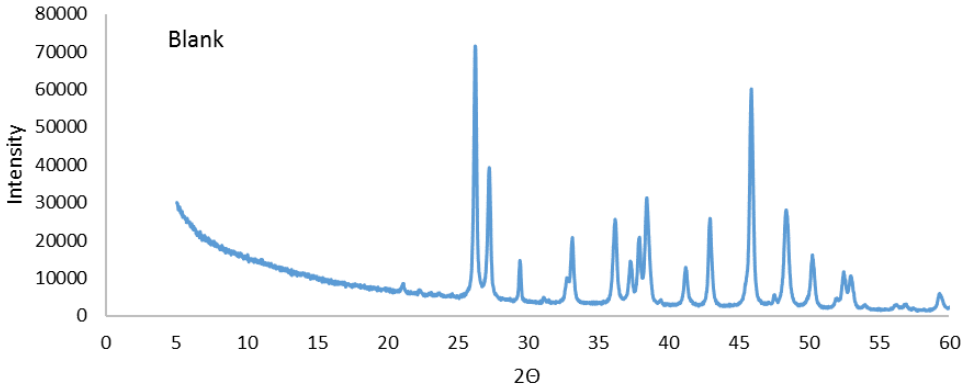
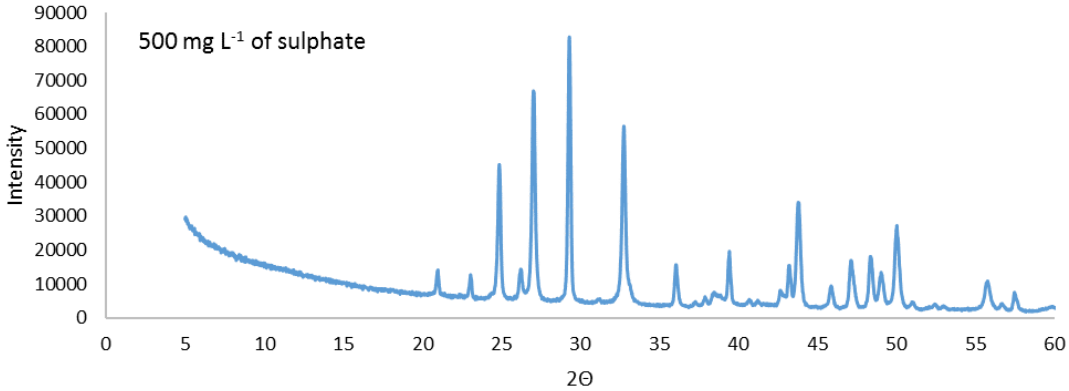
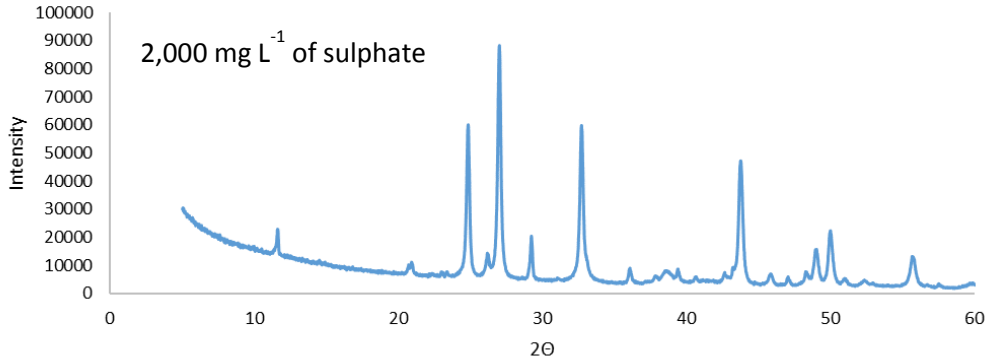
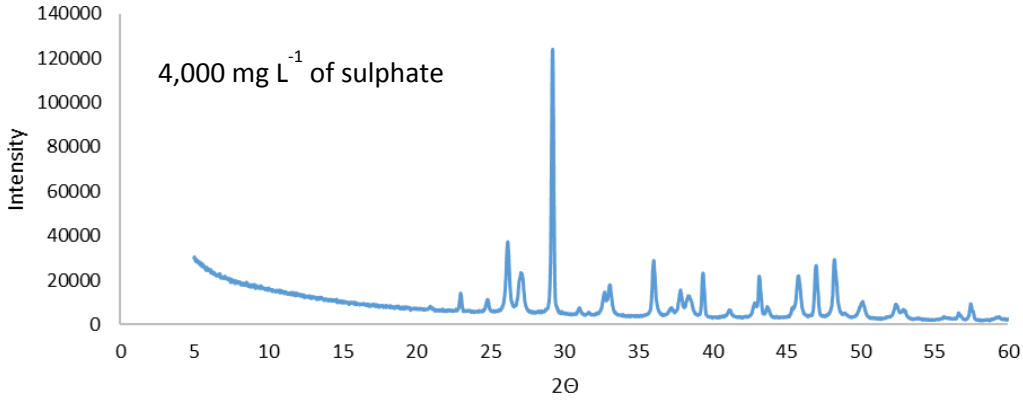
Preferential incorporation of sulfate into calcite polymorphs during calcium carbonate precipitation: An experimental approach

V. Kartnaller, E. M. Ribeiro, F. Venancio, F. F. Rosario and J. Cajaiba





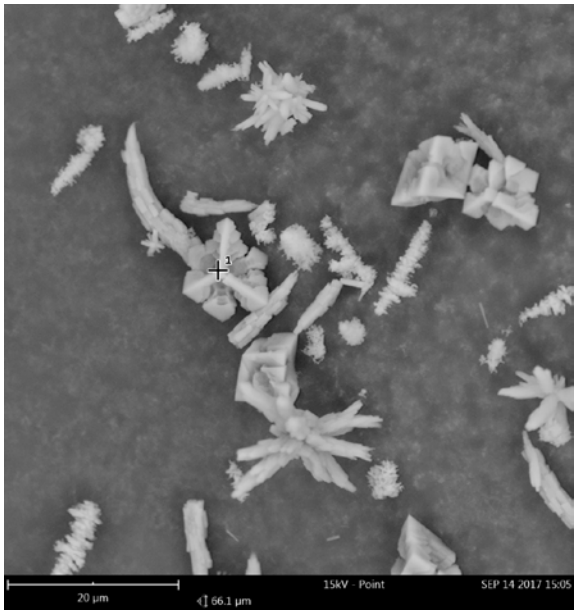




$[Ca^{2+}]$ = 4,000 mg L^{-1} | $[CO_3^{2-}]$ = 4,000 mg L^{-1} | $[SO_4^{2-}]$ = 500 mg L^{-1}

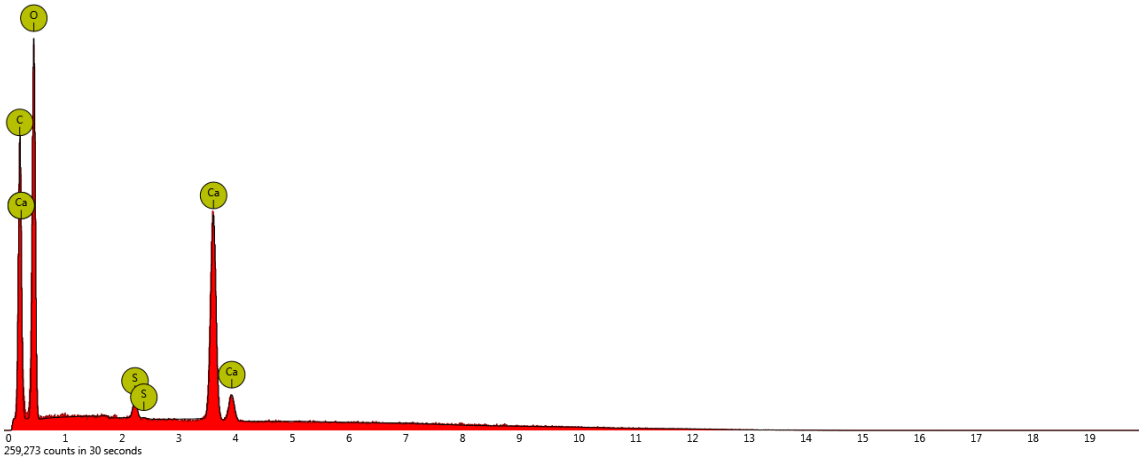
Image 1

1. spot



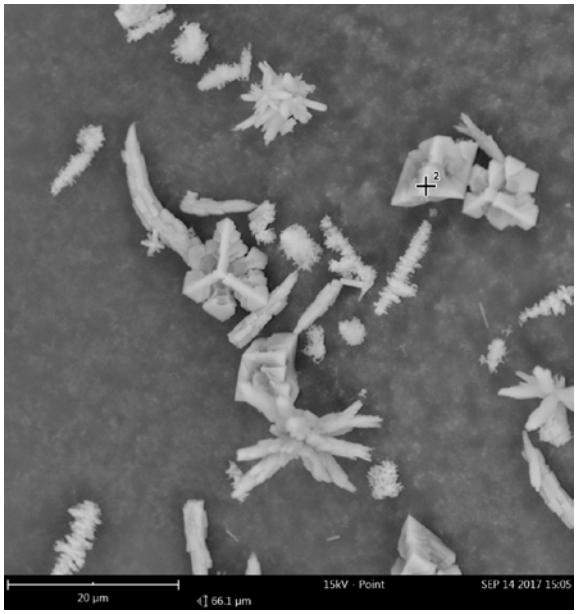
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.88	55.40
6	C	Carbon	41.05	31.69
20	Ca	Calcium	4.78	12.32
16	S	Sulfur	0.28	0.59

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



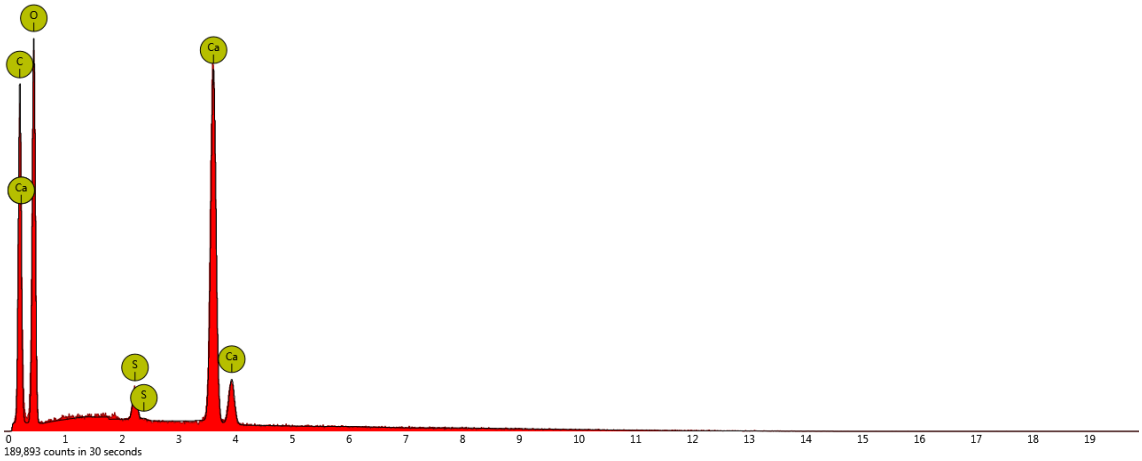
Disabled elements: B, N, Sb

2. spot



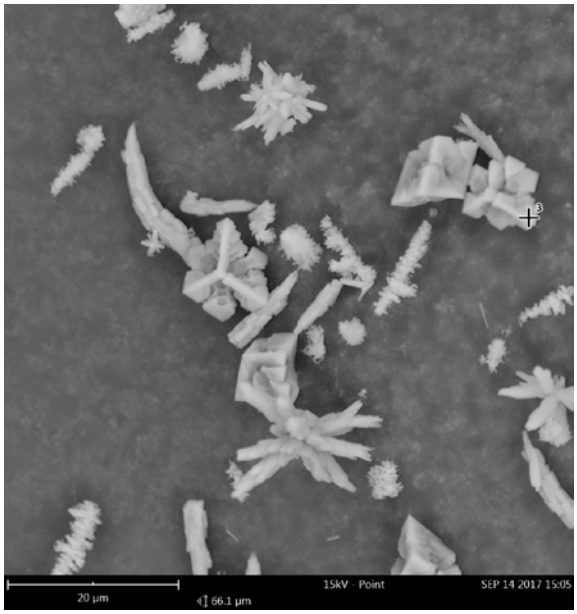
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.22	51.67
6	C	Carbon	40.24	29.88
20	Ca	Calcium	7.08	17.54
16	S	Sulfur	0.46	0.91

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



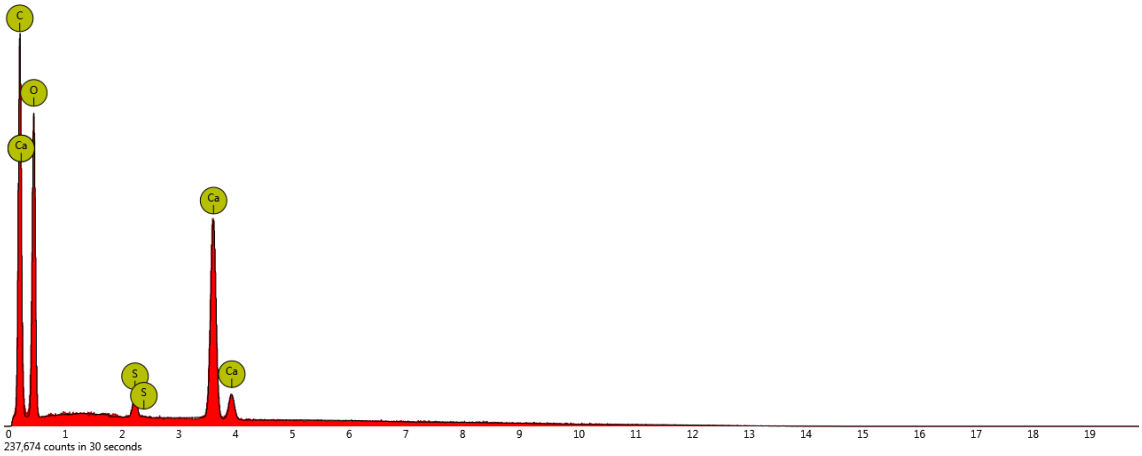
Disabled elements: B, Sb

3. spot



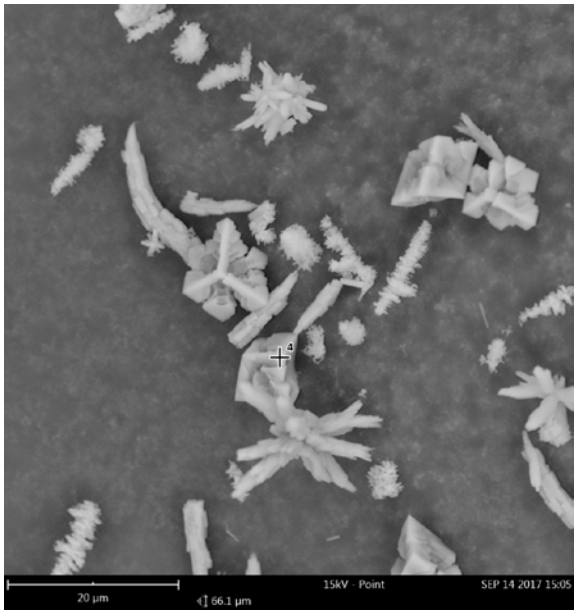
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	45.80	48.46
6	C	Carbon	49.53	39.34
20	Ca	Calcium	4.35	11.52
16	S	Sulfur	0.32	0.69

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



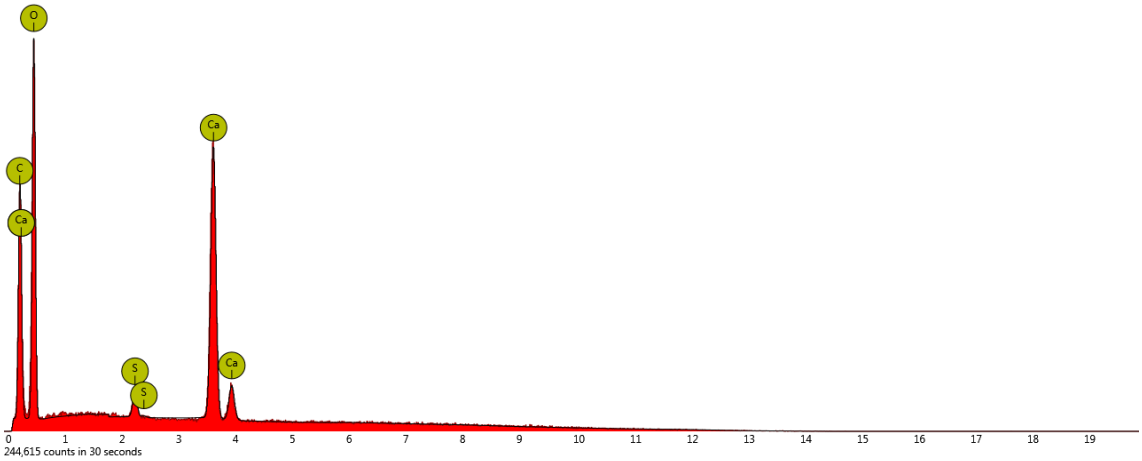
Disabled elements: B, Sb

4. spot



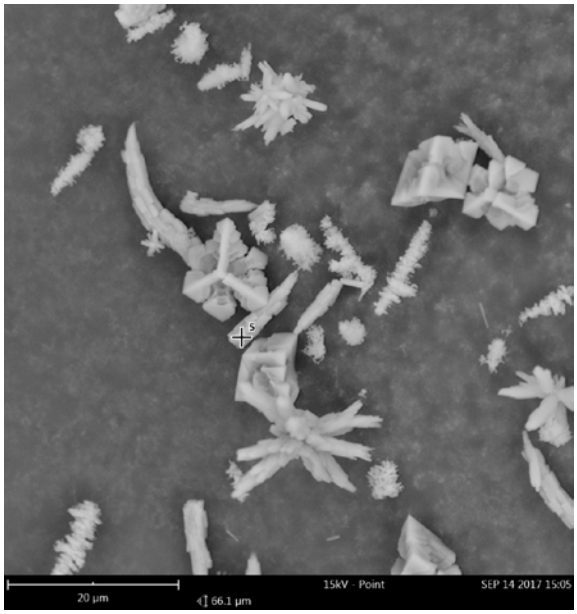
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.26	55.69
6	C	Carbon	36.82	27.36
20	Ca	Calcium	6.48	16.08
16	S	Sulfur	0.44	0.87

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



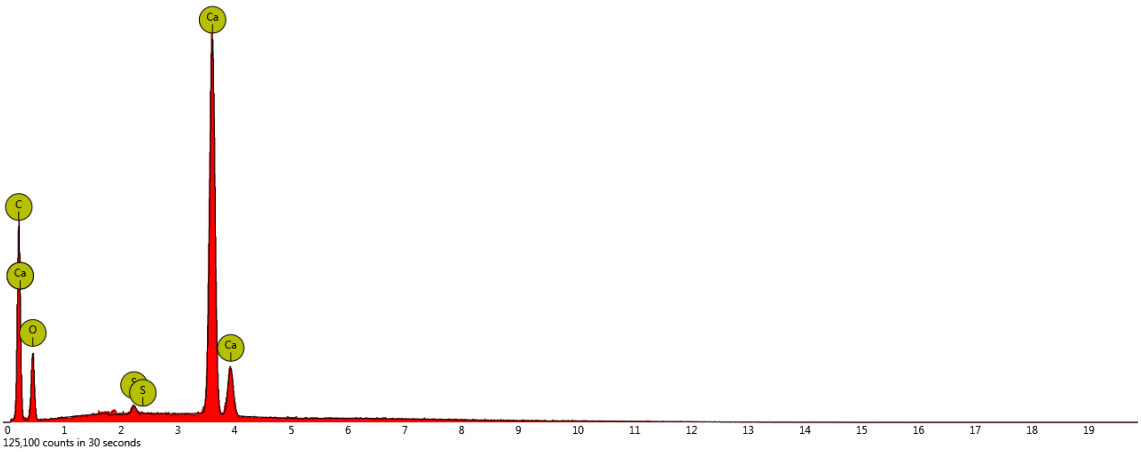
Disabled elements: B, I, Sb

5. spot



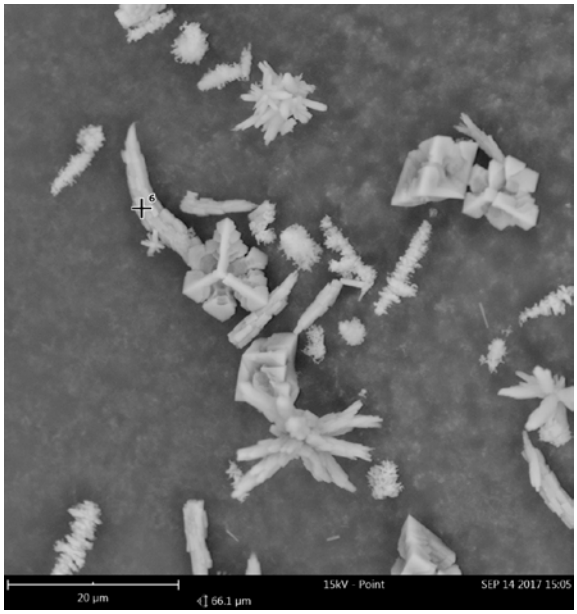
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	17.03	37.66
6	C	Carbon	50.59	33.52
8	O	Oxygen	32.10	28.33
16	S	Sulfur	0.28	0.49

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



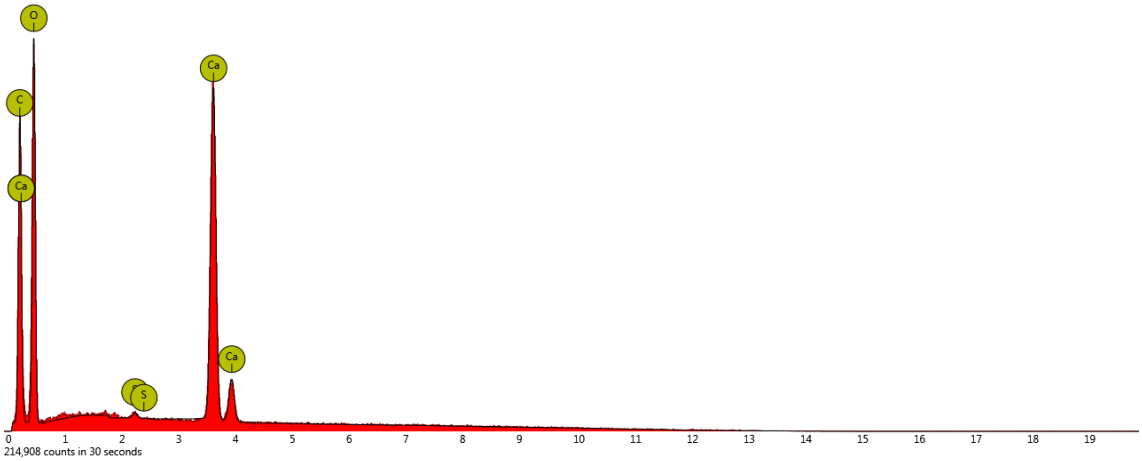
Disabled elements: B, Sb

6. spot



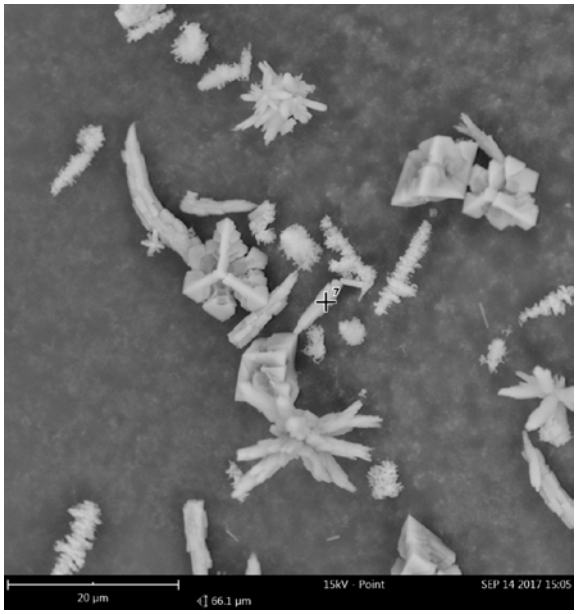
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.63	53.17
6	C	Carbon	39.26	29.22
20	Ca	Calcium	7.02	17.44
16	S	Sulfur	0.09	0.17

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



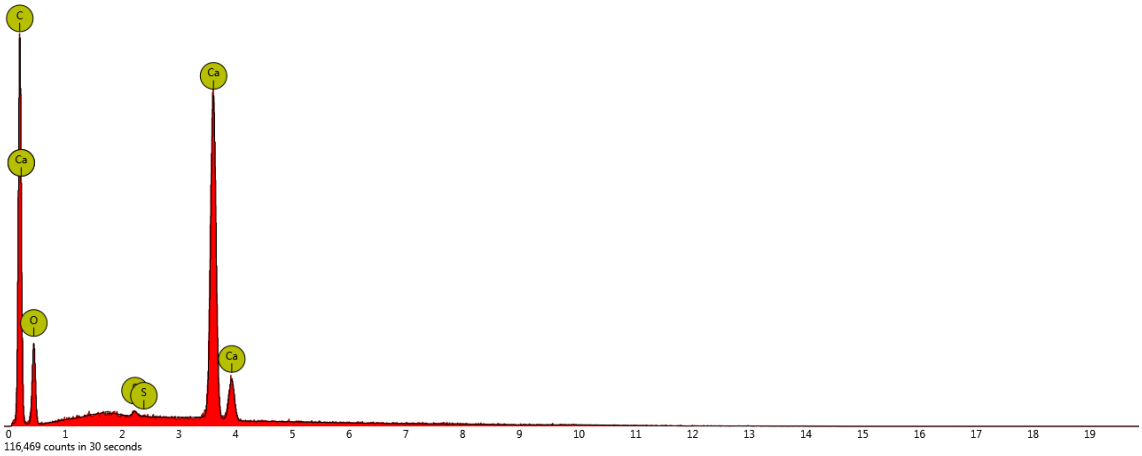
Disabled elements: B, Sb

7. spot



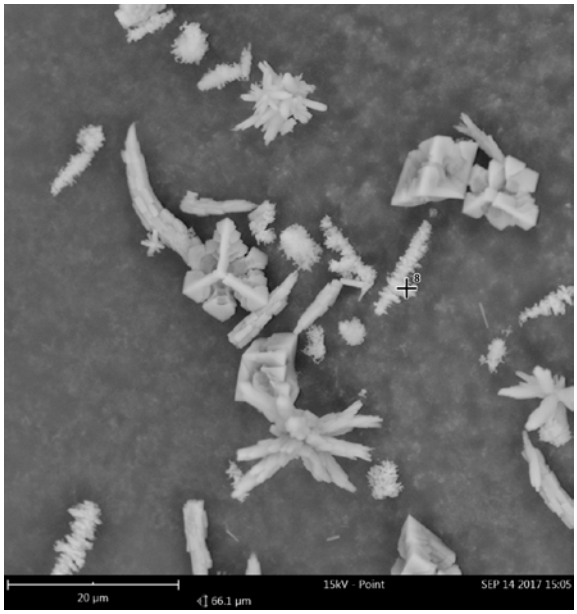
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	63.03	47.35
8	O	Oxygen	26.55	26.57
20	Ca	Calcium	10.32	25.87
16	S	Sulfur	0.11	0.21

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



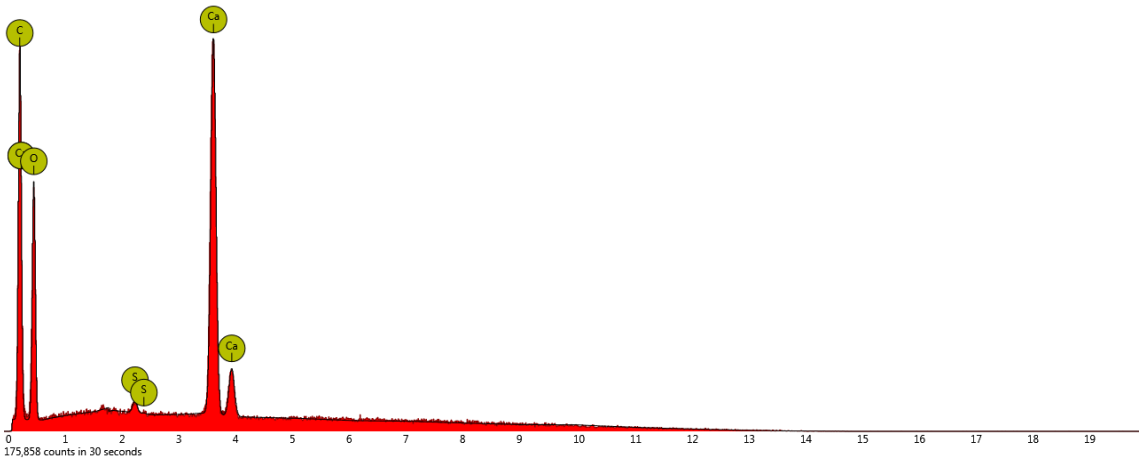
Disabled elements: B, Sb

8. spot



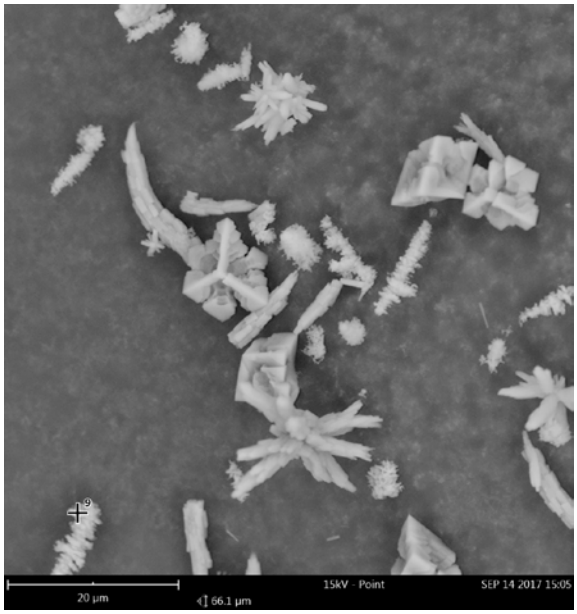
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	43.15	42.76
6	C	Carbon	48.20	35.86
20	Ca	Calcium	8.46	20.99
16	S	Sulfur	0.20	0.39

FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



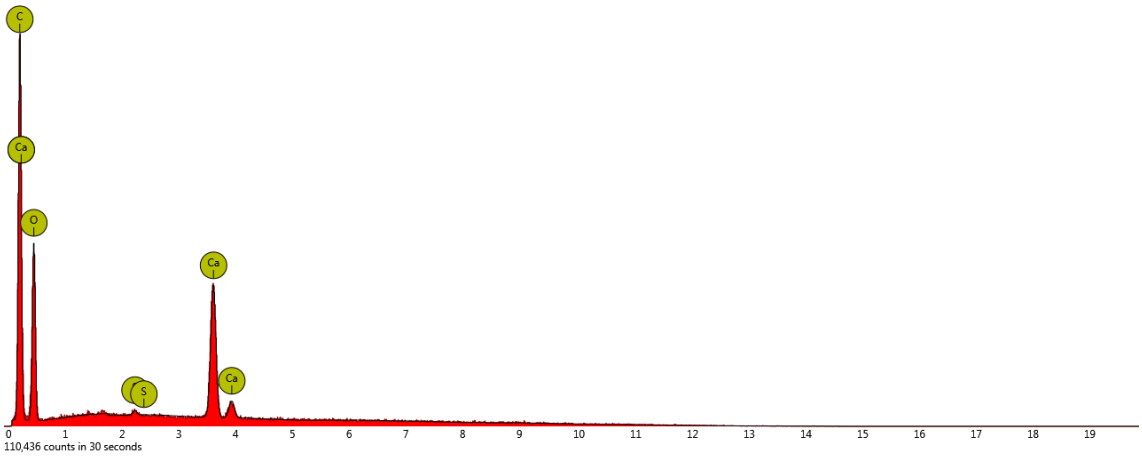
Disabled elements: B, Sb

9. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	57.76	47.49
8	O	Oxygen	38.42	42.08
20	Ca	Calcium	3.73	10.23
16	S	Sulfur	0.09	0.20

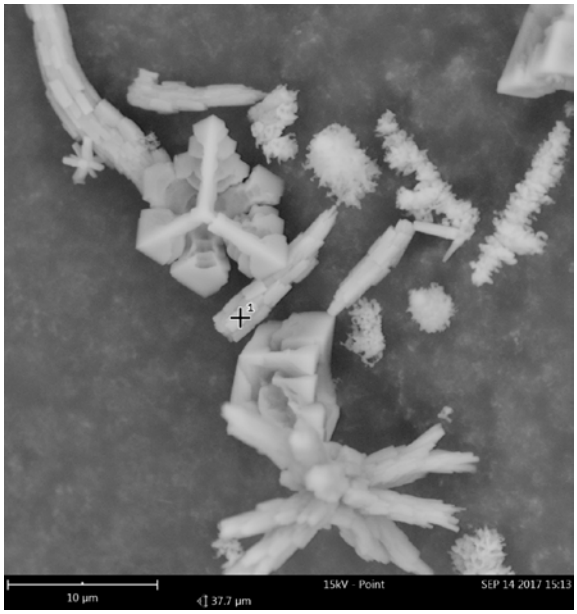
FOV: 66.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:05



Disabled elements: B, I, Mo, Sb

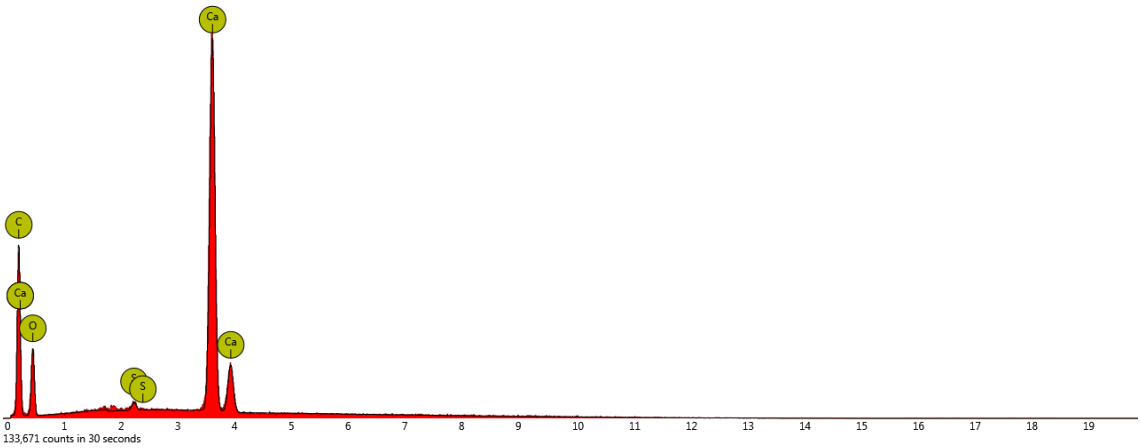
Image 2

1. spot



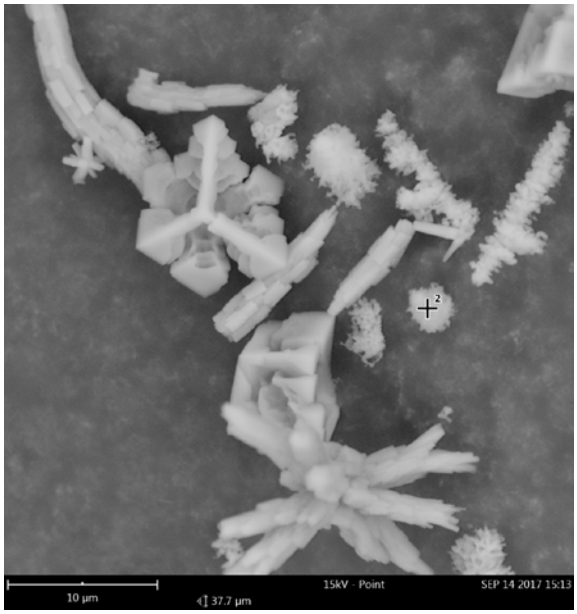
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	18.20	39.32
6	C	Carbon	47.14	30.52
8	O	Oxygen	34.37	29.65
16	S	Sulfur	0.29	0.51

FOV: 37.7 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:13



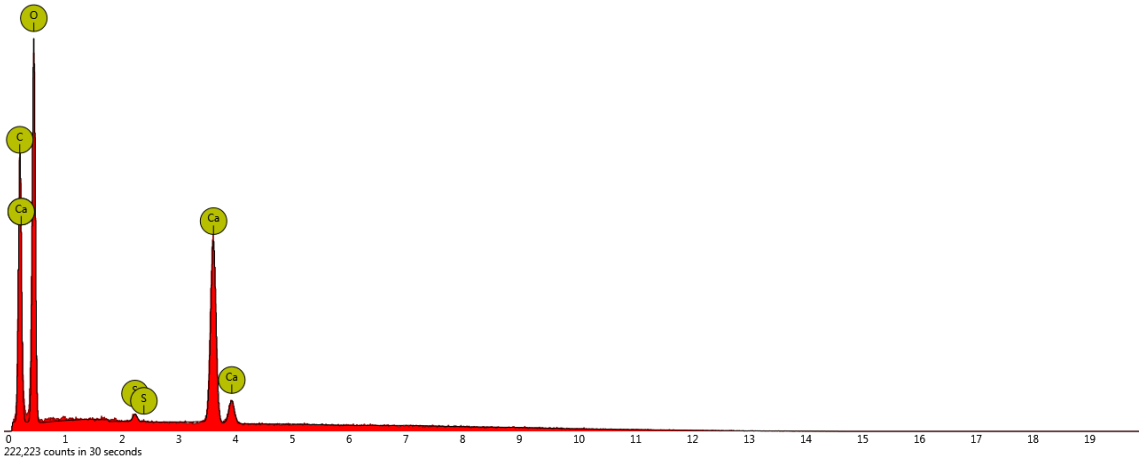
Disabled elements: B, Sb

2. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	55.02	56.86
6	C	Carbon	40.39	31.33
20	Ca	Calcium	4.45	11.53
16	S	Sulfur	0.13	0.28

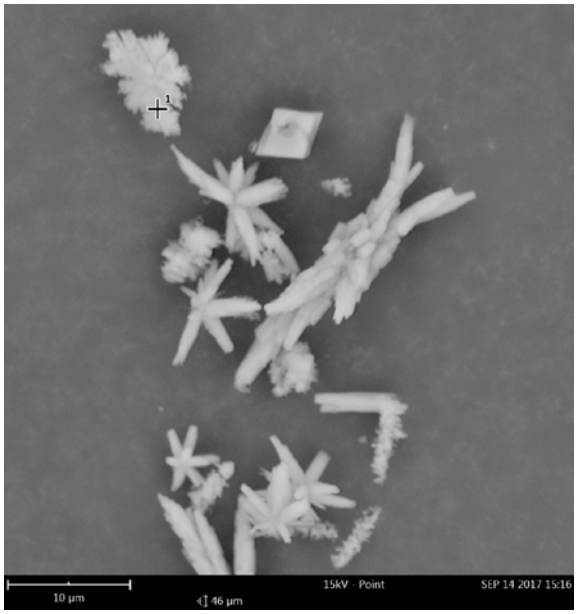
FOV: 37.7 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:13



Disabled elements: B, I, N, Sb

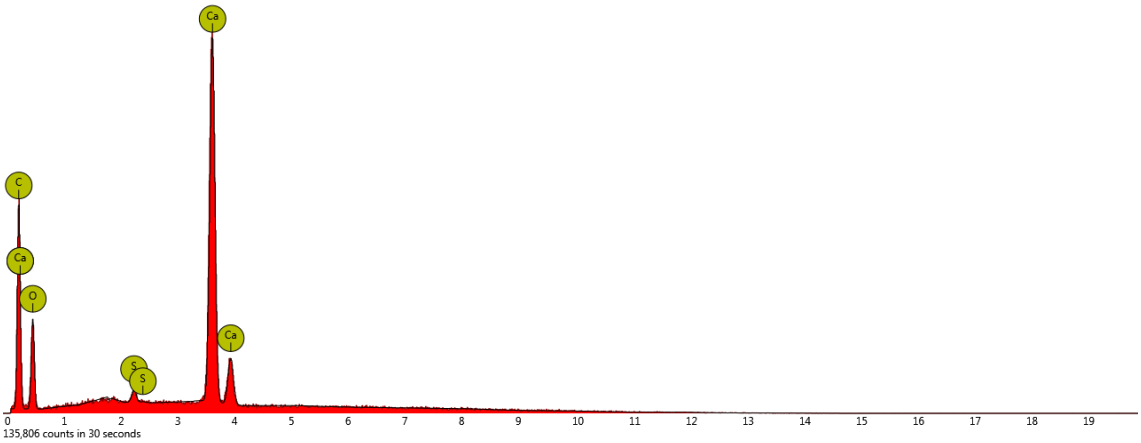
Image 3

1. spot



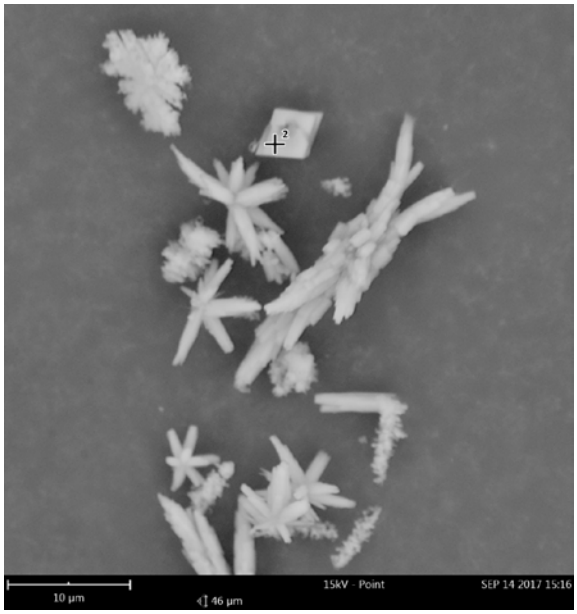
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	14.82	33.60
6	C	Carbon	48.72	33.09
8	O	Oxygen	36.08	32.64
16	S	Sulfur	0.37	0.67

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:16



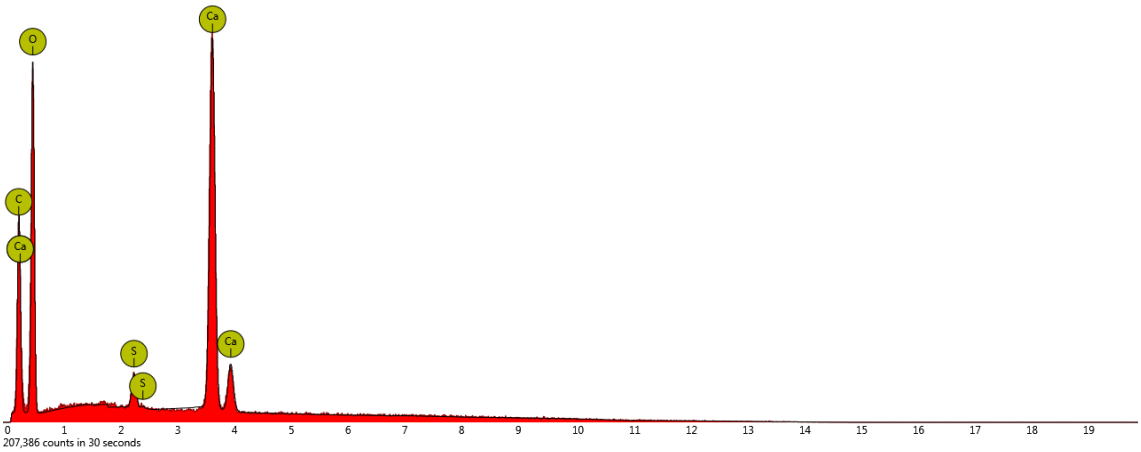
Disabled elements: B, Sb

2. spot



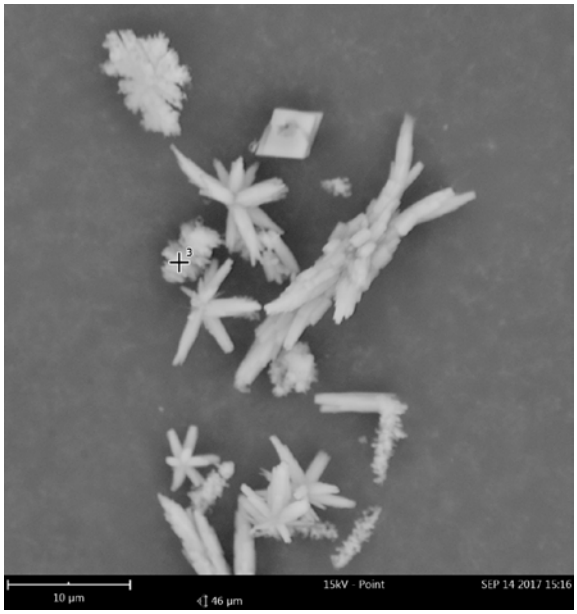
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	57.52	54.18
6	C	Carbon	32.76	23.17
20	Ca	Calcium	9.12	21.53
16	S	Sulfur	0.60	1.13

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:16



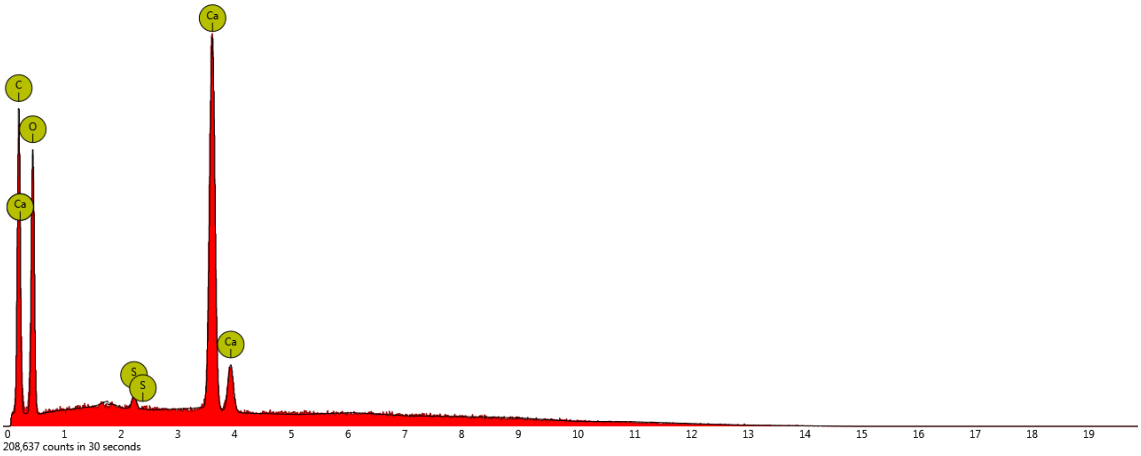
Disabled elements: B, Sb

3. spot



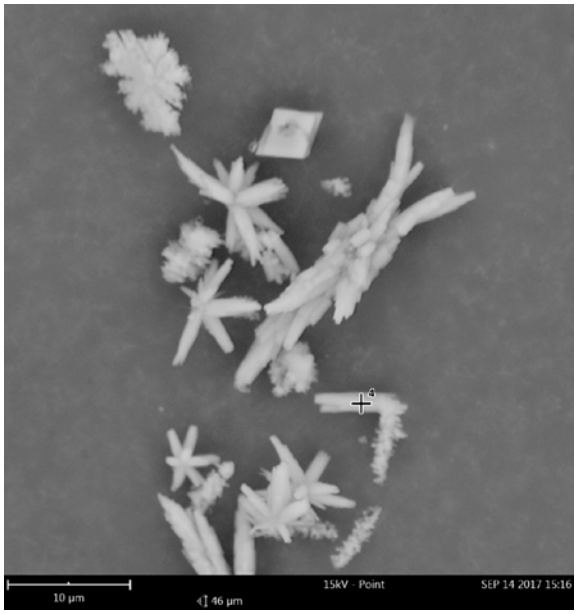
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	48.53	46.97
6	C	Carbon	42.21	30.67
20	Ca	Calcium	9.03	21.90
16	S	Sulfur	0.23	0.45

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:16



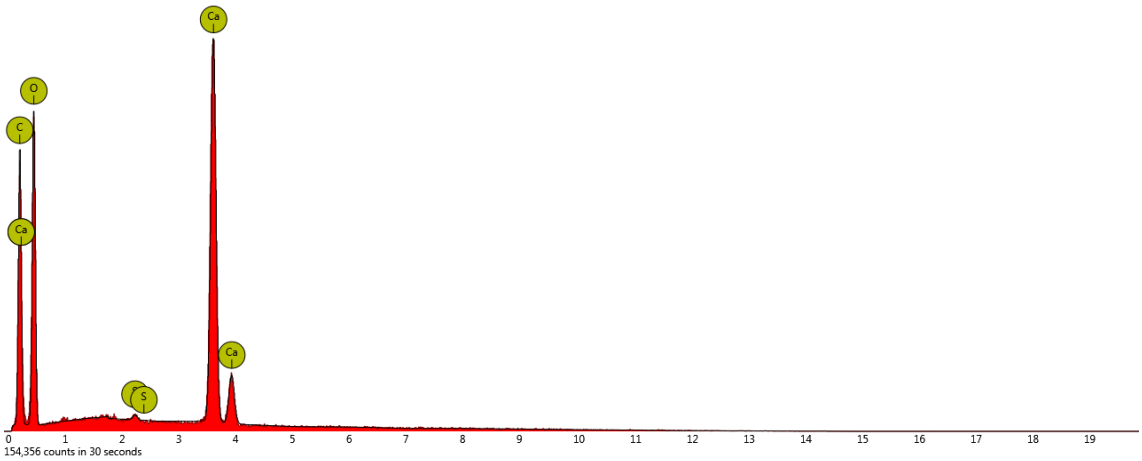
Disabled elements: B, Sb

4. spot



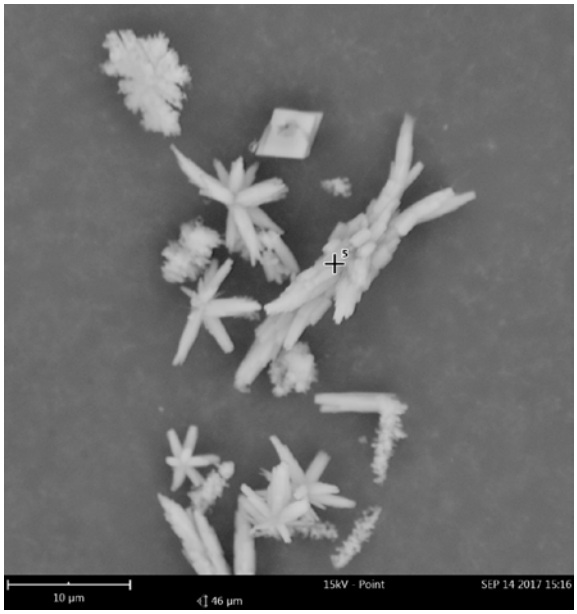
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.40	51.03
6	C	Carbon	37.30	26.76
20	Ca	Calcium	9.21	22.04
16	S	Sulfur	0.09	0.18

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:16



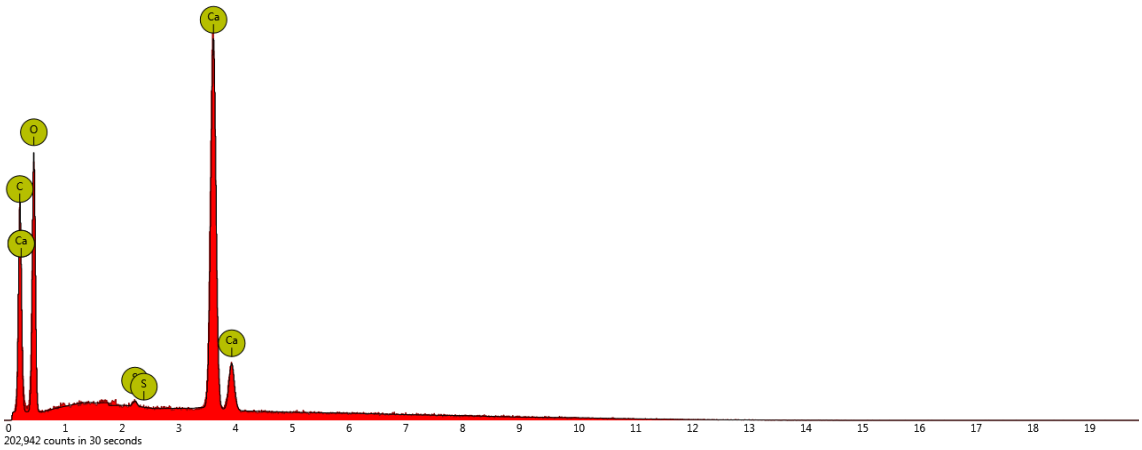
Disabled elements: B, Sb

5. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.46	50.06
6	C	Carbon	36.02	25.32
20	Ca	Calcium	10.40	24.40
16	S	Sulfur	0.11	0.21

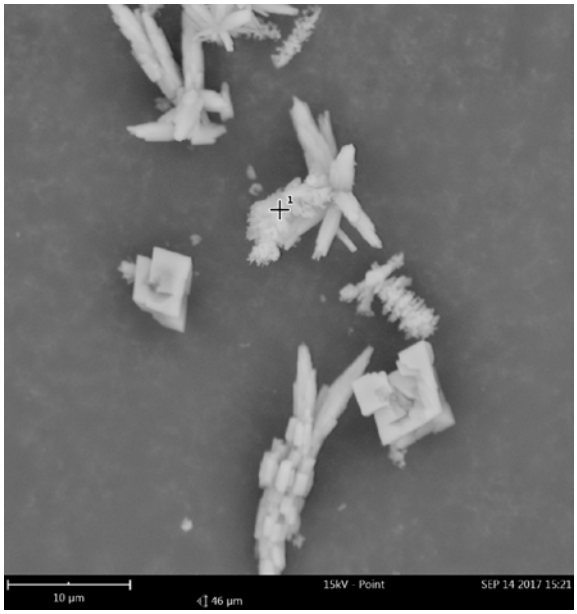
FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:16



Disabled elements: B, Sb

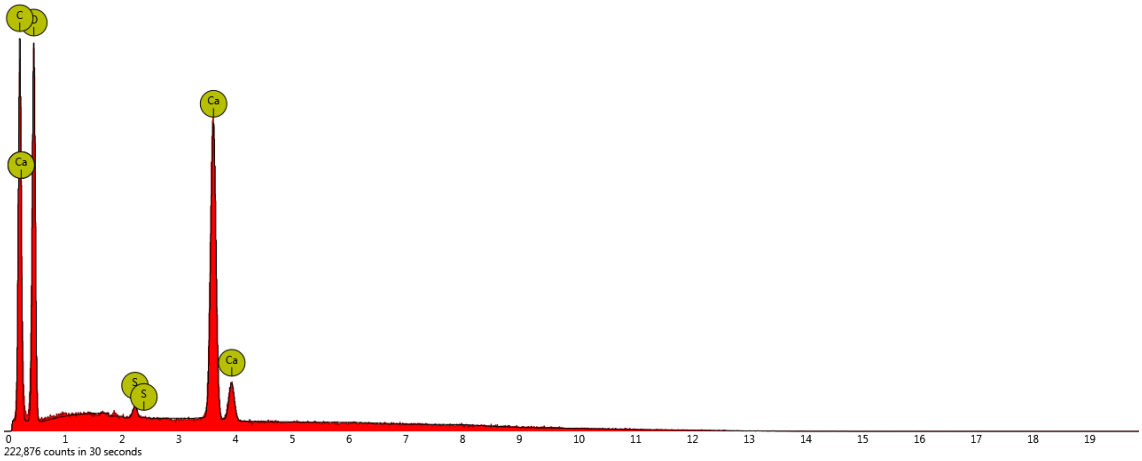
Image 4

1. spot



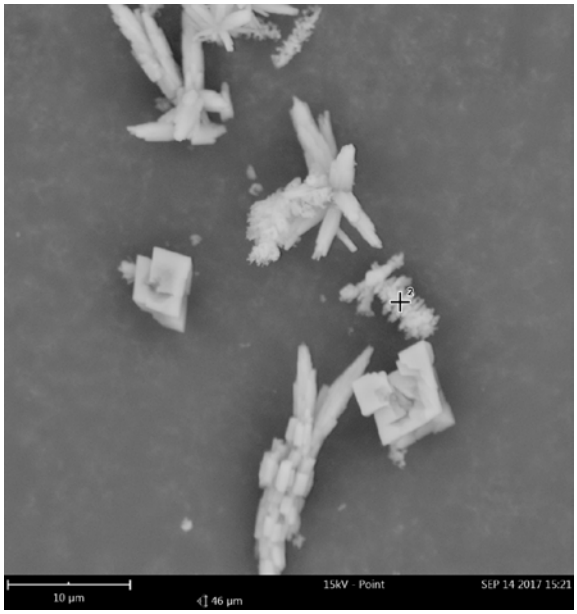
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	50.68	51.53
6	C	Carbon	43.21	32.99
20	Ca	Calcium	5.94	15.13
16	S	Sulfur	0.17	0.35

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:21



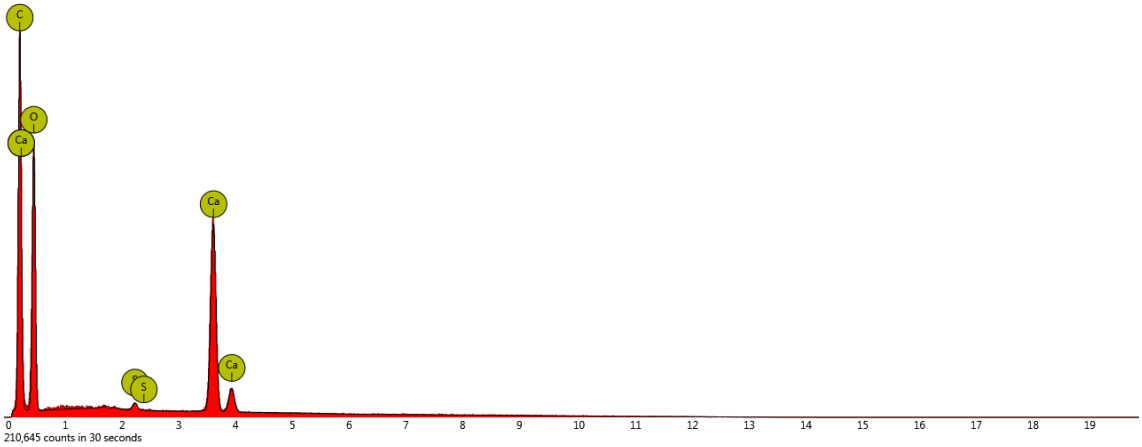
Disabled elements: B, Sb

2. spot



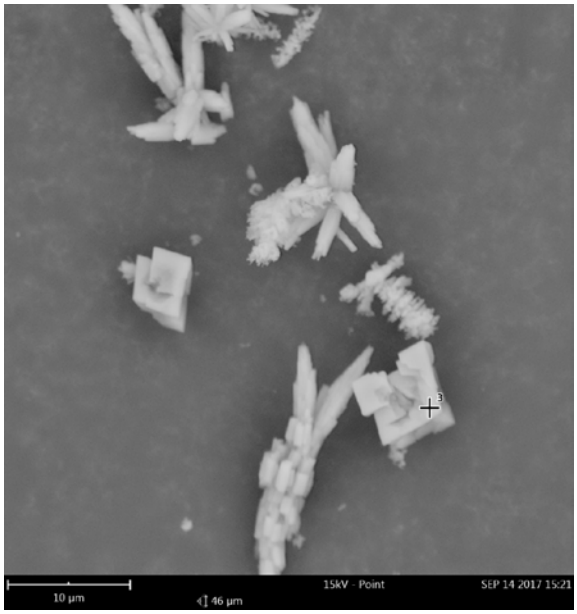
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.94	47.69
6	C	Carbon	50.50	40.23
20	Ca	Calcium	4.45	11.83
16	S	Sulfur	0.12	0.25

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:21



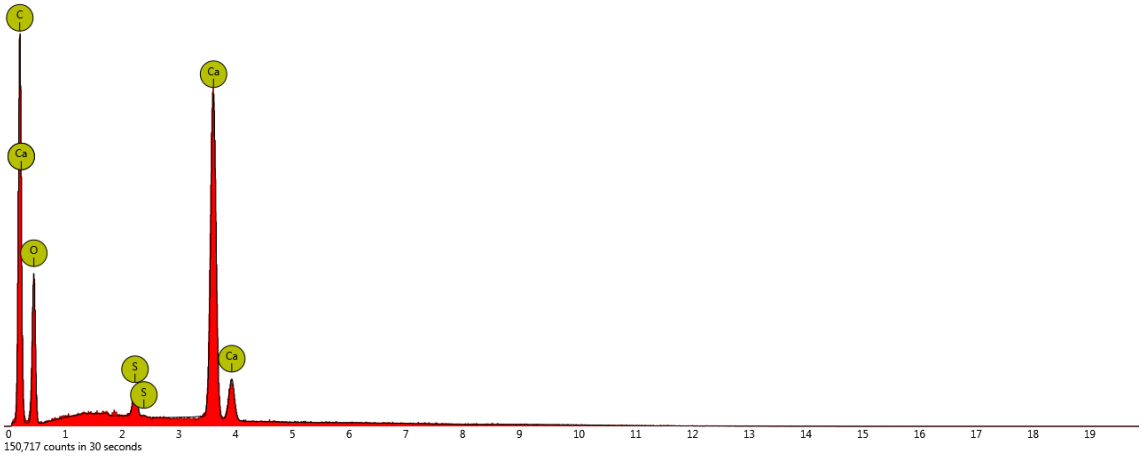
Disabled elements: B, Sb

3. spot



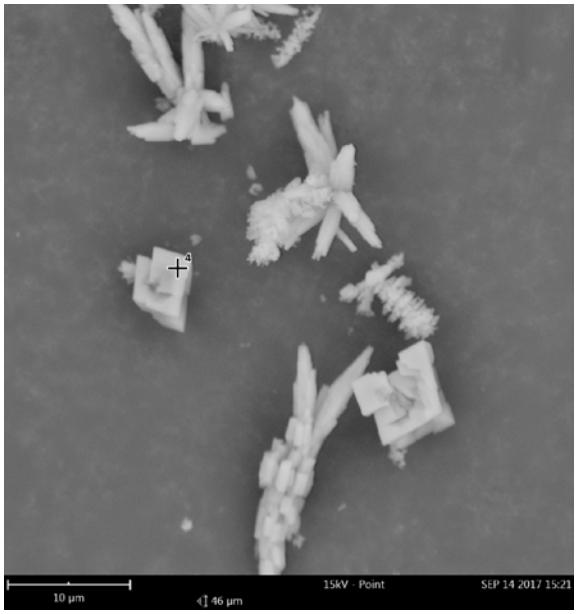
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	56.68	43.05
8	O	Oxygen	34.53	34.93
20	Ca	Calcium	8.30	21.05
16	S	Sulfur	0.48	0.98

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:21



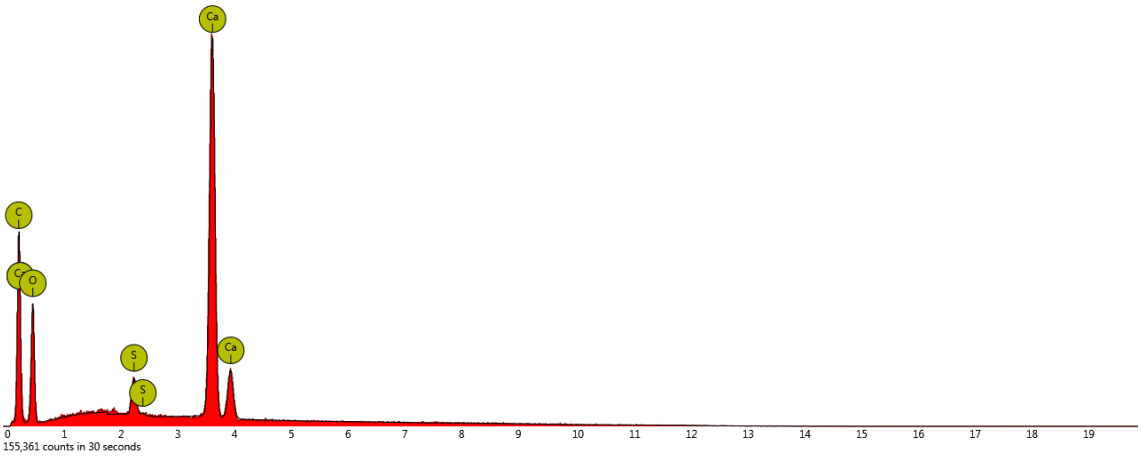
Disabled elements: B, Sb

4. spot



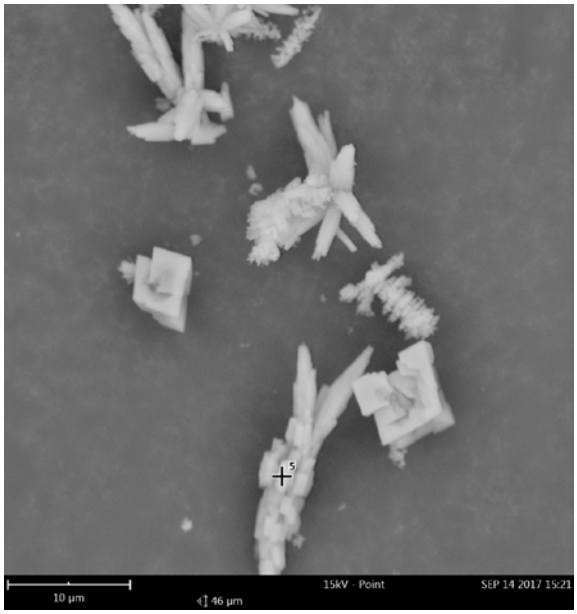
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	40.18	36.36
20	Ca	Calcium	13.81	31.30
6	C	Carbon	45.06	30.61
16	S	Sulfur	0.95	1.72

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:21



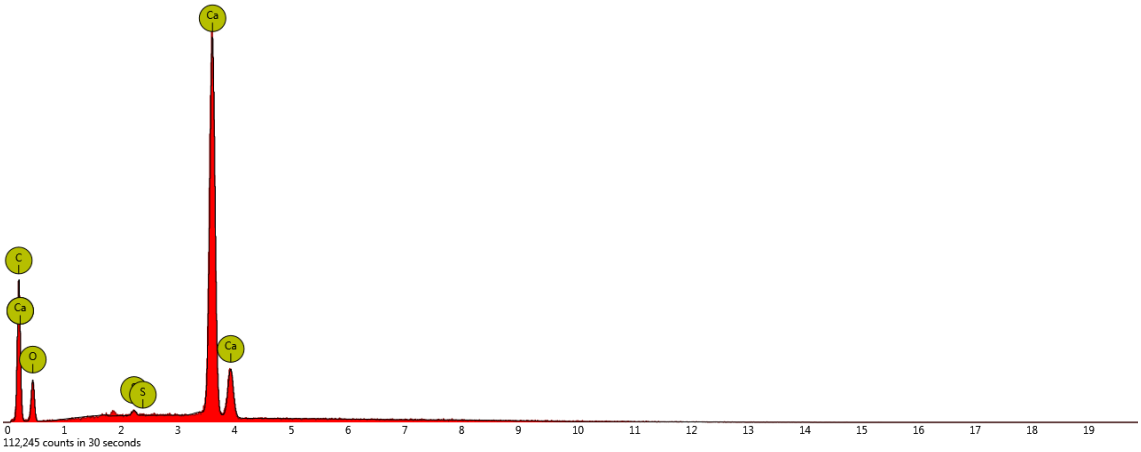
Disabled elements: B, Sb

5. spot



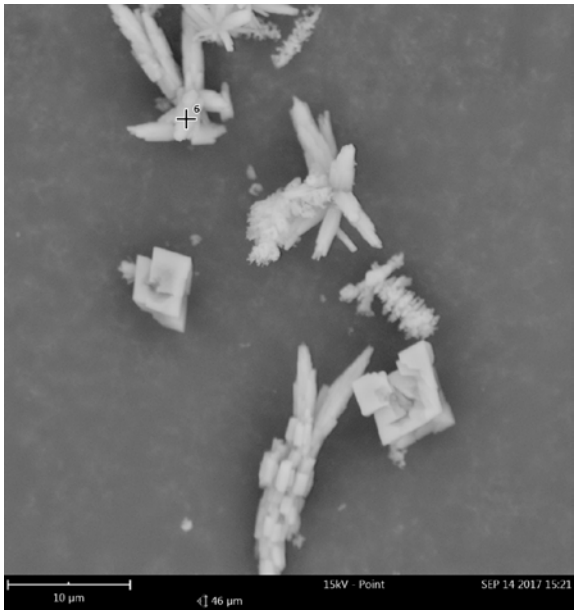
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	22.51	46.24
6	C	Carbon	48.75	30.01
8	O	Oxygen	28.52	23.39
16	S	Sulfur	0.22	0.36

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:21



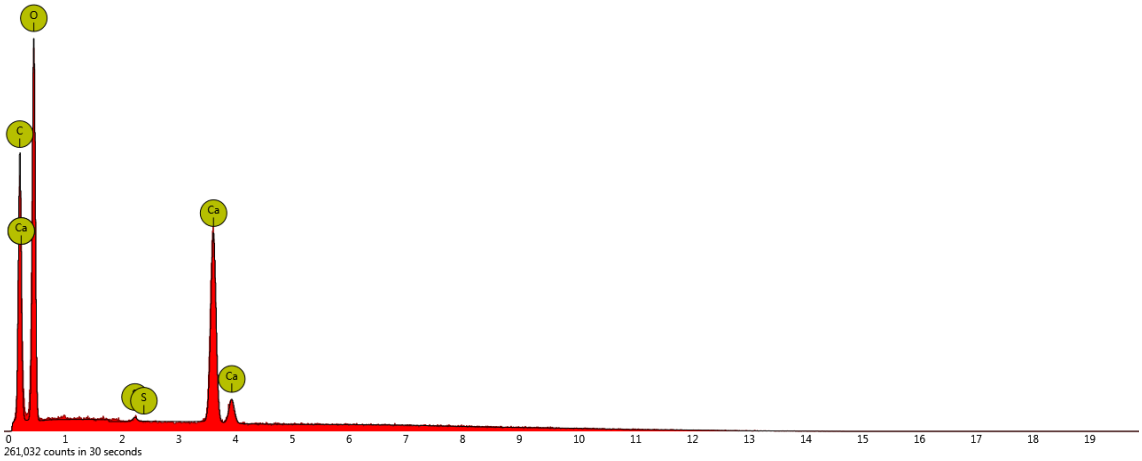
Disabled elements: B, Sb

6. spot



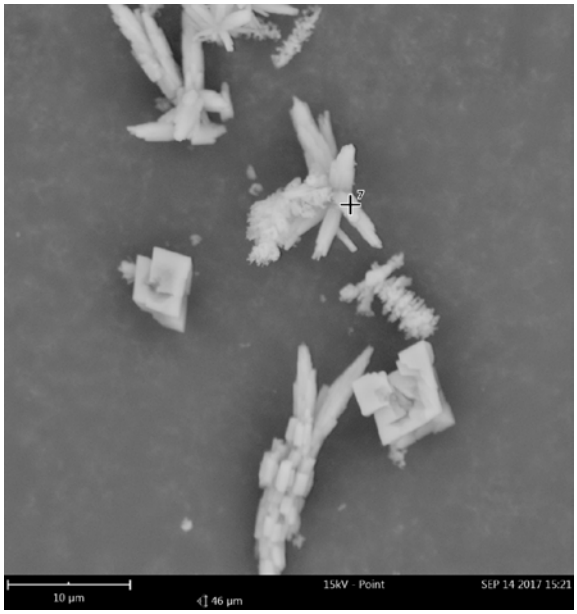
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.55	57.84
6	C	Carbon	38.52	29.58
20	Ca	Calcium	4.85	12.43
16	S	Sulfur	0.07	0.15

