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N.T.S. 41P14

A Comprehensive Petrographic and Electron Microprobe Examination of Listwanite Samples from the Laroma Prospect, Midlothian Lake Property,

Larder Lake Mining Division, Midlothian Township, Ontario

By: Dr. Jim Renaud of Renaud Geological Consulting Ltd.,

London, Ontario

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A Comprehensive Petrographic and Electron Microprobe Examination of Listwanite samples from the Laroma Prospect, Midlothian Property

Summary

This report details the petrographic work completed on 14 rocks submitted for petrographic and electron- microprobe investigation by Mr. Robert Dillman and Mr. Jim Renaud. The samples numbers, descriptions, and locations are presented in Table 1 below. The main purpose of the study was to examine the rocks and provide details of textures and mineral compositions, alteration, assemblages and ore characterization associated with the altered ultramafic rocks on the Midlothian property. The samples were collected from the Laroma Prospect on the Midlothian property during a site visit on September 18 2020. Assays for listwanite samples ranged 0.011 to 24.6 ppm Au, 379 to 1,950 ppm Ni, <0.005 to 0.010 ppm Pt, and 0.003 to 0.010 ppm Pd. A boulder of sulphide-bearing mafic metavolcanic rock found on the Laroma Prospect assayed 0.019 ppm Au, 3,630 ppm Ni, 0.109 ppm Pt, and 0.252 ppm Pd. The Midlothian Property consists of 117 mining claim cells. The property covers an approximate area of 2,450 hectares.

At the time field work and petrology was completed, title to the claims were owned by Jim Renaud and (author) Robert Dillman. At the time of this report, title to all claims had been transferred to their company, Goldenfire Minerals Inc. The samples were collected as part of a traverse by property owners: Dr. Jim Renaud and Robert Dillman. The samples were collected between Midlothian Lake and Mitre Lake, on claim:

549439, cell 41P15E081

Location and Access

The Midlothian Lake Property is situated in Midlothian Township in the Larder Lake Mining Division of Ontario. The property is located approximately 23 kilometres southwest of the town of Matachewan (Figure 1). The property is accessible by truck and ATV. From the town of Matachewan, the property can be reached by travelling 2.9 km southwest on Highway 566 to the Asbestos Mine Road. Go west on the mine road for 23 km at which point the road is washed out and the rest of the journey must be made on ATV along a narrow forest trail.

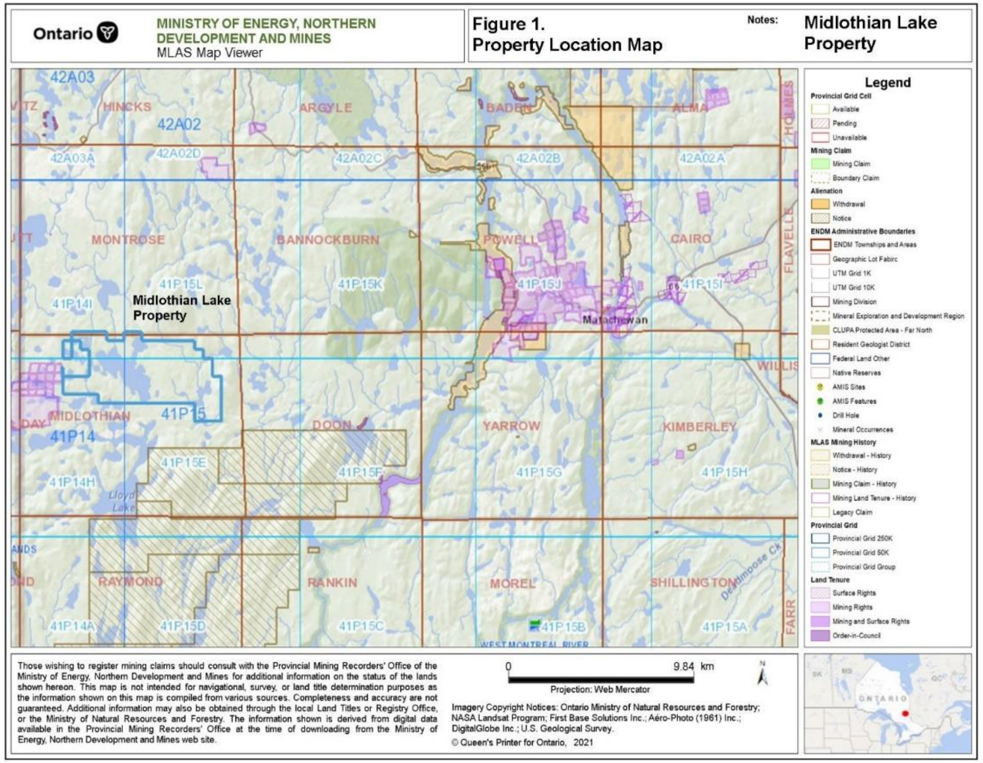


Figure 1 Property Location Map

Claim Logistics and Location of Work

The Midlothian Lake Property consists of 113 mining claim cells. The property covers an approximate area of 2450 hectares (Figure 2). All claims comprising the Midlothian Lake Property are held by Goldenfire Minerals Inc of London, Ontario.

