04	0.61	6.9	92.5	42.6	-13.1	5.6
ANO5_08	4.05	0.55	7.0	92.5	36.1	-10.8	4.5
ANO5_09	3.99	0.57	6.8	92.6	38.8	-13.4	6.5
ANO5_10	3.98	0.49	7.0	92.5	30.5	-11.3	5.8
ANO5_11	3.05	0.36	5.3	94.3	46.7	-16.1	7.2
ANO5_12	3.99	0.54	6.9	92.6	35.8	-13.0	6.6
ANO5_13	4.01	0.56	6.8	92.6	37.1	-13.7	7.1

Table S16. Moran Analysis Of EDS Maps (Anode DoE)

Sample	Sodium		
	Threshold	Mean	Moran
ANO5_01A	42	4.9	0.289
ANO5_01B	42	4.6	0.301
ANO5_01C	40	3.6	0.292
ANO5_01D	36	3.8	0.289
ANO5_02	36	2.0	0.282
ANO5_02A	34	1.9	0.300
ANO5_02B	34	2.8	0.300
ANO5_02C	35	2.8	0.282
ANO5_02D	39	2.2	0.288
ANO5_03	36	3.9	0.288
ANO5_04	37	4.0	0.278
ANO5_05	39	4.3	0.281
ANO5_06	36	3.0	0.289
ANO5_06A	39	3.3	0.289
ANO5_06B	36	3.0	0.292
ANO5_06C	39	3.3	0.286
ANO5_06D	35	3.8	0.281
ANO5_07	31	3.3	0.283
ANO5_08	35	3.8	0.282
ANO5_09	33	3.5	0.288
ANO5_10	38	4.2	0.273
ANO5_11	38	3.2	0.290
ANO5_12	37	4.0	0.296
ANO5_13	37	4.1	0.291

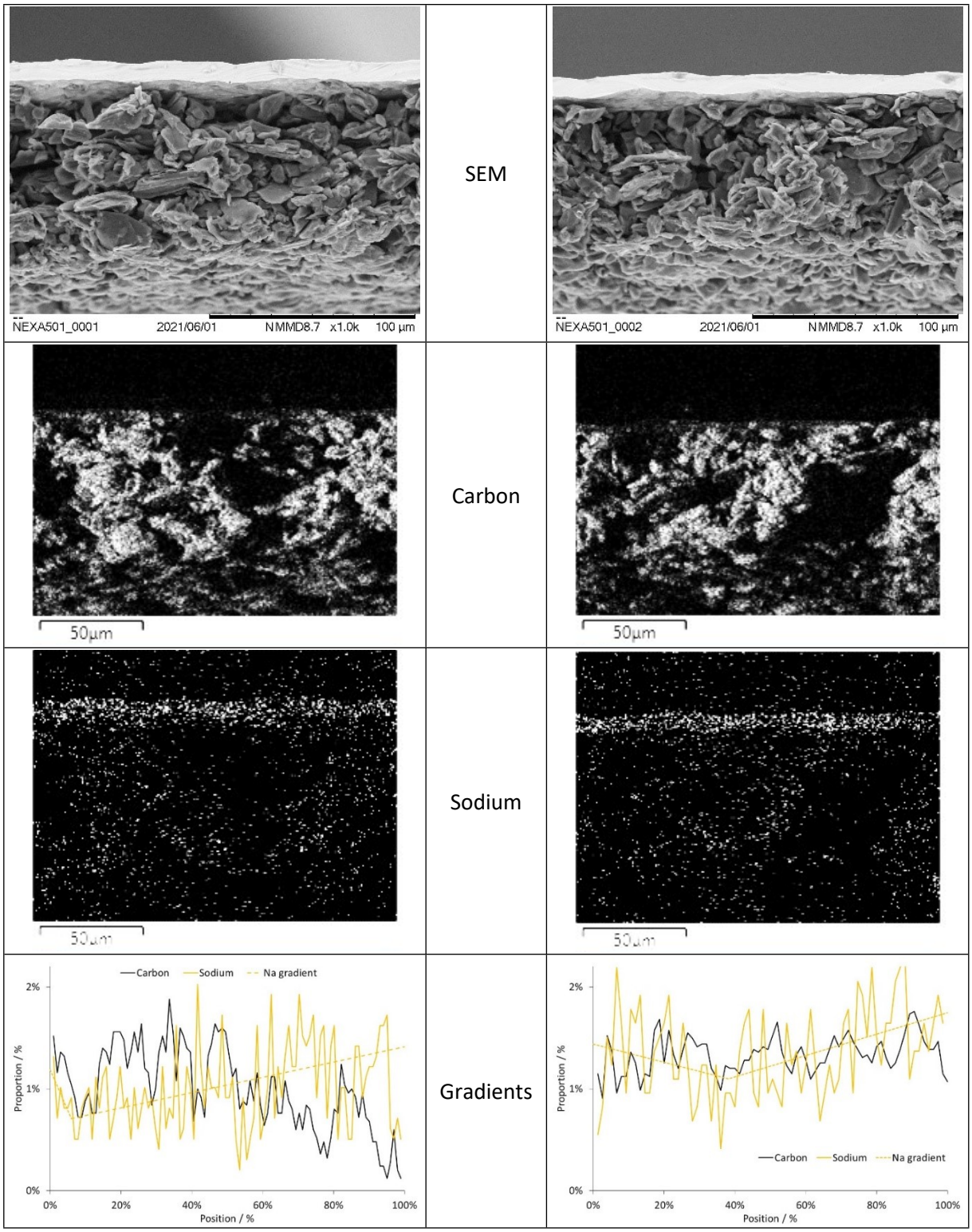


Figure S42. SEM Images And EDS Maps For Anode DoE (5_01A And 5_1B)

