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Supplementary Information

Examining Factors Affecting the Schiff base Post-synthetic Modification of UiO-66-NH_2 Films by Reactive Inkjet Printing

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1 General experimental

All chemicals used were of analytical grade and purchased from either Sigma Aldrich, VWR Australia or Ajax Finechem Pty Ltd. Films of UiO-66-NH_2 were prepared following the method described by Li et al.[1]

Inkjet printing was performed exactly as per our previous description.[2] Briefly, a computer controlled PixDro LP50 piezo-controlled drop-on-demand printer assembled with single 128 nozzle printhead (Type SE 128 AA; nozzle spacing of 502 microns; nozzle diameter 35 microns) with ink bottle connected to the pressure tube and voltage cable was used. The pressure and voltage of jetting were 18-21 mbar and 58-60 V, respectively. After every 10 layers, the active nozzle was checked for blockage.

Leica M205A and Leica DM6000 microscopes fitted with CCD cameras were used to obtain images of the morphology of the samples and resolution of the patterns. The Leica M205A was used at scales from 10 mm to 1 mm and the Leica DM6000 at scales from 500 µm to 25 µm.

A JEOL JSM-7500 was used to study morphologies of all the samples at 15 kV. Energy-Dispersive X-Ray Spectroscopy (EDS) data was recorded on a JEOL JSM-6490LV at 15 kV accelerating voltage. Samples were prepared by attaching the printed material onto a copper heel by a conductive carbon tape and silver paint. Samples for imaging were coated by thin platinum layer. Samples for EDS analysis were not coated.

TG-DSC traces were obtained using a NETZSCH STA 449 F3 Jupiter simultaneous thermogravimetric and differential scanning calorimeter. Data was processed using NETZSCH Proteus Thermal Analyser software, version 6.1.0. Traces were recorded by placing the sample (~5-10 mg) in a Pt pan and subjecting the material to the specified heating protocols reported. This was usually 35-1000 °C at 10 °C/min under a flow of O_2/N_2 (20:80) of 20 cm^3/min.

Powder X-ray diffraction (PXRD) patterns were recorded on a GBC-MMA X-ray diffractometer with samples mounted on the borosilicate glass substrate 2ϑ angle range of 5°-45° in 2θ with a step size of 0.05° at 1° per minute.

Gas adsorption studies were carried out at the Wollongong Isotope and Geochronology Laboratory using a Quantachrome Autosorb MP instrument and high purity nitrogen (99.999%) gas. Surface areas were determined using Brunauer-Emmett-Teller (BET) calculations.

[1] J. Li, F. Wu, L. Lin, Y. Guo, H. Liu and X. Zhang, *Chem. Eng. J.*, 2018, **333**, 146.

[2] F. Al-Ghazzawi, L. Conte, K. K. Wagner, C. Richardson and P. Wagner *Chem. Commun.*, 2021, **57**, 4706

2 List of Experiments

Exp.	Solvent	Repetitions	Temp. (°C)	Time (d)	S (Wt%)	s.d.
1	1-butanol	100	25	6	1.79	0.17
2	1,4-dioxane	100	25	0	0.86	0.10
3	1,4-dioxane	100	25	1	1.27	0.15
4	1,4-dioxane	100	25	2	2.13	0.35
5	1,4-dioxane	100	25	4	2.19	0.15
6	1,4-dioxane	100	25	6	2.74	0.24
7	1,4-dioxane	50	25	2	0.98	0.09
8	1,4-dioxane	200	25	2	3.17	0.24
9	1,4-dioxane	100	40	0	0.95	0.03
10	1,4-dioxane	100	40	1	1.42	0.10
11	1,4-dioxane	100	40	2	2.45	0.07
12	1,4-dioxane	100	70	0	1.34	0.08
13	1,4-dioxane	100	70	1	2.08	0.07
14	1,4-dioxane	100	70	2	3.19	0.15

3 Ink surface tensions and contact angles

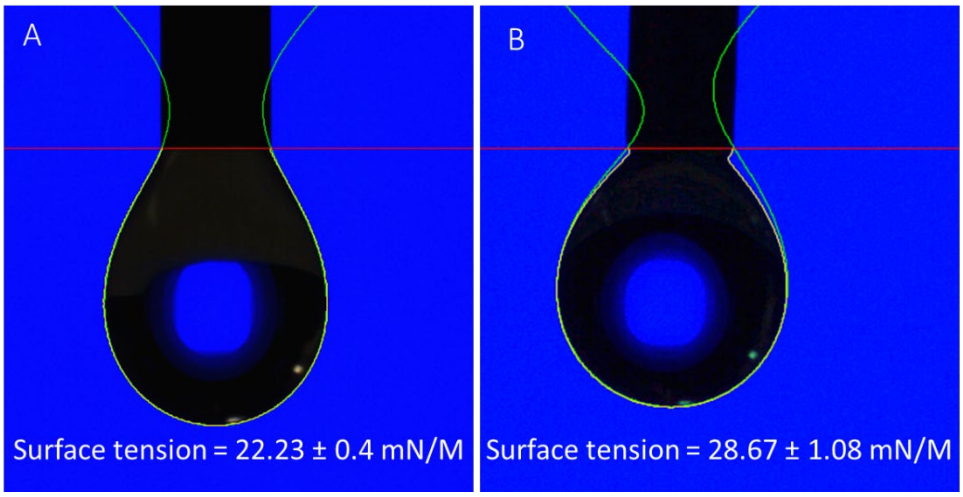

Figure S 1 Surface tensions of 0.1 M Th-CHO inks in (A) 1-butanol and (B) 1,4-dioxane.

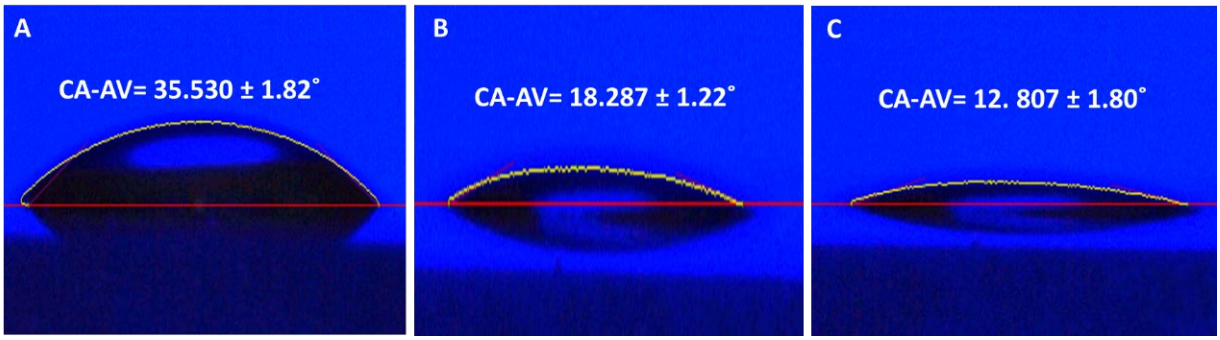

Figure S 2 Contact angles of (A) H_2O, (B) 0.1 M Ch-CHO in 1-butanol ink, and (C) 0.1 M Th-CHO in 1,4-dioxane ink on UiO-66-NH_2 films.

4 Optical and SEM-EDS imaging and scans of films

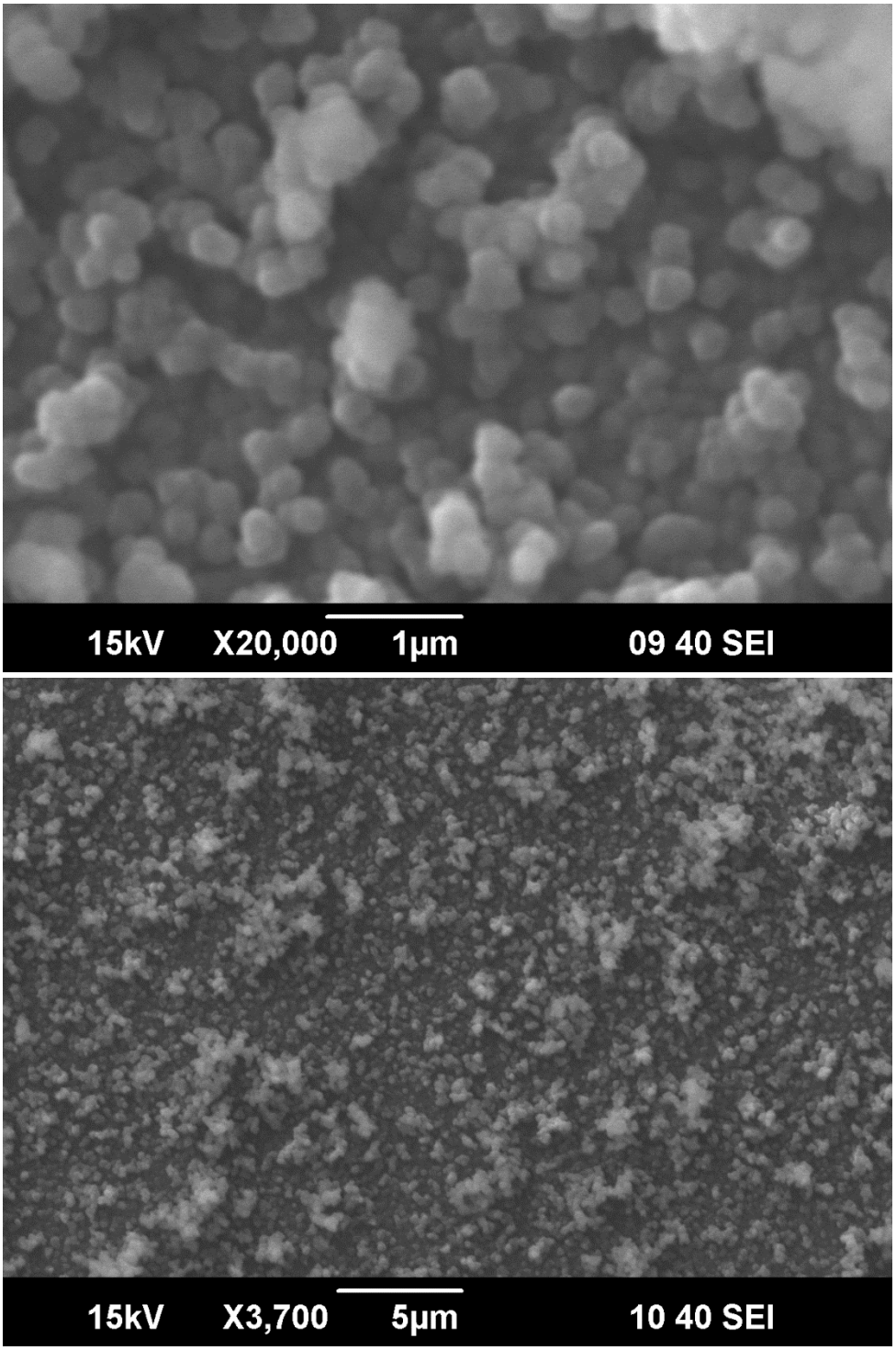

Figure S 3 SEM imaging of a representative UiO-66-NH_2 film.

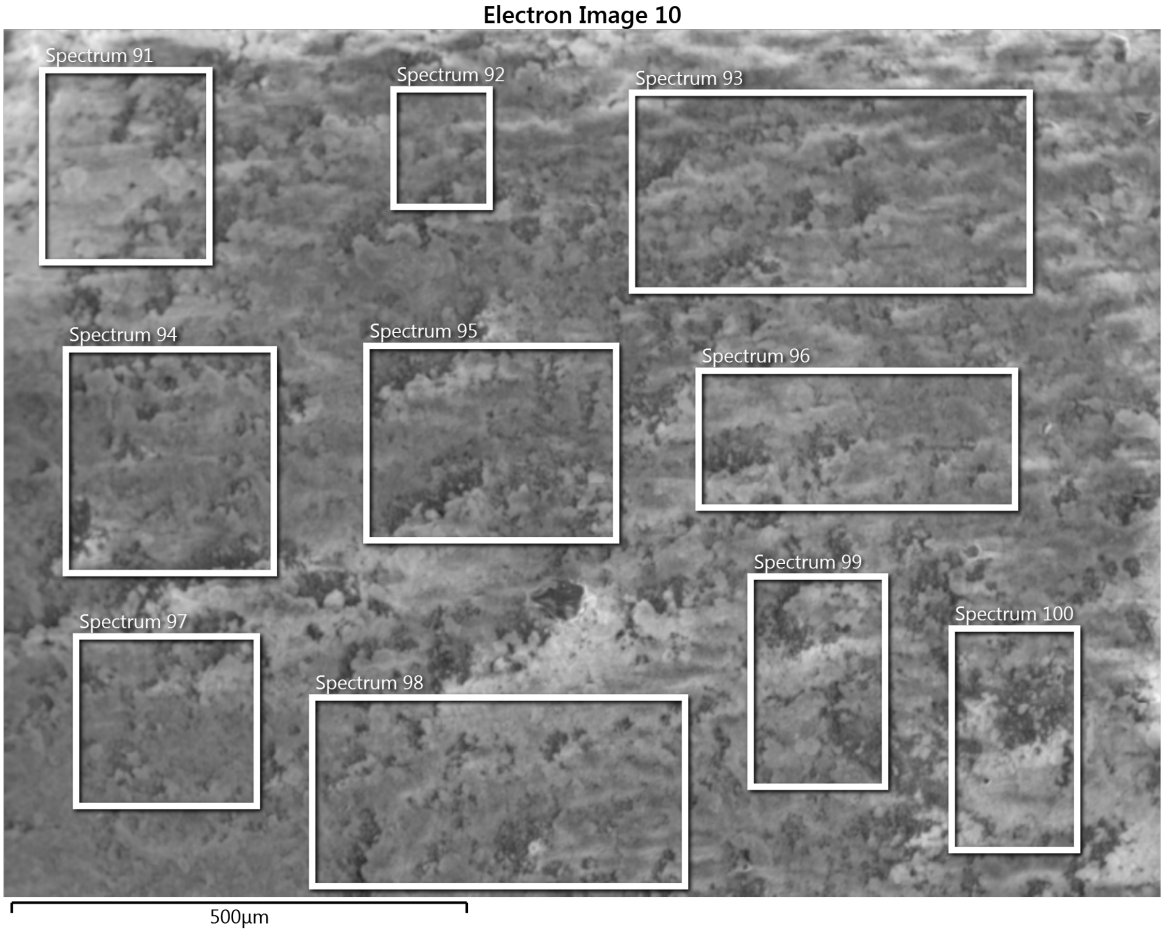

Figure S 4 This scan analysed all the elements in a UiO-66-NH_2 film. The signals of glass were removed from all other spectra.