Land Status and Topography

The Midlothian Lake Property is situated entirely on Crown Land. The property is uninhabited. There are no buildings or habitats. An electrical powerline follows the Asbestos Mine Road which crosses the southeast section of the property. A system of non-maintained logging roads provide access to most areas of the property. Sections of the property have been logged within the last 3 decades. Some of these areas are partially reforested with spruce trees. Uncut forest consisting of large spruce, balsam and poplar trees can be found bordering bodies of water and growing in higher elevations. Cedar trees and alders grow in lower areas.

The property is at a mean elevation ranging between 360 to 400 metres above sea level. Most of the property has gentle relief with rounded hills averaging 20 metres in height. Rugged terrain exists east of Elizabeth Lake where steep hills rise over 40 metres above the lake and close to Midlothian Lake where ridges and knobby outcrops range between 5 to 40 metres in height and follow the outline of the lake. The northeast section of the property where the traverse was done is situated at the base of a large, steep hill rising over 540 metres above sea level. There are several lakes on the property. The largest is Midlothian Lake covering an approximate area of 366 hectares.

Outcrop exposure in many sections of the property is good. Outcrops are abundant in higher elevations and variable exposures occur in lower elevations. Overburden is generally shallow and consists of glacial till deposited by a glacier initially moving from the northeast to the southwest and shifting northwest to southeast in its final advance.

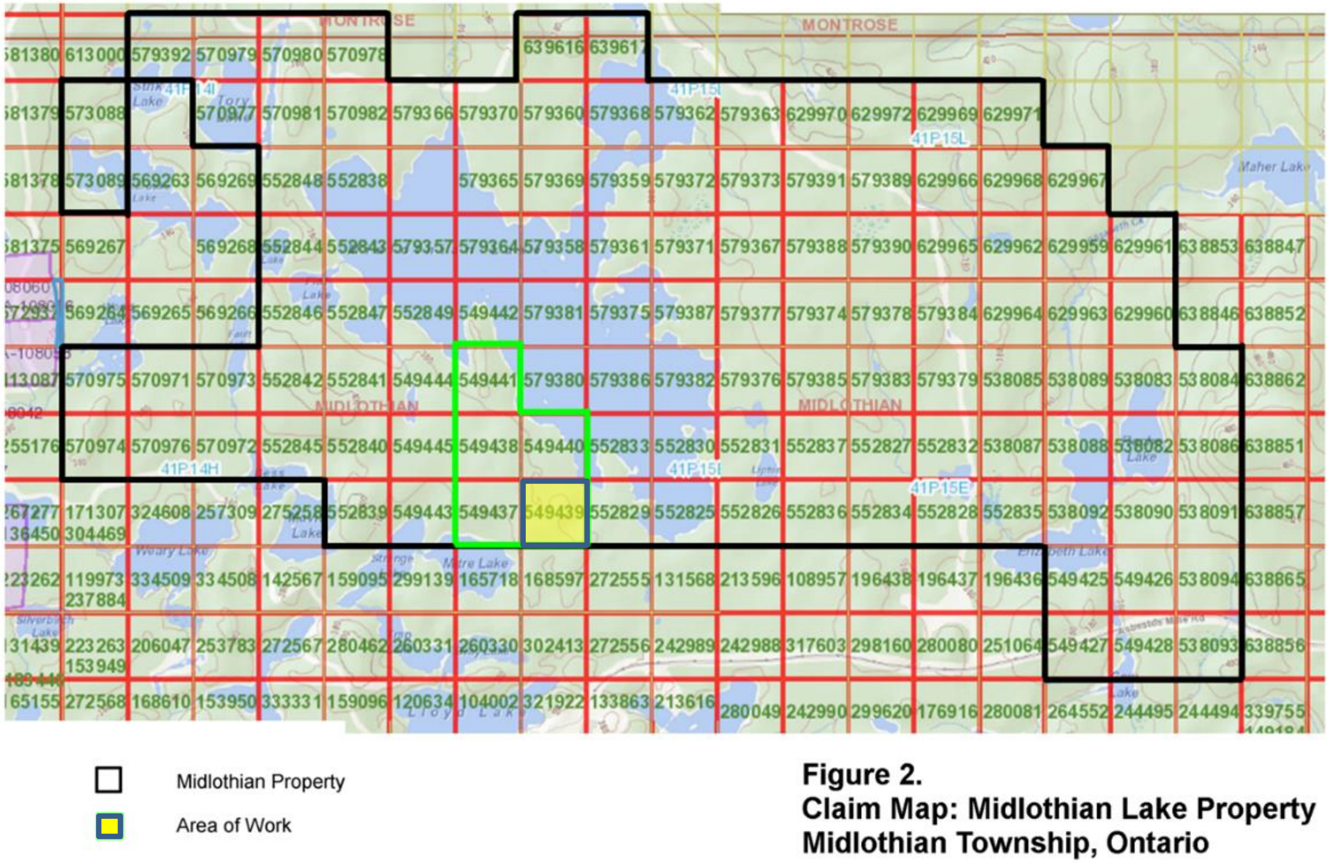


Figure 2 Claim Map

Regional and Local Geology

The Midlothian Lake Property is located in the Halliday Dome area within the western portion of the Abitibi Subprovince of the Superior Province. The Halliday Dome consists mainly of calc- alkaline felsic and intermediate volcanic rocks with minor quantities of iron formation and basaltic rocks of the Tisdale Assemblage, unconformably overlain by younger Kinojevis Assemblage rocks, which are in turn unconformably overlain by sedimentary rocks of the Porcupine Assemblage.

