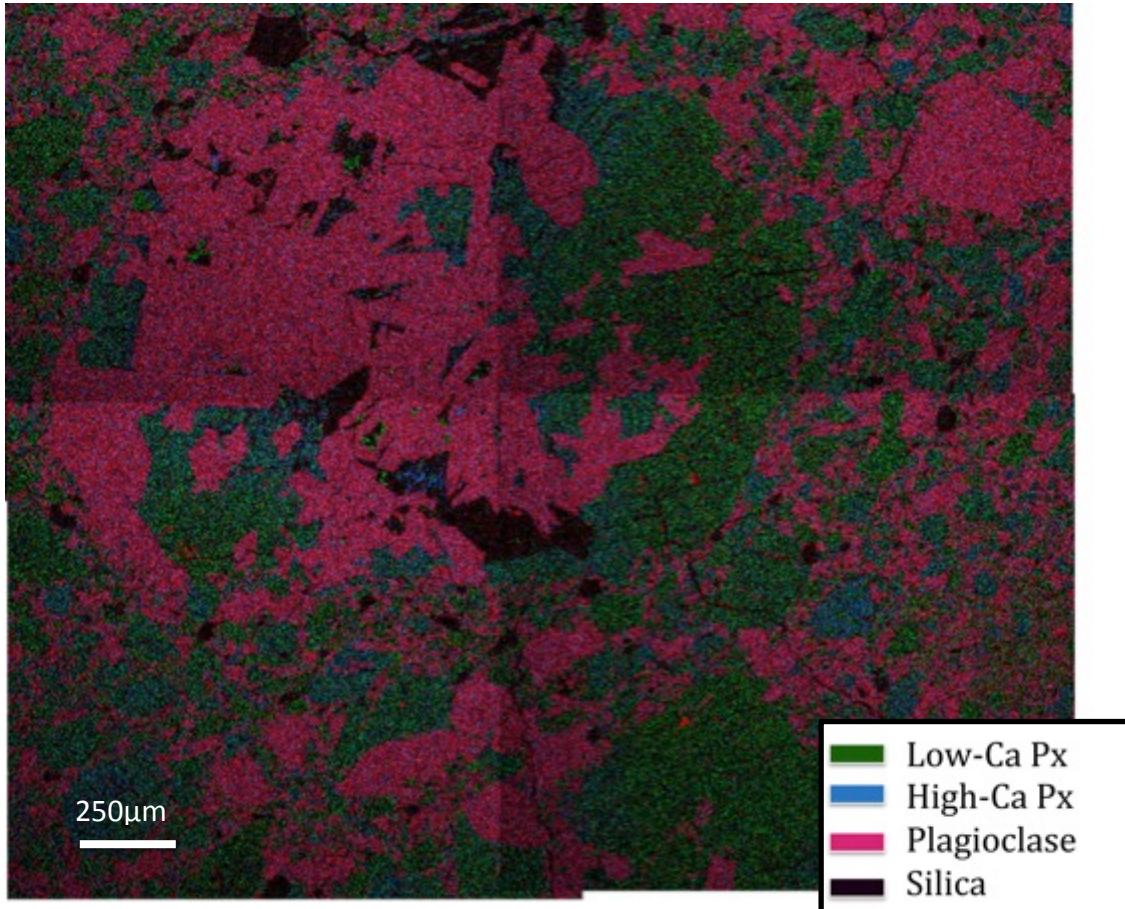


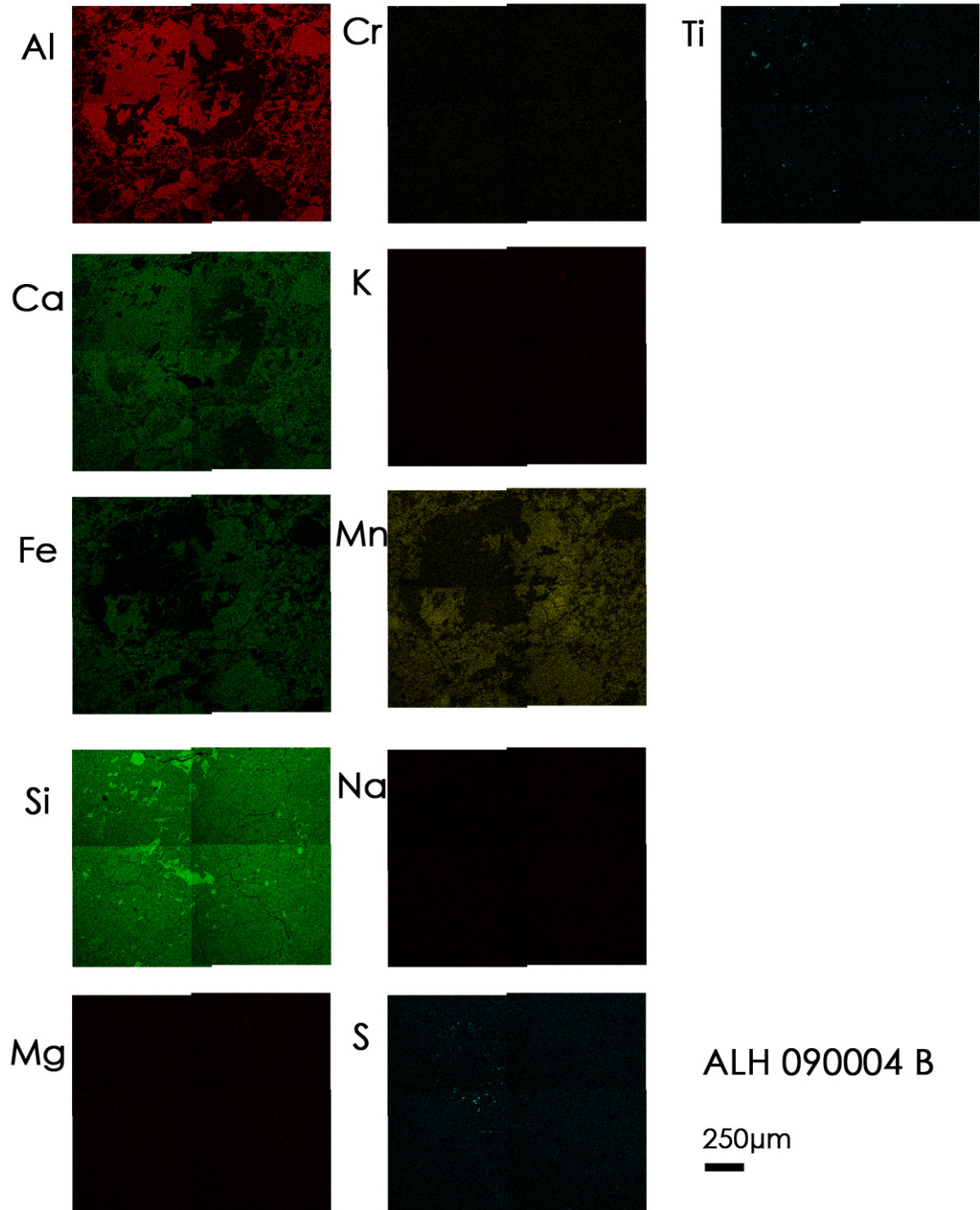
**Appendix H - ALH 090004B**

**H1. SEM Mineral Map**