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:21



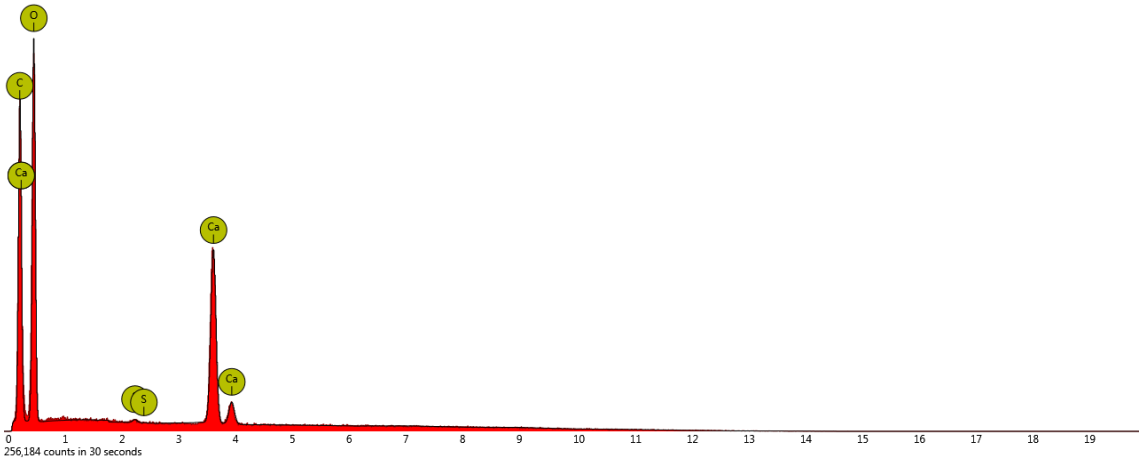
Disabled elements: B, Sb

7. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.47	55.14
6	C	Carbon	43.53	34.34
20	Ca	Calcium	3.95	10.41
16	S	Sulfur	0.05	0.11

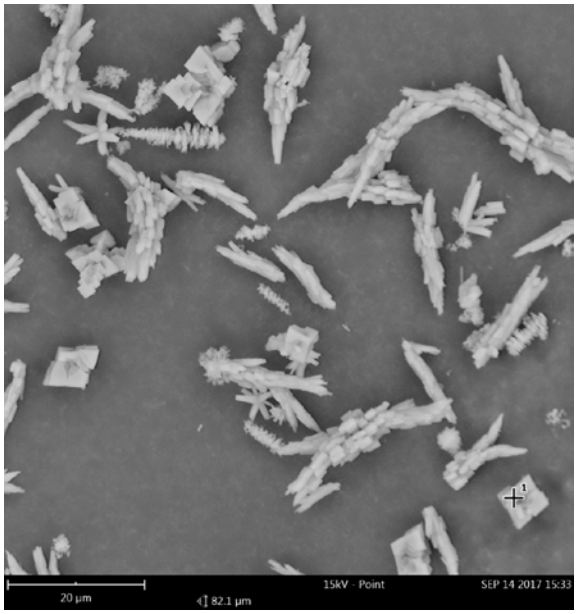
FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:21



Disabled elements: B, N, Sb

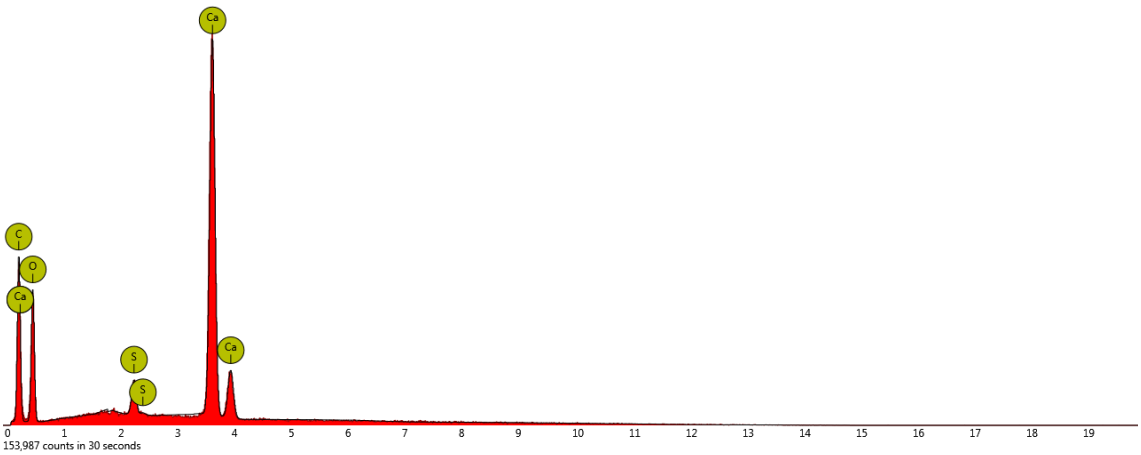
Image 6

1. spot



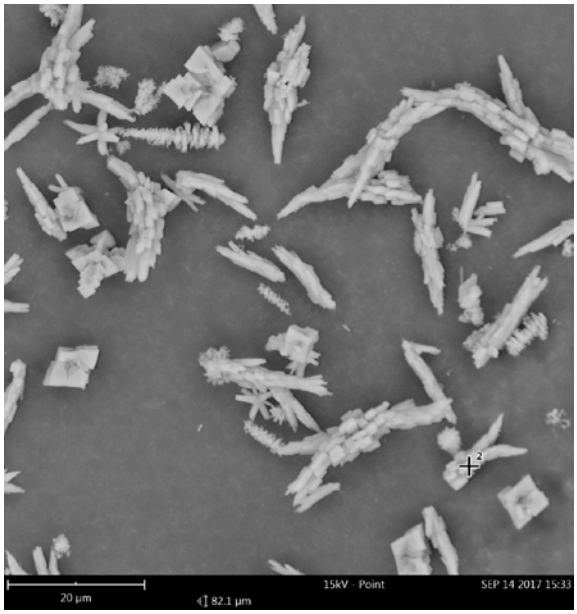
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.96	39.85
20	Ca	Calcium	14.45	32.09
6	C	Carbon	39.65	26.39
16	S	Sulfur	0.94	1.67

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



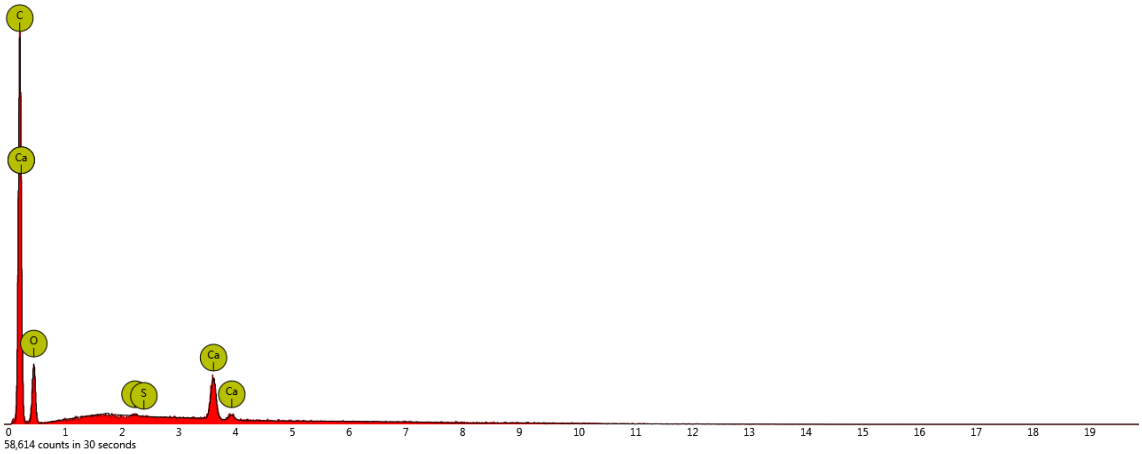
Disabled elements: B, Sb

2. spot



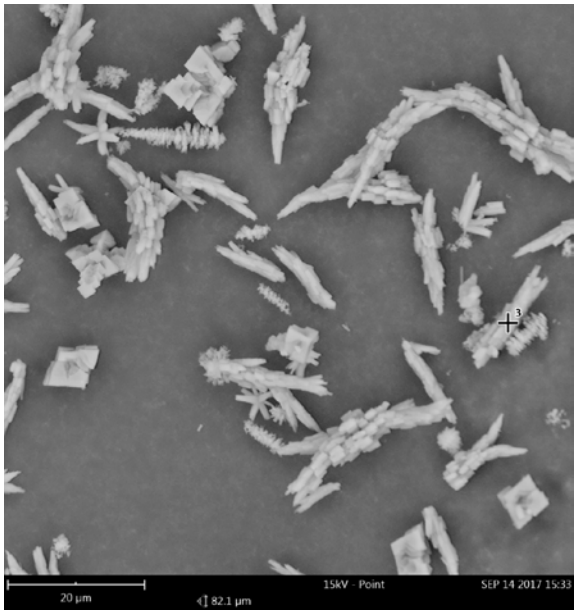
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	74.26	66.23
8	O	Oxygen	23.94	28.45
20	Ca	Calcium	1.76	5.24
16	S	Sulfur	0.04	0.09

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



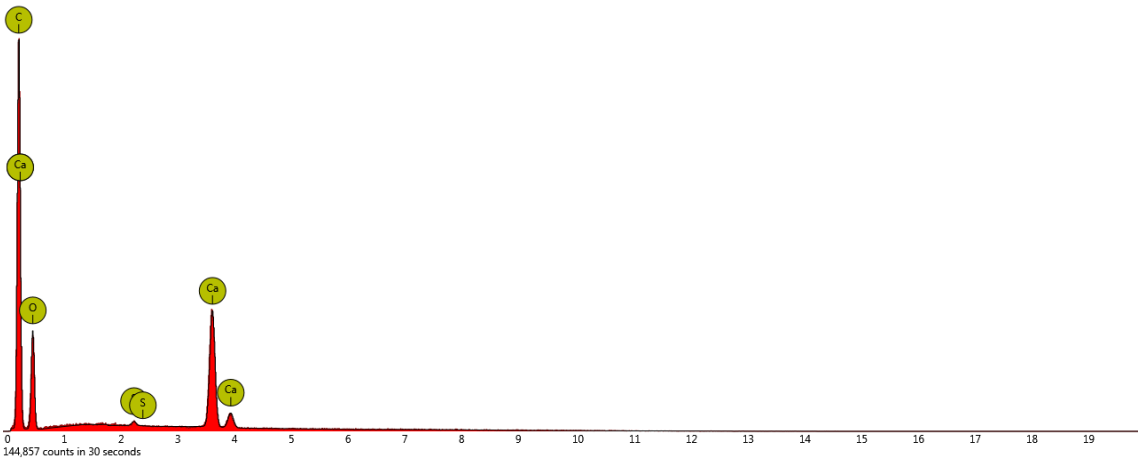
Disabled elements: B

3. spot



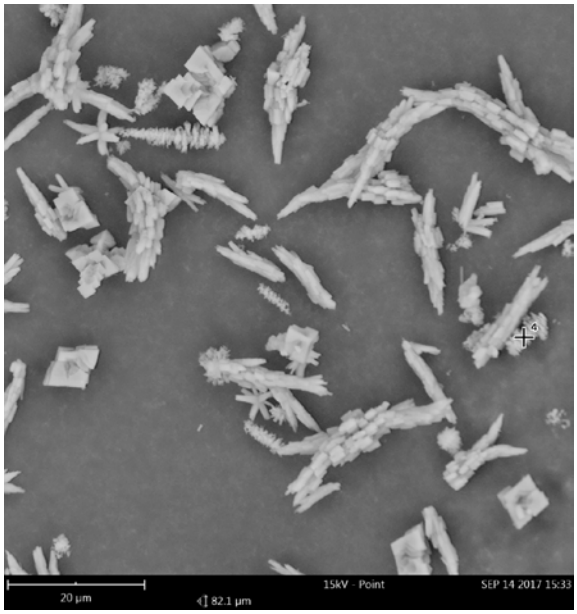
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	66.00	55.27
8	O	Oxygen	29.91	33.37
20	Ca	Calcium	3.99	11.14
16	S	Sulfur	0.10	0.22

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



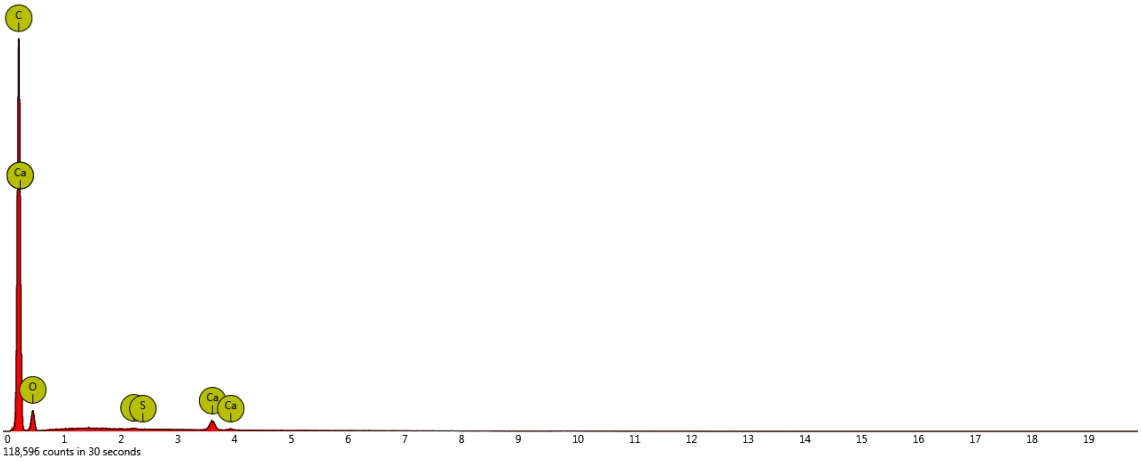
Disabled elements: B, I, Sb

4. spot



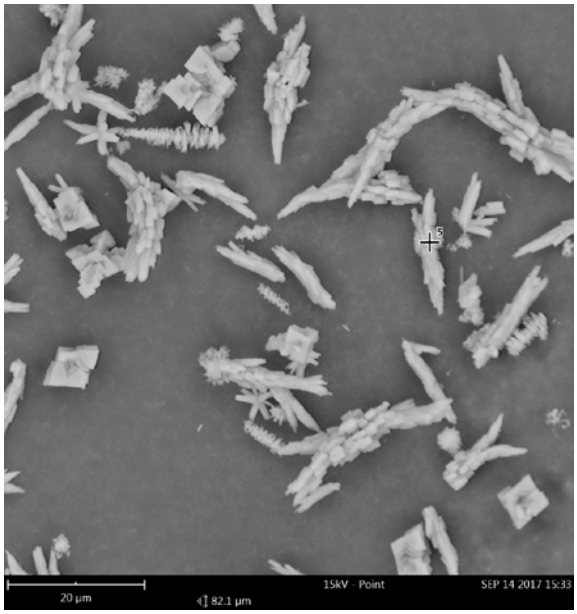
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	86.32	81.72
8	O	Oxygen	13.13	16.56
20	Ca	Calcium	0.51	1.62
16	S	Sulfur	0.04	0.09

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



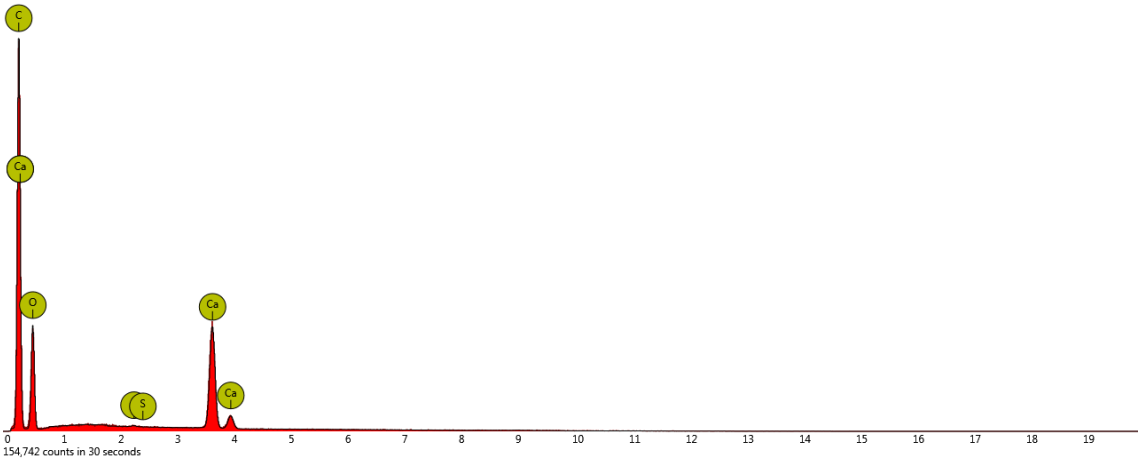
Disabled elements: B

5. spot



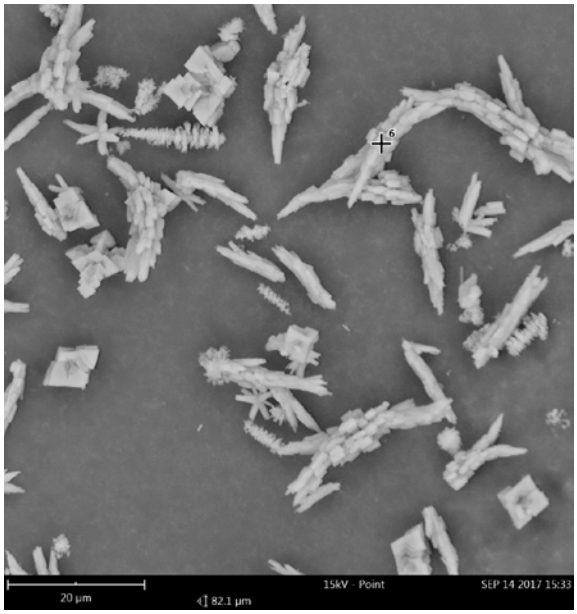
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	65.58	55.36
8	O	Oxygen	30.90	34.75
20	Ca	Calcium	3.49	9.83
16	S	Sulfur	0.02	0.05

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



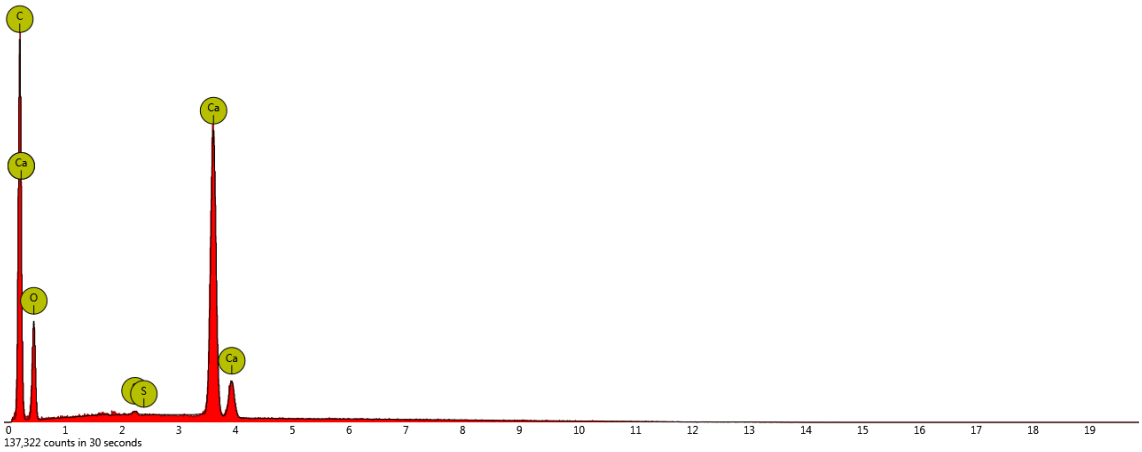
Disabled elements: B, Sb

6. spot



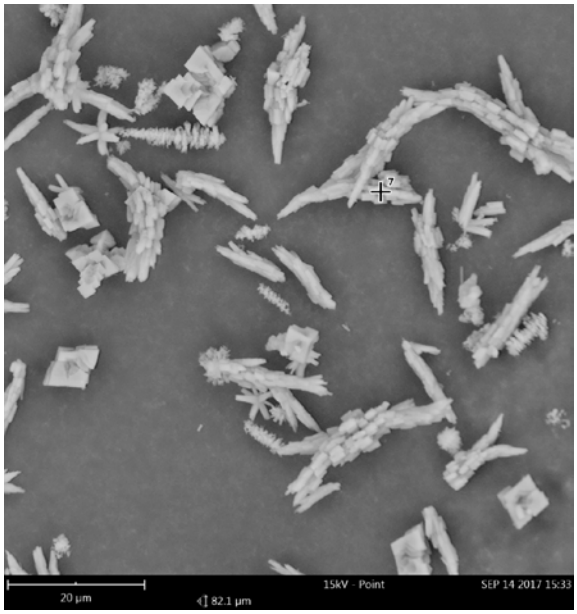
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	61.08	46.66
8	O	Oxygen	29.92	30.45
20	Ca	Calcium	8.92	22.75
16	S	Sulfur	0.07	0.14

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



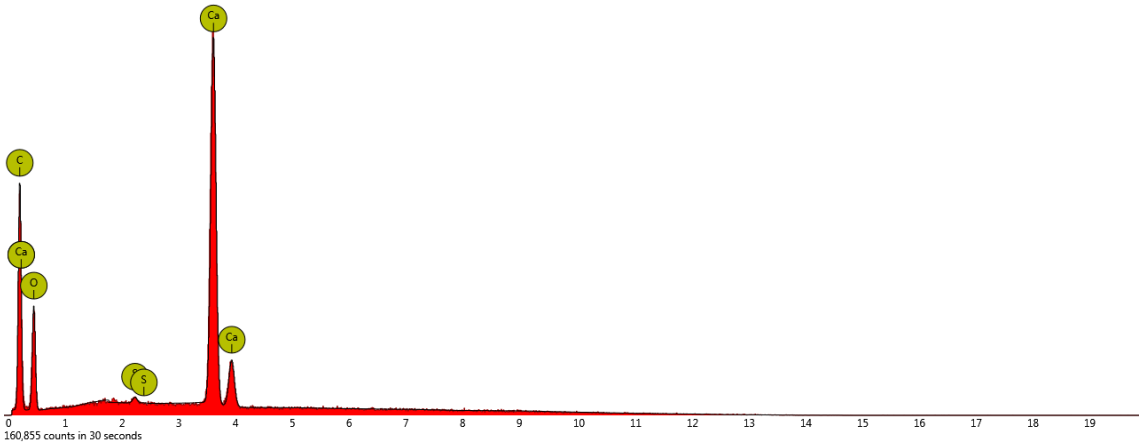
Disabled elements: B, Sb

7. spot



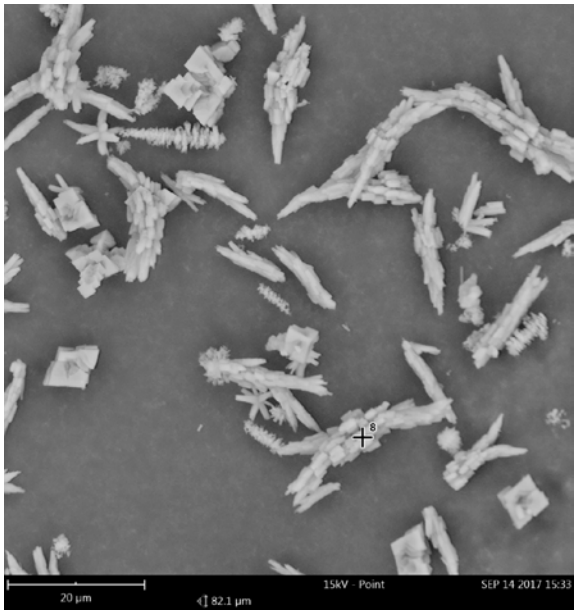
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	38.09	34.82
6	C	Carbon	47.71	32.74
20	Ca	Calcium	14.04	32.15
16	S	Sulfur	0.16	0.29

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



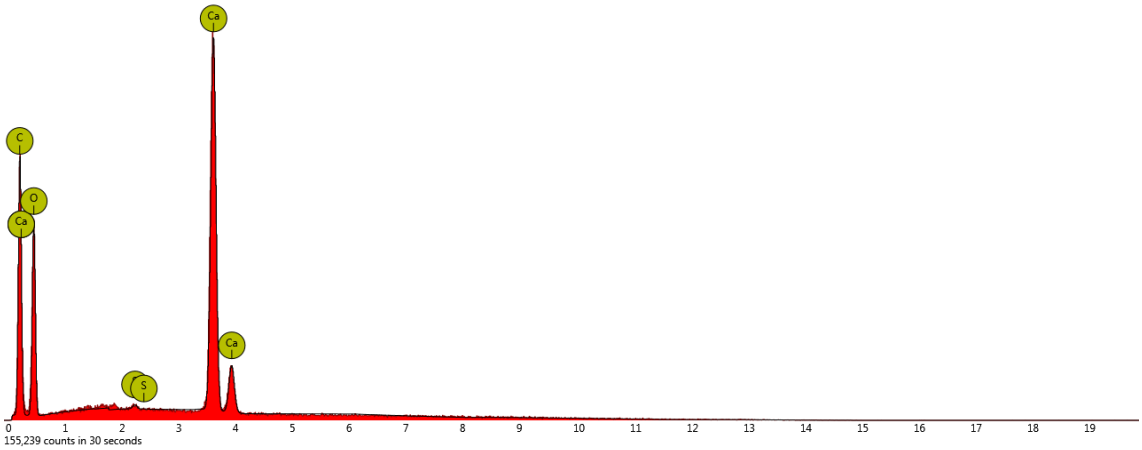
Disabled elements: B, Sb

8. spot



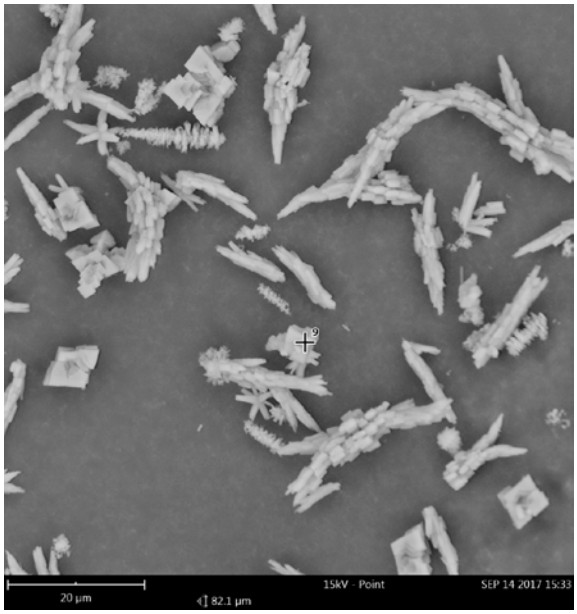
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	45.81	43.44
6	C	Carbon	43.35	30.86
20	Ca	Calcium	10.75	25.54
16	S	Sulfur	0.09	0.16

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



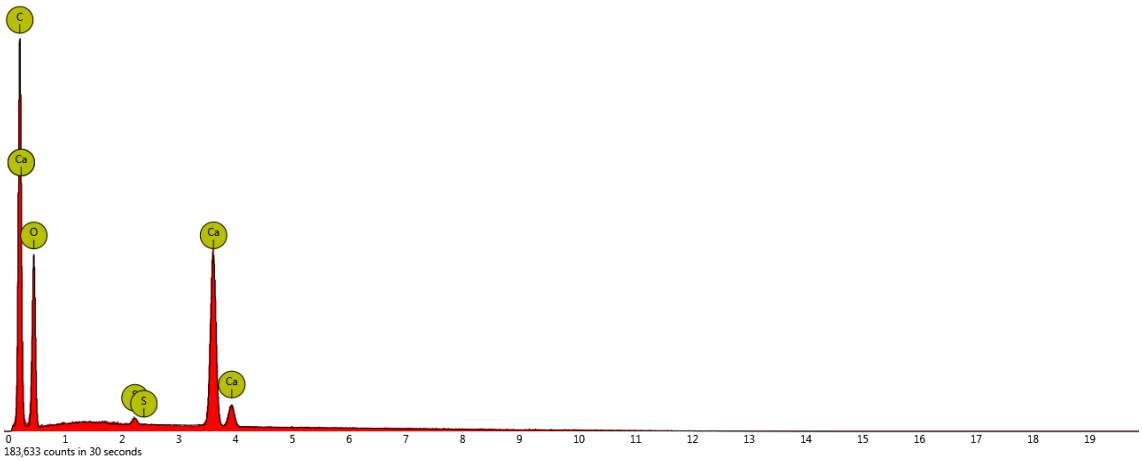
Disabled elements: B, Sb

9. spot



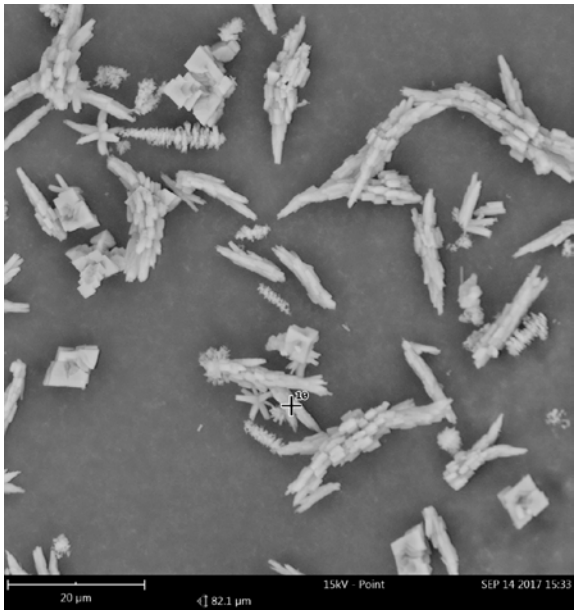
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	57.43	46.40
8	O	Oxygen	37.72	40.60
20	Ca	Calcium	4.73	12.74

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



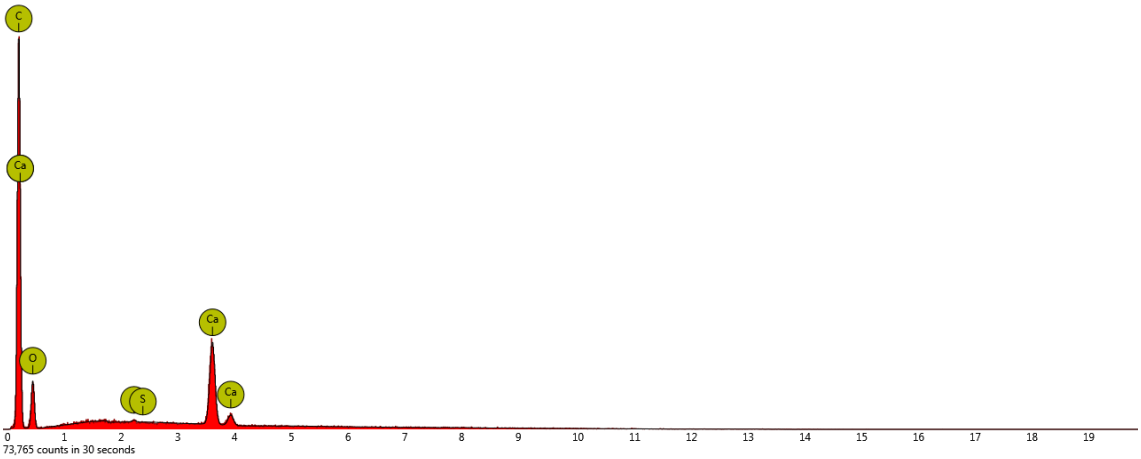
Disabled elements: B, Sb

10. spot



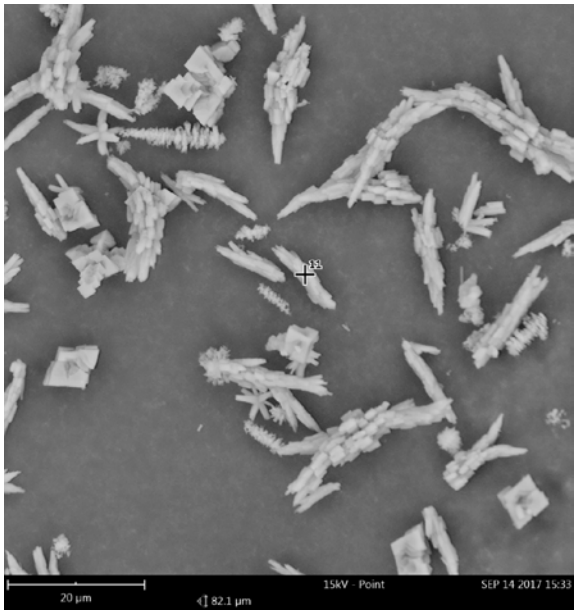
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	75.46	65.40
8	O	Oxygen	20.91	24.14
20	Ca	Calcium	3.58	10.34
16	S	Sulfur	0.05	0.13

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



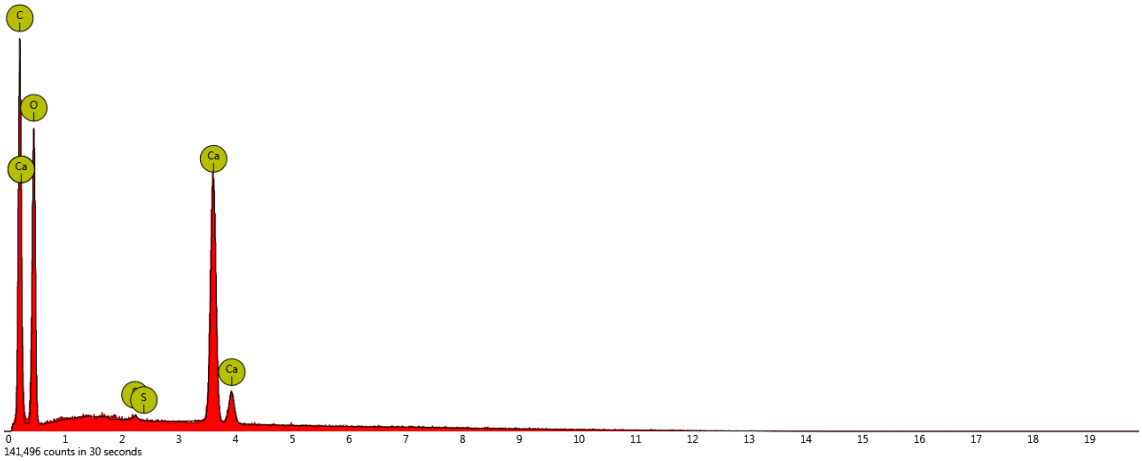
Disabled elements: B, Sb

11. spot



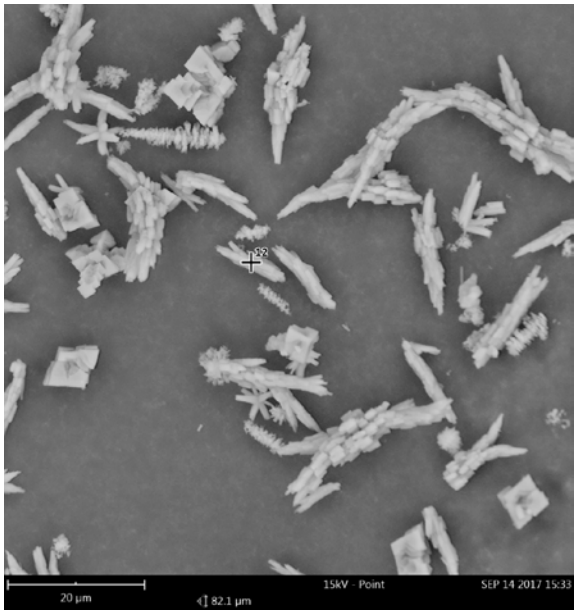
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	47.00	48.66
6	C	Carbon	47.40	36.84
20	Ca	Calcium	5.52	14.33
16	S	Sulfur	0.08	0.17

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



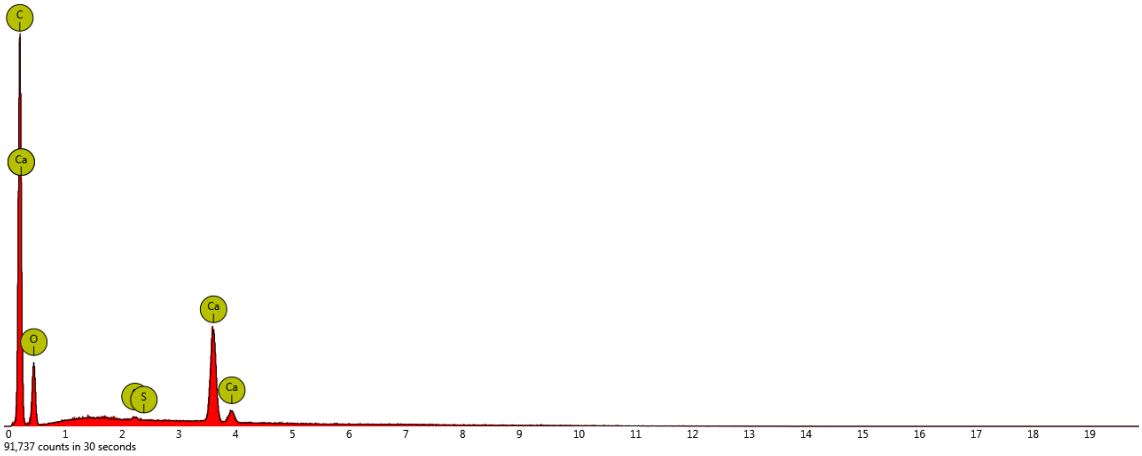
Disabled elements: B, I, Sb

12. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	72.07	61.72
8	O	Oxygen	24.16	27.57
20	Ca	Calcium	3.68	10.52
16	S	Sulfur	0.09	0.19

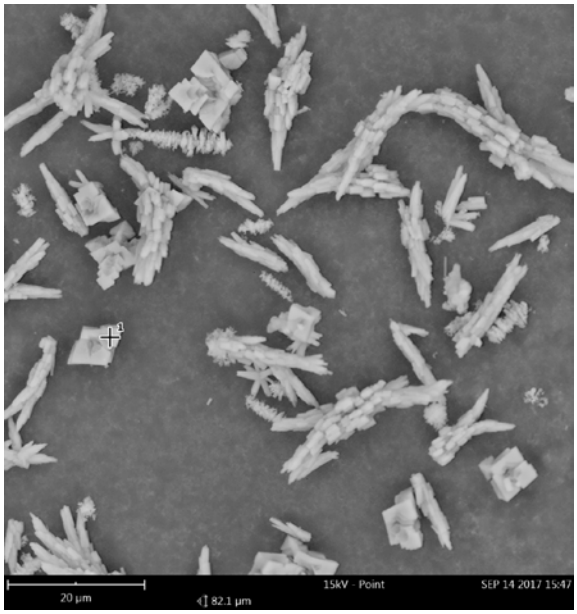
FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:33



Disabled elements: B, Sb

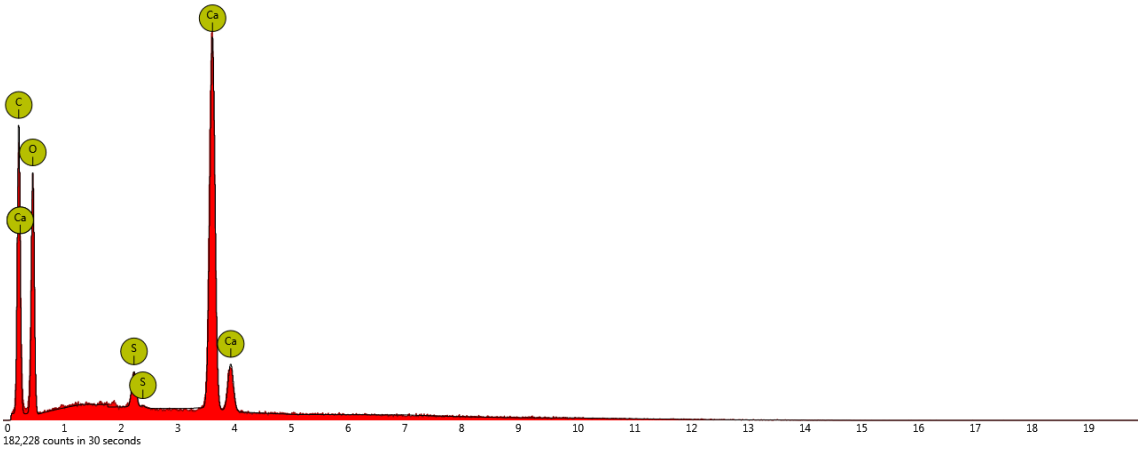
Image 7

1. spot



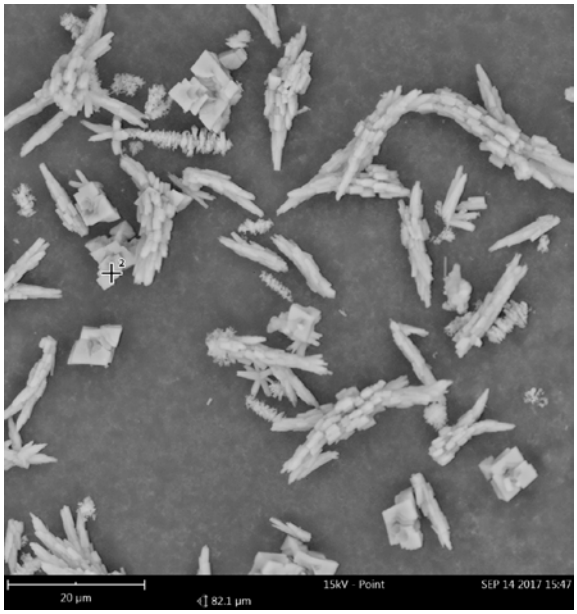
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.72	45.03
6	C	Carbon	43.40	31.41
20	Ca	Calcium	9.25	22.34
16	S	Sulfur	0.63	1.22

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



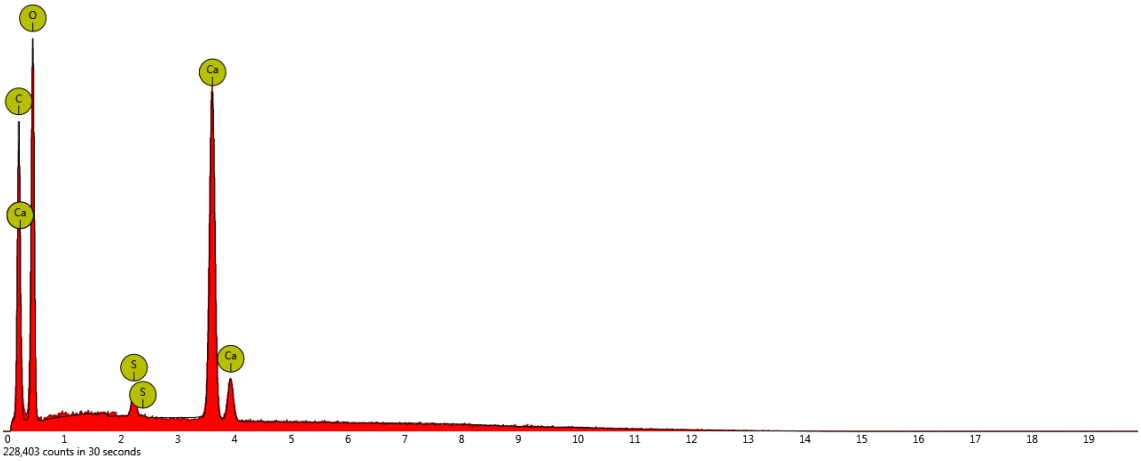
Disabled elements: B, Sb

2. spot



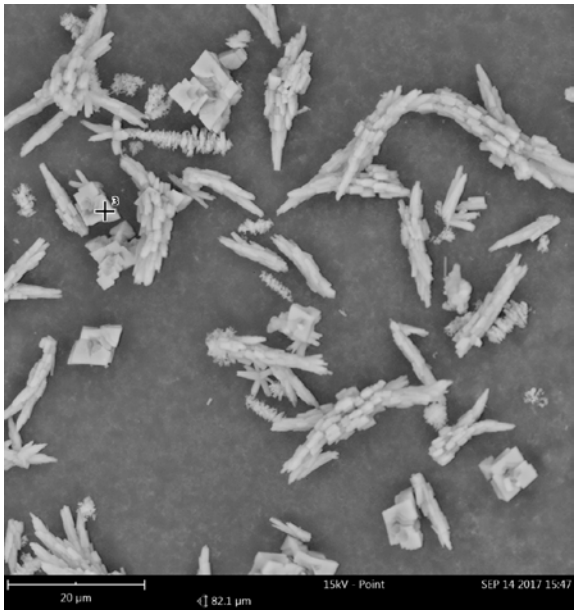
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.94	53.19
6	C	Carbon	38.59	28.57
20	Ca	Calcium	7.03	17.37
16	S	Sulfur	0.44	0.87

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



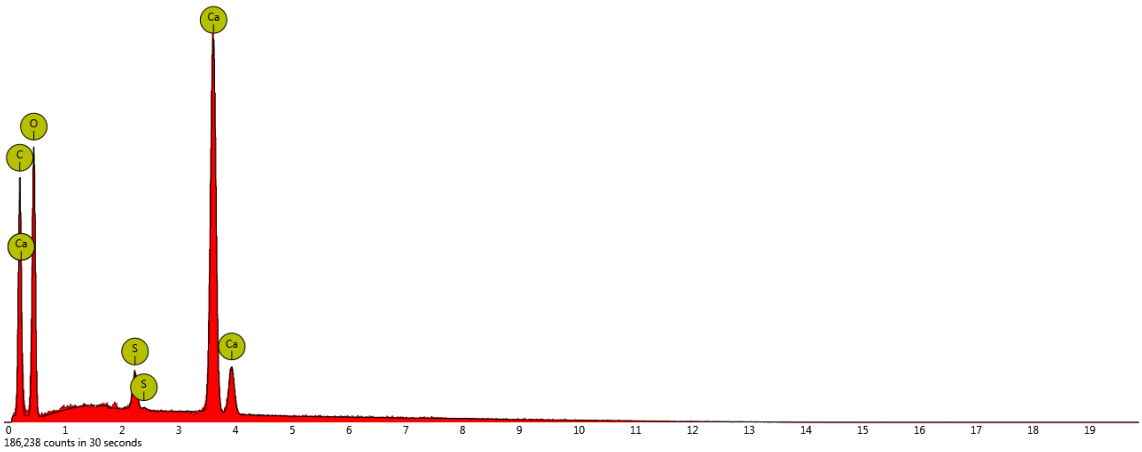
Disabled elements: B, Sb

3. spot



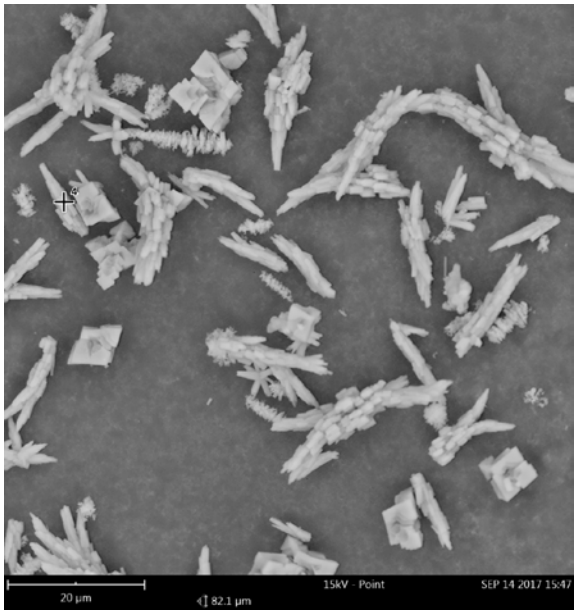
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	51.53	48.71
6	C	Carbon	38.09	27.03
20	Ca	Calcium	9.69	22.94
16	S	Sulfur	0.69	1.32

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



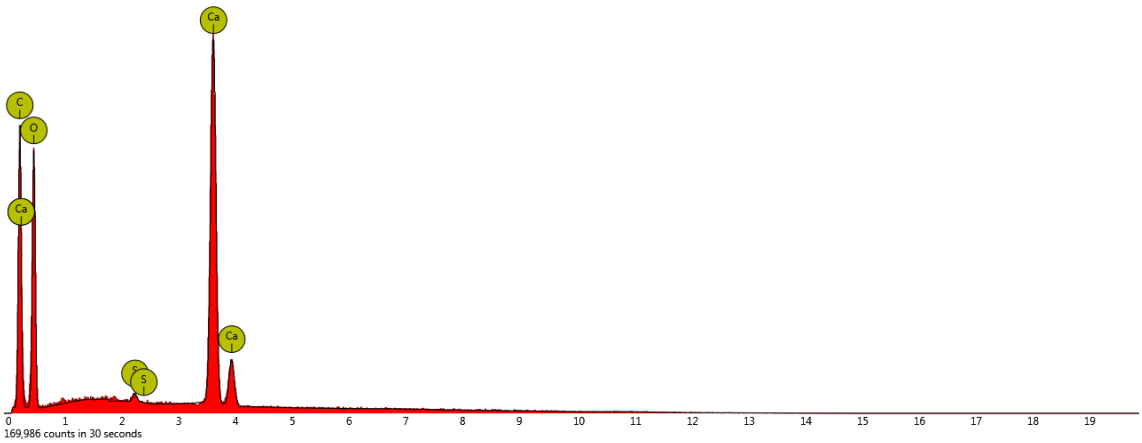
Disabled elements: B, Sb

4. spot



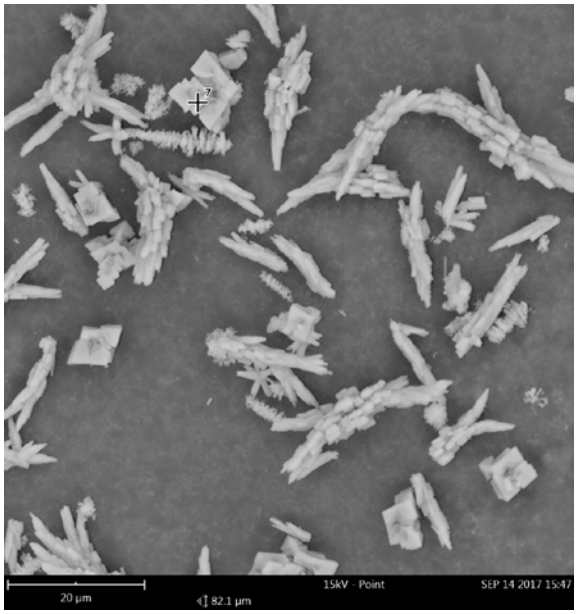
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	49.67	47.72
6	C	Carbon	40.80	29.43
20	Ca	Calcium	9.37	22.55
16	S	Sulfur	0.15	0.30

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



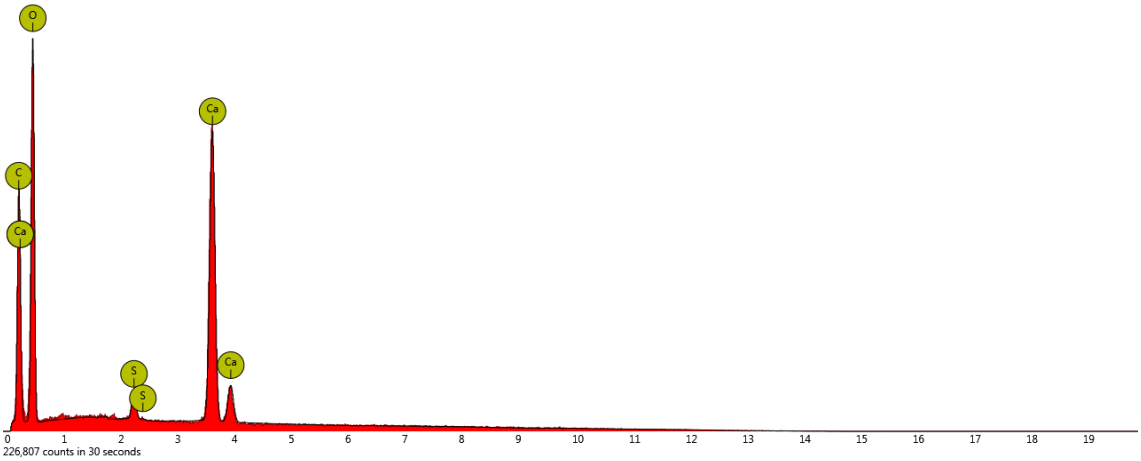
Disabled elements: B, Sb

7. spot



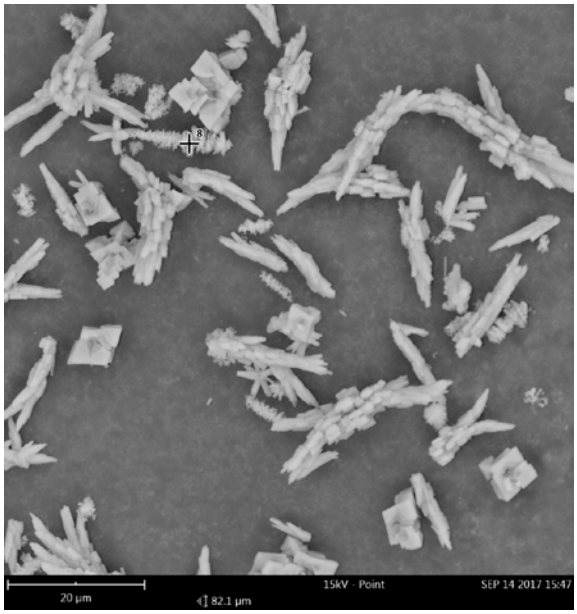
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.70	55.69
6	C	Carbon	35.98	26.53
20	Ca	Calcium	6.88	16.93
16	S	Sulfur	0.43	0.85

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



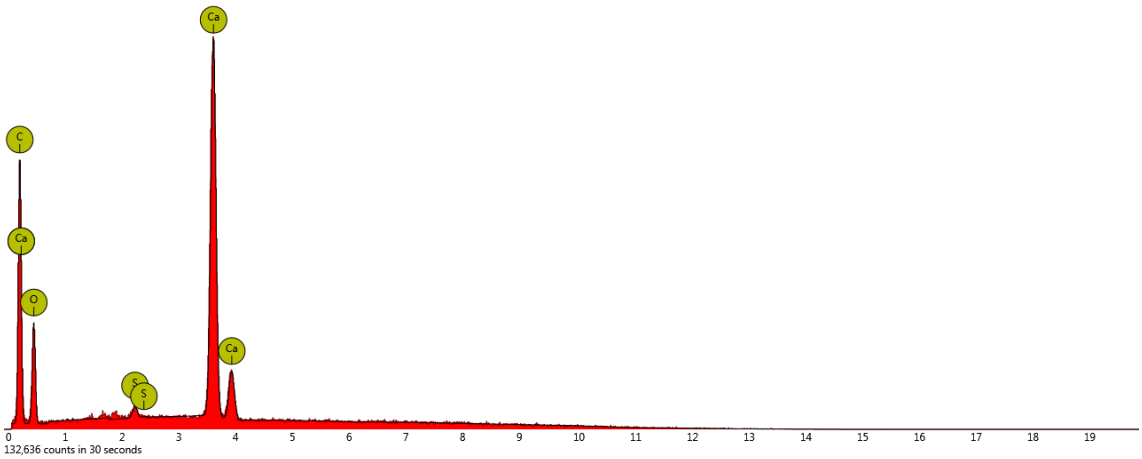
Disabled elements: B, Sb

8. spot



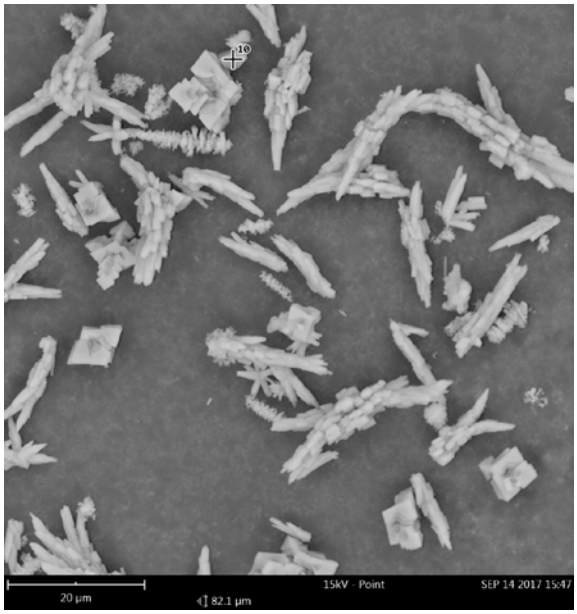
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	52.12	36.54
8	O	Oxygen	34.45	32.17
20	Ca	Calcium	13.14	30.73
16	S	Sulfur	0.30	0.55

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



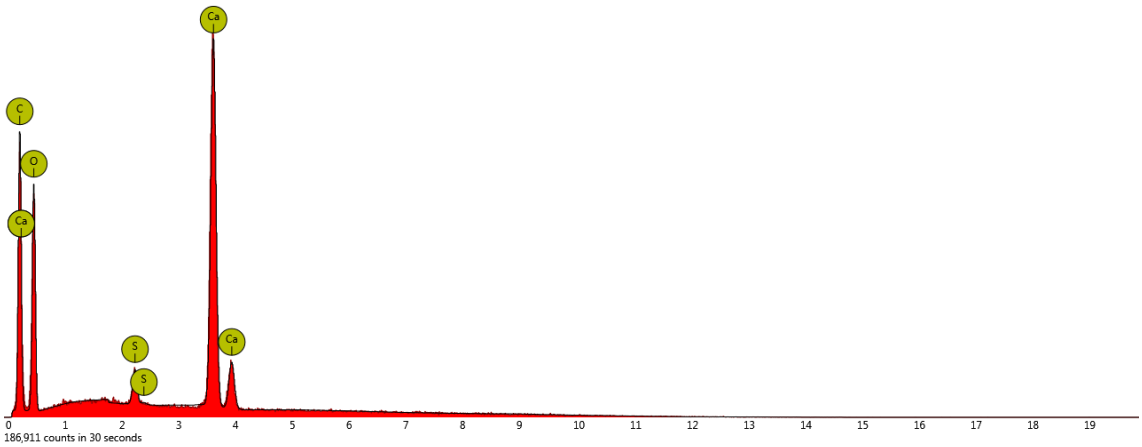
Disabled elements: B, Sb

10. spot



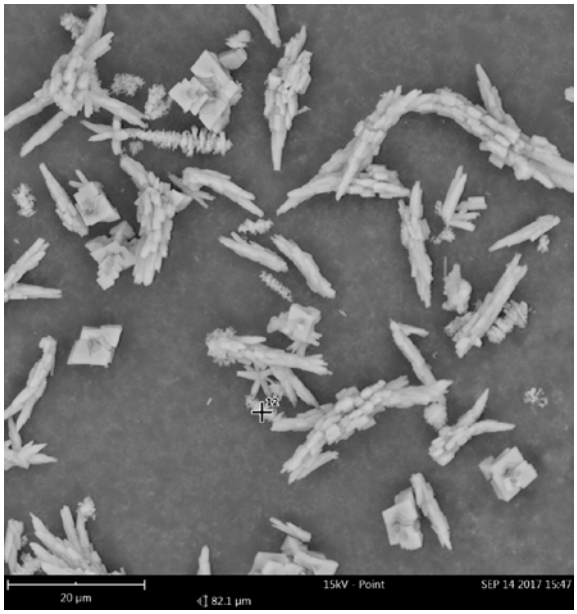
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.21	44.41
6	C	Carbon	43.64	31.48
20	Ca	Calcium	9.50	22.87
16	S	Sulfur	0.64	1.23

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



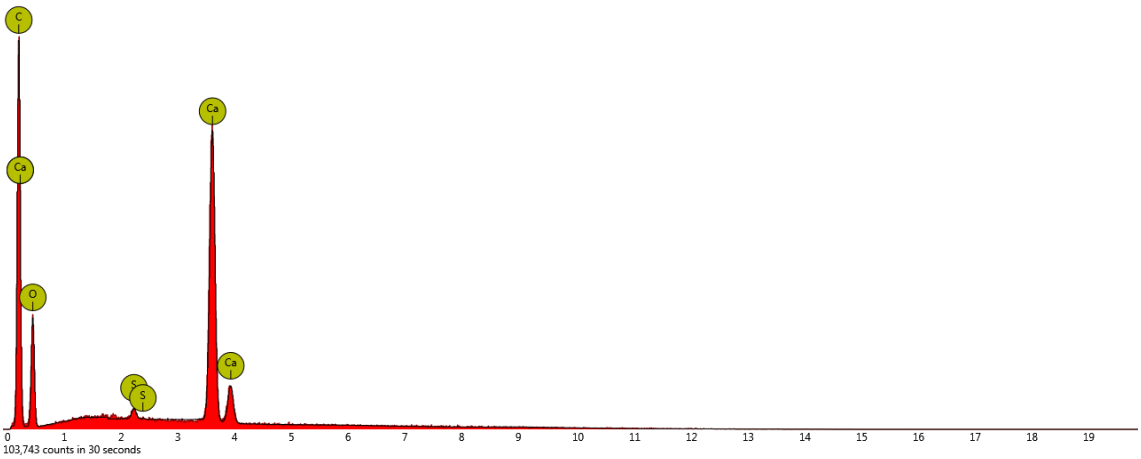
Disabled elements: B, Sb

12. spot



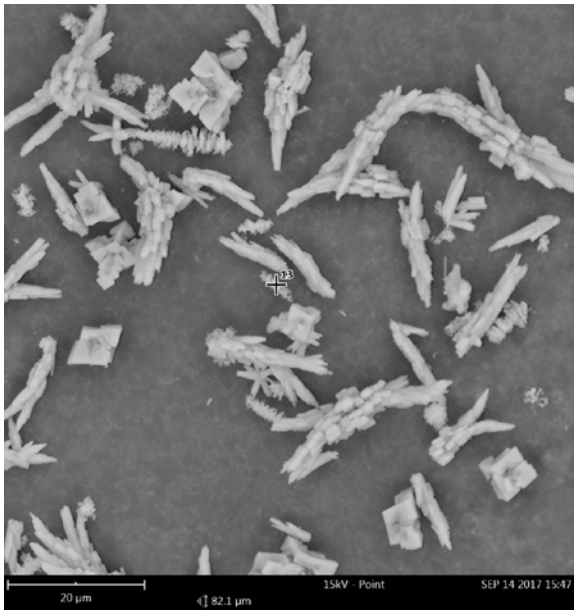
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	60.48	46.30
8	O	Oxygen	30.72	31.33
20	Ca	Calcium	8.58	21.92
16	S	Sulfur	0.22	0.45

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



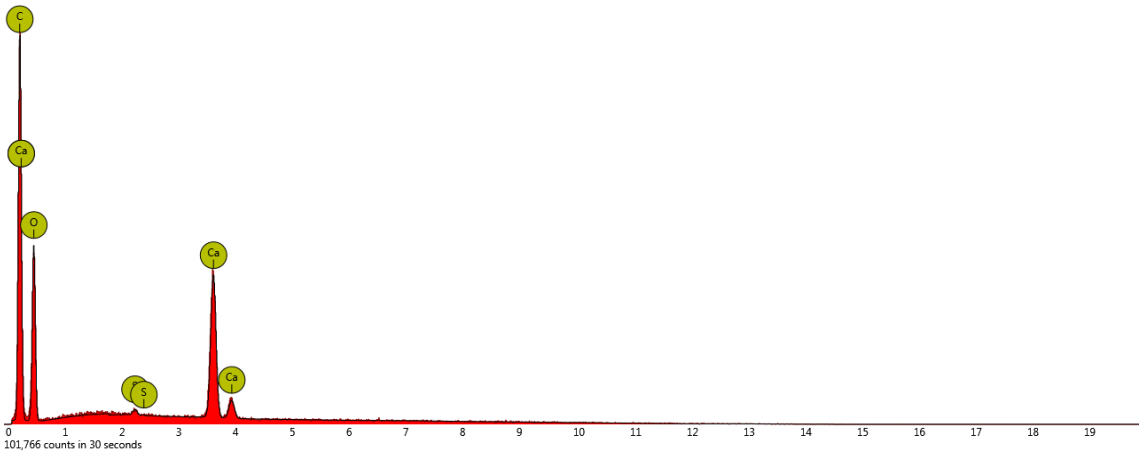
Disabled elements: B

13. spot



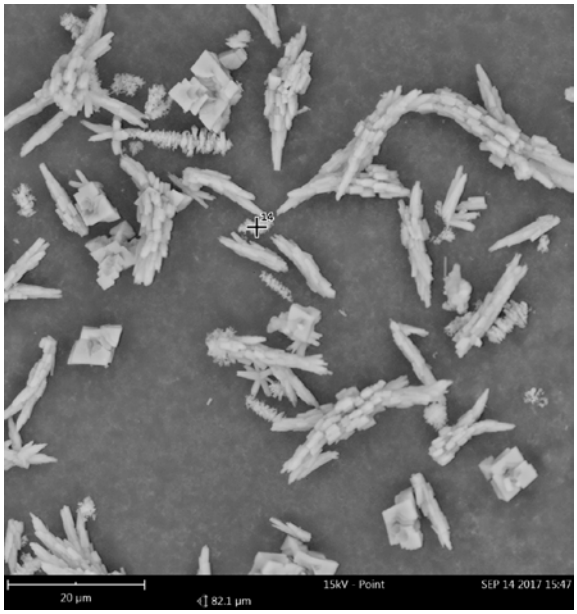
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	57.63	47.14
8	O	Oxygen	38.24	41.67
20	Ca	Calcium	4.01	10.95
16	S	Sulfur	0.11	0.24

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



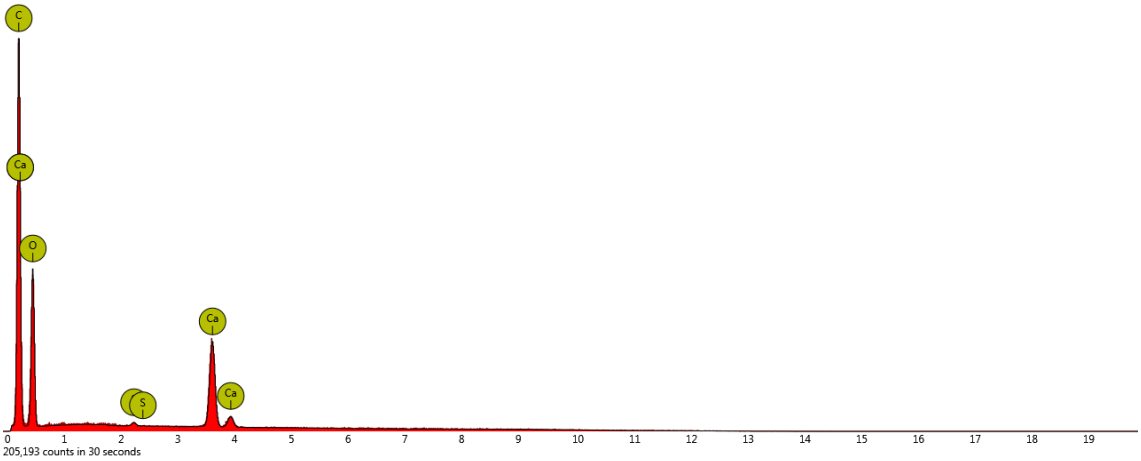
Disabled elements: B, I, Sb

14. spot



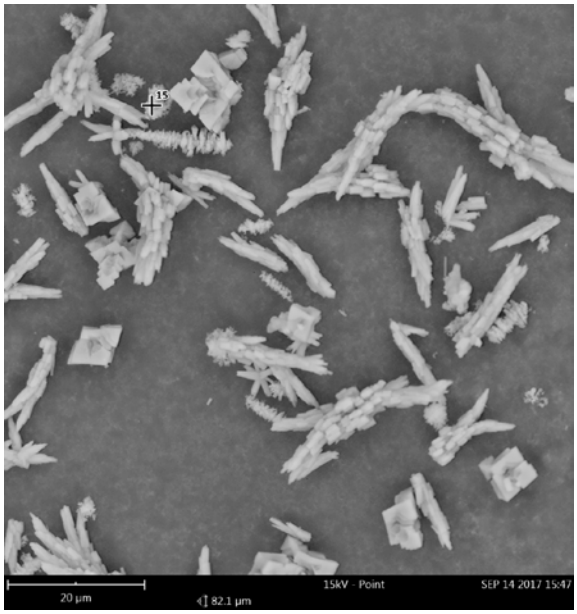
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	60.69	51.29
8	O	Oxygen	36.66	41.26
20	Ca	Calcium	2.59	7.29
16	S	Sulfur	0.07	0.16

FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



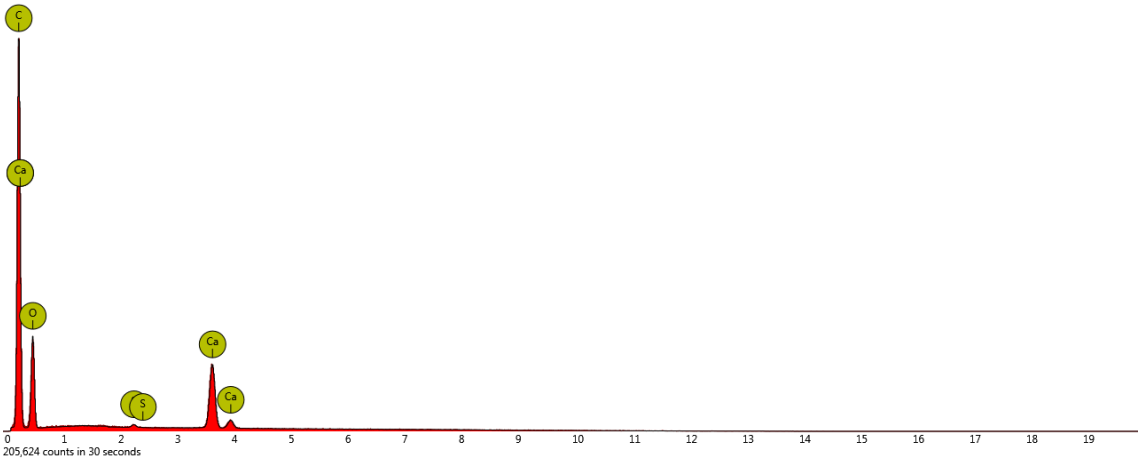
Disabled elements: B, Sb

15. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	68.37	59.31
8	O	Oxygen	29.23	33.78
20	Ca	Calcium	2.33	6.74

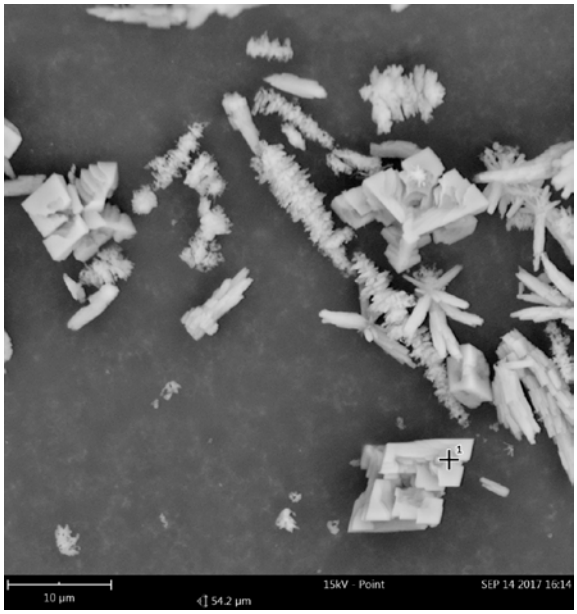
FOV: 82.1 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 15:47



Disabled elements: B, I, Sb

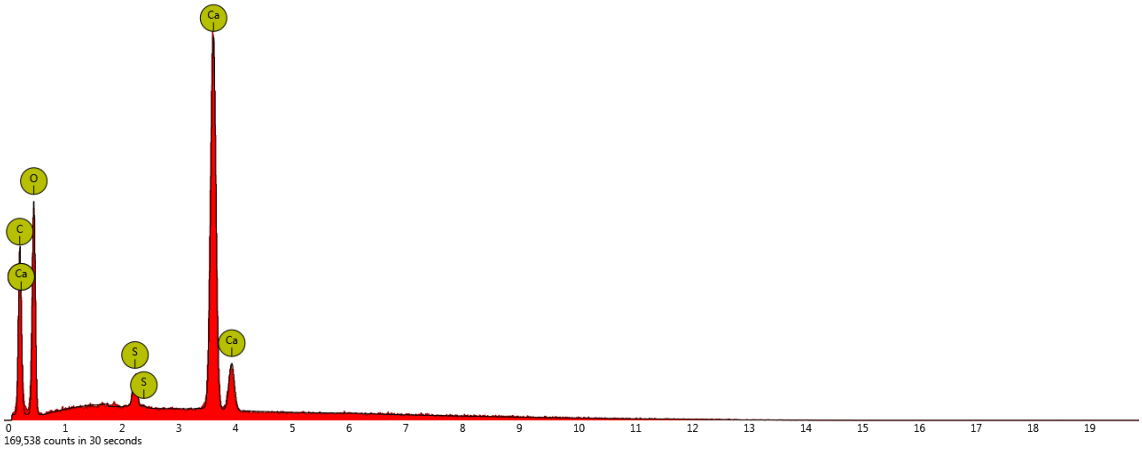
Image 8

1. spot



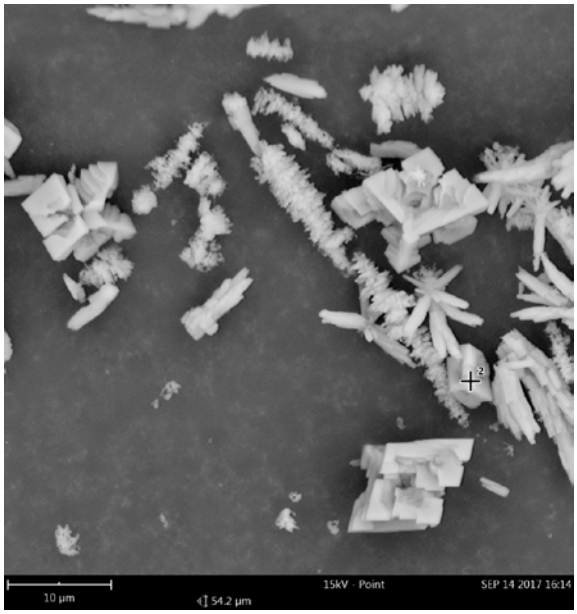
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.14	47.55
20	Ca	Calcium	11.79	26.94
6	C	Carbon	35.35	24.20
16	S	Sulfur	0.71	1.31