Midlothian Township is located on the southeast quadrant of the dome and consists of intermediate to felsic volcanics, flows and pyroclastics, "Timiskaming" sediments and a series of mafic to ultramafic sills. The Coleman Member of the Gowganda Formation lies unconformably on top of the Archean volcanics and sediments. It is thought that the Larder Lake Break extends beneath the Gowganda Formation west of Matachewan and continues through the south portion of Midlothian Township. Surrounding geology in the Bannockburn Township area describes Neoarchean-age calc-alkaline intermediate to felsic volcanic rocks, mafic volcanic rocks, komatiitic basalt to dunite, silicate to sulphide iron formation, gabbro intrusions, and a series of sedimentary rocks including diamictite, arkose, and conglomerate (Préfontaine and Berger, 2005). Proterozoic-age (Huronian Supergroup) sediments (Cobalt Group - Gowganda Formation), composed mainly of clastic metasedimentary rocks such as conglomerate, sandstone, wackes and argillite, unconformably overlie the Archean supracrustal assemblages.

The area northeast of Midlothian Lake is underlain by arkose, sandstone and conglomerates of the Midlothian Formation dated 2688.5 Ma (Préfontaine and Robichaud, 2013). Rock units generally strike northwest to southeast and dip steeply to the north. The area has been intruded by north trending diabase dikes of the Matachewan Swarm dated 2454 Ma (Préfontaine and Robichaud, 2013). To the east, rocks of the Midlothian Formation and Matachewan diabase swarm are unconformably overlain by Huronian rocks consisting of conglomerates, argillite and greywacke of the Cobalt Group of the Gowganda Formation dated circa 2300 Ma (Préfontaine and Robichaud, 2013). Diabase dikes of the Sudbury Swarm dated 1238 Ma also have intruded rocks of the Midlothian Formation and cross the unconformity into the Cobalt Group.

Midlothian Township consists of intermediate to felsic volcanics, flows and pyroclastics, "Timiskaming" sediments and a series of mafic to ultramafic sills. The Coleman Member of the Gowganda Formation lies unconformably on top of the Archean volcanics and sediments. It is thought that the Larder Lake Break extends beneath the Gowganda Formation west of Matachewan and continues through the south portion of Midlothian Township.

The Midlothian Township Property is underlain by intermediate to felsic flows and pyroclastic rocks to the south. The north half of the property is underlain by "Timiskaming" type sediments: mostly conglomerates, greywackes and siltstone. Areas of carbonate and green mica alteration have been discovered on the property along the contact of the volcanics and sediments in the vicinity of Midlothian and Mitre Lakes.

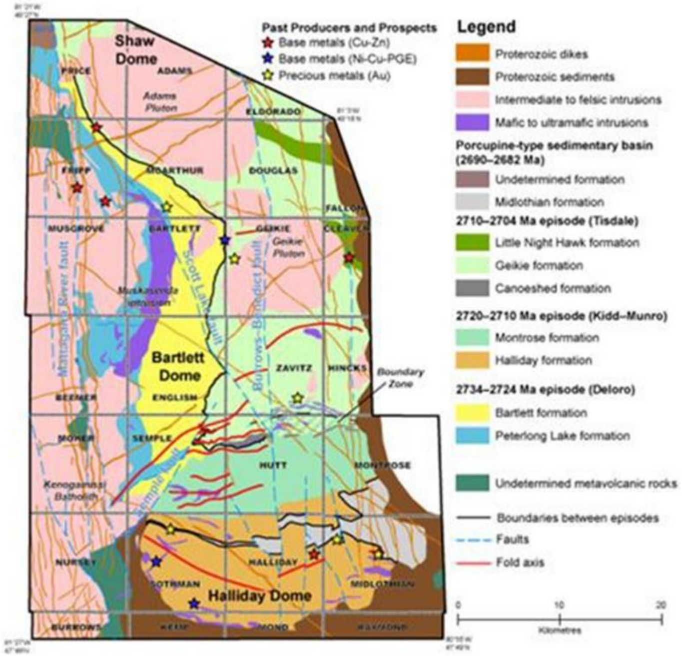


Figure 3. Schematic map of the study area depicting part of the Shaw Dome as well as the Bartlett and Halliday domes. The Bartlett and Halliday domes are further broken down into volcanic- and sediment-dominated episodes (assemblages) and formations. The green hatched pattern at the Zavitz–Hutt township boundary represents the boundary zone between the 2720–2710 Ma volcanic episode (Kidd–Munro) and the 2710–2704 Ma volcanic episode (Tisdale).