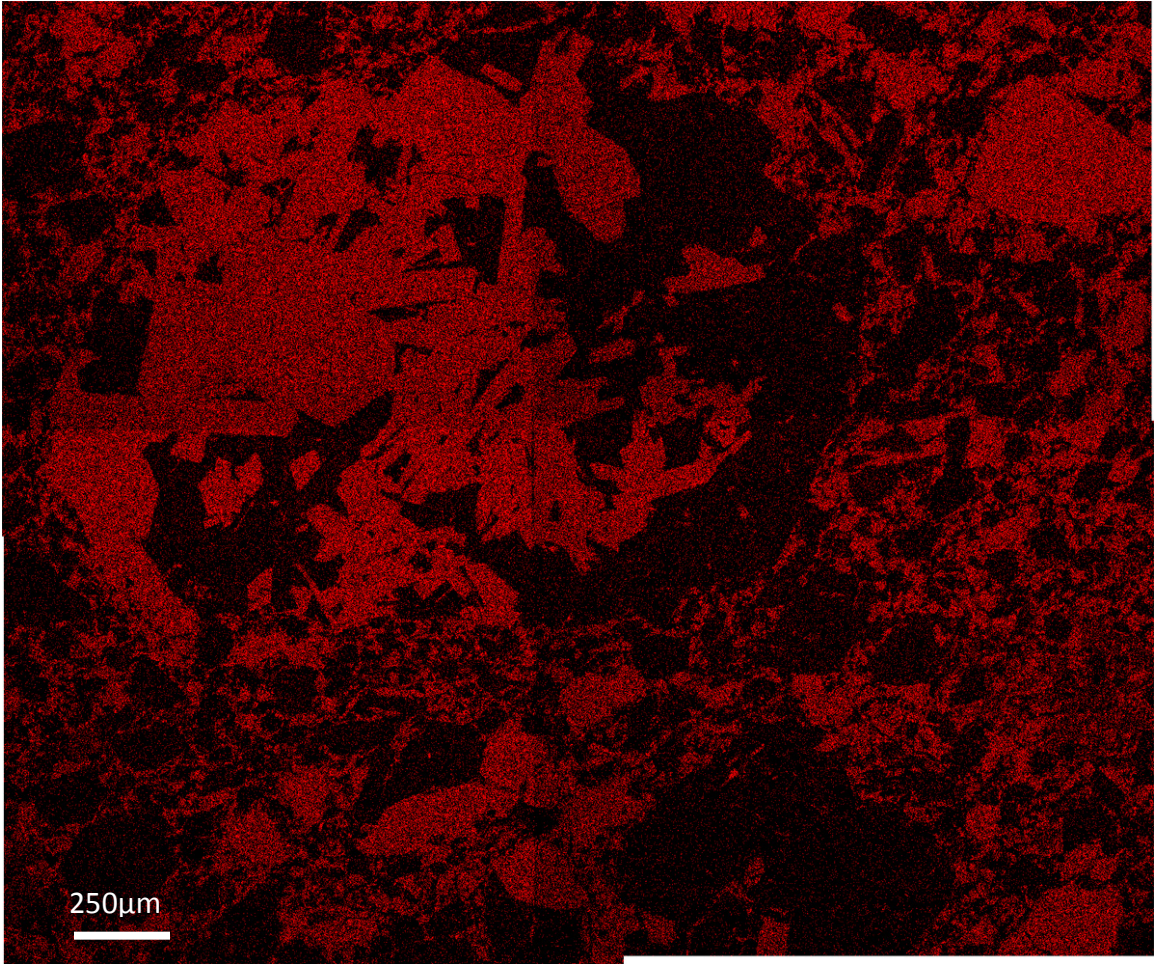


*ALH 090004B has very few lath-like plagioclase grains, zoned pyroxenes and a groundmass rich in pyroxene.*