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



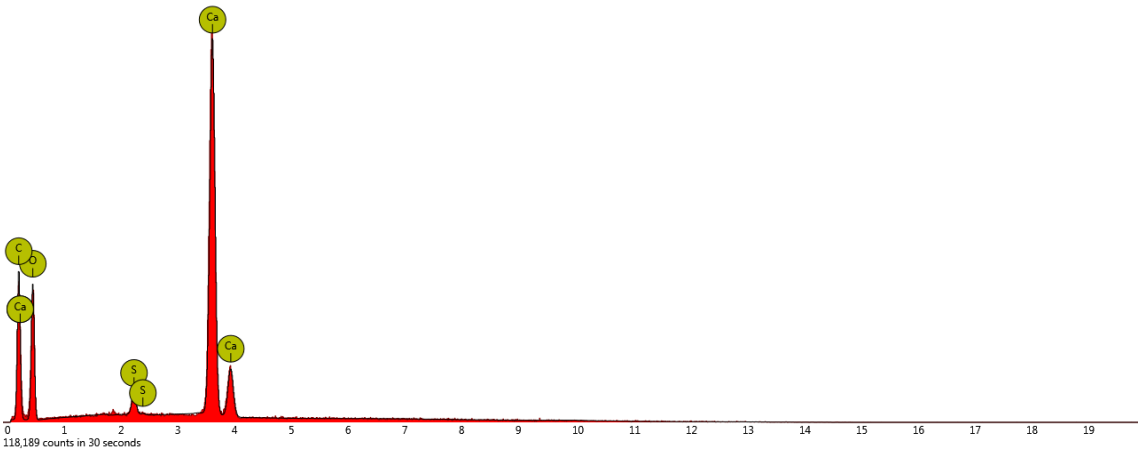
Disabled elements: B, Sb

2. spot



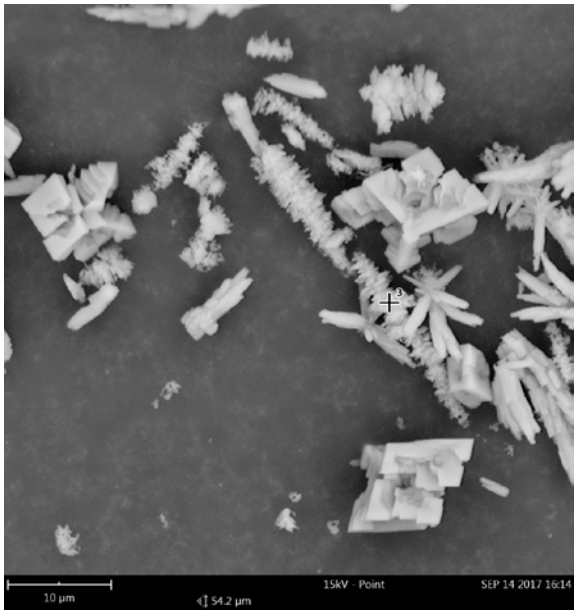
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	47.67	41.73
20	Ca	Calcium	15.12	33.16
6	C	Carbon	36.59	24.04
16	S	Sulfur	0.61	1.07

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



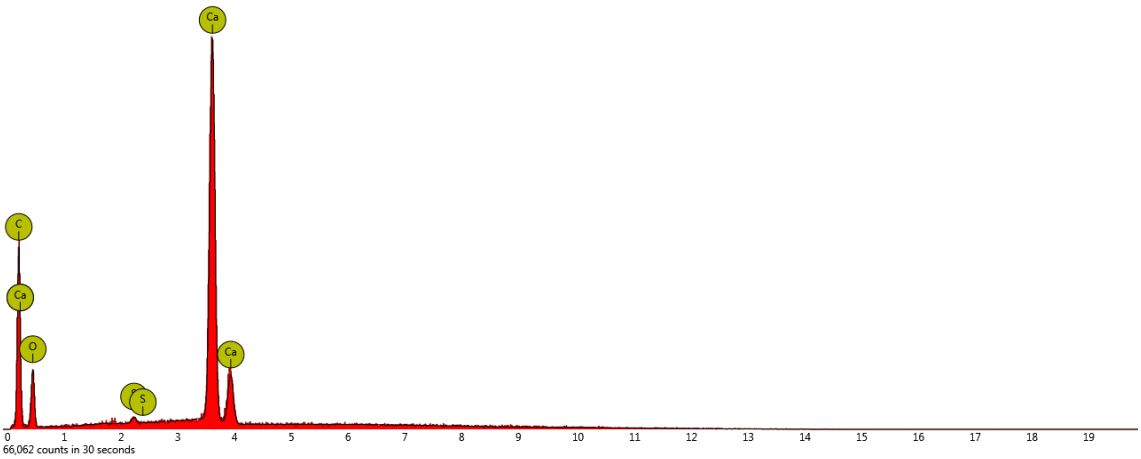
Disabled elements: B, Sb

3. spot



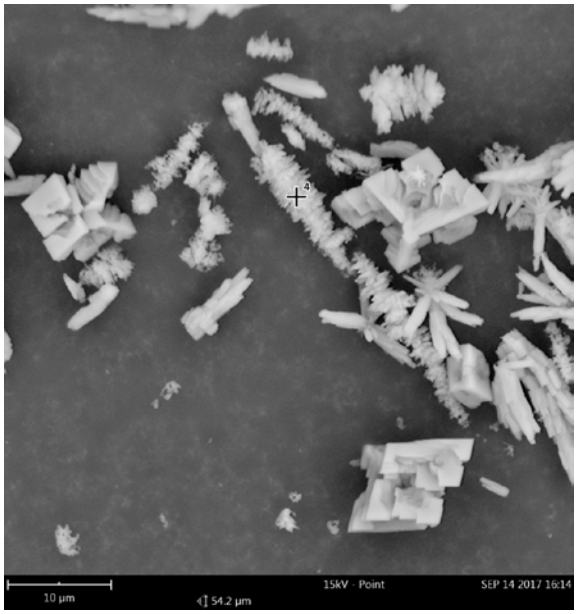
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	18.73	40.48
6	C	Carbon	50.20	32.52
8	O	Oxygen	30.85	26.62
16	S	Sulfur	0.22	0.38

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



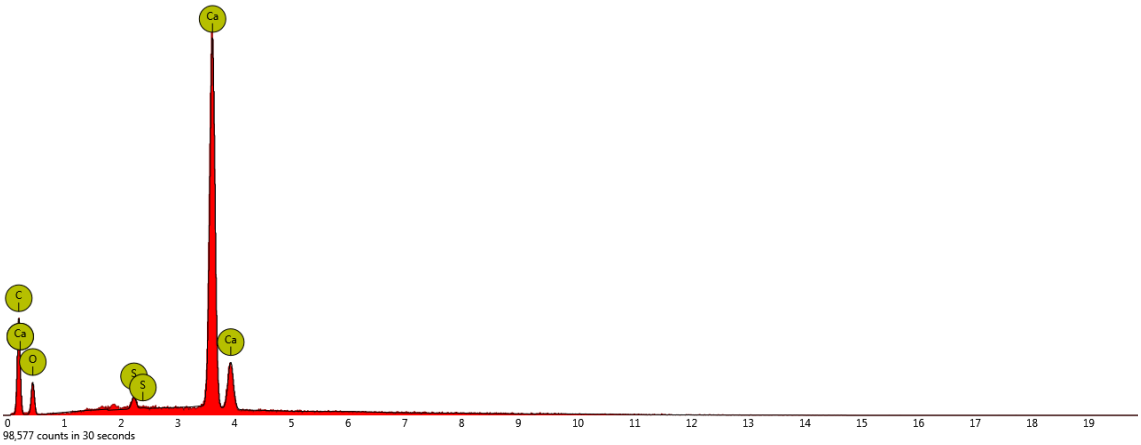
Disabled elements: B, Sb

4. spot



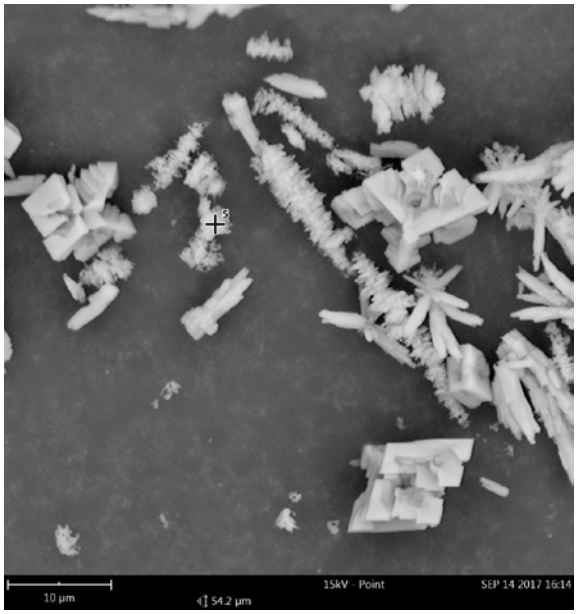
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	27.20	52.14
6	C	Carbon	43.71	25.11
8	O	Oxygen	28.45	21.77
16	S	Sulfur	0.64	0.99

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



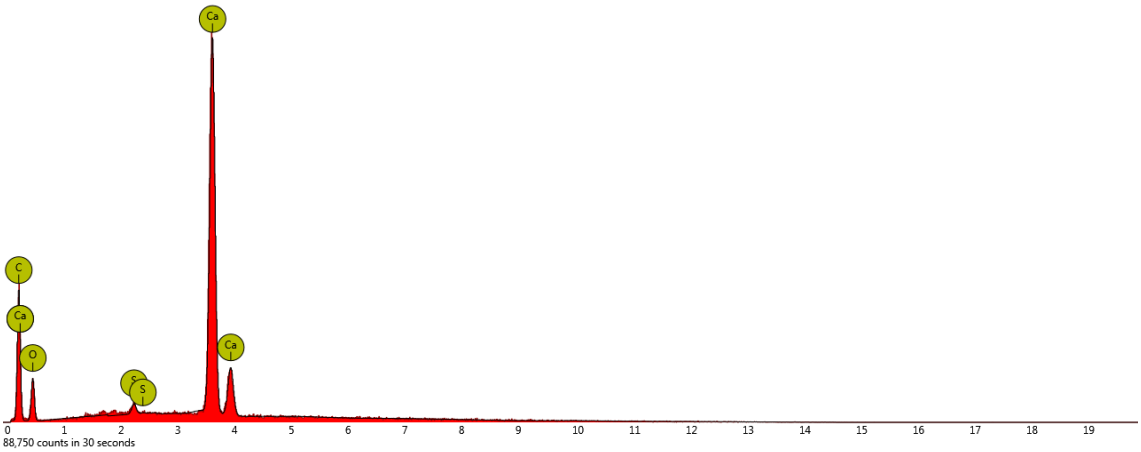
Disabled elements: B, Sb

5. spot



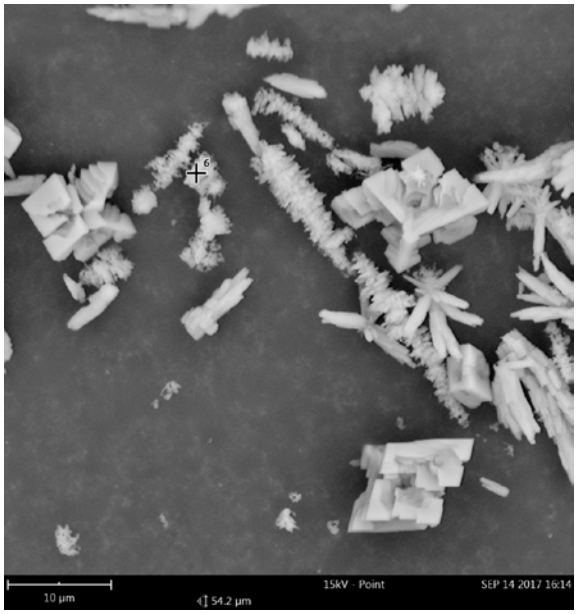
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	22.70	46.31
6	C	Carbon	47.36	28.95
8	O	Oxygen	29.49	24.01
16	S	Sulfur	0.44	0.73

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



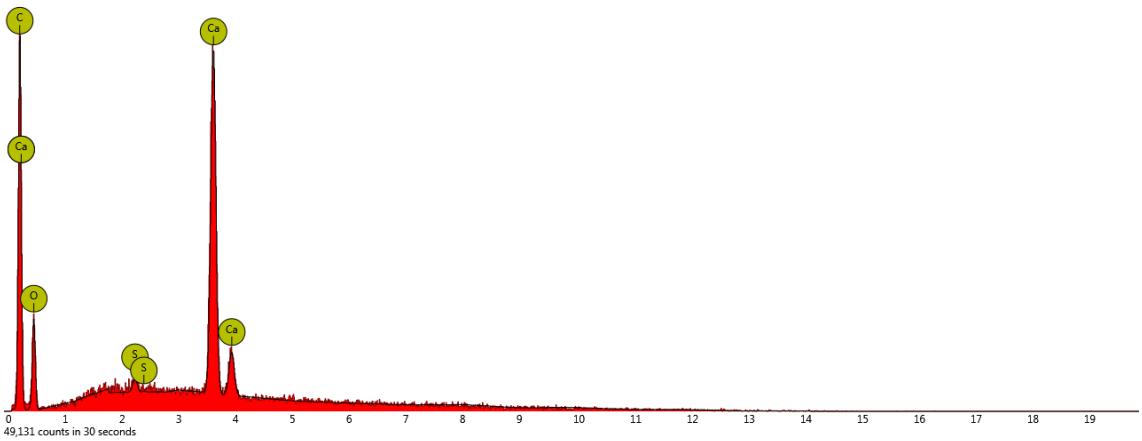
Disabled elements: B, Sb

6. spot



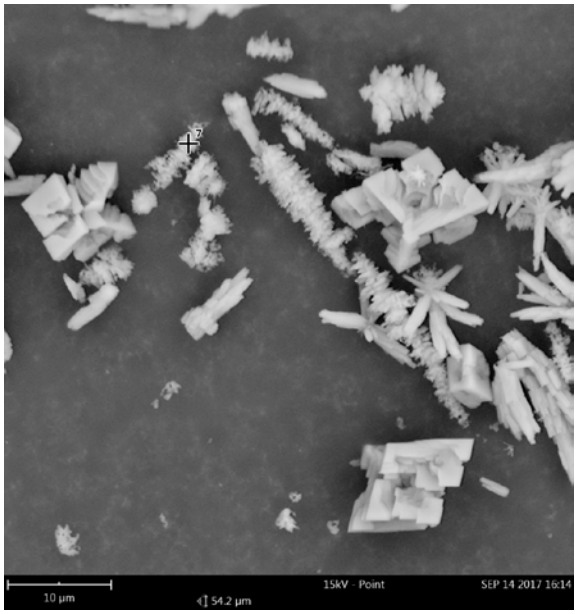
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	61.21	45.58
8	O	Oxygen	28.01	27.78
20	Ca	Calcium	10.47	26.01
16	S	Sulfur	0.32	0.63

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



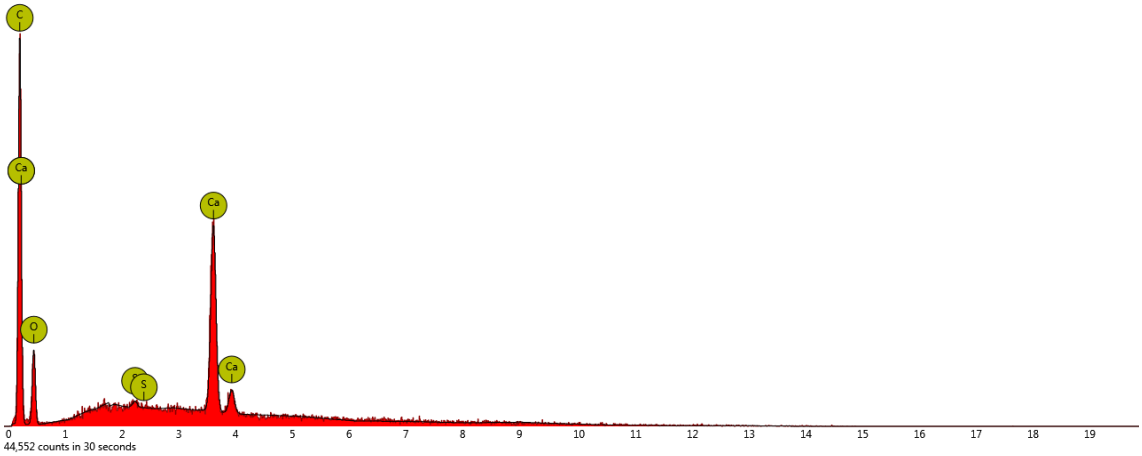
Disabled elements: B, Sb

7. spot



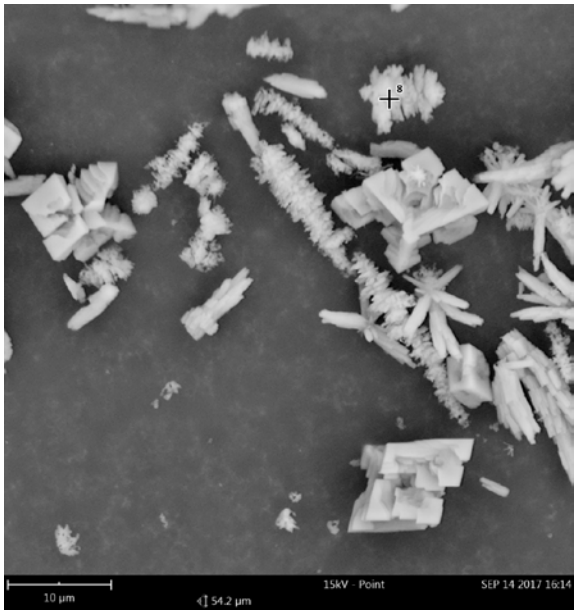
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	67.34	54.21
8	O	Oxygen	25.95	27.83
20	Ca	Calcium	6.56	17.63
16	S	Sulfur	0.15	0.33

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



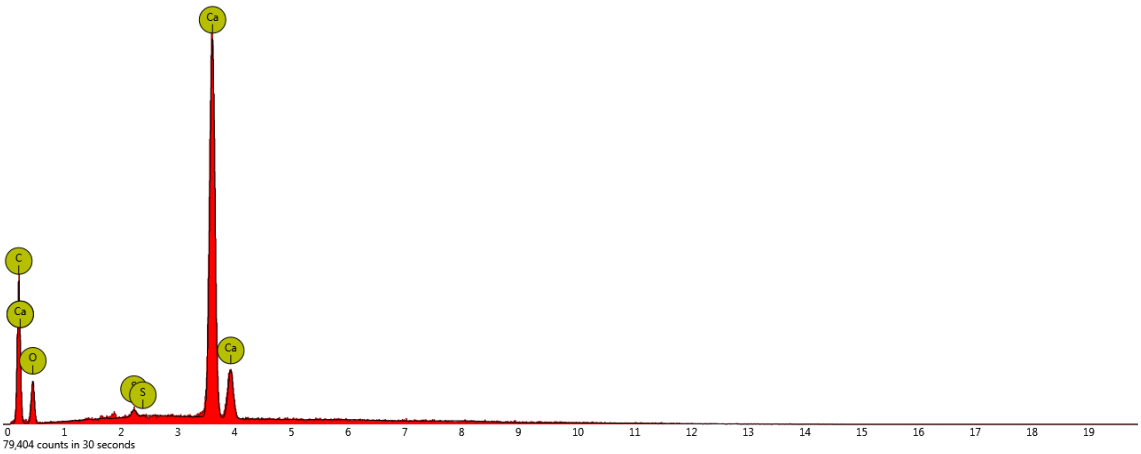
Disabled elements: B

8. spot



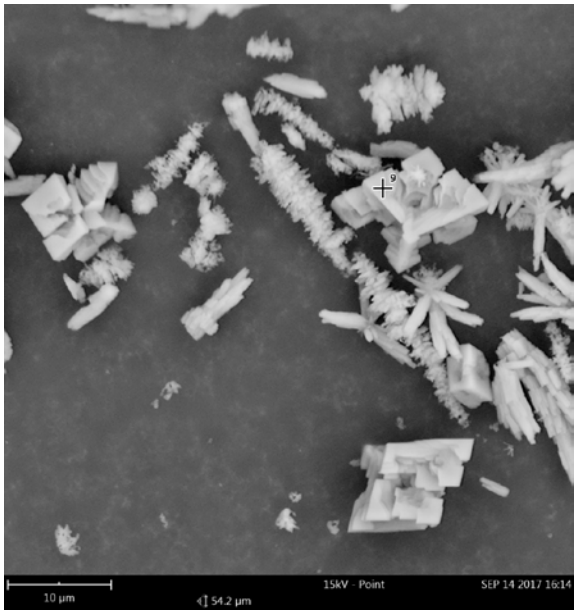
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	22.25	45.83
6	C	Carbon	48.80	30.12
8	O	Oxygen	28.65	23.56
16	S	Sulfur	0.30	0.49

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



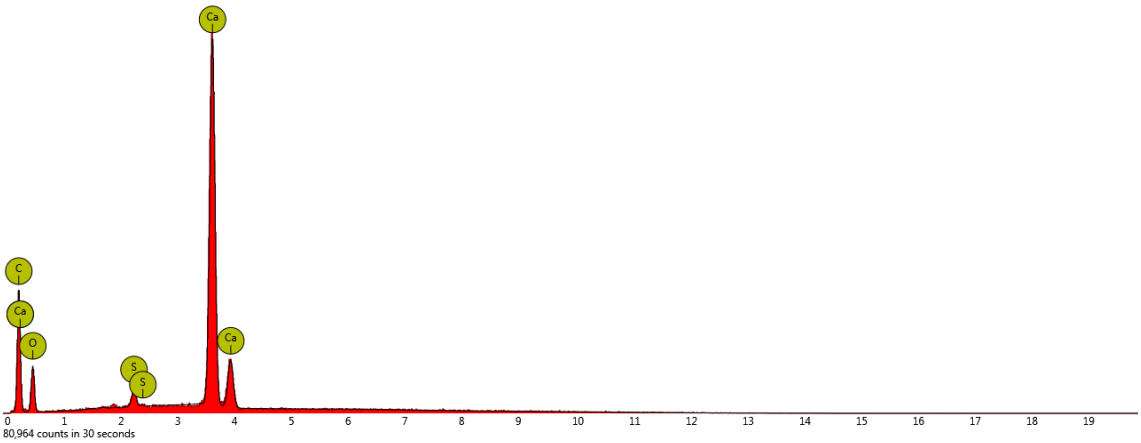
Disabled elements: B, Sb

9. spot



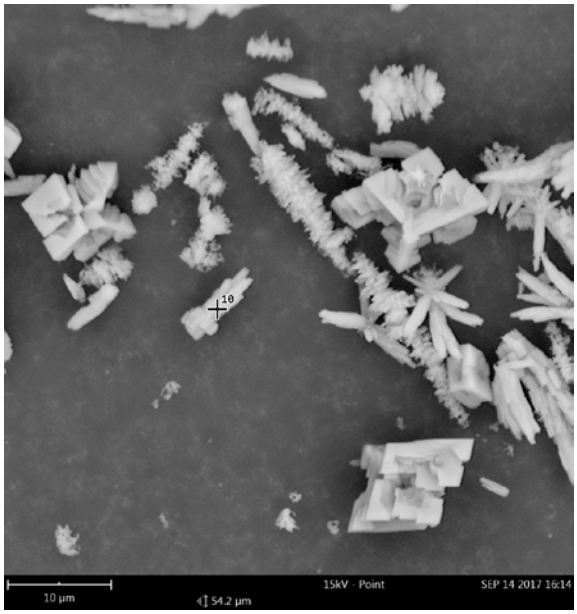
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	22.27	45.43
6	C	Carbon	45.79	27.99
8	O	Oxygen	31.22	25.42
16	S	Sulfur	0.71	1.17

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



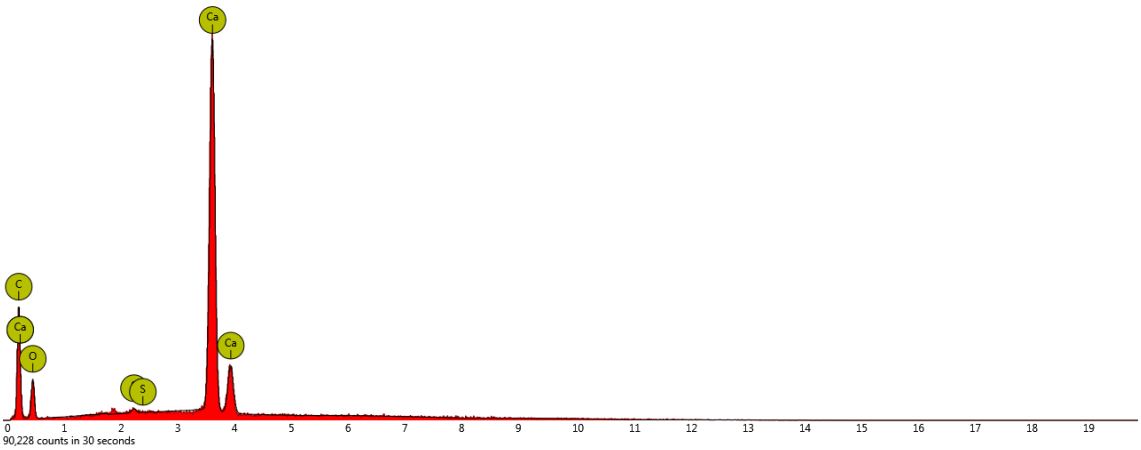
Disabled elements: B, Sb

10. spot



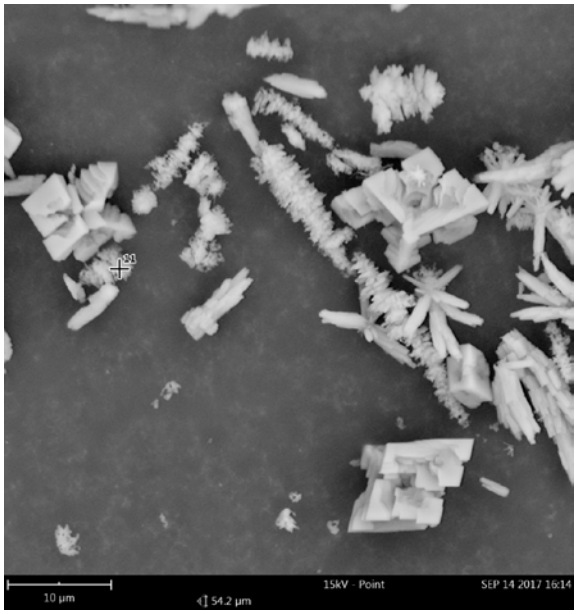
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	24.98	49.35
6	C	Carbon	44.14	26.13
8	O	Oxygen	30.67	24.19
16	S	Sulfur	0.21	0.33

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



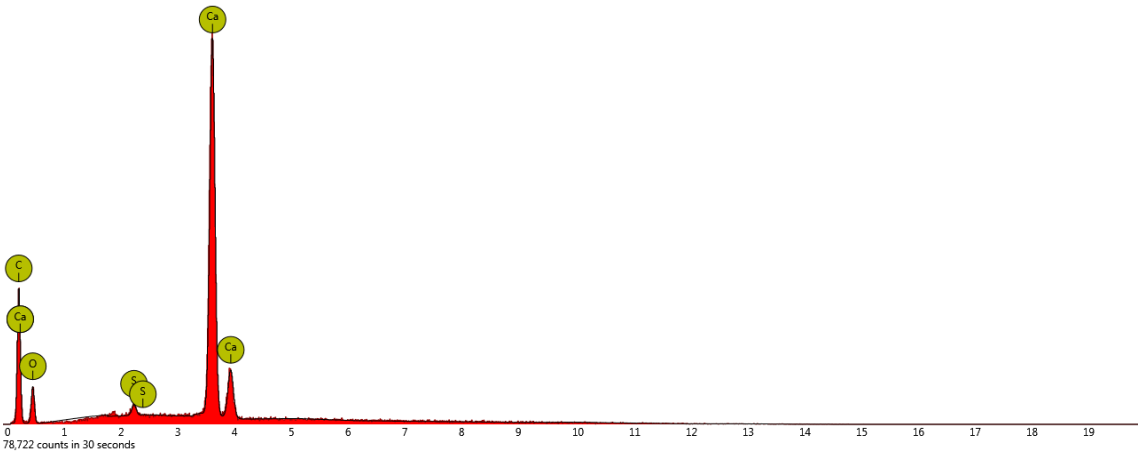
Disabled elements: B, Sb

11. spot



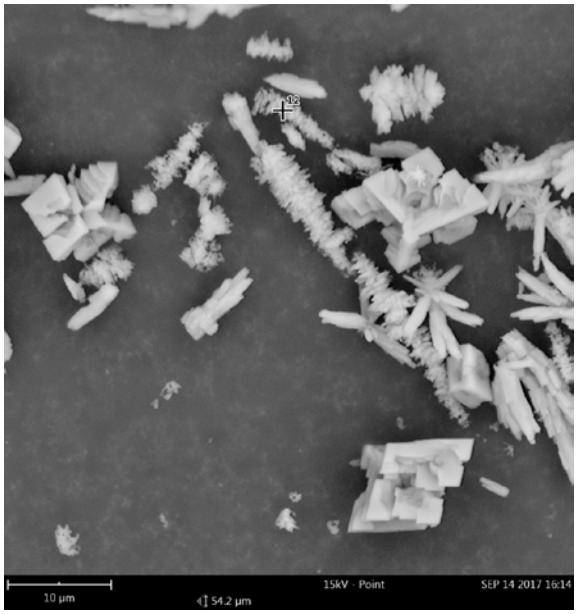
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	23.28	47.34
6	C	Carbon	49.51	30.17
8	O	Oxygen	26.72	21.69
16	S	Sulfur	0.49	0.80

FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



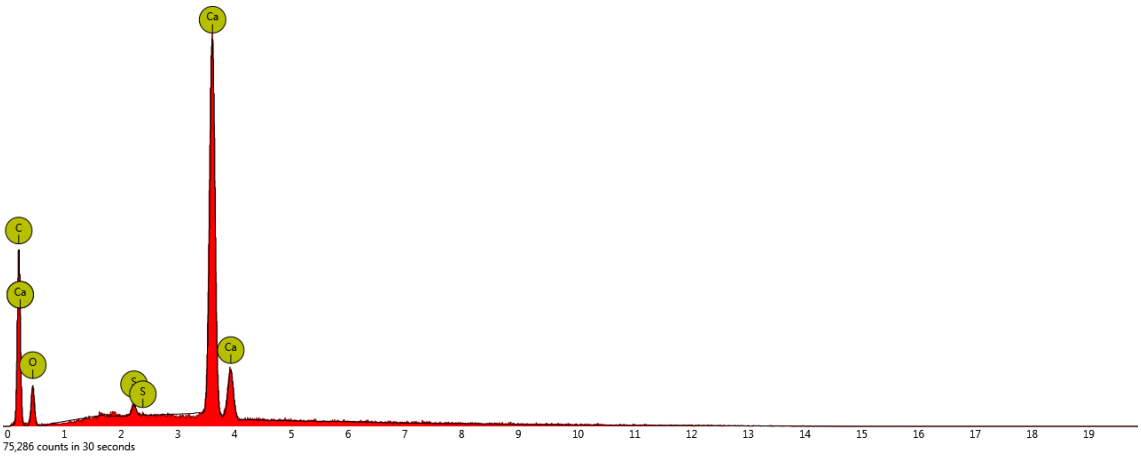
Disabled elements: B, Sb

12. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	20.24	43.21
6	C	Carbon	54.25	34.70
8	O	Oxygen	25.10	21.39
16	S	Sulfur	0.41	0.70

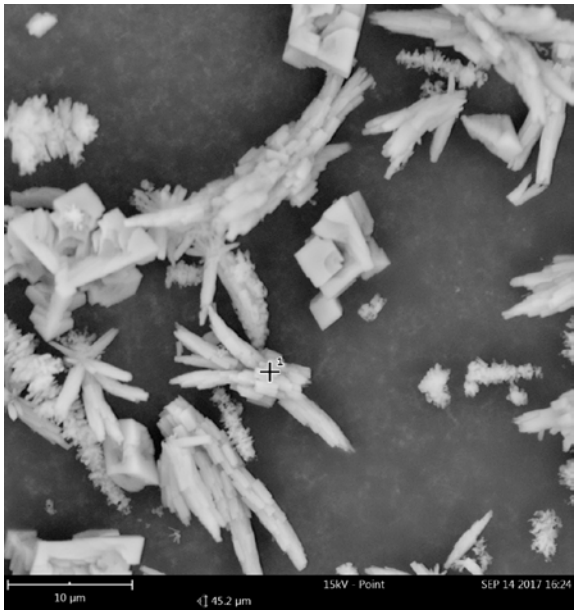
FOV: 54.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:14



Disabled elements: B, Sb

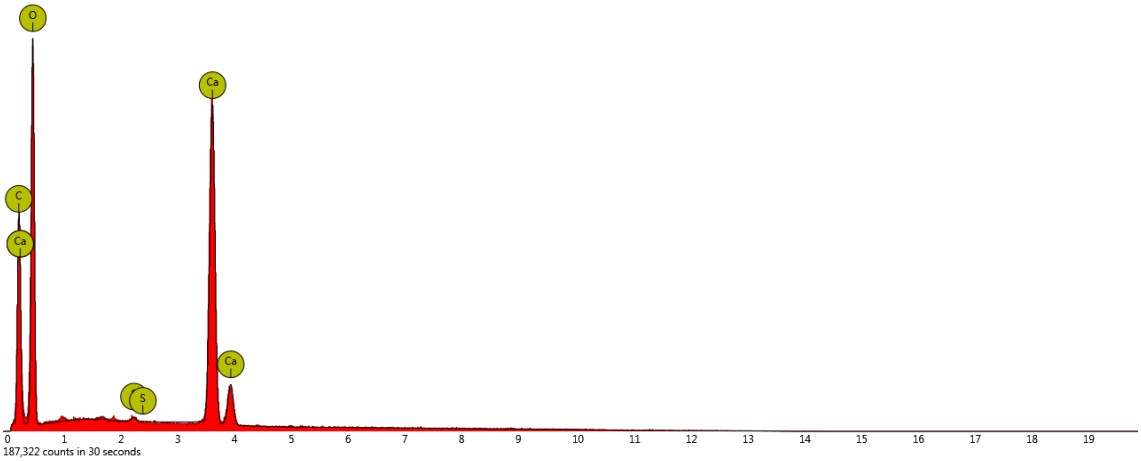
Image 9

1. spot



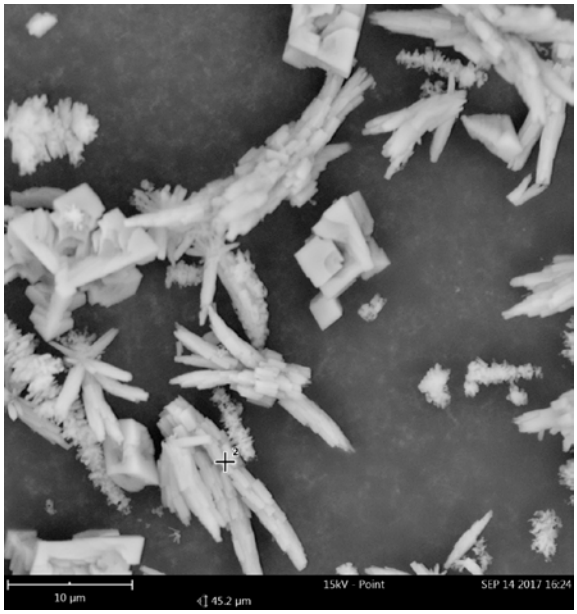
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	59.09	57.01
6	C	Carbon	32.99	23.90
20	Ca	Calcium	7.84	18.95
16	S	Sulfur	0.07	0.14

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



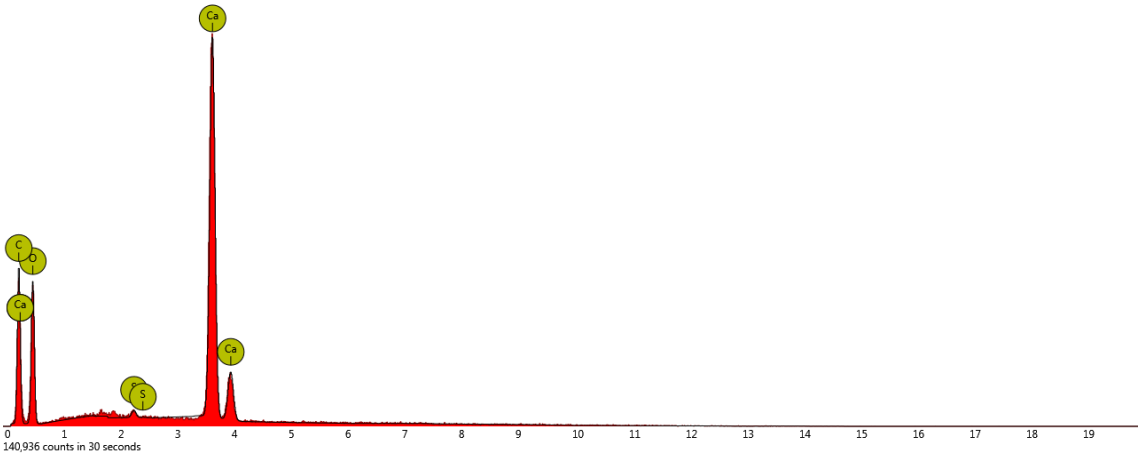
Disabled elements: B, I, Sb

2. spot



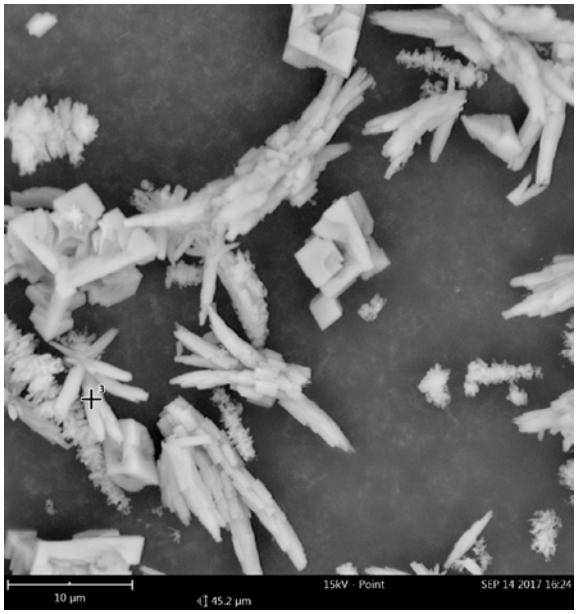
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	48.78	42.80
20	Ca	Calcium	15.10	33.18
6	C	Carbon	35.91	23.65
16	S	Sulfur	0.21	0.37

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



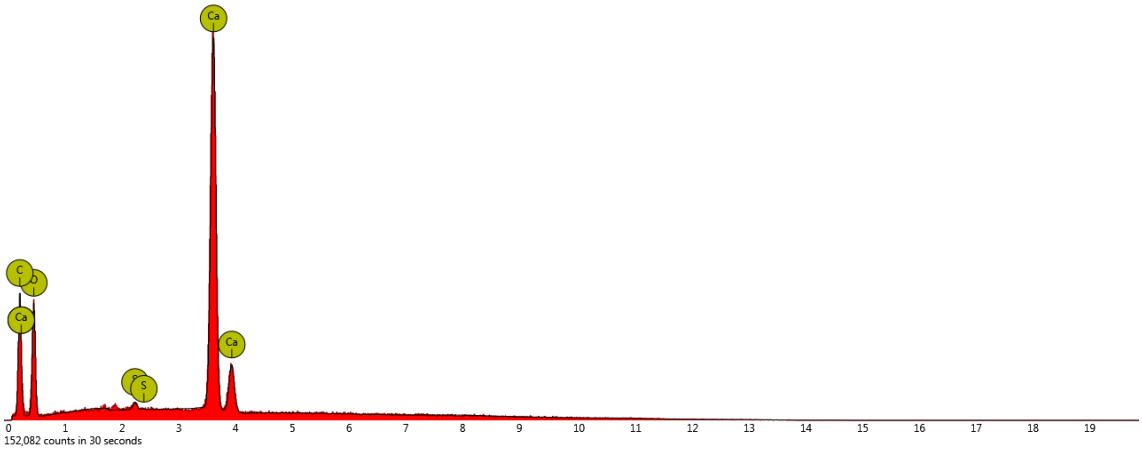
Disabled elements: B, Sb

3. spot



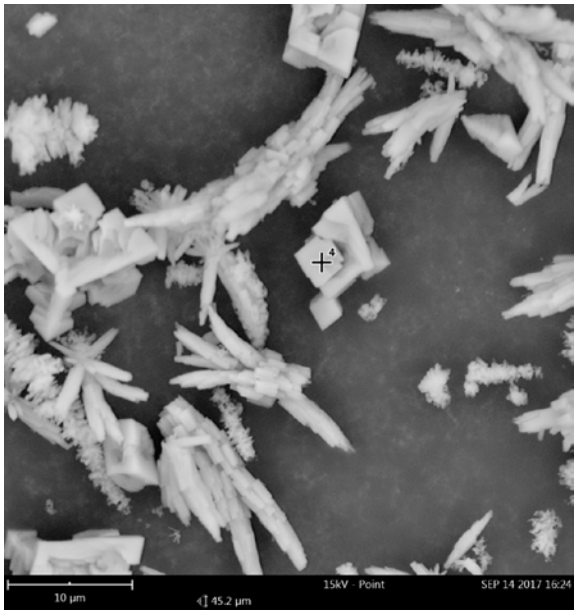
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	48.16	40.77
20	Ca	Calcium	17.52	37.16
6	C	Carbon	34.06	21.64
16	S	Sulfur	0.25	0.42

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



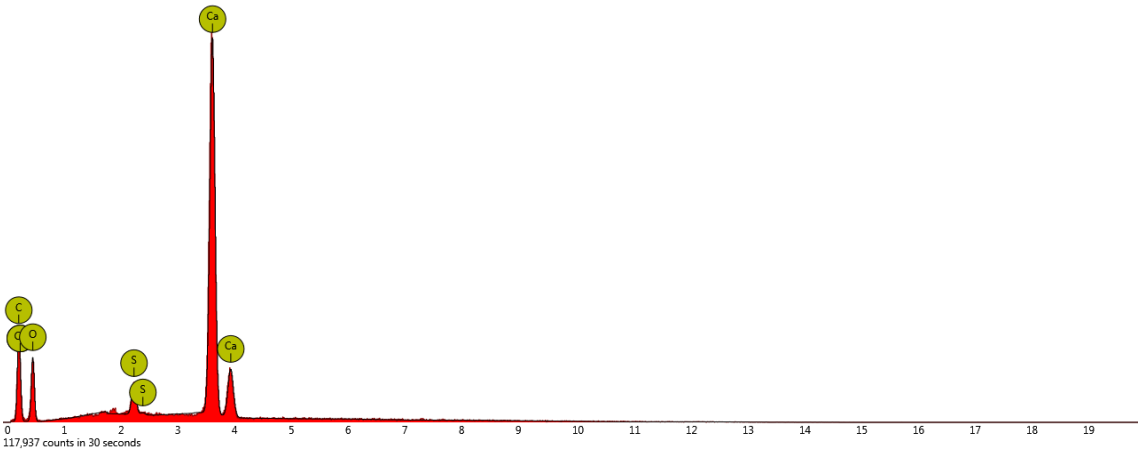
Disabled elements: B, Sb

4. spot



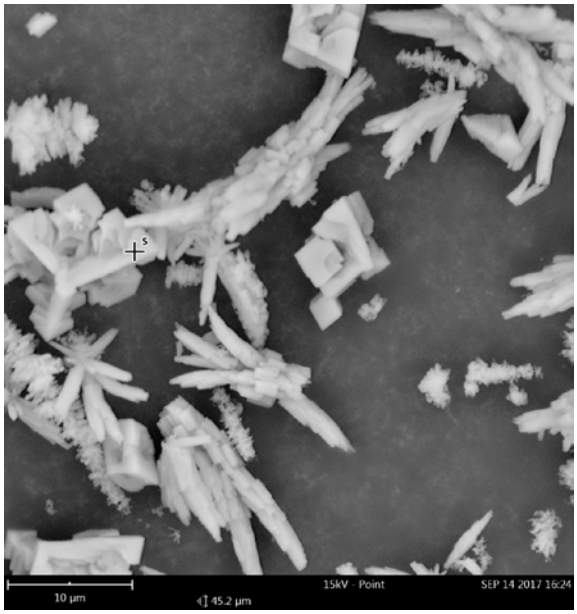
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	22.05	44.14
8	O	Oxygen	39.16	31.29
6	C	Carbon	37.49	22.49
16	S	Sulfur	1.30	2.08

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



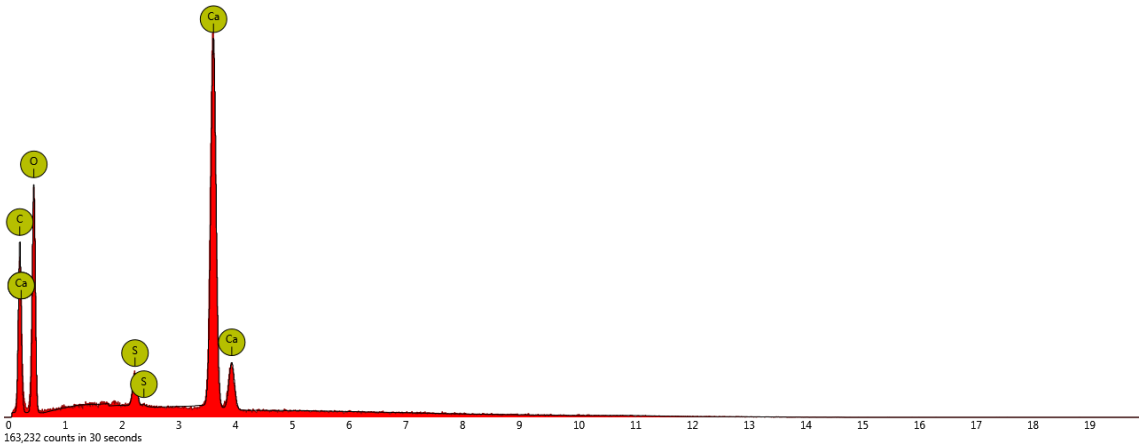
Disabled elements: B, Sb

5. spot



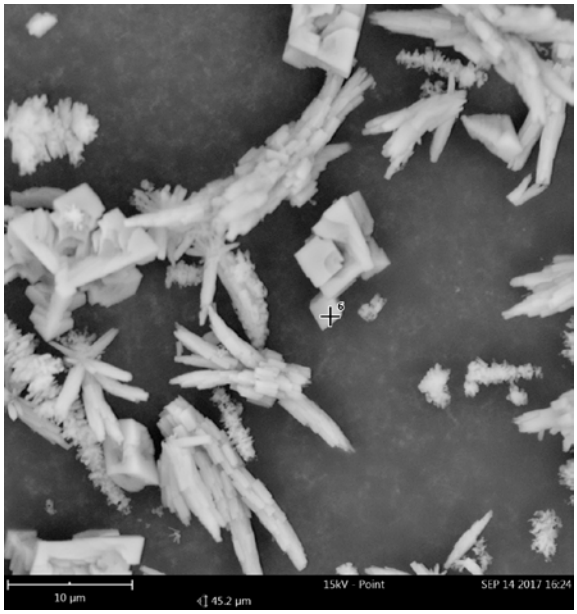
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.91	49.09
20	Ca	Calcium	11.62	26.50
6	C	Carbon	33.73	23.06
16	S	Sulfur	0.74	1.35

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



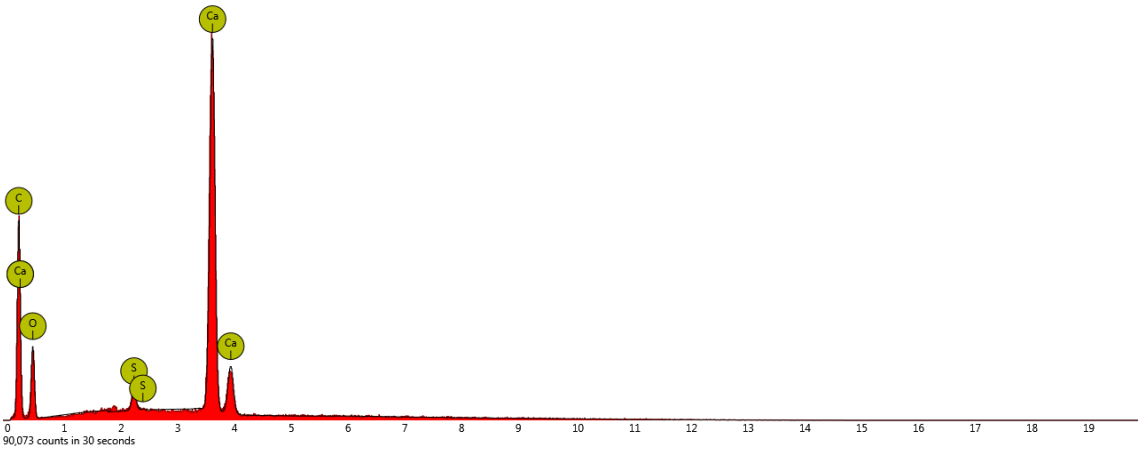
Disabled elements: B, Sb

6. spot



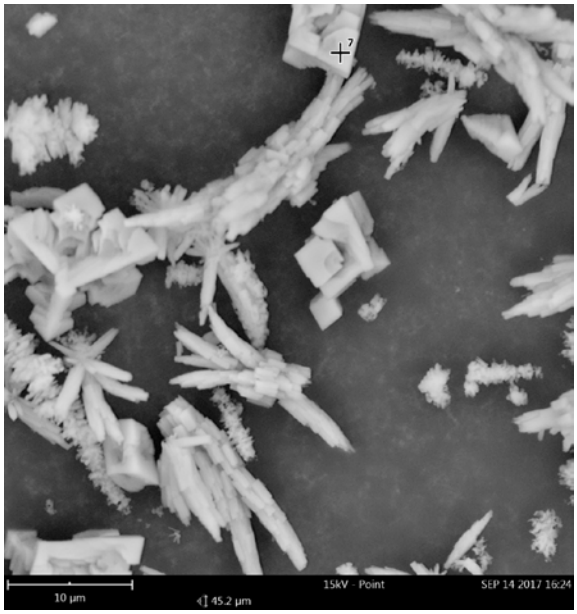
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	16.09	35.96
6	C	Carbon	51.00	34.16
8	O	Oxygen	32.32	28.83
16	S	Sulfur	0.58	1.04

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



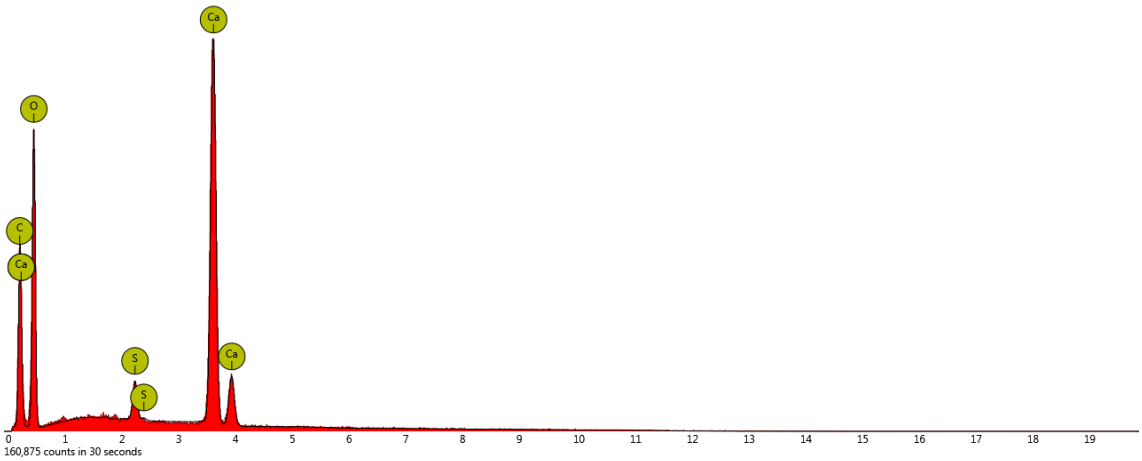
Disabled elements: B, Sb

7. spot



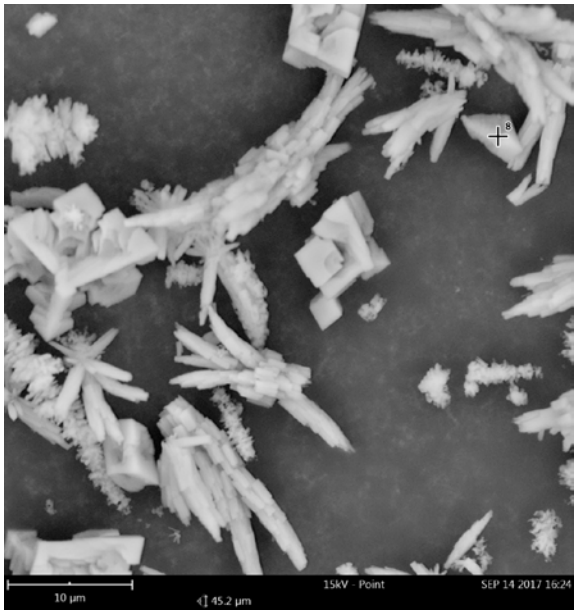
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	55.74	51.71
20	Ca	Calcium	10.21	23.72
6	C	Carbon	33.32	23.20
16	S	Sulfur	0.73	1.36

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



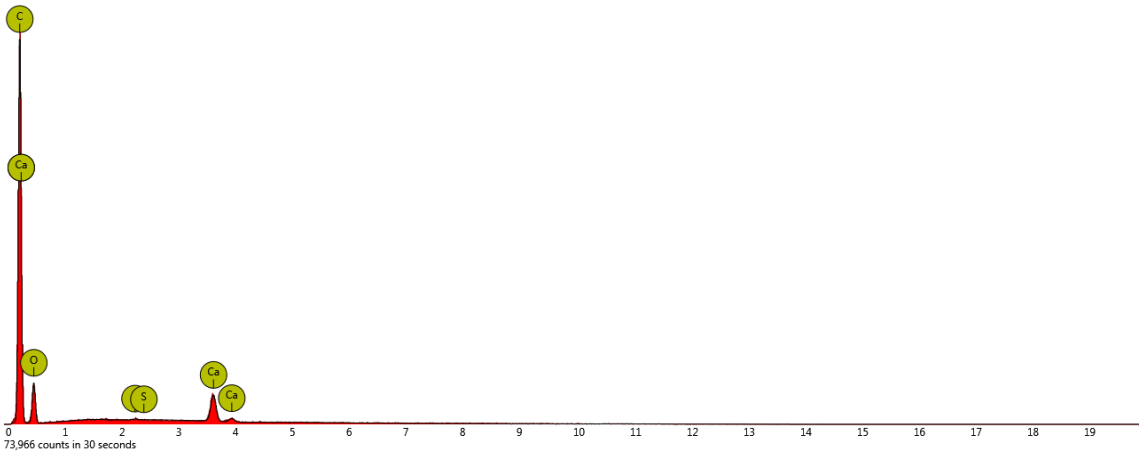
Disabled elements: B, Sb

8. spot



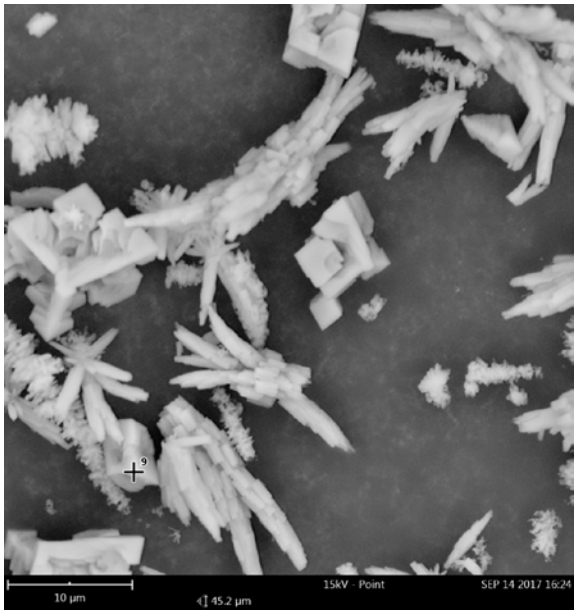
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	79.05	72.17
8	O	Oxygen	19.65	23.90
20	Ca	Calcium	1.27	3.87
16	S	Sulfur	0.03	0.06

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



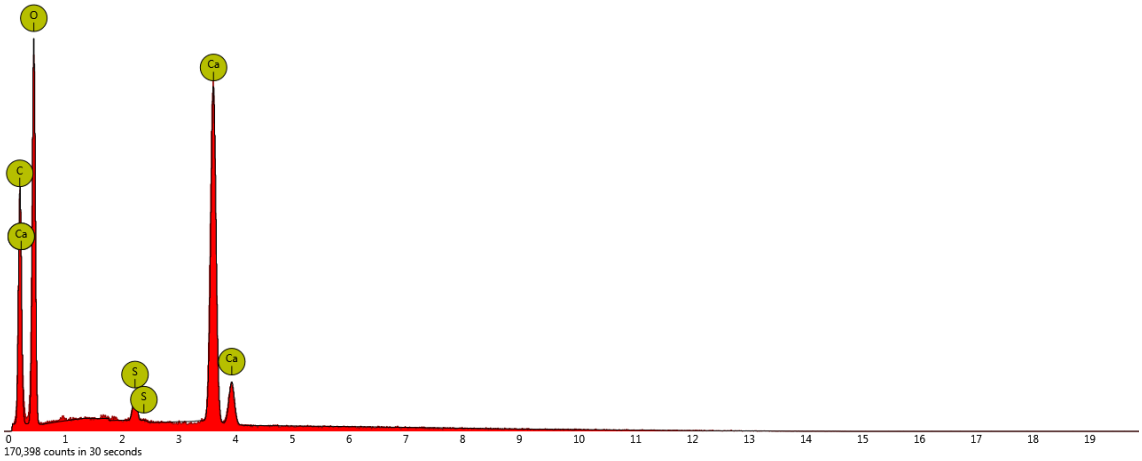
Disabled elements: B

9. spot



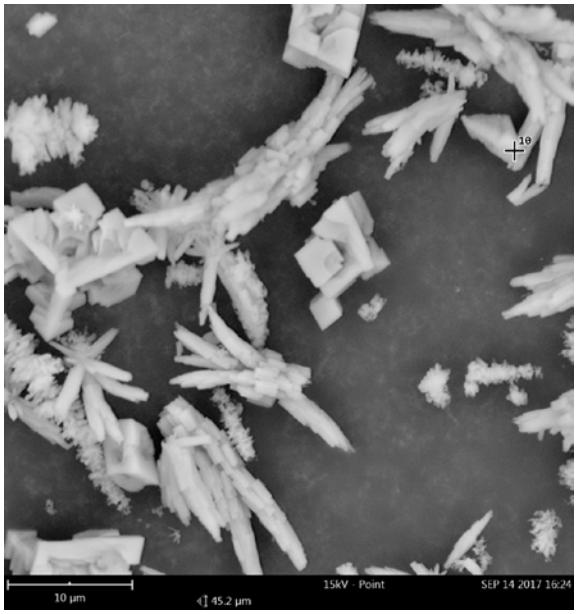
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.63	54.88
6	C	Carbon	35.28	25.67
20	Ca	Calcium	7.67	18.61
16	S	Sulfur	0.43	0.84

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



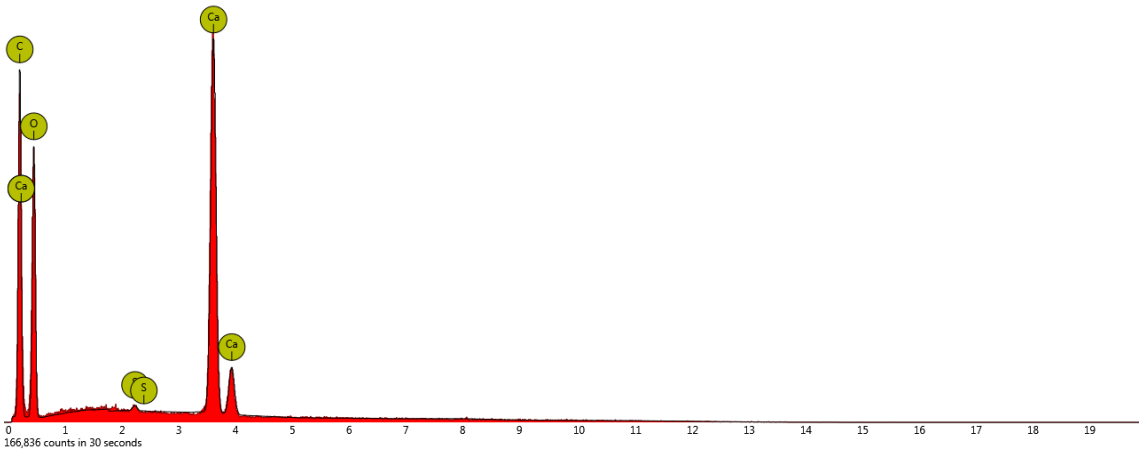
Disabled elements: B, Sb

10. spot



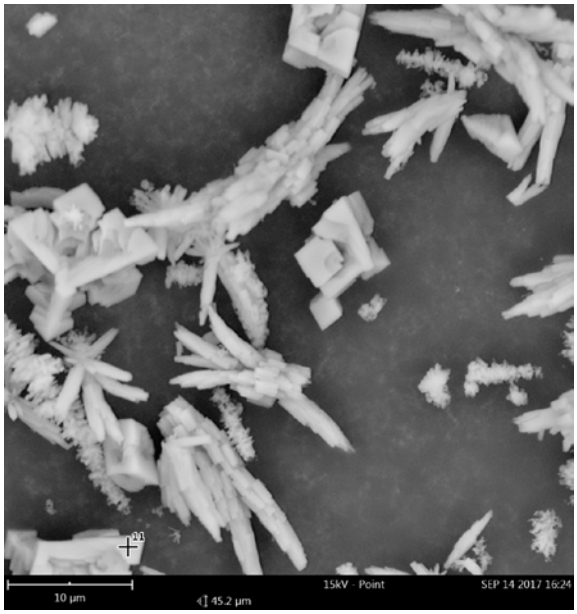
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	47.20	46.28
6	C	Carbon	44.14	32.49
20	Ca	Calcium	8.57	21.05
16	S	Sulfur	0.09	0.18

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24



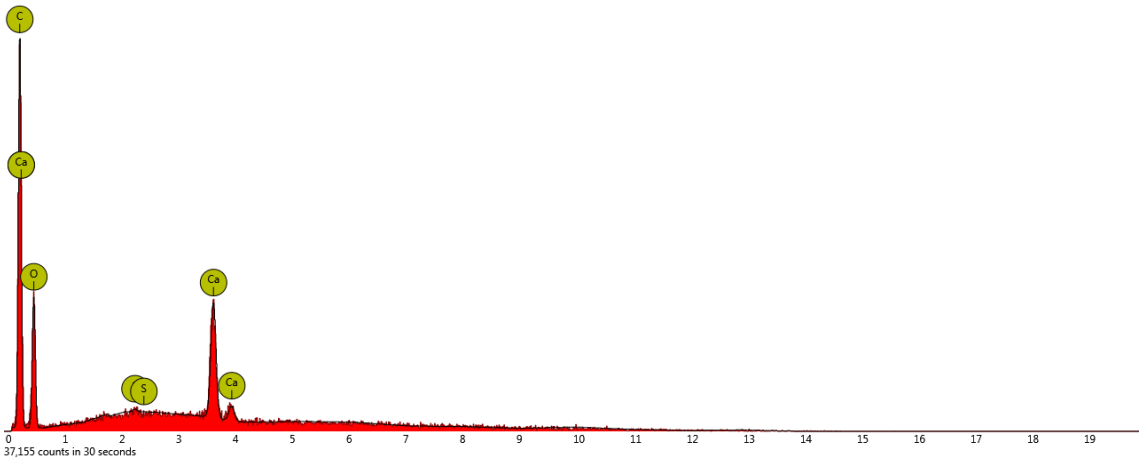
Disabled elements: B, Sb

11. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	62.29	51.95
8	O	Oxygen	34.01	37.79
20	Ca	Calcium	3.64	10.12

FOV: 45.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:24

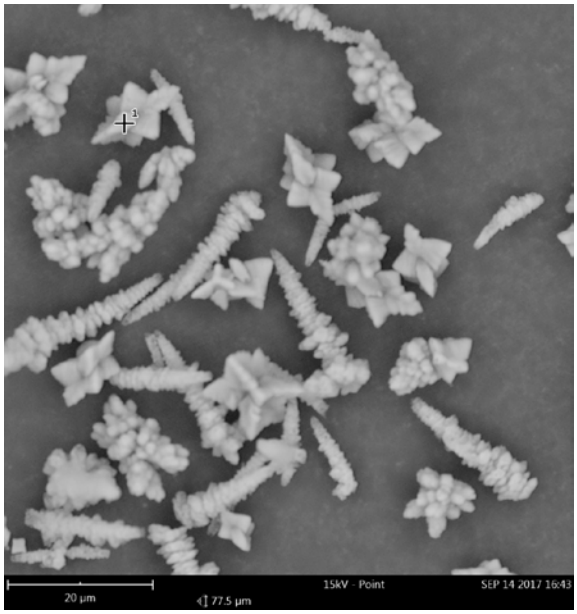


Disabled elements: B, Mo

$[Ca^{2+}]$ = 4,000 mg L^{-1} | $[CO_3^{2-}]$ = 4,000 mg L^{-1} | $[SO_4^{2-}]$ = 2,000 mg L^{-1}

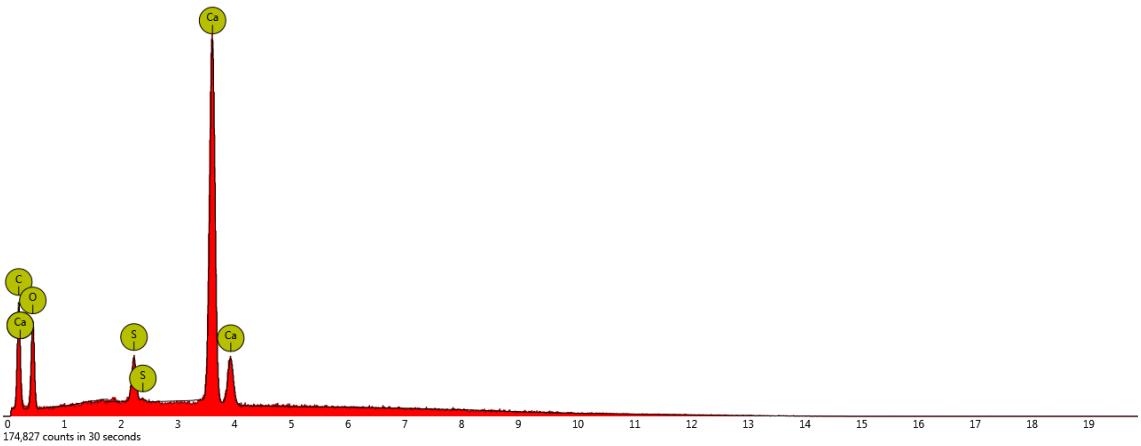
Image 2

1. spot



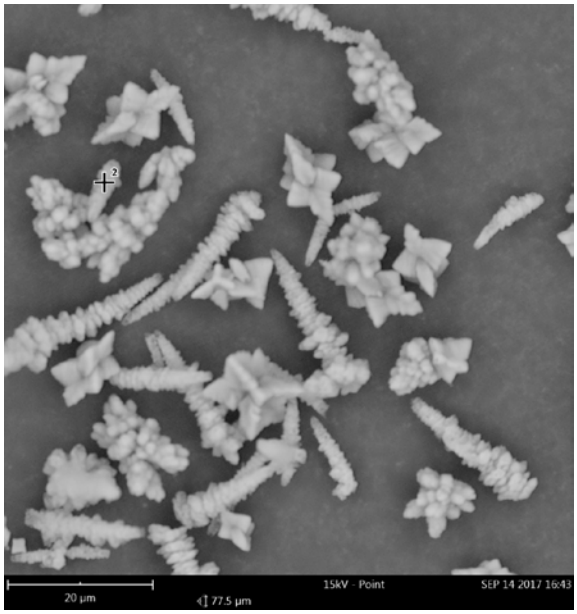
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	18.34	38.31
8	O	Oxygen	42.93	35.79
6	C	Carbon	37.13	23.24
16	S	Sulfur	1.59	2.66

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



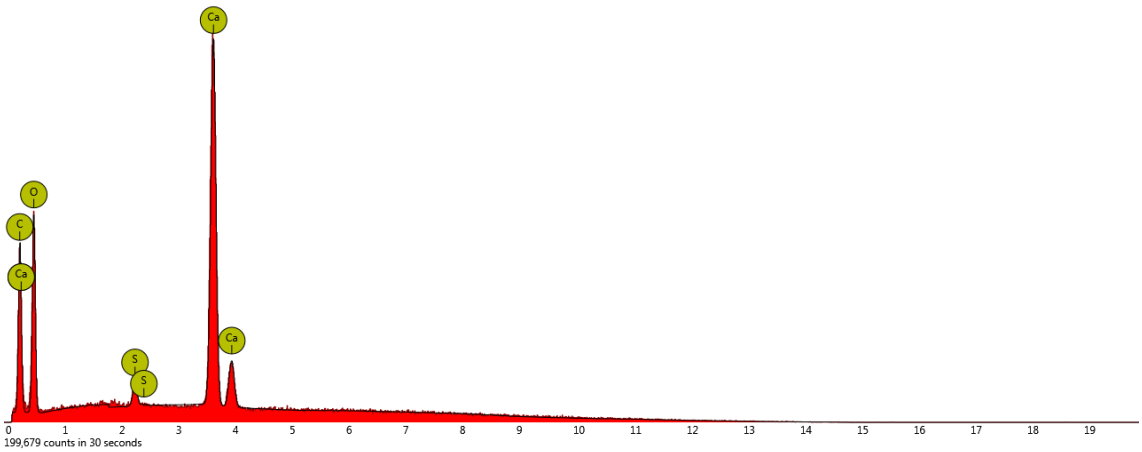
Disabled elements: B, Sb

2. spot



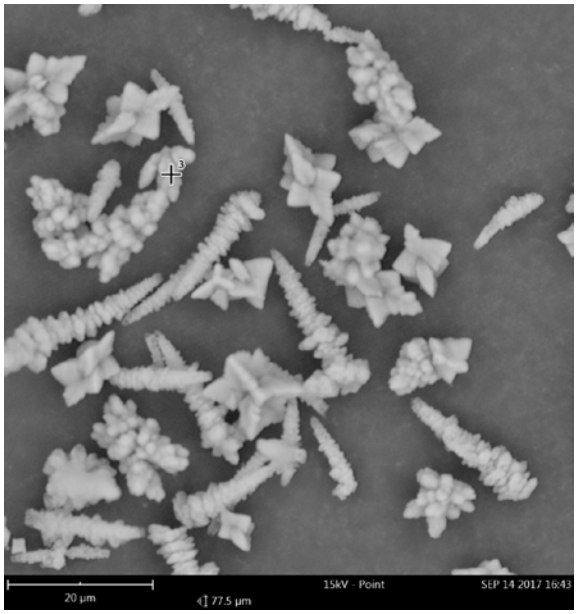
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	51.24	46.70
20	Ca	Calcium	12.08	27.57
6	C	Carbon	36.13	24.72
16	S	Sulfur	0.55	1.01