Figure 3 Regional Geology Map

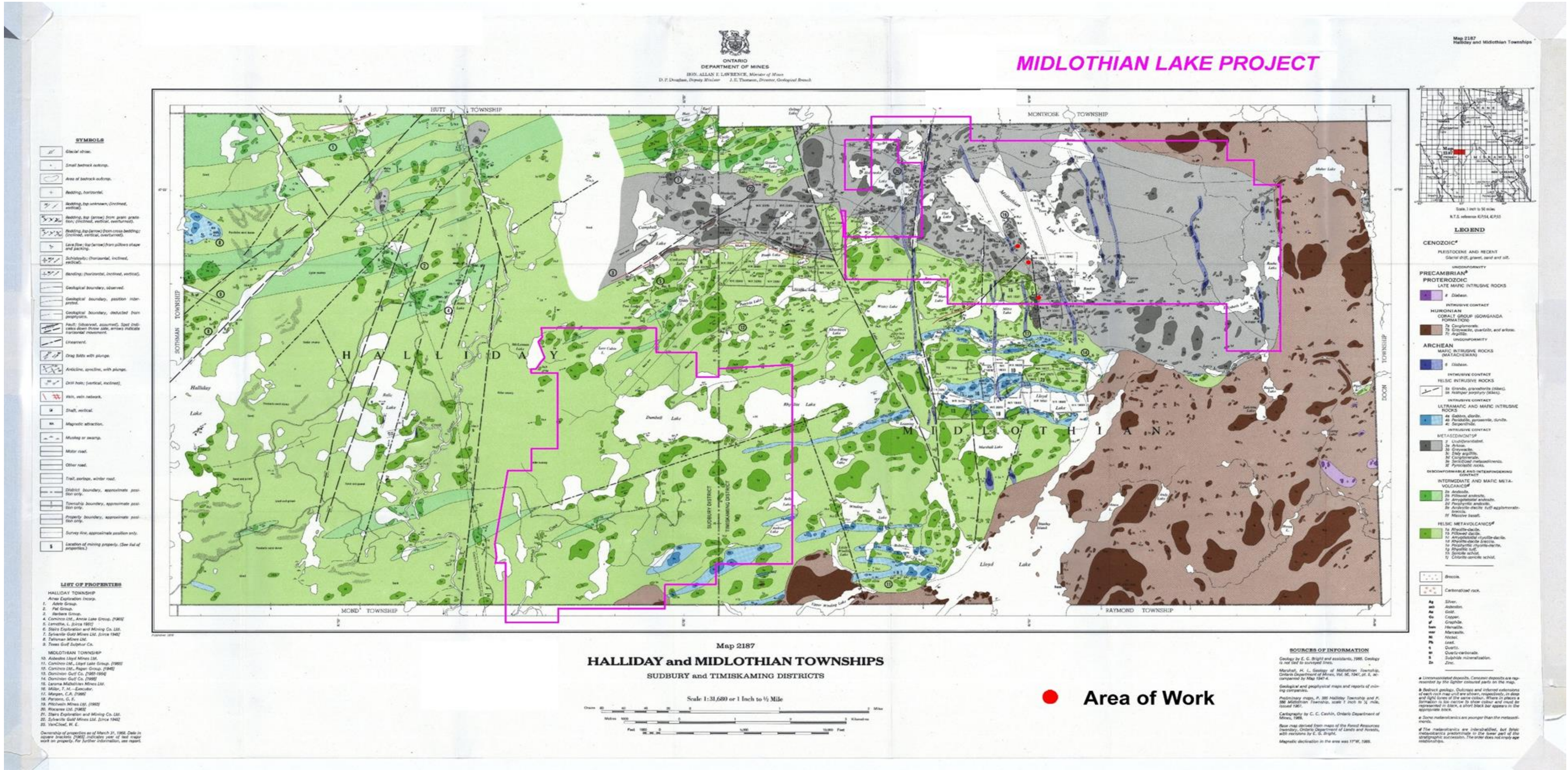


Figure 4 Geology of Halliday and Midlothian Townships ODM Map 2187

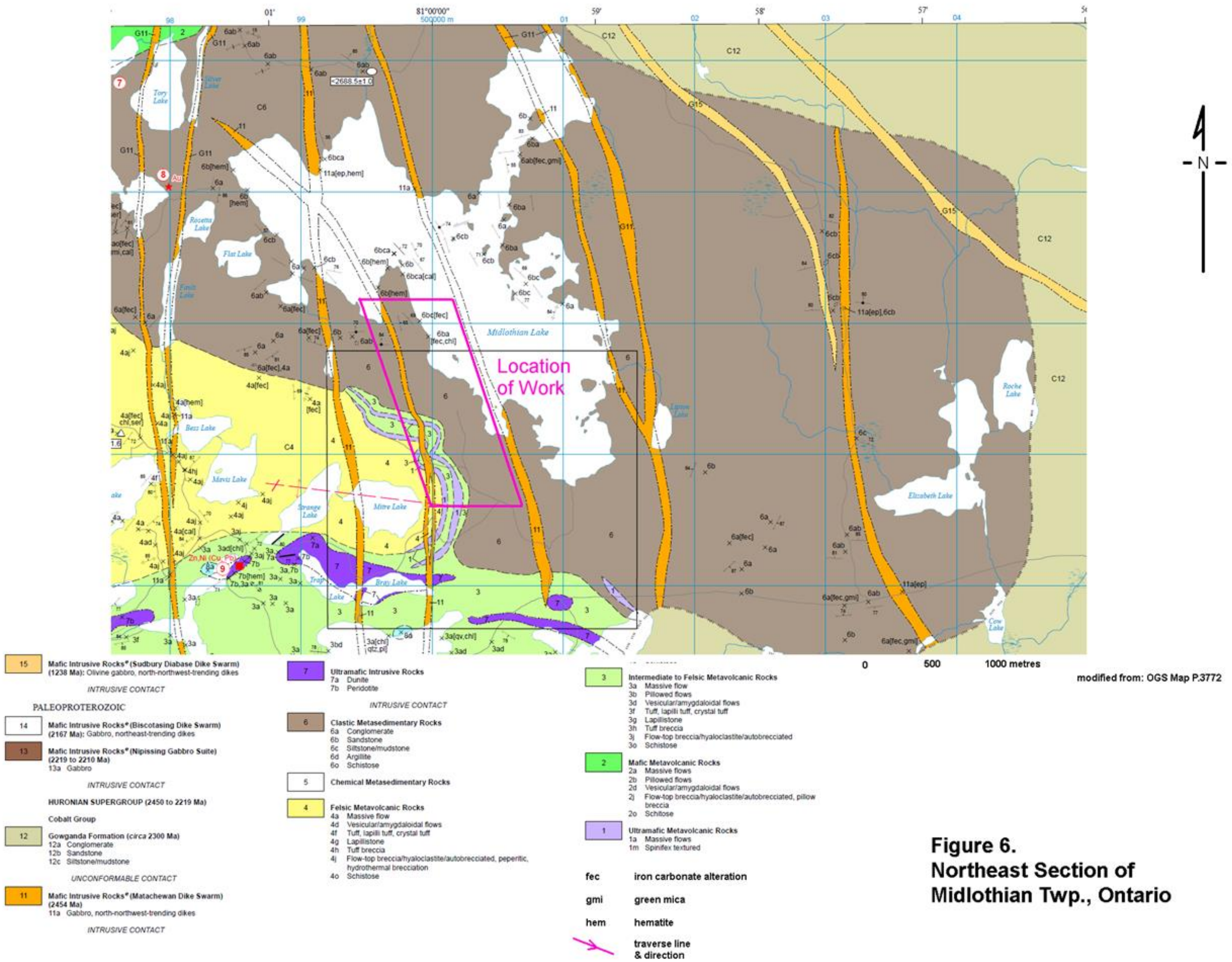


Figure 5 Northeast Section of Midlothian Township, Ontario

History of Exploration

Historic mineral exploration in Midlothian Township has occurred in several periods from as early as 1907 to present day. As a result, different sections of the property have been explored at various times. Historic exploration has led to the discovery of gold, copper, pyrite, graphite and marcasite on the property. The Halliday Dome area has been explored since the turn of the century, with increased activity in the 1960's. Gold exploration has gone through several cycles including the early 1900's, the 1930's and from 1940 to the early 1970's. An Indian land caution halted exploration in the area for over two decades. Savage (1963), a government geologist reported that gold was first found in Midlothian Township in 1909.

In 1946, H. I. Marshall created a detailed geological examination of Midlothian Township for the Ontario Department of Mines (Marshall, 1947) and in 1970 E.G. Bright mapped Halliday and Midlothian Townships reported in Geological Report 79. Montrose Township was presented as "Digital GIS Compilation: Bedrock Geology of Powell, Bannockburn and Montrose Townships", Ontario Geological Survey, MRD 207 (Berger et al, 2006).

The following is a summary of recorded exploration near the property obtained through assessment filings from OGSEarth.

