# Martian simulant: MGS-1

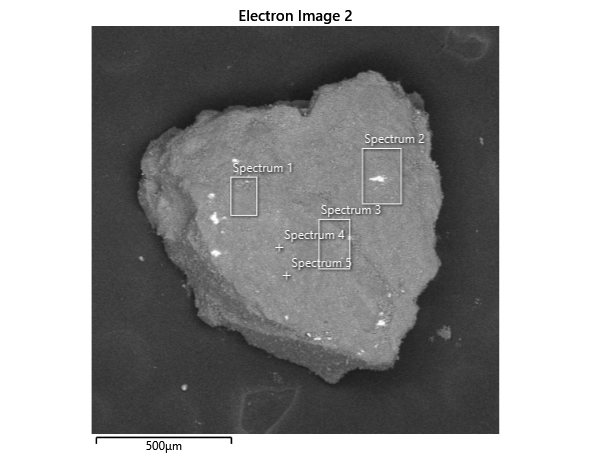
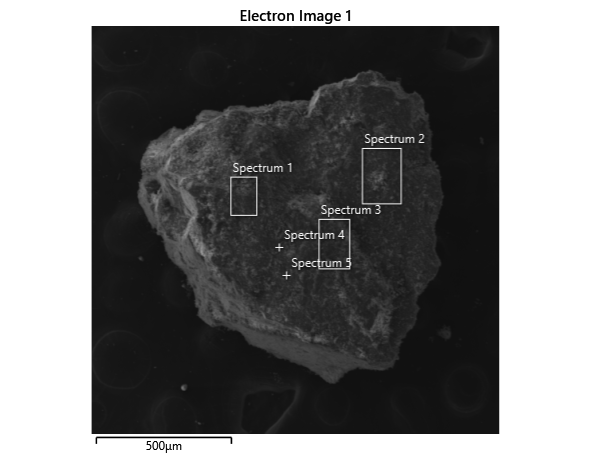
**Samples:**

Grains >1 mm of MGS-1; black and red crystals.

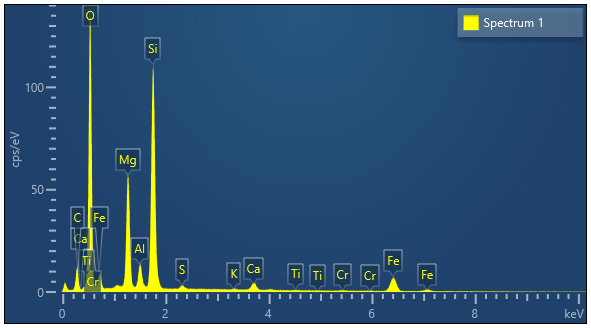


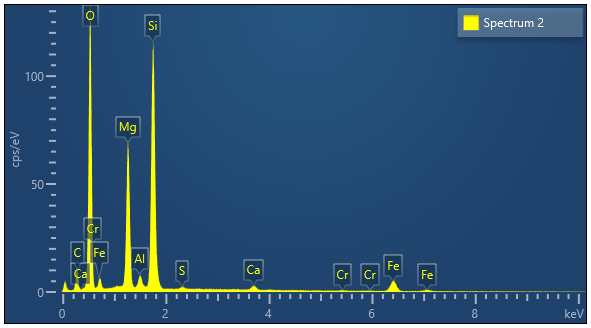
**Black crystals:**

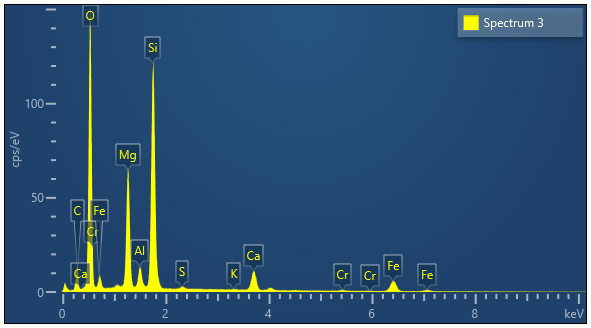
Crystals of pyroxene with traces of phyllosilicates.

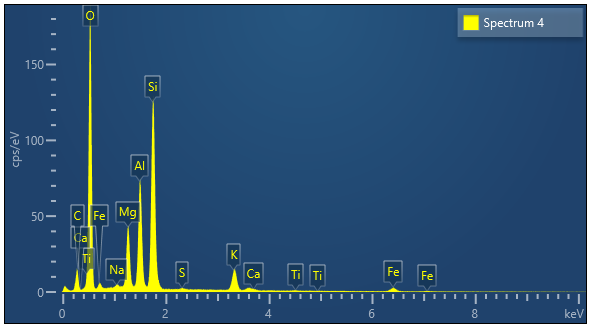


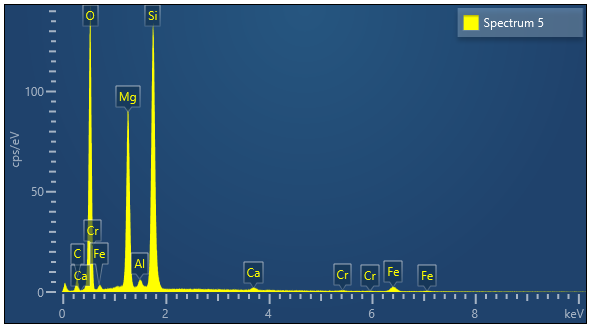
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element (ox%)** | **Na2O** | **MgO** | **Al2O3** | **SiO2** | **SO3** | **K2O** | **CaO** | **TiO2** | **FeO** | **Total** |
| **Spectrum 1** | 0,25 | 17,65 | 4,42 | 53,7 | 1,33 | 0,28 | 2,93 | 0,37 | 19,07 | 100 |
| **Spectrum 2** | 0 | 22 | 2,13 | 58,9 | 0,77 | 0 | 1,68 | 0 | 14,53 | 100 |
| **Spectrum 3** | 0,26 | 18,16 | 3,76 | 54,06 | 0,79 | 0,15 | 7,95 | 0,29 | 14,59 | 100 |
| **Spectrum 4** | 0,46 | 11,46 | 23,67 | 52,76 | 0,47 | 6,11 | 0,52 | 0,26 | 4,29 | 100 |
| **Spectrum 5** | 0,16 | 29,58 | 1,48 | 62,73 | 0 | 0 | 0,87 | 0 | 5,18 | 100 |