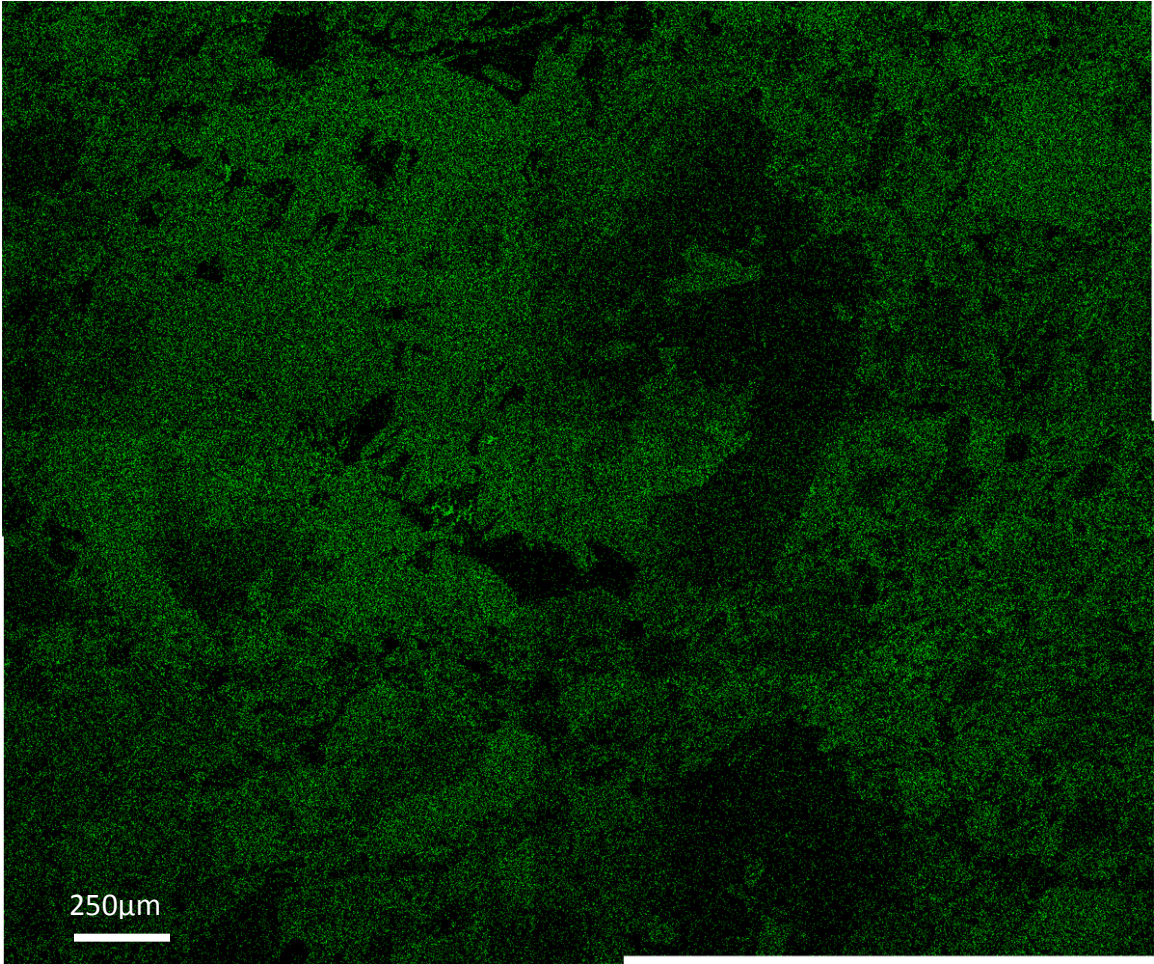
**H2. SEM Elemental X-ray maps** (All clasts were analyzed for eleven elements (Al, Ca, Fe, Si, Mg, Cr, K, Mn, Na, S, and Ti); however if some are extremely dark, this is due to the fact that the element appeared below the detection limit of the SEM, thus showing a colored map with no distinguishable data. For this reason, we have not included a full size element map of Mg, Cr, K, Mn, and Na.