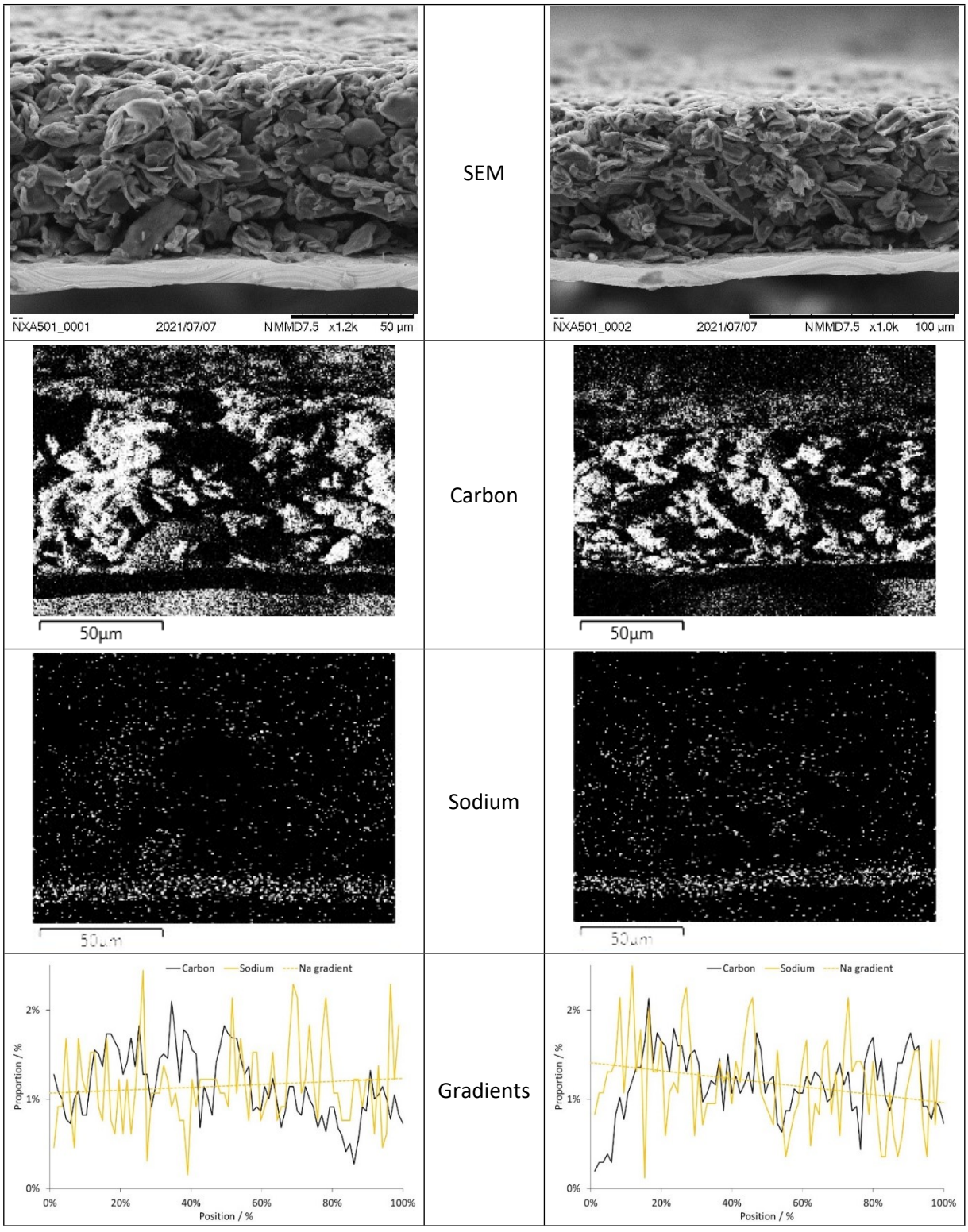


Figure S43. SEM Images And EDS Maps For Anode DoE (5_01C And 5_1D)

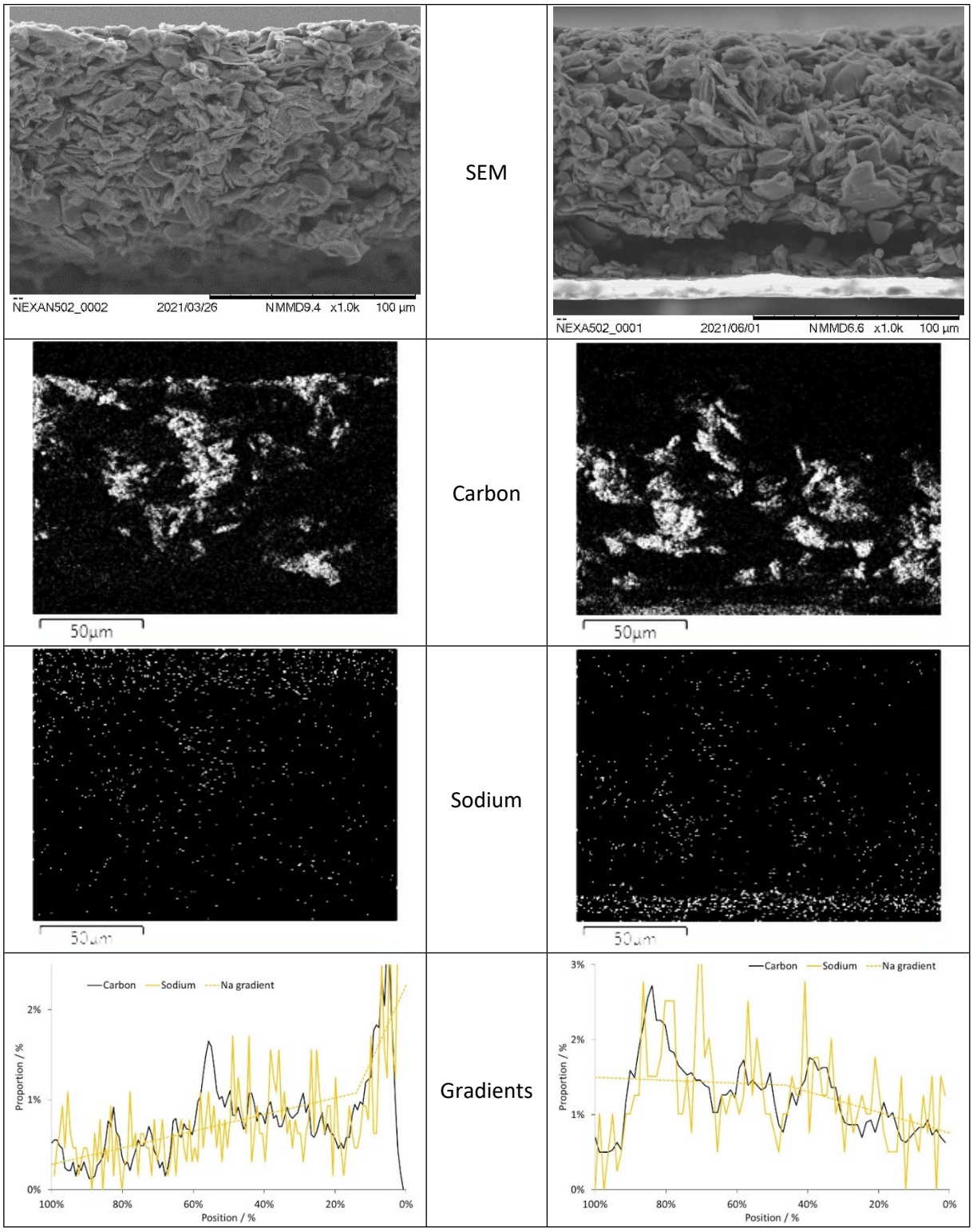


Figure S44. SEM Images And EDS Maps For Anode DoE (5_02 And 5_02A)