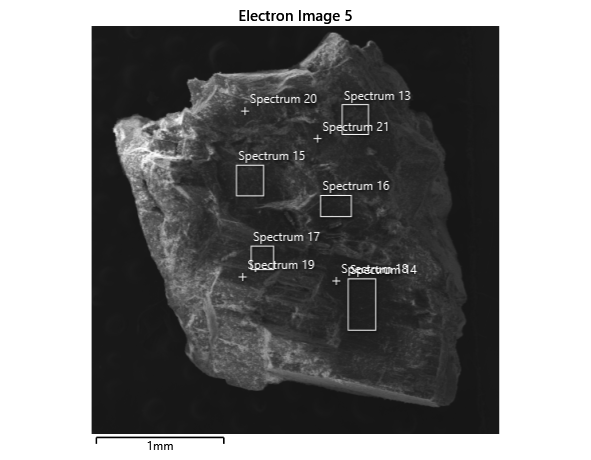




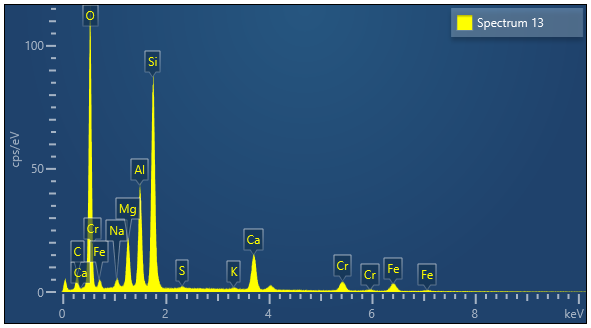


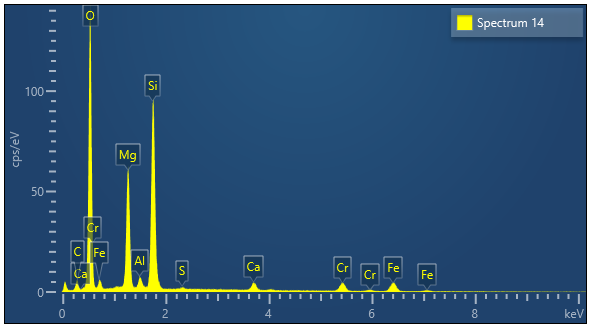


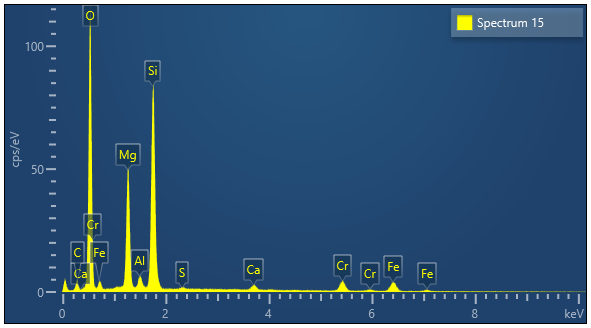


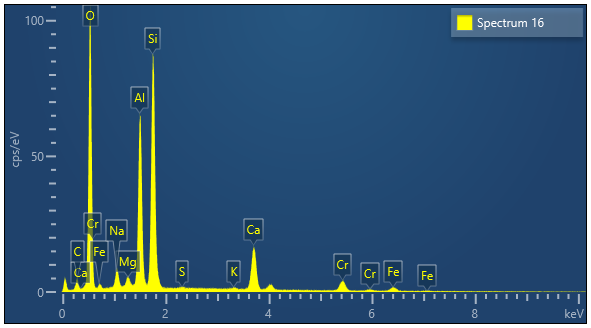


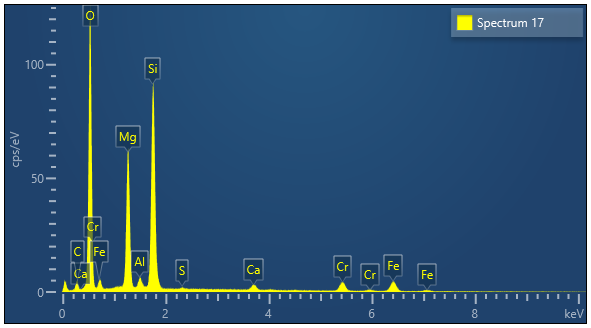
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element (ox%)** | **Na2O** | **MgO** | **Al2O3** | **SiO2** | **SO3** | **K2O** | **CaO** | **TiO2** | **FeO** | **Total** |
| **Spectrum 13** | 1,45 | 8,44 | 19,47 | 49,67 | 0,55 | 0,32 | 11,69 | 0 | 8,41 | 100 |
| **Spectrum 14** | 0,21 | 25,8 | 2,67 | 55,66 | 0,68 | 0 | 3,03 | 0 | 11,95 | 100 |
| **Spectrum 15** | 0,17 | 24,79 | 2,81 | 57,47 | 0,74 | 0 | 1,87 | 0 | 12,15 | 100 |
| **Spectrum 16** | 2,85 | 1,37 | 28,65 | 49,94 | 0,37 | 0,28 | 12,87 | 0 | 3,67 | 100 |
| **Spectrum 17** | 0 | 27,31 | 2,22 | 55,65 | 0,53 | 0 | 1,99 | 0 | 12,3 | 100 |
| **Spectrum 18** | 0 | 24,15 | 1,4 | 62,47 | 0,52 | 0 | 0,61 | 0 | 10,85 | 100 |
| **Spectrum 19** | 0 | 30,54 | 1,44 | 56,72 | 0,32 | 0 | 0,77 | 0 | 10,21 | 100 |
| **Spectrum 20** | 0 | 29,72 | 1,42 | 57,88 | 0 | 0 | 0,92 | 0 | 10,07 | 100 |
| **Spectrum 21** | 0 | 30,32 | 1,46 | 57,52 | 0 | 0 | 2,55 | 0 | 8,14 | 100 |