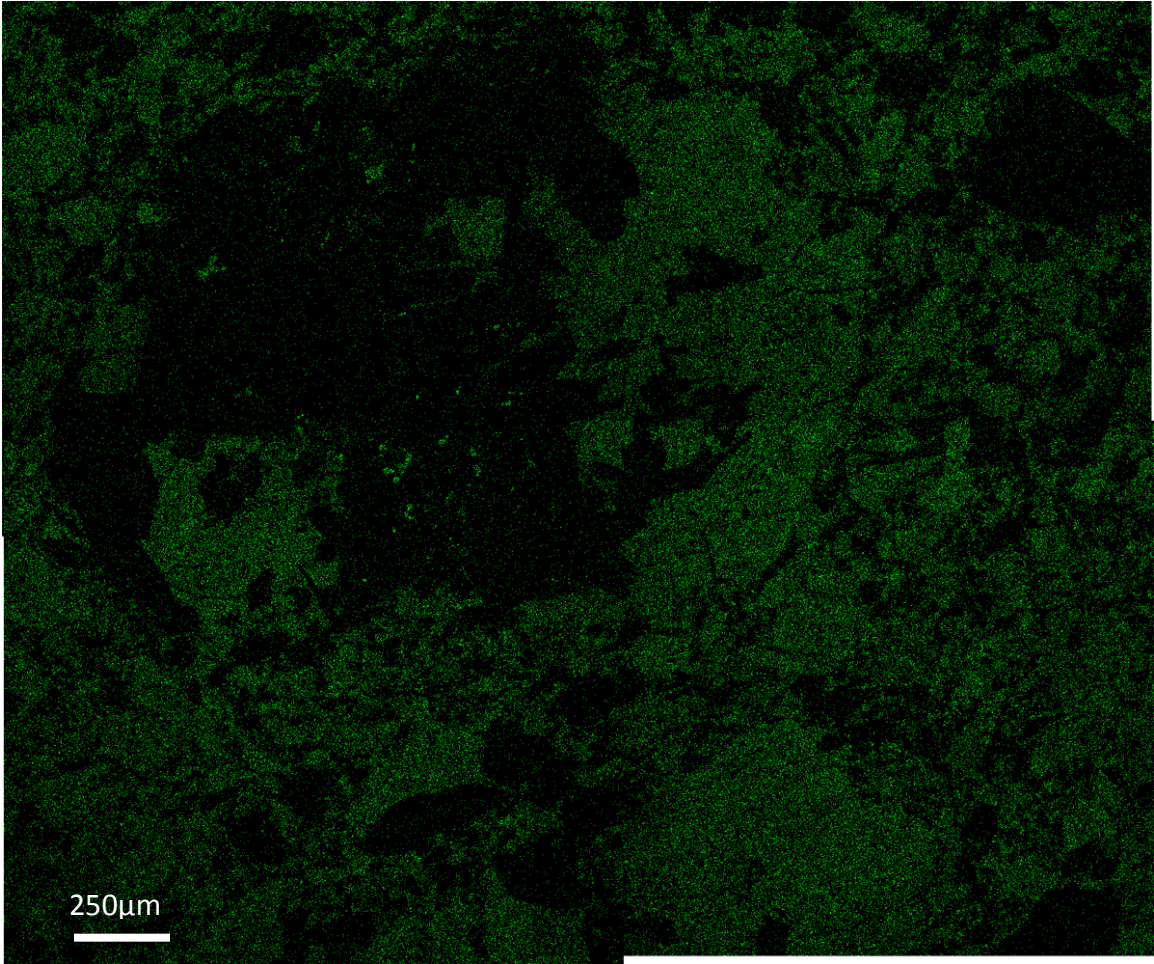
Al



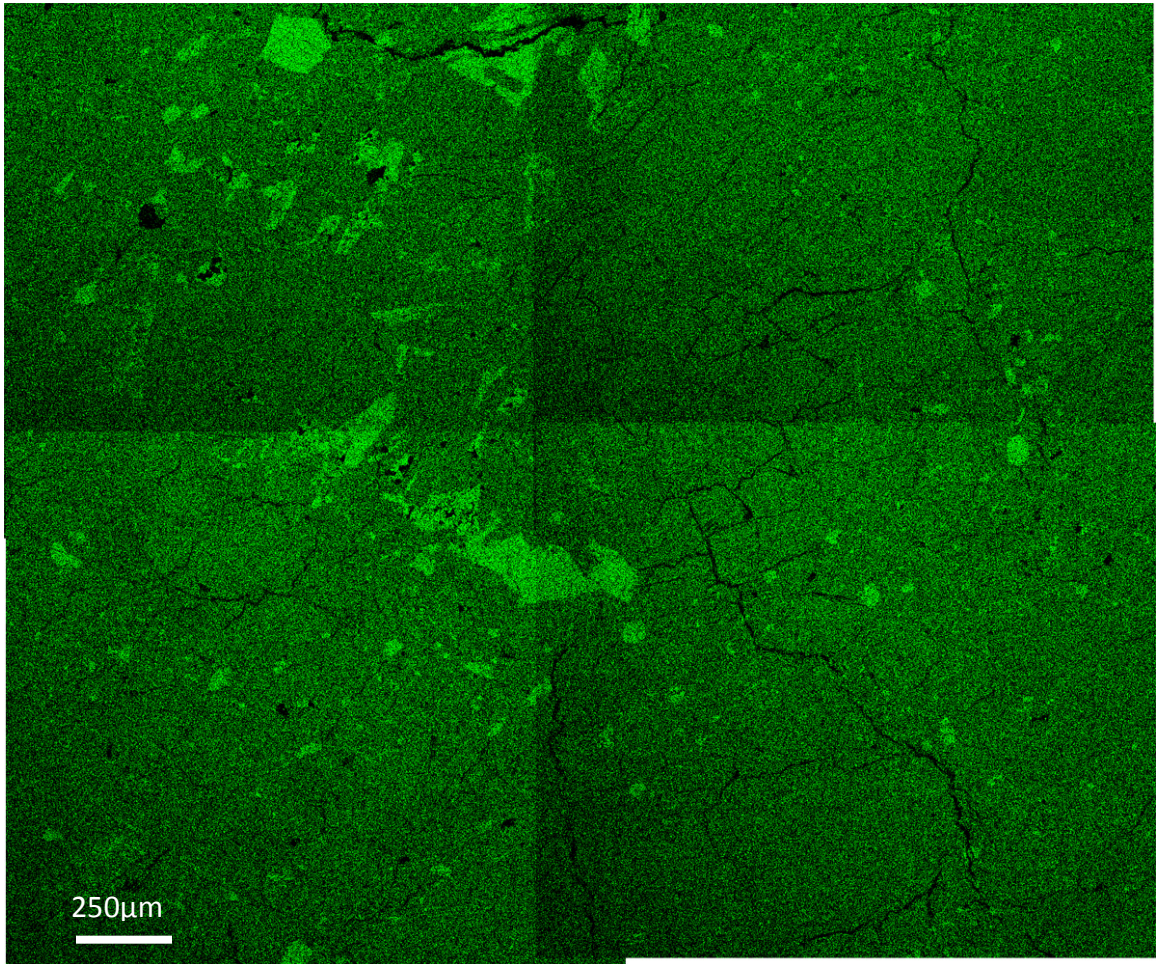
**Ca**



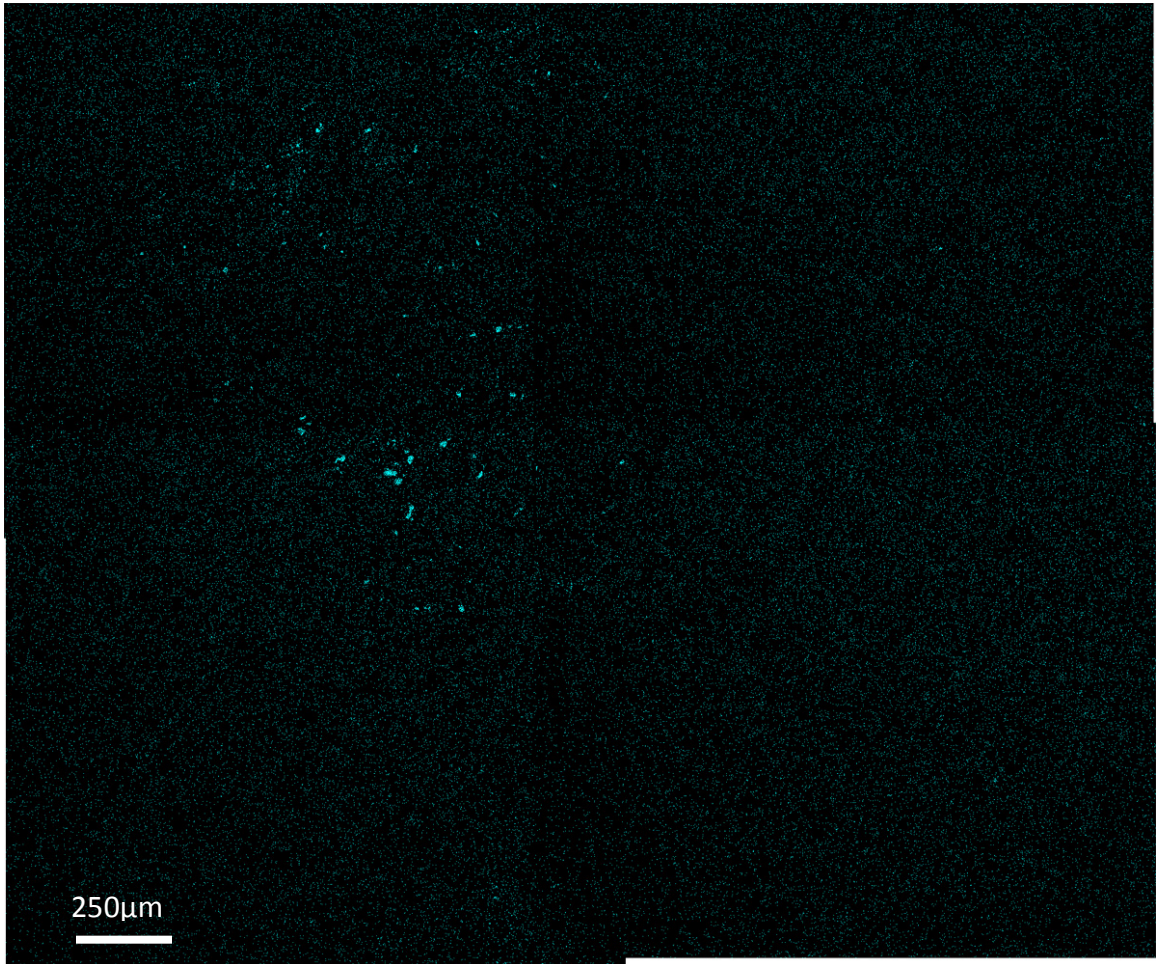
**Fe**



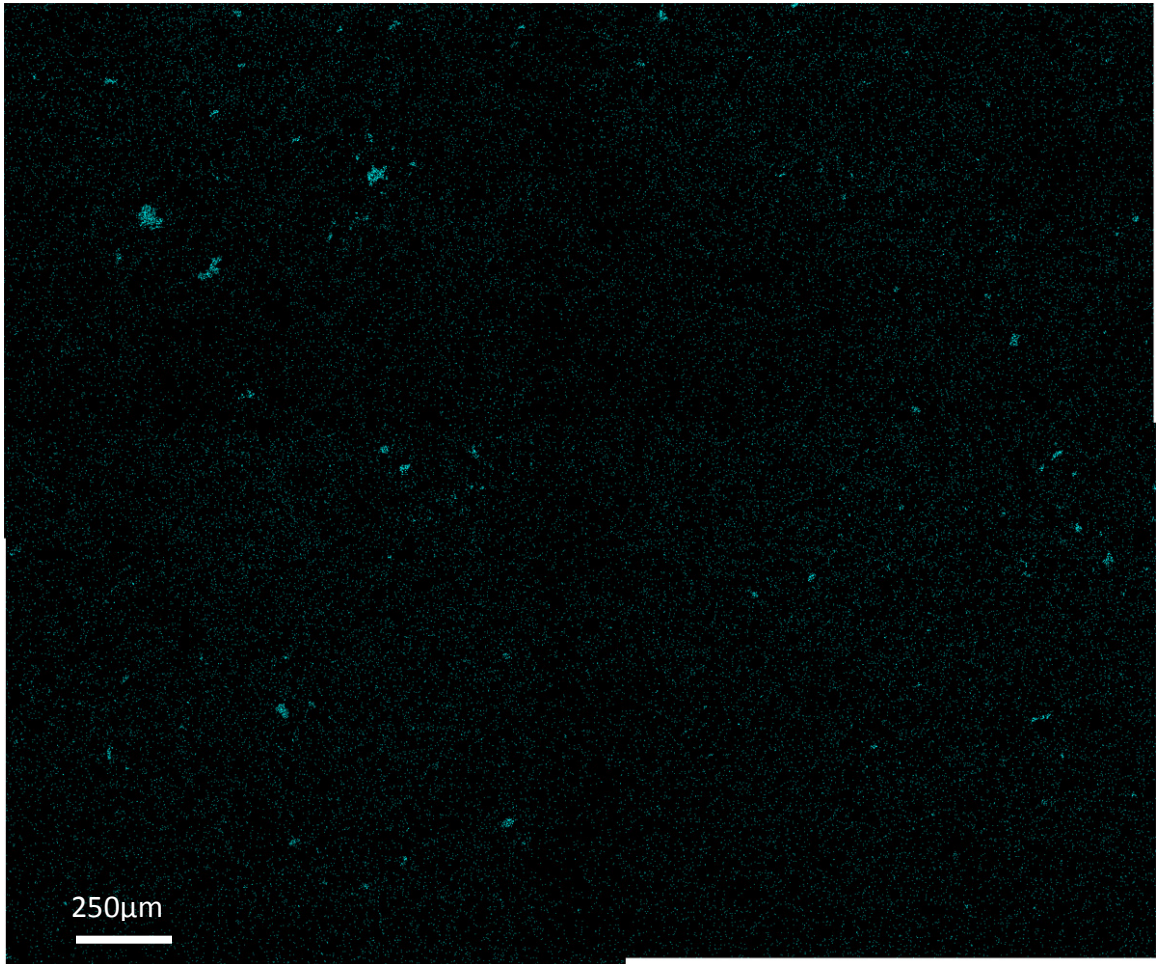
Si



S

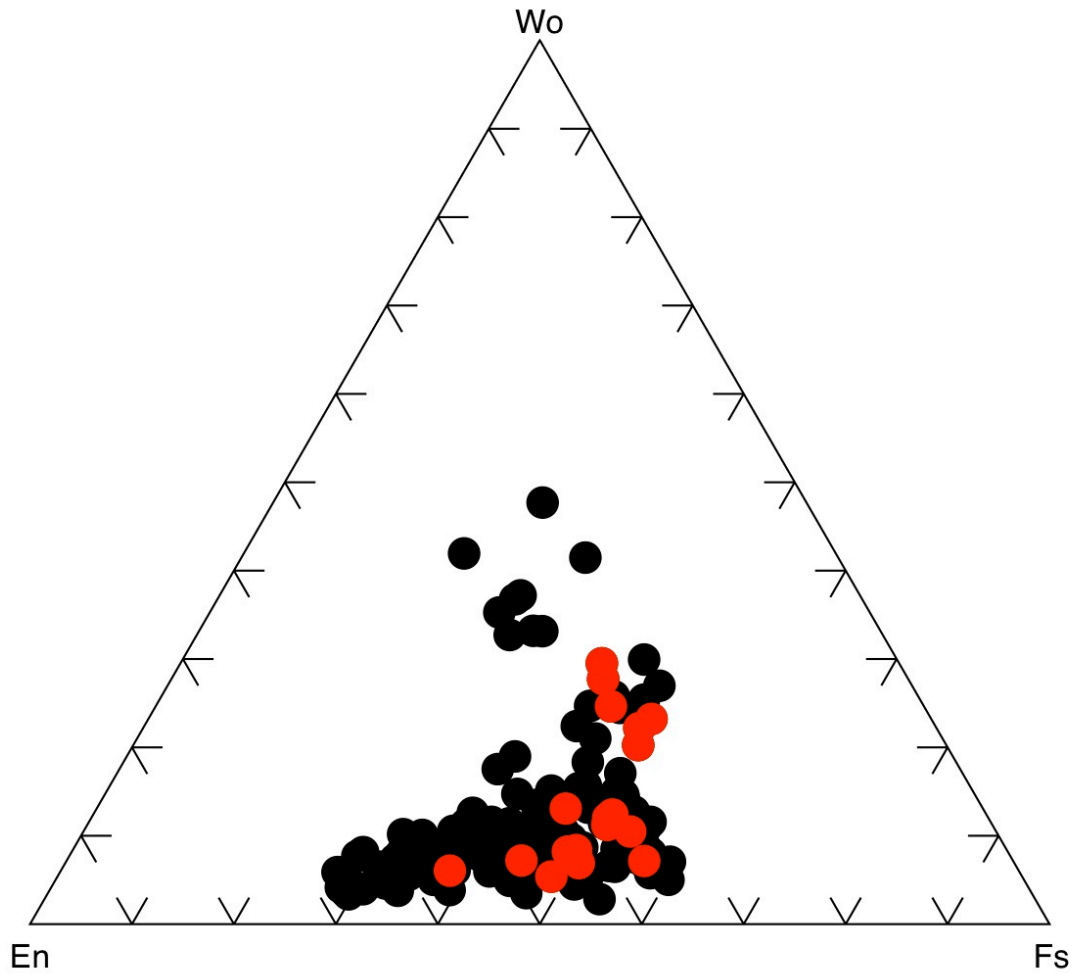


**Ti**

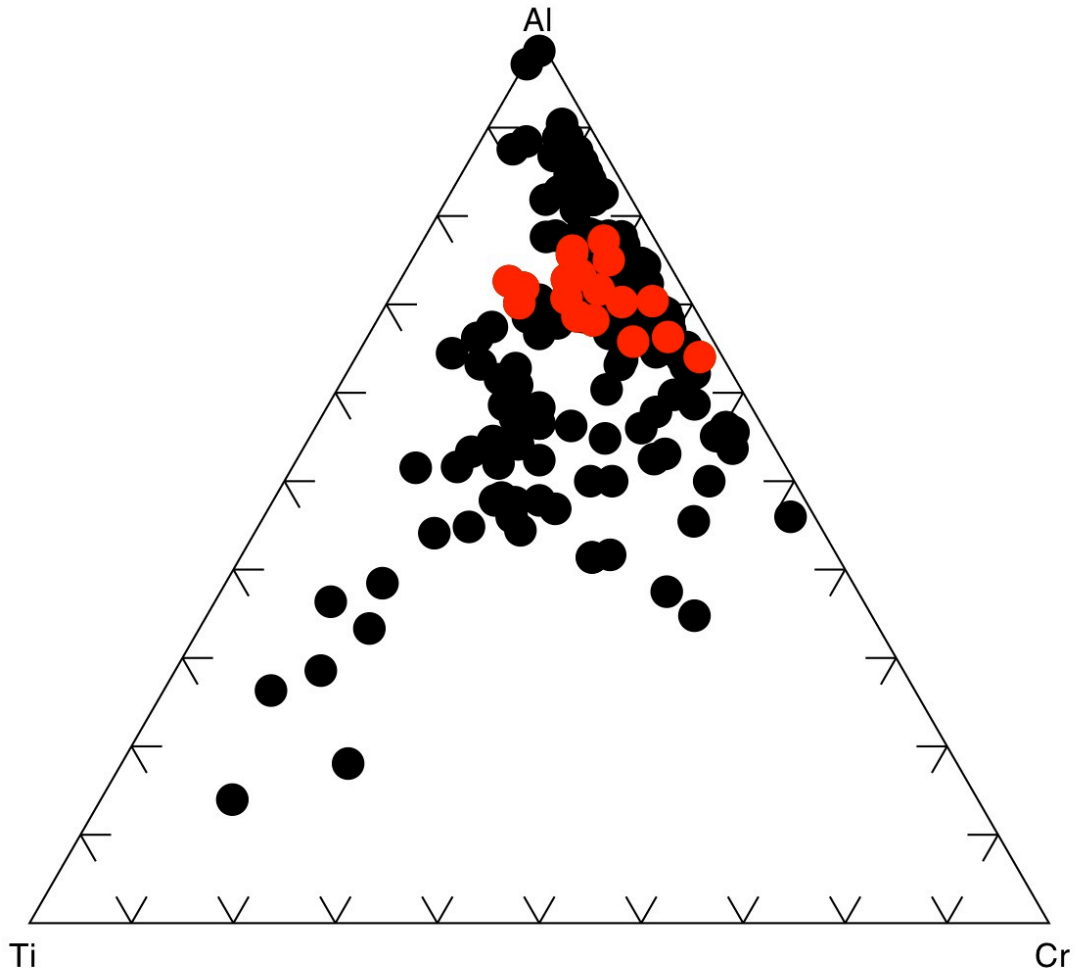




***H3. Major element data of pyroxene (red) compared to all other samples***



***H4. Minor element data of pyroxene (red) compared to all other samples***



## H5. Pyroxene analyses

SiO <sub>2</sub>	48.08	49.09	49.44	48.78	48.06	48.53	48.67	49.03	49.33
CaO	4.75	3.21	6.08	5.75	11.36	10.77	12.73	10.17	5.64
Na <sub>2</sub> O	n.d.	n.d.	0.01	n.d.	0.02	0.04	n.d.	0.02	-0.05
MgO	11.66	14.28	13.70	12.22	10.17	9.13	9.87	9.59	12.60
TiO <sub>2</sub>	0.17	0.14	0.23	0.23	0.42	0.32	0.50	0.22	0.27
FeO	31.10	30.04	27.45	30.26	26.34	29.29	24.91	28.55	30.57