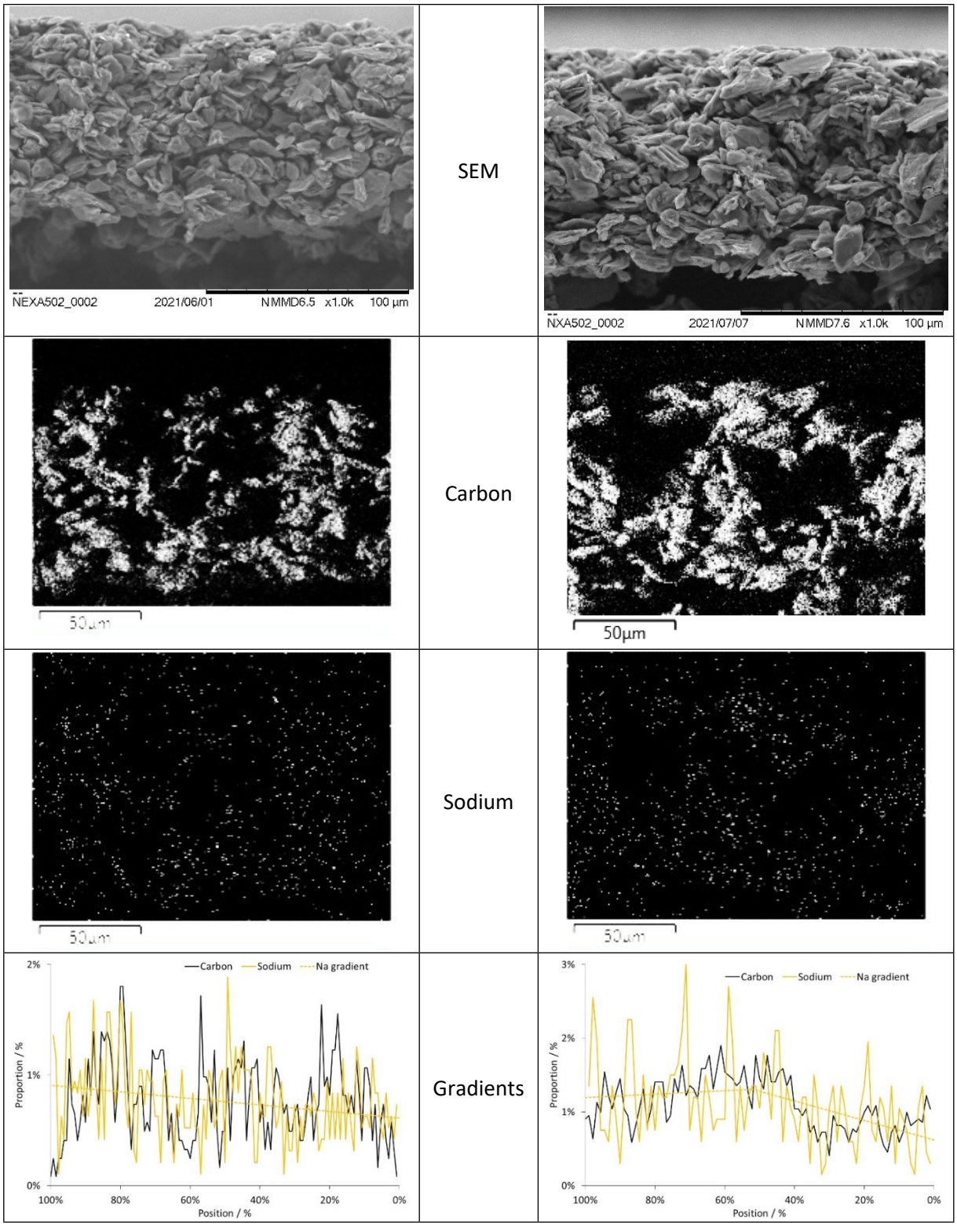


Figure S45. SEM Images And EDS Maps For Anode DoE (5_02B And 5_02C)