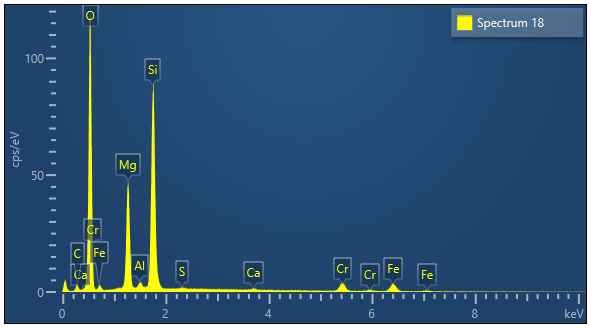


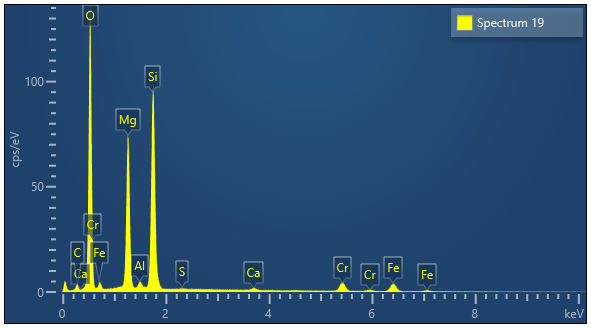


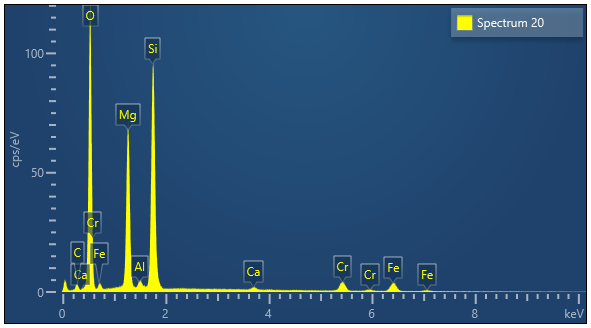


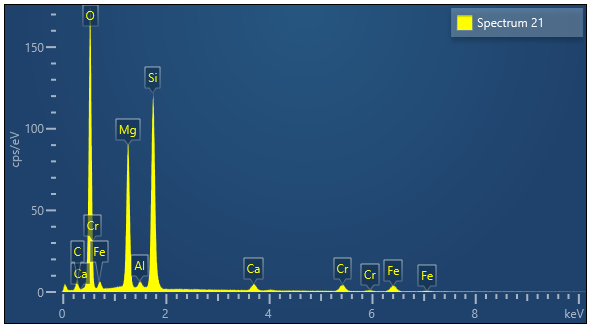


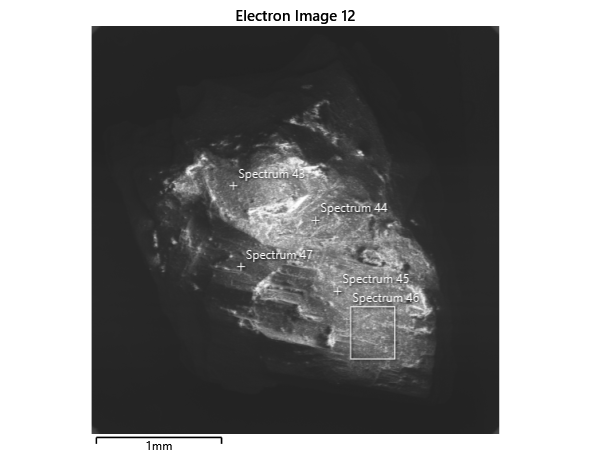
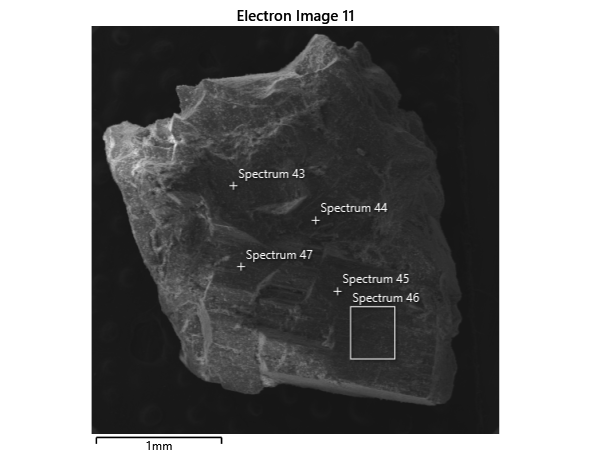