Historic Exploration: Midlothian Lake Property, Mitre Lake Area

Company	*Year*	*Work Description*
Stairs Exploration & Mining	1959 – 1964	21 DDH
Rio Tinto Mines	1963	1 DDH
Laroma Midlothian Mines Ltd.	1964	2 DDH
Laroma Midlothian Mines Ltd.	1964	3 DDH
Timiskaming Nickel	1968	1 DDH
Canadian Johns-Manville Co. Ltd.	1970	3 DDH
Dennison Mines Ltd.	1971	Geological Survey, Geochemical Survey, EM Survey and 2 DDH
Dennison Mines Ltd.	1971	2 DDH
John Hogan	1971	2 DDH
John Hogan	1971	1 DDH
International Trust Company	1972	4 DDH
Larche/Rosseau	1972	8 DDH
Allied Mining Corp.	1972	1 DDH
Allied Mining Corp.	1972	2 DDH
Tojaro Holdings Ltd.	1973	Magnetometer Survey
Stump Mines Ltd.	1973	2 DDH
United Asbestos Inc.	1973	3 DDH
Hanna Mining Company	1974	6 DDH
Hanna Mining Company	1974	6 Holes
Northrim Mines Inc.	1975	2 DDH
International Trust Company	1976	3 DDH
Falconbridge Copper	1978	7 DDH

Mines Ltd.		
Shield Geophysics Ltd.	1981	Airborne EM
Regal Goldfields Ltd.	1983	9 DDH
Goldteck Mines Ltd.	1987 – 1988	Geological Mapping, Mechanical Stripping, Magnetometer and Resistivity Surveys and 94 DDH
Tom Obradovich	1996	Mechanical Stripping
Orezone Resources Inc.	1996	Prospecting, Sampling (Laroma Showing)
Orezone Resources Inc.	2000	7 DDH
Canadian Arrow Mines Ltd.	2002	10 DDH
Mustang Minerals	2004	Airborne EM
Explor Resources	2008	Heli-VTEM
Explor Resources	2009	Ground Mag/IP/VLF
Explor Resource	2011	DDH (Montrose Property)
R. Dillman, J. Renaud	2020-2022	Prospecting, sampling, petrology, microprobe investigations