Table S 1 Elemental analyses obtained from SEM-EDS scans of a representative film of UiO-66-NH_2.

Spectrum Label	Spectrum 100	Spectrum 91	Spectrum 92	Spectrum 93	Spectrum 94	Spectrum 95	Spectrum 96	Spectrum 97	Spectrum 98	Spectrum 99
C	39.33	41.96	40.05	42.29	37.11	37.70	39.08	40.51	42.08	40.64
O	28.80	28.15	28.49	27.81	29.76	29.79	29.20	28.37	28.15	28.78
Na	2.77	1.87	1.45	1.80	2.39	2.36	1.87	2.43	1.96	2.52
Mg	0.82	0.51	0.47	0.53	0.68	0.69	0.54	0.72	0.57	0.76
Al	0.28	0.20	0.17		0.24	0.23	0.19		0.20	0.19
Si	12.39	8.97	7.79	8.94	10.88	10.67	9.03	11.31	9.37	11.56
K	0.13	0.10		0.08				0.11	0.10	0.11
Ca	1.94	1.37	1.32	1.35	1.76	1.66	1.38	1.84	1.47	1.77
Br				0.45				0.45		
Zr	13.53	16.88	20.24	16.75	17.19	16.91	18.71	14.26	16.11	13.67
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	Na	Mg	Al	Si	K	Ca	Br	Zr
Max	42.29	29.79	2.77	0.82	0.28	12.39	0.13	1.94	0.45	20.24
Min	37.11	27.81	1.45	0.47	0.17	7.79	0.08	1.32	0.45	13.53
Average	40.07	28.73	2.14	0.63		10.09		1.59		16.43
Standard Deviation	1.79	0.68	0.41	0.12		1.47		0.23		2.15

4.1 **UiO-66-NH_2**

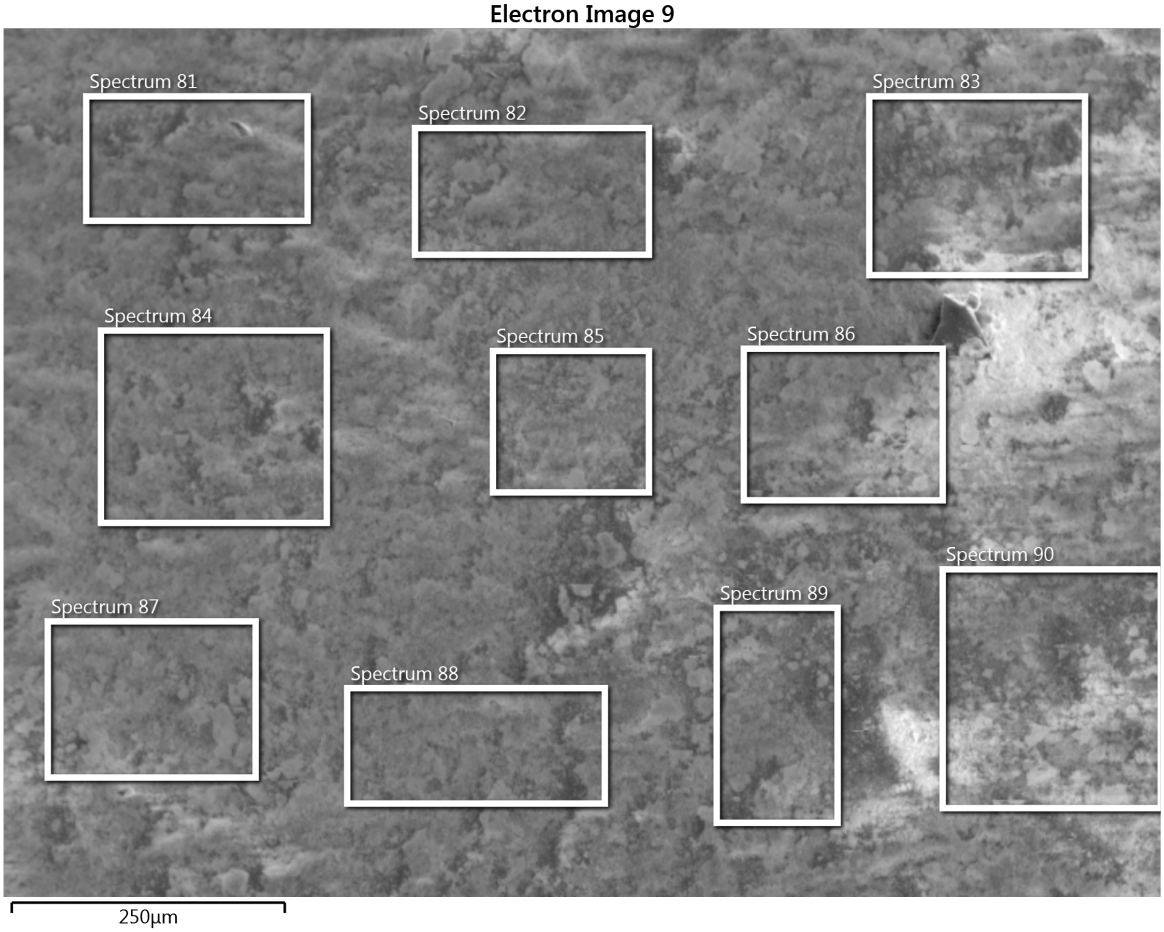

Figure S 5 This scan is UiO-66-NH_2 film with elements of glass removed from the analysis.

Table S 2 Elemental analyses obtained from SEM-EDS scans of a representative film of UiO-66-NH_2.

Spectrum Label	Spectrum 90	Spectrum 81	Spectrum 82	Spectrum 83	Spectrum 84	Spectrum 85	Spectrum 86	Spectrum 87	Spectrum 88	Spectrum 89
C	37.69	39.34	40.08	37.30	39.42	38.64	40.51	39.53	39.07	38.82
O	40.29	36.59	34.71	40.25	36.43	37.83	33.76	36.24	37.02	37.75
Zr	22.02	24.07	25.21	22.46	24.15	23.54	25.73	24.23	23.92	23.43
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	Zr
Max	40.51	40.29	25.73
Min	37.30	33.76	22.02
Average	39.04	37.09	23.87
Standard Deviation	0.99	2.09	1.12

4.2 Exp. 1: 1-Butanol ink printed (100 reps) and matured for 6 days at 25 °C.

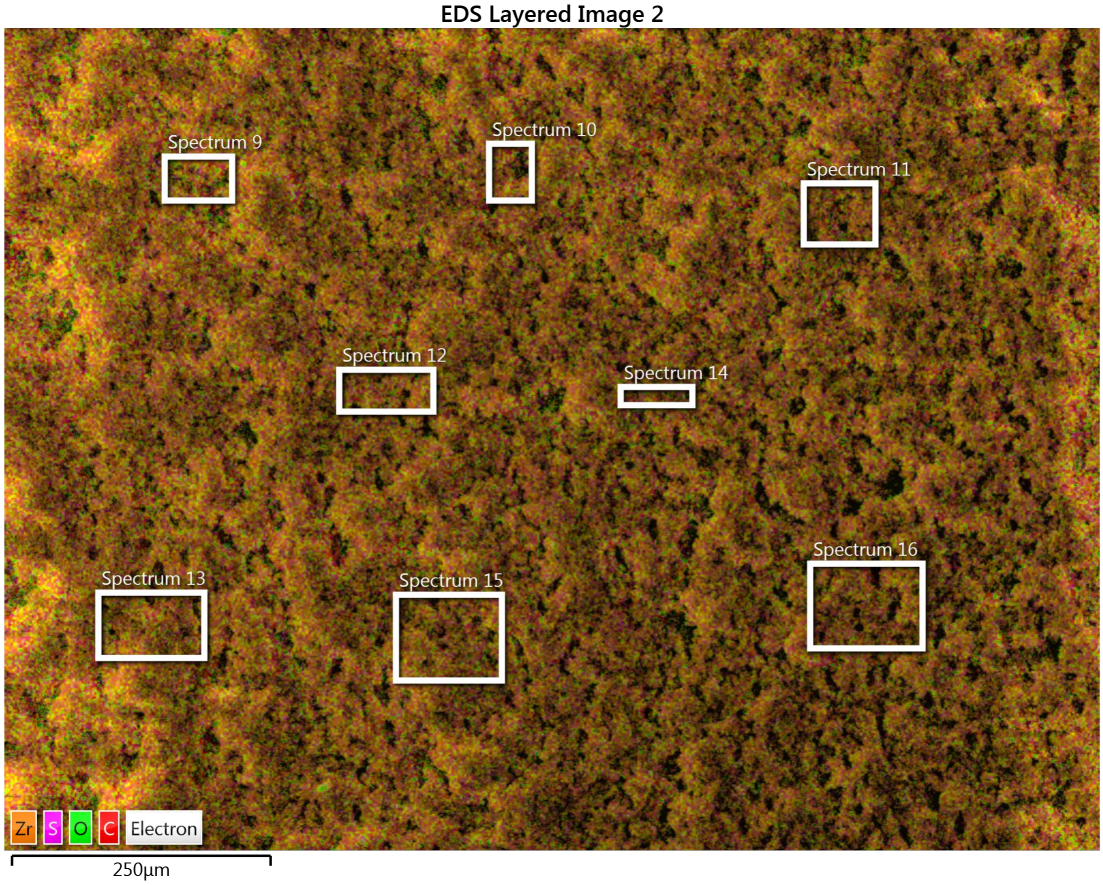

Figure S 6

Table S 3 Elemental EDS vales for the sections examined in the film shown in Figure S6.

Spectrum Label	Spectrum 9	Spectrum 10	Spectrum 11	Spectrum 12	Spectrum 13	Spectrum 14	Spectrum 15	Spectrum 16
C	43.99	43.76	44.38	44.10	44.19	43.49	44.02	44.25
O	30.20	28.97	28.35	28.90	27.89	26.63	29.39	28.64
S	1.49	1.89	1.95	1.69	1.73	2.02	1.72	1.82
Zr	24.32	25.38	25.33	25.31	26.19	27.85	24.87	25.28
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	44.38	30.20	2.02	27.85
Min	43.49	26.63	1.49	24.32
Average	44.02	28.62	1.79	25.57
Standard Deviation	0.28	1.06	0.17	1.06

4.3 **Exp 2: Dioxane ink printed (100 reps) and matured for 0 days at 25 °C.**

No image is provided due to corruption of the image file. This does not impact the data which were acquired in the measurement zones that is provided in the table below.

Table S 4 Elemental EDS vales for the sections examined in the film.

Spectrum Label	Spectrum 24	Spectrum 25	Spectrum 26	Spectrum 27	Spectrum 28	Spectrum 29	Spectrum 30	Spectrum 31
C	42.91	43.48	42.60	44.45	42.55	43.02	44.11	44.55
O	39.44	36.93	39.18	33.20	38.99	38.59	29.29	33.87
S	0.82	0.80	0.76	1.04	0.83	0.77	0.99	0.85
Zr	16.83	18.78	17.46	21.31	17.63	17.63	25.61	20.73
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	44.55	39.44	1.04	25.61
Min	42.55	29.29	0.76	16.83
Average	43.46	36.19	0.86	19.50
Standard Deviation	0.82	3.70	0.10	2.95

4.4 **Exp. 3: Dioxane ink printed (100 reps) and matured for 1 day at 25 °C.**

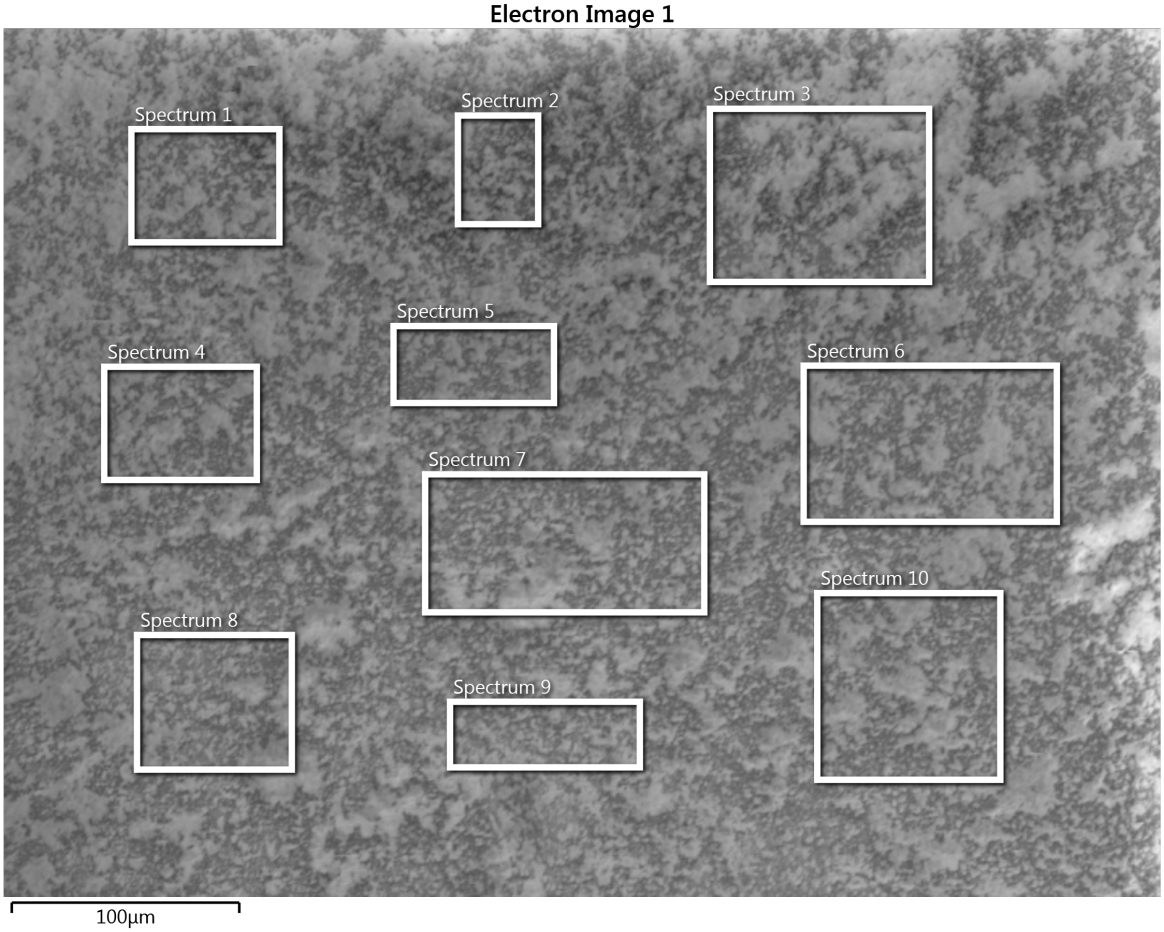

Figure S 7

Table S 5 Elemental EDS vales for the sections examined in the film in Figure S 7.