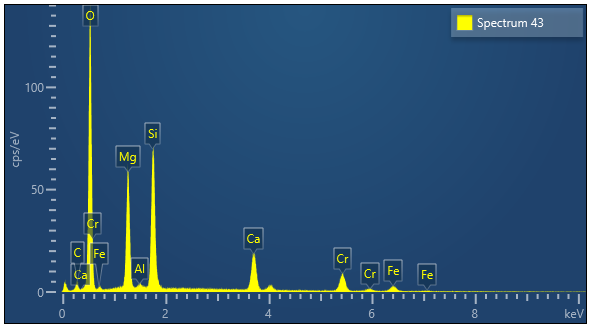


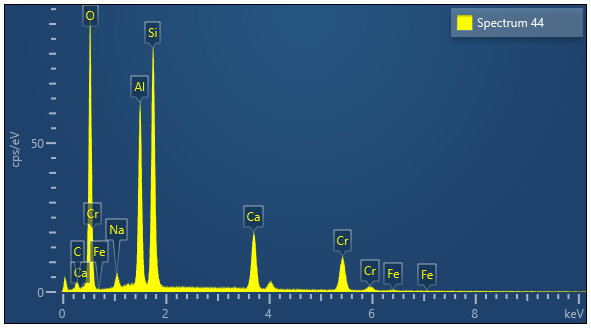


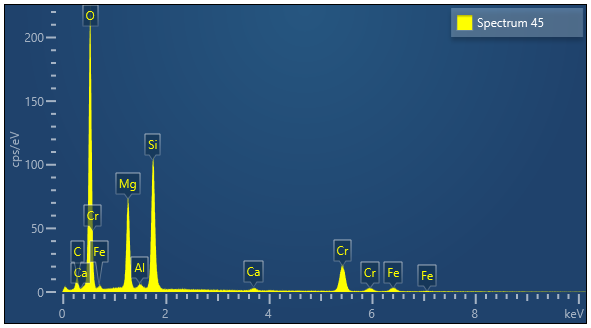


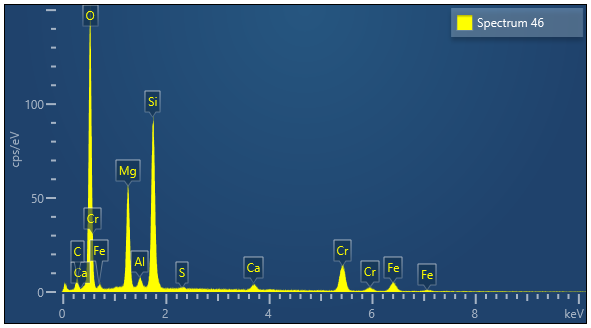


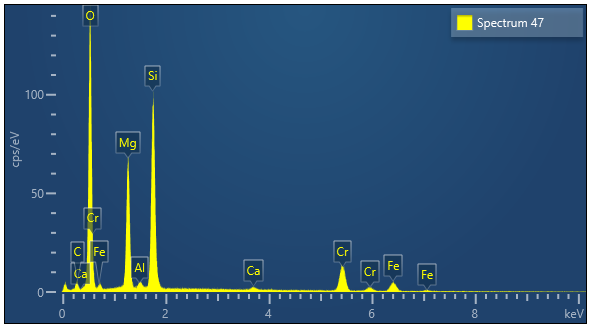
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element (ox%)** | **Na2O** | **MgO** | **Al2O3** | **SiO2** | **SO3** | **K2O** | **CaO** | **TiO2** | **FeO** | **Total** |
| **Spectrum 43** | 0 | 28 | 0,78 | 46,6 | 0 | 0 | 17,1 | 0 | 7,51 | 100 |
| **Spectrum 44** | 2,1 | 0 | 29,24 | 50,85 | 0 | 0 | 17,1 | 0 | 0,71 | 100 |
| **Spectrum 45** | 0 | 29,03 | 1,49 | 60,04 | 0 | 0 | 1,62 | 0 | 7,82 | 100 |
| **Spectrum 46** | 0 | 24,59 | 2,73 | 56,02 | 0,8 | 0 | 2,4 | 0 | 13,45 | 100 |
| **Spectrum 47** | 0 | 27,99 | 1,32 | 57,36 | 0 | 0 | 0,99 | 0 | 12,35 | 100 |





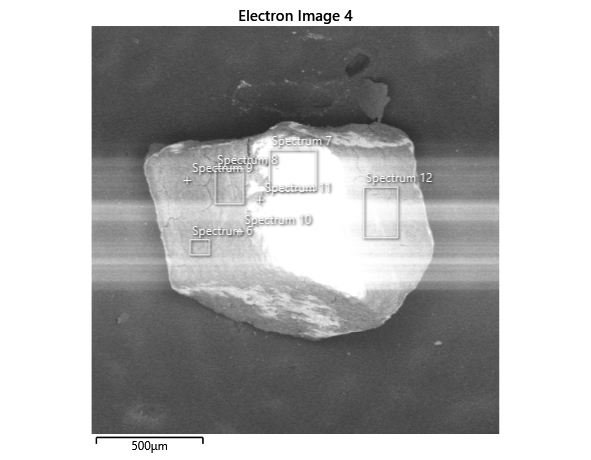
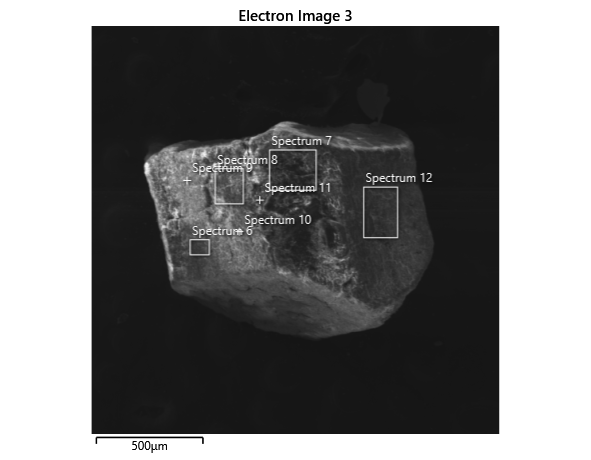




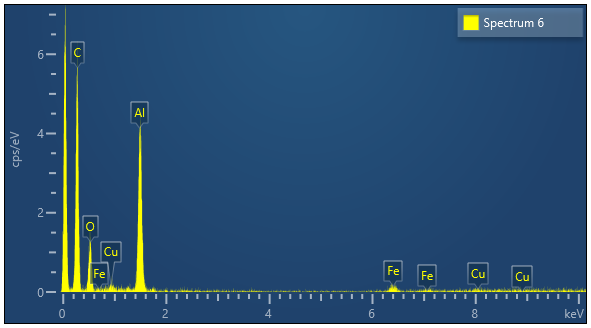


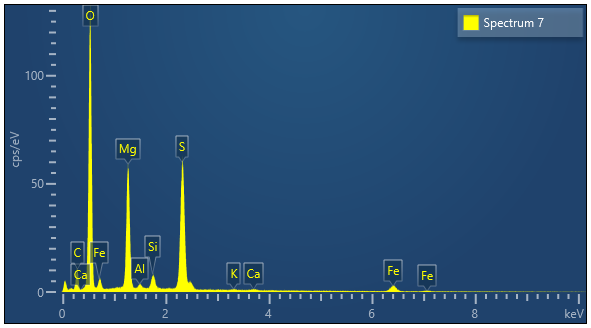
**Red crystals:**

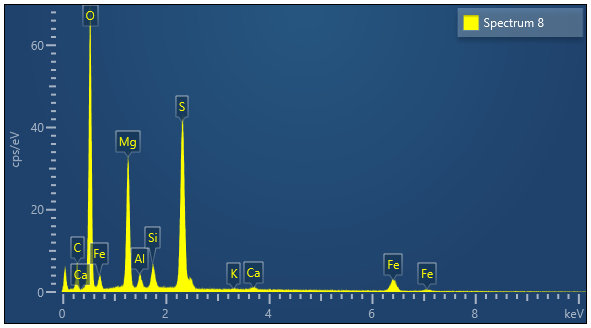
Crystals of gypsum or Al-oxides covered by gypsum, with patina of plagioclase or talc.