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



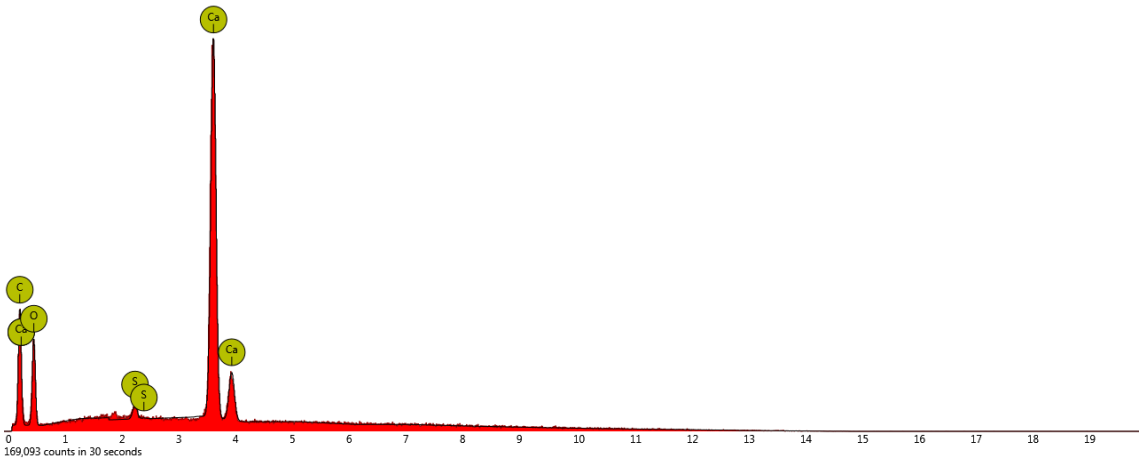
Disabled elements: B, Sb

3. spot



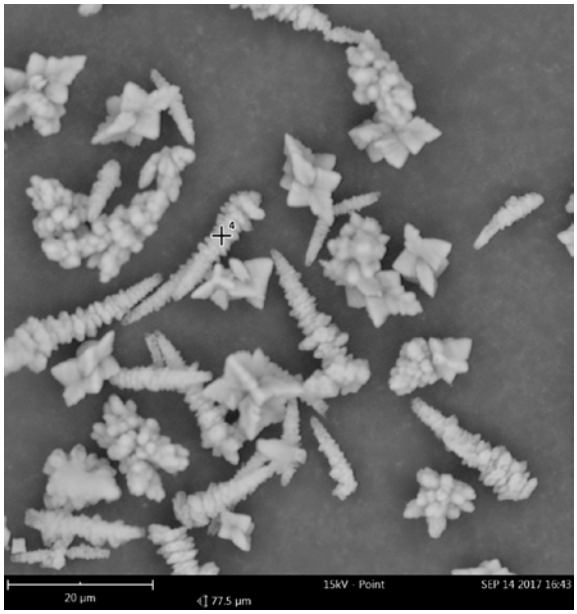
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	19.29	40.18
8	O	Oxygen	42.96	35.72
6	C	Carbon	37.23	23.24
16	S	Sulfur	0.51	0.86

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



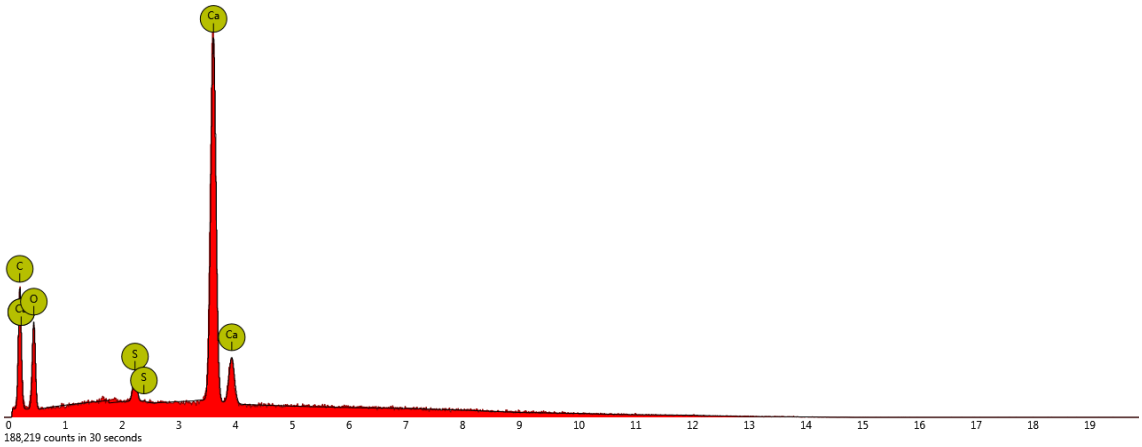
Disabled elements: B, Sb

4. spot



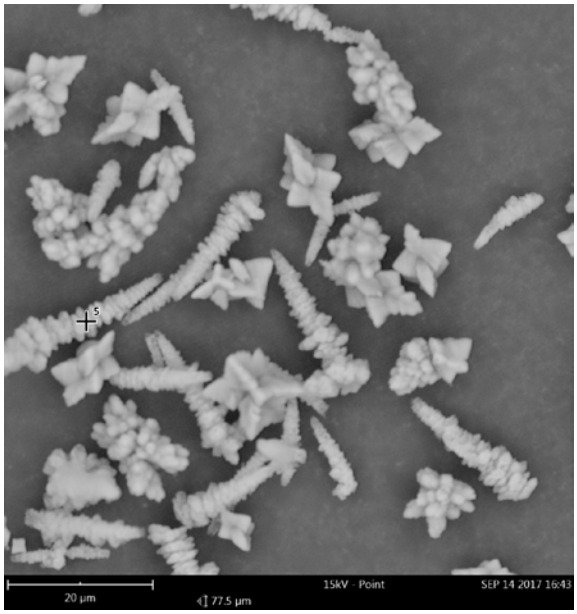
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	18.00	38.15
8	O	Oxygen	41.88	35.43
6	C	Carbon	39.23	24.91
16	S	Sulfur	0.89	1.50

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



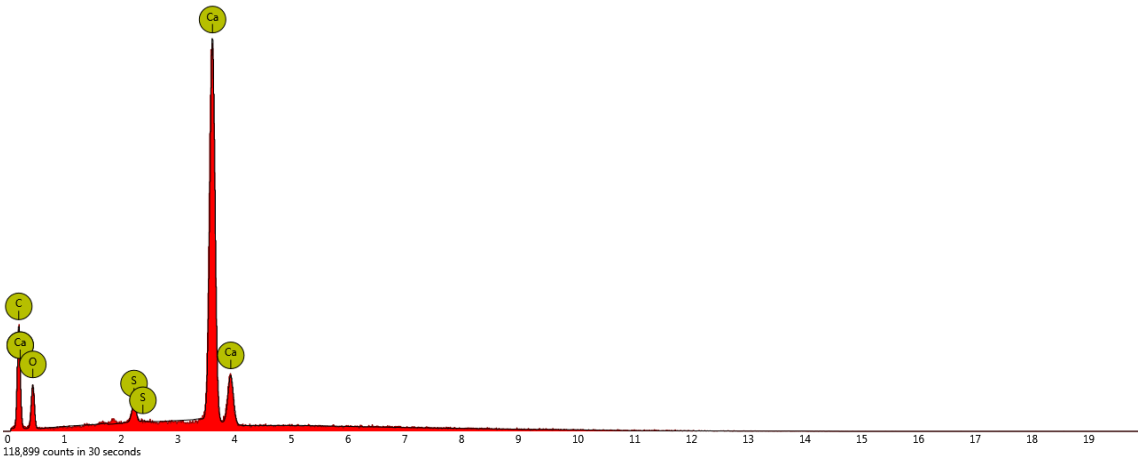
Disabled elements: B, Sb

5. spot



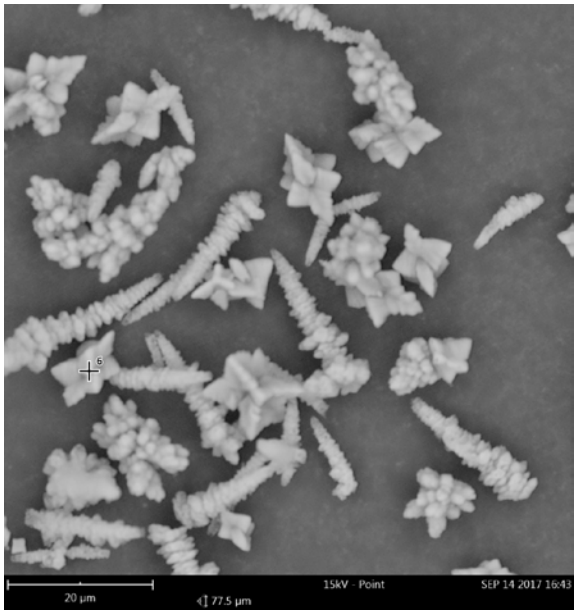
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	24.73	48.56
8	O	Oxygen	32.29	25.31
6	C	Carbon	42.14	24.80
16	S	Sulfur	0.85	1.33

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



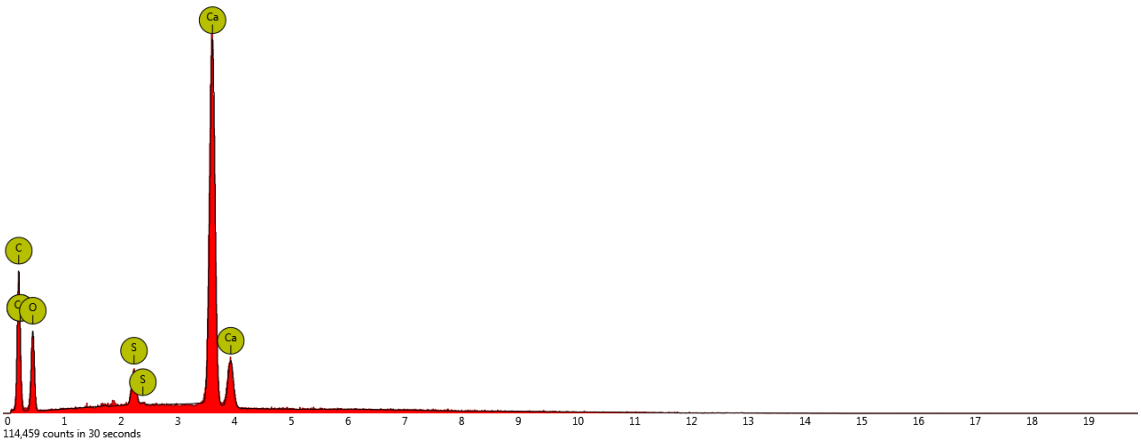
Disabled elements: B, Sb

6. spot



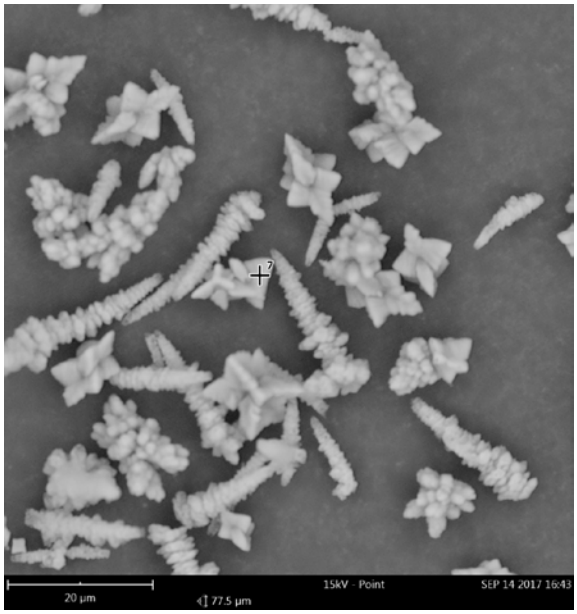
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	17.57	37.66
8	O	Oxygen	38.23	32.71
6	C	Carbon	43.05	27.66
16	S	Sulfur	1.15	1.98

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



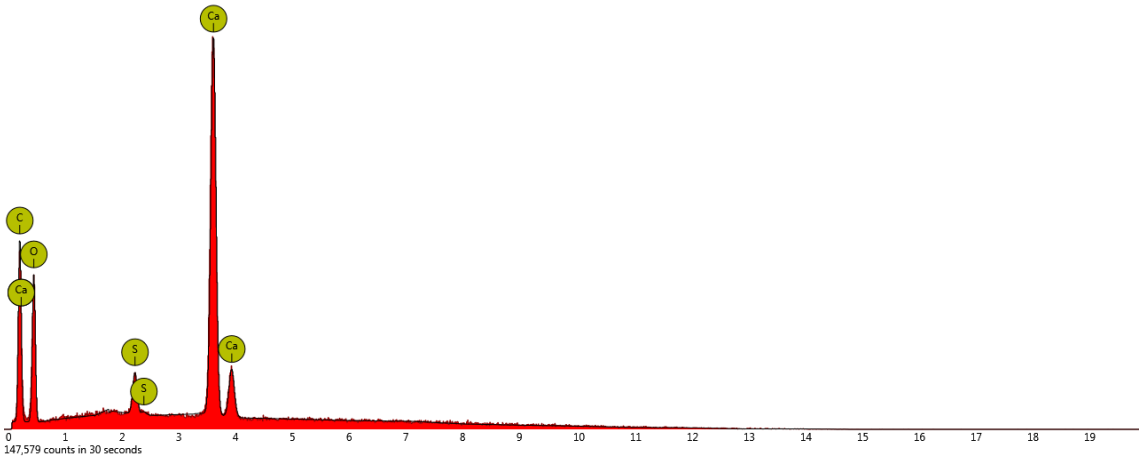
Disabled elements: B, Sb

7. spot



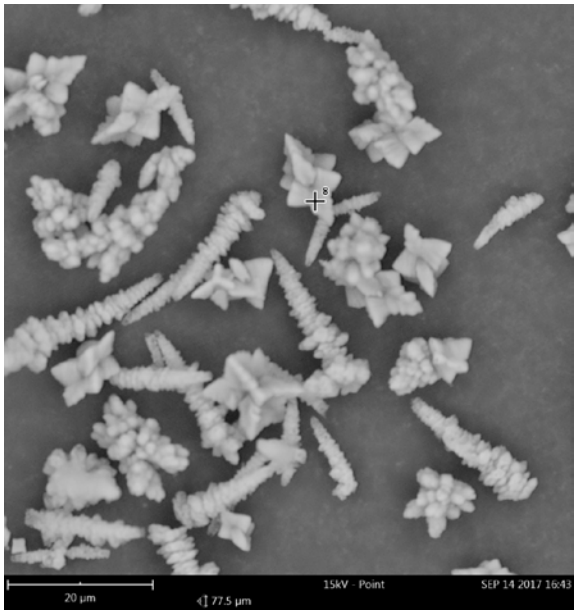
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.96	40.57
20	Ca	Calcium	13.26	29.97
6	C	Carbon	40.75	27.60
16	S	Sulfur	1.03	1.87

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



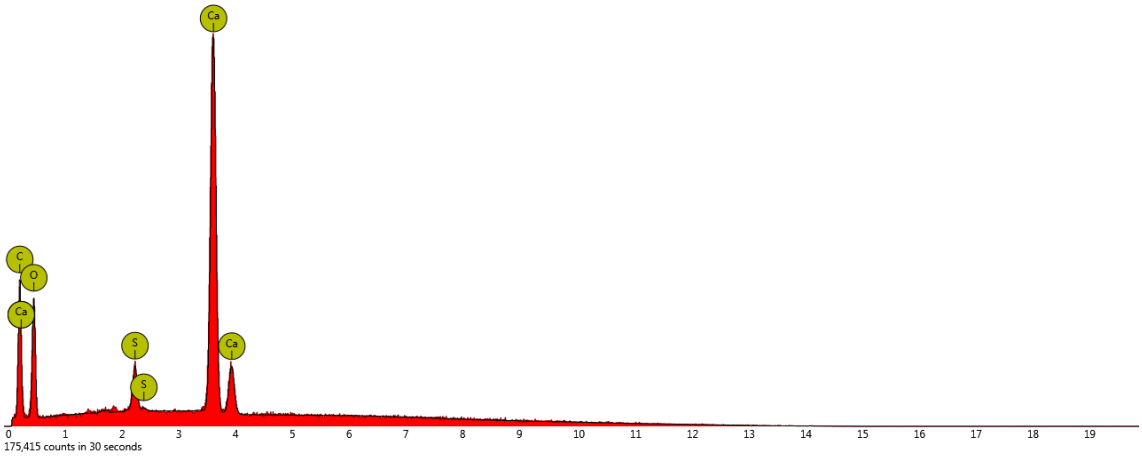
Disabled elements: B, Sb

8. spot



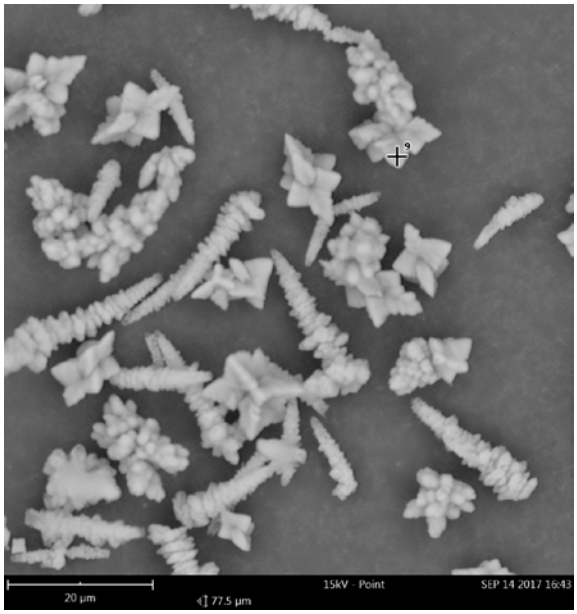
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.93	38.99
20	Ca	Calcium	15.58	33.86
6	C	Carbon	38.18	24.87
16	S	Sulfur	1.31	2.28

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



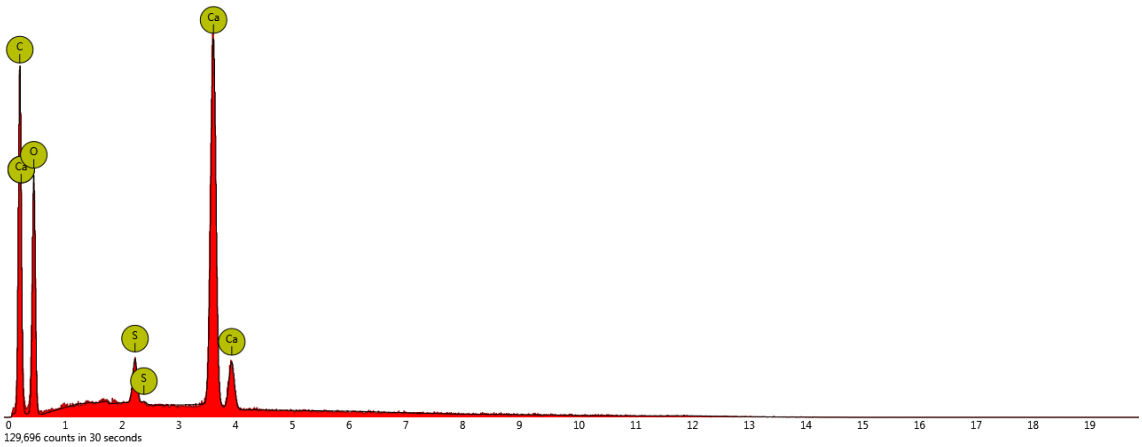
Disabled elements: B, Sb

9. spot



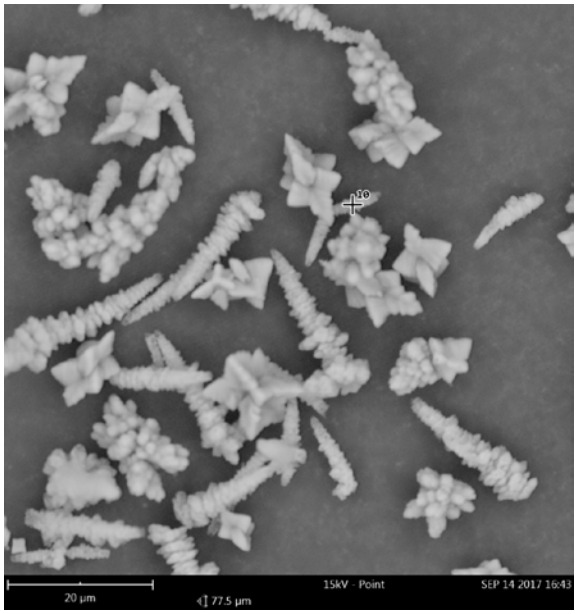
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	42.71	42.31
6	C	Carbon	48.41	36.00
20	Ca	Calcium	8.18	20.29
16	S	Sulfur	0.71	1.40

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



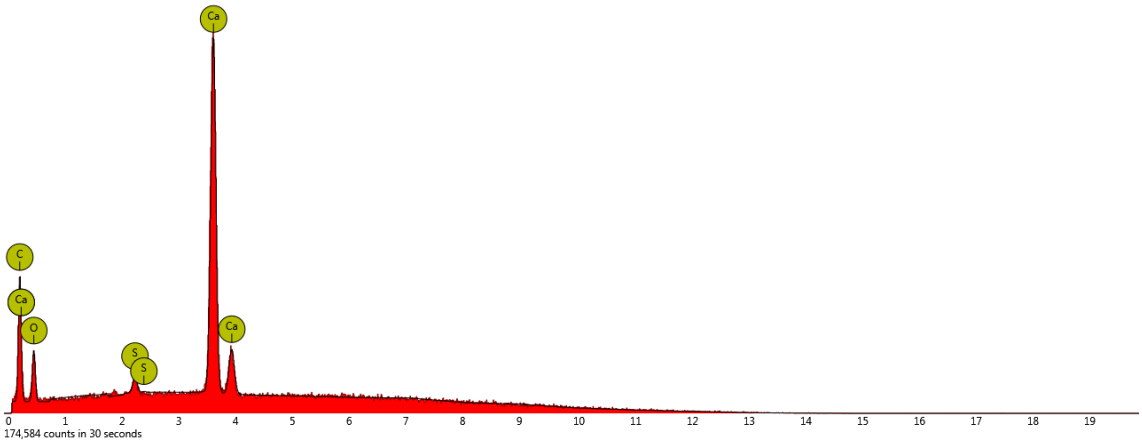
Disabled elements: B, Sb

10. spot



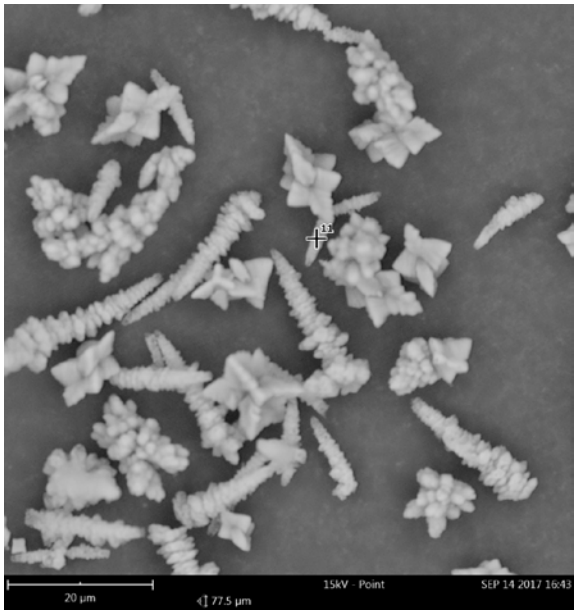
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	20.91	43.37
6	C	Carbon	45.63	28.36
8	O	Oxygen	32.77	27.13
16	S	Sulfur	0.69	1.14

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



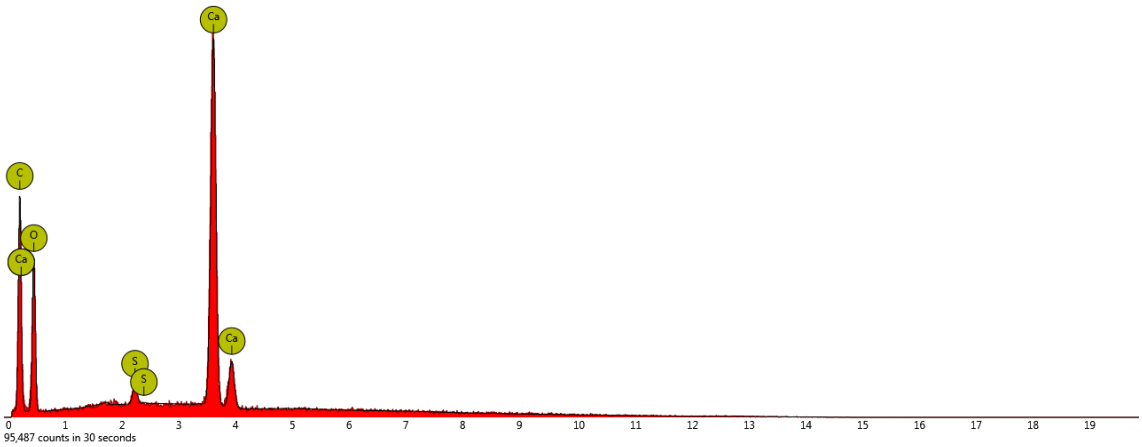
Disabled elements: B, Sb

11. spot



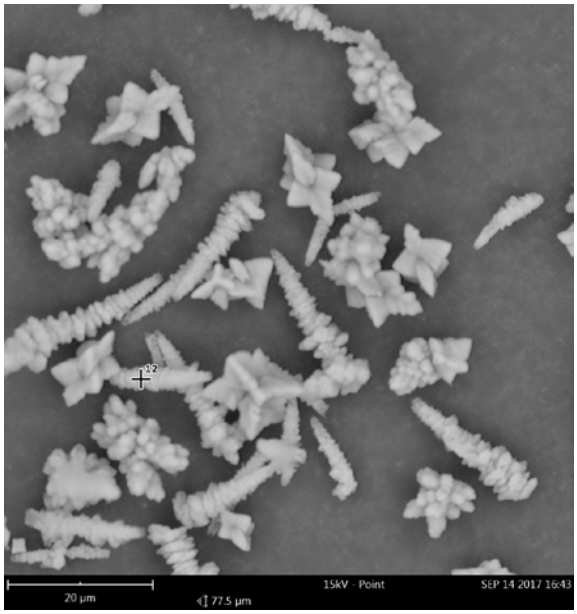
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.41	40.96
6	C	Carbon	42.76	29.61
20	Ca	Calcium	12.36	28.55
16	S	Sulfur	0.47	0.87

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



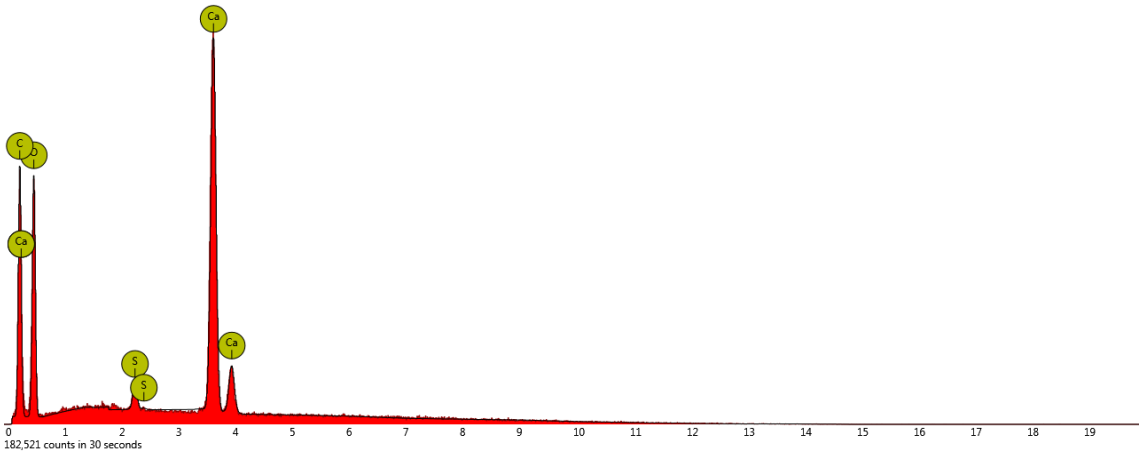
Disabled elements: B, Sb

12. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	49.41	46.84
6	C	Carbon	40.13	28.56
20	Ca	Calcium	9.98	23.69
16	S	Sulfur	0.48	0.92

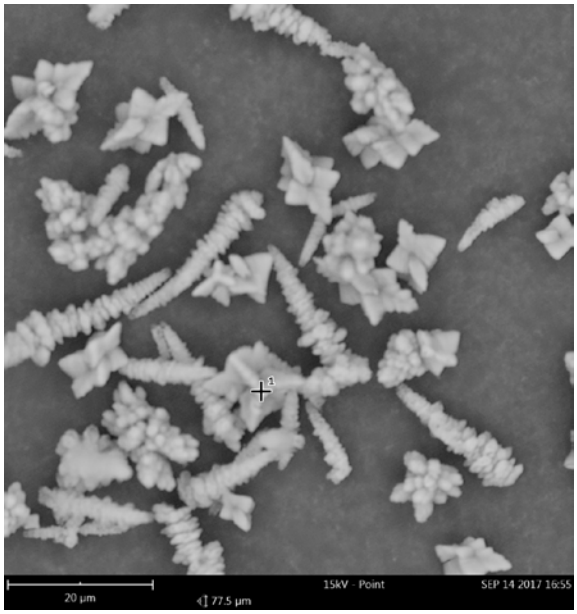
FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:43



Disabled elements: B, Sb

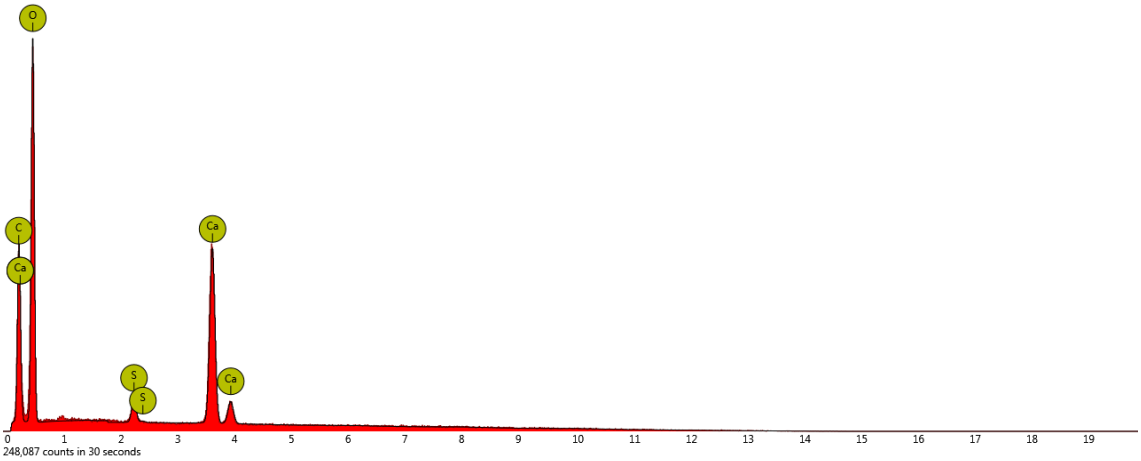
Image 3

1. spot



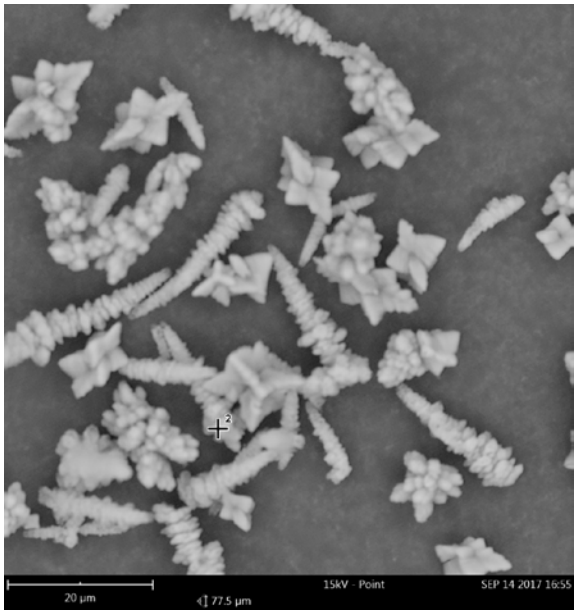
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	60.13	60.44
6	C	Carbon	34.35	25.92
20	Ca	Calcium	5.02	12.64
16	S	Sulfur	0.50	1.01

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



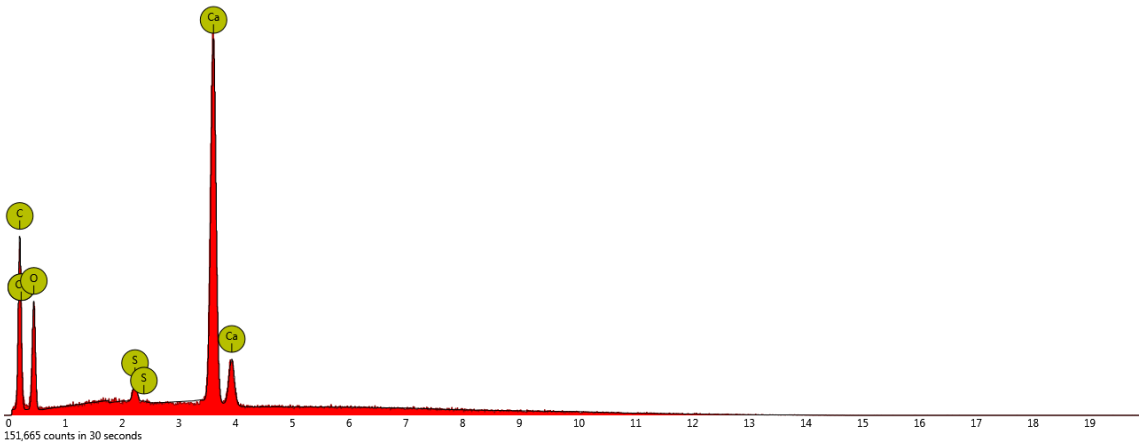
Disabled elements: B, Sb

2. spot



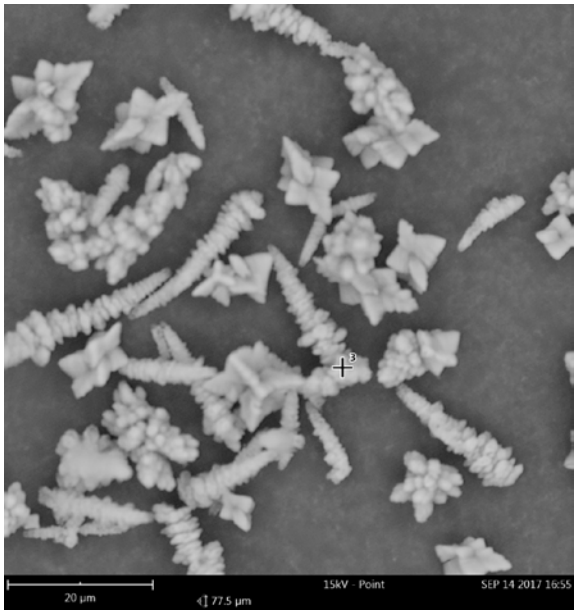
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	41.68	37.06
20	Ca	Calcium	15.02	33.45
6	C	Carbon	42.77	28.54
16	S	Sulfur	0.53	0.95

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



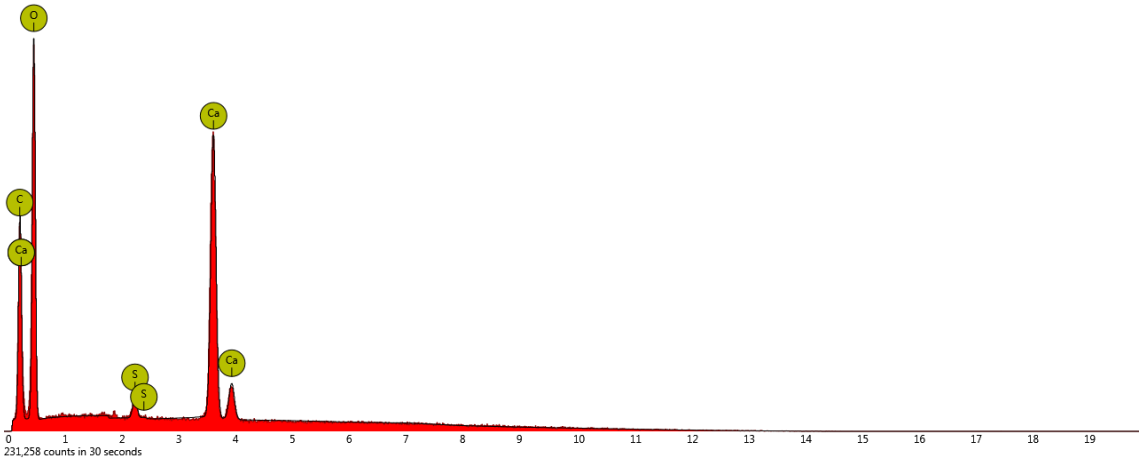
Disabled elements: B, Sb

3. spot



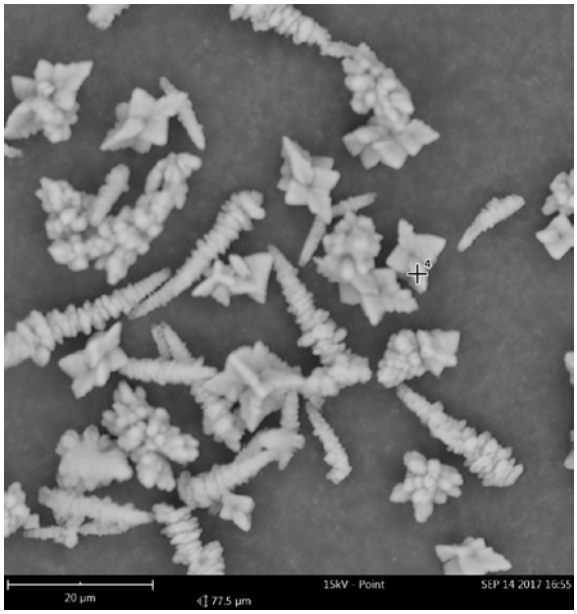
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	58.80	57.22
6	C	Carbon	33.65	24.58
20	Ca	Calcium	7.16	17.46
16	S	Sulfur	0.38	0.74

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



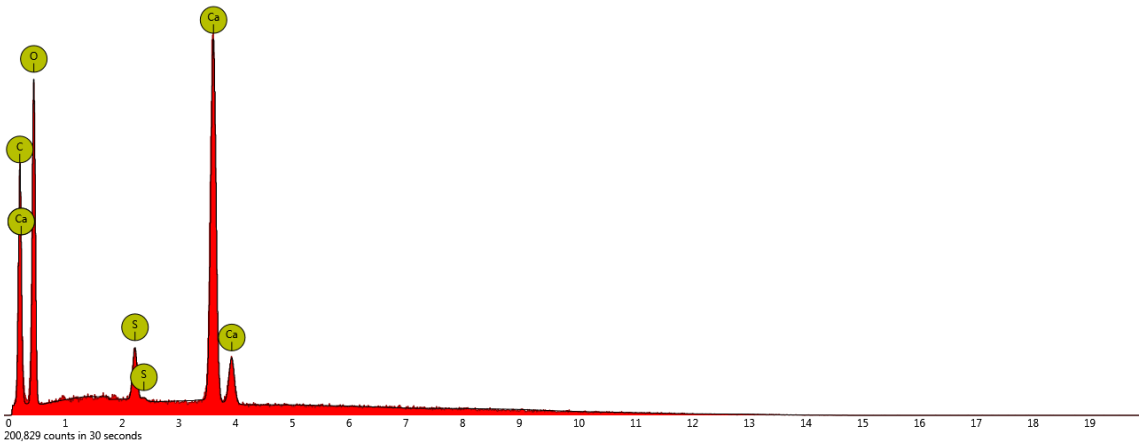
Disabled elements: B, Sb

4. spot



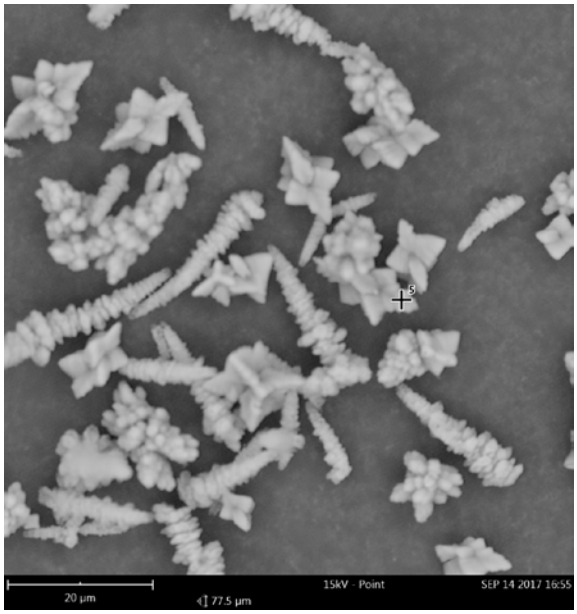
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.82	50.72
6	C	Carbon	37.87	27.30
20	Ca	Calcium	8.44	20.31
16	S	Sulfur	0.87	1.68

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



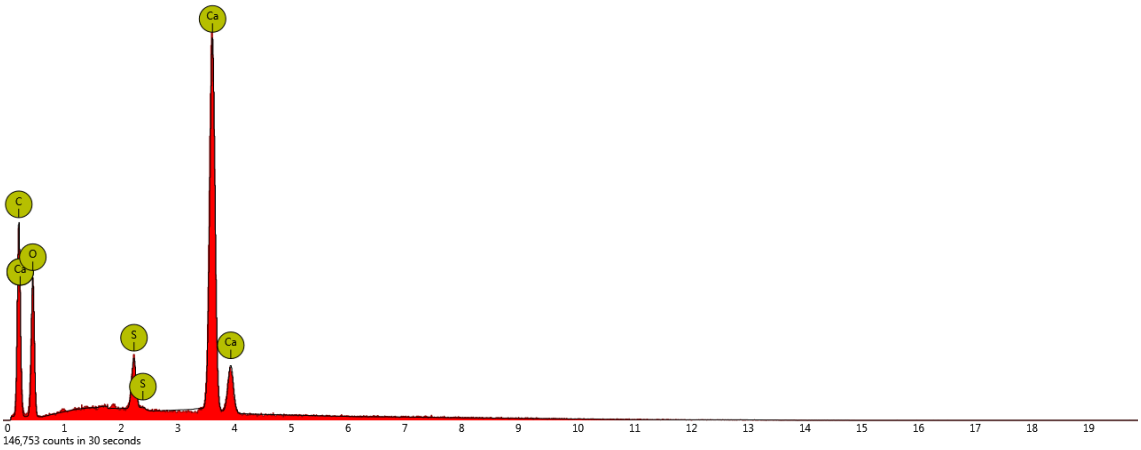
Disabled elements: B, Sb

5. spot



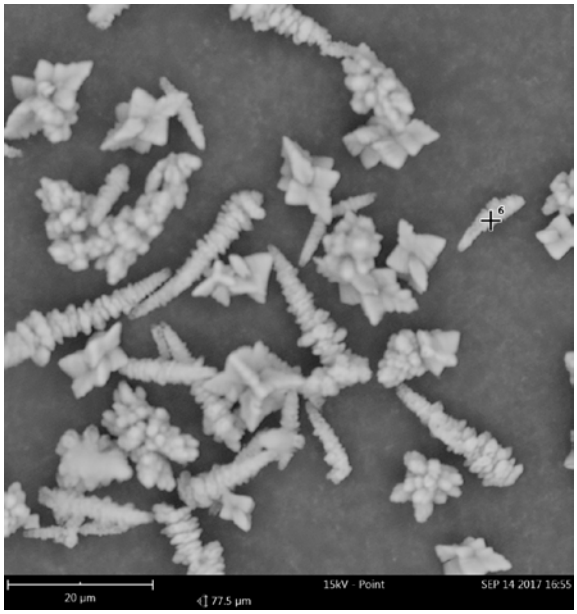
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	41.77	38.28
6	C	Carbon	44.41	30.56
20	Ca	Calcium	12.58	28.89
16	S	Sulfur	1.23	2.27

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



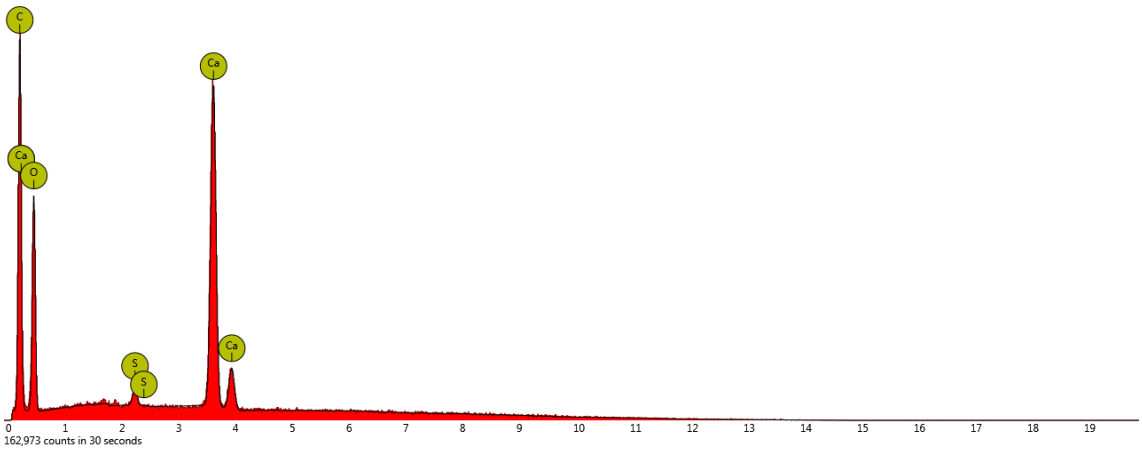
Disabled elements: B, Sb

6. spot



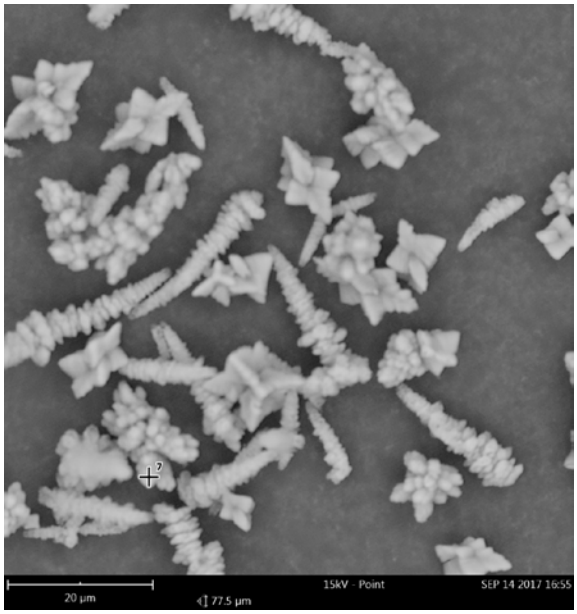
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	41.21	41.59
6	C	Carbon	50.86	38.53
20	Ca	Calcium	7.61	19.23
16	S	Sulfur	0.32	0.65

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



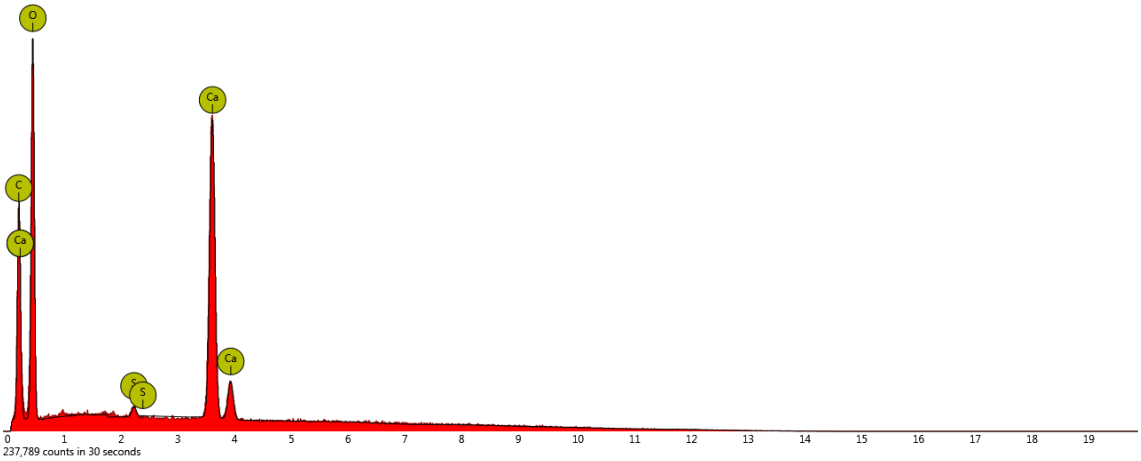
Disabled elements: B, Sb

7. spot



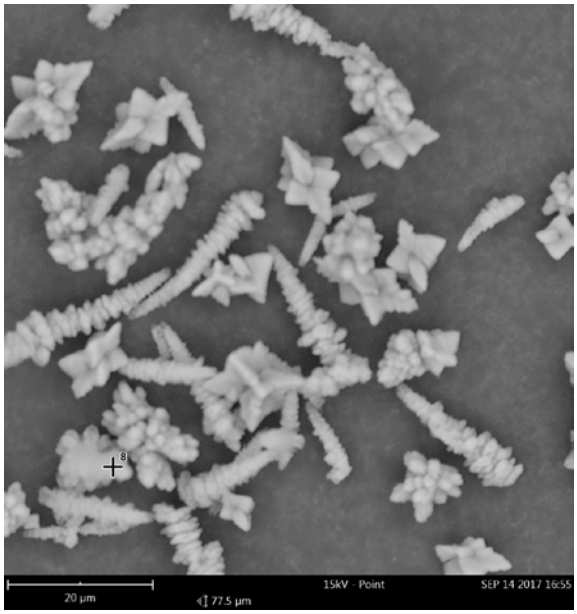
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	58.36	56.76
6	C	Carbon	34.07	24.87
20	Ca	Calcium	7.40	18.02
16	S	Sulfur	0.18	0.35

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



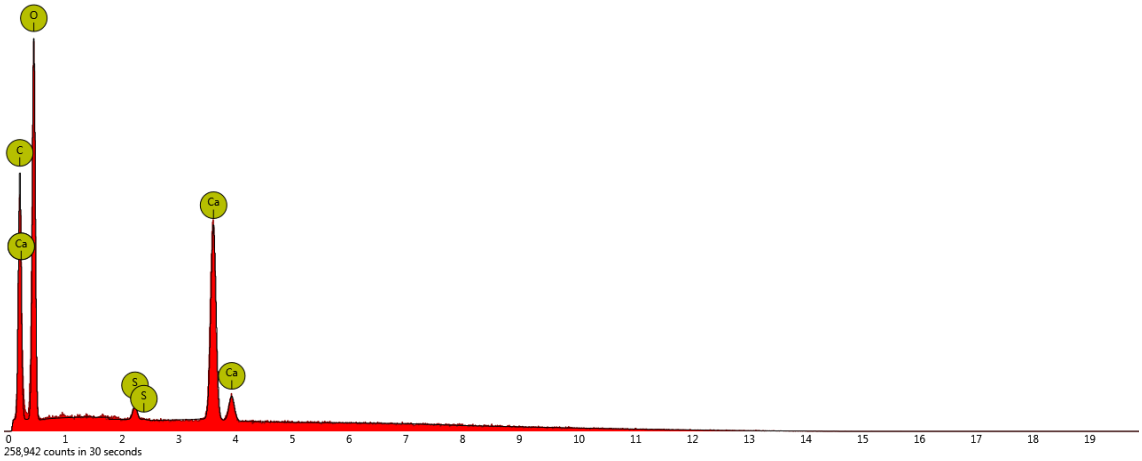
Disabled elements: B, Sb

8. spot



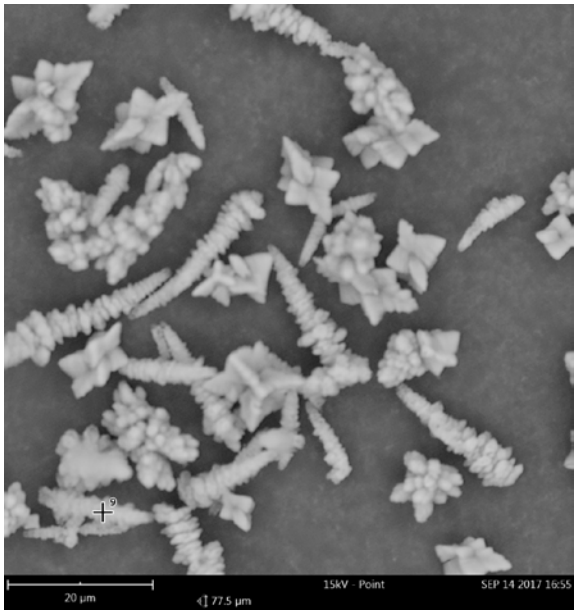
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.99	57.89
6	C	Carbon	37.70	28.75
20	Ca	Calcium	5.04	12.83
16	S	Sulfur	0.26	0.53

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



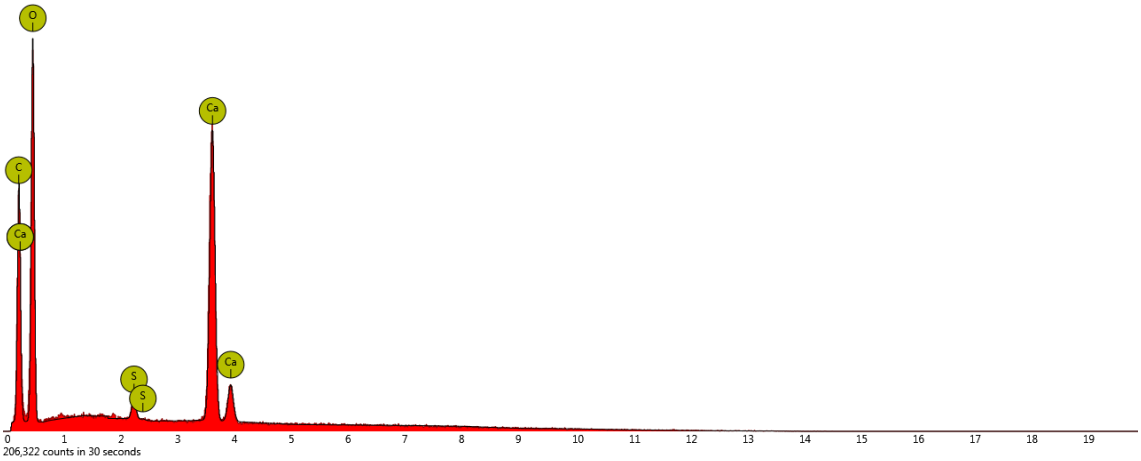
Disabled elements: B, Sb

9. spot



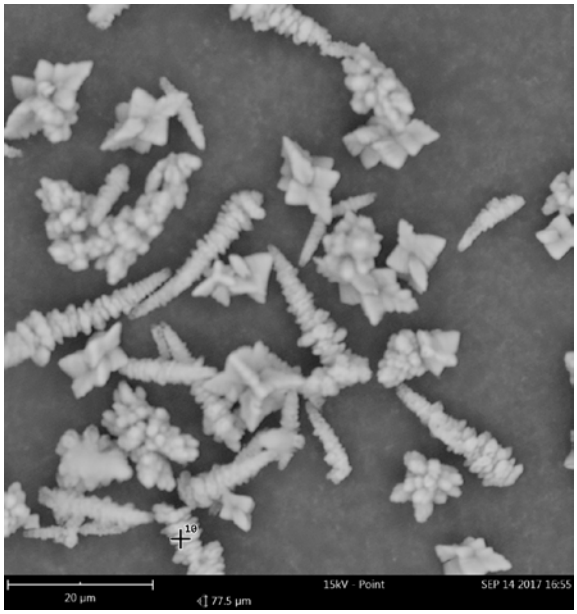
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.75	55.78
6	C	Carbon	36.03	26.58
20	Ca	Calcium	6.89	16.97
16	S	Sulfur	0.34	0.66

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



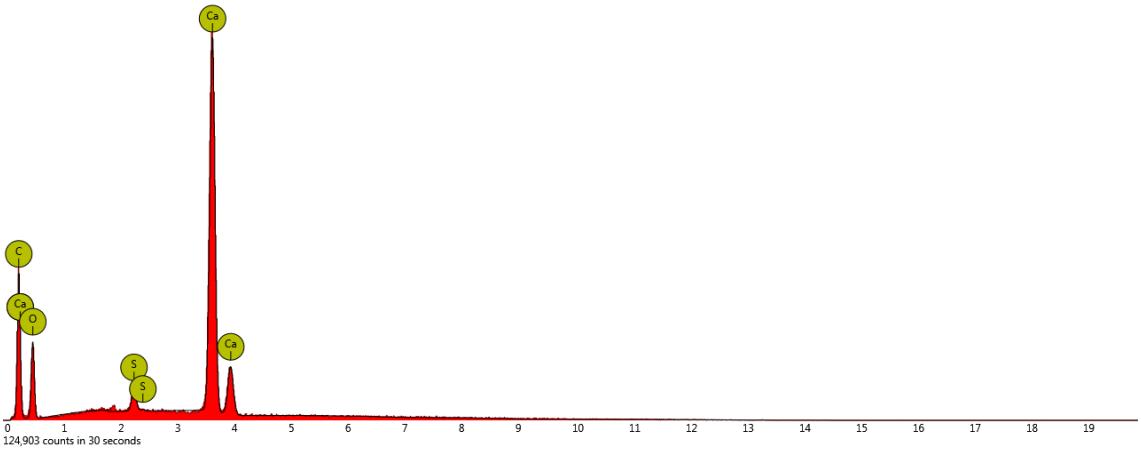
Disabled elements: B, Sb

10. spot



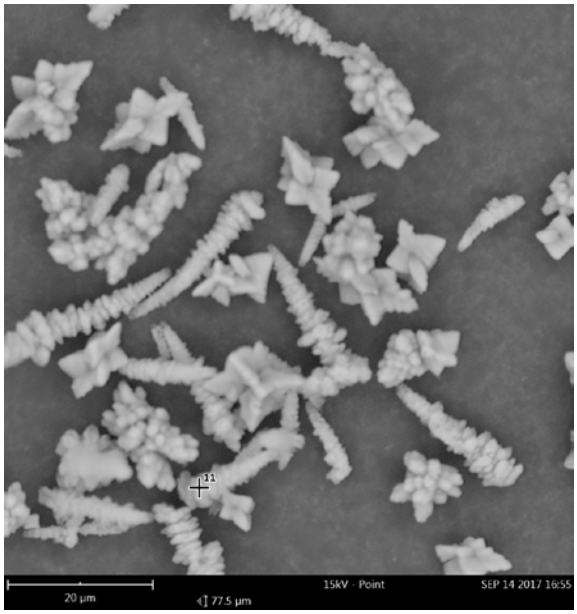
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	17.97	38.52
8	O	Oxygen	37.16	31.80
6	C	Carbon	44.07	28.31
16	S	Sulfur	0.80	1.37

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



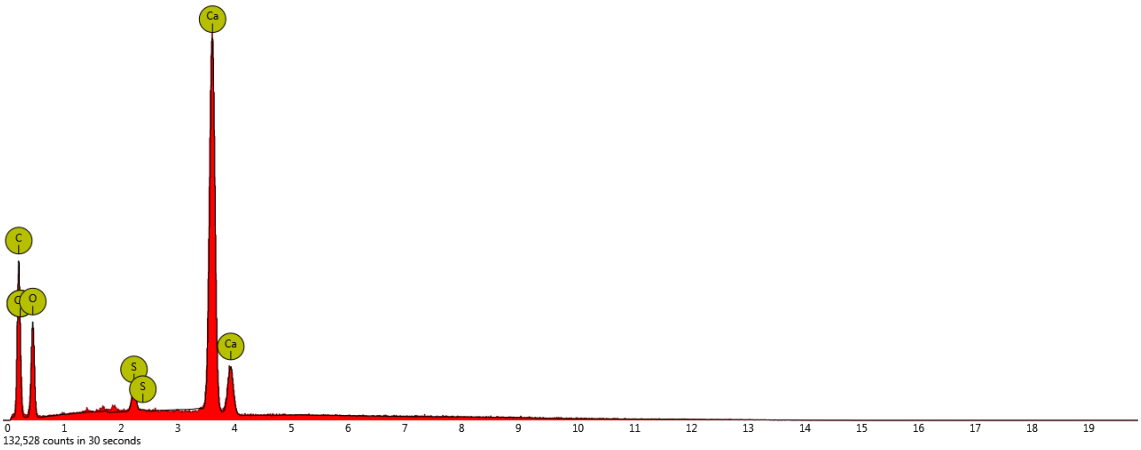
Disabled elements: B, Sb

11. spot



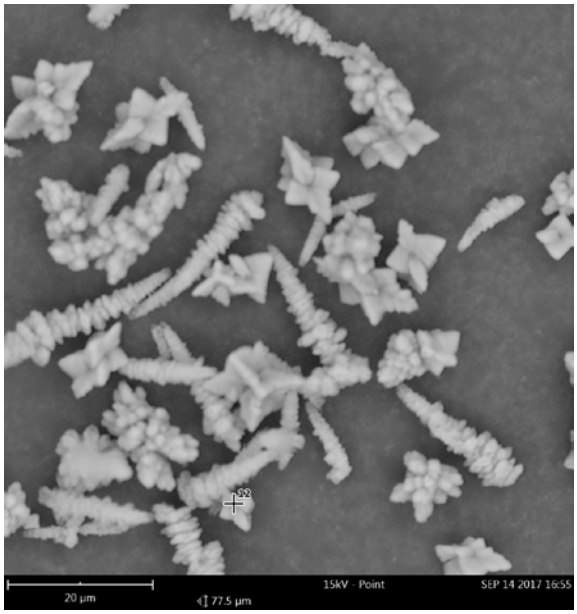
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	16.54	36.00
8	O	Oxygen	40.71	35.37
6	C	Carbon	42.07	27.44
16	S	Sulfur	0.68	1.19

FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



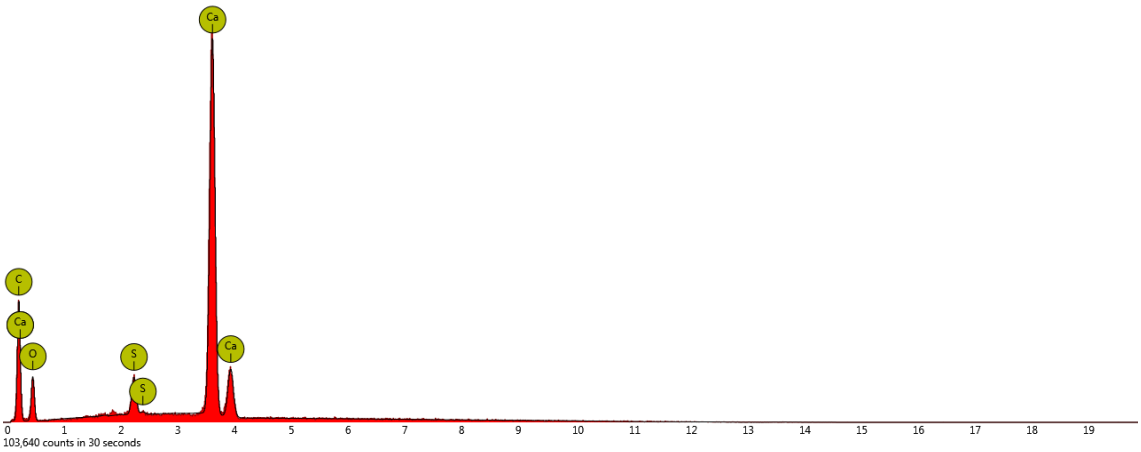
Disabled elements: B, Sb

12. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	21.95	44.78
6	C	Carbon	47.29	28.91
8	O	Oxygen	29.22	23.80
16	S	Sulfur	1.54	2.51

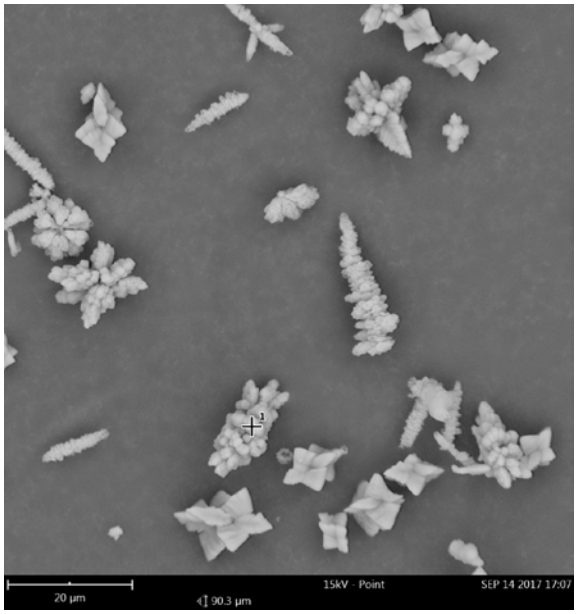
FOV: 77.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 16:55



Disabled elements: B, Sb

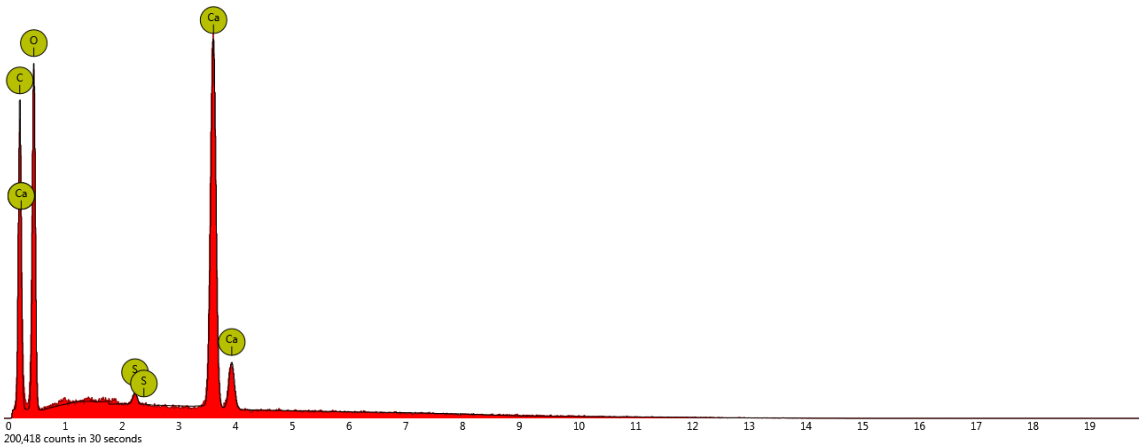
Image 4

1. spot



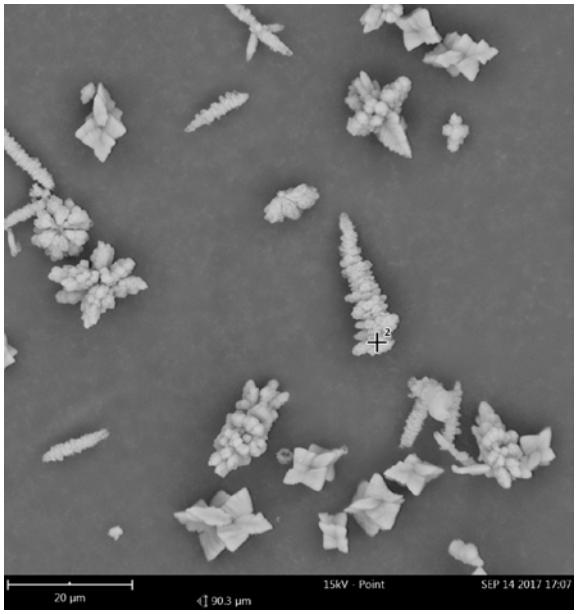
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.80	51.42
6	C	Carbon	38.91	28.44
20	Ca	Calcium	8.11	19.77
16	S	Sulfur	0.18	0.36

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



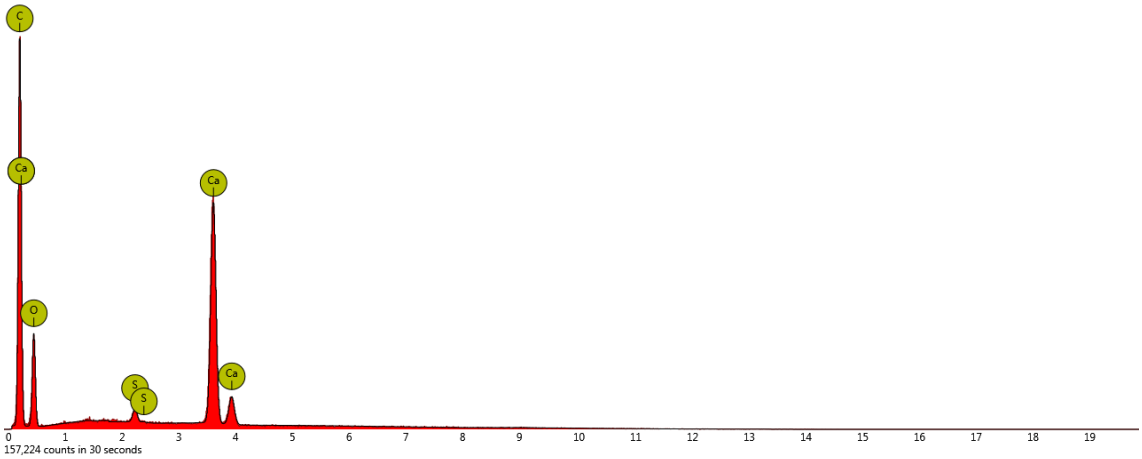
Disabled elements: B, Sb

2. spot



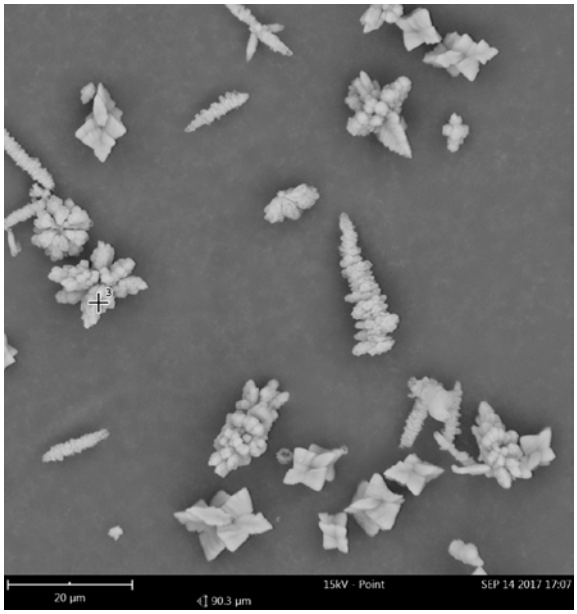
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	64.33	50.91
8	O	Oxygen	28.34	29.88
20	Ca	Calcium	7.03	18.57
16	S	Sulfur	0.31	0.65

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



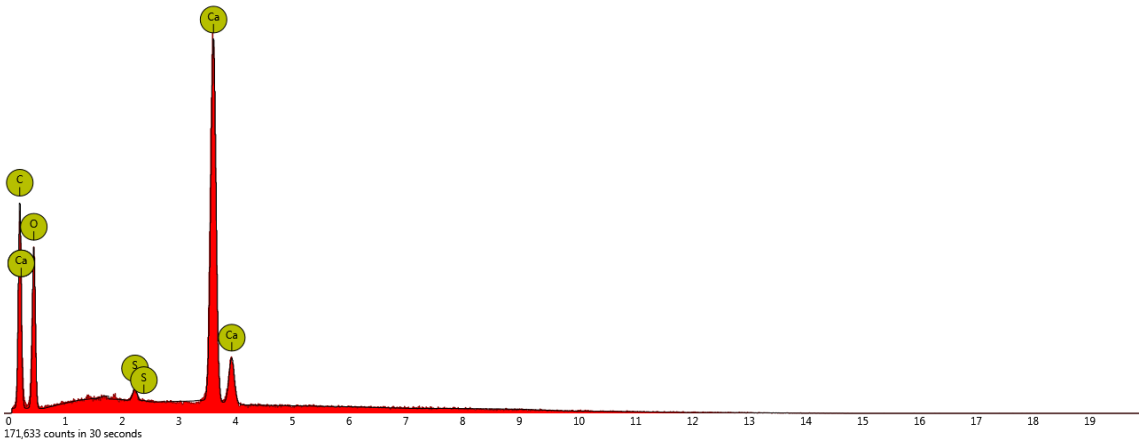
Disabled elements: B, Sb

3. spot



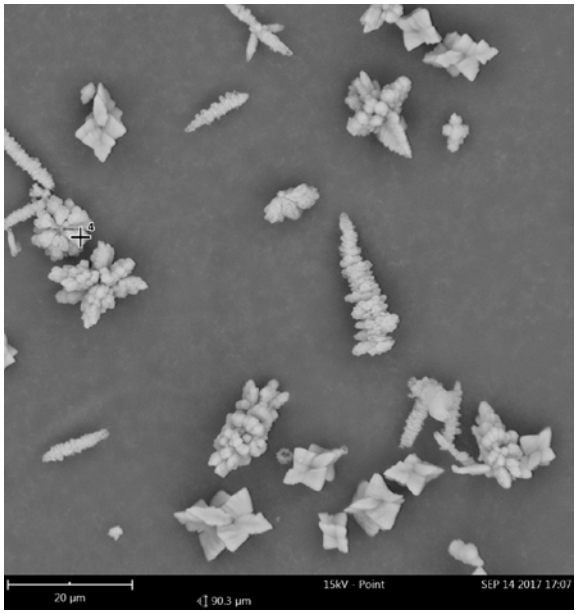
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.53	42.73
20	Ca	Calcium	12.46	28.66
6	C	Carbon	40.72	28.07
16	S	Sulfur	0.29	0.54