In terms of nickel mineralization in the area, historic details from assessment files suggest the ultramafic and mafic sills and stocks in the rhyolitic strata are decent prospects. Peridotite and gabbro sills intrude the outer rhyolitic strata, and extend eastward from Sothman Township, east to north eastward into Halliday and Midlothian Townships. The nickel-copper bearing ultramafic sill of Kirkland Minerals Corporation Limited, in the southeast corner of Sothman Township averages 1.29% nickel, plus approximately 400,000 tons of 0.90% nickel (Survey of Mines, 1968, p. 153).

The following map is a snapped image of the Preliminary Map 983, Geochemical Distribution of Ni in Metavolcanics and Mafic Intrusions in Halliday and Midlothian Townships (1974). The map illustrates the Ni-occurrences south of the Laroma prospect and south of Midlothian Lake toward Bray Lake where Ni values reach 1880 ppm Ni. The black dots illustrate Ni-content of assays in ppm.

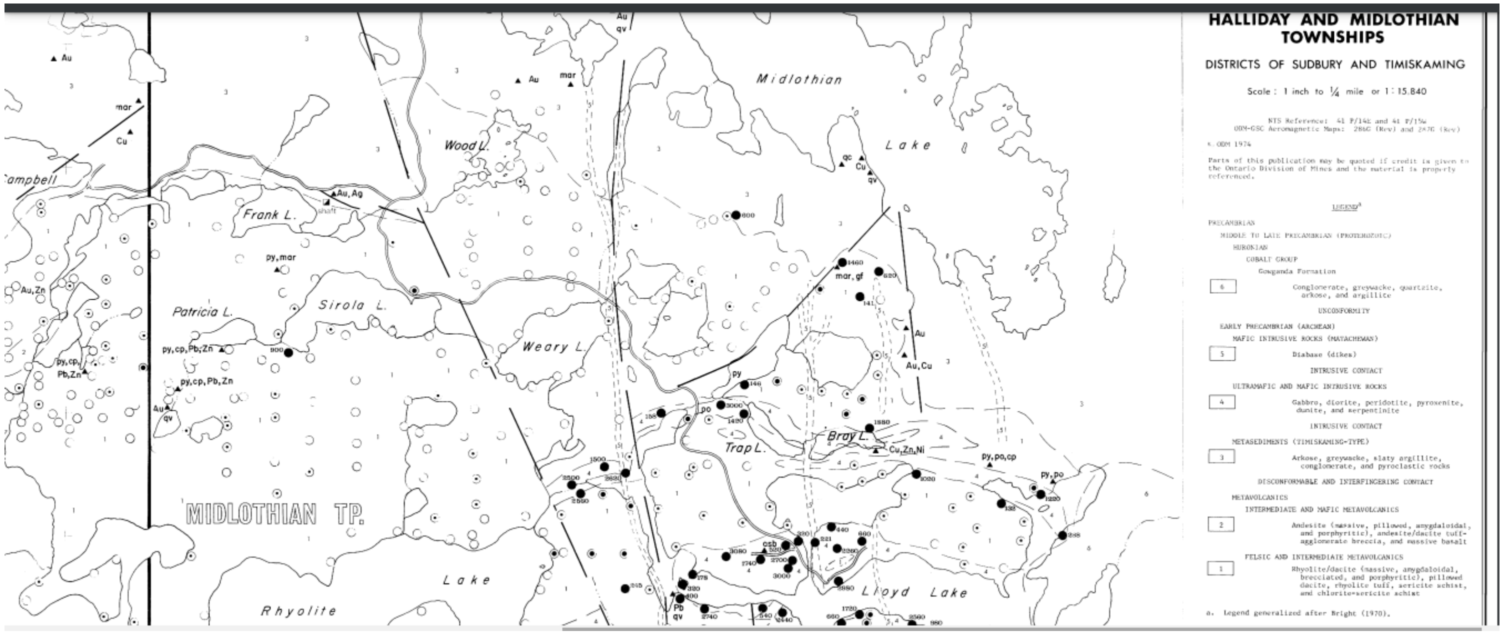


Figure 6 Historic Geochemical Distribution Map of Ni around the Study Area

Survey Date and Personnel

The samples were collected as part of a traverse on September 18, 2020 and again on June 13, 2021 during a resampling some of the favourable results obtained in 2020. A total of 38 samples were collected between September 14, 2020 to September 18, 2020 and 8 samples were collected on the June 13 2021 traverse. The traverses were completed by: Jim Renaud of London, Ontario and Robert Dillman of Mount Brydges, Ontario.