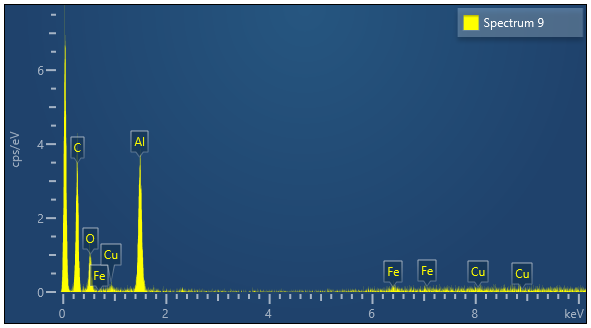


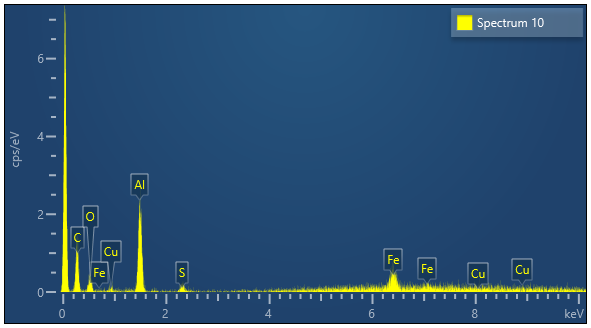
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element (ox%)** | **Na2O** | **MgO** | **Al2O3** | **SiO2** | **SO3** | **K2O** | **CaO** | **TiO2** | **FeO** | **Total** |
| **Spectrum 7** | 0 | 29,04 | 1,09 | 4,35 | 56,24 | 0,28 | 0,5 | 0 | 8,51 | 100 |
| **Spectrum 8** | 0 | 23,4 | 2,83 | 5,1 | 55,2 | 0,23 | 0,74 | 0 | 12,5 | 100 |
| **Spectrum 9** | 0 | 0 | 87,44 | 0 | 0 | 0 | 0 | 0 | 12,56 | 100 |
| **Spectrum 10** | 0 | 0 | 48,68 | 0 | 6,14 | 0 | 0 | 0 | 45,18 | 100 |
| **Spectrum 11** | 0 | 28,38 | 0 | 0,27 | 71,35 | 0 | 0 | 0 | 0 | 100 |
| **Spectrum 12** | 0 | 32,83 | 1,12 | 4,3 | 53,63 | 0 | 0,51 | 0 | 7,62 | 100 |