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



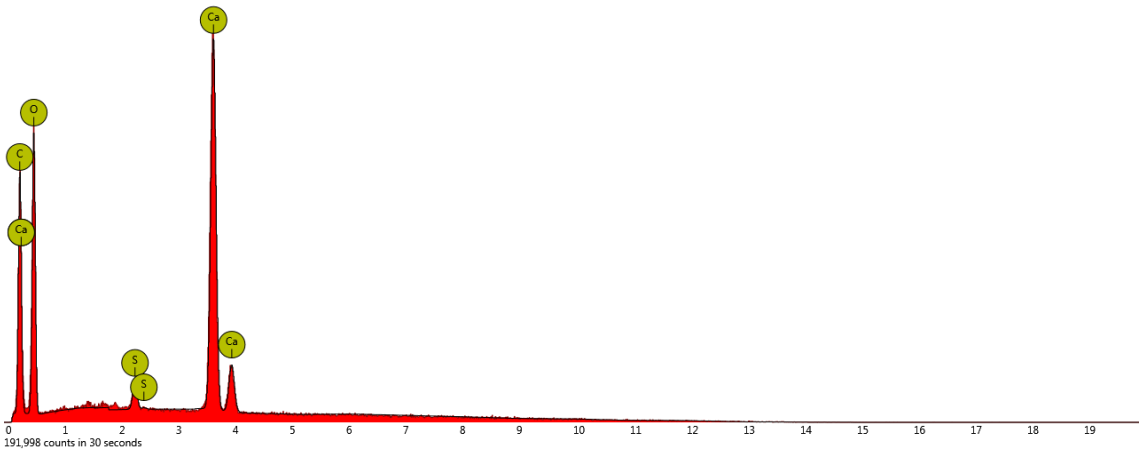
Disabled elements: B, Sb

4. spot



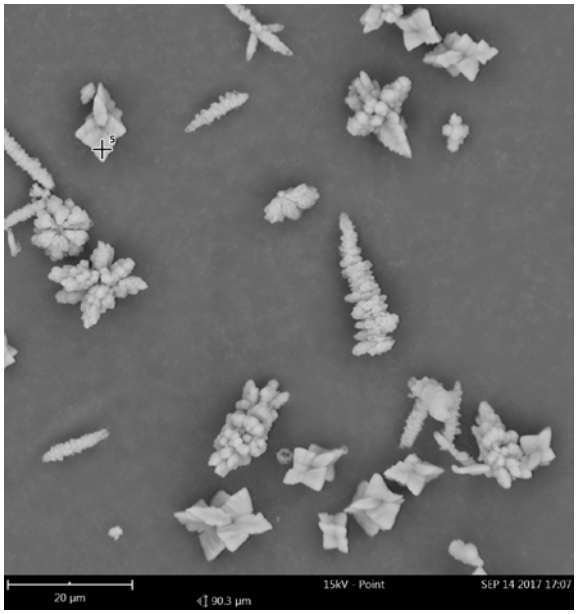
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	51.60	49.19
6	C	Carbon	38.59	27.62
20	Ca	Calcium	9.34	22.30
16	S	Sulfur	0.47	0.90

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



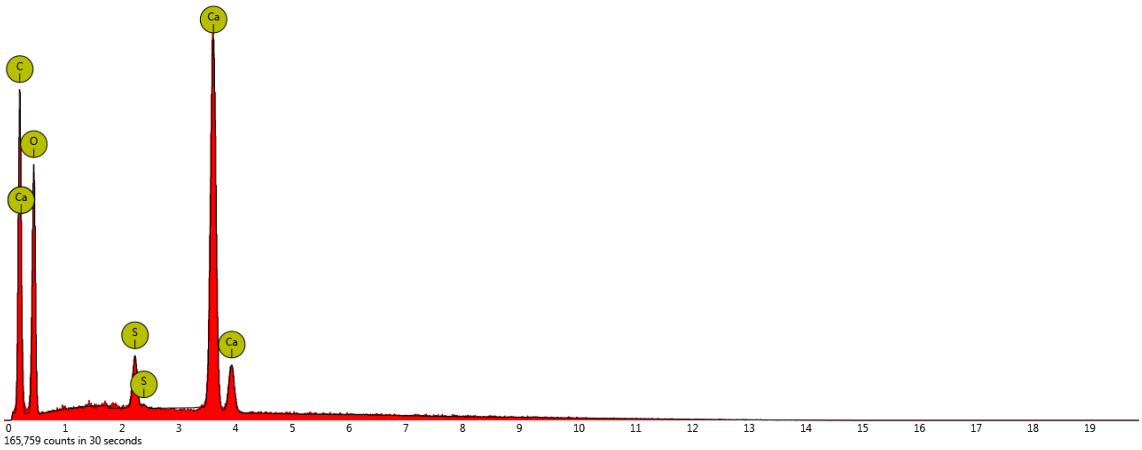
Disabled elements: B, Sb

5. spot



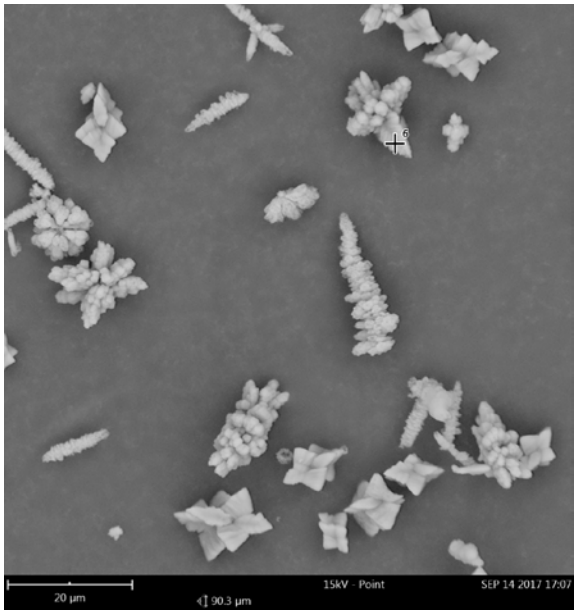
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.73	43.79
6	C	Carbon	45.95	33.77
20	Ca	Calcium	8.47	20.77
16	S	Sulfur	0.85	1.67

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



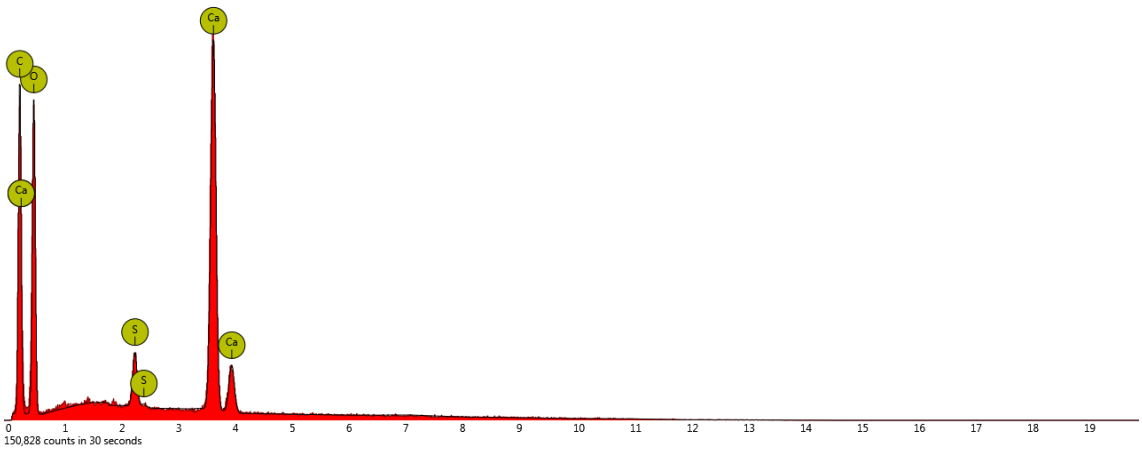
Disabled elements: B, Sb

6. spot



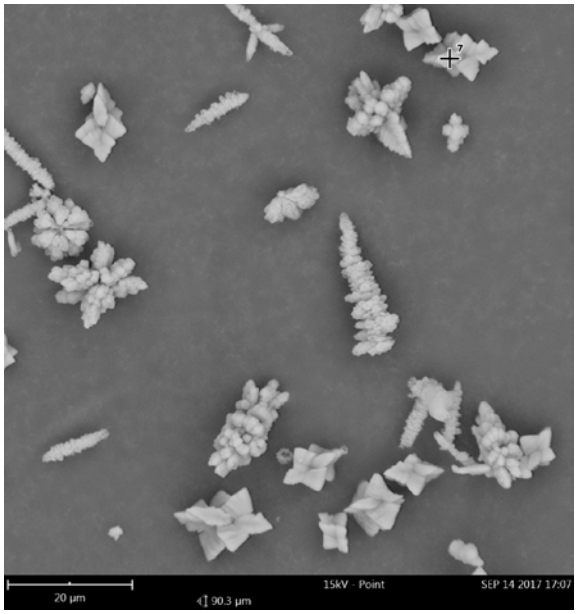
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	48.30	47.47
6	C	Carbon	43.12	31.81
20	Ca	Calcium	7.77	19.13
16	S	Sulfur	0.81	1.60

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



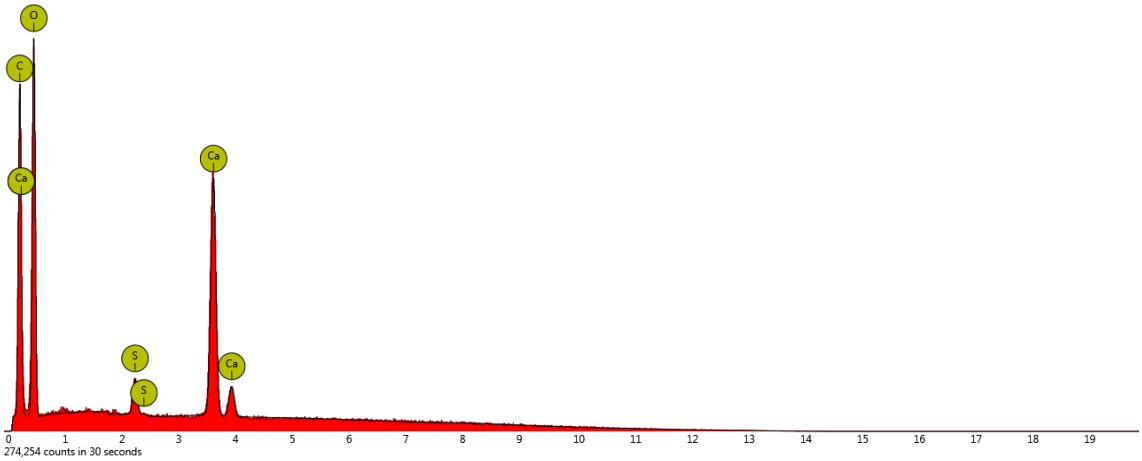
Disabled elements: B, Sb

7. spot



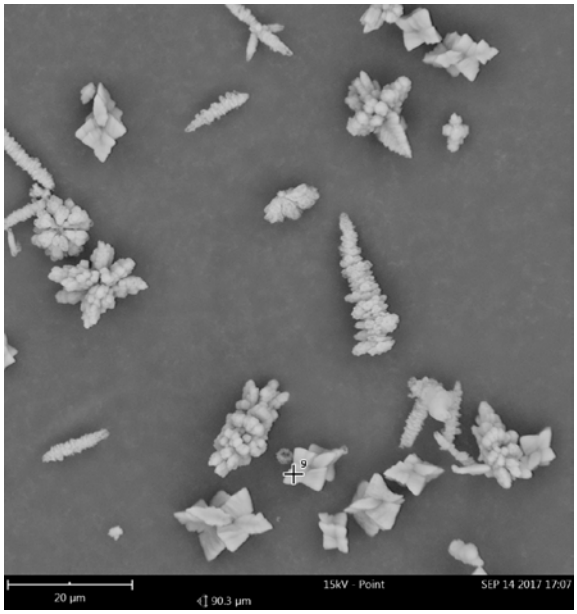
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	50.72	52.25
6	C	Carbon	43.79	33.87
20	Ca	Calcium	4.95	12.77
16	S	Sulfur	0.54	1.11

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



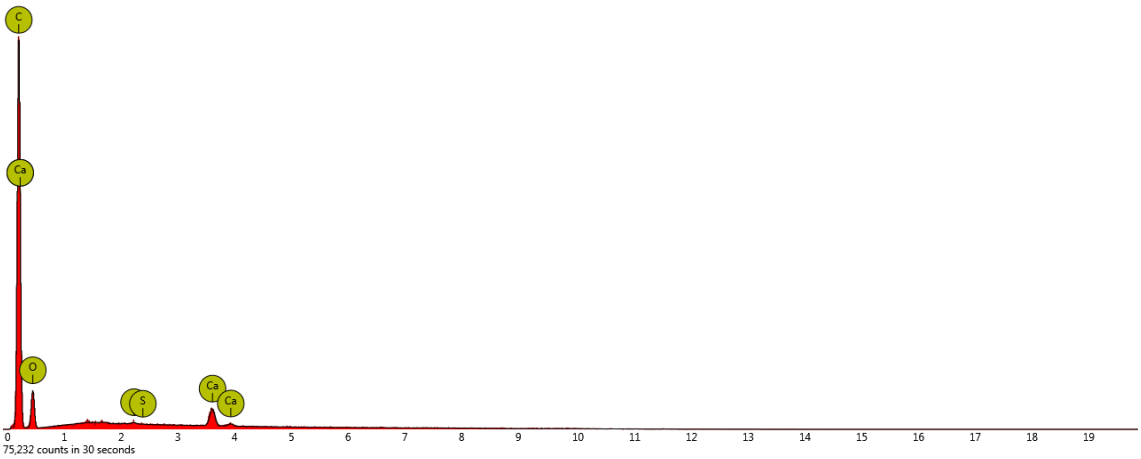
Disabled elements: B, Sb

9. spot



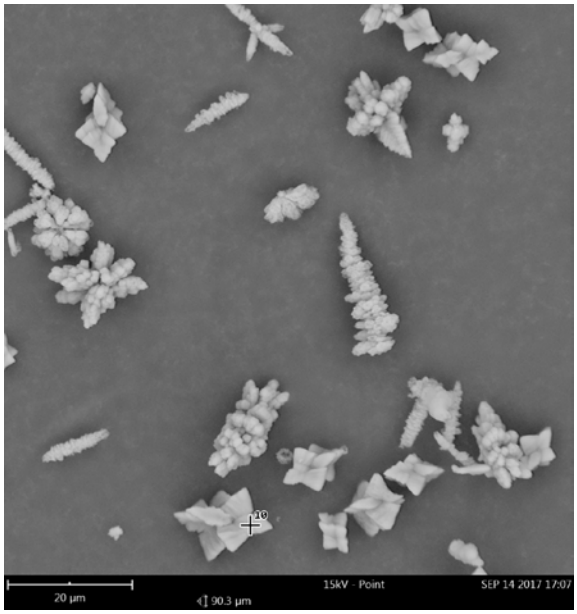
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	80.24	74.10
8	O	Oxygen	18.88	23.23
20	Ca	Calcium	0.83	2.57
16	S	Sulfur	0.04	0.11

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



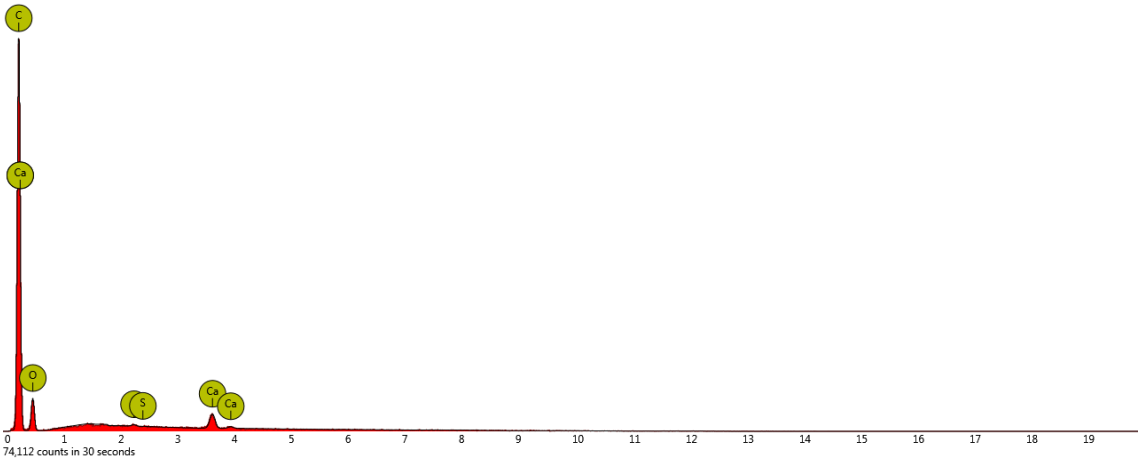
Disabled elements: B

10. spot



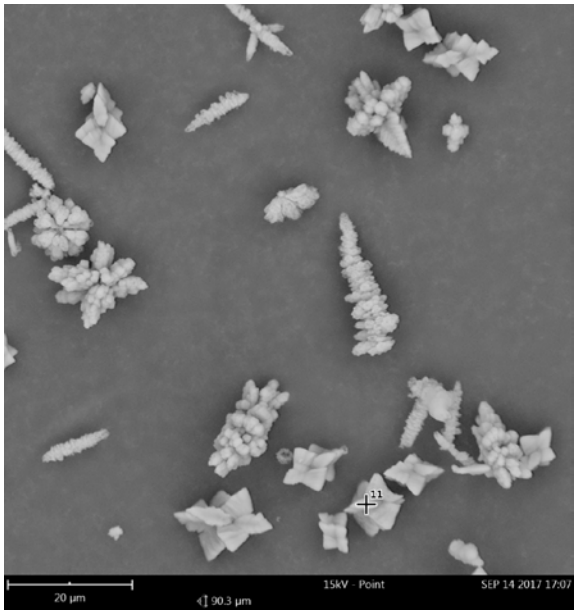
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	81.96	76.23
8	O	Oxygen	17.26	21.38
20	Ca	Calcium	0.73	2.26
16	S	Sulfur	0.05	0.13

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



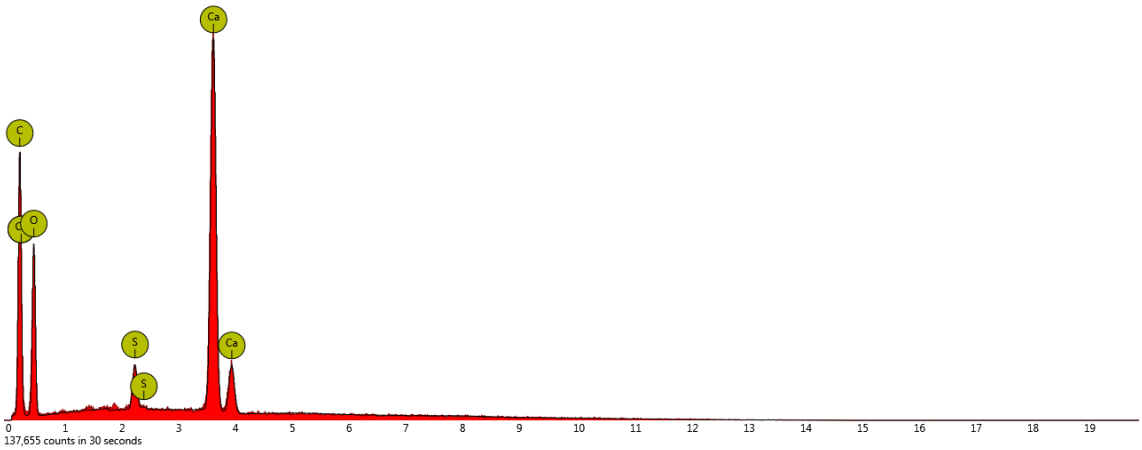
Disabled elements: Al, B, Br, Sb

11. spot



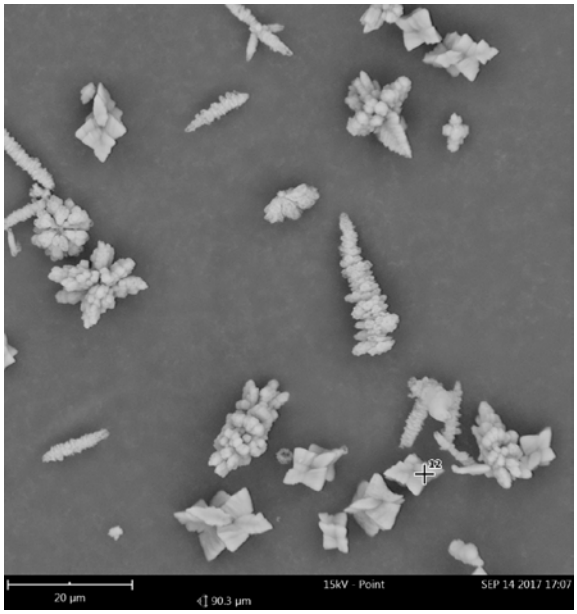
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	41.32	39.42
6	C	Carbon	47.34	33.91
20	Ca	Calcium	10.45	24.98
16	S	Sulfur	0.89	1.70

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



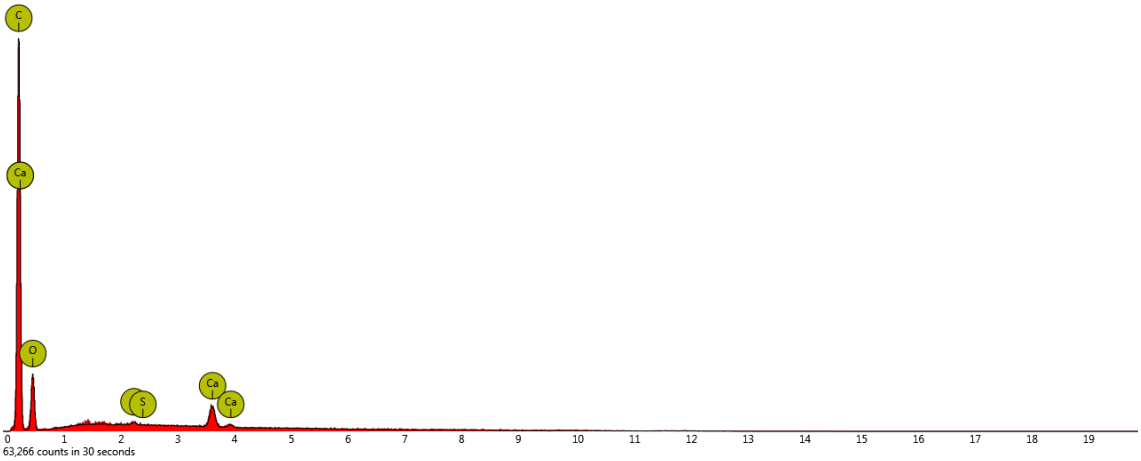
Disabled elements: B, Sb

12. spot



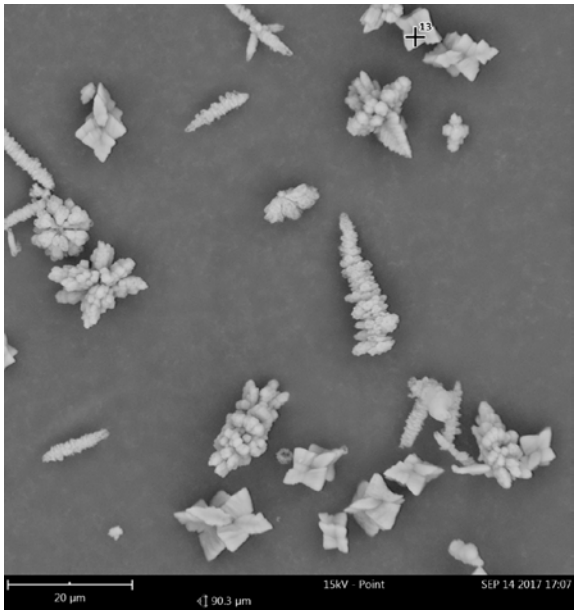
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	75.85	68.99
8	O	Oxygen	23.17	28.07
20	Ca	Calcium	0.91	2.75
16	S	Sulfur	0.08	0.19

FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



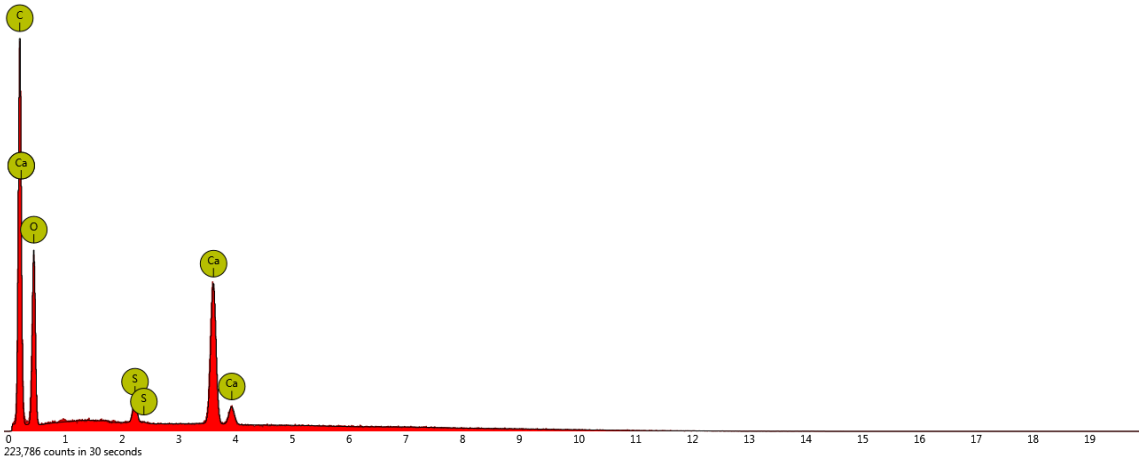
Disabled elements: Al, B, Br

13. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	58.64	48.10
8	O	Oxygen	37.15	40.60
20	Ca	Calcium	3.81	10.43
16	S	Sulfur	0.40	0.87

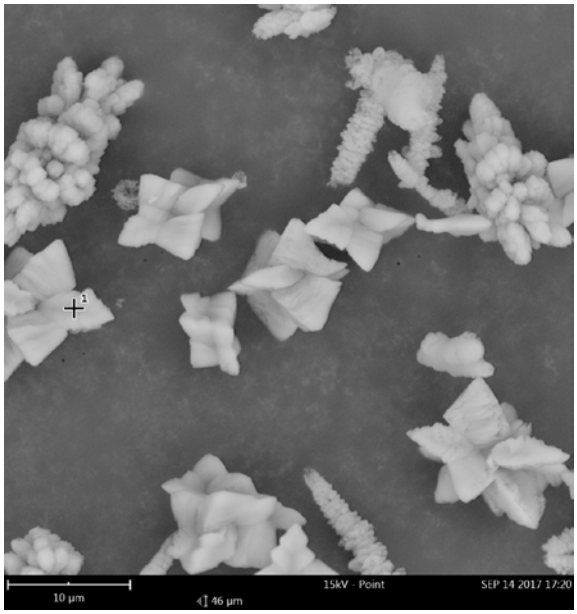
FOV: 90.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:07



Disabled elements: B, Sb

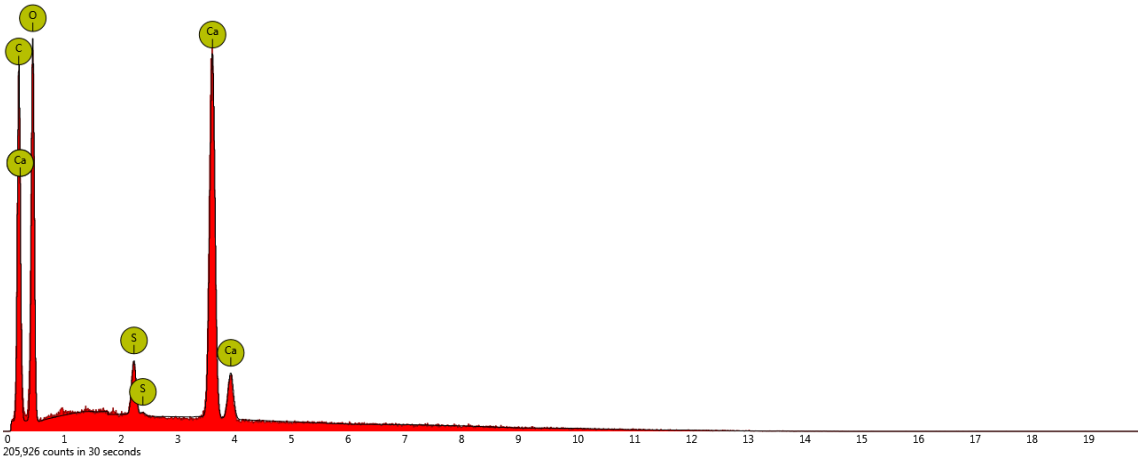
Image 5

1. spot



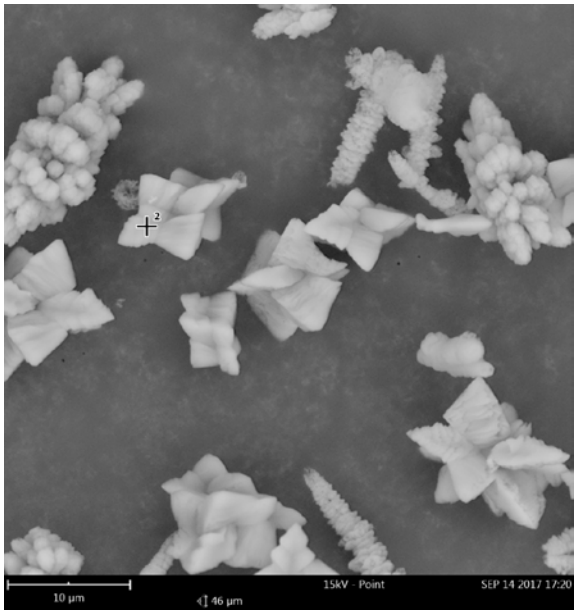
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	49.55	49.46
6	C	Carbon	42.98	32.21
20	Ca	Calcium	6.76	16.89
16	S	Sulfur	0.72	1.44

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:20



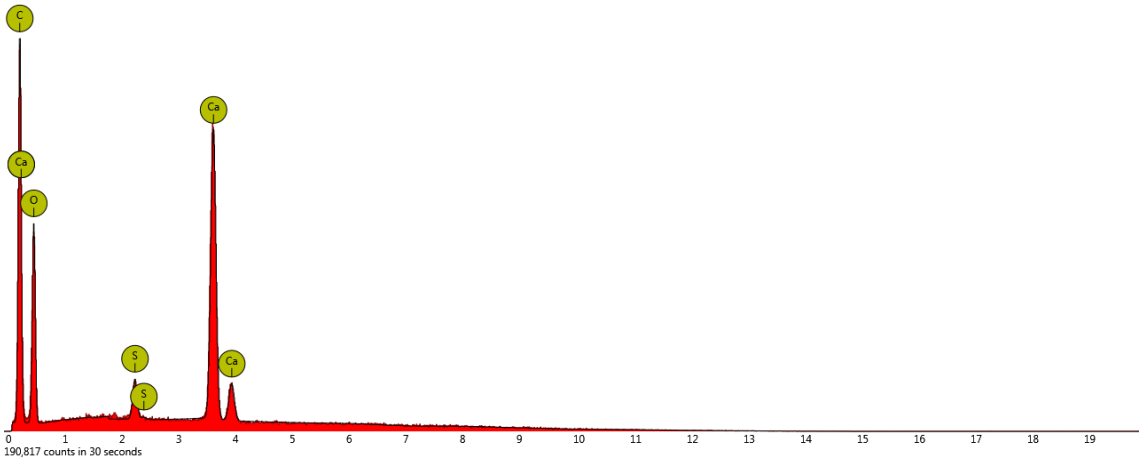
Disabled elements: B, Sb

2. spot



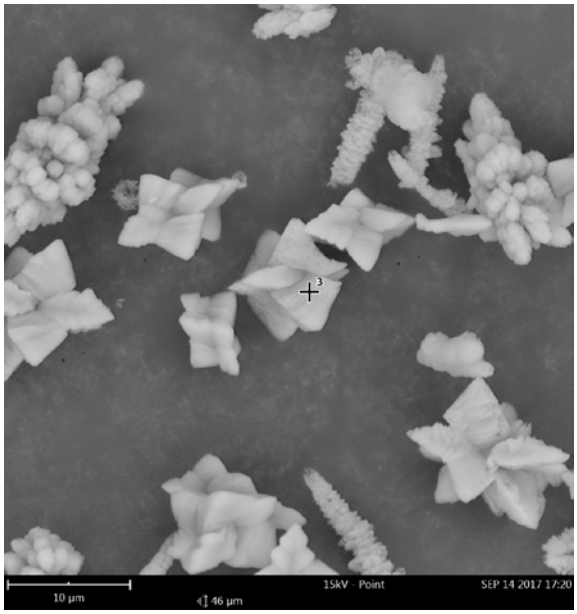
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	54.08	41.69
8	O	Oxygen	38.47	39.50
20	Ca	Calcium	6.78	17.45
16	S	Sulfur	0.67	1.37

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:20



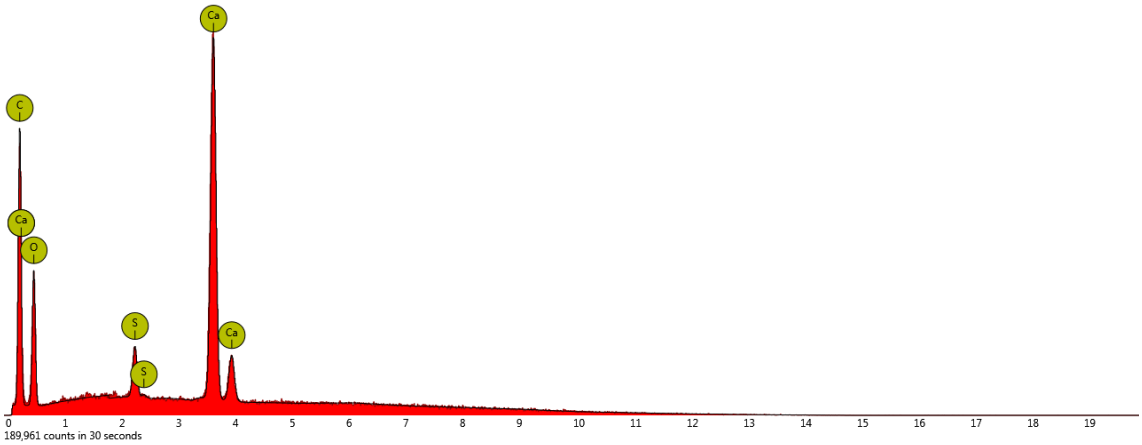
Disabled elements: B, Sb

3. spot



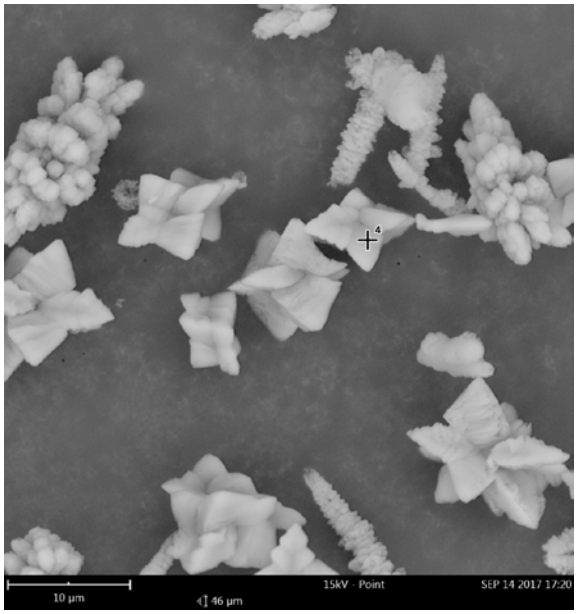
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	51.36	36.90
8	O	Oxygen	36.78	35.20
20	Ca	Calcium	10.78	25.85
16	S	Sulfur	1.08	2.06

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:20



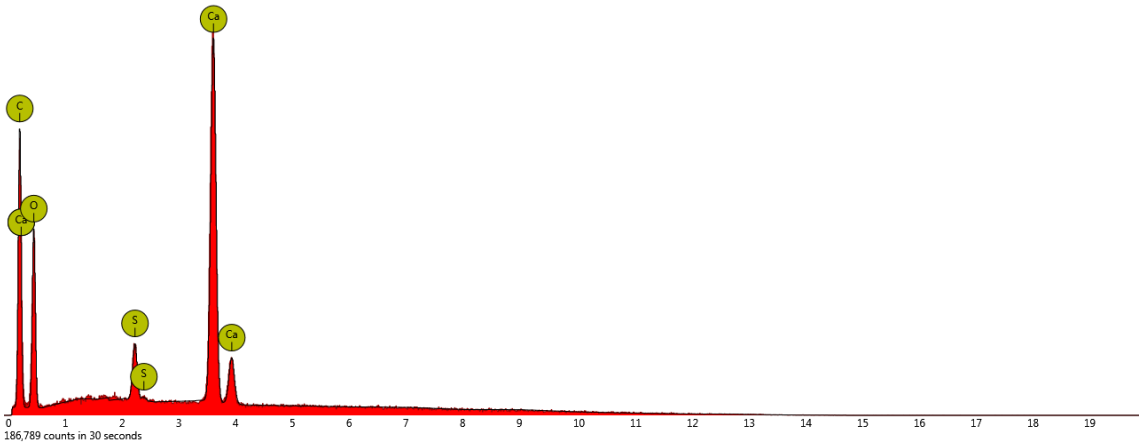
Disabled elements: B, Sb

4. spot



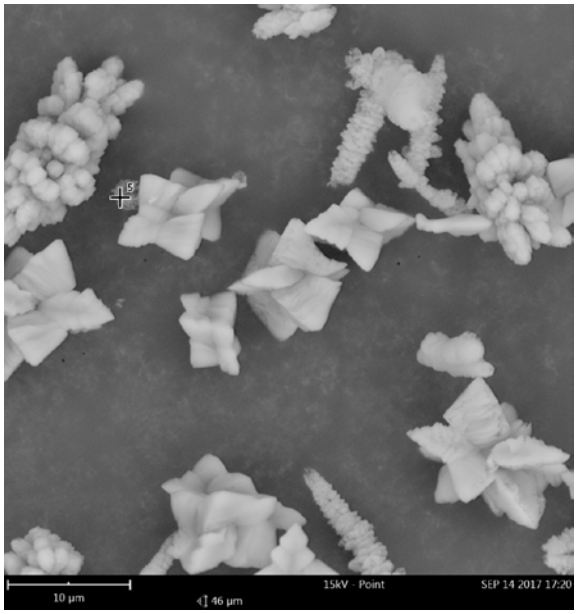
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	41.20	39.61
6	C	Carbon	47.84	34.52
20	Ca	Calcium	9.88	23.79
16	S	Sulfur	1.08	2.08

FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:20



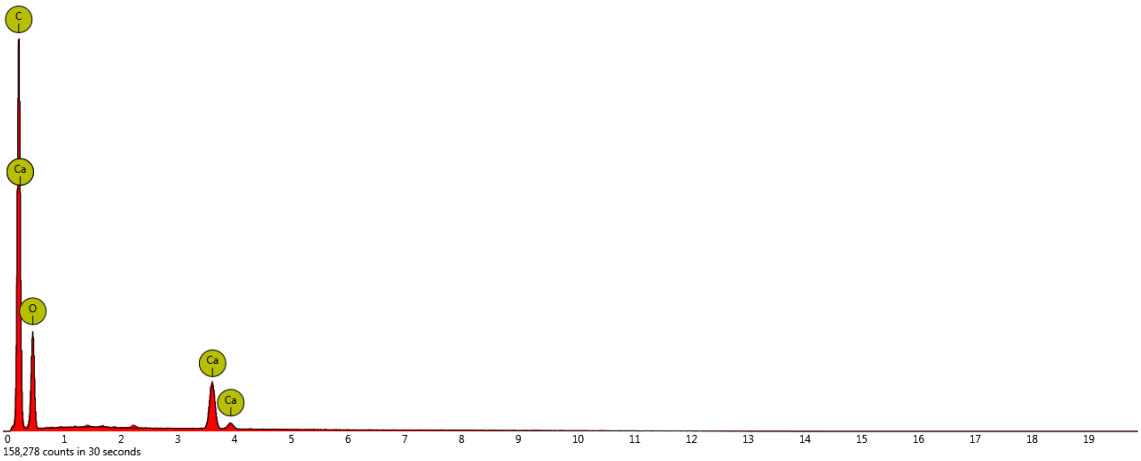
Disabled elements: B, Sb

5. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	68.07	59.73
8	O	Oxygen	30.25	35.36
20	Ca	Calcium	1.68	4.91

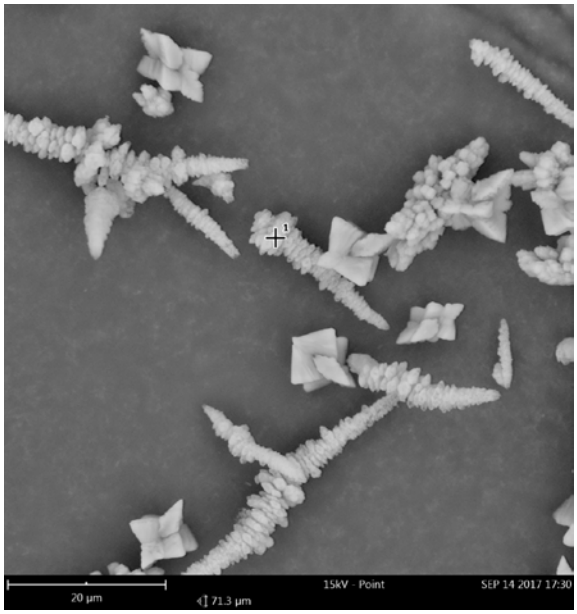
FOV: 46 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:20



Disabled elements: B

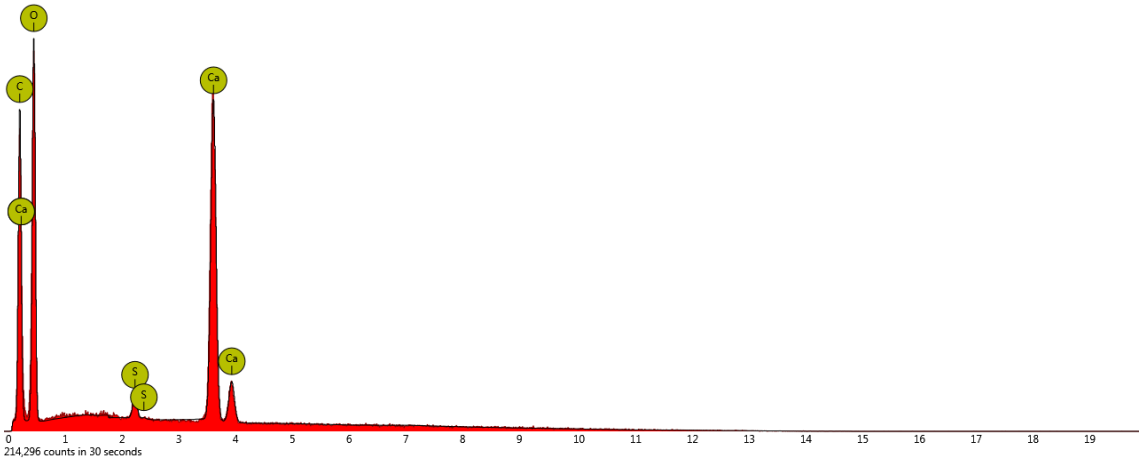
Image 7

1. spot



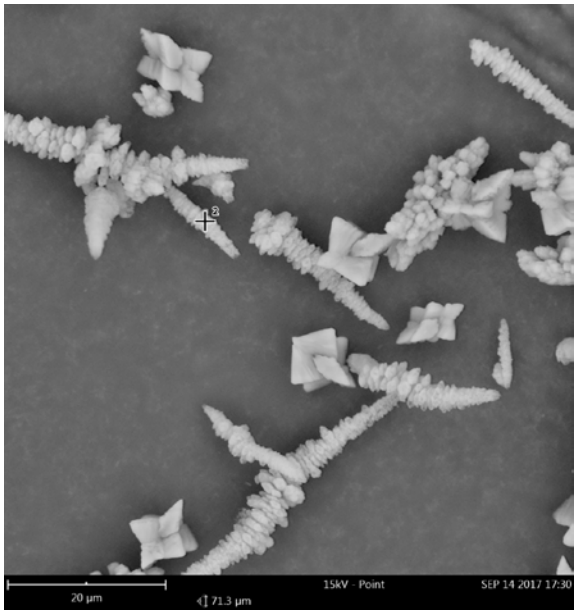
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.44	53.02
6	C	Carbon	39.39	29.34
20	Ca	Calcium	6.81	16.94
16	S	Sulfur	0.35	0.71

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



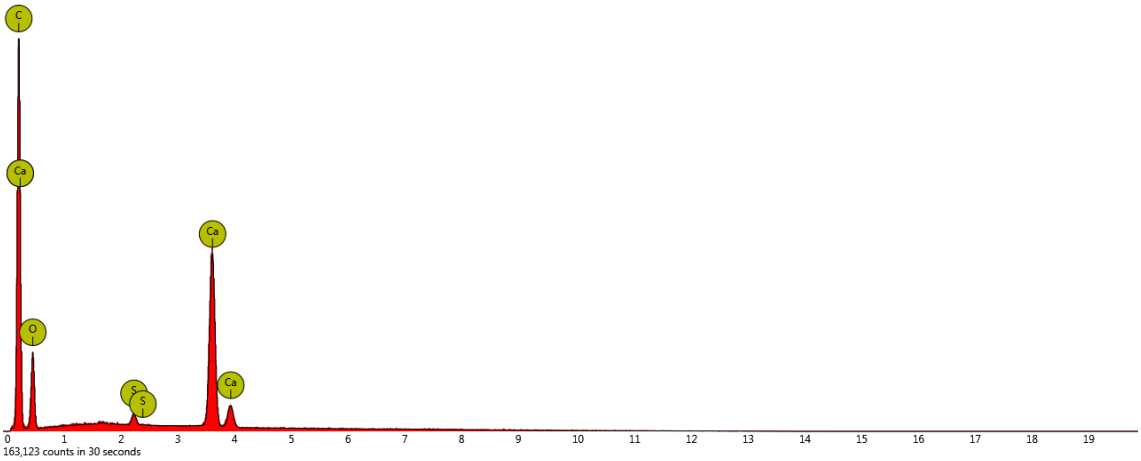
Disabled elements: B, Sb

2. spot



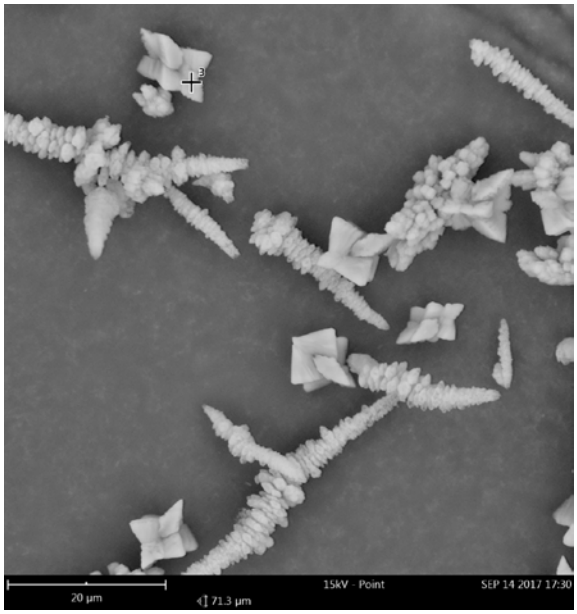
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	67.95	55.23
8	O	Oxygen	25.79	27.92
20	Ca	Calcium	5.99	16.25
16	S	Sulfur	0.27	0.59

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



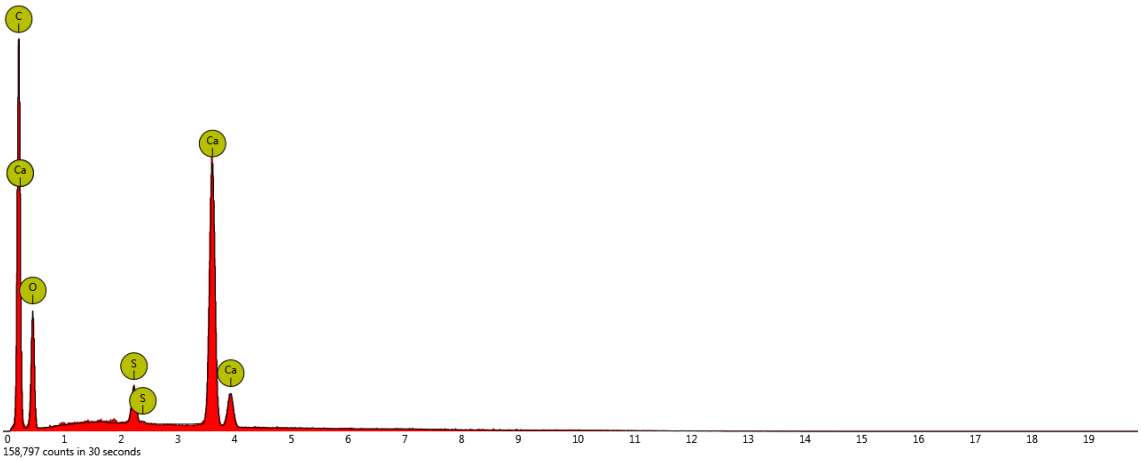
Disabled elements: B, Sb

3. spot



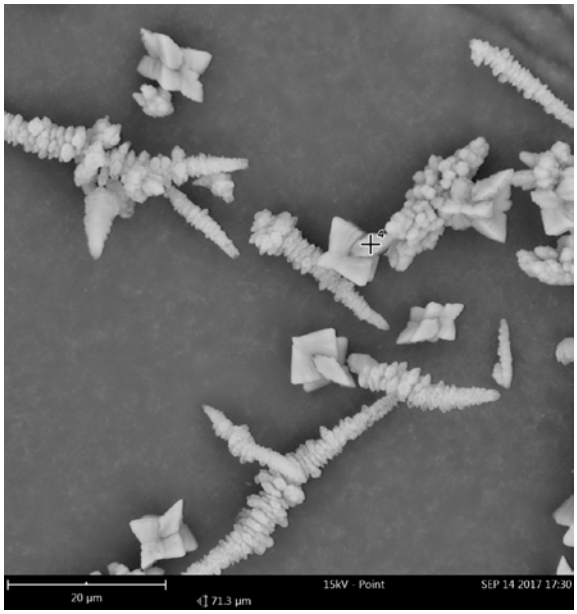
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	61.67	48.09
8	O	Oxygen	30.36	31.54
20	Ca	Calcium	7.26	18.89
16	S	Sulfur	0.71	1.48

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



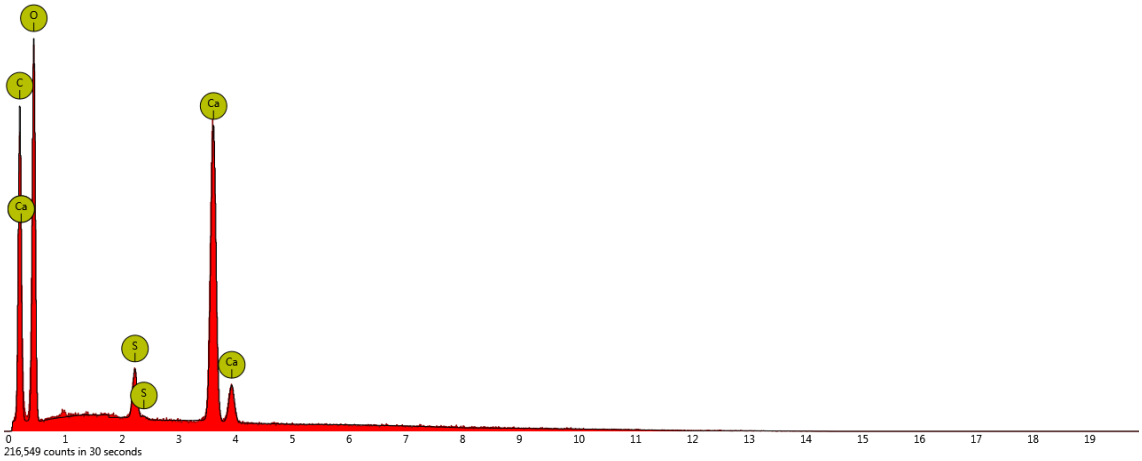
Disabled elements: B, Sb

4. spot



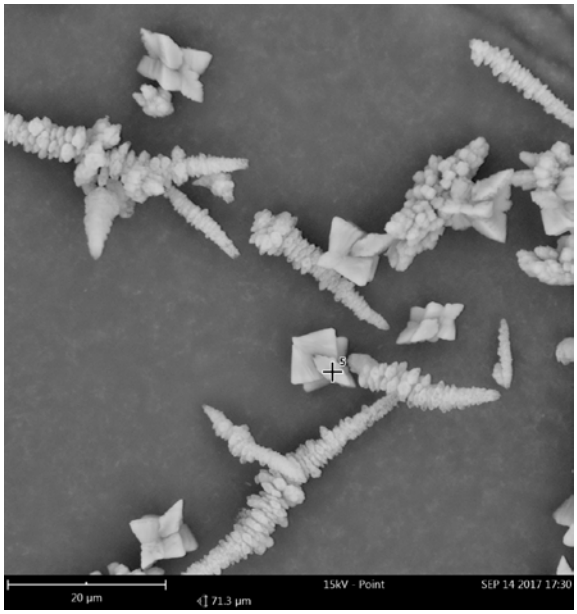
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.12	52.25
6	C	Carbon	41.01	30.86
20	Ca	Calcium	6.14	15.42
16	S	Sulfur	0.73	1.47

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



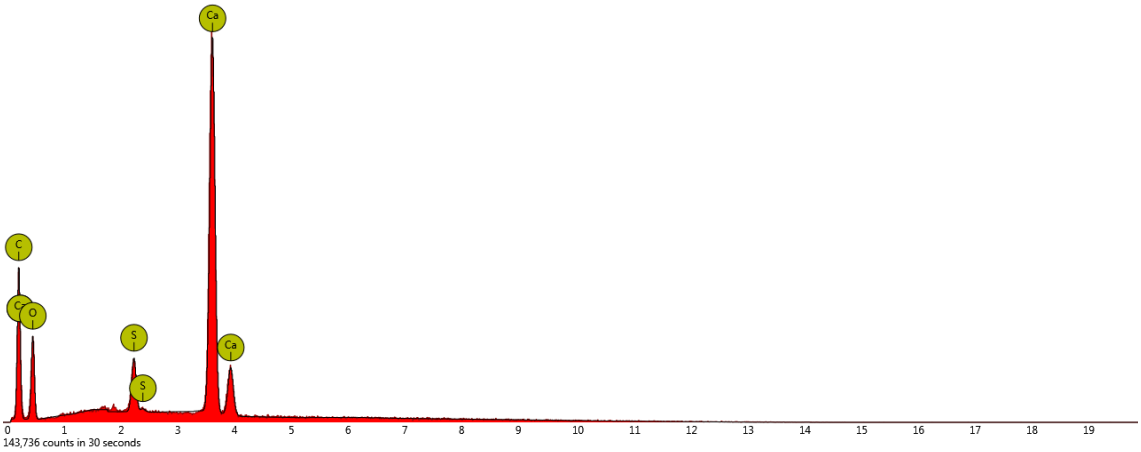
Disabled elements: B, I, Sb

5. spot



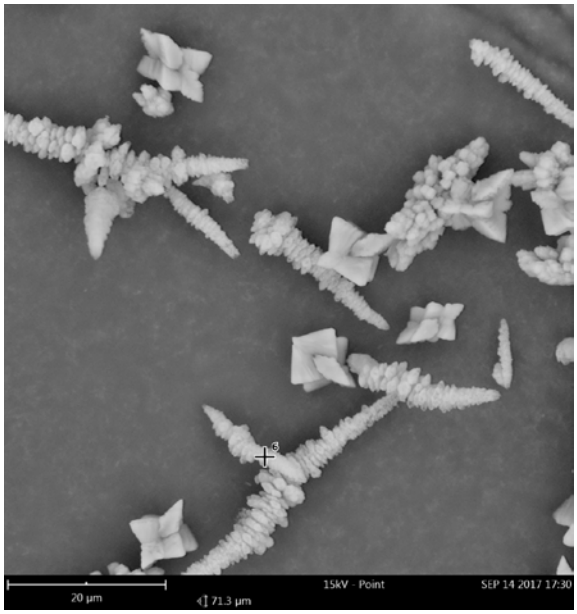
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	16.57	35.98
8	O	Oxygen	36.59	31.71
6	C	Carbon	45.16	29.38
16	S	Sulfur	1.68	2.92

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



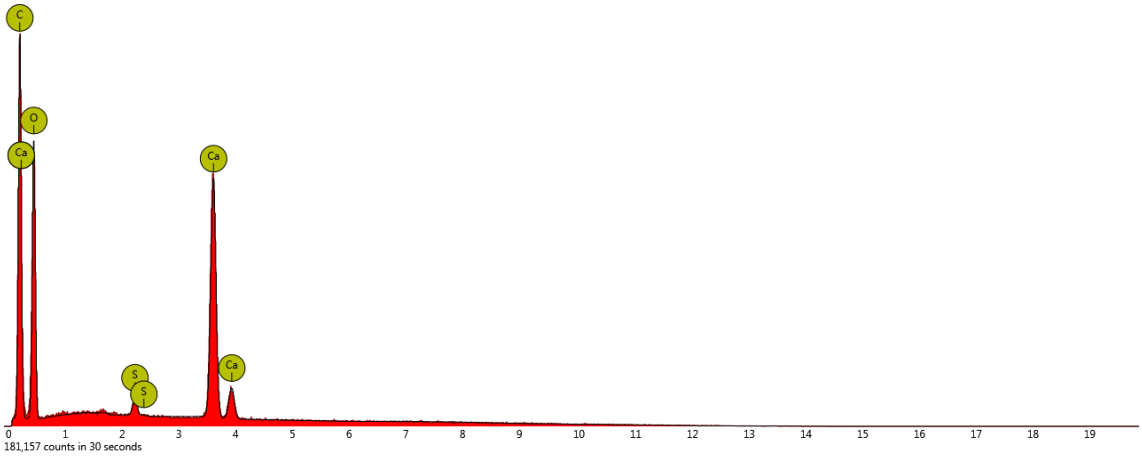
Disabled elements: B, Sb

6. spot



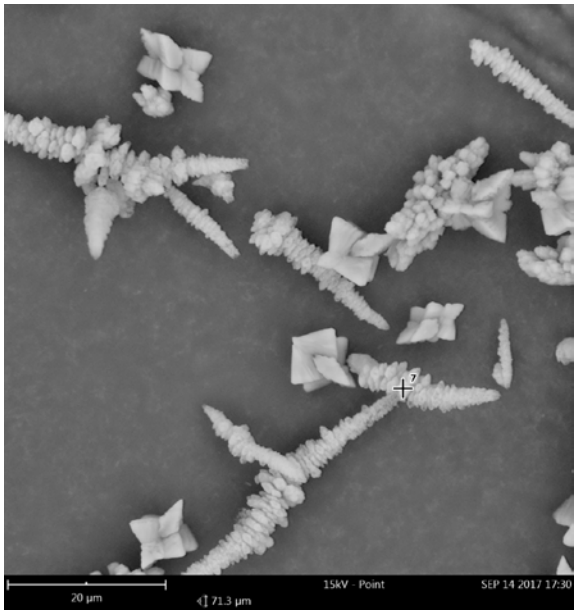
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.75	46.66
6	C	Carbon	49.65	38.86
20	Ca	Calcium	5.33	13.91
16	S	Sulfur	0.27	0.57

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



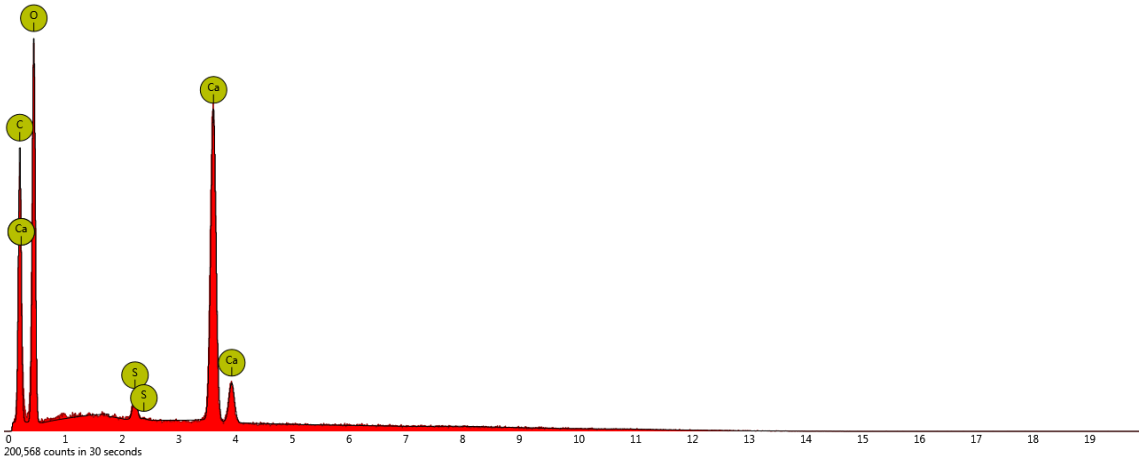
Disabled elements: B, I, Sb

7. spot



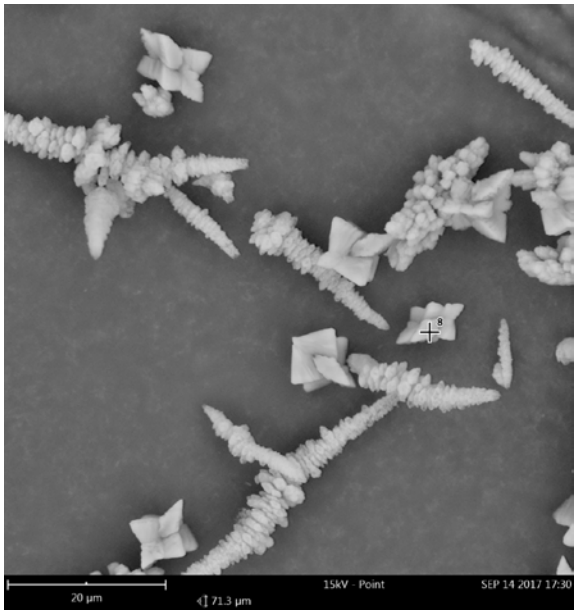
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	55.44	54.51
6	C	Carbon	37.15	27.42
20	Ca	Calcium	7.02	17.30
16	S	Sulfur	0.39	0.77

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



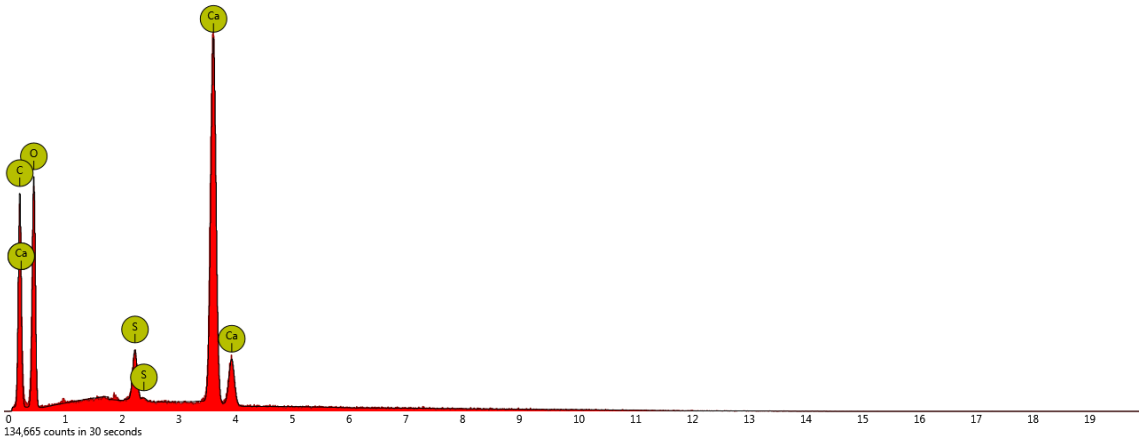
Disabled elements: B, Sb

8. spot



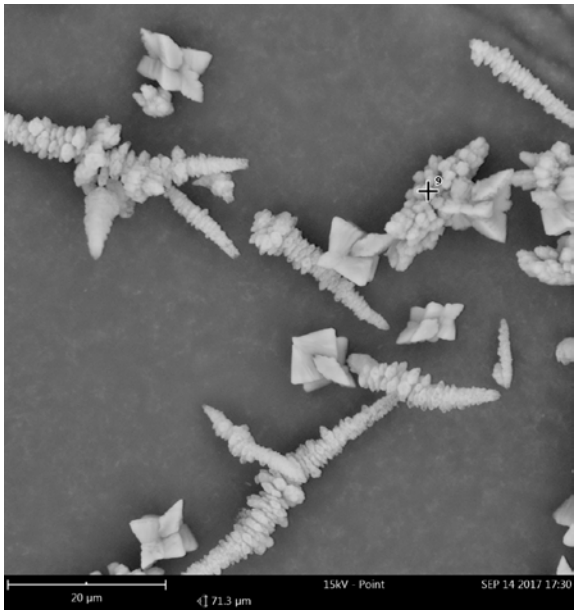
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	49.79	46.62
6	C	Carbon	38.92	27.36
20	Ca	Calcium	10.28	24.12
16	S	Sulfur	1.01	1.90

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



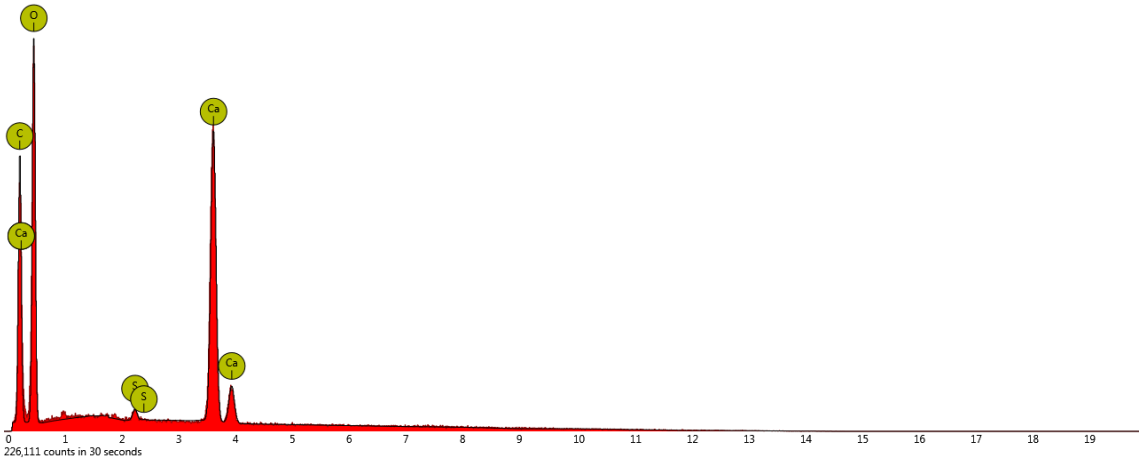
Disabled elements: B, Sb

9. spot



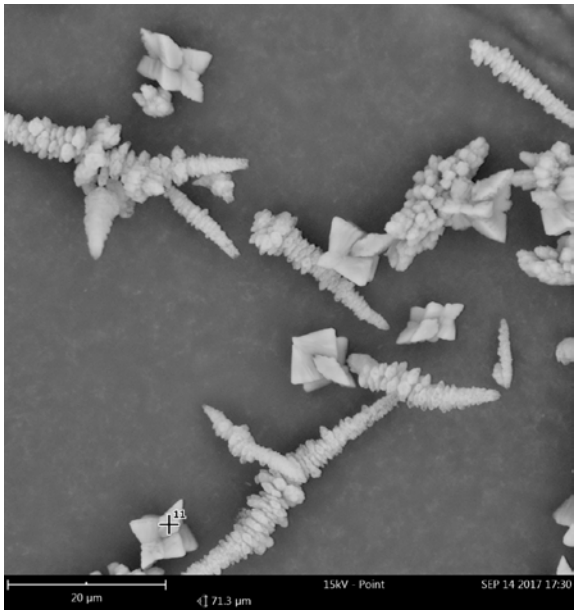
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.48	55.72
6	C	Carbon	36.50	27.03
20	Ca	Calcium	6.83	16.88
16	S	Sulfur	0.19	0.38

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



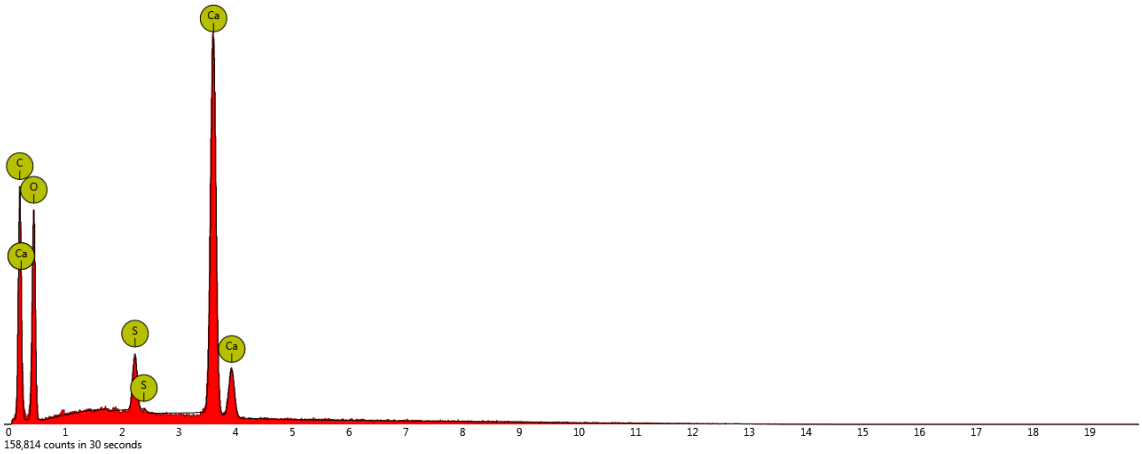
Disabled elements: B, I, Sb

11. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.65	43.82
6	C	Carbon	41.77	29.45
20	Ca	Calcium	10.46	24.61
16	S	Sulfur	1.13	2.12

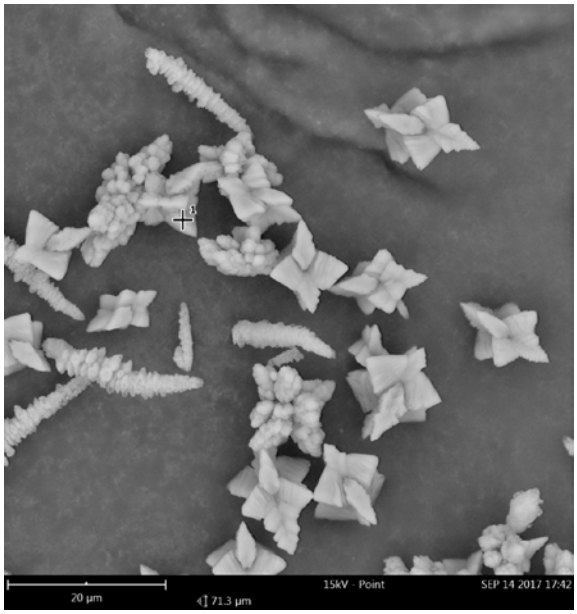
FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:30



Disabled elements: B, Sb

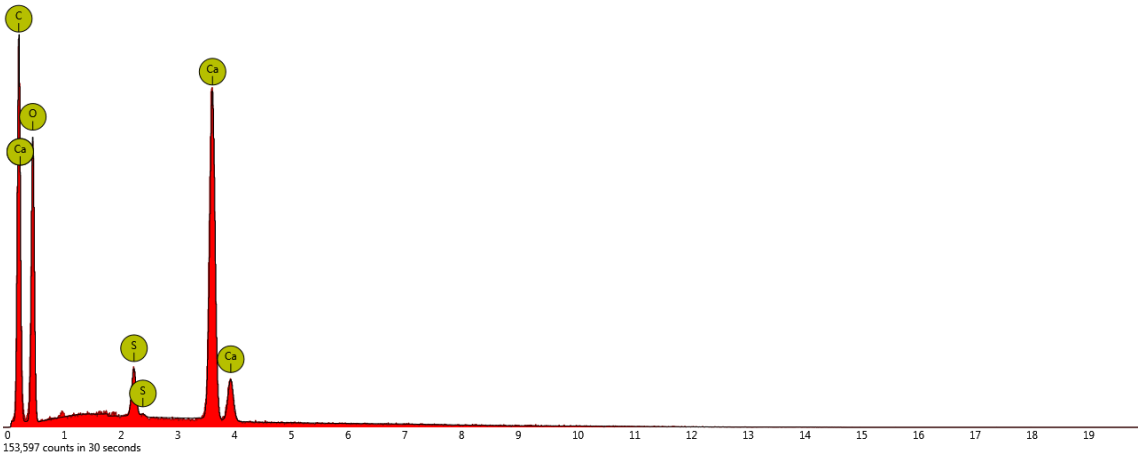
Image 8

1. spot



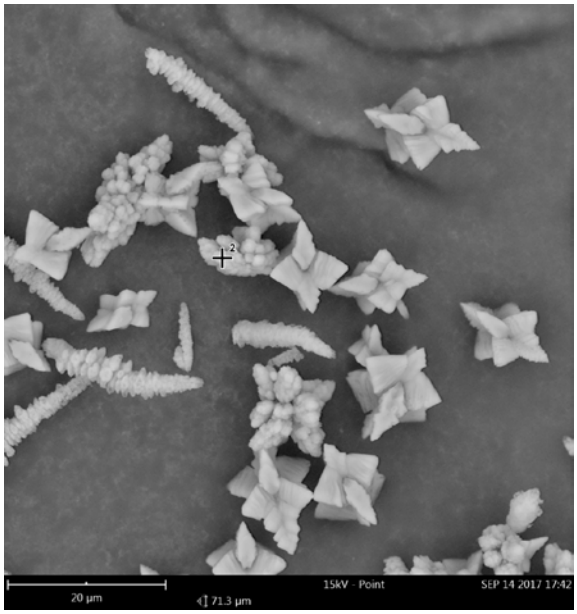
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	43.78	44.44
6	C	Carbon	48.89	37.26
20	Ca	Calcium	6.65	16.90
16	S	Sulfur	0.69	1.40