Al <sub>2</sub> O <sub>3</sub>	1.46	1.38	1.24	1.34	1.20	1.50	1.54	1.02	1.04
K <sub>2</sub> O	0.01	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.01	n.d.
MnO	0.94	0.86	0.86	0.96	0.85	0.90	0.77	0.92	0.94
Cr <sub>2</sub> O <sub>3</sub>	0.52	0.45	0.42	0.37	0.33	0.48	0.38	0.43	0.41
Total	98.68	99.45	99.45	99.91	98.75	100.94	99.36	99.95	100.75
Si	1.94	1.94	1.95	1.94	1.93	1.93	1.93	1.96	1.94
Ca	0.21	0.14	0.26	0.25	0.49	0.46	0.54	0.43	0.24
Na	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Mg	0.70	0.84	0.80	0.72	0.61	0.54	0.59	0.57	0.74
Ti	0.01	n.d.	0.01	0.01	0.01	0.01	0.02	0.01	0.01
Fe	1.05	0.99	0.90	1.01	0.89	0.97	0.83	0.95	1.01
Al	0.07	0.06	0.06	0.06	0.05	0.07	0.07	0.05	0.05
K	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Mn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cr	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Total	4.02	4.02	4.02	4.02	4.02	4.02	4.01	4.01	4.02