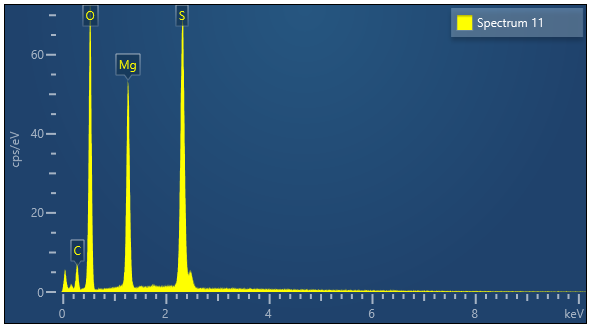


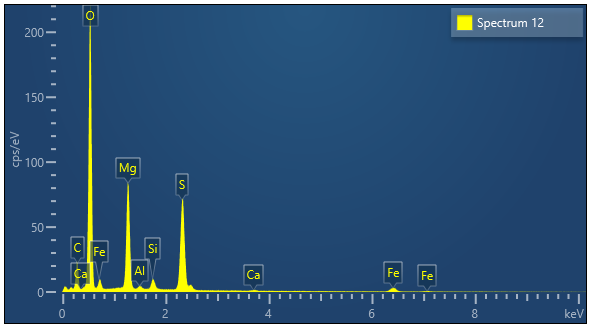


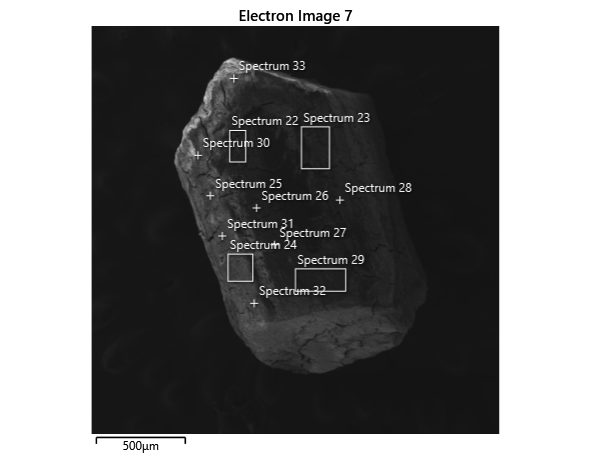




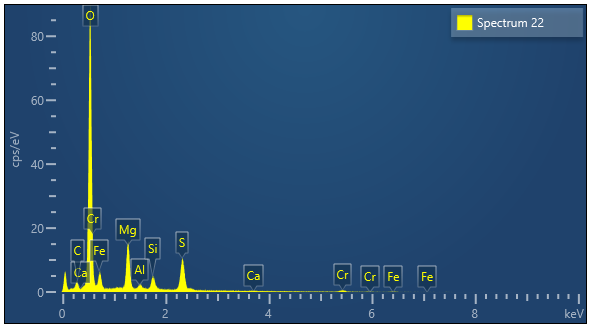


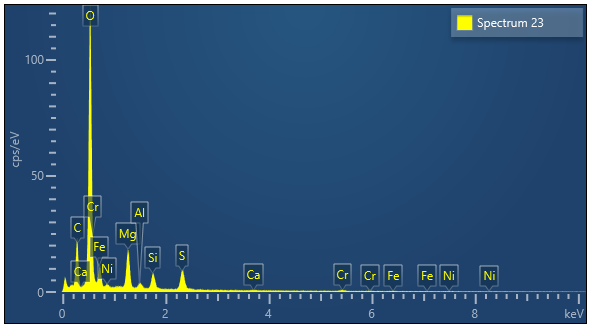


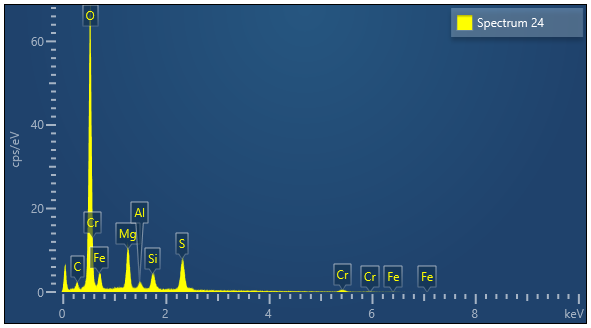


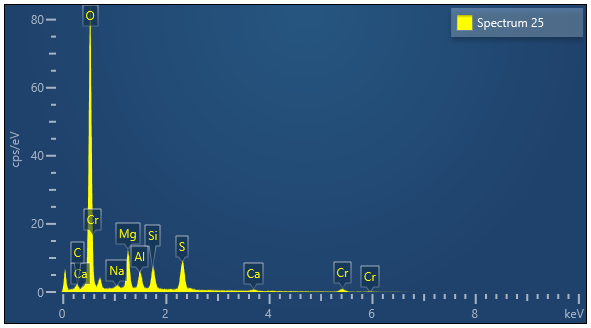


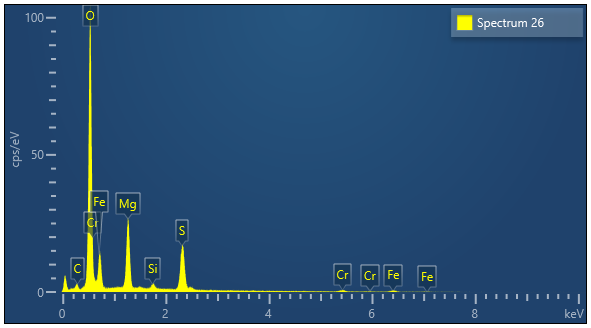
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element (ox%)** | **Na2O** | **MgO** | **Al2O3** | **SiO2** | **SO3** | **K2O** | **CaO** | **TiO2** | **FeO** | **Total** |
| **Spectrum 22** | 0 | 33,74 | 3,81 | 13,35 | 47,06 | 0 | 0,57 | 0 | 1,47 | 100 |
| **Spectrum 23** | 0 | 33,98 | 5,48 | 20,54 | 37,31 | 0 | 0,9 | 0 | 1,79 | 100 |
| **Spectrum 24** | 0 | 30,61 | 5,8 | 16,7 | 46,89 | 0 | 0 | 0 | 0 | 100 |
| **Spectrum 25** | 1,64 | 24,07 | 13,55 | 20,22 | 38,79 | 0 | 1,73 | 0 | 0 | 100 |
| **Spectrum 26** | 0 | 38,92 | 0,74 | 3,93 | 50,92 | 0 | 0 | 0 | 5,48 | 100 |
| **Spectrum 27** | 1,59 | 24,91 | 3,94 | 10,96 | 46,73 | 0 | 8,34 | 1,22 | 2,32 | 100 |
| **Spectrum 28** | 12,23 | 4,2 | 21,52 | 55,98 | 4,68 | 0,56 | 0,83 | 0 | 0 | 100 |
| **Spectrum 29** | 0 | 33,48 | 6,59 | 20,41 | 38,57 | 0 | 0 | 0 | 0,95 | 100 |
| **Spectrum 30** | 0 | 35,01 | 2,3 | 12,52 | 48,98 | 0 | 0 | 0 | 1,2 | 100 |
| **Spectrum 31** | 0 | 28,24 | 3,01 | 5,2 | 62,16 | 0 | 0 | 0 | 1,39 | 100 |
| **Spectrum 32** | 0 | 35,2 | 2,7 | 14,62 | 47,48 | 0 | 0 | 0 | 0 | 100 |
| **Spectrum 33** | 0 | 15,07 | 15,77 | 44,58 | 15,15 | 0 | 1,81 | 0 | 7,62 | 100 |