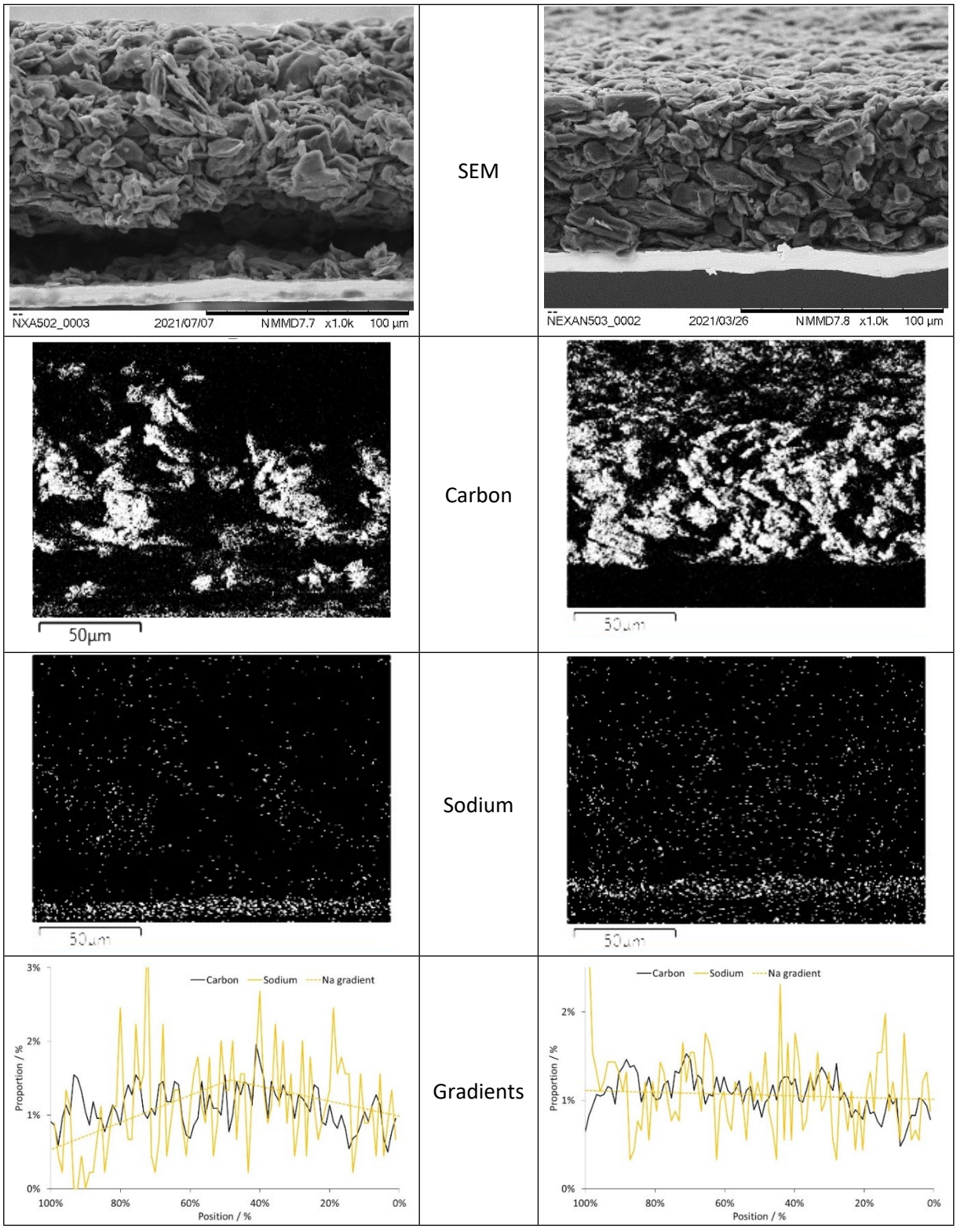


Figure S46. SEM Images And EDS Maps For Anode DoE (5_02D And 5_03)

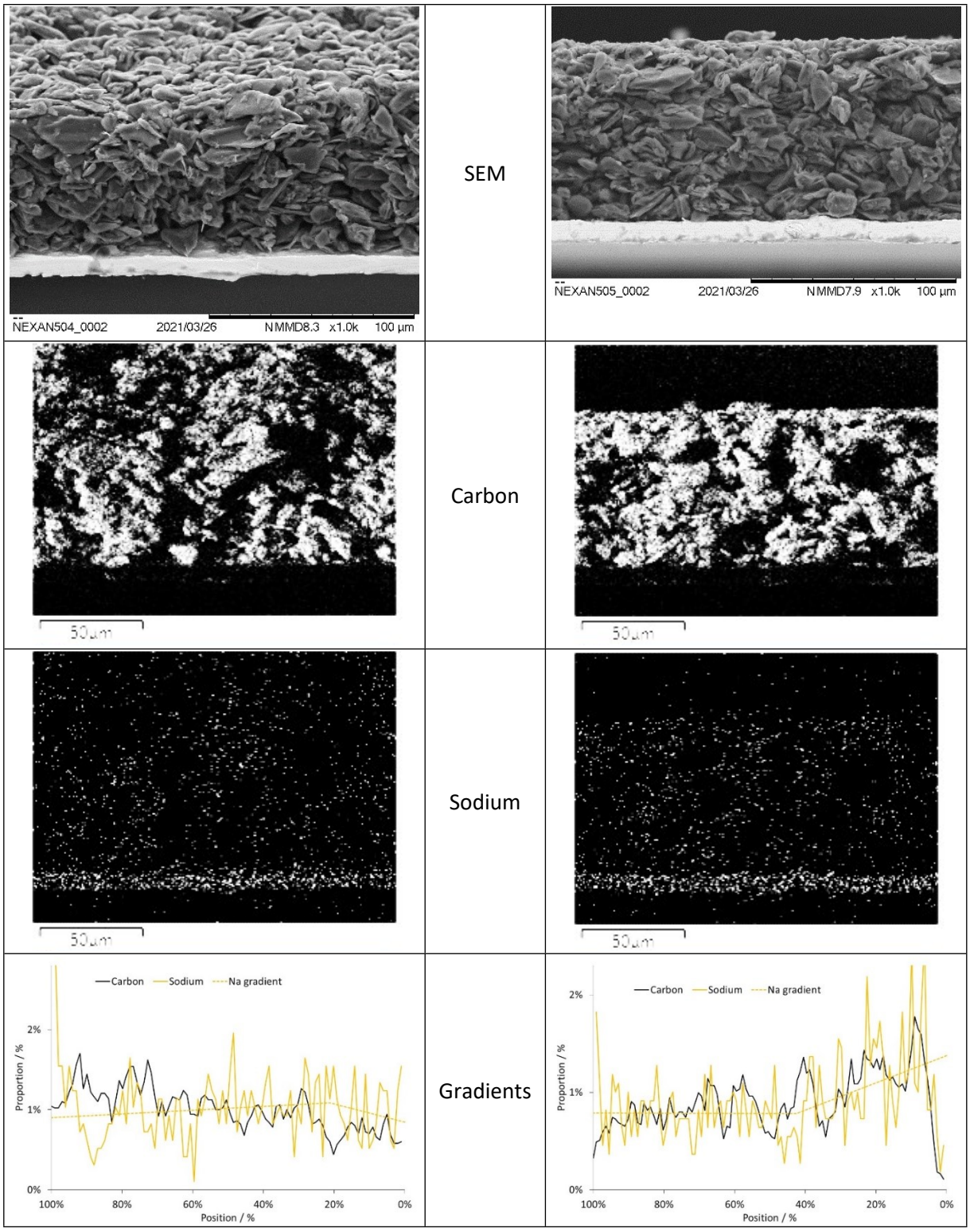


Figure S47. SEM Images And EDS Maps For Anode DoE (5_04 And 5_05)