Spectrum Label	Spectrum 1	Spectrum 2	Spectrum 3	Spectrum 4	Spectrum 5	Spectrum 6	Spectrum 7	Spectrum 8	Spectrum 9	Spectrum 10
C	48.36	45.26	46.37	48.76	48.80	47.00	48.29	48.93	48.87	48.38
O	35.95	38.12	34.11	35.70	36.47	36.58	36.56	35.99	35.50	35.26
S	1.29	1.53	1.50	1.30	1.28	1.18	1.13	1.27	1.14	1.09
Zr	14.40	15.09	18.03	14.24	13.45	15.23	14.02	13.81	14.49	15.27
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	48.93	38.12	1.53	18.03
Min	45.26	34.11	1.09	13.45
Average	47.90	36.02	1.27	14.80
Standard Deviation	1.26	1.05	0.15	1.29

4.5 Exp. 4: Dioxane ink printed (100 reps) and matured for 2 days at 25 °C.

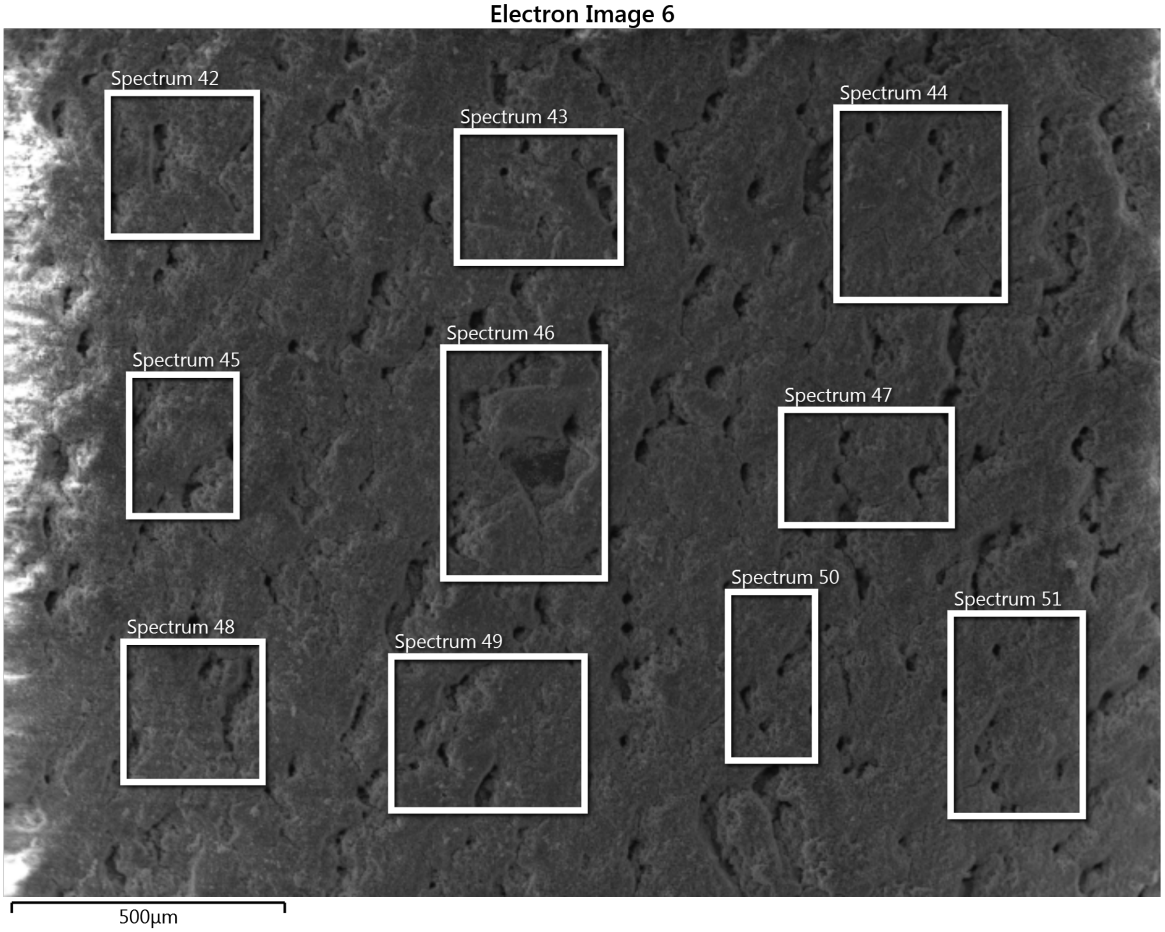

Figure S 8

Table S 6 Elemental EDS vales for the sections examined in the film in Figure S8.

Spectrum Label	Spectrum 51	Spectrum 42	Spectrum 43	Spectrum 44	Spectrum 45	Spectrum 46	Spectrum 47	Spectrum 48	Spectrum 49	Spectrum 50
C	41.53	41.60	41.50	41.85	41.56	41.44	41.50	41.94	41.41	41.59
O	28.66	28.60	28.67	28.24	27.77	29.30	28.45	27.56	27.92	28.70
S	2.35	1.96	2.22	2.41	1.99	2.15	2.47	1.36	1.84	2.51
Zr	27.46	27.84	27.61	27.50	28.68	27.12	27.57	29.14	28.83	27.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	41.94	29.30	2.51	29.14
Min	41.41	27.56	1.36	27.12
Average	41.59	28.39	2.13	27.90
Standard Deviation	0.17	0.52	0.35	0.72

4.6 Exp. 5: Dioxane ink printed (100 reps) and matured for 4 days at 25 °C.

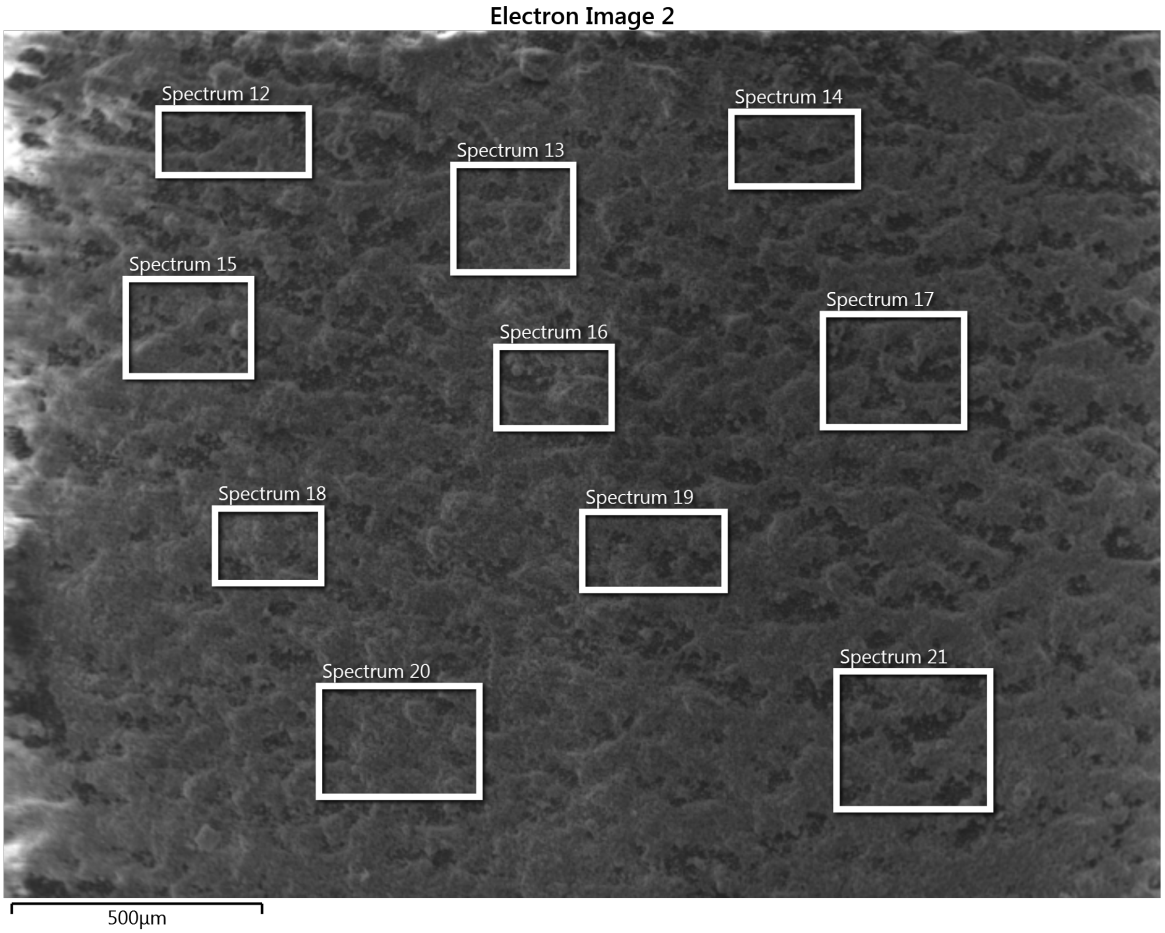

Figure S 9

Table S 7 Elemental EDS vales for the sections examined in the film in Figure S 9.

Spectrum Label	Spectrum 21	Spectrum 12	Spectrum 13	Spectrum 14	Spectrum 15	Spectrum 16	Spectrum 17	Spectrum 18	Spectrum 19	Spectrum 20
C	43.10	43.22	43.58	44.21	43.12	43.70	43.32	43.25	44.85	42.59
O	31.89	31.21	30.18	30.97	30.87	30.64	31.25	30.24	30.58	29.76
S	2.16	2.08	2.09	2.23	2.13	2.36	2.10	2.09	2.53	2.17
Zr	22.85	23.49	24.14	22.59	24.88	23.30	23.33	24.42	22.04	25.48
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	44.85	31.89	2.53	25.48
Min	42.59	29.76	2.08	22.04
Average	43.50	30.66	2.19	23.65
Standard Deviation	0.64	0.68	0.15	1.07

4.7 Exp. 6: Dioxane ink printed (100 reps) and matured for 6 days at 25 °C.

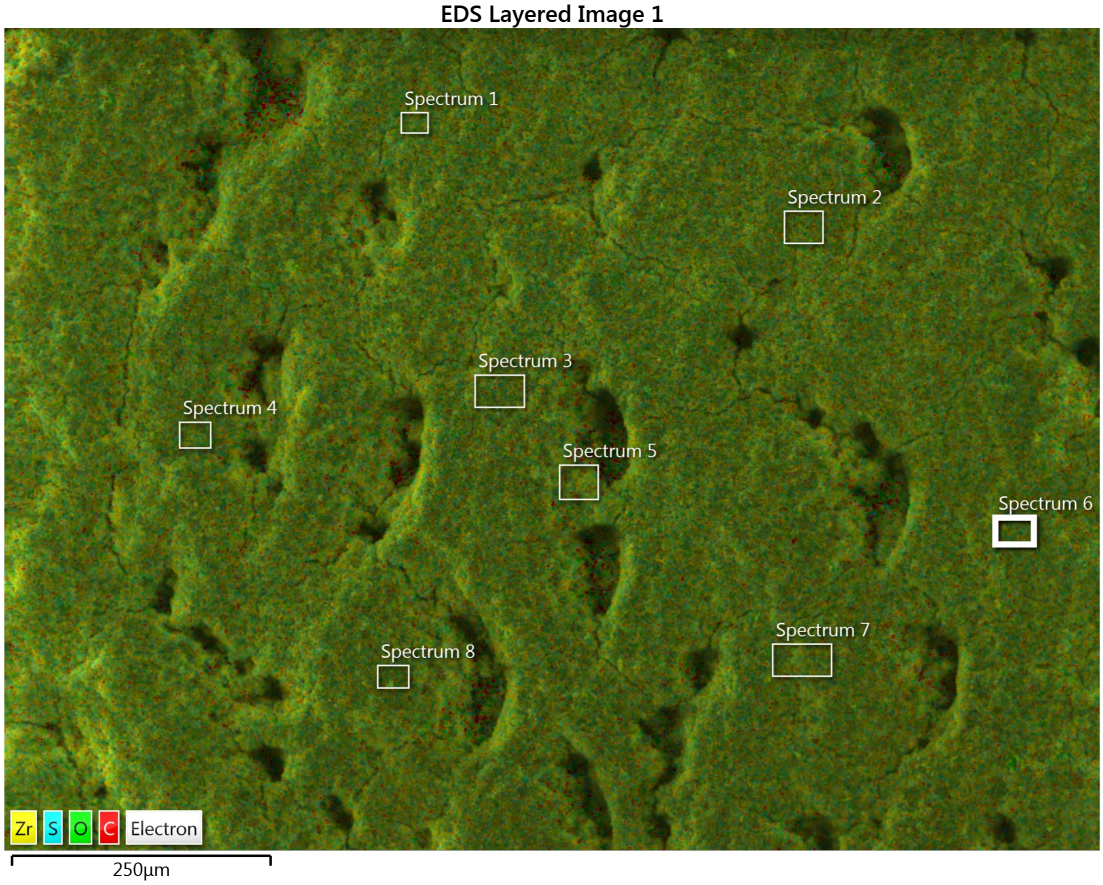

Figure S 10

Table S 8 Elemental EDS vales for the sections examined in the film in Figure S 10.