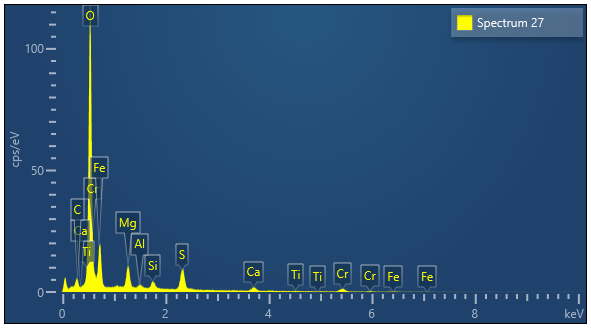


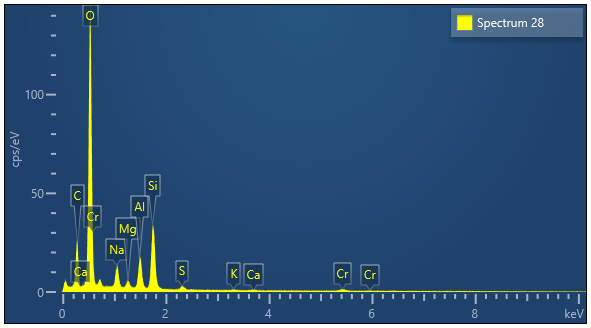


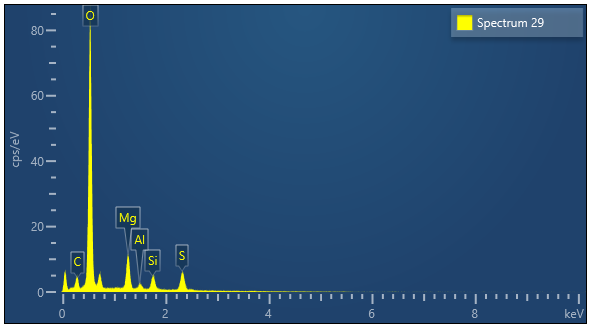


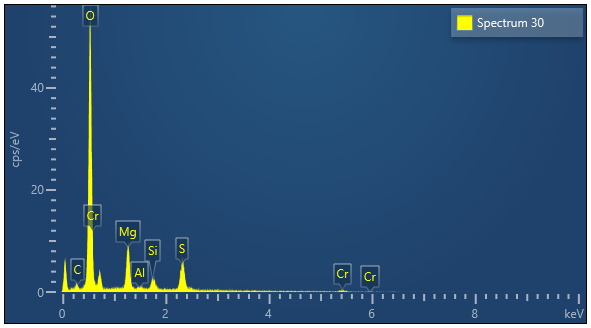


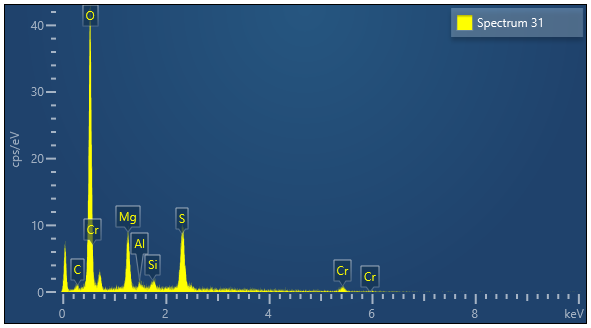


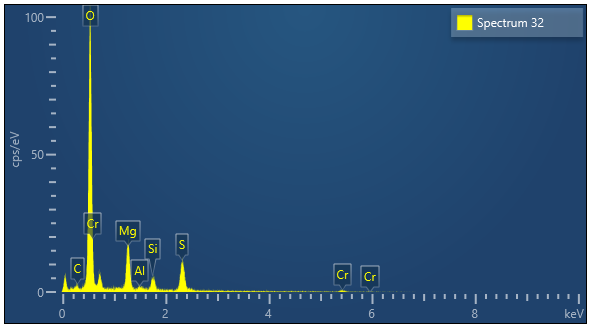


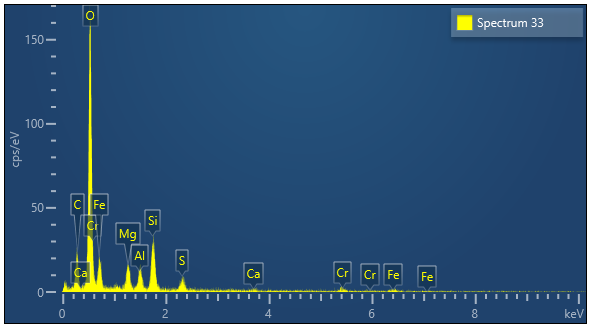


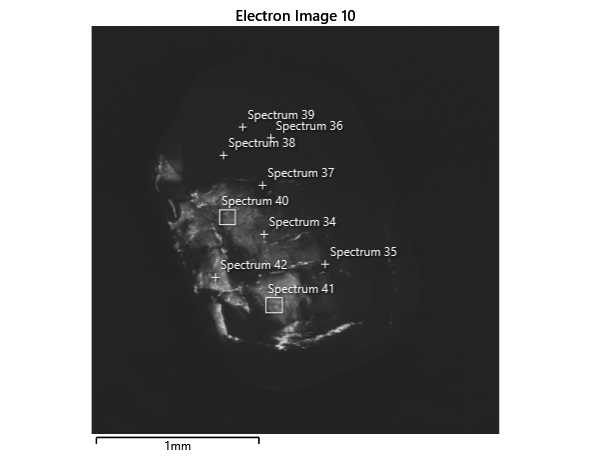
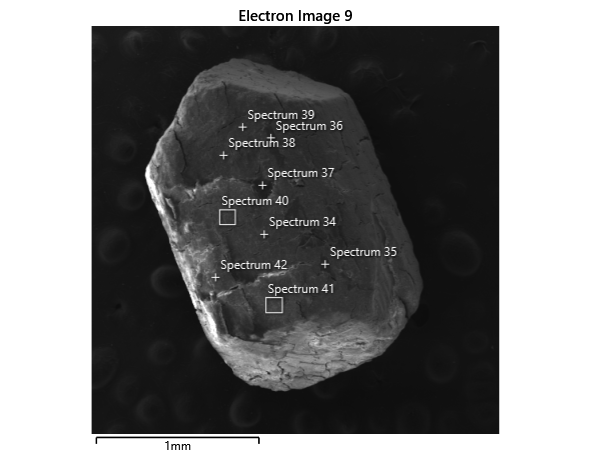




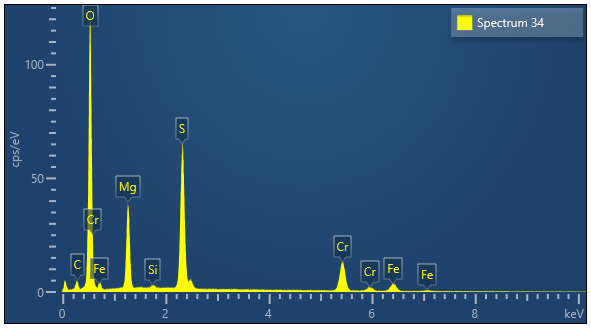


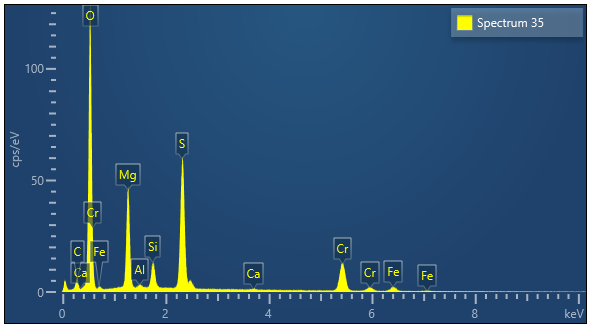


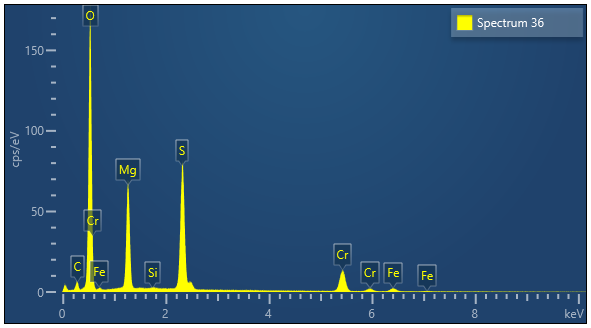


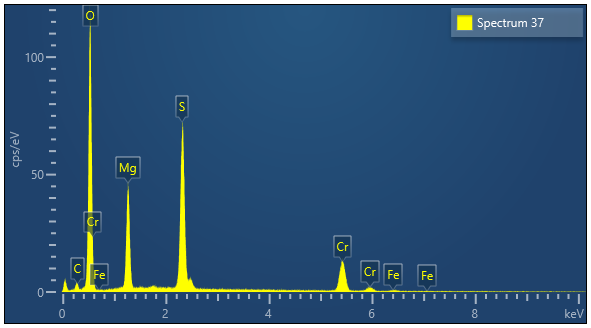


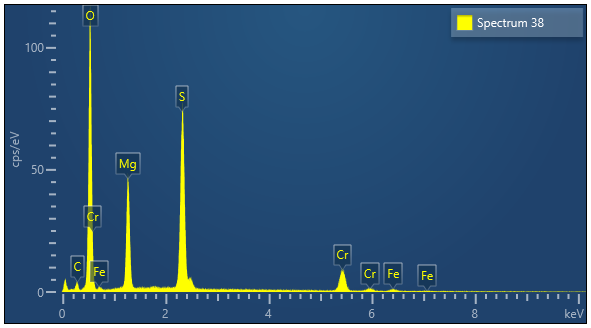
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element (ox%)** | **Na2O** | **MgO** | **Al2O3** | **SiO2** | **SO3** | **K2O** | **CaO** | **TiO2** | **FeO** | **Total** |
| **Spectrum 34** | 0 | 22,14 | 0 | 0,75 | 65,27 | 0 | 0 | 0 | 11,84 | 100 |
| **Spectrum 35** | 0 | 24,22 | 0,77 | 8,23 | 59,8 | 0 | 0,45 | 0 | 6,52 | 100 |
| **Spectrum 36** | 0 | 29,29 | 0 | 0,4 | 64,86 | 0 | 0 | 0 | 5,45 | 100 |
| **Spectrum 37** | 0 | 24,68 | 0 | 0,54 | 73,43 | 0 | 0 | 0 | 1,34 | 100 |
| **Spectrum 38** | 0 | 24,28 | 0 | 0 | 72,95 | 0 | 0 | 0 | 2,77 | 100 |
| **Spectrum 39** | 0,42 | 16,67 | 4,72 | 18,91 | 42,98 | 0,33 | 1,9 | 0 | 14,06 | 100 |
| **Spectrum 40** | 0 | 21,79 | 0,87 | 4,43 | 62,5 | 0 | 0,31 | 0 | 10,1 | 100 |
| **Spectrum 41** | 0 | 20,52 | 0,98 | 4,01 | 61,74 | 0 | 0,6 | 0 | 12,13 | 100 |
| **Spectrum 42** | 0 | 4,21 | 0,28 | 0,83 | 59,8 | 0 | 0 | 0,58 | 34,29 | 100 |