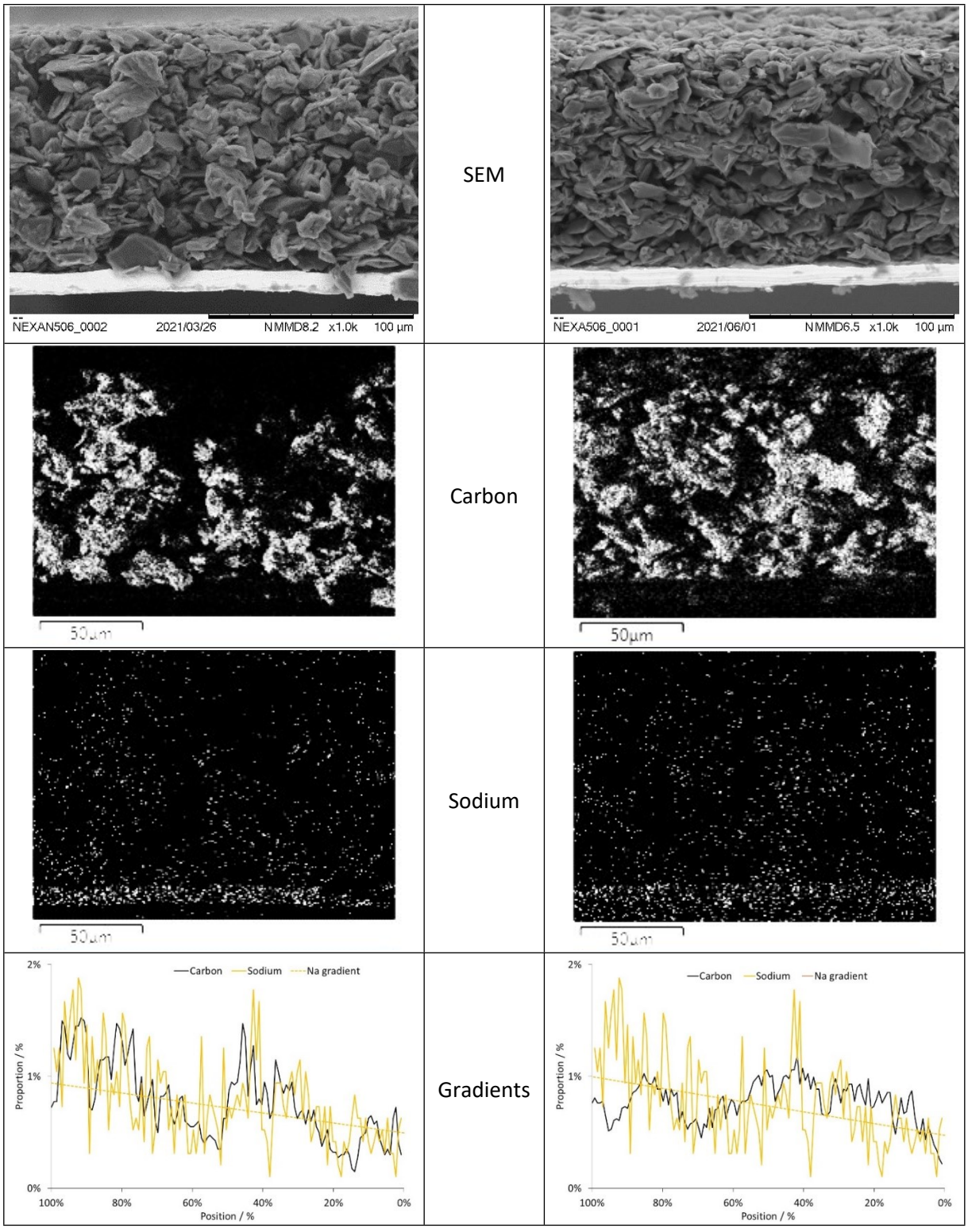


Figure S48. SEM Images And EDS Maps For Anode DoE (5_06 And 5_06A)