Wo	10.48	6.90	13.08	12.41	24.65	23.23	27.72	22.19	12.00
En	35.89	42.72	40.92	36.68	30.70	27.43	29.92	29.14	37.30
Fs	53.63	50.38	46.01	50.91	44.66	49.34	42.35	48.67	50.71
SiO <sub>2</sub>	49.39	49.79	49.50	48.40	49.24	50.86	48.70	48.76	49.35
CaO	3.88	3.43	3.95	9.36	5.28	2.95	2.53	3.34	13.92
Na <sub>2</sub> O	0.08	n.d.	0.02	0.03	n.d.	n.d.	n.d.	n.d.	0.01
MgO	14.66	16.47	14.31	10.03	12.76	19.52	15.58	12.16	9.88
TiO <sub>2</sub>	0.20	0.15	0.16	0.30	0.17	0.11	0.05	0.12	0.47
FeO	29.47	27.18	29.80	29.31	30.69	23.82	29.14	33.95	24.96
Al <sub>2</sub> O <sub>3</sub>	1.15	1.45	1.19	1.19	0.97	1.35	1.29	0.78	1.39
K <sub>2</sub> O	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MnO	0.86	0.80	0.84	0.92	0.92	0.82	0.87	1.01	0.75
Cr <sub>2</sub> O <sub>3</sub>	0.66	0.90	0.56	0.42	0.40	0.70	0.96	0.22	0.28
Total	100.34	100.16	100.33	99.96	100.42	100.12	99.12	100.34	101.01
Si	1.93	1.93	1.94	1.94	1.95	1.93	1.93	1.95	1.93
Ca	0.16	0.14	0.17	0.40	0.22	0.12	0.11	0.14	0.58
Na	0.01	n.d.	n.d.	n.d.	-0.01	n.d.	n.d.	n.d.	n.d.
Mg	0.86	0.95	0.84	0.60	0.75	1.11	0.92	0.72	0.58
Ti	0.01	n.d.	0.01	0.01	0.01	n.d.	n.d.	n.d.	0.01
Fe	0.97	0.88	0.98	0.98	1.01	0.76	0.96	1.13	0.82
Al	0.05	0.06	0.05	0.05	0.04	0.06	0.06	0.04	0.06
K	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Mn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cr	0.02	0.03	0.02	0.01	0.01	0.02	0.03	0.01	0.01
Total	4.03	4.02	4.02	4.02	4.02	4.02	4.03	4.03	4.02
Wo	8.22	7.20	8.39	20.26	11.22	6.05	5.38	7.15	29.51
En	43.15	48.20	42.24	30.22	37.78	55.80	46.18	36.18	29.16
Fs	48.64	44.60	49.37	49.52	51.01	38.16	48.44	56.67	41.33