Survey Logistics

The traverse was initiated to prospect areas between Midlothian Lake and Mitre Lake on the Midlothian Property to find occurrences of green mica- bearing metasediments and quartz-carbonate alteration as reported in previous work. As a result of the discovery of nickel sulphides in the Laroma Prospect, additional assays and nickel tests were performed on 20 rock samples collected from the prospect and which had been previously analyzed for gold. Unfortunately, the pulps and rejects of the original samples had been discarded and further assays were performed on small fragments of the original samples which had been retained for reference and further analyses. These samples were assigned new numbers. The locations of the original rock sample sites, corresponding new sample numbers, descriptions and assay results of both previous and subsequent analyses are presented in Table 1 and plotted at a scale of 1 : 5,000 with geology and surface features on the appended map.

Sample locations were recorded using a Garmin GPS model GPSMAP 66st and a CAT S42 smartphone handheld device equipped with the Discovery MapInfo. The GPS unit was set to NAD83, Zone 17.

A compass and a Garmin GPS model GPSMAP 66st were used to navigate. The GPS unit was set to NAD83, Zone 17. Waypoints (WP) for the traverse were periodically recorded and are listed in Table 1.

All rock samples from the property were delivered to AGAT Laboratory for analyses. The lab is in Mississauga, Ontario. All rock samples were Fire Assayed for gold using a 50-gram charge and finished by Inductively Coupled Plasma – Optical Emission Spectroscopy (ICP-OES) to measure the gold concentration. Two samples were assay for gold using a Total Metallic Assay method. Assay certificates from the lab are appended to this report.

Rock sample locations, descriptions and assay results are also presented in Table 1 and plotted with geology and surface features on the appended map at a scale of 1 : 5,000.

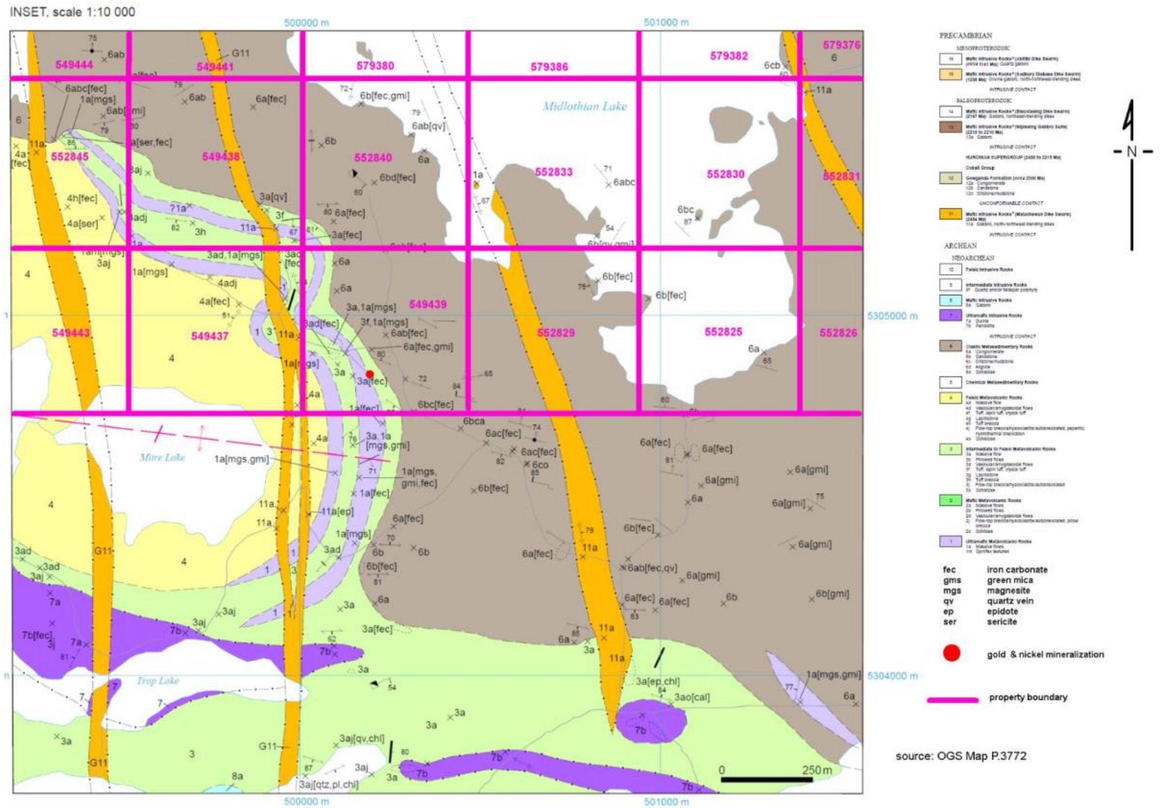


Figure 7 Mitre Lake area, Midlothian Township.