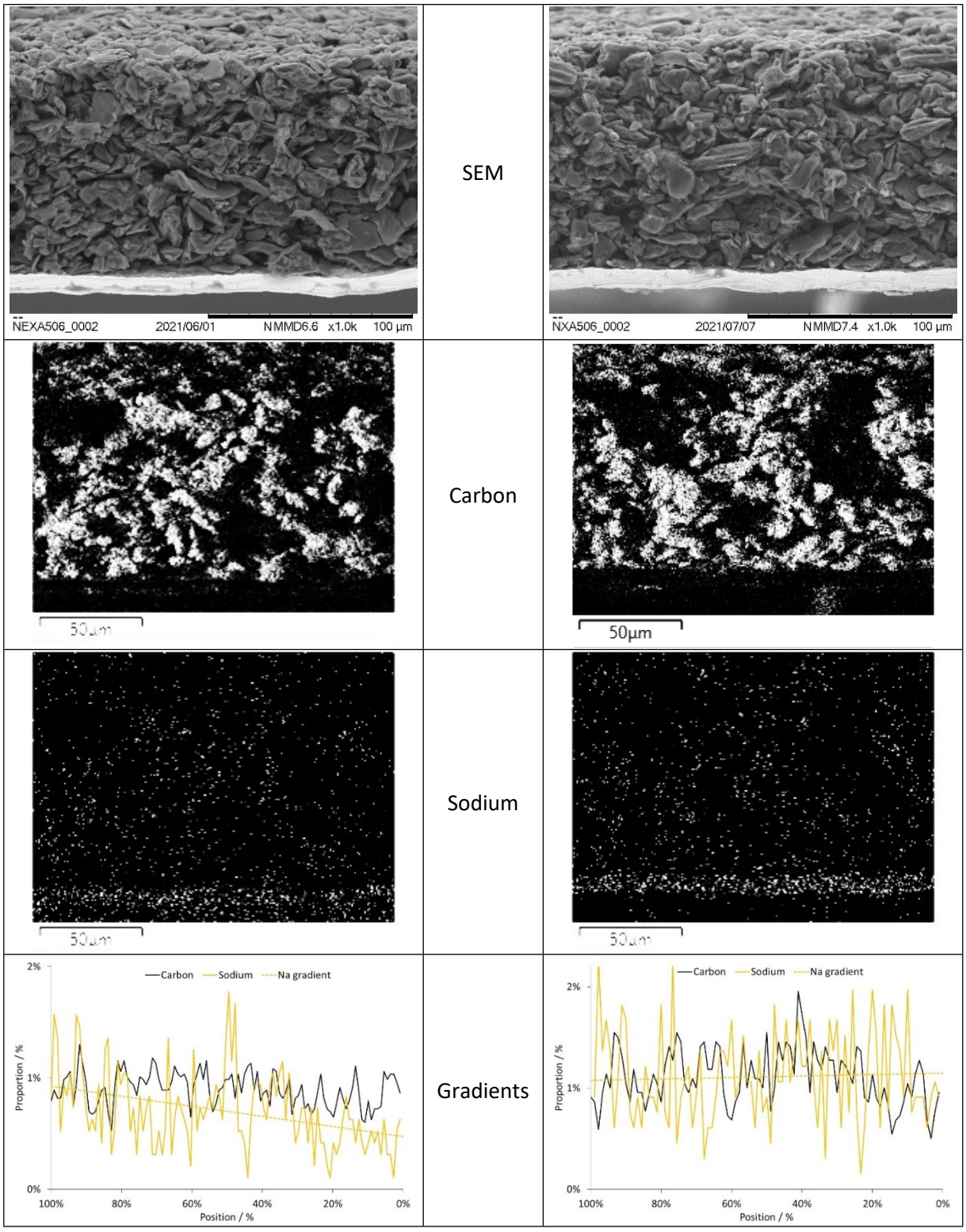


Figure S49. SEM Images And EDS Maps For Anode DoE (5_06B And 5_06C)

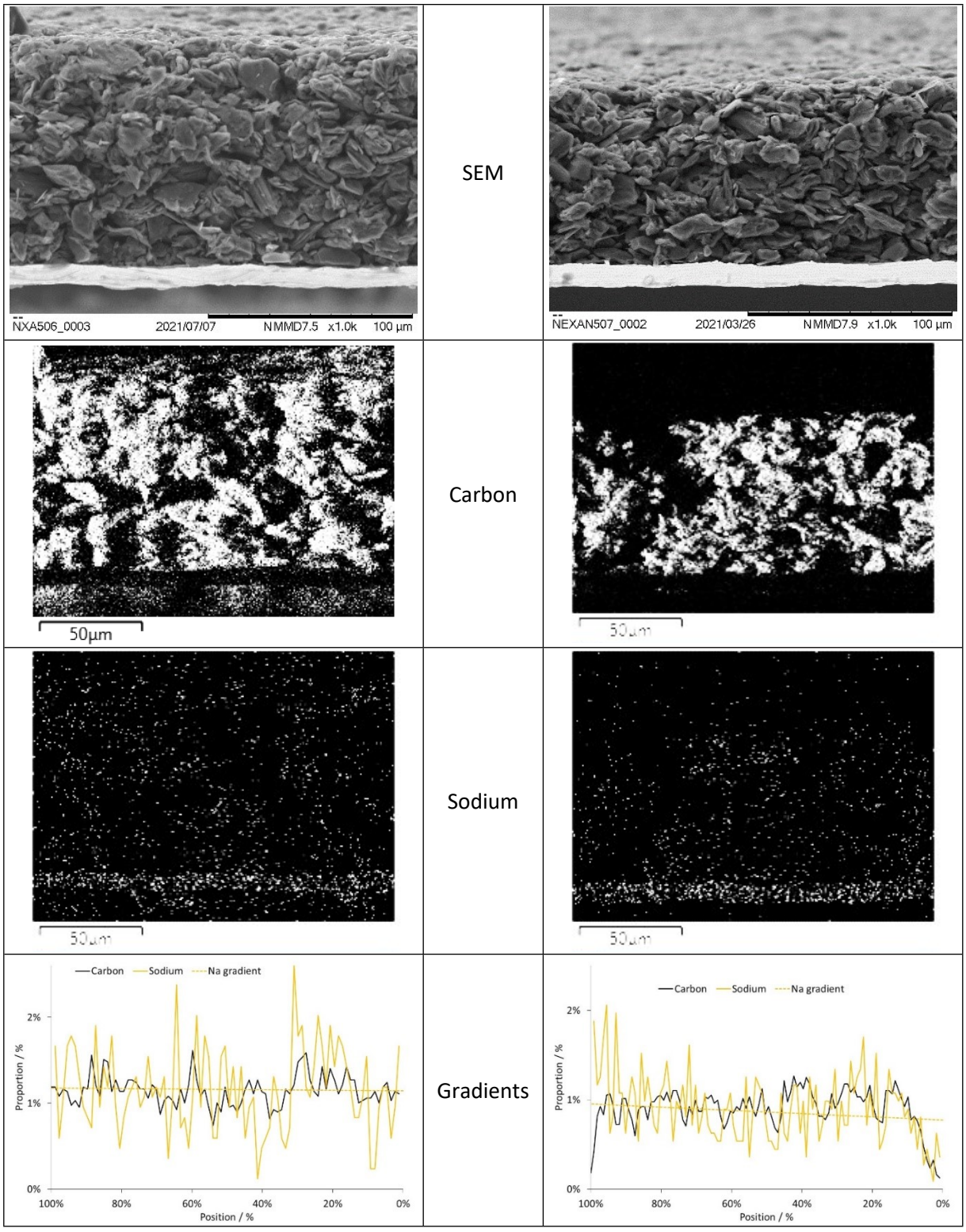


Figure S50. SEM Images And EDS Maps For Anode DoE (5_06D And 5_07)