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:42



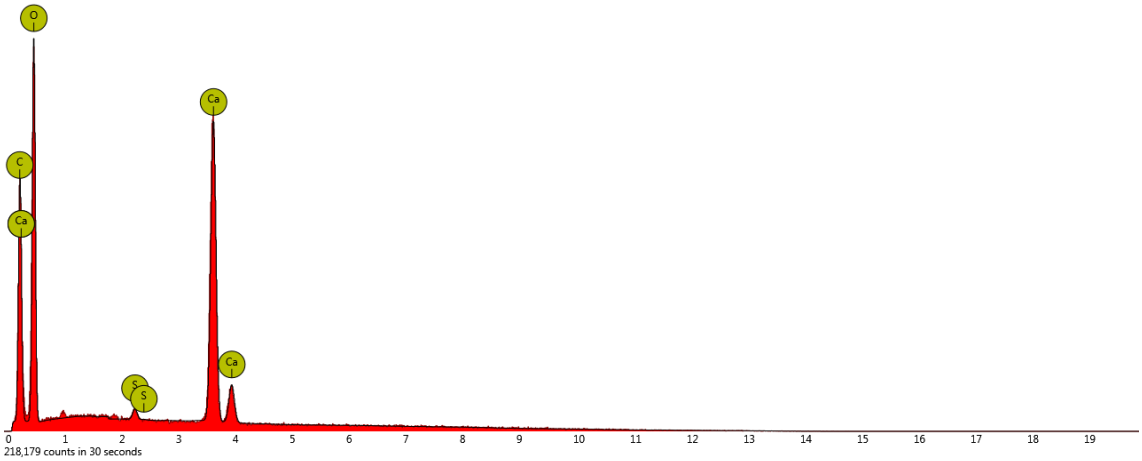
Disabled elements: B, Sb

2. spot



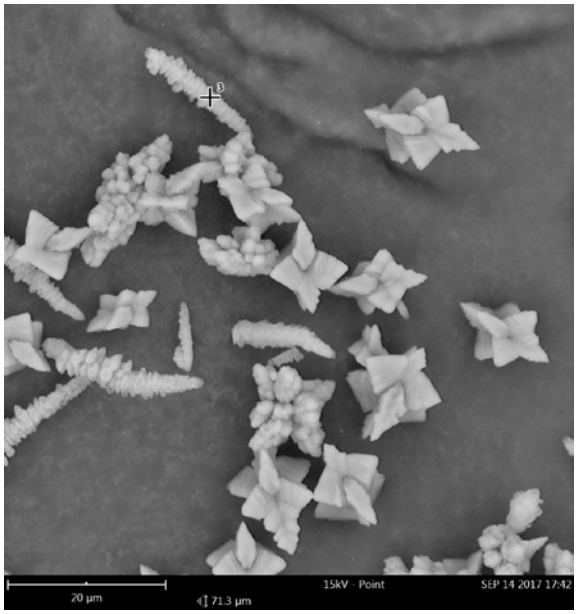
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.67	55.66
6	C	Carbon	36.08	26.60
20	Ca	Calcium	7.06	17.37
16	S	Sulfur	0.19	0.37

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:42



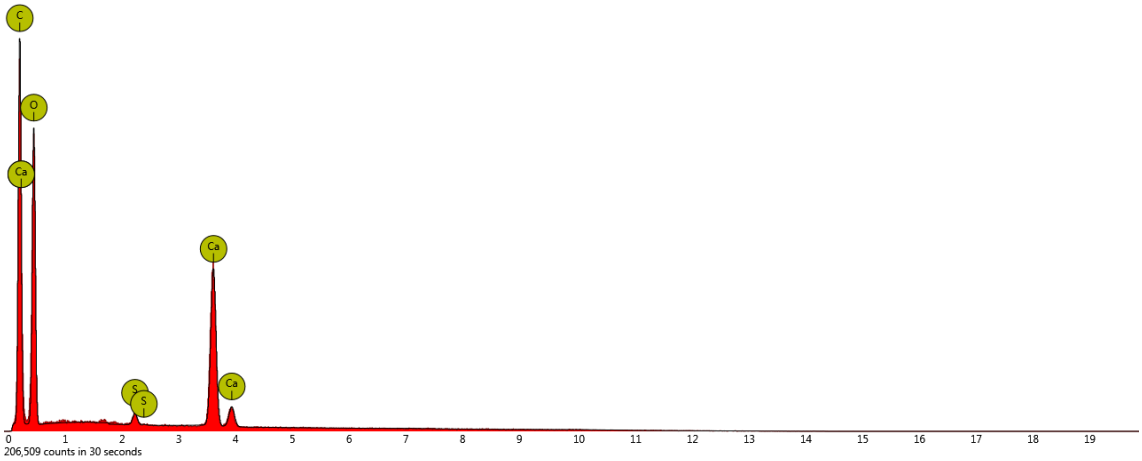
Disabled elements: B, I, Sb

3. spot



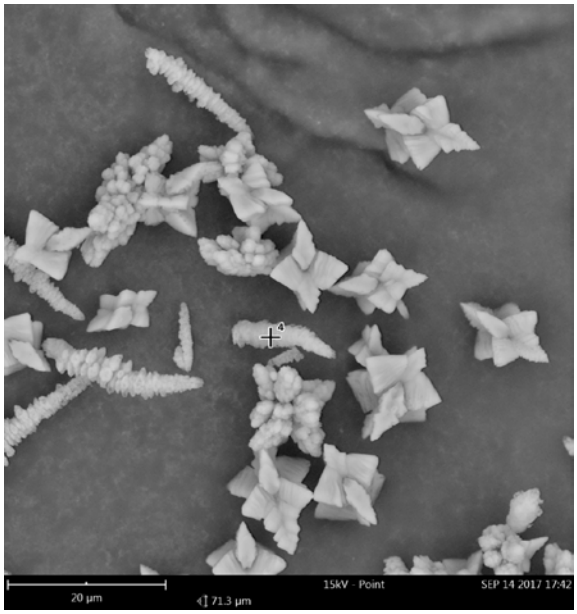
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.26	49.58
6	C	Carbon	49.87	40.12
20	Ca	Calcium	3.68	9.88

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:42



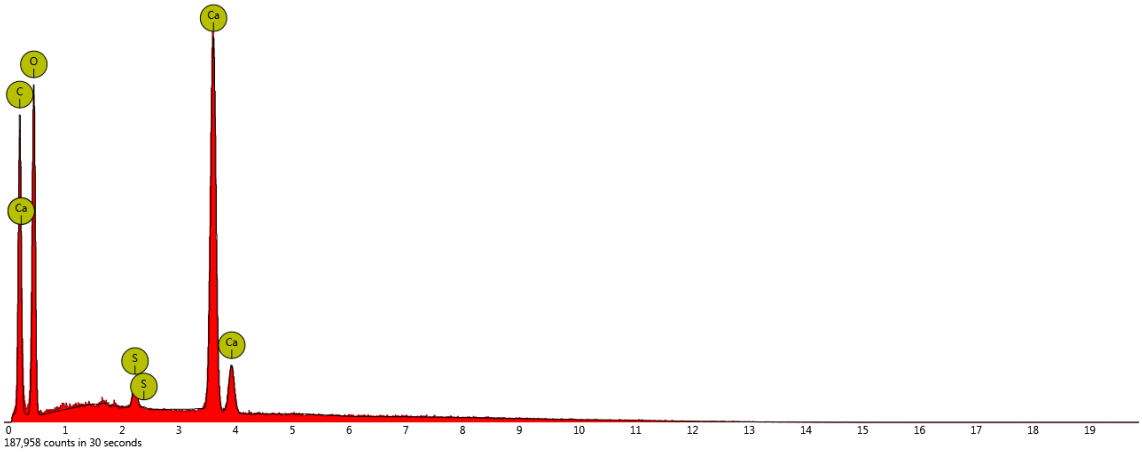
Disabled elements: B, I, Sb

4. spot



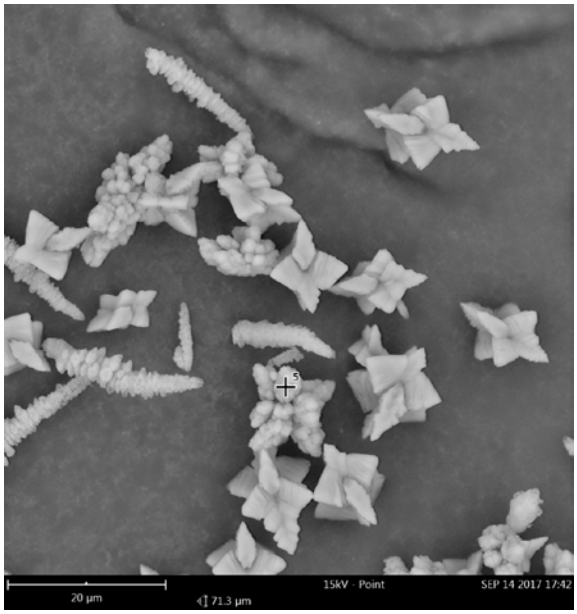
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	51.69	50.19
6	C	Carbon	39.62	28.88
20	Ca	Calcium	8.27	20.11
16	S	Sulfur	0.42	0.82

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:42



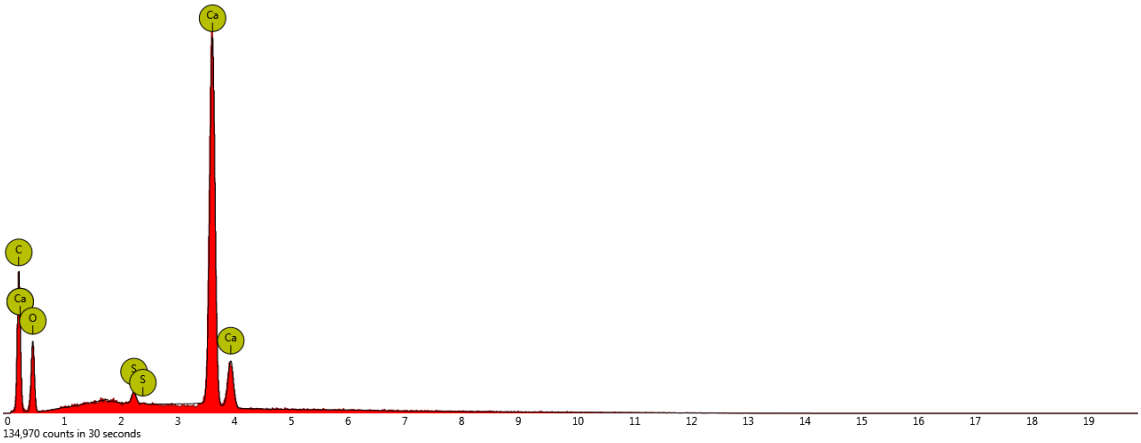
Disabled elements: B, Sb

5. spot



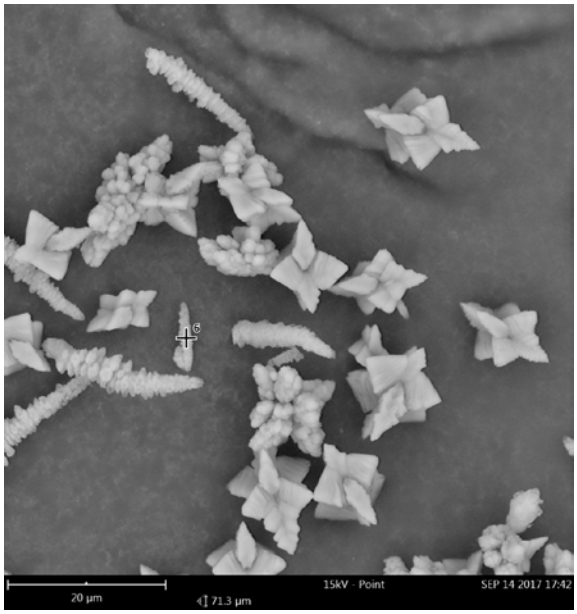
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	18.82	40.00
8	O	Oxygen	37.18	31.54
6	C	Carbon	43.57	27.75
16	S	Sulfur	0.42	0.72

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:42



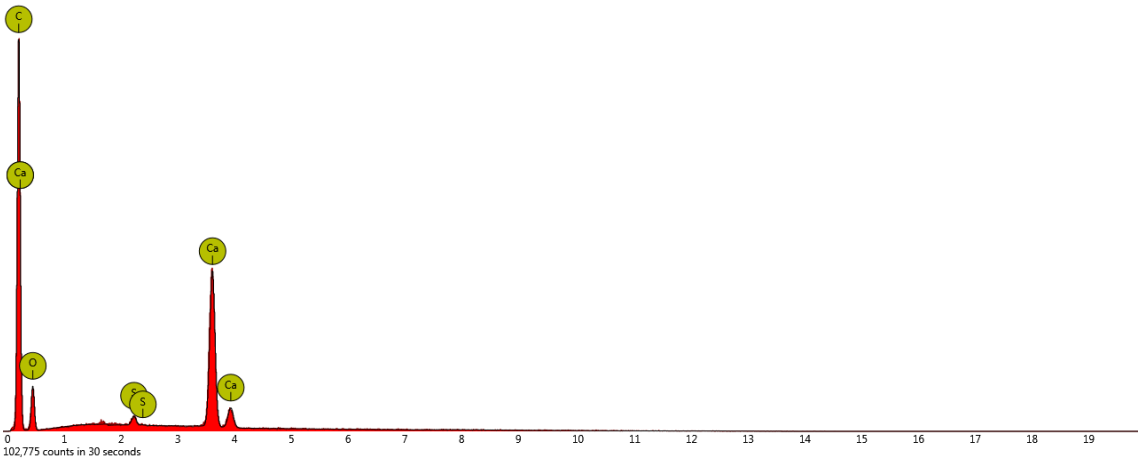
Disabled elements: B, Sb

6. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	74.38	61.26
8	O	Oxygen	19.10	20.95
20	Ca	Calcium	6.27	17.24
16	S	Sulfur	0.25	0.55

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 14 2017 17:42



Disabled elements: B, Sb

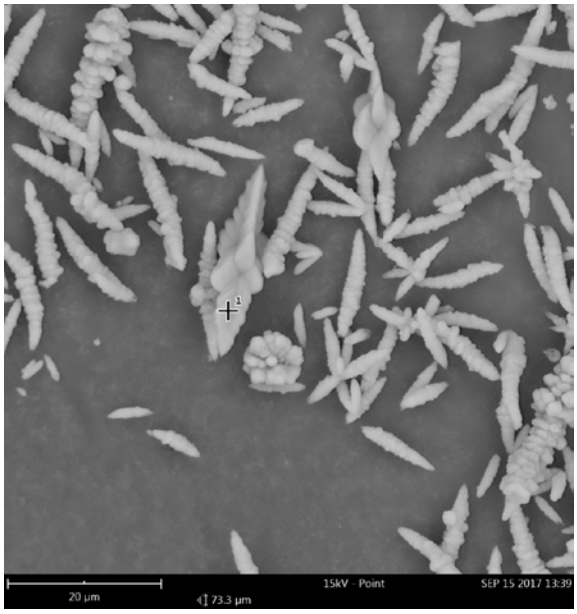
Preferential incorporation of sulfate into calcite polymorphs during calcium carbonate precipitation: An experimental approach

V. Kartnaller, E. M. Ribeiro, F. Venancio, F. F. Rosario and J. Cajaiba

$[Ca^{2+}]$ = 4,000 mg L^{-1} | $[CO_3^{2-}]$ = 4,000 mg L^{-1} | $[SO_4^{2-}]$ = 4,000 mg L^{-1}

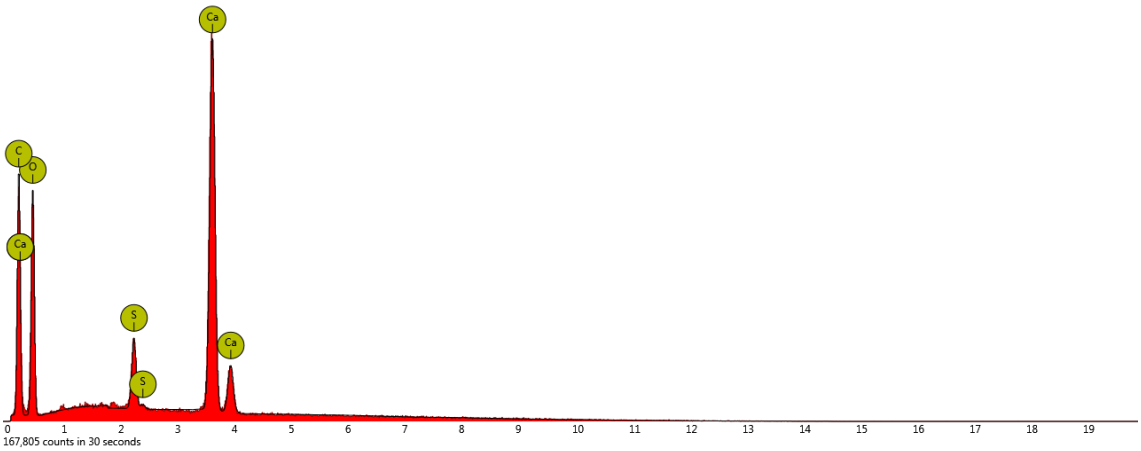
Image 2

1. spot



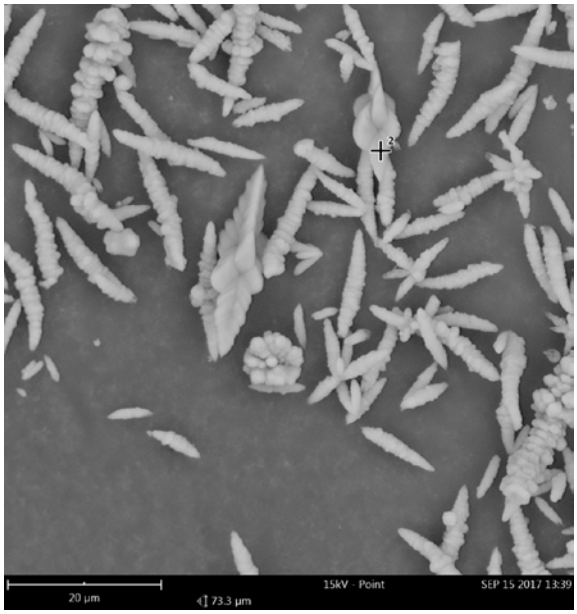
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.73	44.26
6	C	Carbon	42.15	29.97
20	Ca	Calcium	9.80	23.26
16	S	Sulfur	1.32	2.51

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



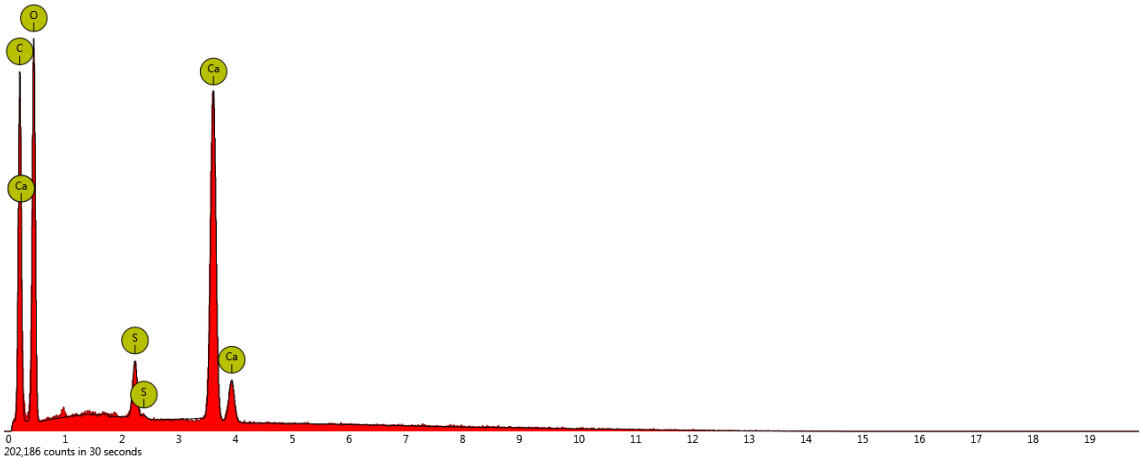
Disabled elements: B, Sb

2. spot



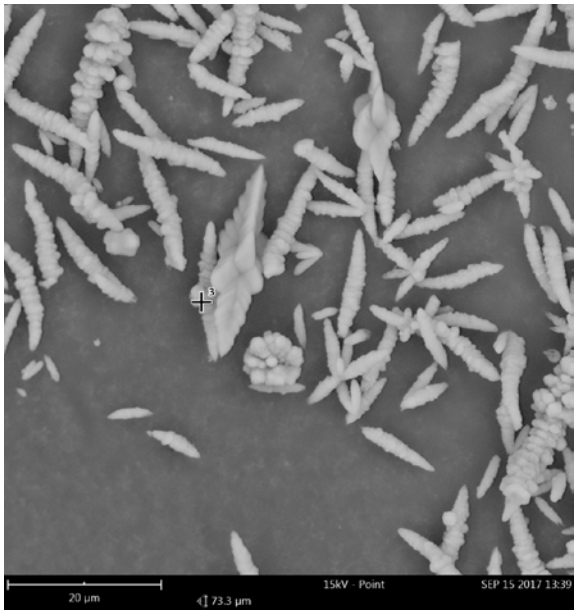
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	50.41	50.51
6	C	Carbon	42.43	31.92
20	Ca	Calcium	6.37	15.99
16	S	Sulfur	0.79	1.58

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



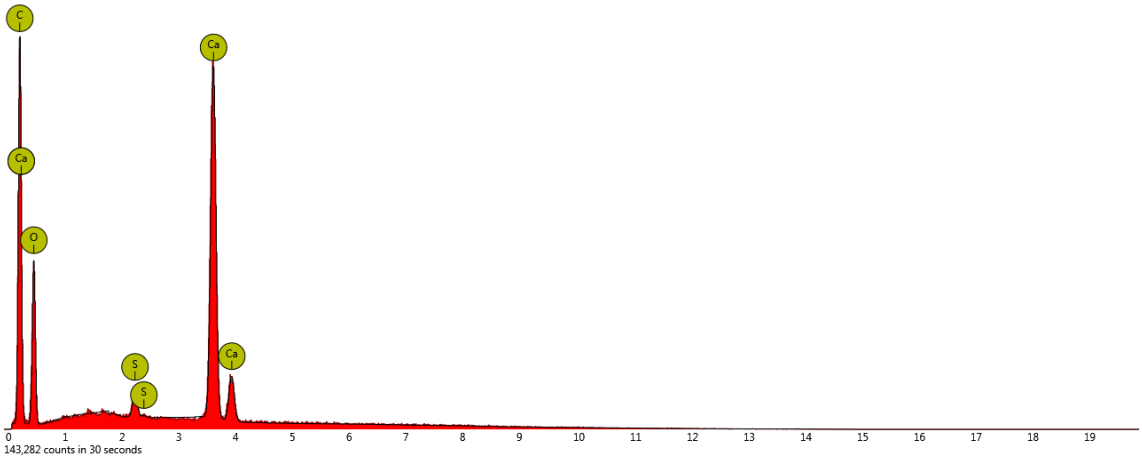
Disabled elements: B, Sb

3. spot



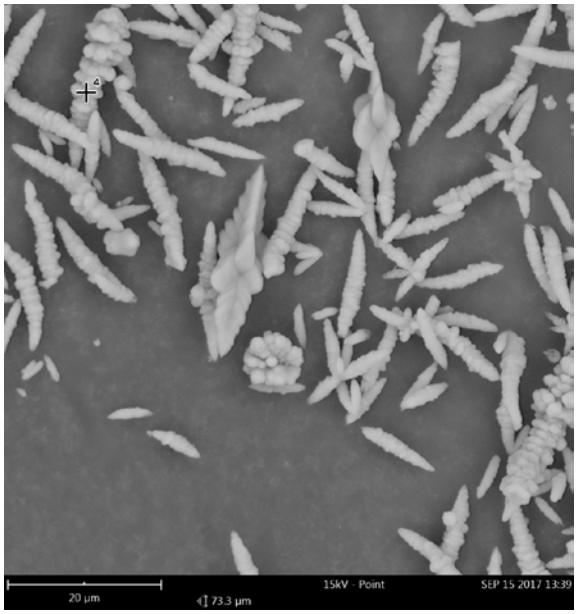
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	55.07	41.43
8	O	Oxygen	35.78	35.86
20	Ca	Calcium	8.63	21.67
16	S	Sulfur	0.52	1.04

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



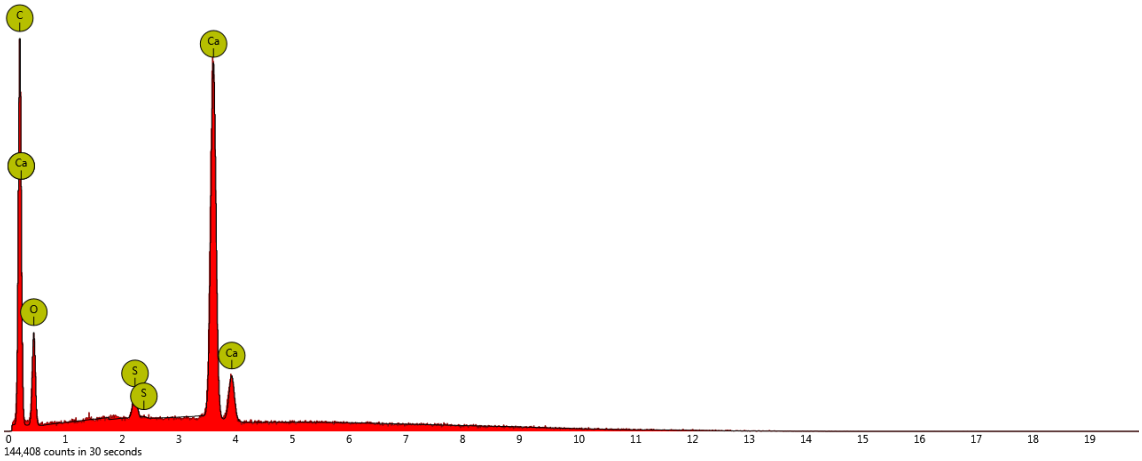
Disabled elements: B, Sb

4. spot



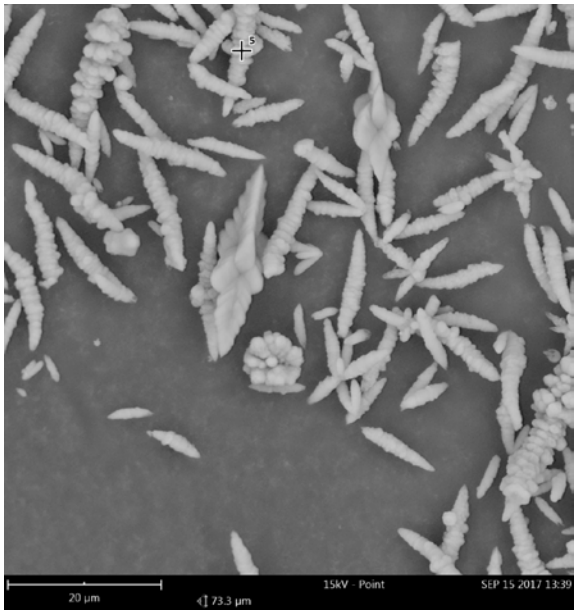
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	61.83	46.16
8	O	Oxygen	27.40	27.25
20	Ca	Calcium	10.28	25.61
16	S	Sulfur	0.49	0.98

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



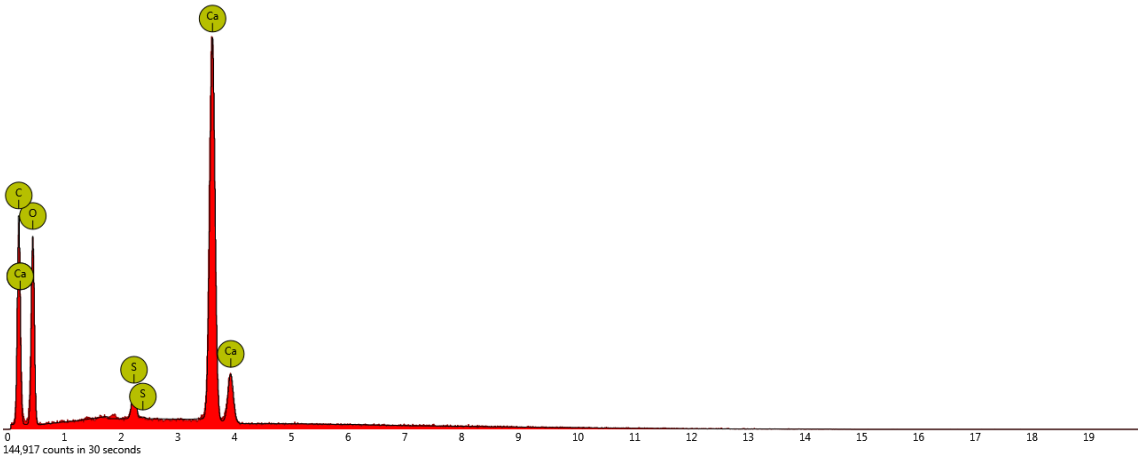
Disabled elements: B, Sb

5. spot



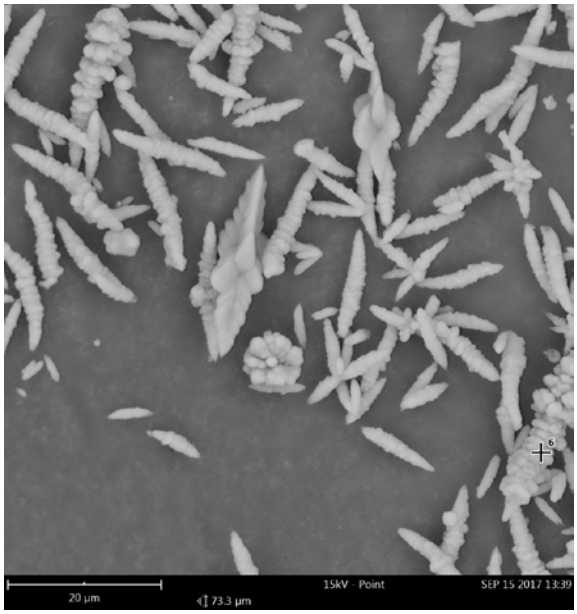
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	47.89	44.05
20	Ca	Calcium	11.93	27.48
6	C	Carbon	39.54	27.30
16	S	Sulfur	0.64	1.18

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



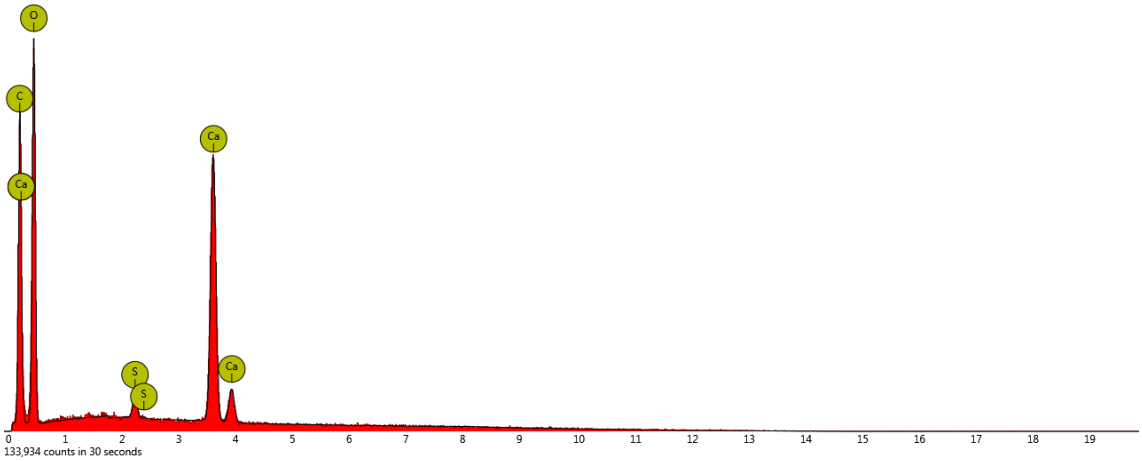
Disabled elements: B, Sb

6. spot



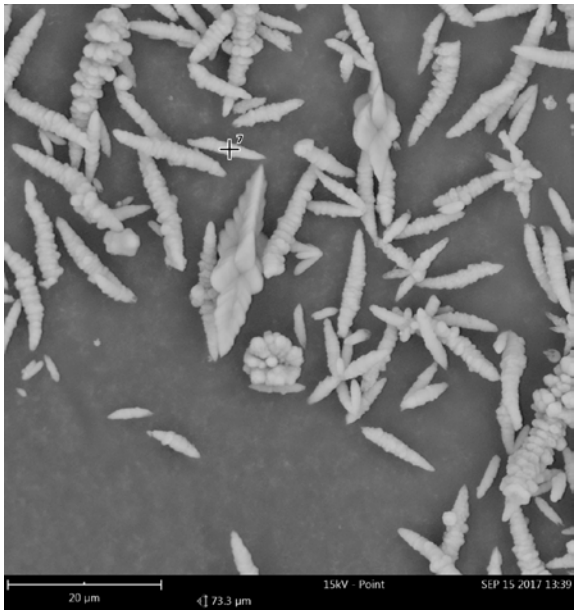
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.50	53.34
6	C	Carbon	41.54	31.68
20	Ca	Calcium	5.61	14.28
16	S	Sulfur	0.34	0.70

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



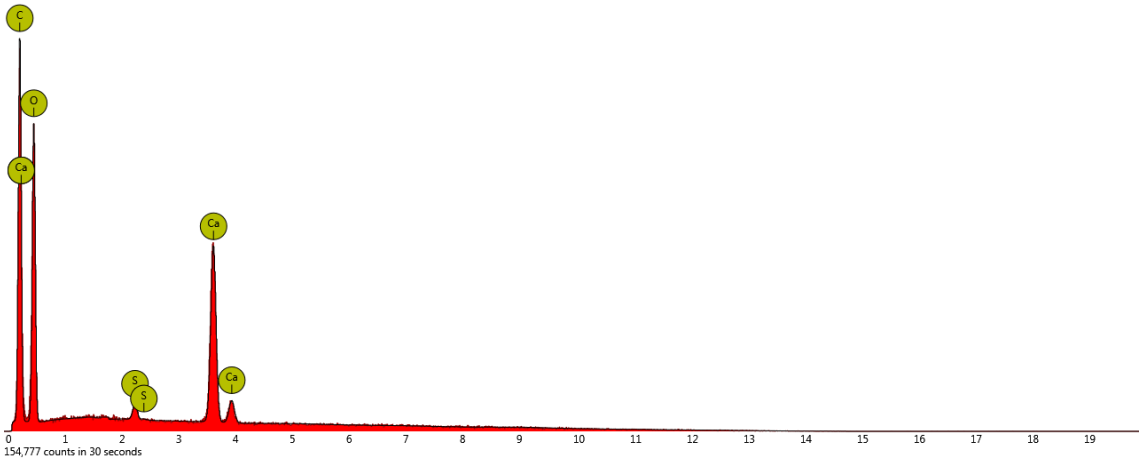
Disabled elements: B, Sb

7. spot



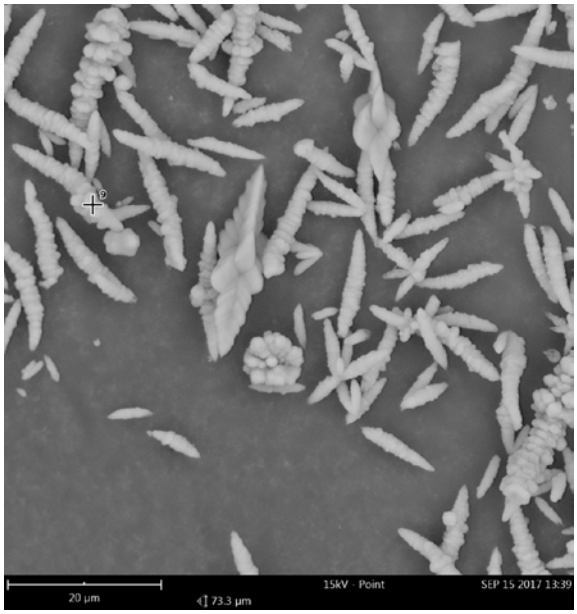
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.42	49.33
6	C	Carbon	49.26	39.30
20	Ca	Calcium	4.07	10.83
16	S	Sulfur	0.25	0.54

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



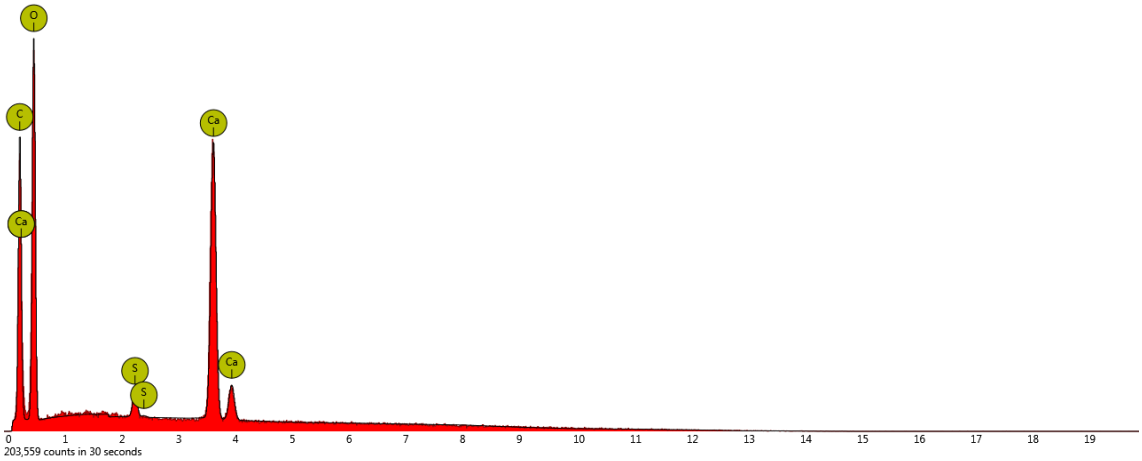
Disabled elements: B, I, Sb

9. spot



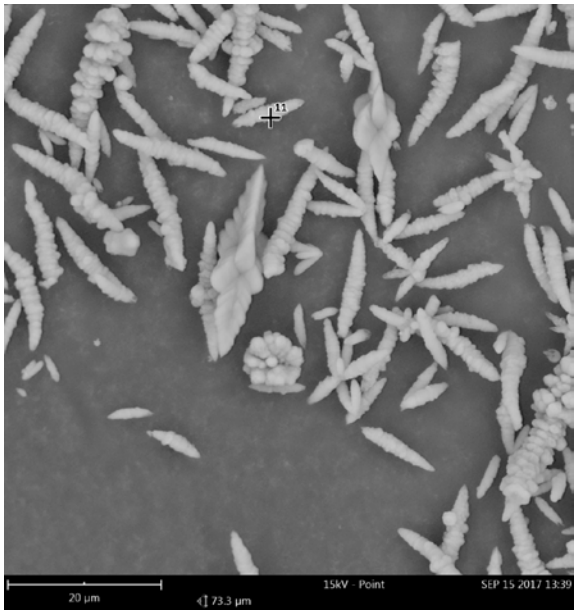
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	54.75	54.60
6	C	Carbon	38.55	28.86
20	Ca	Calcium	6.29	15.71
16	S	Sulfur	0.42	0.84

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



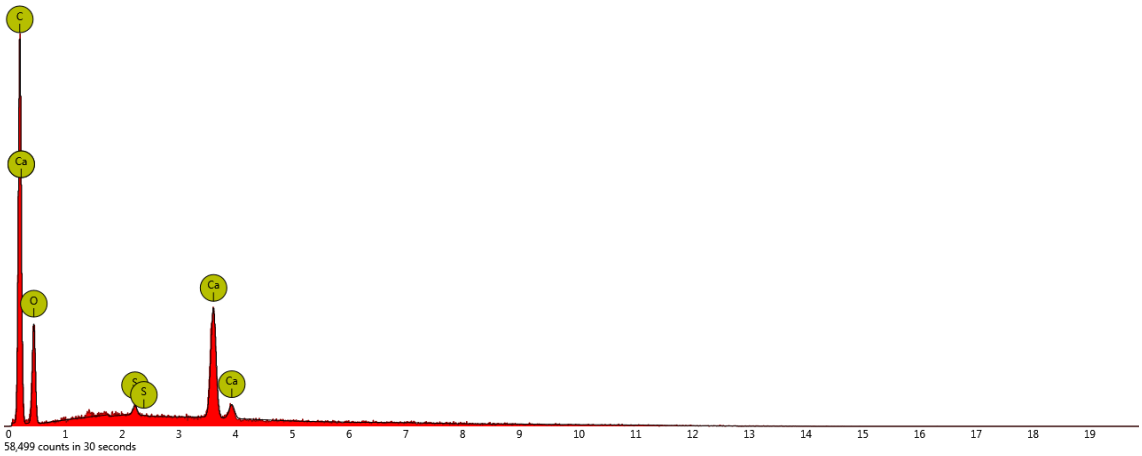
Disabled elements: B, Sb

11. spot



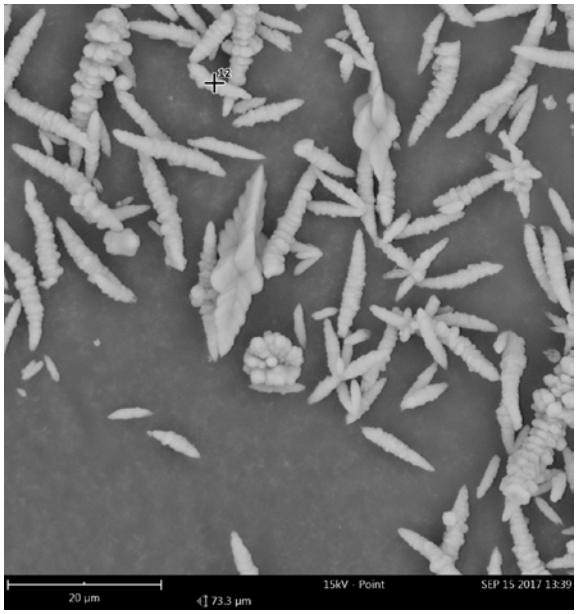
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	66.25	55.69
8	O	Oxygen	29.79	33.36
20	Ca	Calcium	3.72	10.43
16	S	Sulfur	0.23	0.52

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



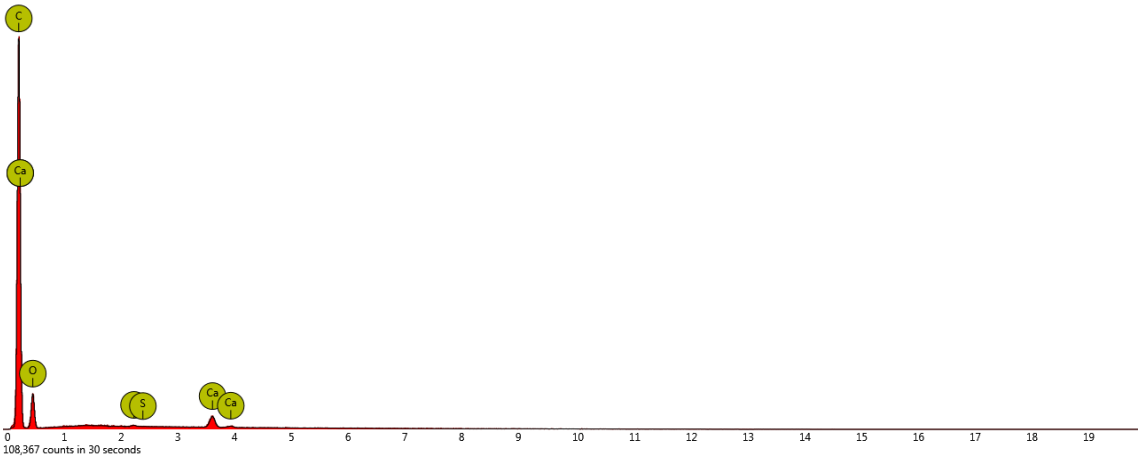
Disabled elements: B, Sb

12. spot



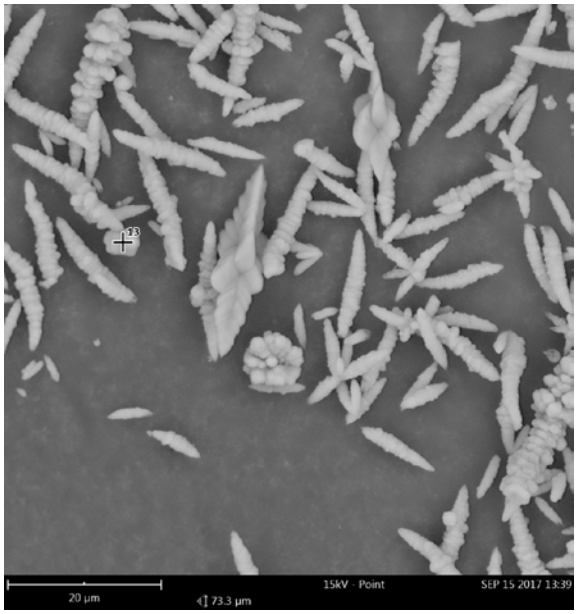
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	81.46	75.90
8	O	Oxygen	17.95	22.28
20	Ca	Calcium	0.56	1.73
16	S	Sulfur	0.04	0.10

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



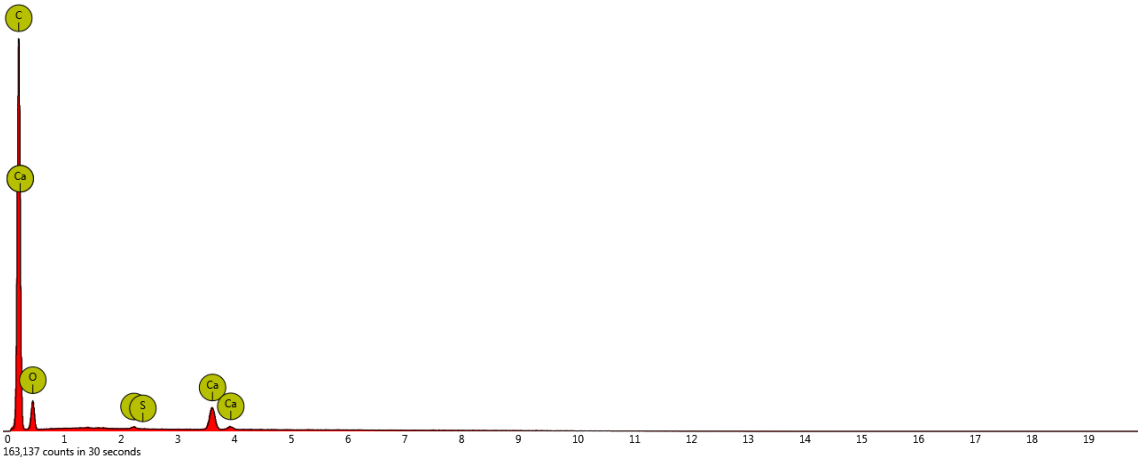
Disabled elements: B

13. spot



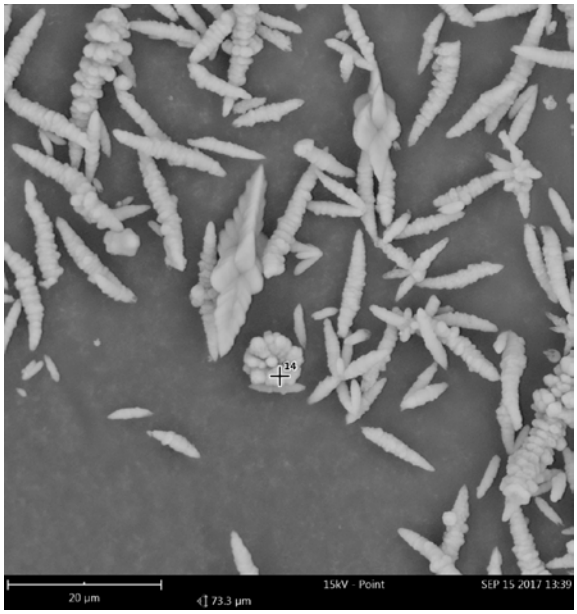
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	82.65	76.44
8	O	Oxygen	16.15	19.90
20	Ca	Calcium	1.13	3.49
16	S	Sulfur	0.07	0.17

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



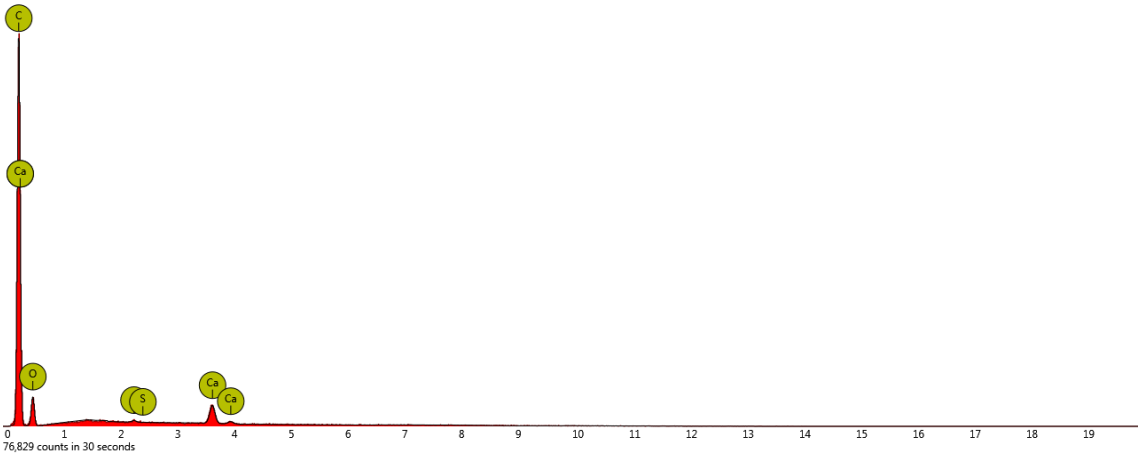
Disabled elements: B, Sb

14. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	82.79	76.88
8	O	Oxygen	16.20	20.04
20	Ca	Calcium	0.95	2.93
16	S	Sulfur	0.06	0.14

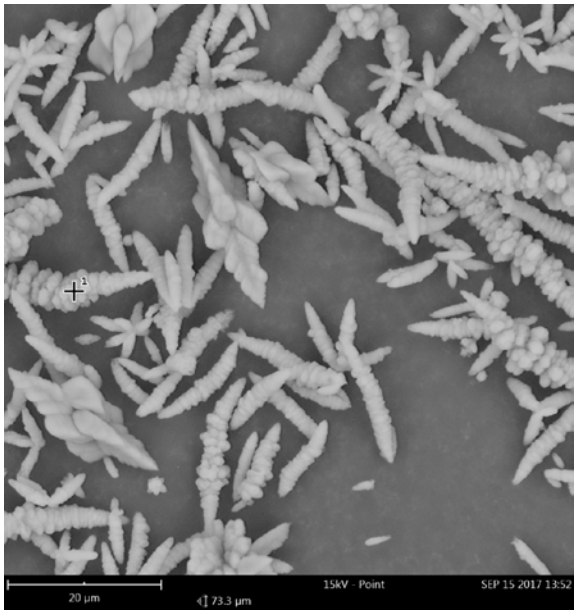
FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:39



Disabled elements: B

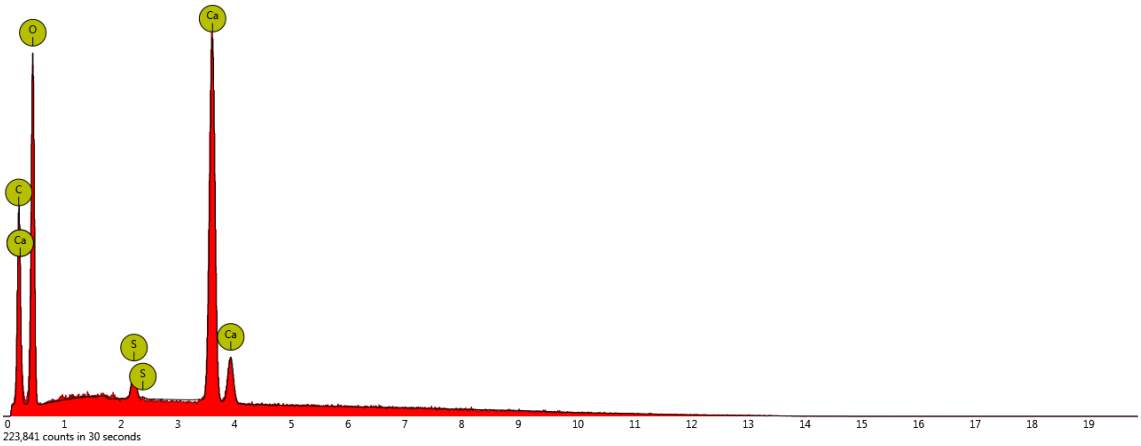
Image 4

1. spot



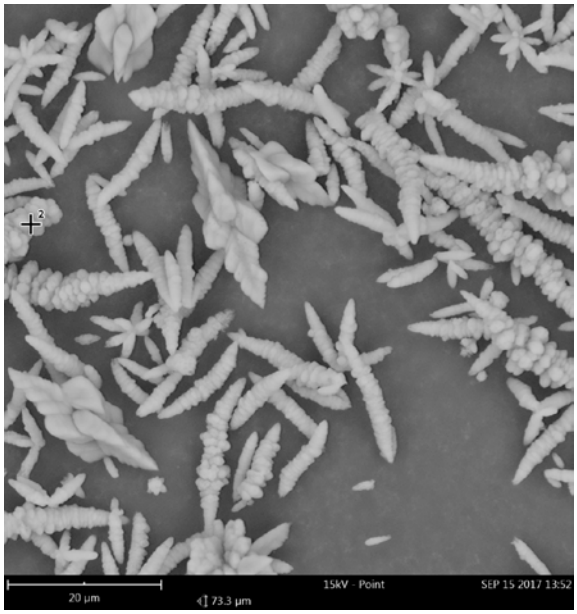
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	57.67	54.44
6	C	Carbon	32.77	23.22
20	Ca	Calcium	9.01	21.31
16	S	Sulfur	0.55	1.04

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



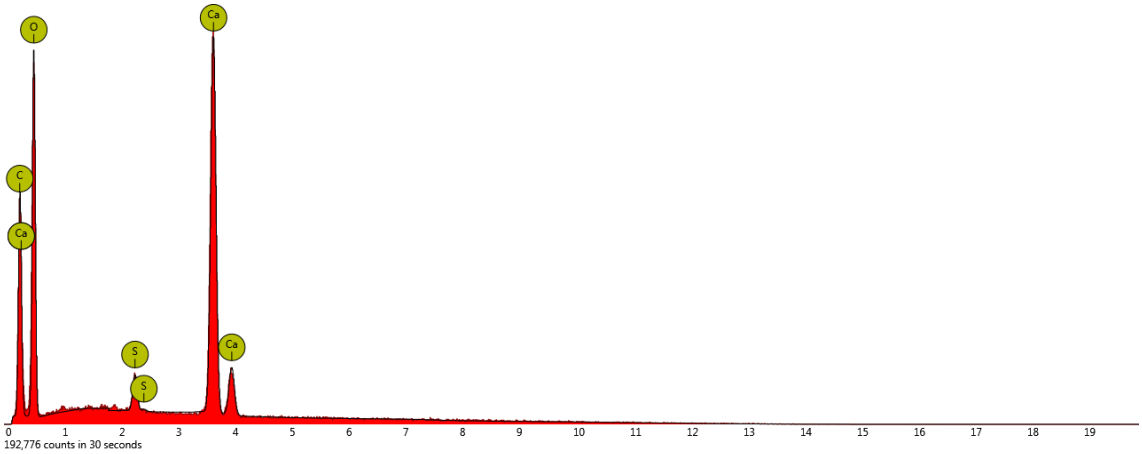
Disabled elements: B, Sb

2. spot



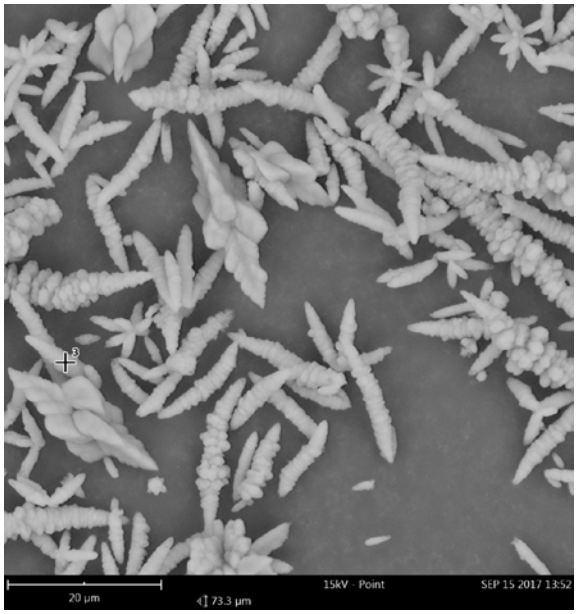
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.29	53.59
6	C	Carbon	34.45	24.62
20	Ca	Calcium	8.66	20.66
16	S	Sulfur	0.59	1.13

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



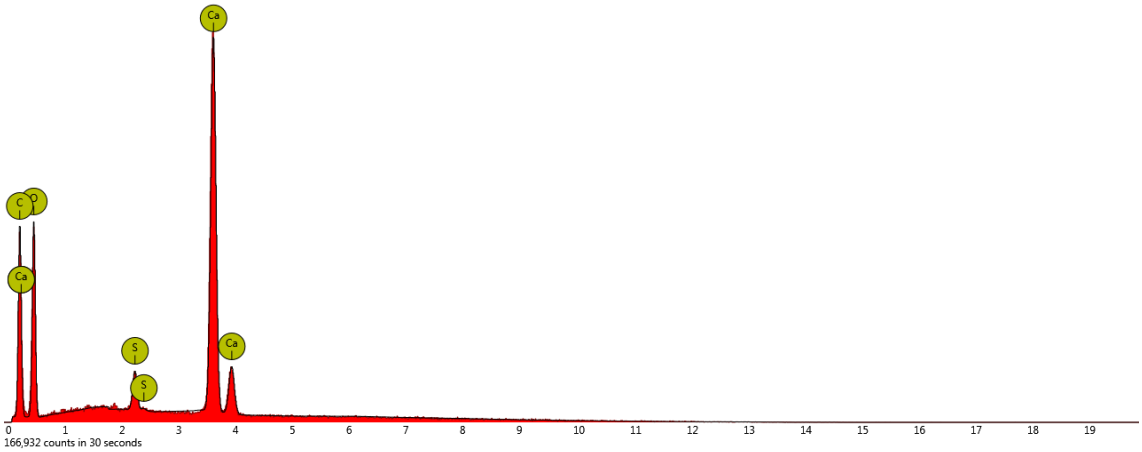
Disabled elements: B, Sb

3. spot



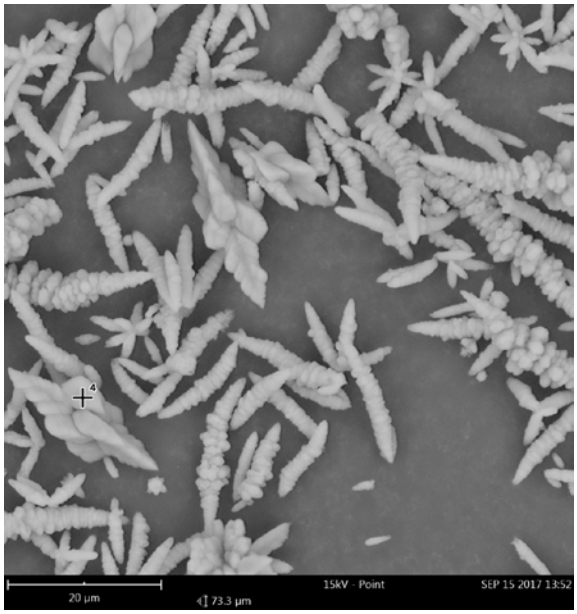
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	49.25	45.12
20	Ca	Calcium	11.80	27.08
6	C	Carbon	38.07	26.18
16	S	Sulfur	0.88	1.61

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



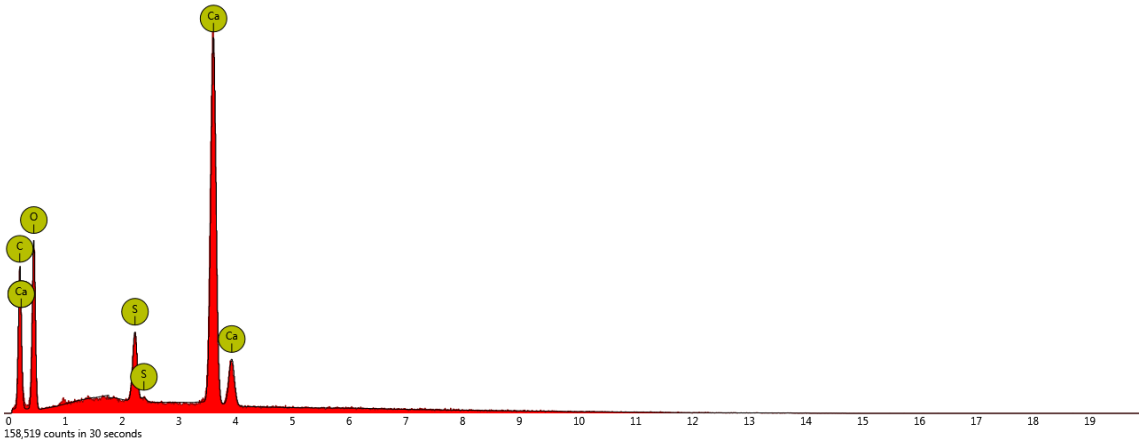
Disabled elements: B, Sb

4. spot



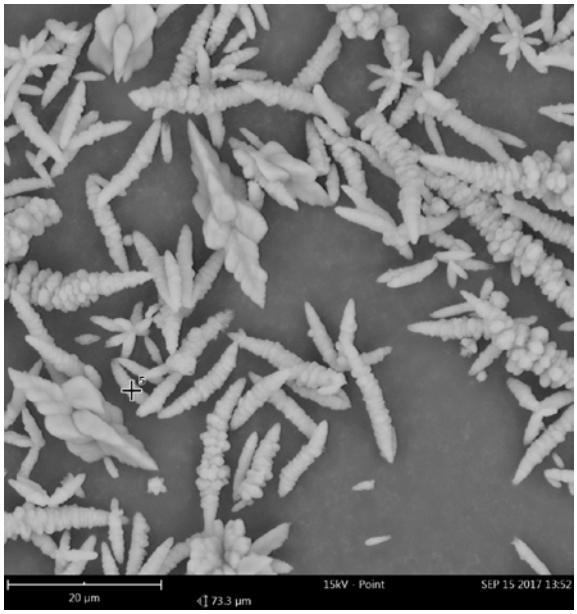
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	48.49	43.39
20	Ca	Calcium	12.80	28.68
6	C	Carbon	37.00	24.86
16	S	Sulfur	1.71	3.07

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



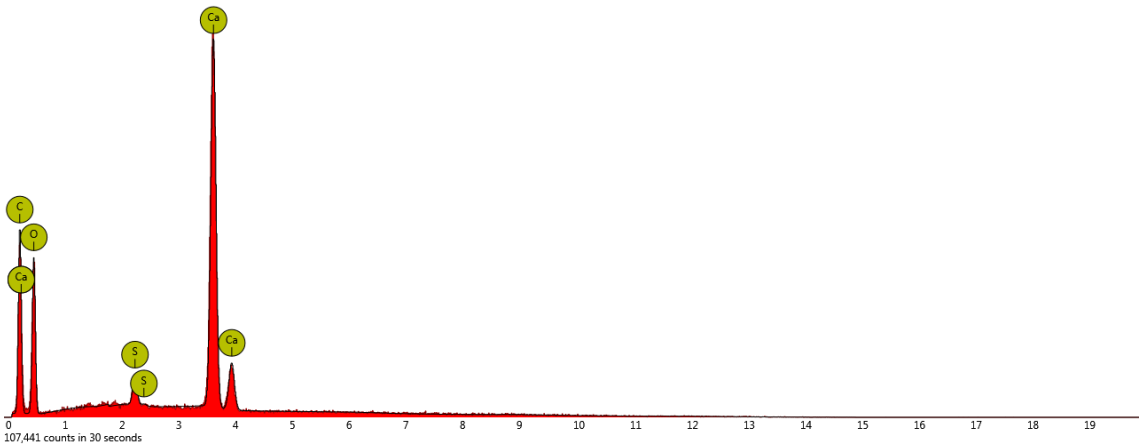
Disabled elements: B, Sb

5. spot



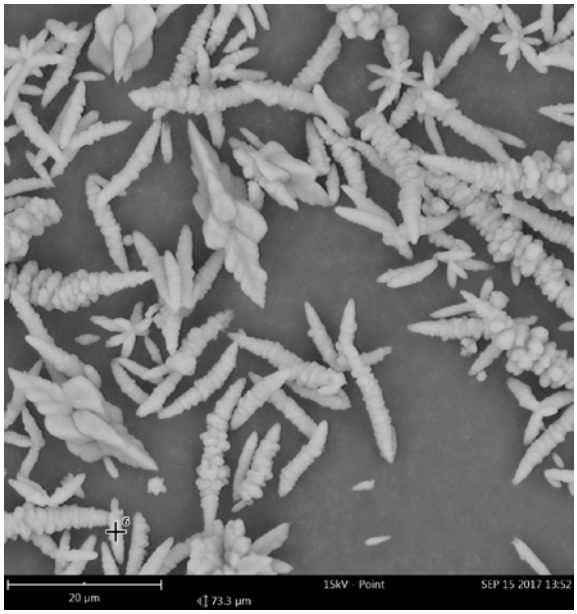
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.58	42.20
20	Ca	Calcium	12.97	29.44
6	C	Carbon	39.69	26.99
16	S	Sulfur	0.75	1.37

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



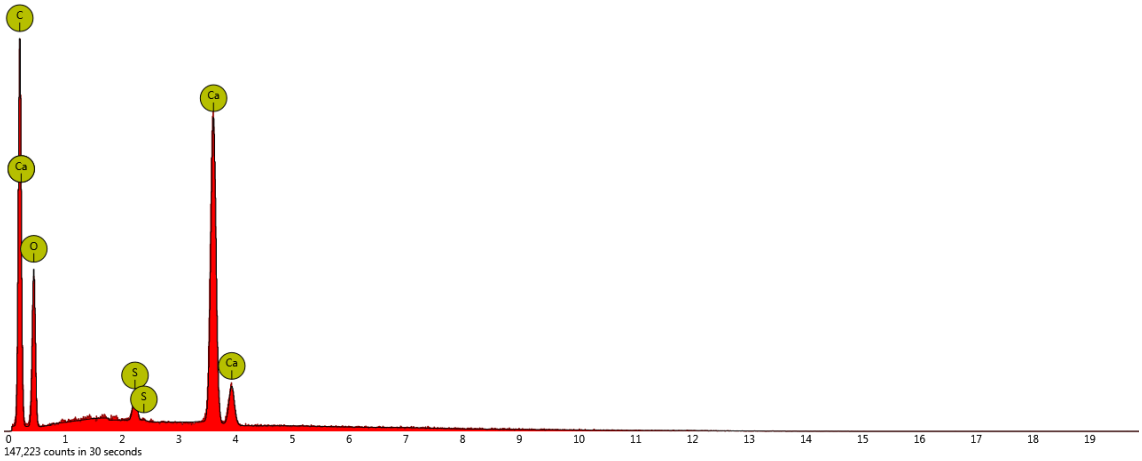
Disabled elements: B, Sb

6. spot



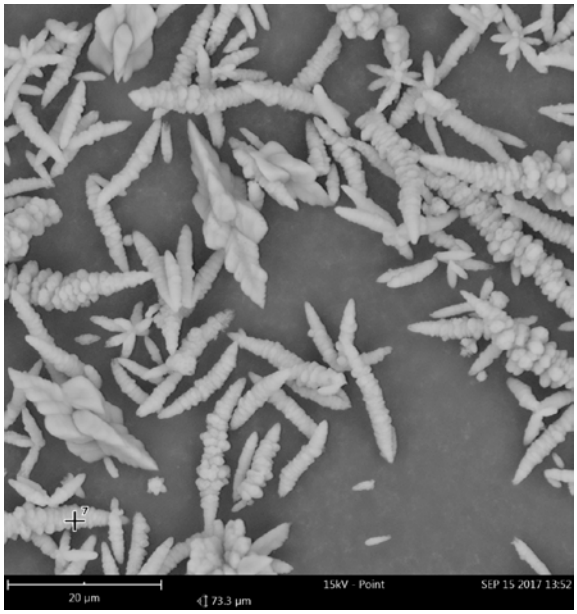
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	56.31	43.07
8	O	Oxygen	35.44	36.11
20	Ca	Calcium	7.80	19.90
16	S	Sulfur	0.45	0.92

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



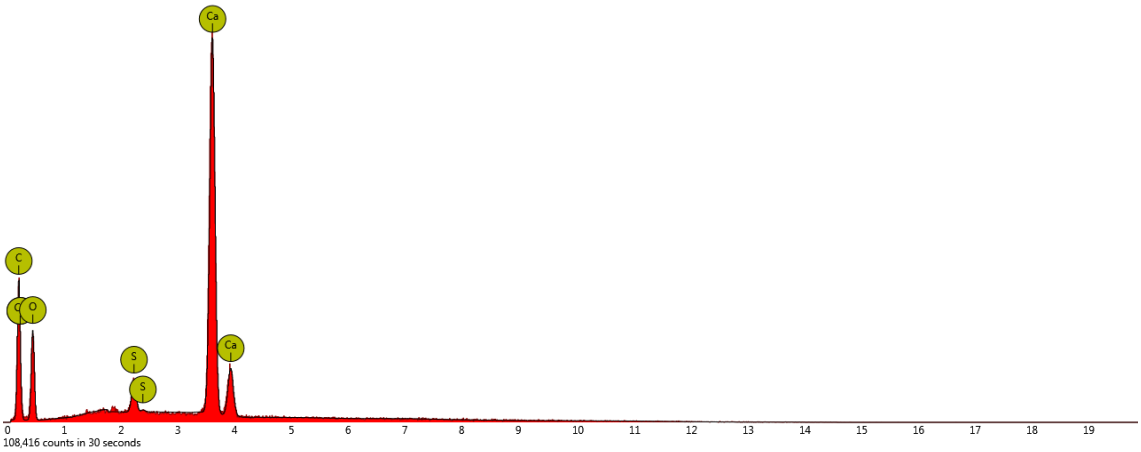
Disabled elements: B, Sb

7. spot



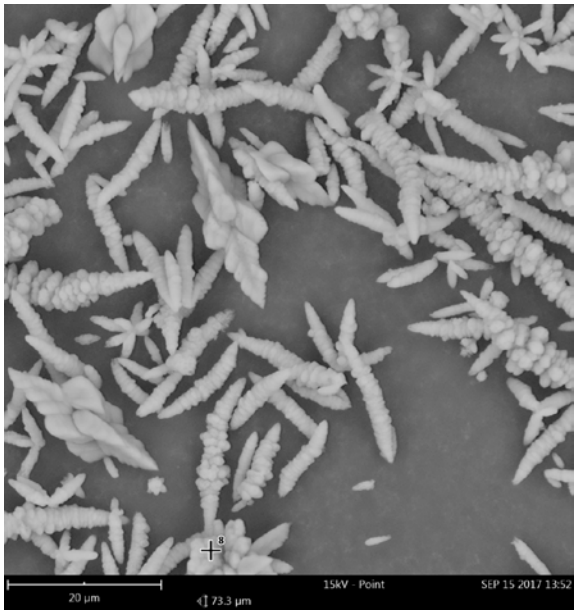
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
20	Ca	Calcium	17.09	36.82
8	O	Oxygen	39.85	34.26
6	C	Carbon	42.02	27.13
16	S	Sulfur	1.04	1.79