Spectrum Label	Spectrum 8	Spectrum 1	Spectrum 2	Spectrum 3	Spectrum 4	Spectrum 5	Spectrum 6	Spectrum 7
C	42.63	44.06	43.44	42.65	42.86	42.67	42.94	43.53
O	27.19	31.16	29.01	28.21	28.68	29.11	30.13	30.42
S	2.68	2.62	2.77	3.16	3.01	2.41	2.75	2.54
Zr	27.50	22.15	24.78	25.99	25.46	25.80	24.18	23.51
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	44.06	31.16	3.16	27.50
Min	42.63	27.19	2.41	22.15
Average	43.10	29.24	2.74	24.92
Standard Deviation	0.52	1.28	0.24	1.65

4.8 **Exp. 7: Dioxane ink printed (50 reps) and matured for 2 days at 25 °C.**

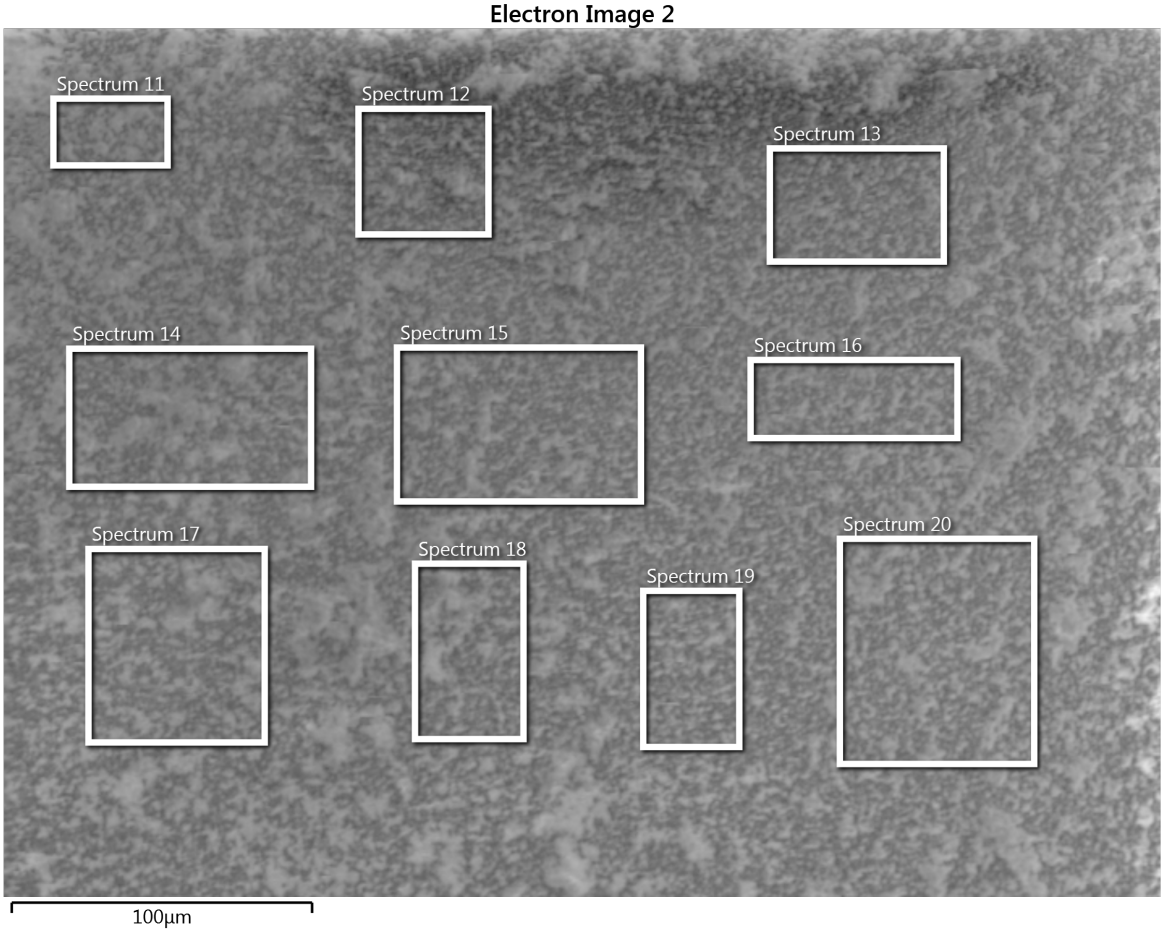

Figure S 11

Table S 9 Elemental EDS vales for the sections examined in the film in Figure S11.

Spectrum Label	Spectrum 20	Spectrum 11	Spectrum 12	Spectrum 13	Spectrum 14	Spectrum 15	Spectrum 16	Spectrum 17	Spectrum 18	Spectrum 19
C	50.16	51.27	51.32	52.26	49.63	51.03	51.89	48.72	50.97	51.07
O	35.47	33.30	34.41	34.83	33.97	35.52	35.32	35.79	34.80	35.33
S	0.95	1.10	1.01	0.89	1.15	0.90	0.89	1.05	0.95	0.91
Zr	13.41	14.33	13.26	12.02	15.25	12.55	11.90	14.44	13.28	12.69
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	52.26	35.79	1.15	15.25
Min	48.72	33.30	0.89	11.90
Average	50.83	34.88	0.98	13.31
Standard Deviation	1.06	0.78	0.09	1.09

4.9 **Exp. 8: Dioxane ink printed (200 reps) and matured for 2 days at 25 °C.**

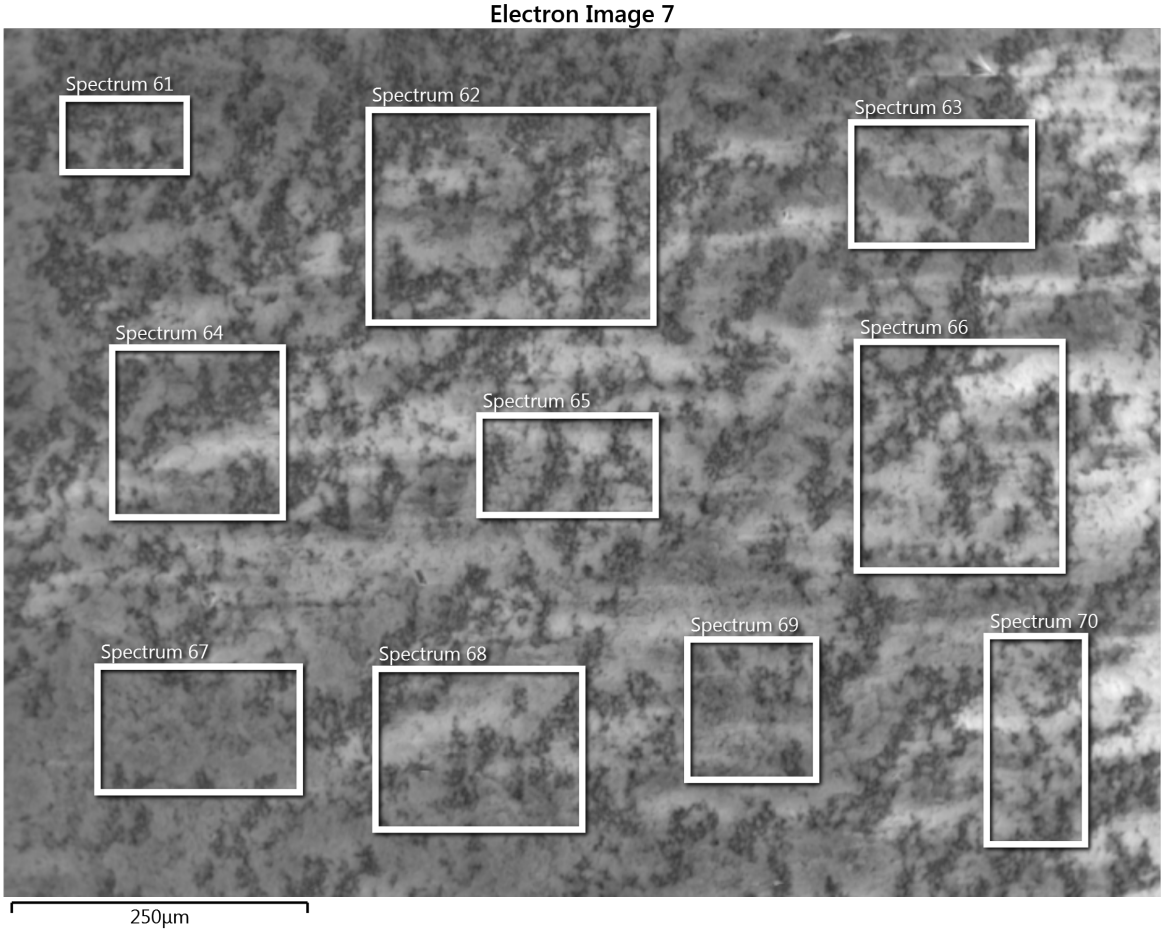

Figure S 12

Table S 10 Elemental EDS vales for the sections examined in the film in Figure S12.

Spectrum Label	Spectrum 70	Spectrum 61	Spectrum 62	Spectrum 63	Spectrum 64	Spectrum 65	Spectrum 66	Spectrum 67	Spectrum 68	Spectrum 69
C	41.22	42.46	41.33	42.17	41.01	40.02	41.12	42.72	41.07	43.26
O	34.33	32.84	34.33	29.79	33.45	35.62	33.66	28.67	33.37	29.30
S	2.95	2.99	3.00	3.52	3.15	2.92	3.15	3.46	3.09	3.51
Zr	21.51	21.72	21.35	24.51	22.40	21.44	22.06	25.15	22.47	23.92
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	43.26	35.62	3.52	25.15
Min	40.02	28.67	2.92	21.35
Average	41.64	32.54	3.17	22.65
Standard Deviation	0.98	2.40	0.24	1.38

4.10 **Exp. 9: Dioxane ink printed (100 reps) and matured for 0 days at 40 °C.**

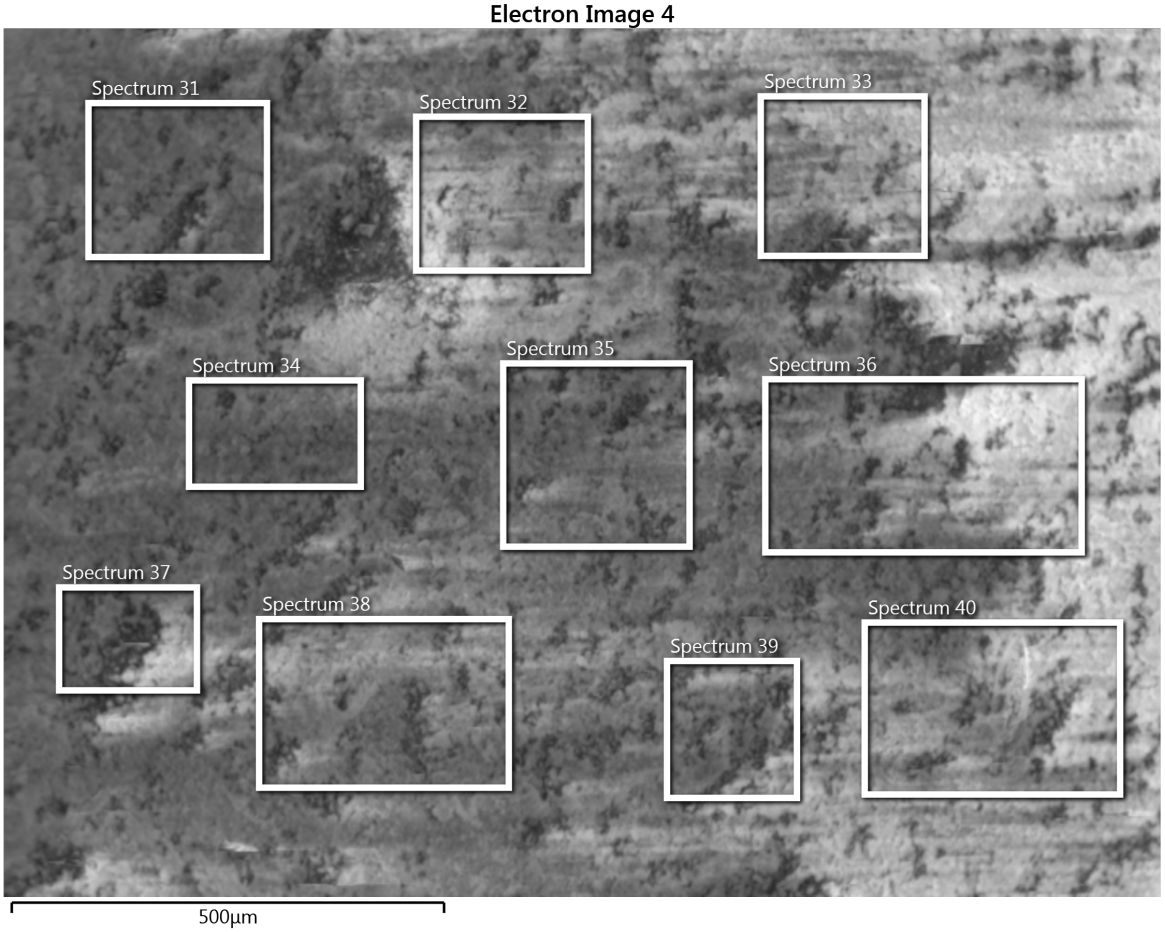

Figure S 13

Table S 11 Elemental EDS vales for the sections examined in the film in Figure S 13.