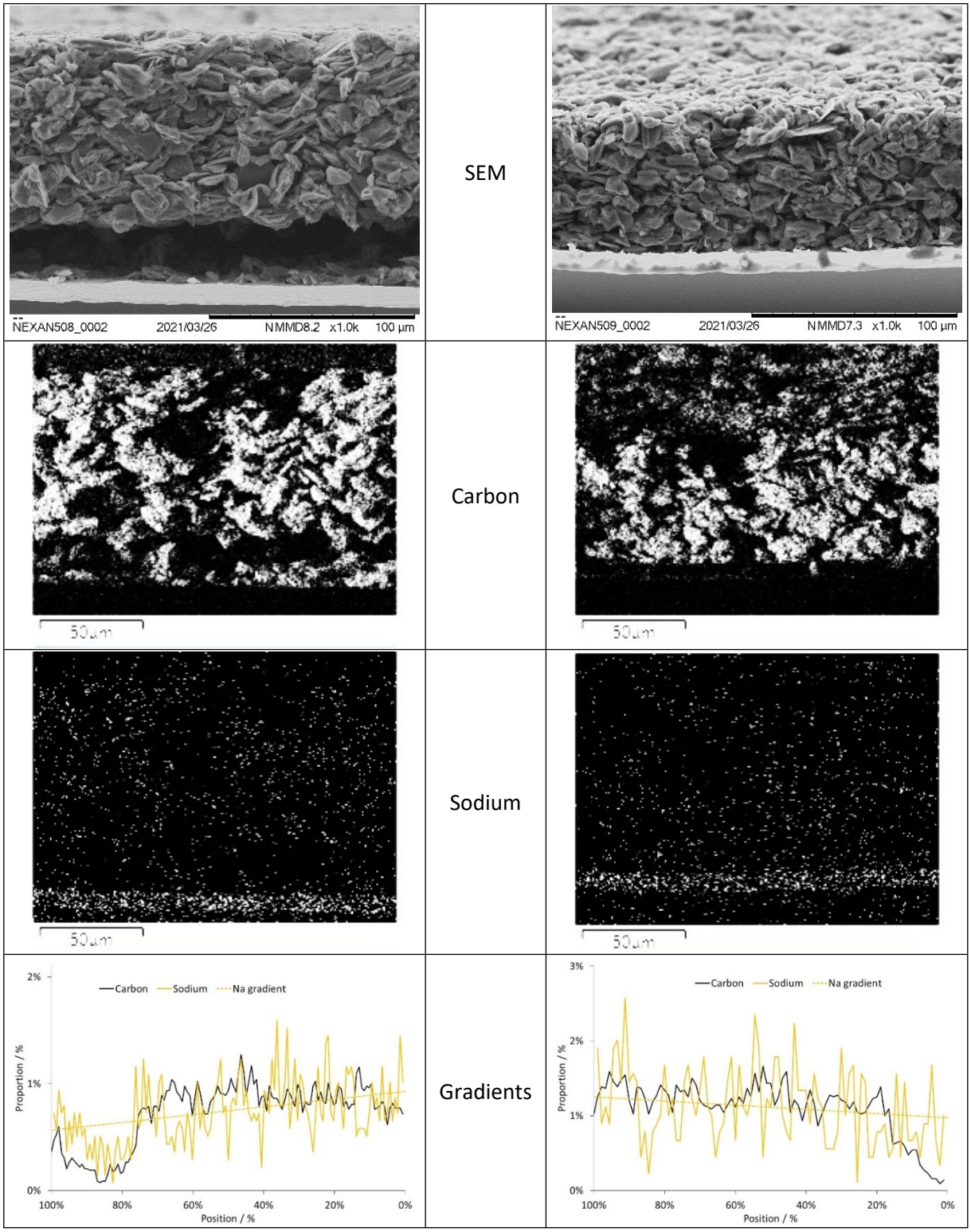


Figure S51. SEM Images And EDS Maps For Anode DoE (5_08 And 5_09)

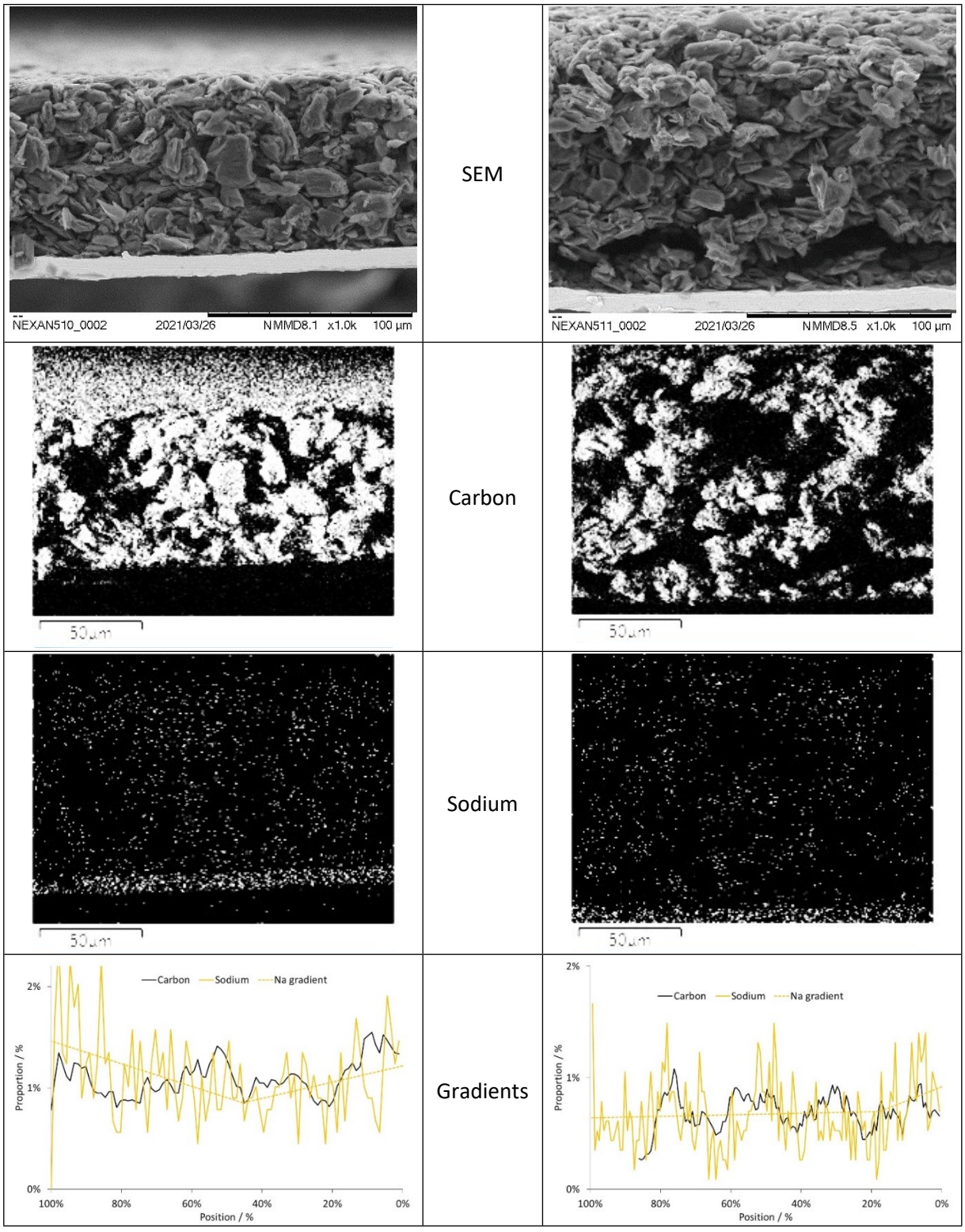


Figure S52. SEM Images And EDS Maps For Anode DoE (5_10 And 5_11)