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



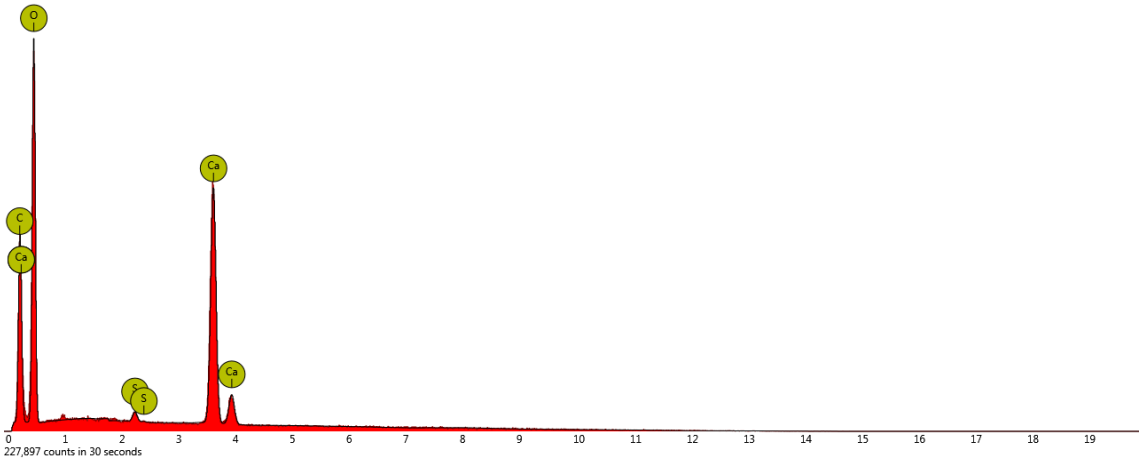
Disabled elements: B, Sb

8. spot



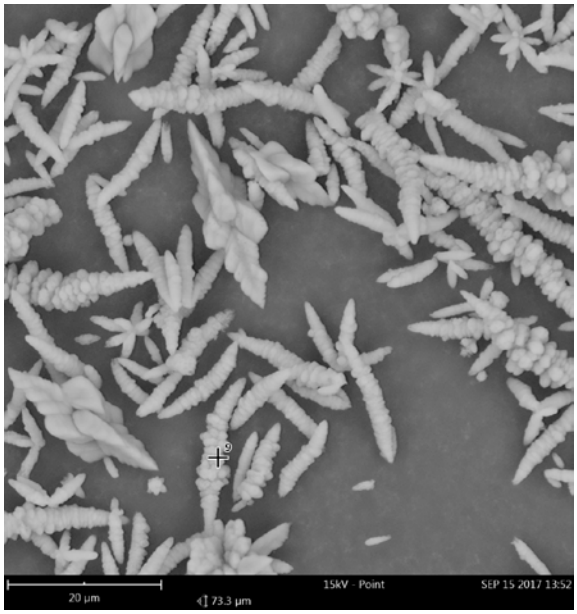
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	60.33	59.38
6	C	Carbon	33.07	24.43
20	Ca	Calcium	6.41	15.82
16	S	Sulfur	0.19	0.37

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



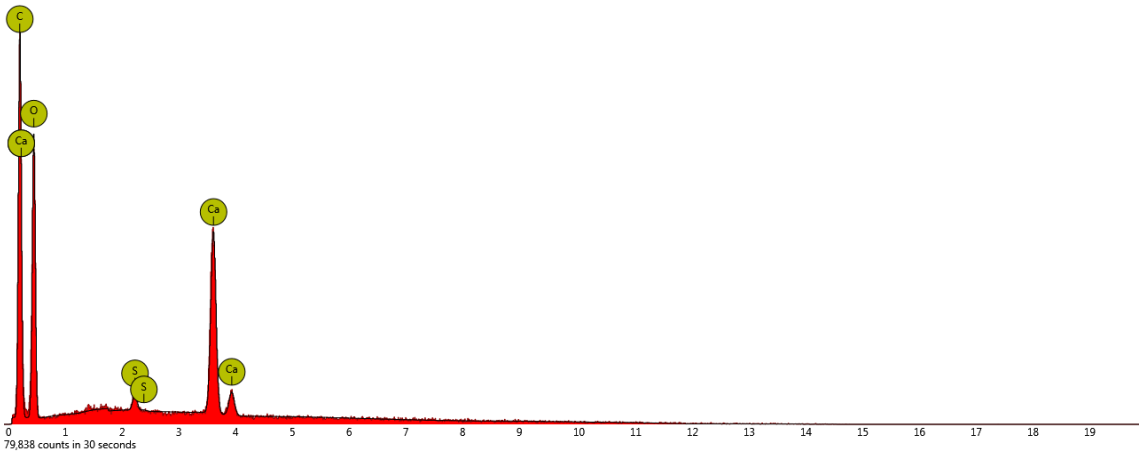
Disabled elements: B, Sb

9. spot



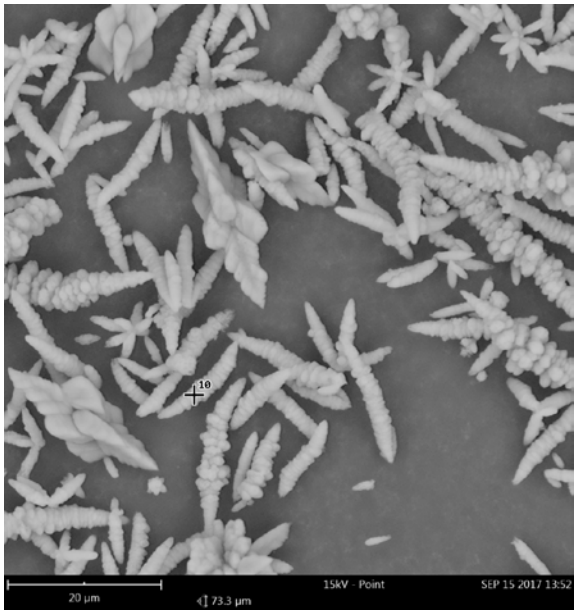
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.84	47.78
6	C	Carbon	50.75	40.59
20	Ca	Calcium	4.14	11.05
16	S	Sulfur	0.27	0.58

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



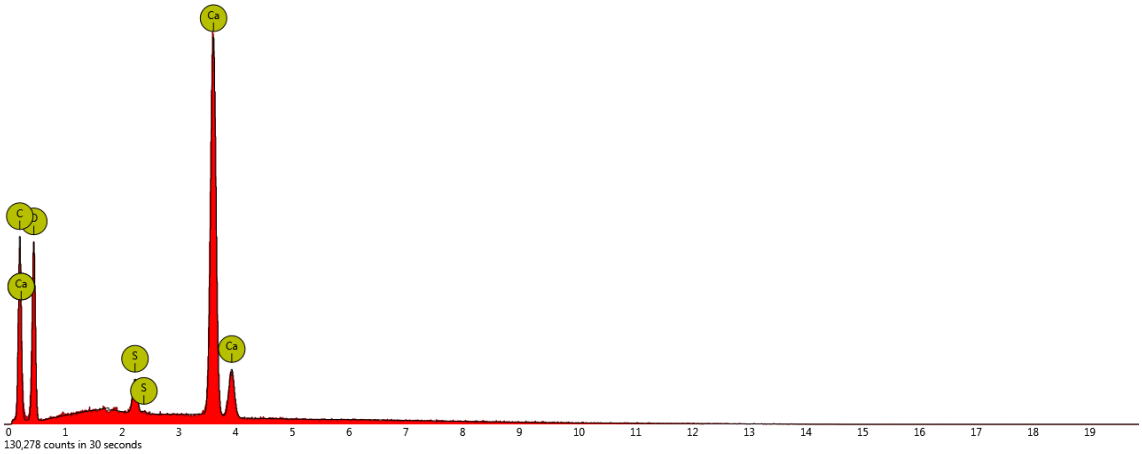
Disabled elements: B, N, Sb

10. spot



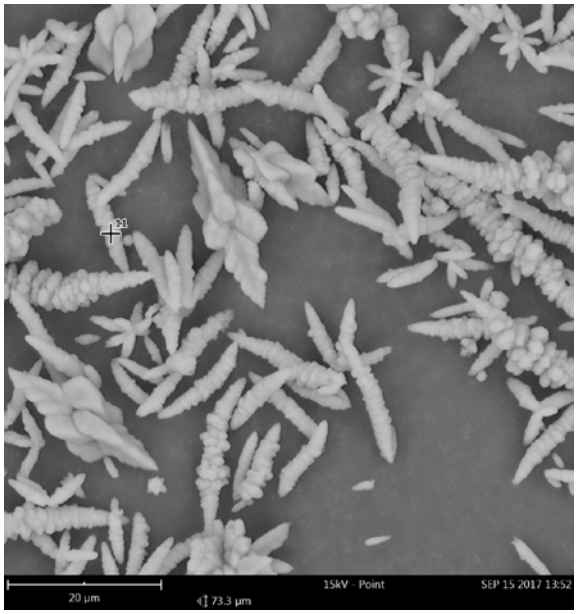
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	48.62	44.11
20	Ca	Calcium	12.56	28.55
6	C	Carbon	38.01	25.89
16	S	Sulfur	0.80	1.46

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



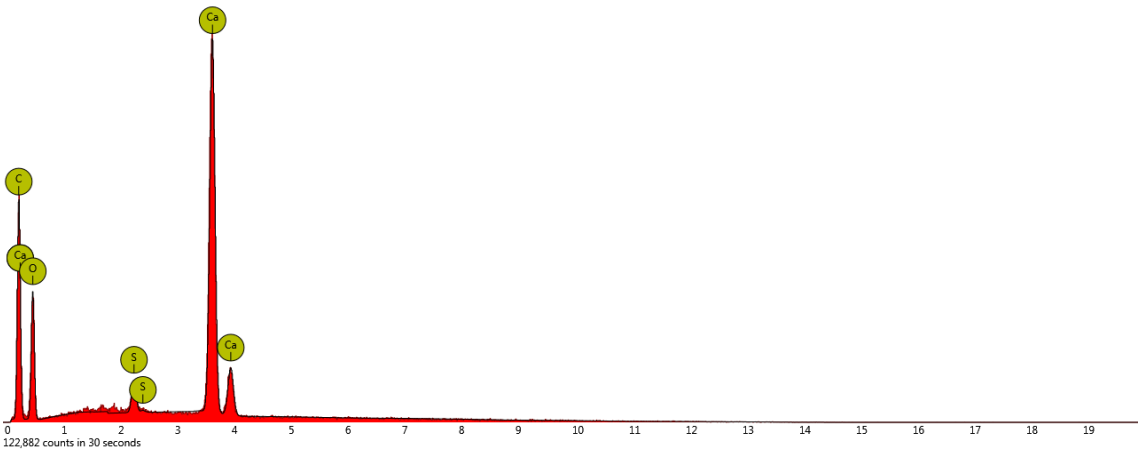
Disabled elements: B, Sb

11. spot



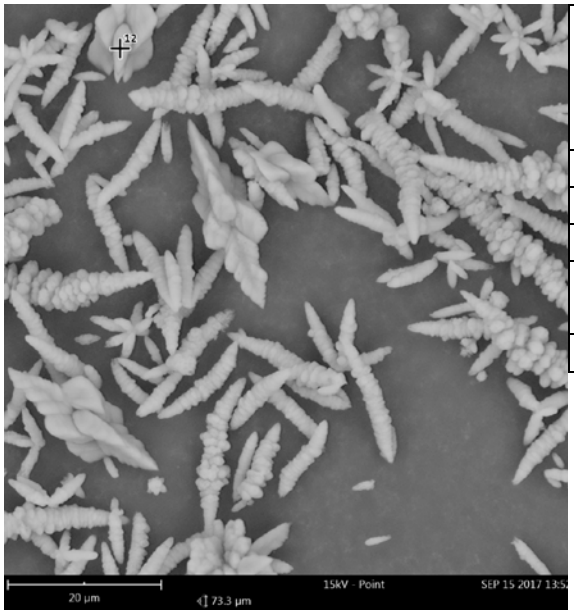
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	39.64	36.65
6	C	Carbon	46.90	32.55
20	Ca	Calcium	12.67	29.35
16	S	Sulfur	0.78	1.45

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



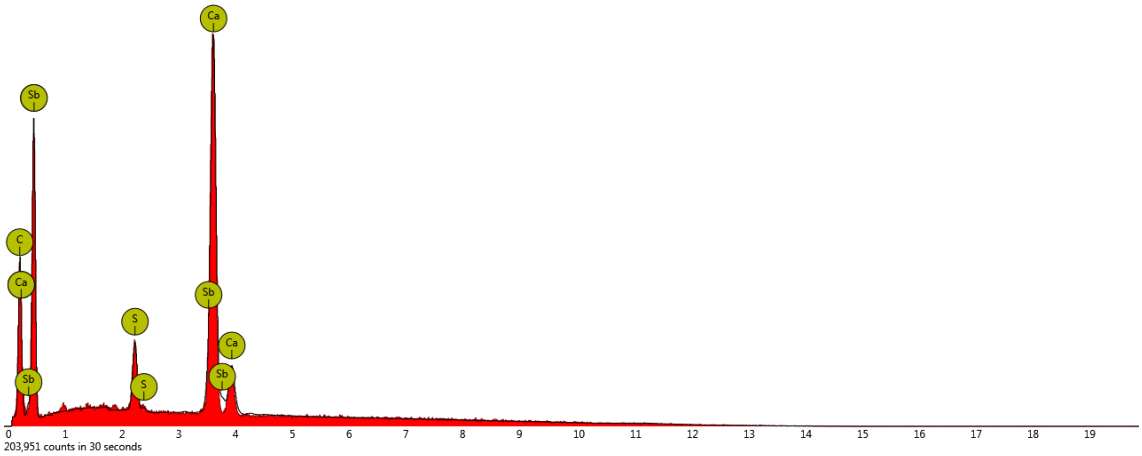
Disabled elements: B, Sb

12. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	54.57	46.60
20	Ca	Calcium	10.99	23.52
6	C	Carbon	31.89	20.45
51	Sb	Antimony	1.06	6.89
16	S	Sulfur	1.49	2.54

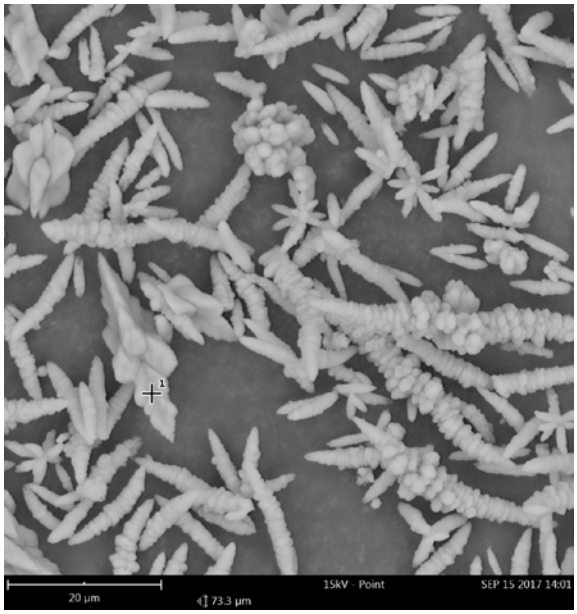
FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 13:52



Disabled elements: B

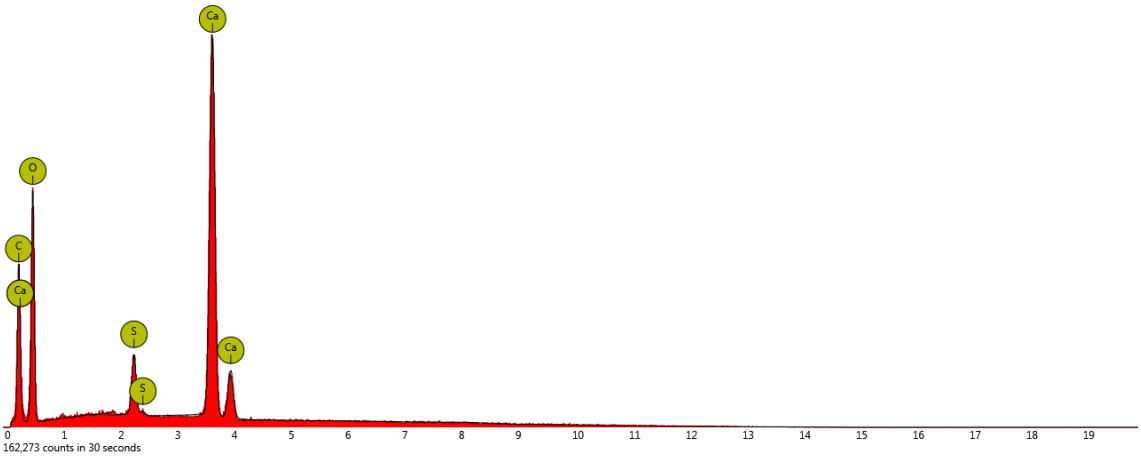
Image 5

1. spot



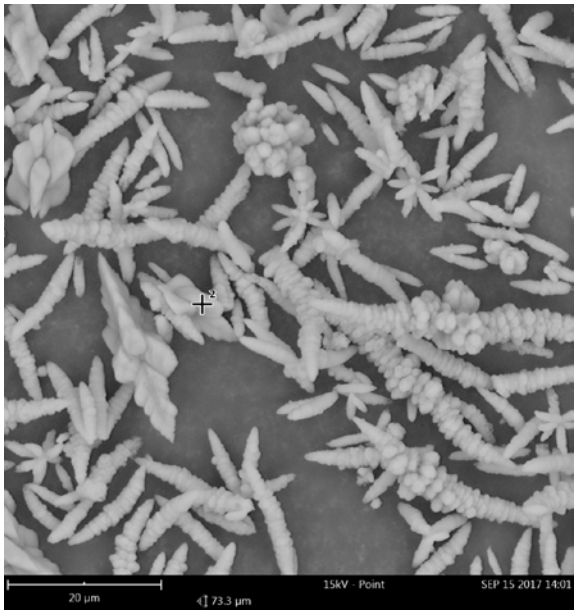
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.89	48.07
20	Ca	Calcium	11.49	26.14
6	C	Carbon	34.31	23.41
16	S	Sulfur	1.31	2.39

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



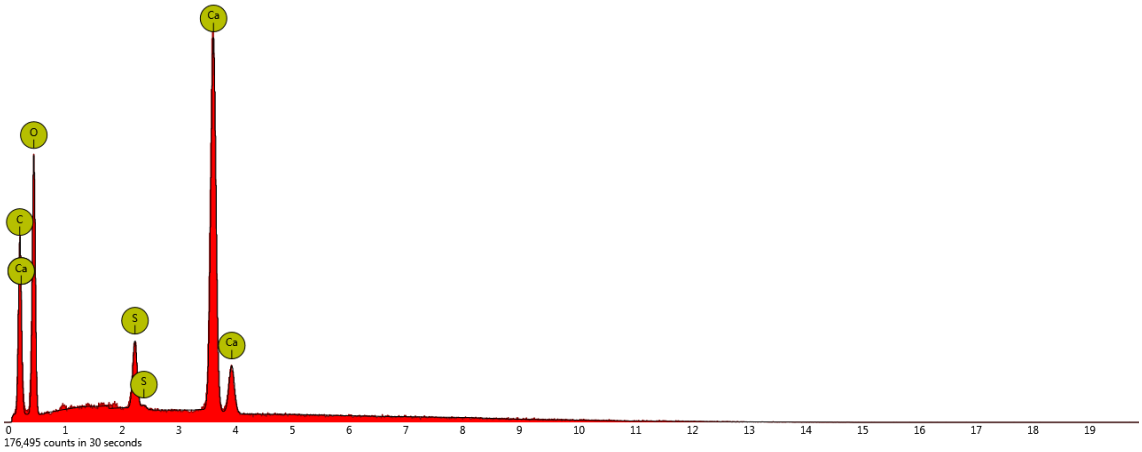
Disabled elements: B, Sb

2. spot



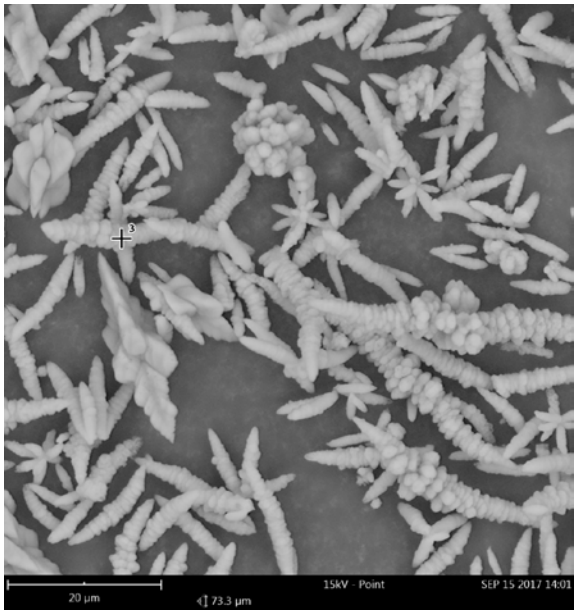
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.81	48.87
6	C	Carbon	35.51	24.67
20	Ca	Calcium	10.34	23.98
16	S	Sulfur	1.34	2.48

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



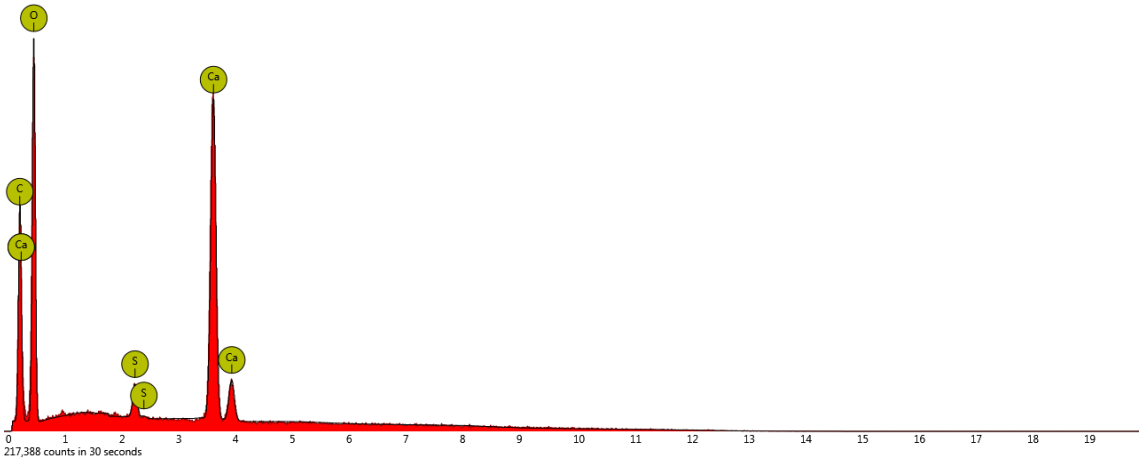
Disabled elements: B, Sb

3. spot



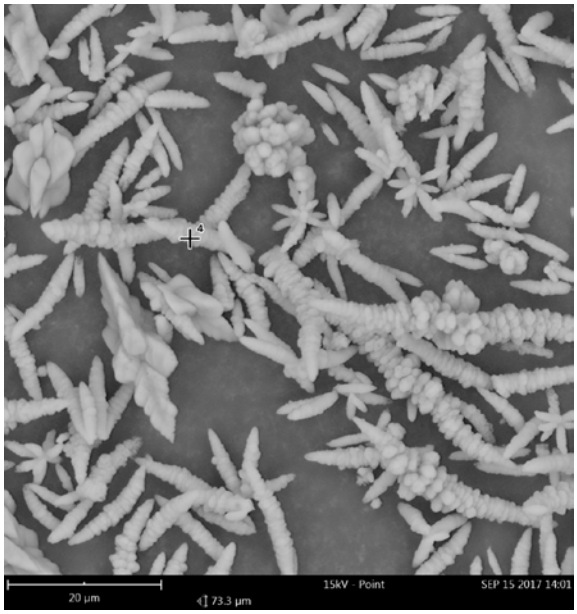
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	57.54	55.61
6	C	Carbon	34.29	24.88
20	Ca	Calcium	7.61	18.42
16	S	Sulfur	0.56	1.09

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



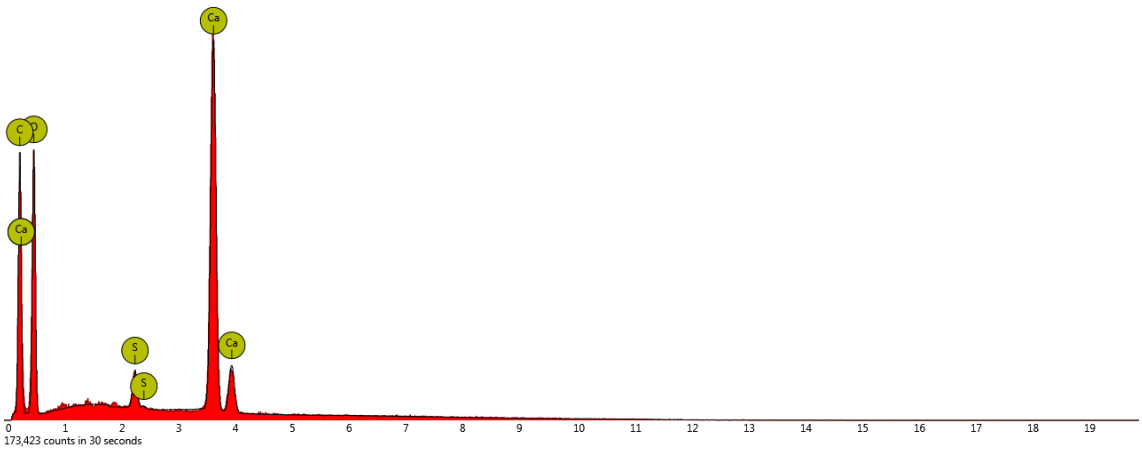
Disabled elements: B, Sb

4. spot



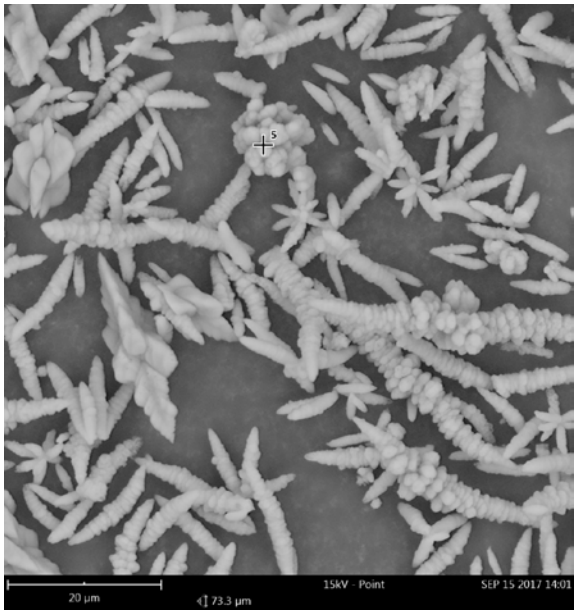
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	49.78	47.54
6	C	Carbon	40.22	28.83
20	Ca	Calcium	9.34	22.34
16	S	Sulfur	0.67	1.28

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



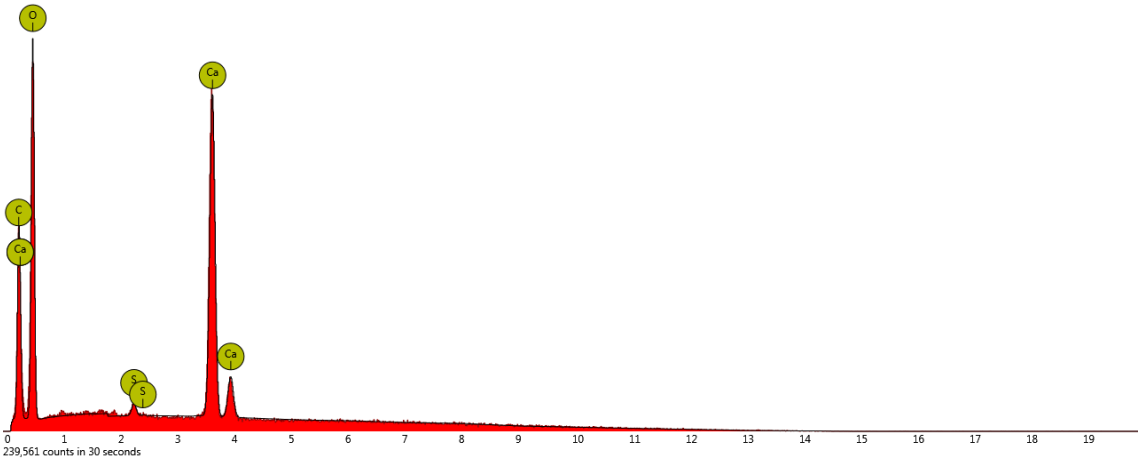
Disabled elements: B, Sb

5. spot



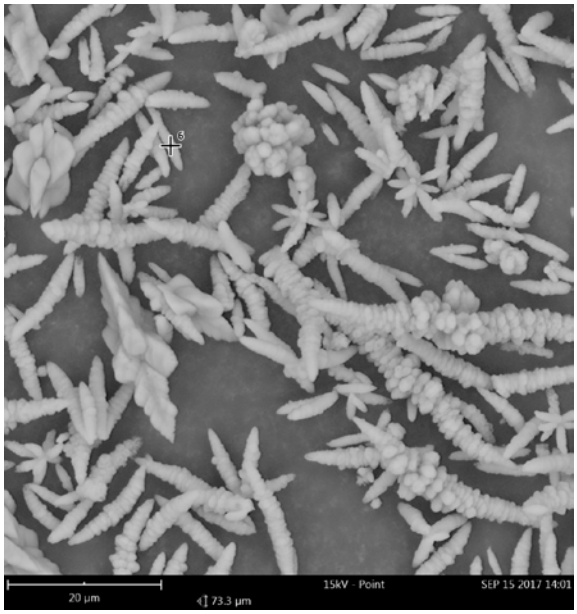
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	59.84	57.22
6	C	Carbon	31.78	22.82
20	Ca	Calcium	8.15	19.52
16	S	Sulfur	0.23	0.44

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



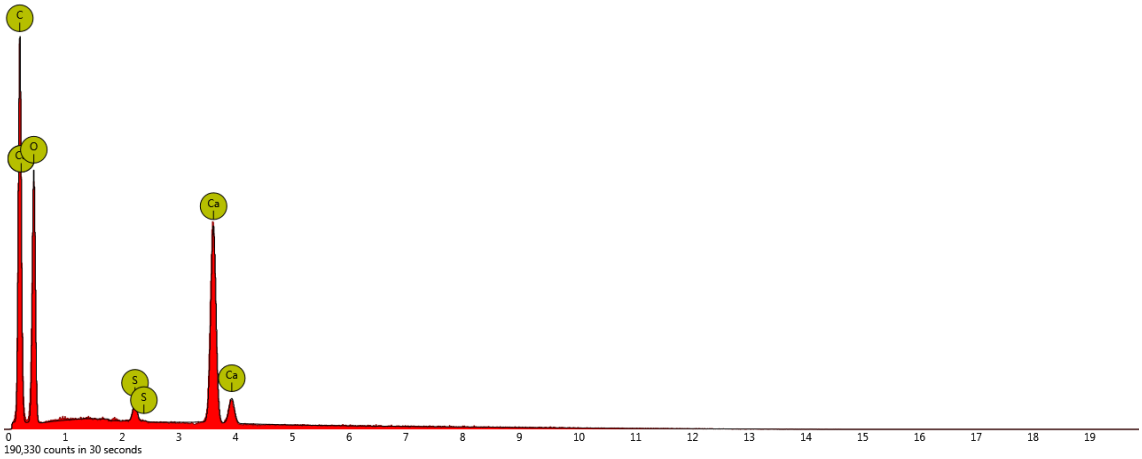
Disabled elements: B, Sb

6. spot



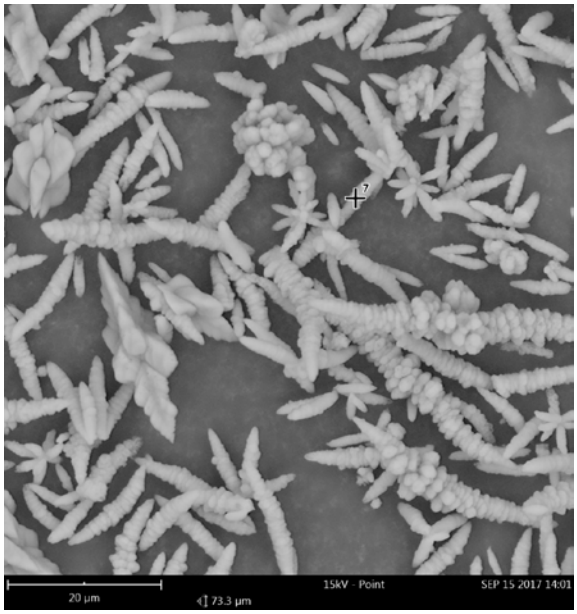
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	43.02	45.64
6	C	Carbon	52.07	41.47
20	Ca	Calcium	4.61	12.25
16	S	Sulfur	0.30	0.64

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



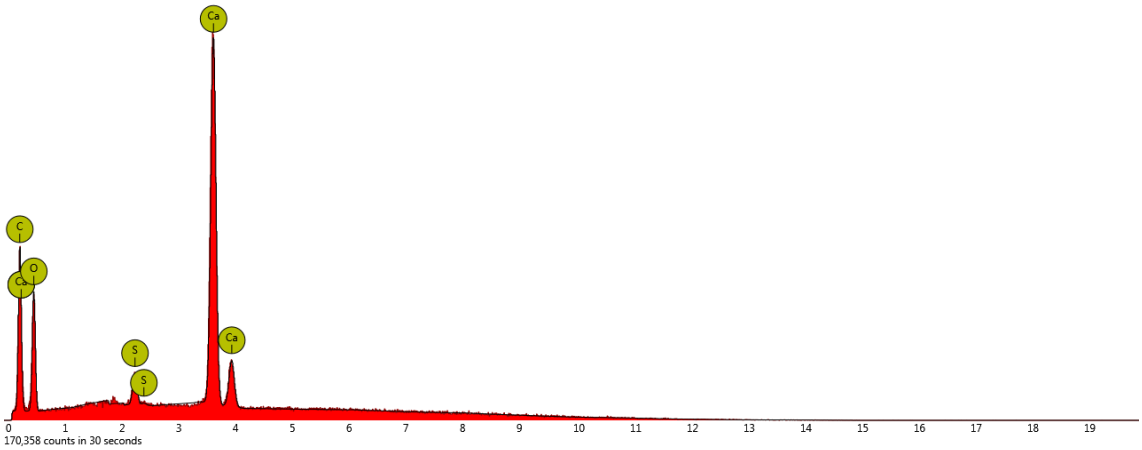
Disabled elements: B, Sb

7. spot



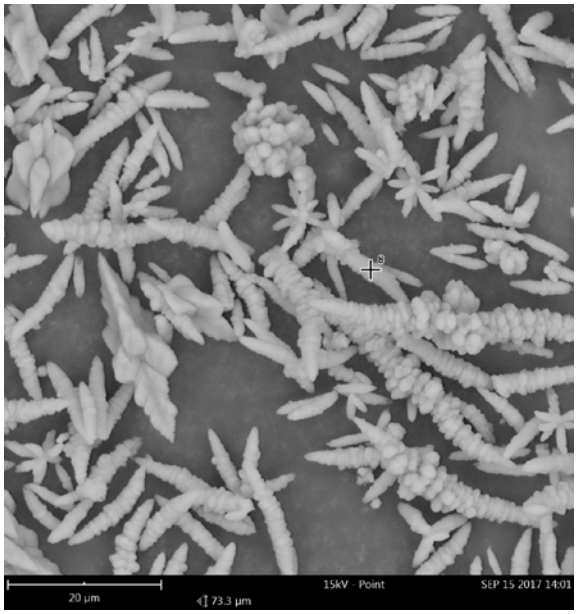
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	42.71	38.10
20	Ca	Calcium	14.41	32.19
6	C	Carbon	42.00	28.13
16	S	Sulfur	0.89	1.58

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



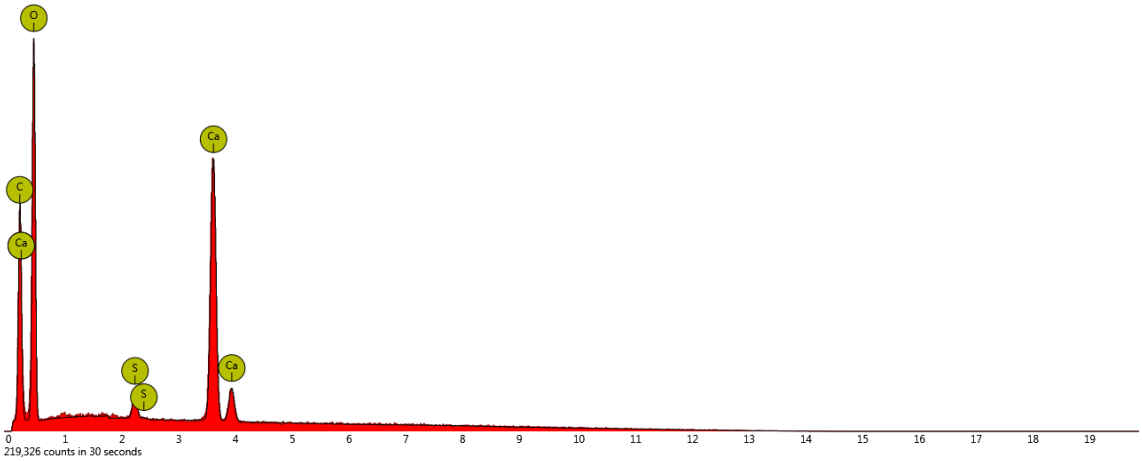
Disabled elements: B, Sb

8. spot



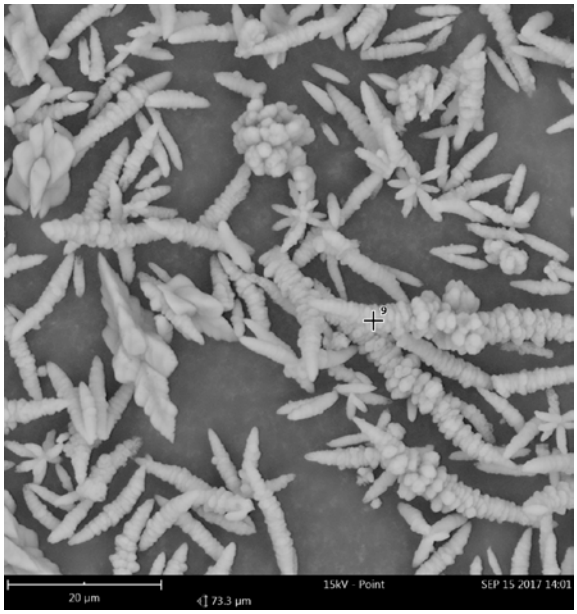
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	57.52	56.72
6	C	Carbon	35.50	26.28
20	Ca	Calcium	6.49	16.04
16	S	Sulfur	0.49	0.97

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



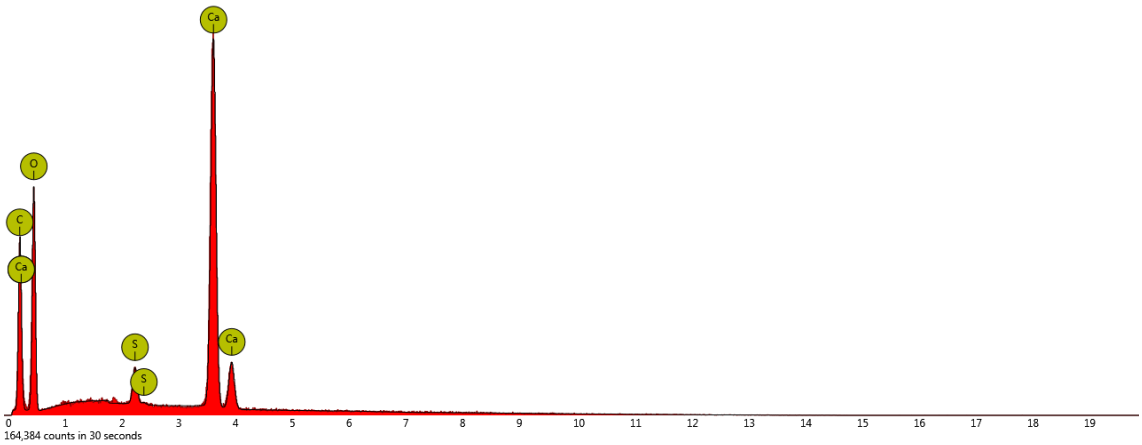
Disabled elements: B, Sb

9. spot



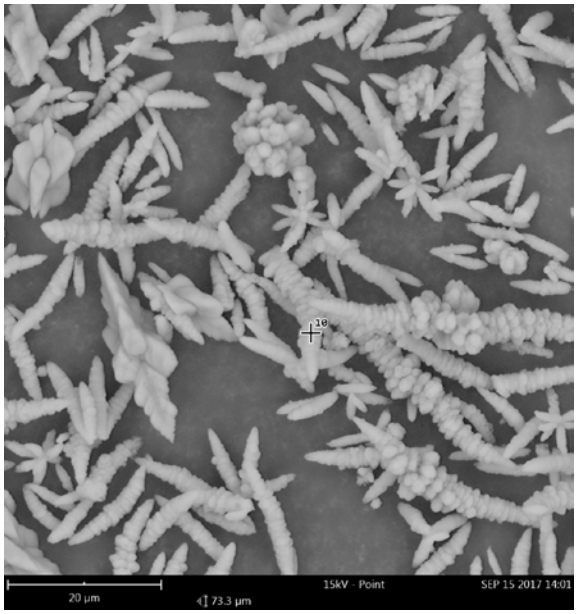
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.22	47.95
20	Ca	Calcium	11.29	25.97
6	C	Carbon	35.68	24.59
16	S	Sulfur	0.80	1.48

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



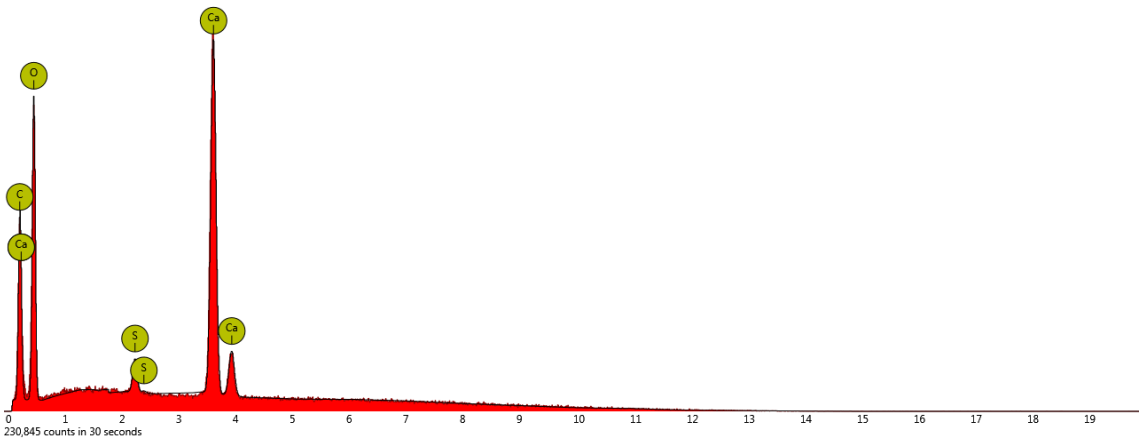
Disabled elements: B, Sb

10. spot



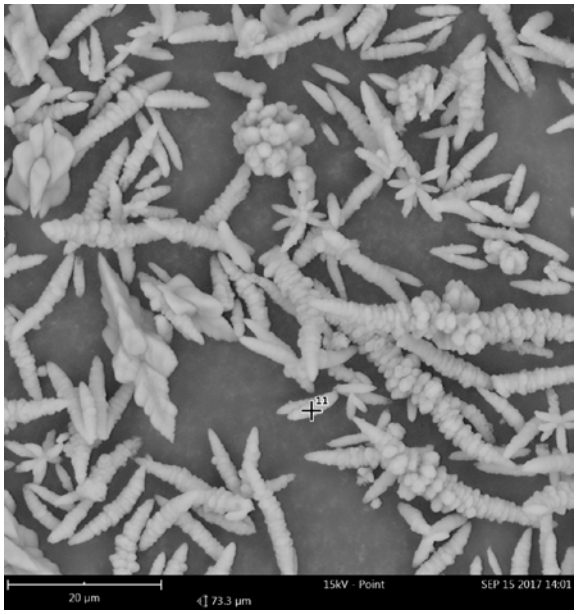
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.04	52.62
6	C	Carbon	33.83	23.85
20	Ca	Calcium	9.49	22.32
16	S	Sulfur	0.64	1.21

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



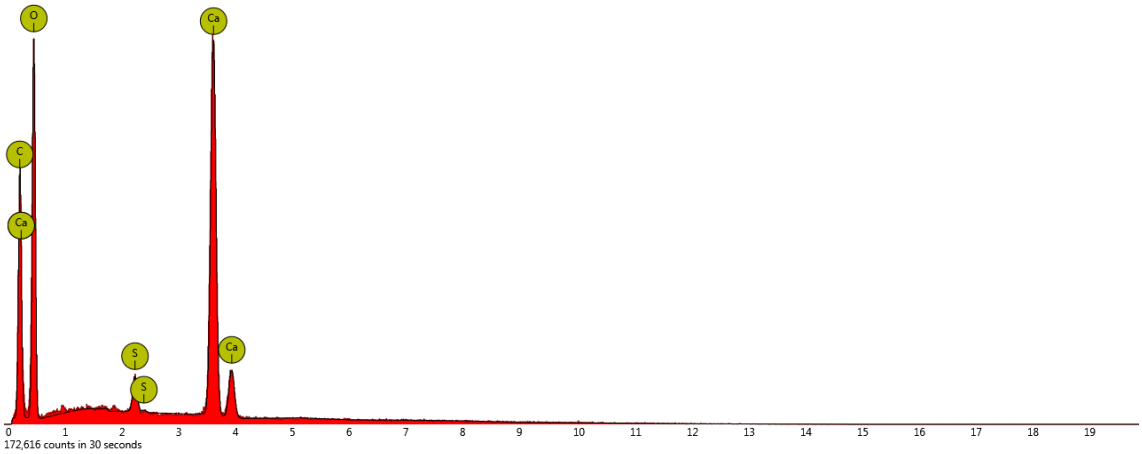
Disabled elements: B, Sb

11. spot



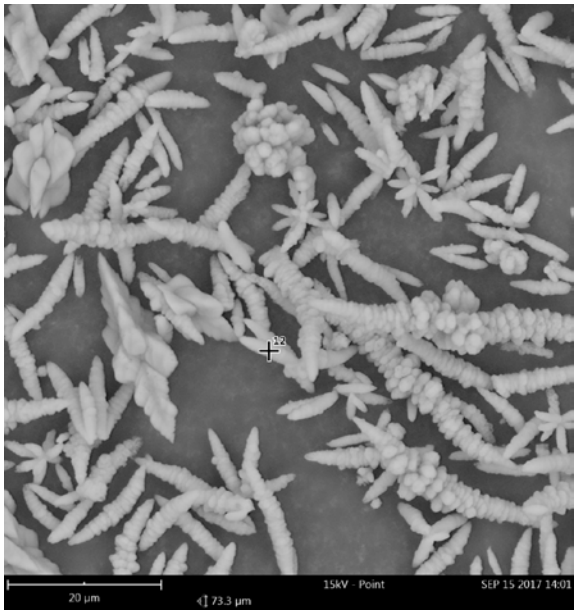
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	55.36	53.25
6	C	Carbon	35.88	25.91
20	Ca	Calcium	8.20	19.77
16	S	Sulfur	0.56	1.07

FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



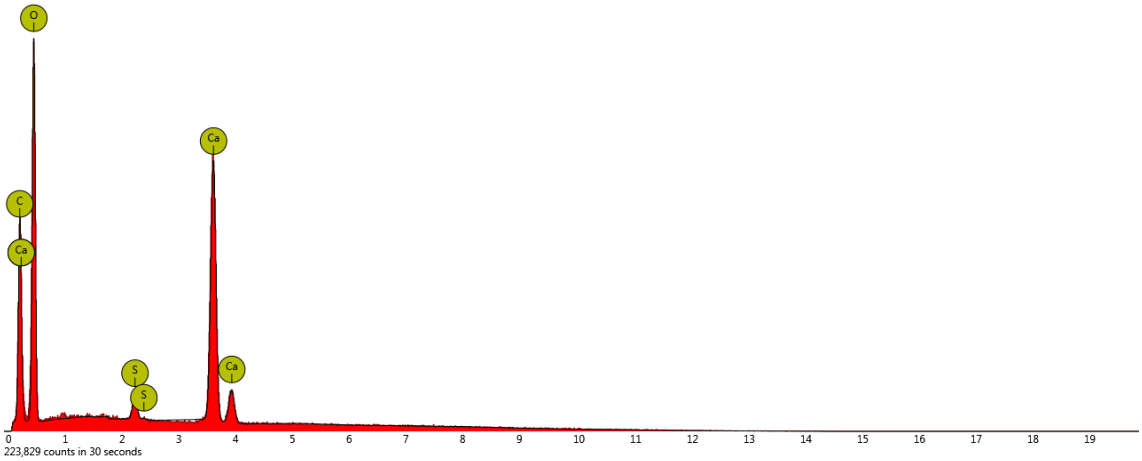
Disabled elements: B, Sb

12. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	58.49	57.42
6	C	Carbon	34.41	25.36
20	Ca	Calcium	6.62	16.29
16	S	Sulfur	0.47	0.93

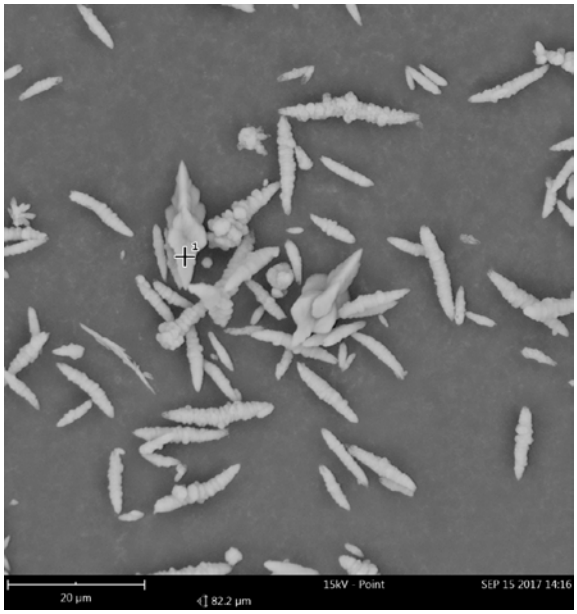
FOV: 73.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:01



Disabled elements: B, Sb

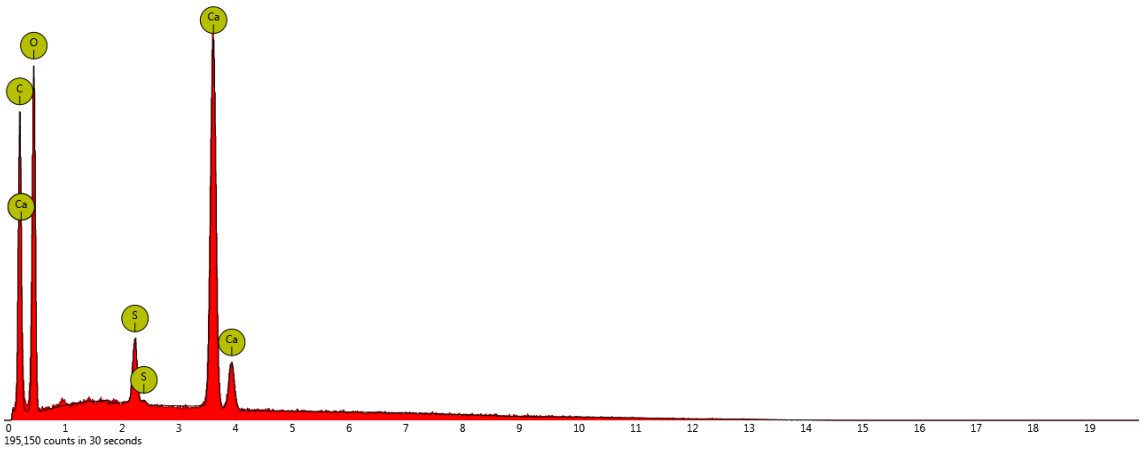
Image 7

1. spot



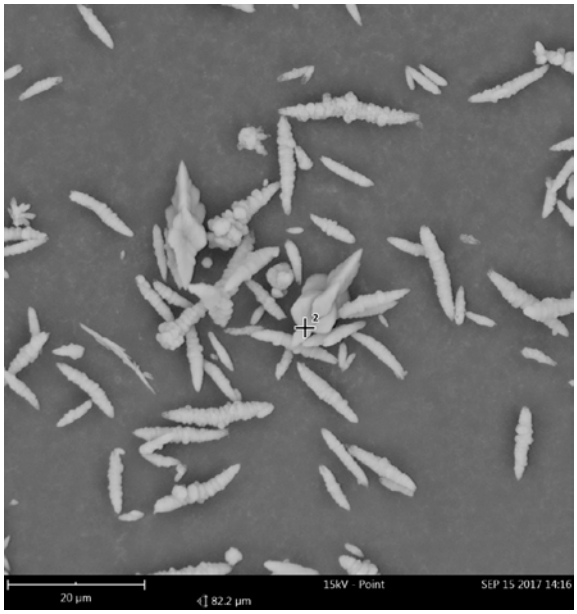
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	50.91	49.66
6	C	Carbon	40.40	29.58
20	Ca	Calcium	7.72	18.87
16	S	Sulfur	0.97	1.89

FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:16



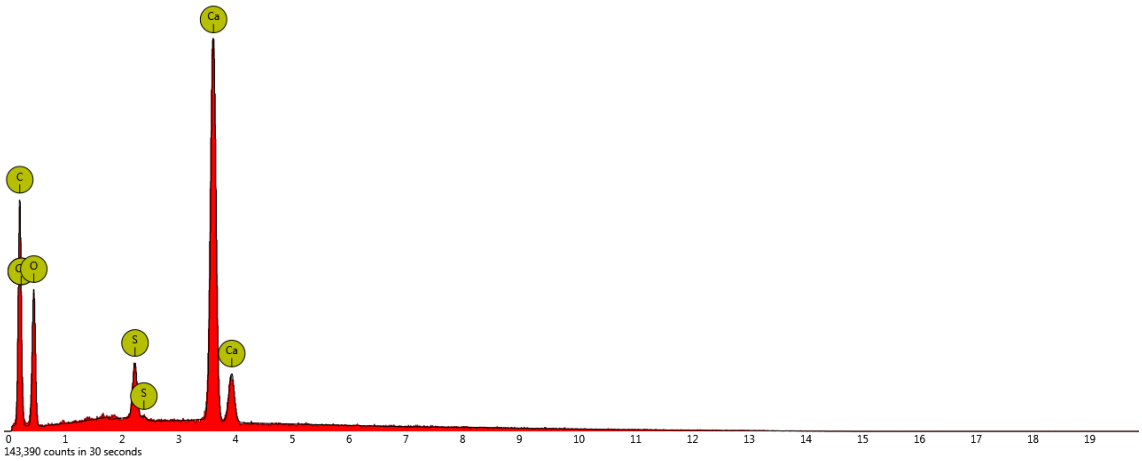
Disabled elements: B, Sb

2. spot



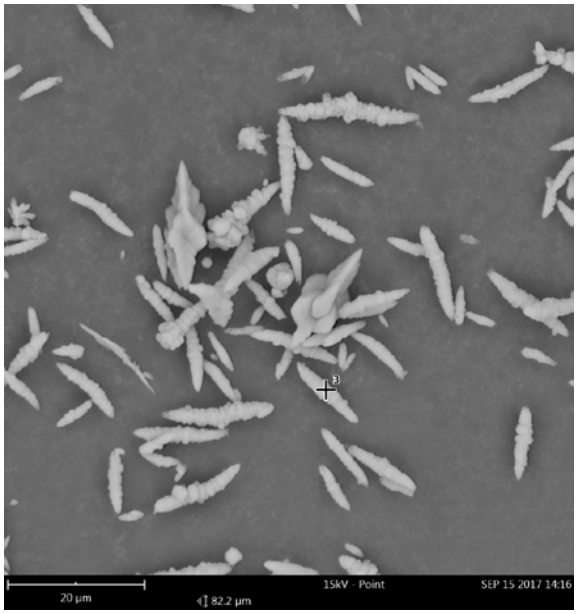
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	39.65	36.69
6	C	Carbon	46.82	32.53
20	Ca	Calcium	12.26	28.43
16	S	Sulfur	1.27	2.35

FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:16



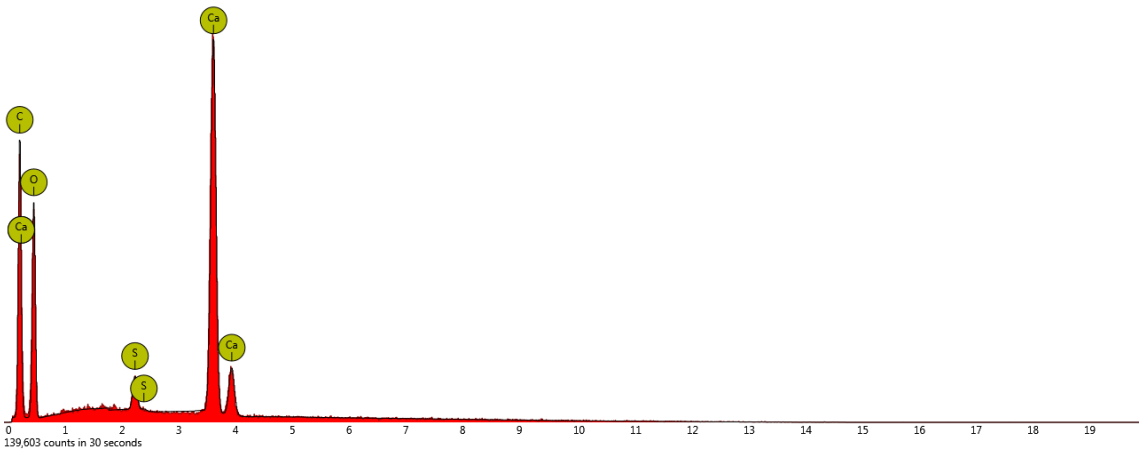
Disabled elements: B, Sb

3. spot



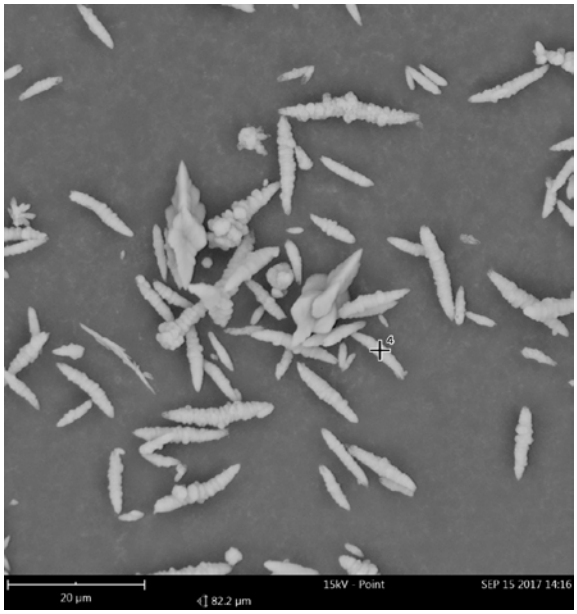
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	45.54	43.59
6	C	Carbon	43.99	31.61
20	Ca	Calcium	9.84	23.58
16	S	Sulfur	0.64	1.22

FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:16



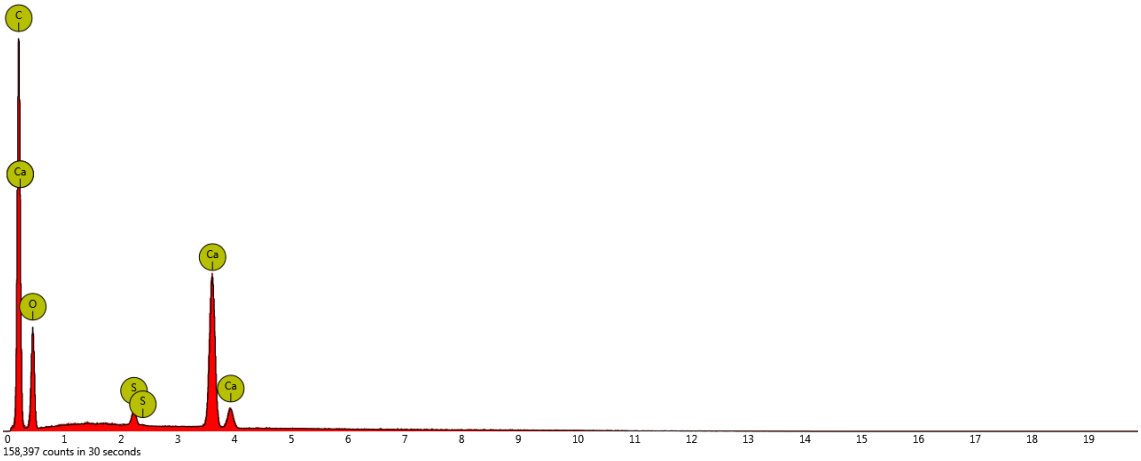
Disabled elements: B, Sb

4. spot



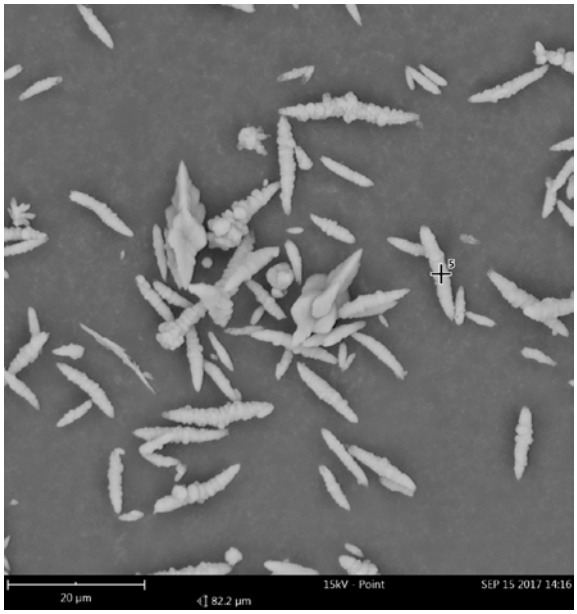
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	65.22	53.60
8	O	Oxygen	29.61	32.41
20	Ca	Calcium	4.85	13.30
16	S	Sulfur	0.31	0.69

FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:16



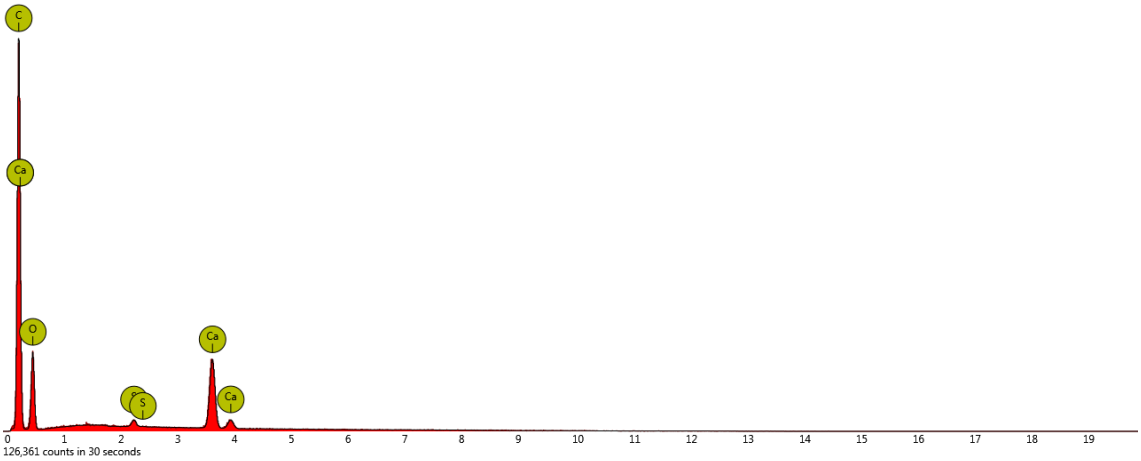
Disabled elements: B, I, Sb

5. spot



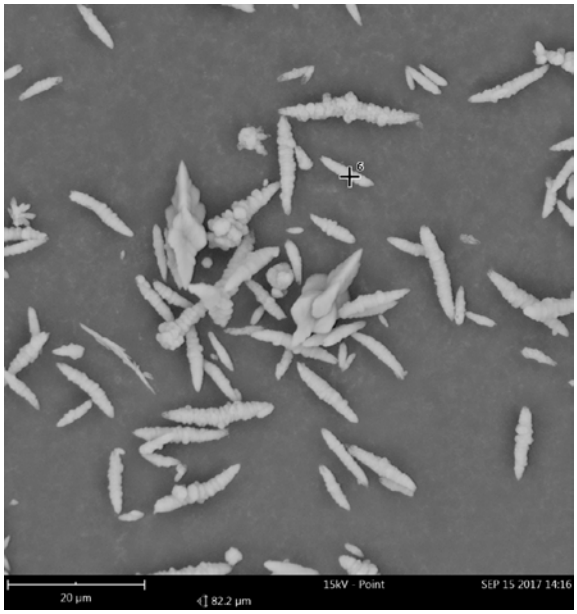
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	70.69	61.39
8	O	Oxygen	26.54	30.70
20	Ca	Calcium	2.59	7.51

FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:16



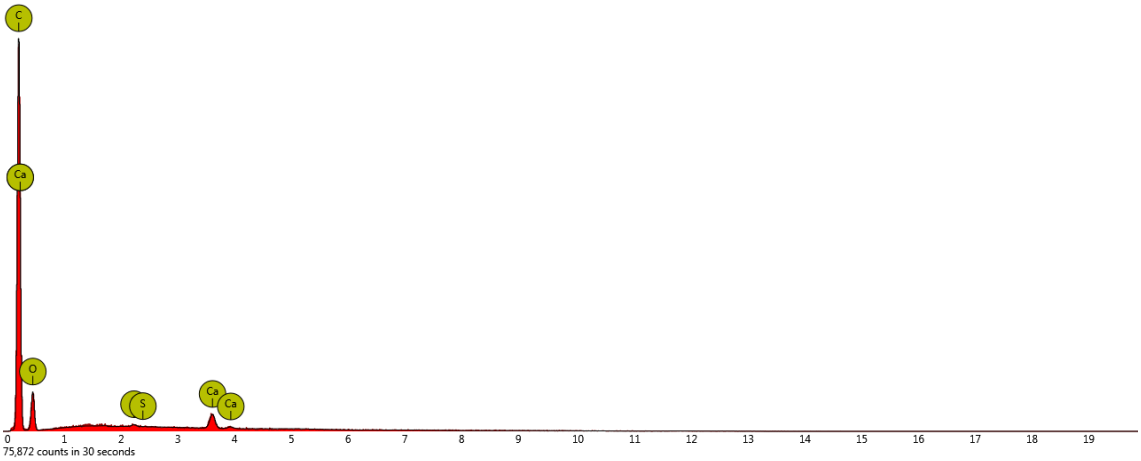
Disabled elements: B, I, Sb

6. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	80.23	74.27
8	O	Oxygen	19.02	23.46
20	Ca	Calcium	0.68	2.11
16	S	Sulfur	0.07	0.16

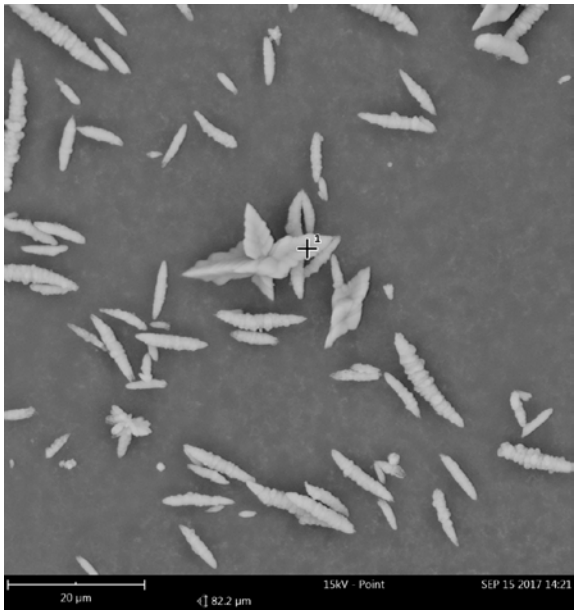
FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:16



Disabled elements: B

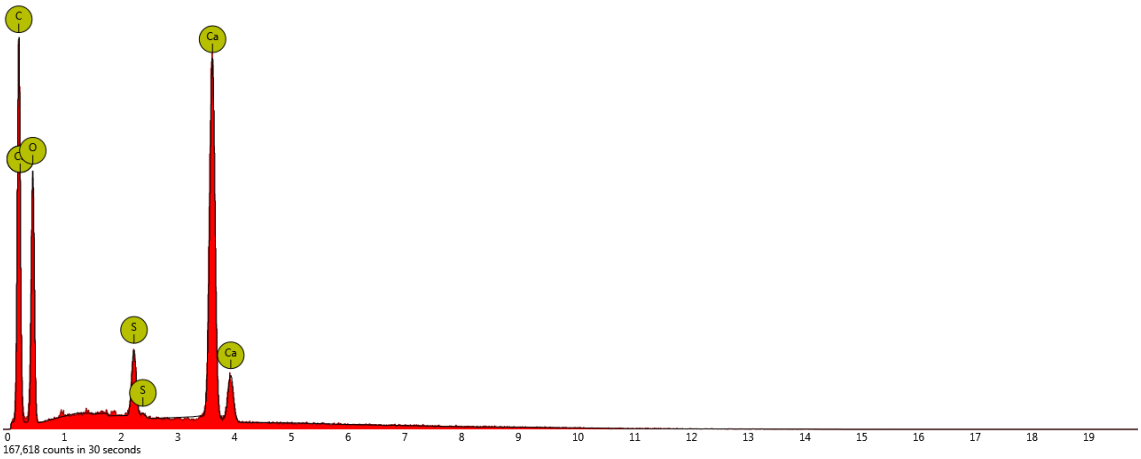
Image 8

1. spot



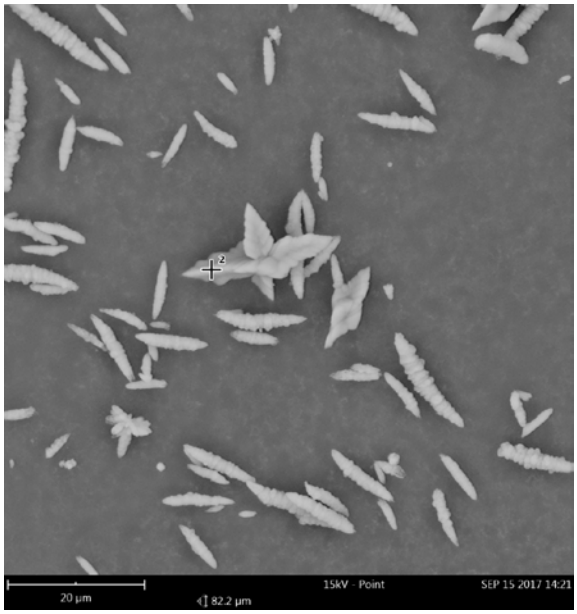
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	41.18	41.43
6	C	Carbon	50.52	38.15
20	Ca	Calcium	7.34	18.49
16	S	Sulfur	0.96	1.93

FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:21



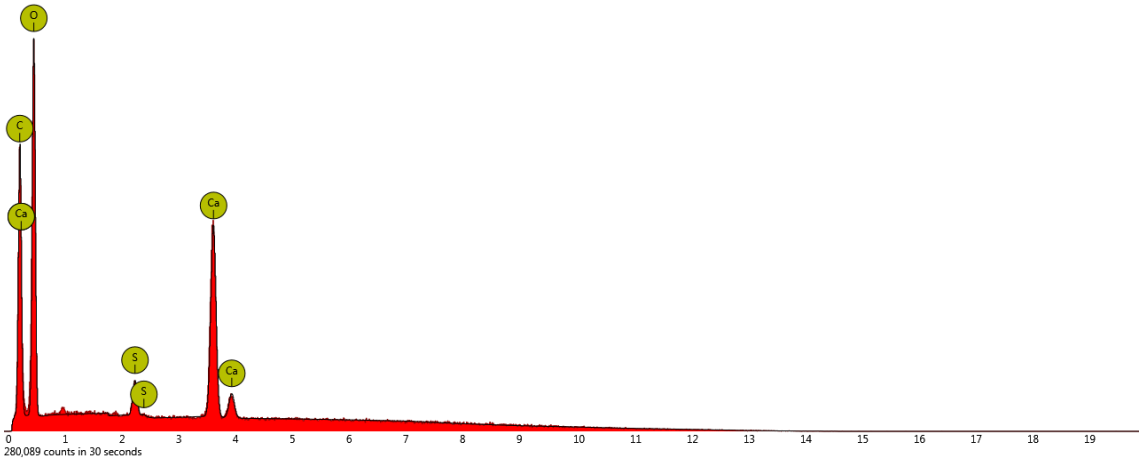
Disabled elements: B, Sb

2. spot



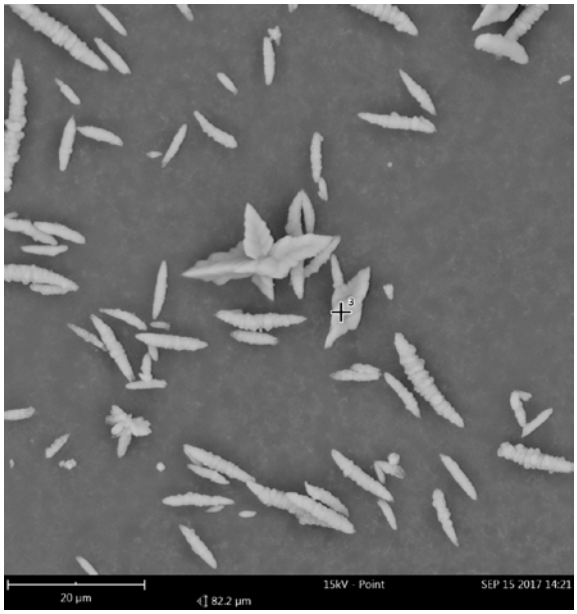
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	53.43	55.06
6	C	Carbon	41.46	32.08
20	Ca	Calcium	4.50	11.63
16	S	Sulfur	0.60	1.24

FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:21



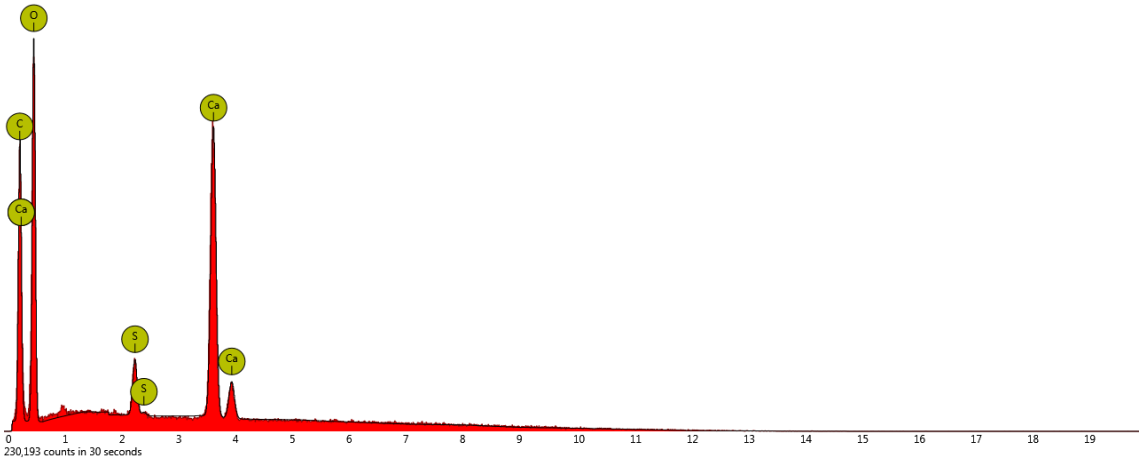
Disabled elements: B, Sb

3. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.78	52.74
6	C	Carbon	40.22	30.17
20	Ca	Calcium	6.15	15.40
16	S	Sulfur	0.85	1.69

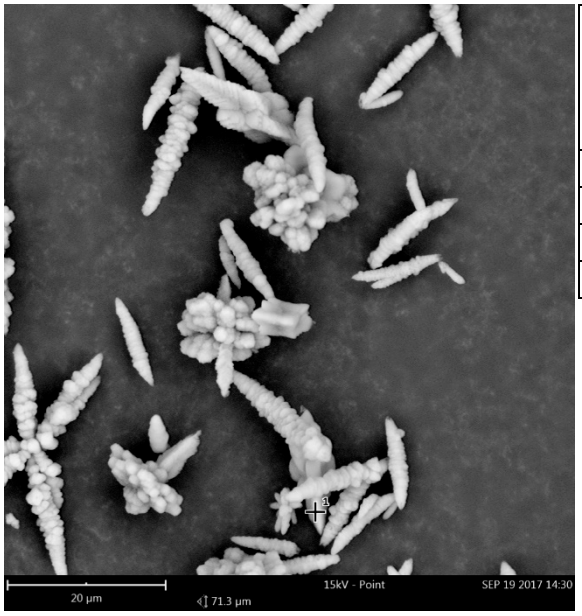
FOV: 82.2 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 15 2017 14:21



Disabled elements: B, Sb

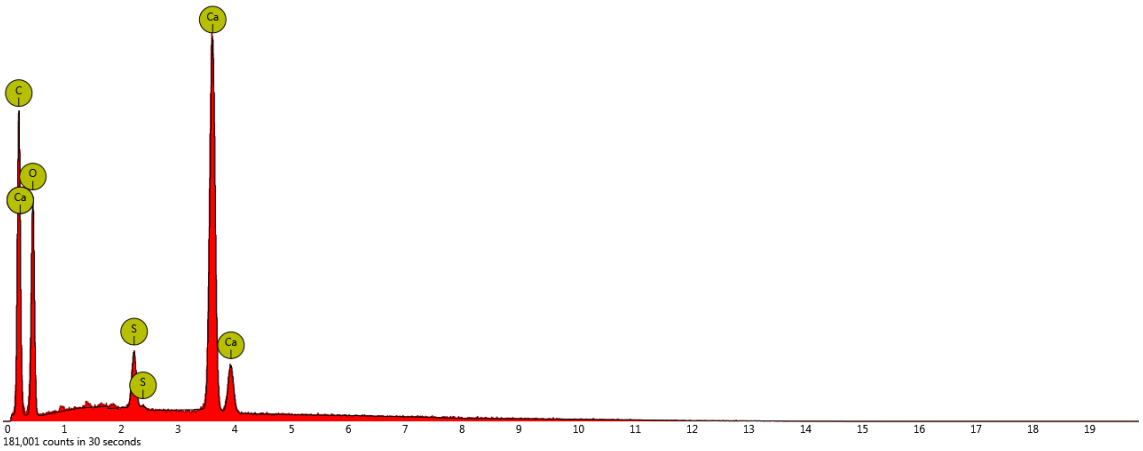
Image 9

1. spot



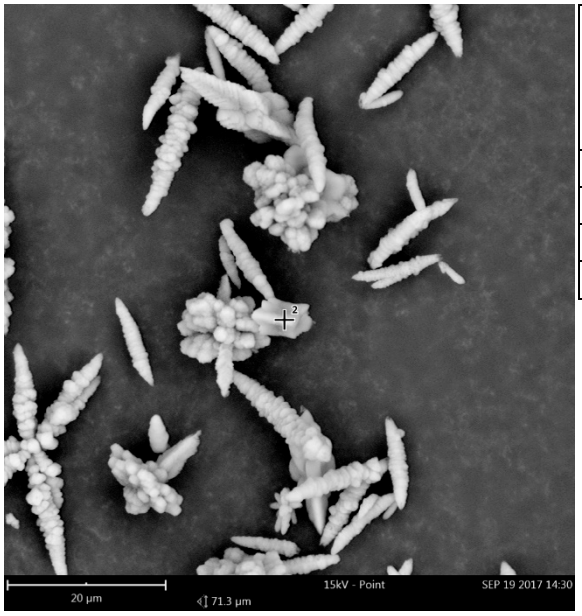
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	42.66	41.61
6	C	Carbon	47.46	34.75
20	Ca	Calcium	8.91	21.77
16	S	Sulfur	0.96	1.88

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:30



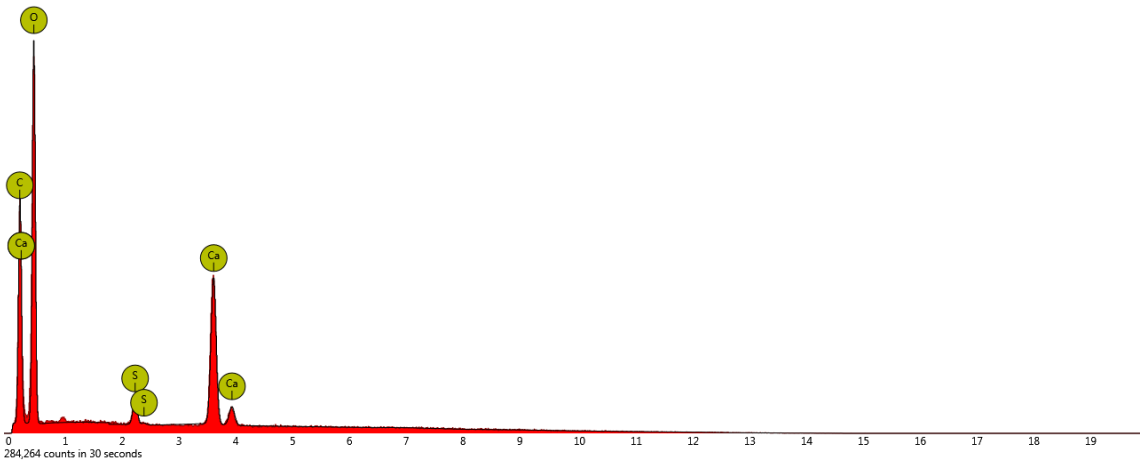
Disabled elements: B, Sb

2. spot



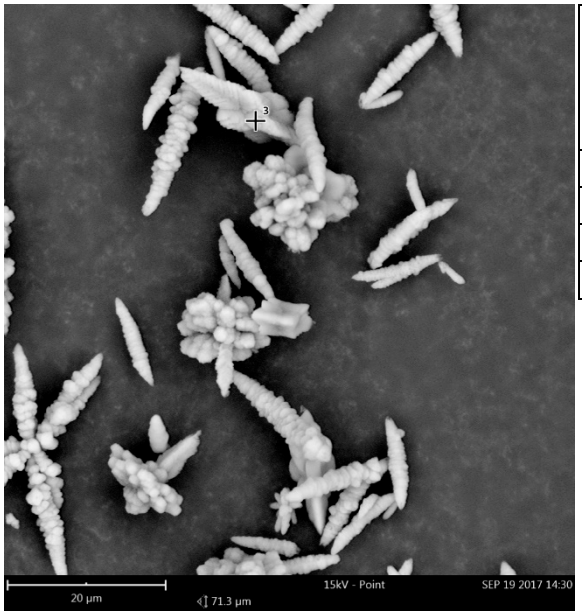
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	56.53	58.50
6	C	Carbon	39.08	30.36
20	Ca	Calcium	3.90	10.11
16	S	Sulfur	0.49	1.02

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:30



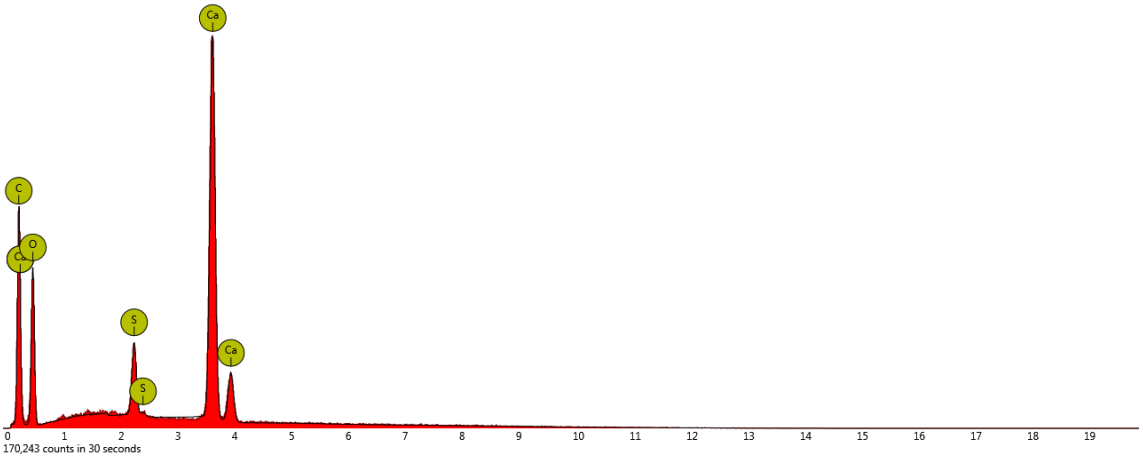
Disabled elements: B, N, Sb

3. spot



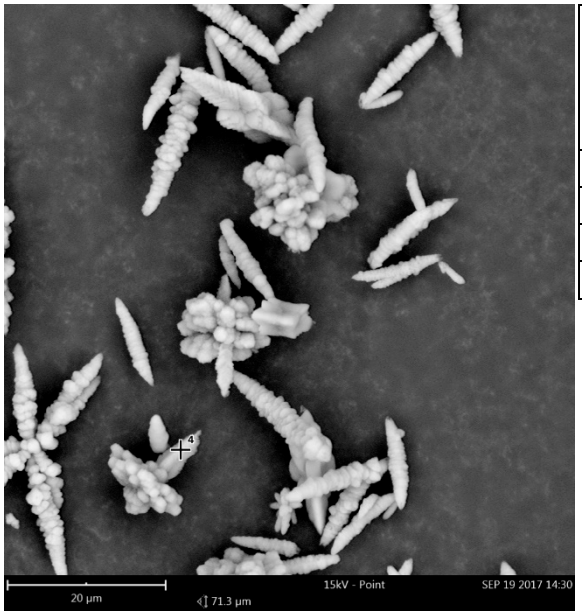
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	41.11	38.31
6	C	Carbon	45.91	32.12
20	Ca	Calcium	11.43	26.68
16	S	Sulfur	1.55	2.89

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:30



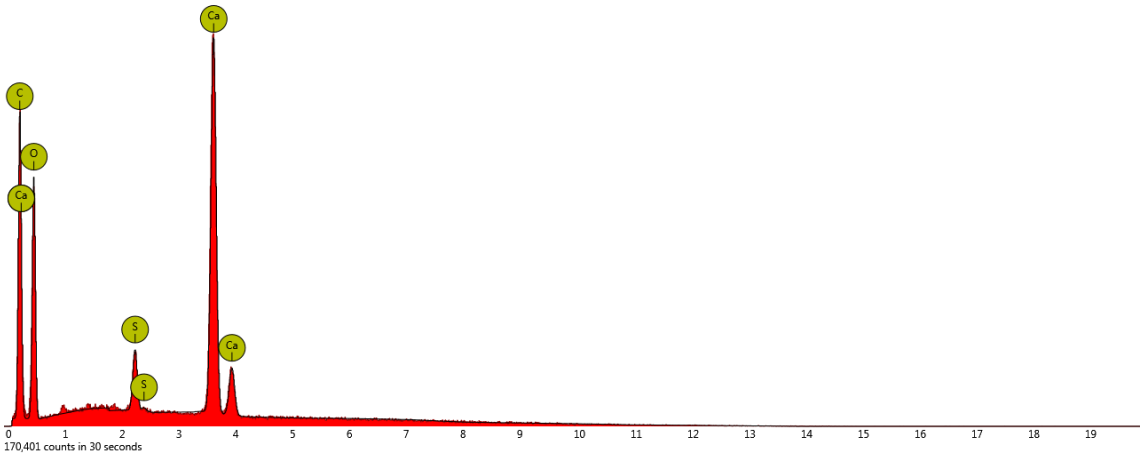
Disabled elements: B, Sb

4. spot



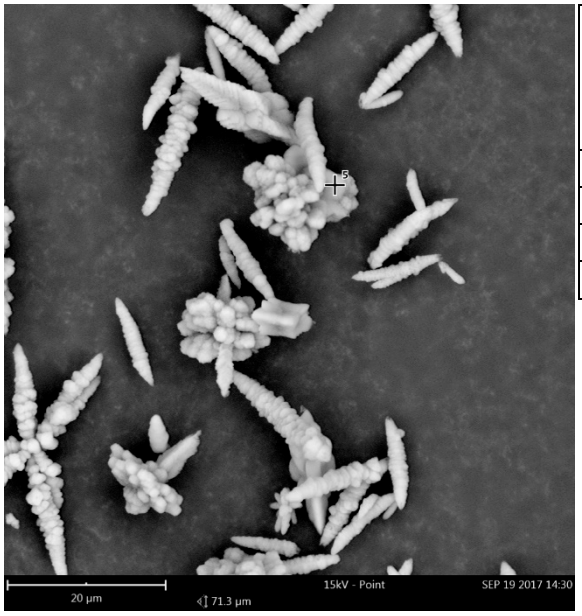
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.07	43.03
6	C	Carbon	46.33	33.96
20	Ca	Calcium	8.61	21.06
16	S	Sulfur	0.99	1.94

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:30



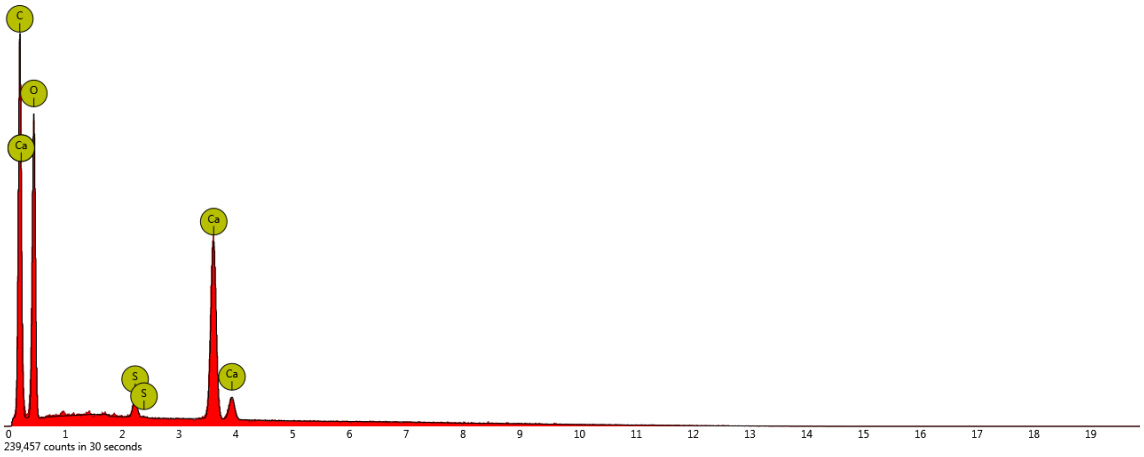
Disabled elements: B, Sb

5. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	45.86	48.90
6	C	Carbon	49.90	39.94
20	Ca	Calcium	3.95	10.56
16	S	Sulfur	0.28	0.60

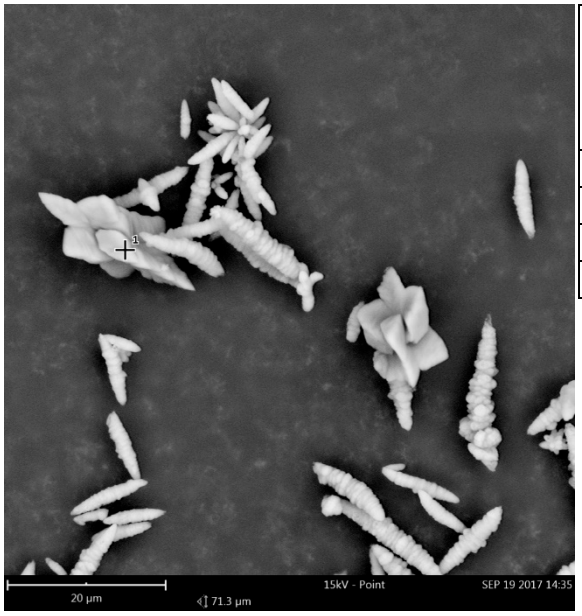
FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:30



Disabled elements: B, I, Sb

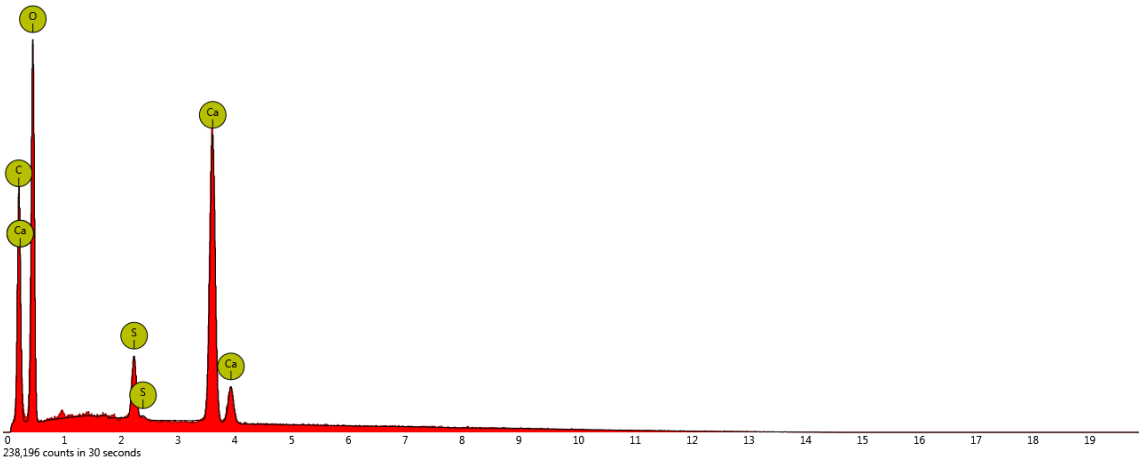
Image 10

1. spot



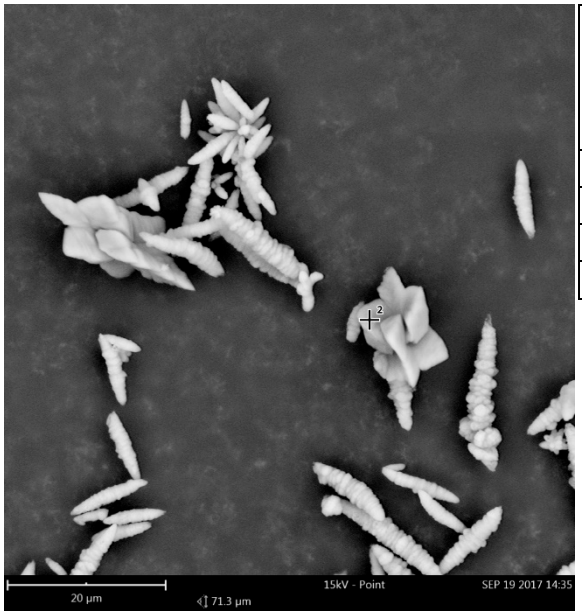
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	54.92	54.14
6	C	Carbon	37.56	27.79
20	Ca	Calcium	6.50	16.06
16	S	Sulfur	1.02	2.01

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:35



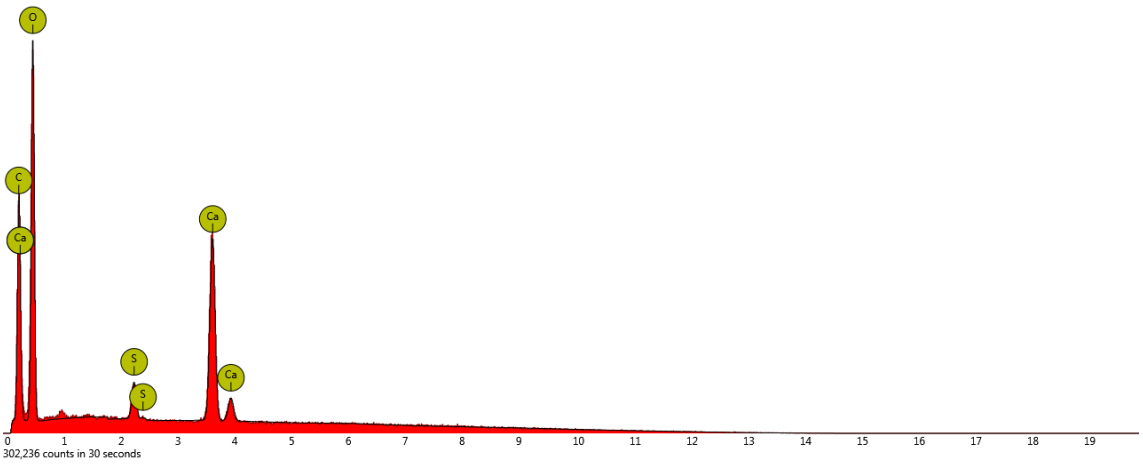
Disabled elements: B, I, Sb

2. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	55.96	57.11
6	C	Carbon	38.74	29.69
20	Ca	Calcium	4.62	11.82
16	S	Sulfur	0.68	1.38

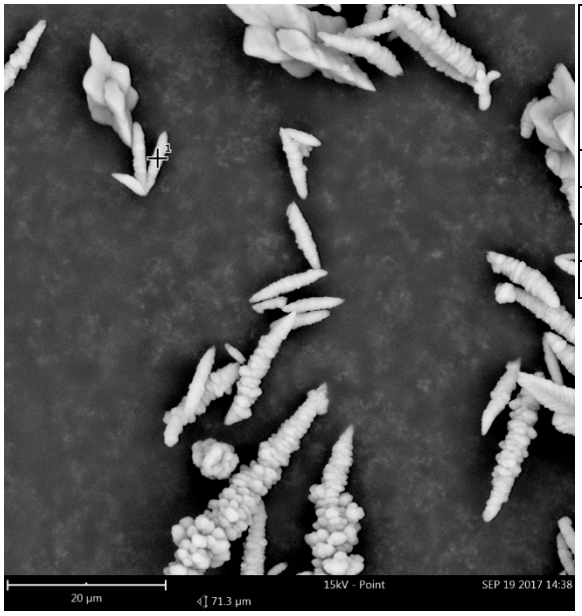
FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:35



Disabled elements: B, Sb

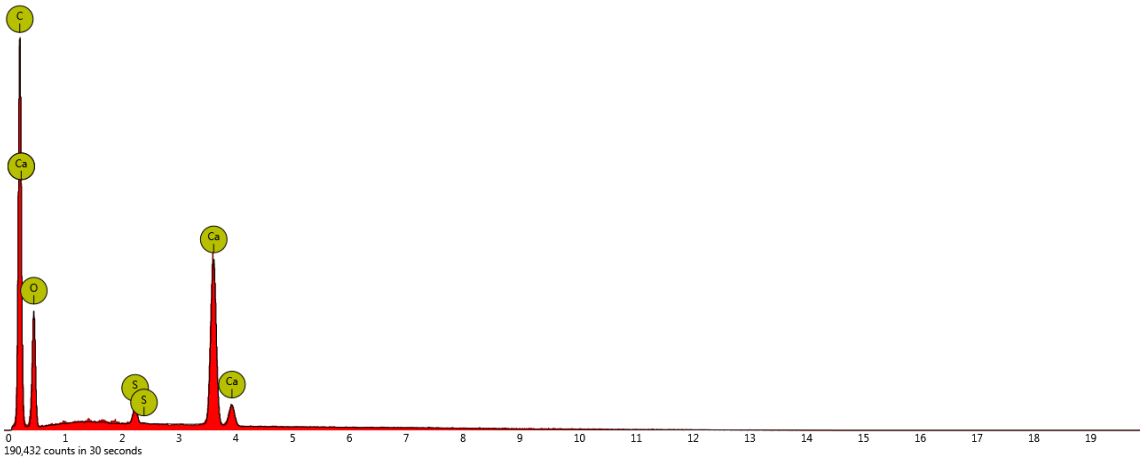
Image 11

1. spot



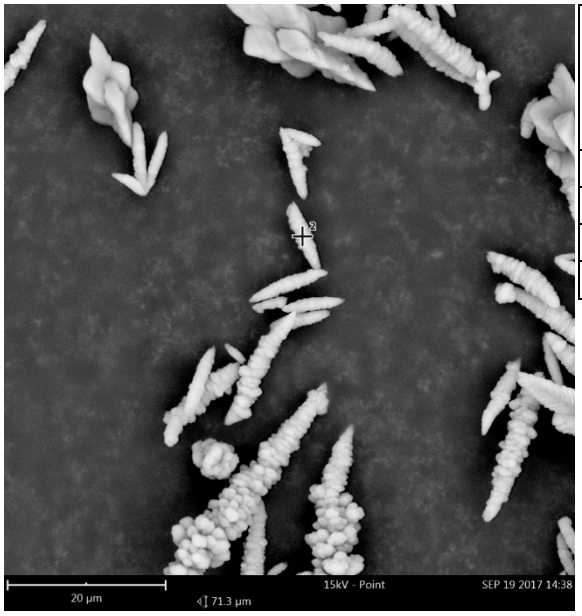
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	63.19	51.43
8	O	Oxygen	31.40	34.05
20	Ca	Calcium	5.08	13.79
16	S	Sulfur	0.34	0.73

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:38



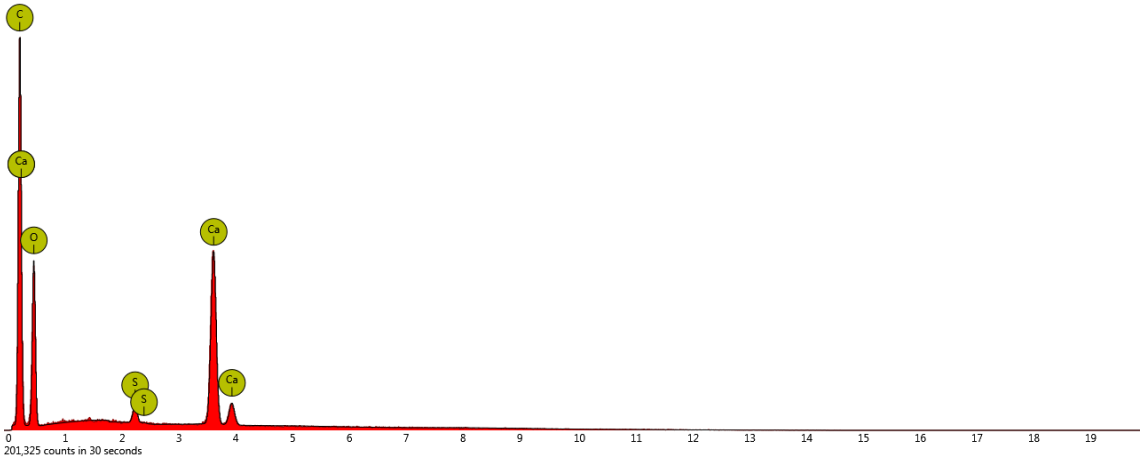
Disabled elements: B, Sb

2. spot



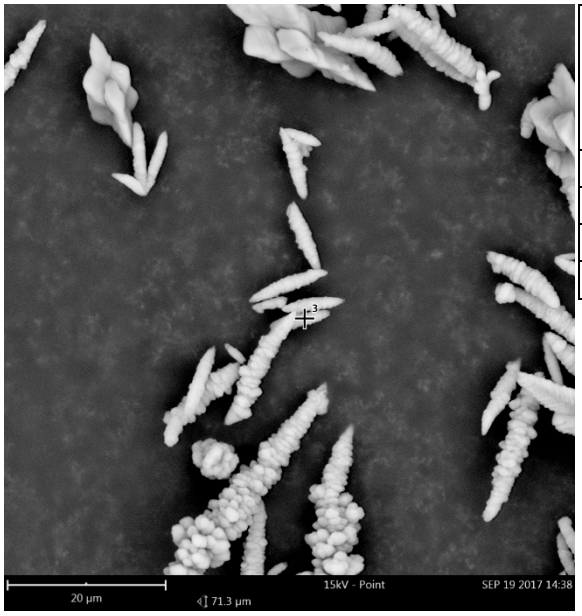
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	58.47	47.27
8	O	Oxygen	36.49	39.30
20	Ca	Calcium	4.71	12.71
16	S	Sulfur	0.34	0.72

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:38



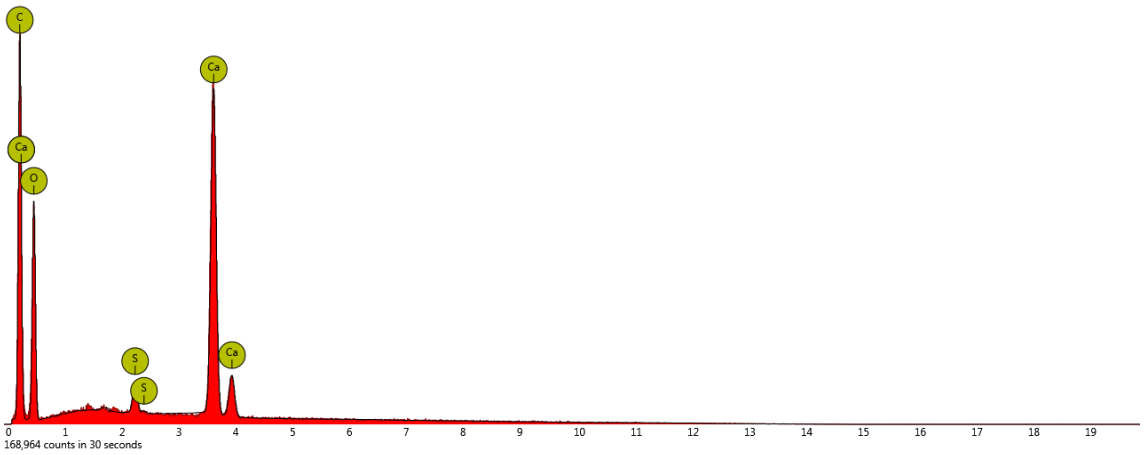
Disabled elements: B, Sb

3. spot



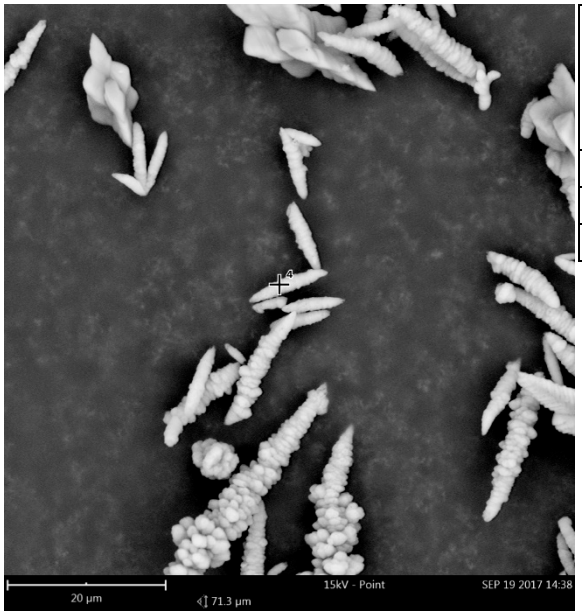
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	40.38	40.91
6	C	Carbon	51.73	39.33
20	Ca	Calcium	7.39	18.74
16	S	Sulfur	0.50	1.02

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:38



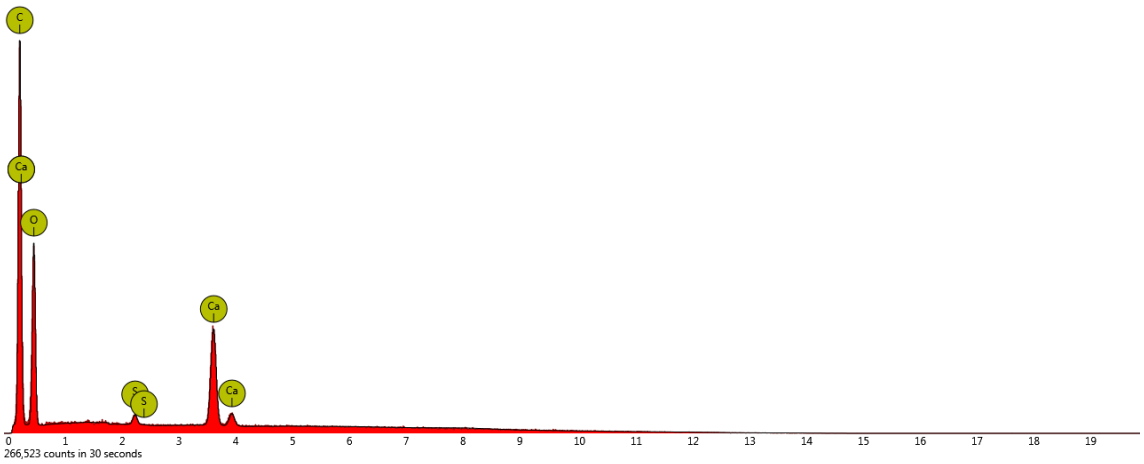
Disabled elements: B

4. spot



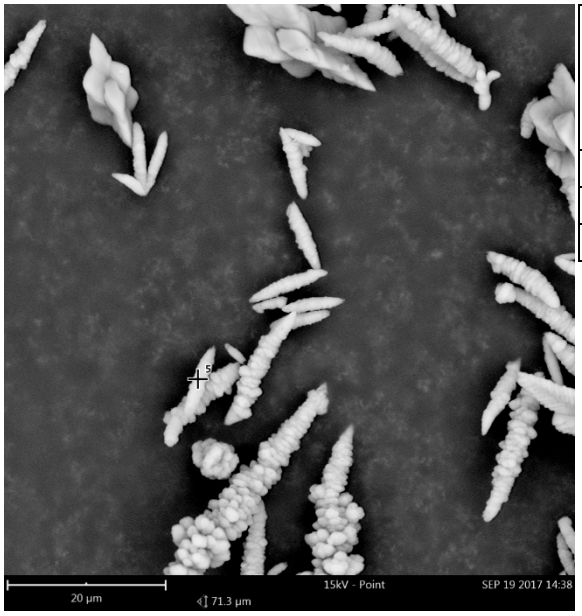
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	58.66	49.10
8	O	Oxygen	38.41	42.83
20	Ca	Calcium	2.73	7.62

FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:38



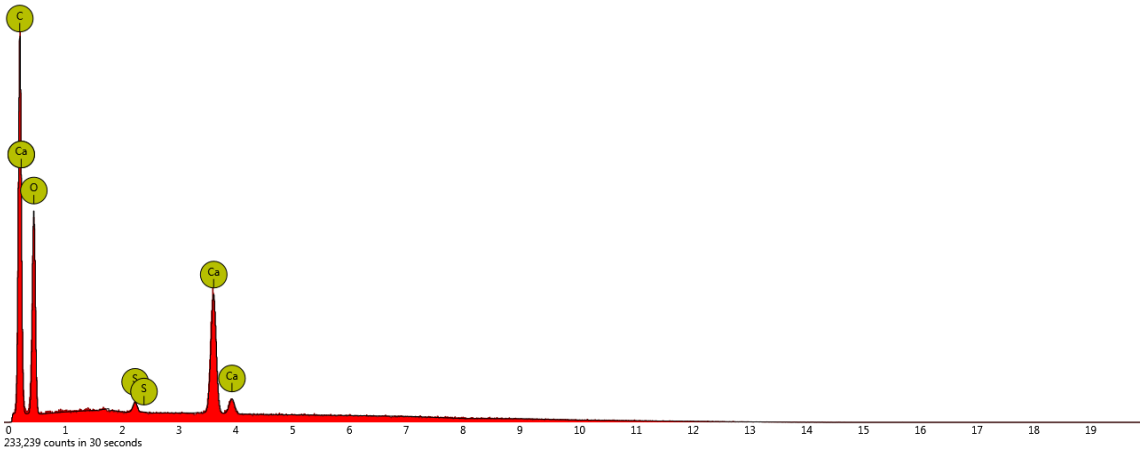
Disabled elements: B, Sb

5. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	56.28	46.41
8	O	Oxygen	40.30	44.28
20	Ca	Calcium	3.22	8.87

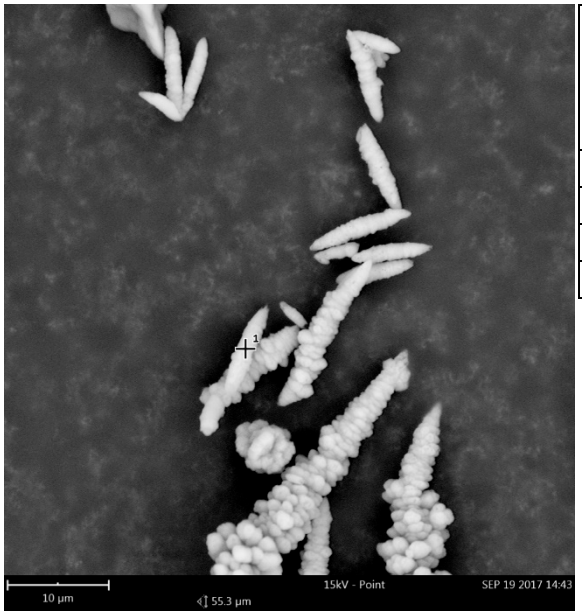
FOV: 71.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:38



Disabled elements: B, Sb

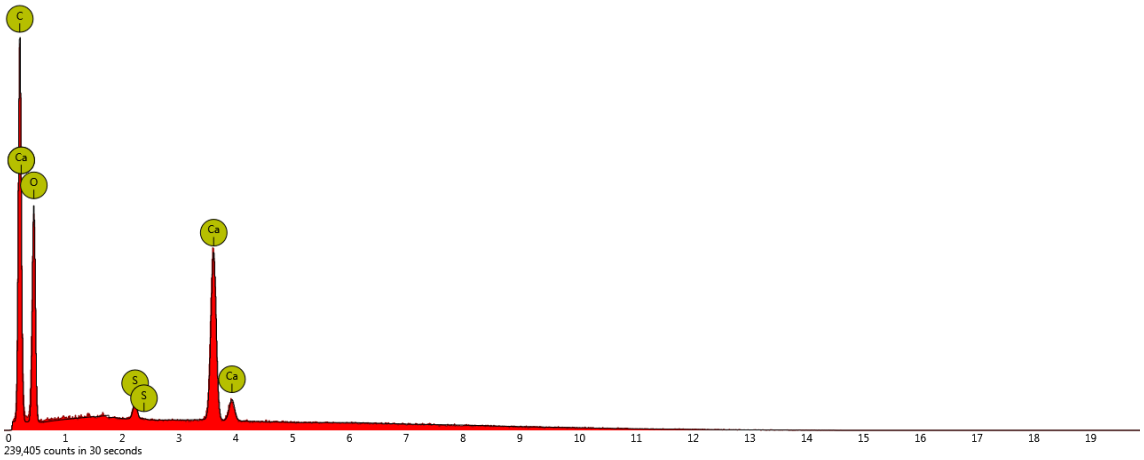
Image 12

1. spot



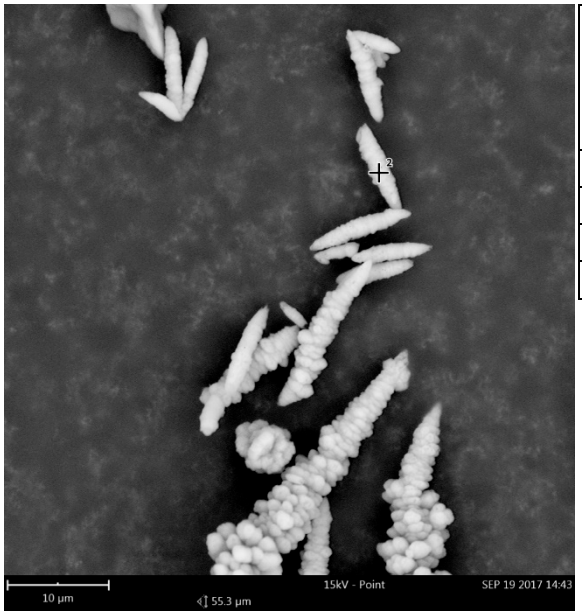
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	54.68	44.12
8	O	Oxygen	40.81	43.87
20	Ca	Calcium	4.24	11.41
16	S	Sulfur	0.28	0.60

FOV: 55.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:43



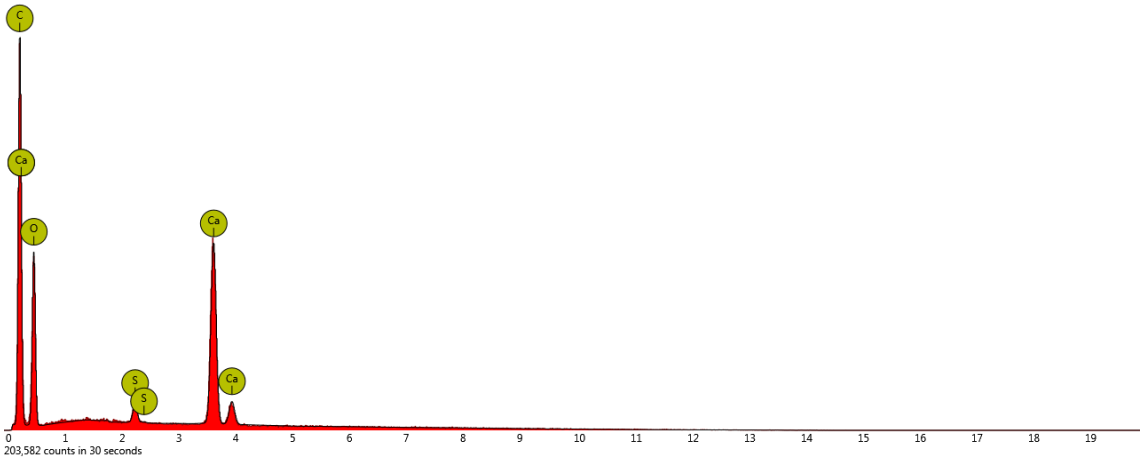
Disabled elements: B, N, Sb

2. spot



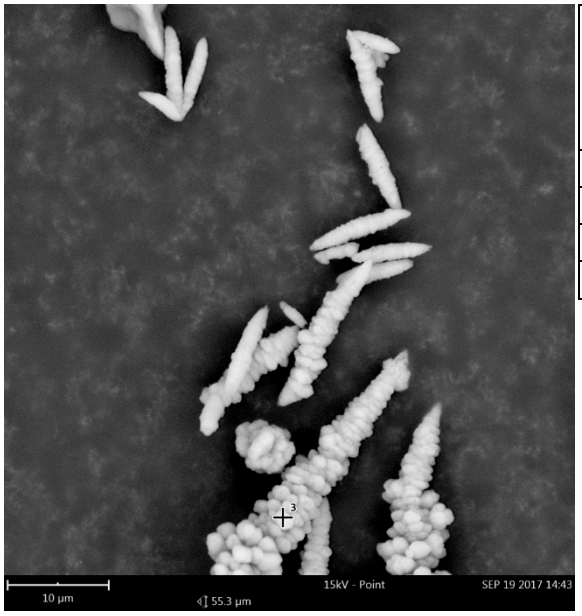
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	57.68	46.44
8	O	Oxygen	37.14	39.84
20	Ca	Calcium	4.82	12.95
16	S	Sulfur	0.36	0.77

FOV: 55.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:43



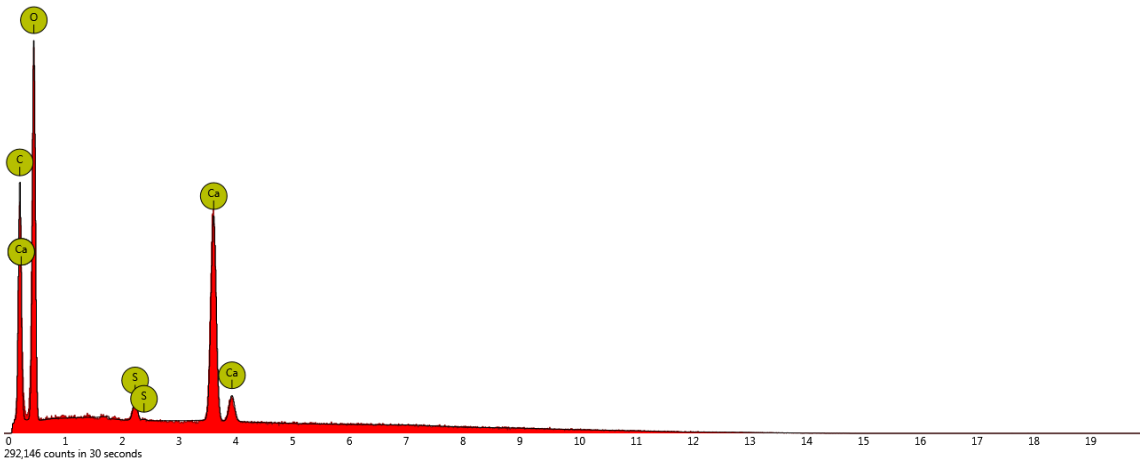
Disabled elements: B, Sb

3. spot



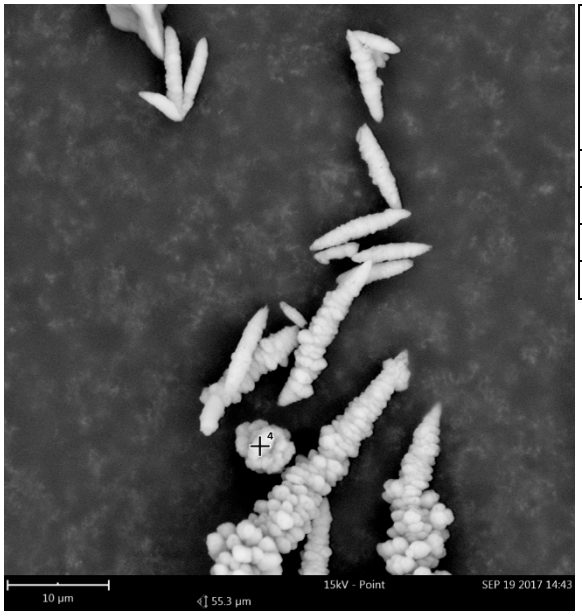
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	57.27	57.77
6	C	Carbon	37.05	28.06
20	Ca	Calcium	5.32	13.44
16	S	Sulfur	0.36	0.73

FOV: 55.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:43



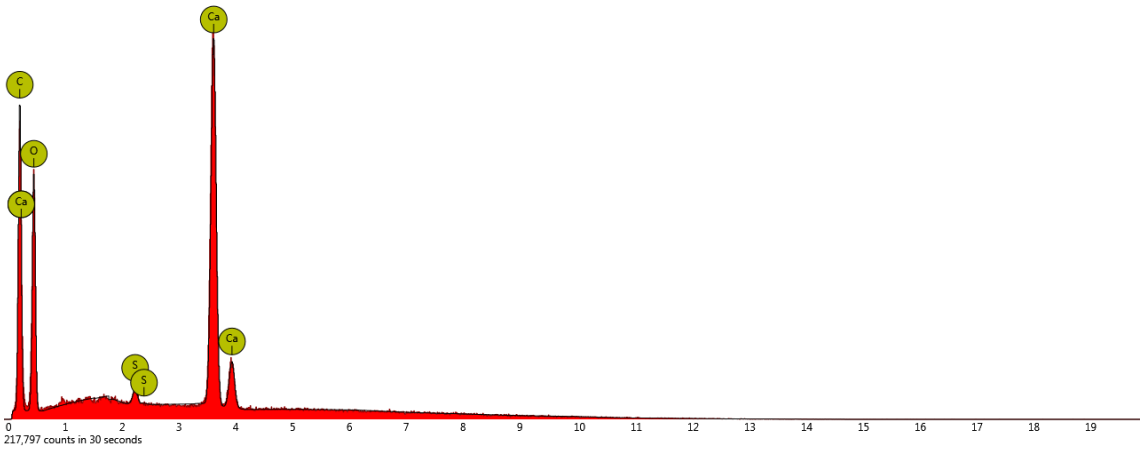
Disabled elements: B, Sb

4. spot



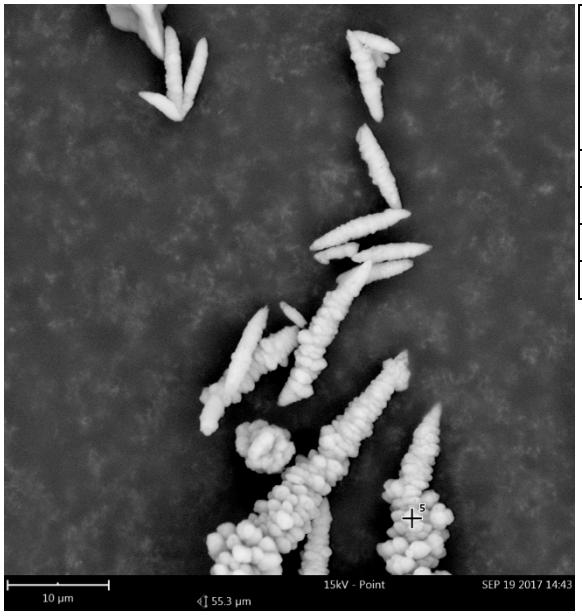
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	46.63	45.15
6	C	Carbon	43.84	31.87
20	Ca	Calcium	9.25	22.44
16	S	Sulfur	0.28	0.54

FOV: 55.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:43



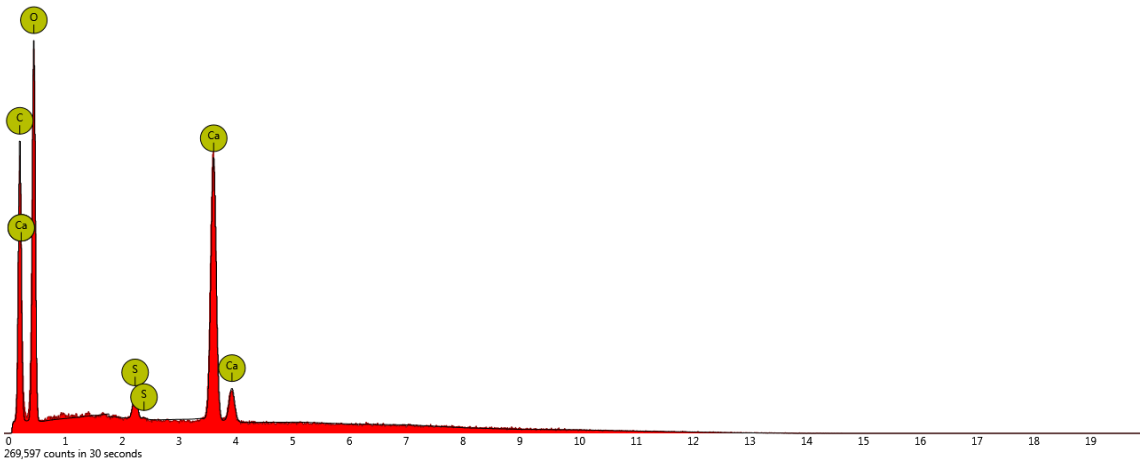
Disabled elements: B, Sb

5. spot



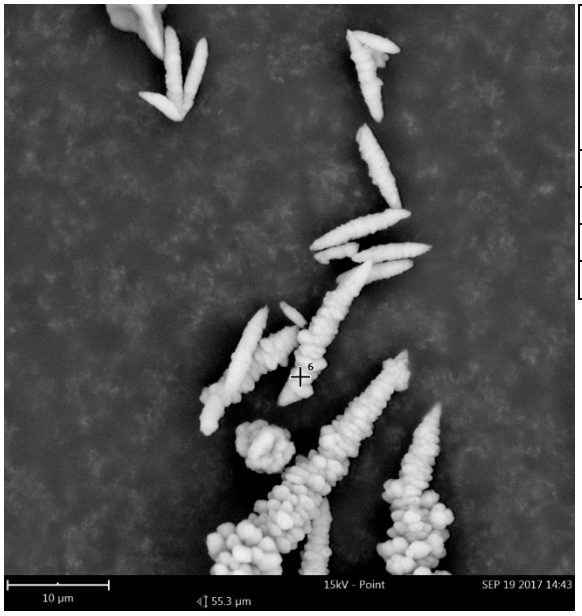
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	54.76	54.85
6	C	Carbon	38.78	29.16
20	Ca	Calcium	6.03	15.13
16	S	Sulfur	0.43	0.86

FOV: 55.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:43



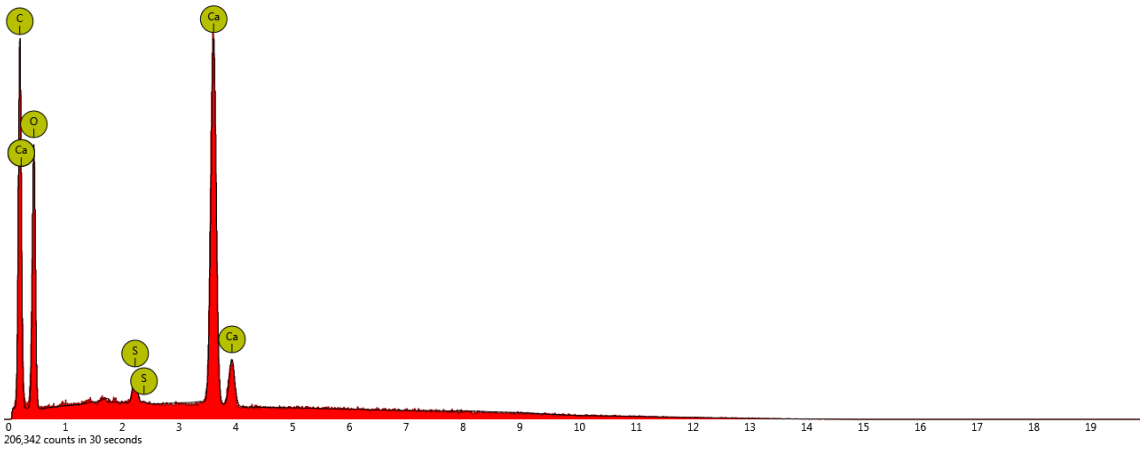
Disabled elements: B, Sb

6. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	44.09	43.96
6	C	Carbon	47.65	35.66
20	Ca	Calcium	7.81	19.50
16	S	Sulfur	0.44	0.89

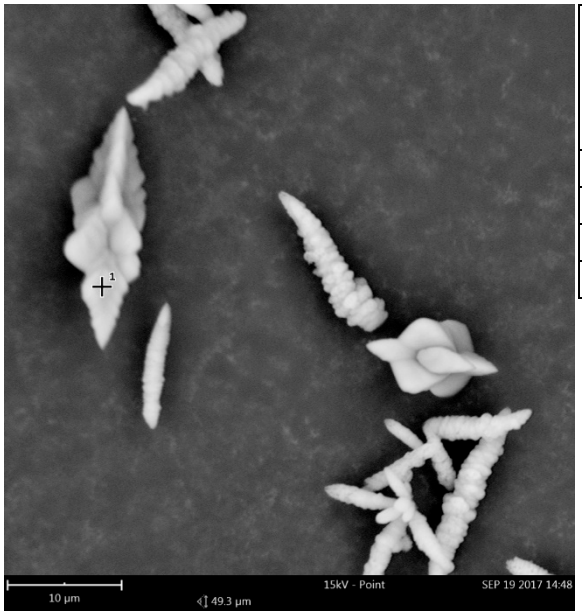
FOV: 55.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:43



Disabled elements: B, Sb

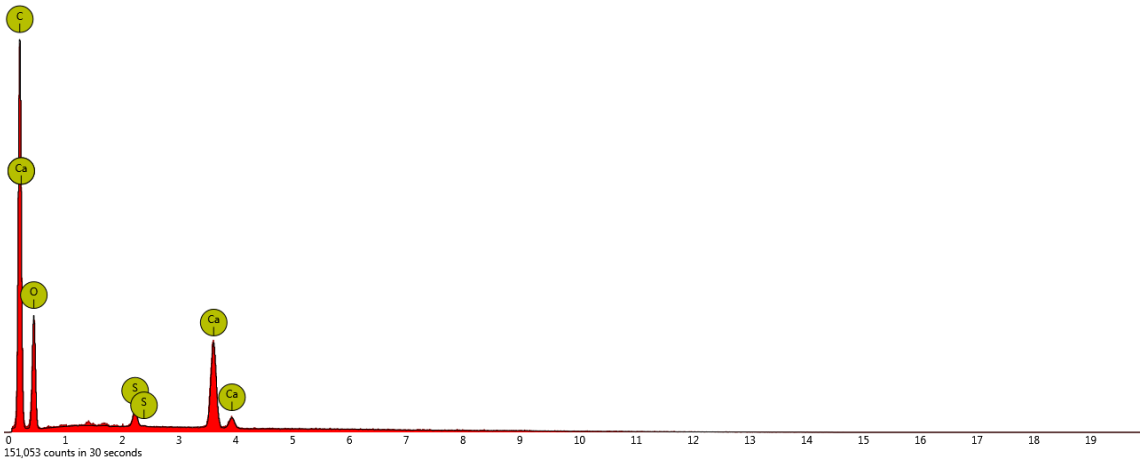
Image 13

1. spot



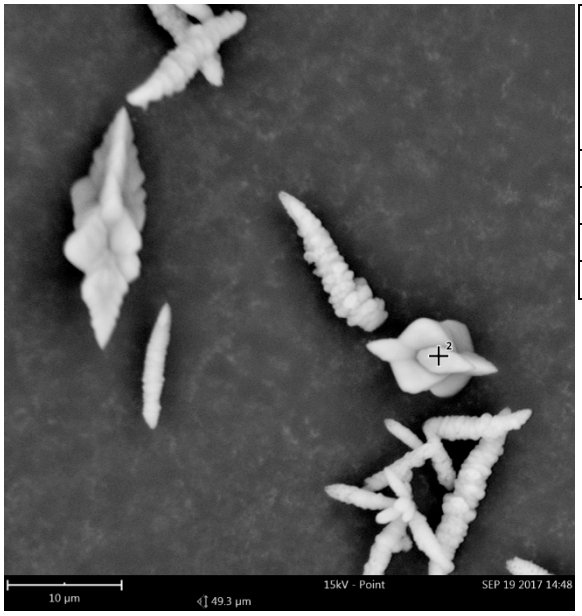
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	65.86	56.13
8	O	Oxygen	31.04	35.24
20	Ca	Calcium	2.75	7.83
16	S	Sulfur	0.35	0.80

FOV: 49.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:48



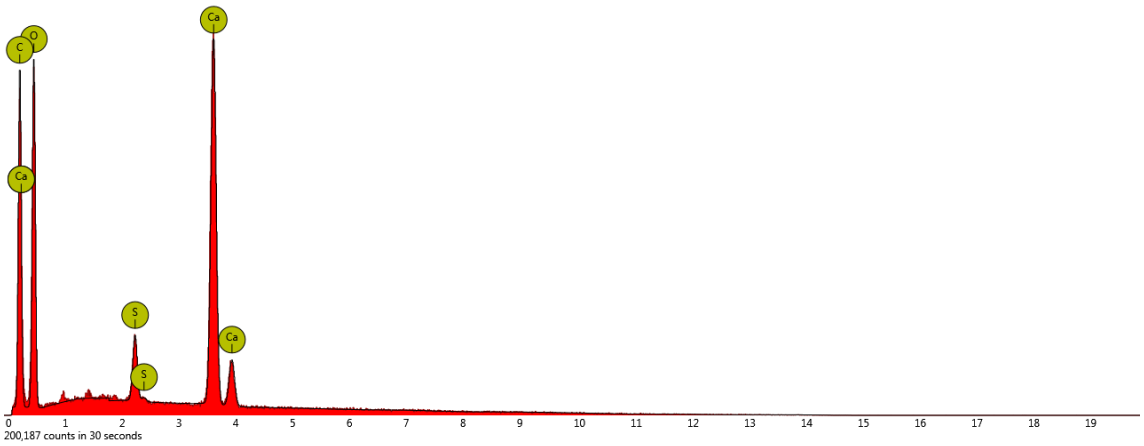
Disabled elements: B, Sb

2. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	49.28	48.65
6	C	Carbon	42.51	31.50
20	Ca	Calcium	7.28	18.00
16	S	Sulfur	0.93	1.84

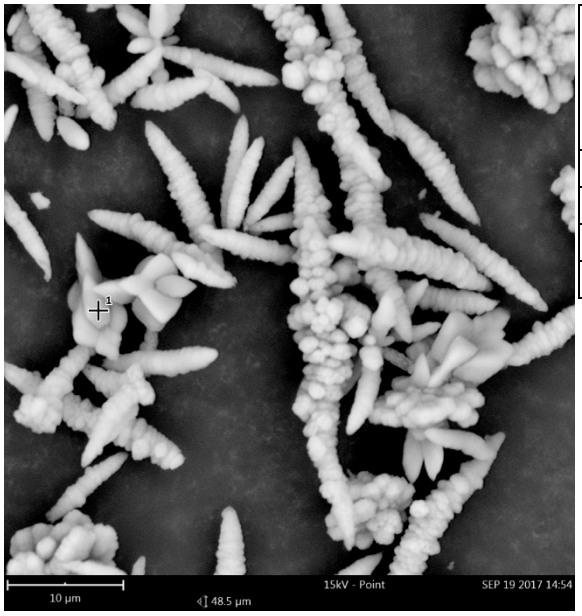
FOV: 49.3 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:48



Disabled elements: B, Sb

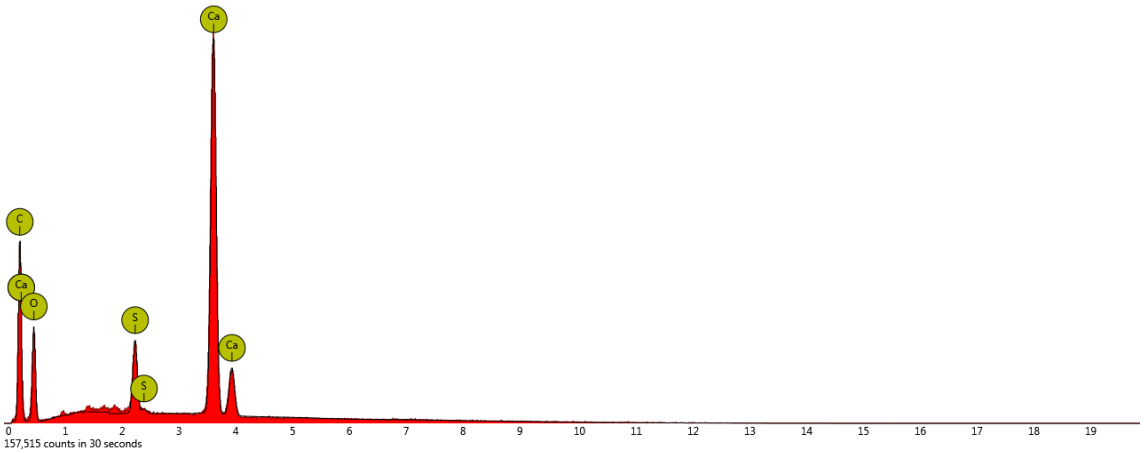
Image 14

1. spot



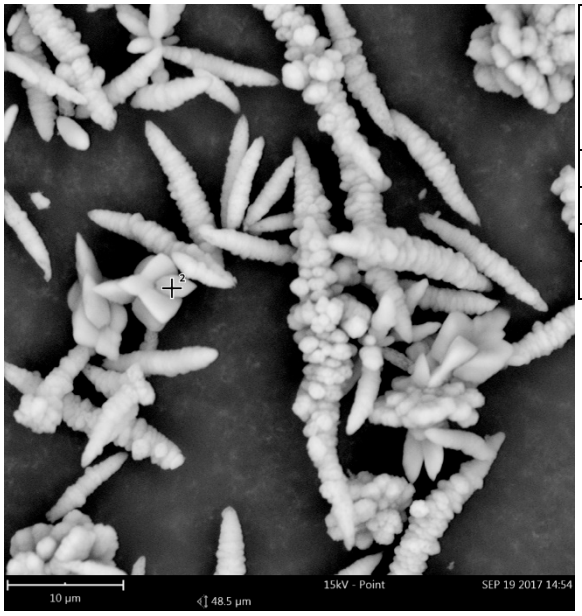
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
6	C	Carbon	48.94	33.07
20	Ca	Calcium	14.19	31.99
8	O	Oxygen	34.92	31.43
16	S	Sulfur	1.95	3.51

FOV: 48.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:54



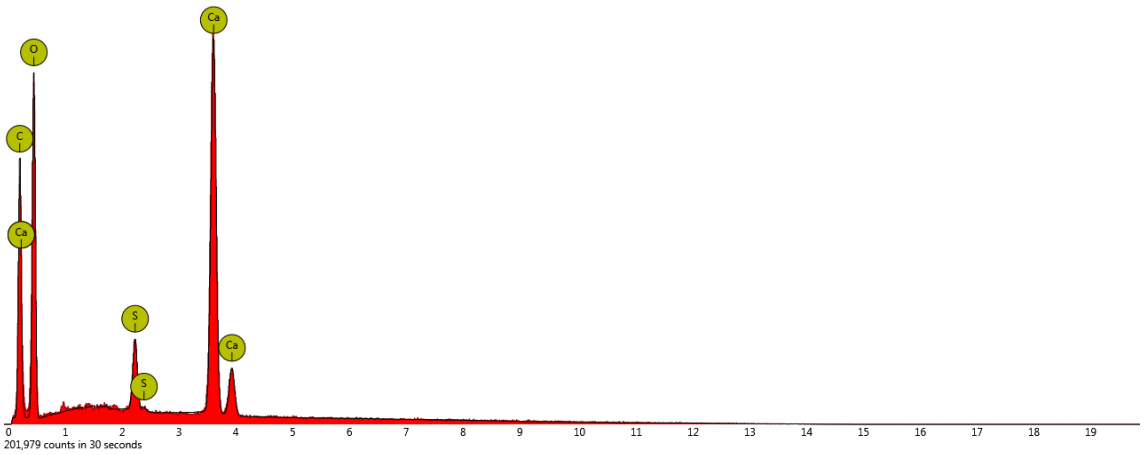
Disabled elements: B, Sb

2. spot



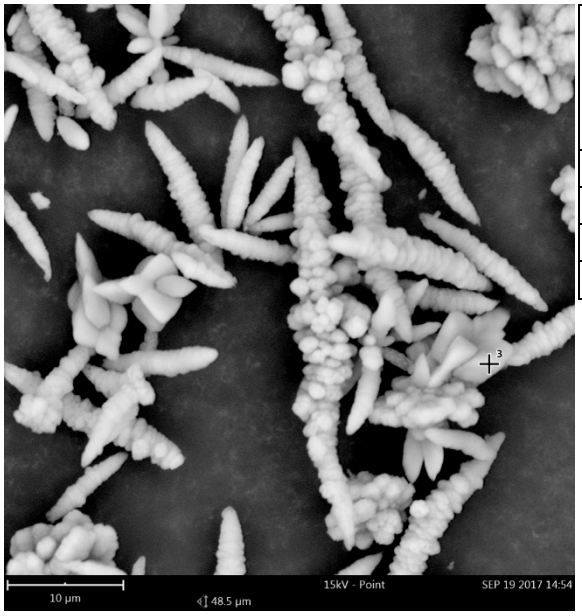
Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	52.93	50.80
6	C	Carbon	37.68	27.15
20	Ca	Calcium	8.27	19.88
16	S	Sulfur	1.13	2.17

FOV: 48.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:54



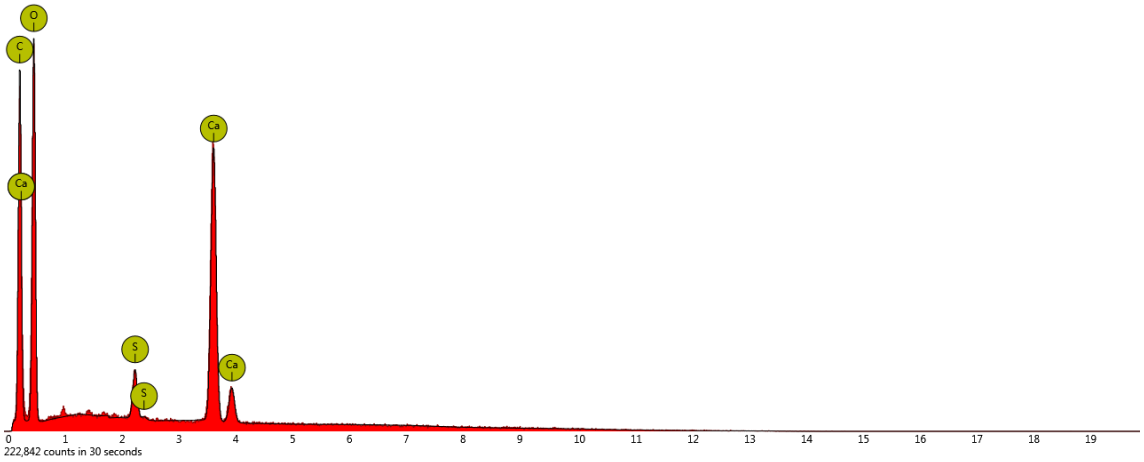
Disabled elements: B, Sb

3. spot



Element Number	Element Symbol	Element Name	Atomic Conc.	Weight Conc.
8	O	Oxygen	50.46	51.43
6	C	Carbon	43.37	33.18
20	Ca	Calcium	5.47	13.96
16	S	Sulfur	0.70	1.43

FOV: 48.5 µm, Mode: 15kV - Point, Detector: BSD Full, Time: SEP 19 2017 14:54



Disabled elements: B, Sb