Spectrum Label	Spectrum 40	Spectrum 31	Spectrum 32	Spectrum 33	Spectrum 34	Spectrum 35	Spectrum 36	Spectrum 37	Spectrum 38	Spectrum 39
C	40.91	40.11	40.48	41.26	41.59	40.64	40.25	38.58	40.42	39.03
O	34.13	34.11	33.17	31.29	31.01	34.10	33.08	36.45	34.04	37.07
S	0.93	1.01	0.92	0.97	0.98	0.95	0.94	0.94	0.99	0.92
Zr	24.03	24.77	25.42	26.48	26.43	24.32	25.73	24.04	24.55	22.98
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	41.59	37.07	1.01	26.48
Min	38.58	31.01	0.92	22.98
Average	40.33	33.84	0.95	24.87
Standard Deviation	0.93	1.92	0.03	1.13

4.11 **Exp. 10: Dioxane ink printed (100 reps) and matured for 1 days at 40 °C.**

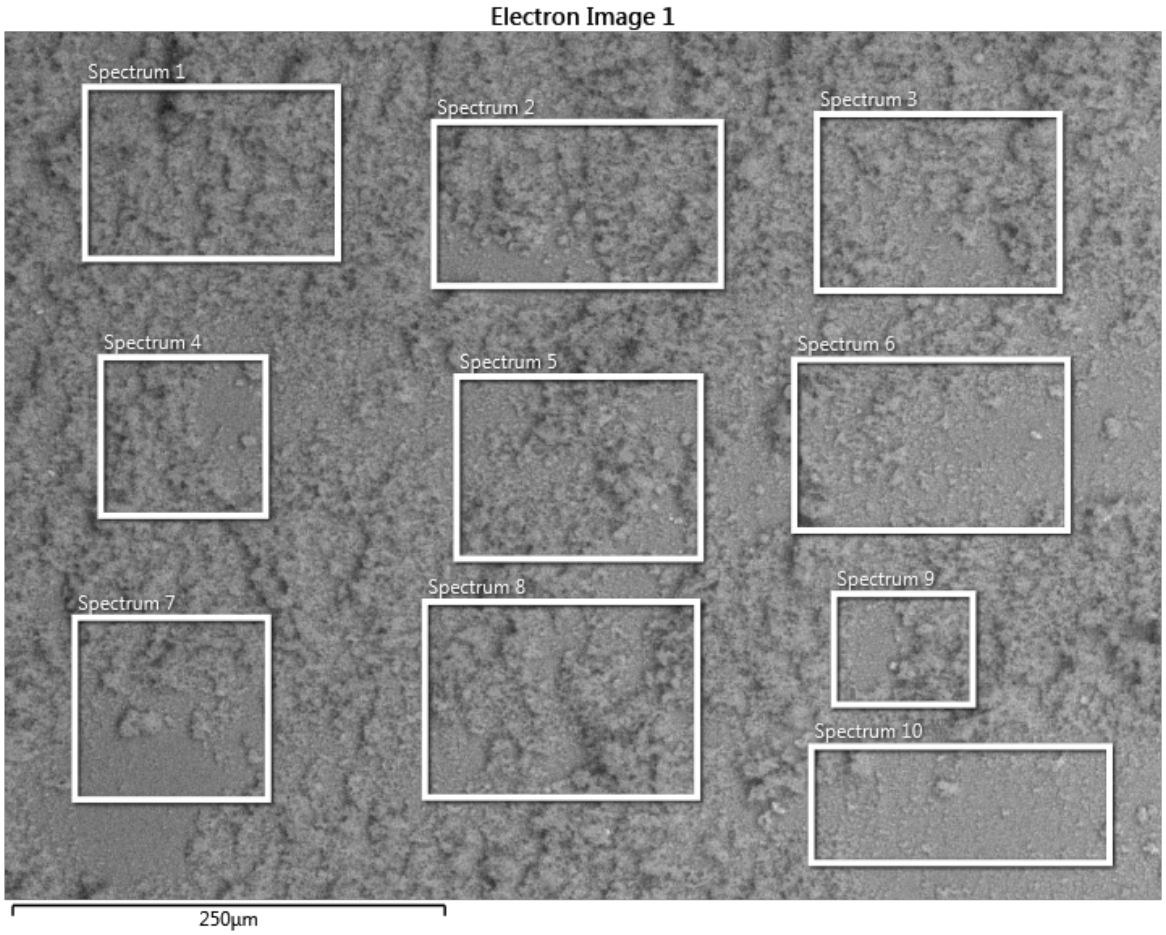

Figure S 14

Table S 12 Elemental EDS vales for the sections examined in the film in Figure S 14.

Spectrum Label	Spectrum 10	Spectrum 1	Spectrum 2	Spectrum 3	Spectrum 4	Spectrum 5	Spectrum 6	Spectrum 7	Spectrum 8	Spectrum 9
C	32.81	38.21	37.73	36.91	37.12	37.41	35.33	34.86	38.00	36.30
O	46.48	38.35	39.36	40.46	40.50	39.58	43.15	43.49	38.88	41.09
S	1.28	1.53	1.50	1.49	1.50	1.53	1.26	1.32	1.45	1.39
Zr	19.44	21.92	21.41	21.14	20.88	21.48	20.26	20.34	21.67	21.22
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	38.21	46.48	1.53	21.92
Min	32.81	38.35	1.26	19.44
Average	36.47	41.13	1.42	20.97
Standard Deviation	1.69	2.53	0.10	0.76

4.12 **Exp. 11: Dioxane ink printed (100 reps) and matured for 2 days at 40 °C.**

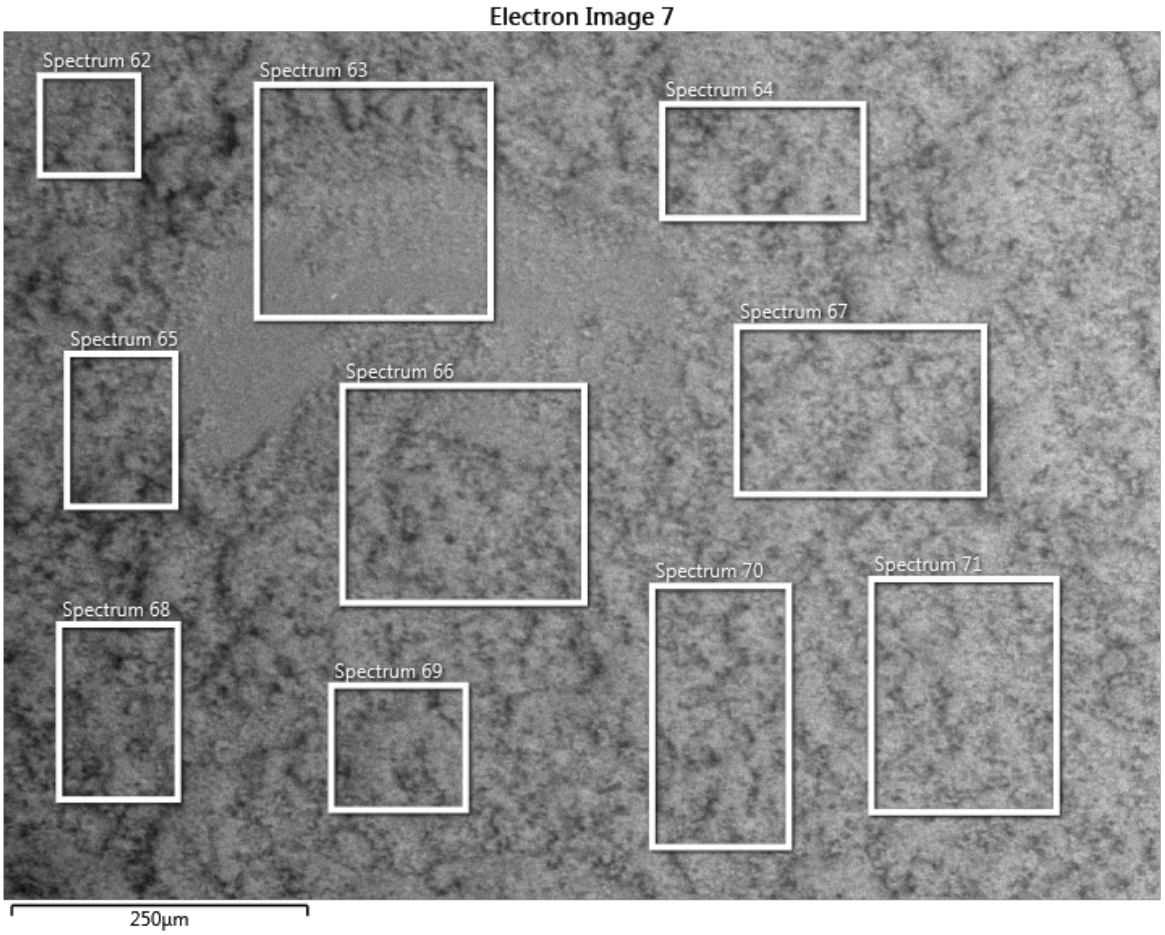

Figure S 15

Table S 13 Elemental EDS vales for the sections examined in the film in Figure S 15.

Spectrum Label	Spectrum 71	Spectrum 62	Spectrum 63	Spectrum 64	Spectrum 65	Spectrum 66	Spectrum 67	Spectrum 68	Spectrum 69	Spectrum 70
C	41.66	43.01	40.67	42.68	44.10	43.34	42.48	45.05	44.32	43.31
O	31.73	32.31	34.73	30.98	30.27	30.45	31.28	28.98	28.85	29.82
S	2.52	2.42	2.33	2.50	2.35	2.49	2.45	2.41	2.52	2.47
Zr	24.09	22.27	22.27	23.84	23.28	23.71	23.79	23.56	24.31	24.39
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	45.05	34.73	2.52	24.39
Min	40.67	28.85	2.33	22.27
Average	43.06	30.94	2.45	23.55
Standard Deviation	1.29	1.74	0.07	0.75

4.13 **Exp. 12: Dioxane ink printed (100 reps) and matured for 0 days at 70 °C.**

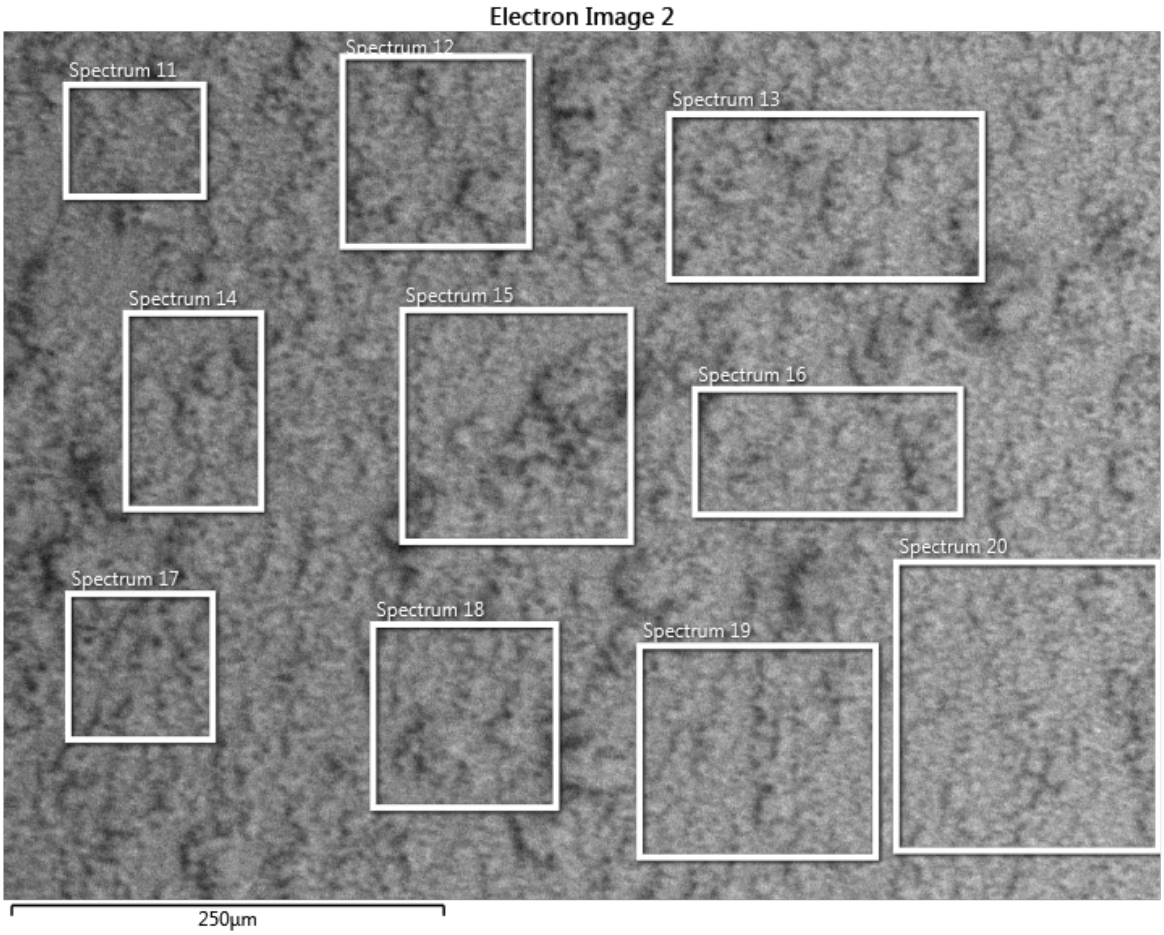

Figure S 16

Table S 14 Elemental EDS vales for the sections examined in the film in Figure S 16.