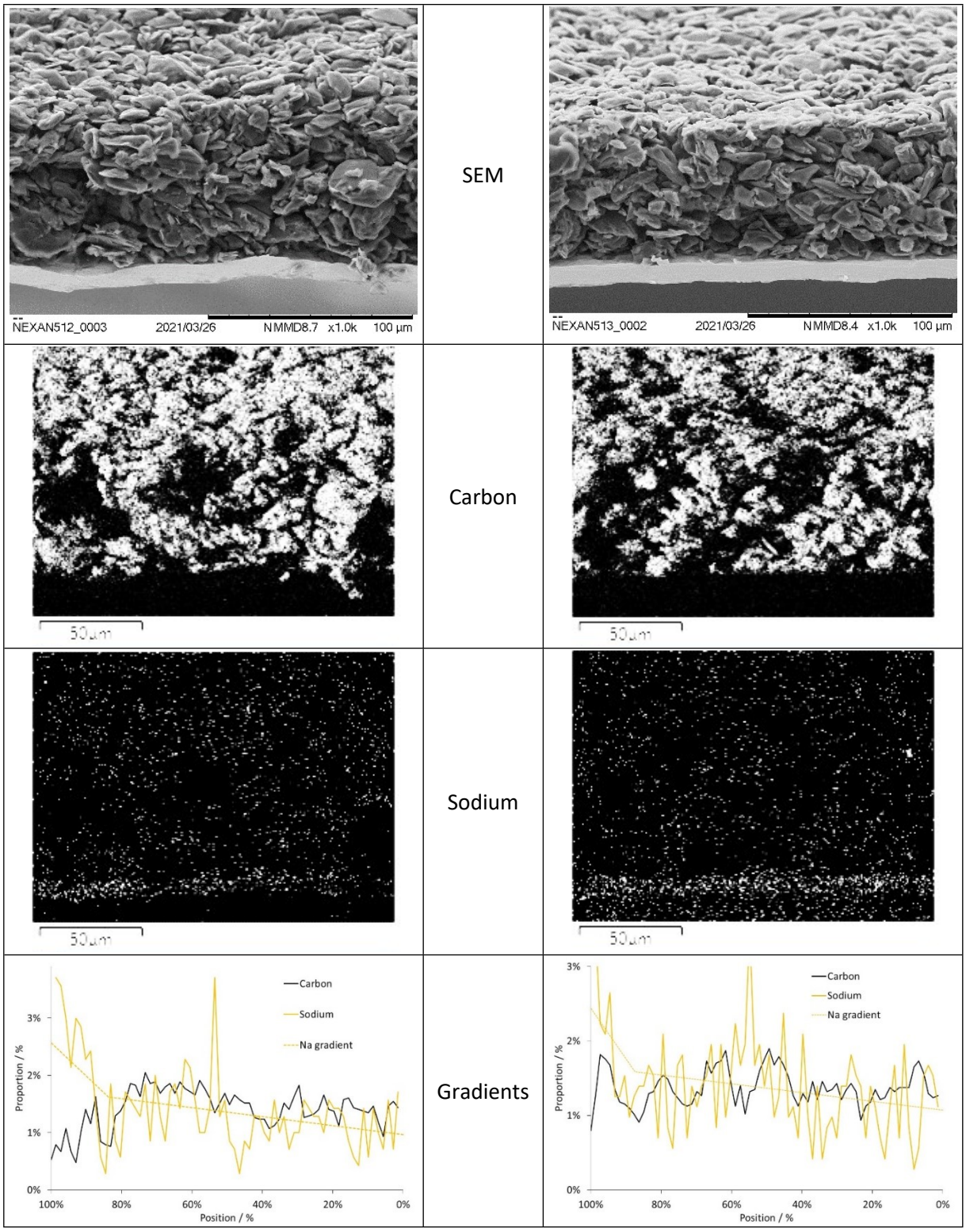


Figure S53. SEM Images And EDS Maps For Anode DoE (5_12 And 5_13)

Peclet Number Calculations

During the drying stage of lithium ion electrode coating, three processes can occur [10] :-

Diffusion	Mobile particles move to achieve a uniform distribution.
Evaporation	Mobile particles move up towards the surface, as the solvent evaporates.
Sedimentation	Mobile particles move down towards the metal foil.

The predominant mechanism depends on the Peclet numbers for evaporation and sedimentation :-

Peclet number for evaporation, P_e (evap) = $6\Pi\mu RH_oE$ / kT

Peclet number for sedimentation, P_e (sed) = $4\Pi R^4g(\rho_s - \rho_f)$ / 3kT

The definition of the symbols, and typical values for a cathode coating using PVDF / NMP [10] :-

R	particle radius	5 um (active), 22 nm (conductive carbon)	(m)
H_o	initial film thickness	200 um	(m)
E	rate of evaporation front reduction	0.95, 14.5, 58.3 x 10^{-9} at 25, 70 and 120 ^oC	m s^{-1}
k	Boltzmann coefficient	1.38 x 10^{-23}	J K^{-1}
T	Absolute temperature	298, 343, 393	K
μ	Solvent viscosity	10	Pa s (J m^{-3} s)
g	Acceleration due to gravity	9.8	m s^{-2}
ρ_s	Density of particles	4.75 (active), 1.78 (PVDF), 1.95 (carbon)	g m^{-3}
ρ_f	Density of surrounding fluid	1.03 (NMP)	g m^{-3}

Temperature		P_e (evaporation)		P_e (sedimentation)	
/ ^oC	/ K	Active	Carbon	Active	Carbon
25	298.15	4.4 x 10^4	1.9 x 10^2	2.3 x 10^4	8.7 x 10^{-6}
70	343.15	5.8 x 10^5	2.5 x 10^3	2.0 x 10^4	7.6 x 10^{-6}
120	393.15	2.0 x 10^6	8.9 x 10^3	1.8 x 10^4	6.6 x 10^{-6}

Based on these values, the active particles will sediment, but the conductive carbon will not. During the second stage of coating, carbon will move towards the surface, but this process is strongly temperature dependent. Solef® 5130 is a typical high molecular weight PVDF, used in cathode mixes. The molecular weight is 1.3 MDa and the density ~ 1.75 g cm^{-3}, which gives a notional particle radius of around 7 nm, and a P_e (evap) value of ~ 1500 at 100 ^oC.

NaCMC polymers with a molecular weight of 0.725 MDa and a density of ~ 1.0 g cm^{-3} also have a notional particle radius of around 7 nm. However, because of the lower coating temperature and solvent viscosity, the P_e (evap) is less than 10. Thus, there is much more competition between evaporation and diffusion.