## H6. Plagioclase analyses

SiO <sub>2</sub>	43.97	43.83	43.62	44.61	43.89	43.54	44.24	44.85	47.04	43.57
CaO	17.88	18.56	17.86	18.49	19.03	18.84	18.64	17.11	16.67	17.97
Na <sub>2</sub> O	0.97	0.98	1.02	1.06	0.93	0.91	0.97	1.50	2.12	1.19
MgO	n.d.	0.02	0.19	0.01	0.01	n.d.	0.01	0.20	0.03	n.d.
TiO <sub>2</sub>	n.d.	n.d.	n.d.	n.d.	0.03	n.d.	n.d.	0.04	0.03	0.01
FeO	0.56	0.32	1.82	0.20	0.06	0.09	0.41	1.10	0.13	0.25
Al <sub>2</sub> O <sub>3</sub>	34.39	34.96	33.91	34.79	35.06	35.16	35.06	32.03	32.69	34.20
K <sub>2</sub> O	0.05	0.04	0.05	0.04	0.03	0.03	0.05	0.09	0.18	0.05
MnO	0.01	n.d.	0.04	n.d.	n.d.	0.01	n.d.	0.03	n.d.	n.d.
Cr <sub>2</sub> O <sub>3</sub>	-0.02	n.d.	n.d.	0.03	n.d.	n.d.	0.01	0.03	0.01	n.d.
Total	97.80	98.72	98.50	99.24	99.04	98.59	99.39	96.97	98.89	97.23
Si	2.08	2.06	2.06	2.08	2.05	2.05	2.06	2.14	2.19	2.07
Ca	0.91	0.93	0.91	0.92	0.95	0.95	0.93	0.88	0.83	0.92
Na	0.09	0.09	0.09	0.10	0.08	0.08	0.09	0.14	0.19	0.11
Mg	n.d.	n.d.	0.01	n.d.	n.d.	n.d.	n.d.	0.01	n.d.	n.d.
Ti	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Fe	0.02	0.01	0.07	0.01	n.d.	n.d.	0.02	0.04	0.01	0.01
Al	1.92	1.93	1.89	1.91	1.93	1.95	1.92	1.80	1.79	1.92
K	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.01	0.01	n.d.
Mn	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Cr	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Total	5.01	5.02	5.04	5.01	5.02	5.02	5.02	5.02	5.01	5.02
An	90.77	91.02	90.41	90.31	91.72	91.77	91.18	85.88	80.50	89.09
Ab	8.93	8.68	9.29	9.39	8.08	8.03	8.53	13.63	18.53	10.61
Or	0.30	0.29	0.30	0.29	0.19	0.19	0.29	0.49	0.97	0.29
SiO <sub>2</sub>	42.74	43.23	44.63	43.32	44.17	44.26	44.76	43.91	47.36	
CaO	18.18	17.90	18.56	18.98	18.23	18.50	18.32	19.01	16.40	
Na <sub>2</sub> O	1.03	1.24	1.24	0.86	1.18	1.16	1.27	0.94	2.29	
MgO	0.04	0.10	0.03	n.d.	n.d.	n.d.	n.d.	0.03	0.03	
TiO <sub>2</sub>	0.01	0.03	n.d.	n.d.	0.03	0.03	0.01	0.06	0.04	
FeO	0.29	0.75	0.07	0.14	0.09	0.09	0.06	0.04	0.11	
Al <sub>2</sub> O <sub>3</sub>	33.65	33.11	34.46	34.77	34.12	34.60	34.22	34.90	32.85	
K <sub>2</sub> O	0.05	0.06	0.06	0.03	0.05	0.05	0.07	0.04	0.14	
MnO	n.d.	n.d.	0.02	0.01	n.d.	0.01	n.d.	n.d.	n.d.	
Cr <sub>2</sub> O <sub>3</sub>	0.01	n.d.	0.01	n.d.	n.d.	0.01	n.d.	0.01	0.01	
Total	96.01	96.41	99.06	98.11	97.88	98.69	98.72	98.94	99.23	
Si	2.06	2.08	2.08	2.05	2.09	2.07	2.10	2.05	2.19	
Ca	0.94	0.92	0.93	0.96	0.92	0.93	0.92	0.95	0.81	
Na	0.10	0.12	0.11	0.08	0.11	0.11	0.12	0.09	0.21	
Mg	n.d.	0.01	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
Ti	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
Fe	0.01	0.03	n.d.	0.01	n.d.	n.d.	n.d.	n.d.	n.d.	
Al	1.91	1.88	1.90	1.94	1.90	1.91	1.89	1.92	1.79	
K	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.01	
Mn	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
Cr	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
Total	5.02	5.03	5.02	5.03	5.01	5.02	5.02	5.02	5.01	
An	90.47	88.58	88.89	92.32	89.25	89.59	88.52	91.63	79.24	
Ab	9.24	11.04	10.73	7.49	10.45	10.13	11.09	8.17	19.98	
Or	0.29	0.38	0.38	0.19	0.29	0.29	0.39	0.19	0.78	

**H7. BSE image with microprobe points (rotated 180° clockwise from original SEM map).**