Spectrum Label	Spectrum 20	Spectrum 11	Spectrum 12	Spectrum 13	Spectrum 14	Spectrum 15	Spectrum 16	Spectrum 17	Spectrum 18	Spectrum 19
C	40.79	41.50	42.10	41.73	41.87	42.06	41.54	41.90	41.44	41.69
O	34.80	34.87	33.70	33.81	34.40	33.65	33.87	33.46	33.69	33.82
S	1.36	1.23	1.25	1.38	1.21	1.40	1.44	1.29	1.40	1.39
Zr	23.05	22.40	22.94	23.08	22.51	22.89	23.15	23.34	23.47	23.09
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	42.10	34.87	1.44	23.47
Min	40.79	33.46	1.21	22.40
Average	41.66	34.01	1.34	22.99
Standard Deviation	0.38	0.50	0.08	0.33

4.14 **Exp. 13: Dioxane ink printed (100 reps) and matured for 1 days at 70 °C.**

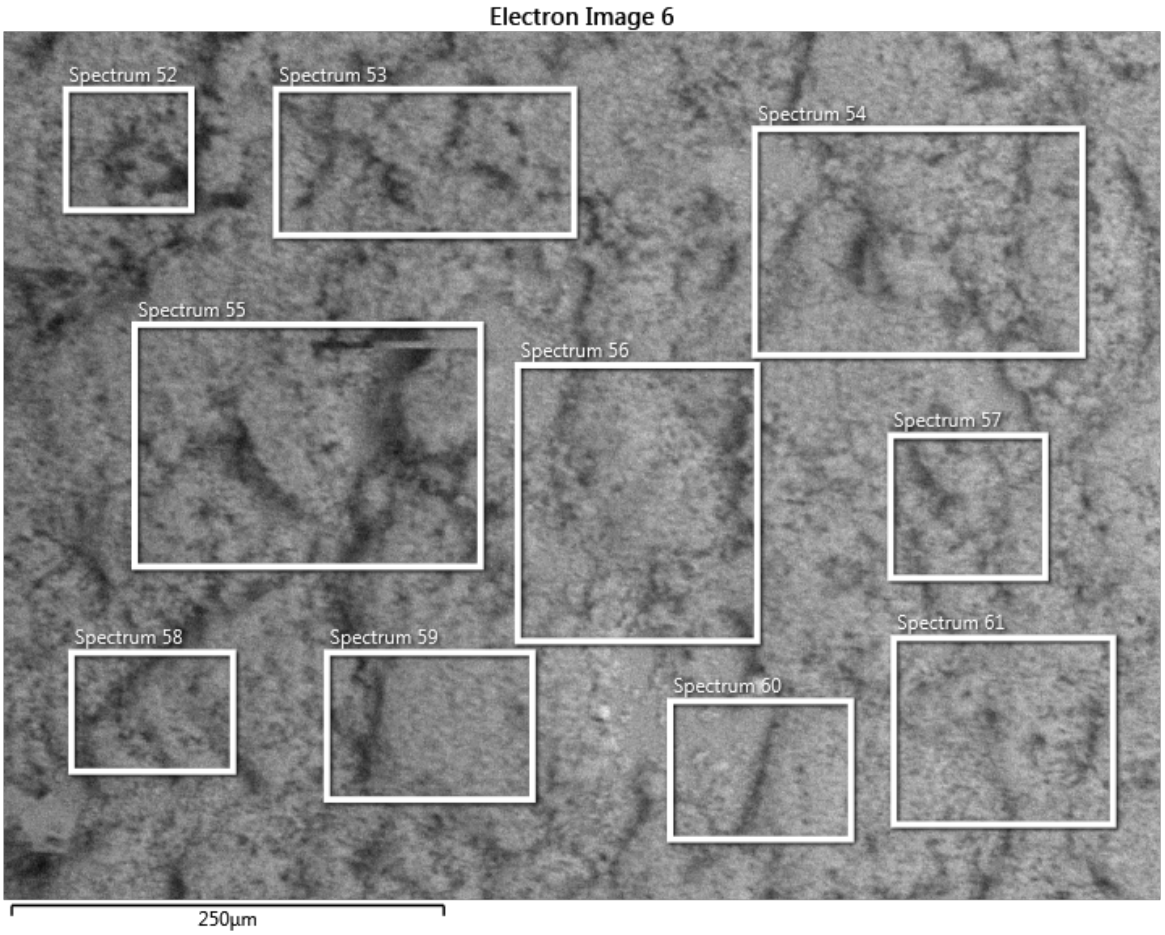

Figure S 17

Table S 15 Elemental EDS vales for the sections examined in the film in Figure S 17.

Spectrum Label	Spectrum 61	Spectrum 52	Spectrum 53	Spectrum 54	Spectrum 55	Spectrum 56	Spectrum 57	Spectrum 58	Spectrum 59	Spectrum 60
C	44.79	44.32	45.02	44.31	44.31	44.87	44.96	44.26	44.77	44.03
O	27.08	27.12	26.59	27.32	27.28	26.81	26.79	26.27	27.08	28.66
S	2.12	2.09	2.05	2.09	2.03	2.07	1.99	2.22	2.12	1.99
Zr	26.00	26.47	26.34	26.29	26.38	26.25	26.26	27.25	26.03	25.32
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	45.02	28.66	2.22	27.25
Min	44.03	26.27	1.99	25.32
Average	44.57	27.10	2.08	26.26
Standard Deviation	0.35	0.64	0.07	0.48

4.15 **Exp. 14: Dioxane ink printed (100 reps) and matured for 2 days at 70 °C.**

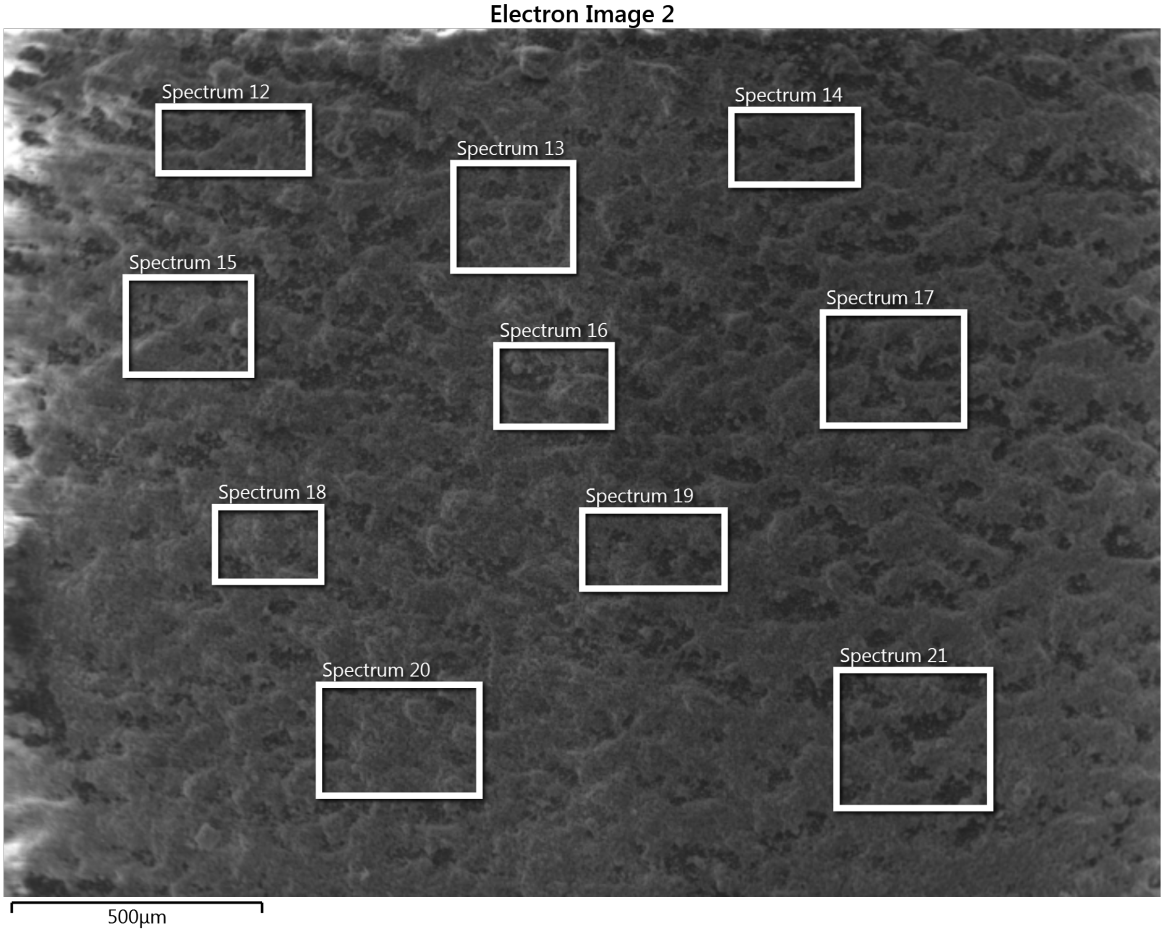

Figure S 18

Table S 16 Elemental EDS vales for the sections examined in the film in Figure S 18.

Spectrum Label	Spectrum 21	Spectrum 12	Spectrum 13	Spectrum 14	Spectrum 15	Spectrum 16	Spectrum 17	Spectrum 18	Spectrum 19	Spectrum 20
C	43.10	43.22	43.58	44.21	43.12	43.70	43.32	43.25	44.85	42.59
O	30.89	30.21	29.18	29.97	28.87	29.64	30.25	29.24	29.58	28.76
S	3.16	3.08	3.09	3.23	3.13	3.36	3.10	3.09	3.53	3.17
Sr			0.00							
Zr	22.85	23.49	24.14	22.59	24.88	23.30	23.33	24.42	22.04	25.48
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Statistics	C	O	S	Zr
Max	44.85	30.89	3.53	25.48
Min	42.59	28.76	3.08	22.04
Average	43.50	29.66	3.19	23.65
Standard Deviation	0.64	0.68	0.15	1.07

5 Top-down optical images of films printed and matured at different temperatures

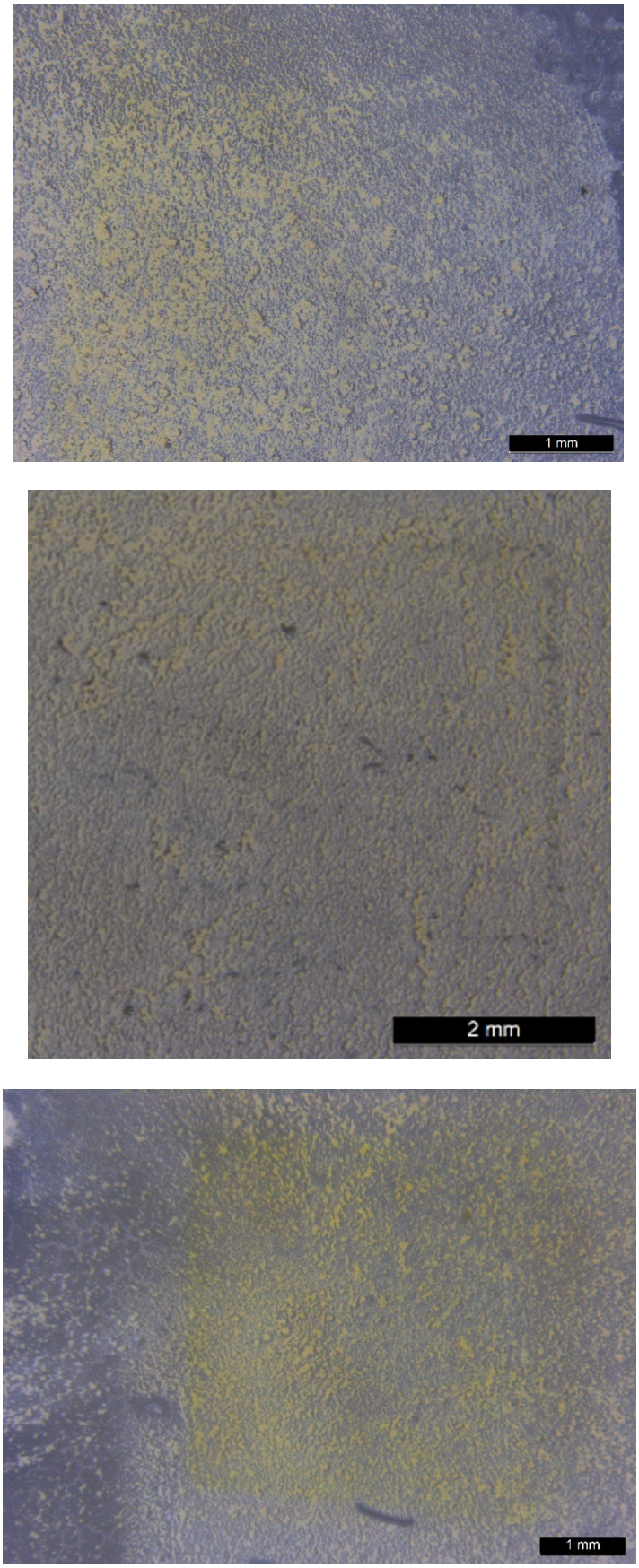

Figure S 19 Optical images of printing 100 reps and maturing at 25 °C at day 0 (top), day 1 (middle) and day 2 (bottom).