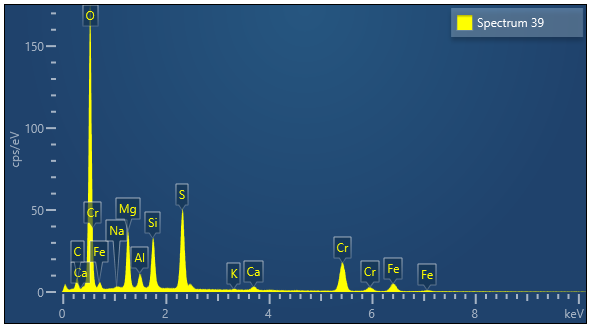


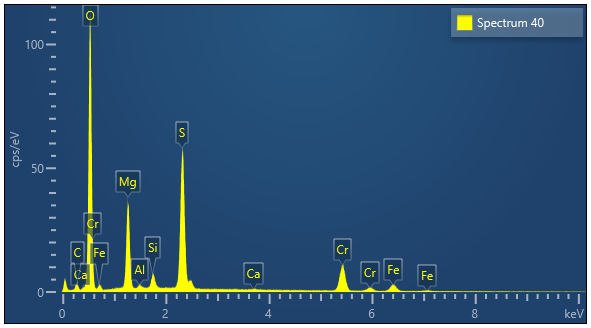


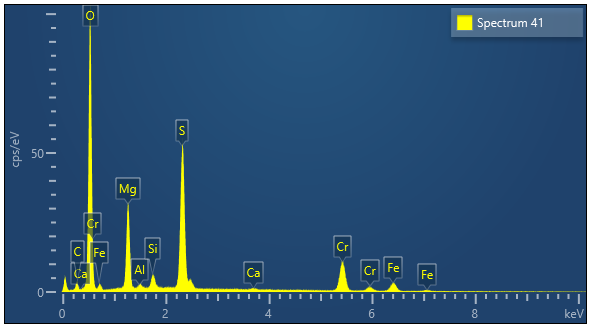


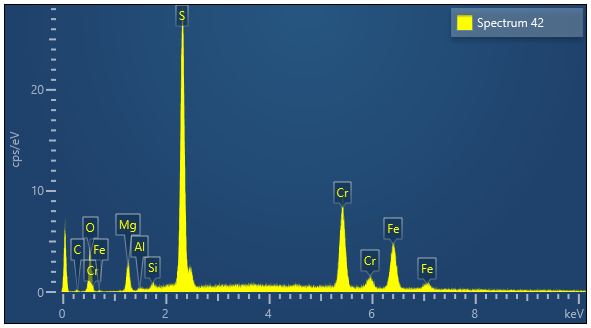


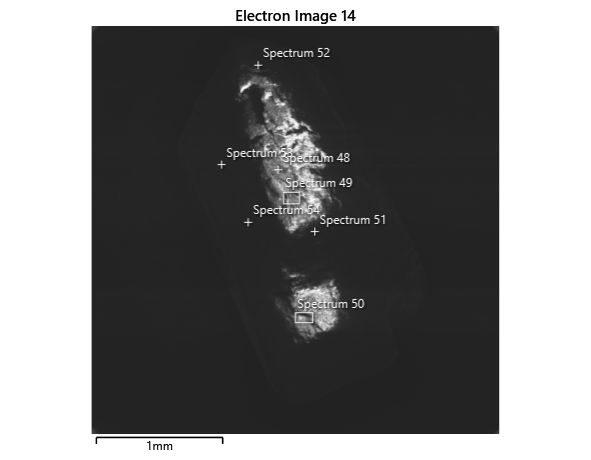
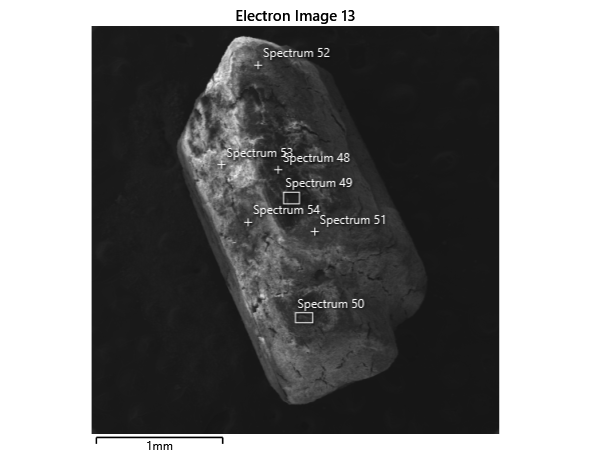












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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Element (ox%)** | **Na2O** | **MgO** | **Al2O3** | **SiO2** | **SO3** | **K2O** | **CaO** | **TiO2** | **FeO** | **Total** |
| **Spectrum 48** | 0 | 30,97 | 0,65 | 3,09 | 61,87 | 0 | 0,42 | 0 | 3 | 100 |
| **Spectrum 49** | 0 | 29,91 | 1,79 | 5,75 | 56,46 | 0 | 0,67 | 0 | 5,42 | 100 |
| **Spectrum 50** | 0,44 | 22,57 | 4,36 | 13,96 | 41,97 | 0 | 1,73 | 0 | 14,96 | 100 |
| **Spectrum 51** | 0 | 17,95 | 3,14 | 7,65 | 55,49 | 0,44 | 0,77 | 0 | 14,56 | 100 |
| **Spectrum 52** | 0,68 | 17,82 | 5,66 | 12,56 | 33,3 | 0 | 2,59 | 0,58 | 26,79 | 100 |
| **Spectrum 53** | 0 | 0,29 | 1,11 | 3,62 | 1,45 | 0 | 0,89 | 0,93 | 91,71 | 100 |
| **Spectrum 54** | 0 | 1,49 | 5,1 | 16,51 | 1,61 | 0,68 | 4,33 | 0 | 70,27 | 100 |