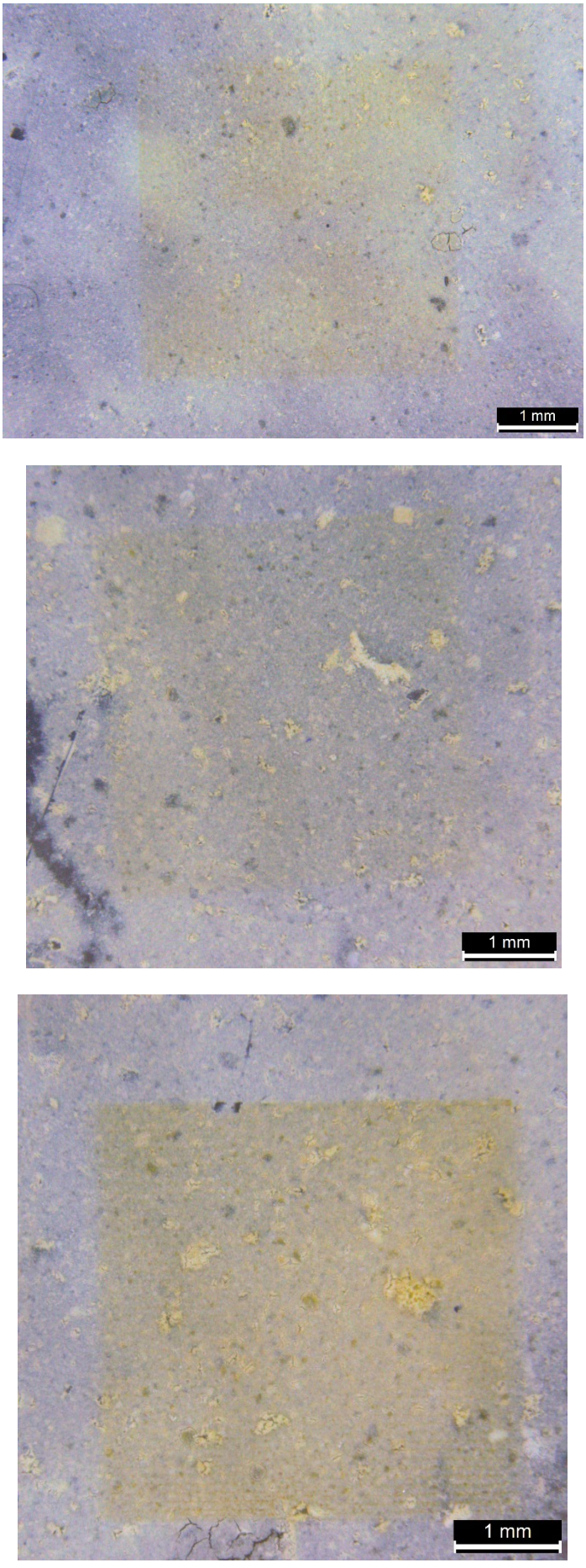

Figure S 20 Optical imagses of printing 100 reps and maturing at 40 °C at day 0 (top), day 1 (middle) and day 2 (bottom).

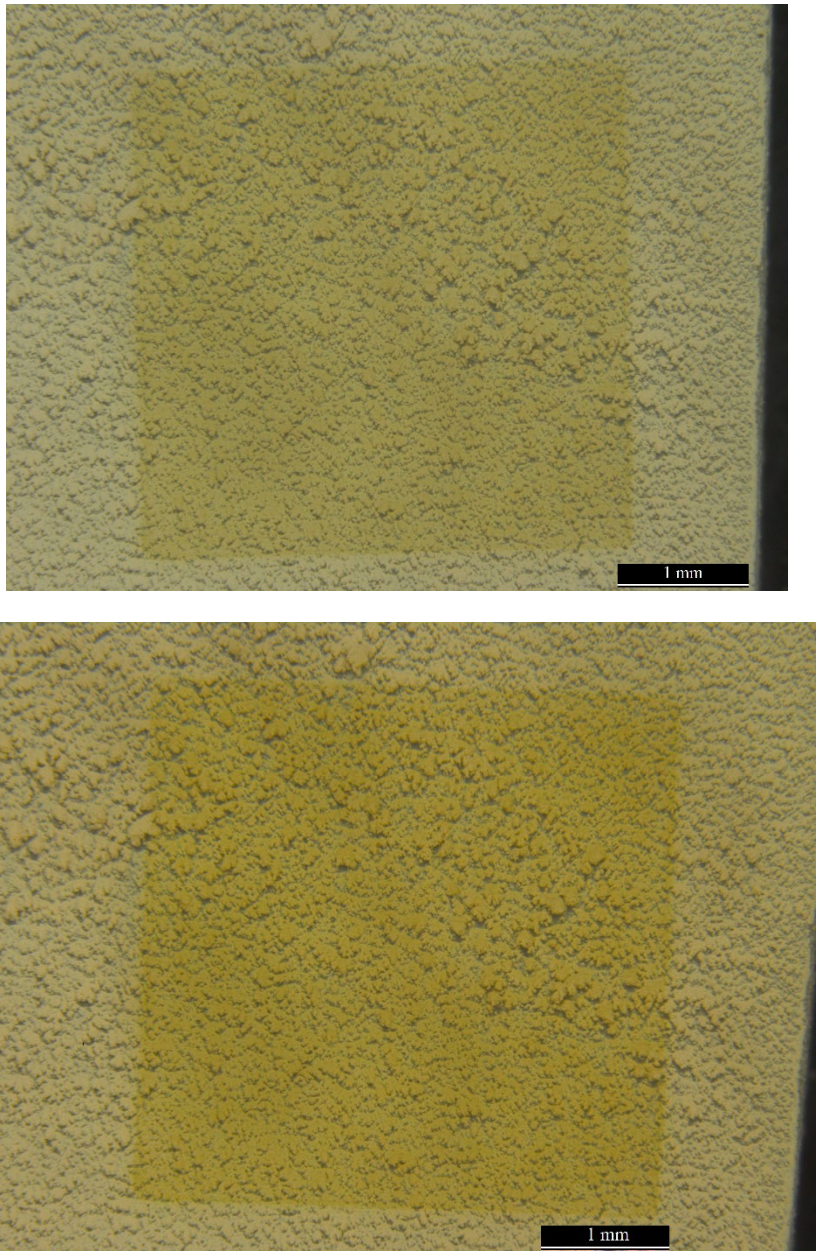

Figure S 21 Optical images of printing 100 reps and maturing at 70 °C at day 1 (top) and day 2 (bottom).

6 SEM-EDS analyses of film cross sections

6.1 Dioxane printed (100 reps) and matured for 0 days at 25 °C.

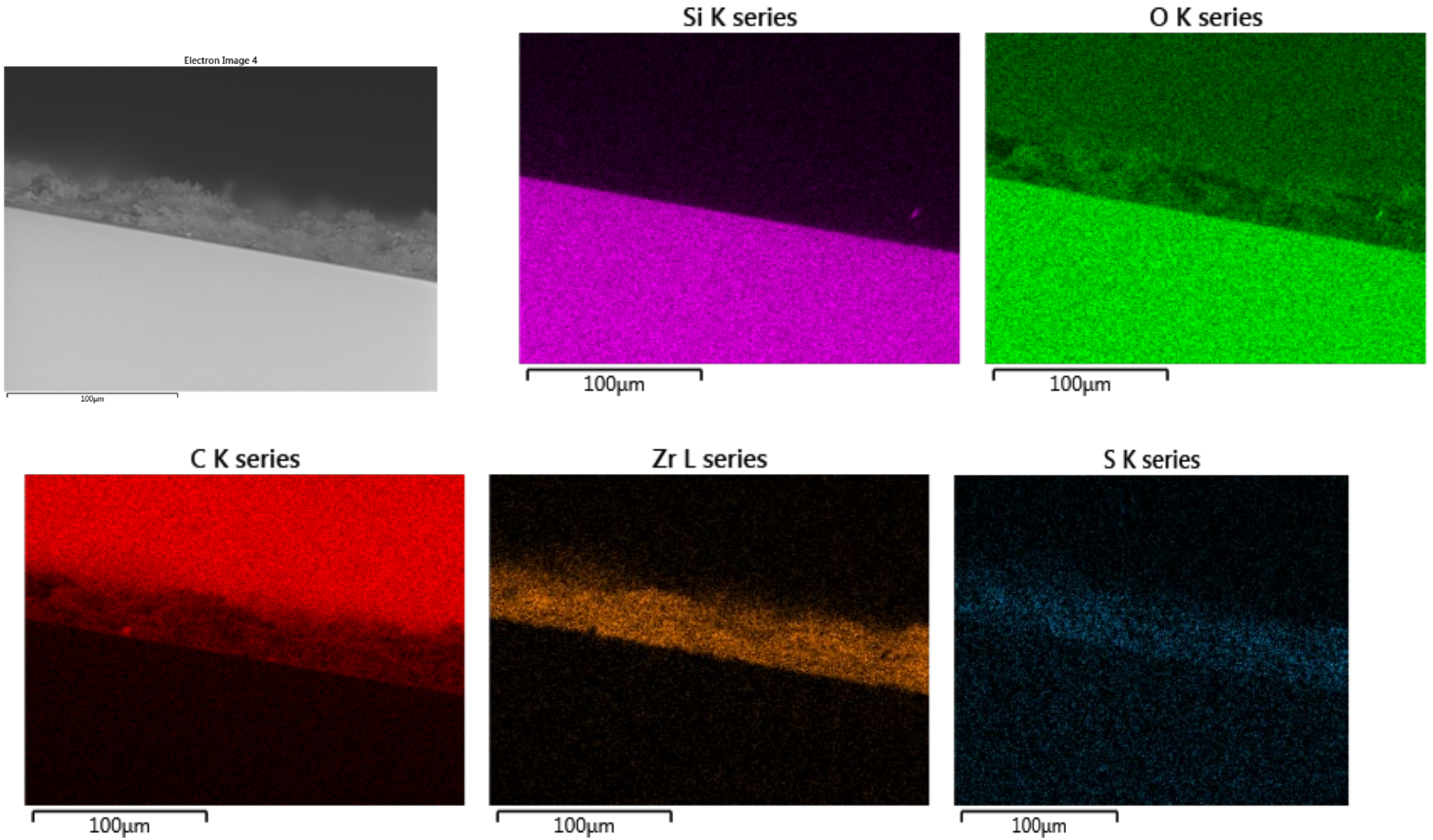

Figure S 22

6.2 **Dioxane printed (100 reps) and matured for 2 days at 25 °C.**

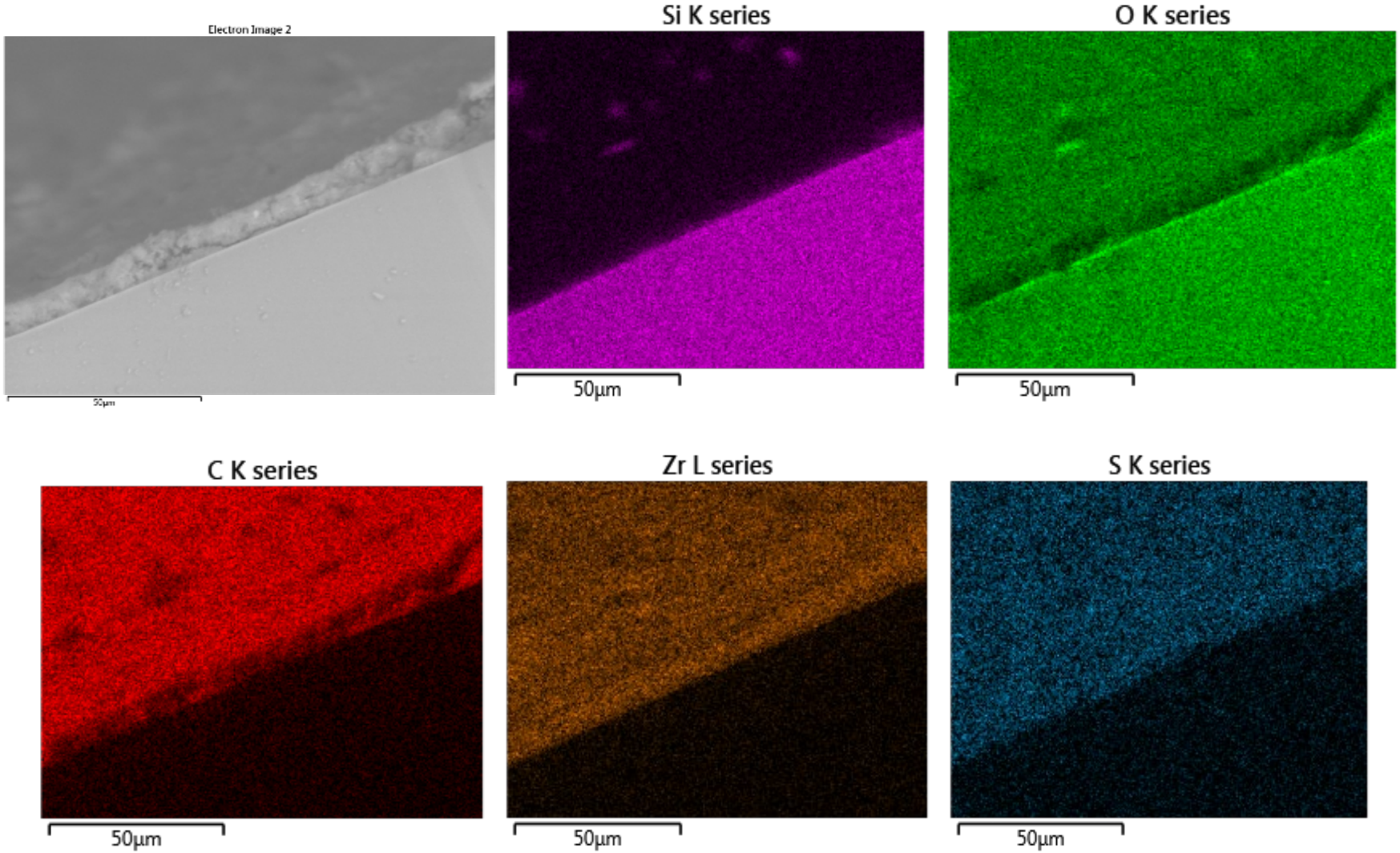

Figure S 23

6.3 **Dioxane printed (100 reps) and matured for 0 days at 70 °C.**

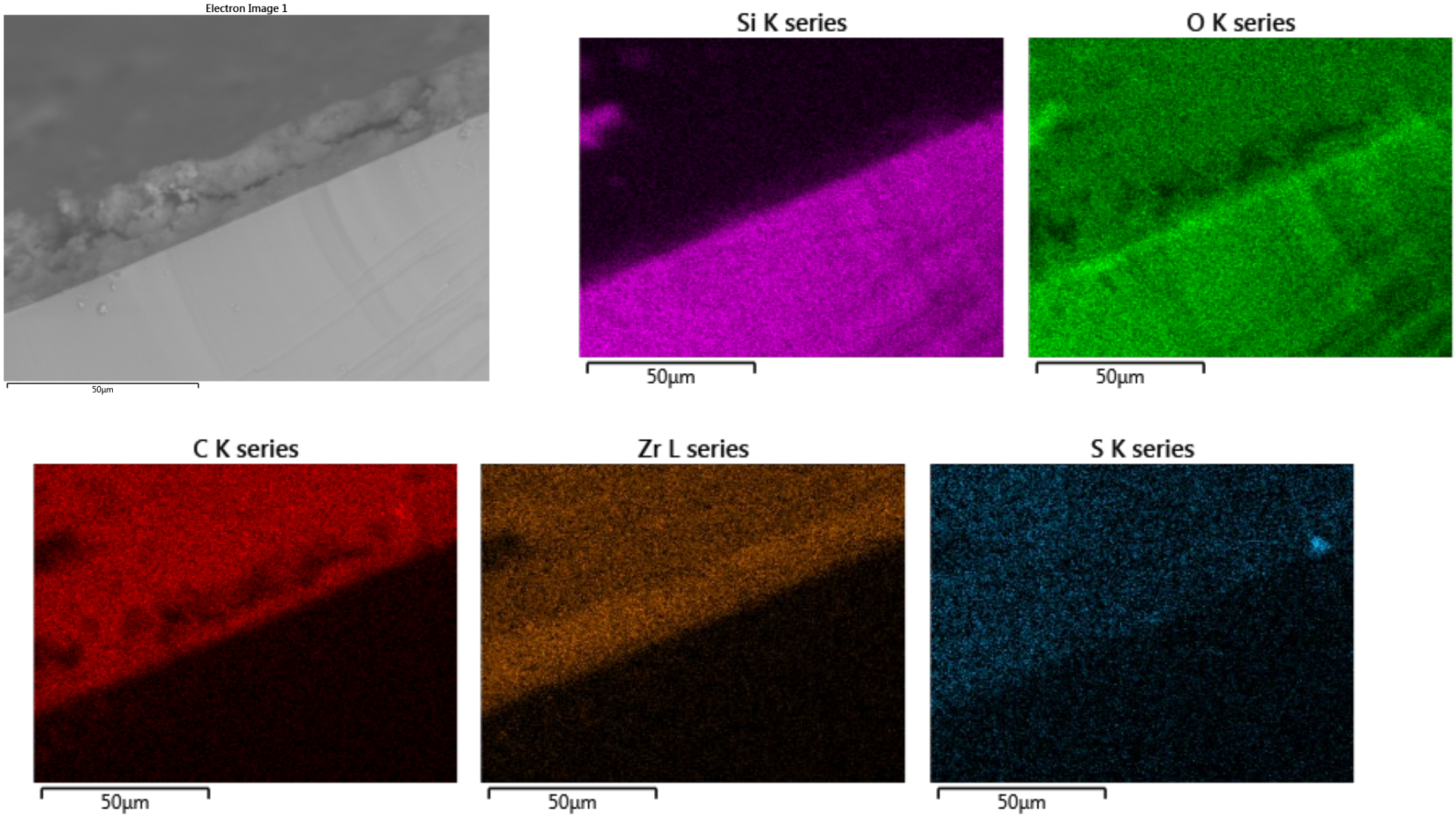

Figure S 24

6.4 **Dioxane printed (100 reps) and matured for 2 days at 70 °C.**

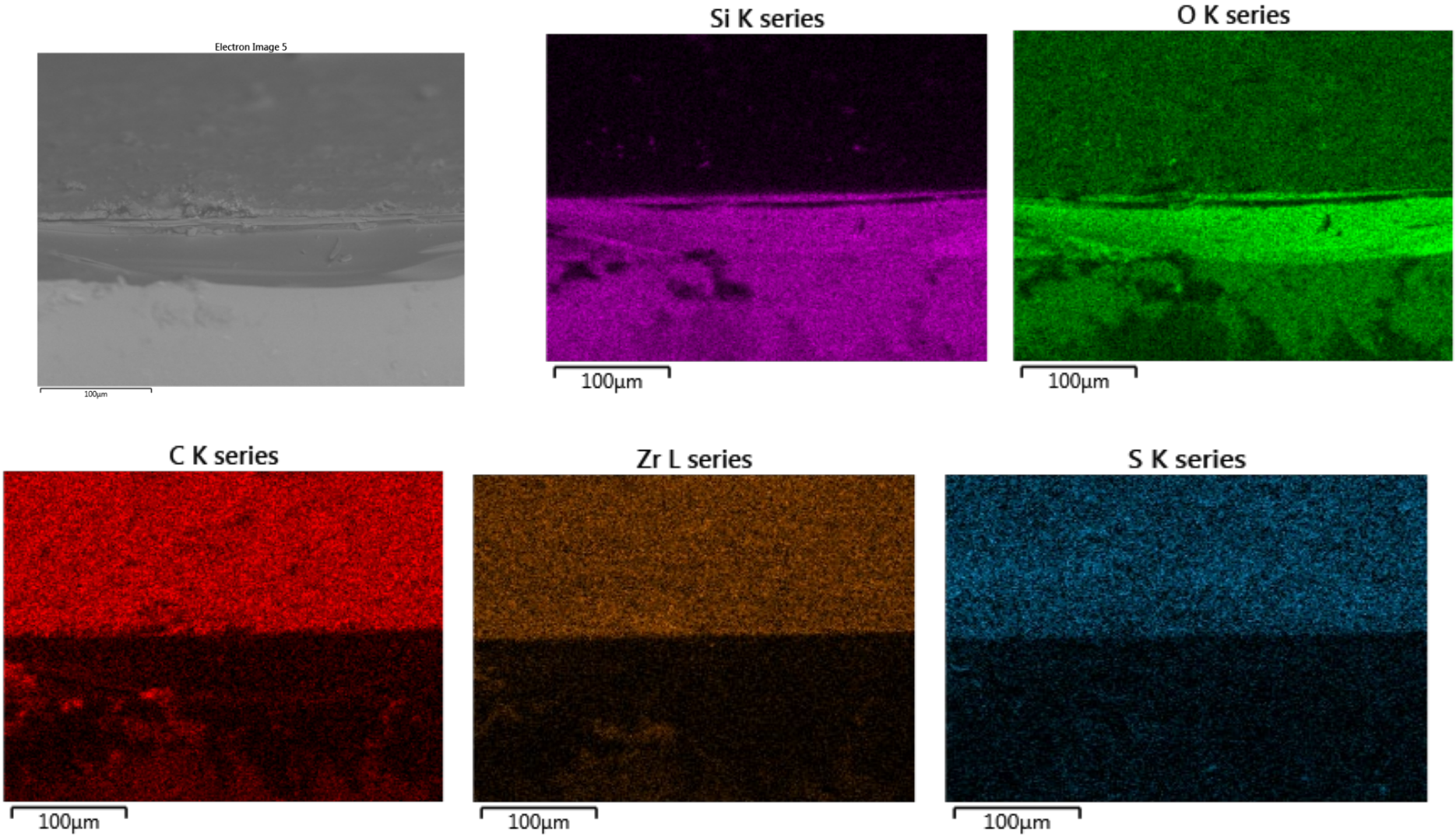

Figure S 25

7 Gas adsorption

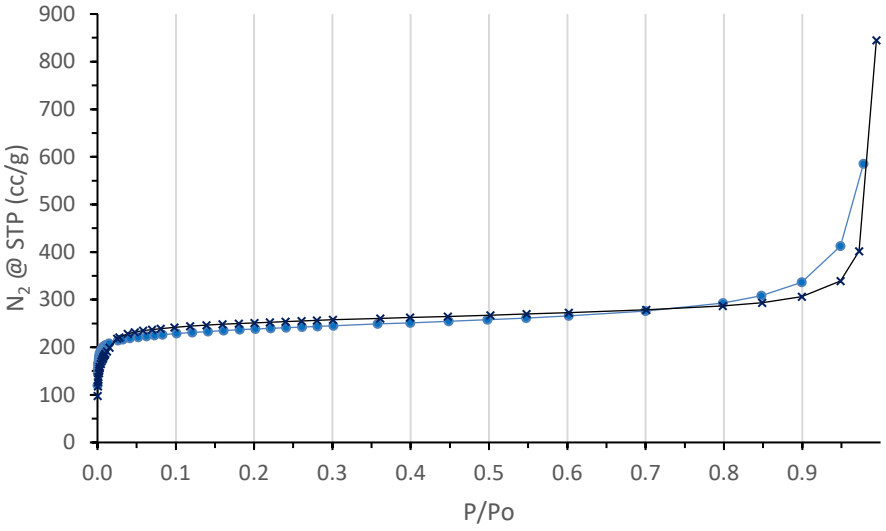

Figure S 26 N_2 adsorption isotherms at 77 K of UiO-66-NH_2 (black), modifed MOF (blue). A line on the adsoption leg of the isotherms are shown as a guide for the eye.

Table S 17 BET Summary table for UiO-66-NH_2 film.

Slope =		3.448
Intercept =		8.64E-03
Correlation coefficient, r =		0.999868
C constant =		400.168
Surface Area =		1007.567 m^2/g
Relative Pressure (P/Po)	**Volume @ STP (cc/g)**	**1 / [W((Po/P) - 1)]**
0.012021	191.4906	0.050841
0.015032	199.0806	0.061339
0.025186	217.957	0.094848
0.027952	221.0841	0.10407
0.038613	228.3483	0.14073
0.047382	231.7867	0.1717
0.058198	234.812	0.21056

Table S 18 BET Summary table for modified film.

Slope =		3.776
Intercept =		1.819e-03
Correlation coefficient, r =		0.999996
C constant =		2077.272
Surface Area =		921.833 m^2/g
Relative Pressure (P/Po)	**Volume @ STP (cc/g)**	**1 / [W((Po/P) - 1)]**
1.00239e-02	204.1531	3.9683e-02
1.19932e-02	205.6266	4.7233e-02
1.49484e-02	208.0643	5.8356e-02
2.64011e-02	214.0206	1.0138e-01
3.22315e-02	216.0982	1.2331e-01
4.15376e-02	218.7523	1.5851e-01

5.19271e-02	221.1534	1.9816e-01

Table S 19 N_2 @ 77 K isotherm data for the UiO-66-NH_2 sample and the modified sample.

UiO-66-NH_2 film			Modified film	
Relative Pressure	Volume @ STP (cc/g)		Relative Pressure	Volume @ STP (cc/g)
0.00009335	120.2958		0.00009220	97.9796
0.00032144	144.0888		0.00031980	117.879
0.00055476	155.1988		0.00055432	126.8968
0.00077691	161.8678		0.00077578	132.7546
0.00100291	167.0056		0.00099888	137.3614
0.00151934	175.1777		0.00151774	145.3587
0.00203410	180.7724		0.00199892	150.8209
0.00253715	184.8766		0.00249851	155.3847
0.00305505	188.1089		0.00301261	159.2863
0.00406700	192.6134		0.00400500	165.2973
0.00508567	195.8038		0.00501720	170.2066
0.00607140	198.1639		0.00601830	174.2387
0.00704017	200.0212		0.00702886	177.8085
0.00800466	201.5397		0.00803395	180.9981
0.00904286	202.9778		0.00902179	183.8899
0.01002390	204.1531		0.01001440	186.6054
0.01199320	205.6266		0.01202130	191.4906
0.01494840	208.0643		0.01503240	199.0806
0.02640110	214.0206		0.02518620	217.957
0.03223150	216.0982		0.02795210	221.0841
0.04153760	218.7523		0.03861320	228.3483
0.05192710	221.1534		0.04738180	231.7867
0.06240010	223.1818		0.05819790	234.812
0.07283200	224.9063		0.06952060	237.2529
0.08286620	226.4542		0.08059920	239.2092
0.10086000	228.8054		0.09804870	241.7622
0.12092800	231.0975		0.11839000	244.2151
0.14117400	233.1628		0.13913900	246.3336
0.16130600	235.008		0.15949500	248.2008
0.18158700	236.7369		0.18028000	249.8627
0.20163000	238.3757		0.20038500	251.3702
0.22115500	239.8191		0.21989200	252.744
0.24091300	241.2728		0.24006100	254.0507
0.26108900	242.6617		0.26024600	255.294
0.28105600	244.0364		0.28014800	256.4917
0.30148600	245.2764		0.30040400	257.5298
0.35761100	248.9496		0.36093000	260.8267
0.39937600	251.422		0.39886100	262.5633
0.44826900	254.5316		0.44708000	264.8882
0.49807500	257.9374		0.50153700	267.5964
0.54728500	261.46		0.54769900	269.7217
0.60188000	266.0398		0.60176700	272.5707
0.70005000	275.8776		0.70060700	278.4198

0.79873600	292.5057		0.79843600	286.7765
0.84772400	308.3132		0.84844500	293.5561
0.89939800	336.5071		0.89944400	306.2291
0.94877700	412.8397		0.94877400	339.2968
0.97811600	585.0648		0.97229700	401.6661
0.97274700	576.6195		0.99462700	844.9511
0.94254500	445.7877		0.99213900	841.2557
0.90135700	363.4589		0.97306100	552.7968
0.84957700	322.6593		0.94367500	372.0458
0.74904800	287.5096		0.90244400	317.2631
0.65102600	272.3255		0.84928900	297.8562
0.55026500	262.8679		0.74792600	284.01
0.44884100	255.4269		0.65310800	276.8069
0.38800600	251.2457		0.55080000	270.9807
0.35044400	248.8855		0.45005100	265.9083
0.25280700	242.2504		0.38922200	262.8521
0.22865200	240.4782		0.35164800	260.9096
0.19911900	238.2495		0.24774100	254.825
0.17315600	236.1066		0.22882700	253.5929
0.16085300	235.0183		0.20066700	251.6301
0.14998400	234.0139		0.17475600	249.6536
0.12939600	231.9914		0.16133800	248.5433
0.11772300	230.7387		0.15050800	247.5905
0.09363090	227.9311		0.13120400	245.7548
0.07389220	225.1097		0.11890300	244.4489
0.05389300	221.5395		0.09611360	241.7198
0.02432170	212.9903		0.07675650	238.7838
0.01897040	210.2608		0.05215700	233.4786
0.01492300	207.6217		0.02483610	218.2349
0.01246630	205.5475		0.01903160	207.6645
0.00995108	204.021		0.01497690	197.8691
0.00798731	201.4716		0.01250590	191.5259
			0.01001260	186.9088
			0.00797998	181.0036