Rock Sample	Original Sample	Easting	Northing	Claim Cell	Gold ppm	Previous Gold ppm	Ni ppm	Pt ppm	Pd ppm	Notes
MID-11	ML-41	500169	5304748	549939, 41P15E081	0.022 0.019	0.006	3630	0.109	0.252	Sheared mafic with 5% pyrite, qtz & carbonate, big boulder
MID-12	PIT sample	500168	5304820	549939, 41P15E081	0.045 0.035	NA	1010	<0.005	0.005	Office sample, large pit, green carbonate with grey and white quartz stringers , carbonated. Big Pit
MID-13	PIT sample	500168	5304820	549939, 41P15E081	24.6 2.23	NA	379	<0.005	0.003	Office Sample, same as above. Big Pit
MID-14	MID-5	500156	5304825	549939, 41P15E081	0.008 0.011	0.005	1320	<0.005	0.006	Weak green carbonate, dolomite &light brown altered wallrock to green carbonate. Grey quartz, trace epidote, no sulphides. Big Pit
MID-15	ML-5	500104	5304904	549439, 41P15E081	0.015 0.013	0.002	764	<0.005	0.007	Strong green carb close to diabase dike, siliceous, tr. fine py, stripped area.
MID-16	MID-6	500163	5304823	549939, 41P15E081	0.212 0.194	0.446	1950	0.005	0.007	strong green carbonate with grey – white qtz stringers 3 cm wide 1-5% fine pyrite in wallrock and along string contacts. Big Pit
MID-17	MID-8	500155	5304808	549939, 41P15E081	0.071 0.063	0.034	1010	<0.005	0.006	Moderate green carbonate + 50% quartz, 1-5% fine disseminated pyrite in wallrock. Loose, bottom of pit.
MID-18	MID-2	500108	5304837	549939, 41P15E081	0.005 0.004	0.013	691	<0.005	0.004	Loose by small pit. Strong green carbonate. Same as MID 1, two generation grey & white quartz stringers, Tr-3% disseminated cubic py in wallrock
MID-19	MID-3	500160	5304823	549939, 41P15E081	0.604 0.840	3.65	745	0.007	0.005	Strong green carbonate with grey and white quartz stringers. Trace fine pyrite in wallrock. Resample of ML-50 Big Pit
MID-20	MID-4	500160	5304823	549939, 41P15E081	0.047 0.006	0.077	1100	0.009	0.010	Moderate green carbonate, same as MID 3, 50:50 grey & white qtz and wallrock 1-5% fine cubic py in wallrock. Big Pit
MID-21	MID-7	500161	5304805	549939, 41P15E081	0.028 0.034	0.013	866	<0.005	0.004	Strong green carbonate with trace – 3% fine pyrite & several generations of quartz, trace bornite with malachite. Loose in pit.
MID-22	MID-1	500103	5304840	549939, 41P15E081	0.004 0.003	0.048	865	0.008	0.009	Strong green carbonate, small pit east side of green carbonate unit. White to pink qtz stringers at various orientations. Trace pyrite in wallrock
MID-23	ML-45	500111	5304803	549939, 41P15E081	0.043 0.027	0.074	1700	0.006	0.007	Quartz + strong green carbonate, 1% pyrite in pit
MID-24	ML-6	500104	5304904	549439, 41P15E081	0.005 0.006	0.004	618	0.010	0.010	Diabase contact with conglomerate, qtz carb tr. cpy. Stripped area.
MID-25	ML-39	500161	5304733	549939, 41P15E081	0.027 0.028	0.018	892	<0.005	0.006	Moderate green carb with grey quartz outcrop, steep slope E, boulder.
MID-26	ML-49	500167	5304820	549939, 41P15E081	0.175 0.157	0.072	1050	<0.005	0.003	Qtz + fuch + black tourmaline 1-5% fine pyrite, loose by pit E side
MID-27	ML-46	500111	5304803	549939, 41P15E081	0.054 0.053	0.108	799	<0.005	0.004	Strong green carbonate with qtz stringers with 5% 2cm blebs of pyrite , loose beside pit
MID-28	ML-47	500113	5304803	549939, 41P15E081	2,94 1.72	0.527	463	<0.005	0.003	White to pink Qtz – carb – fuch stringers, Tr, - 2% cubic pyrite, loose beside pit. Fire Assay & Total Metallics Assay.
MID-29	ML-50	500165	5304821	549939, 41P15E081	0.070 IS	14.7	435	IS	IS	Quartz stringers/ veins in green carbonate, NW corner bottom of pit, chips 1m. Fire Assay & Total Metallic Assay. Big Pit
MID-30	ML-51	500163	5304822	549939, 41P15E081	0.070 0.070	0.104	1160	0.005	0.004	Grab at top W side of big pit, quartz + FeC + white quartz in green carb wallrock, 1-5% py, tr. cpy. Big Pit

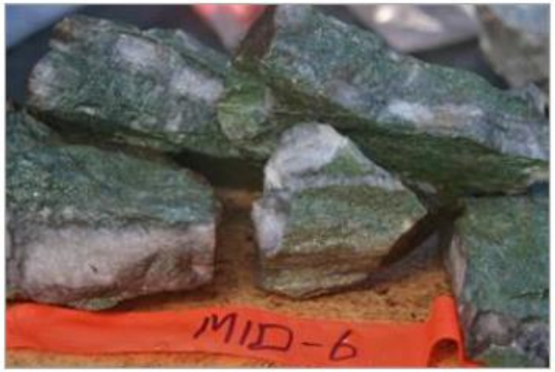
Table 1 Rock sample locations, descriptions, and assay values. Samples highlighted in yellow are part of the current investigation.

MID-11 (ML-41) 3,630 ppm Ni, 0.109 ppm Pt, 0.252 ppm Pd

MID-12 (ML-41) 1,010 ppm Ni

MID-14 (MID-5) 1,320 ppm Ni

MID-15 (ML-5) 764 ppm Ni



MID-16 (MID-6) 1,950 ppm Ni

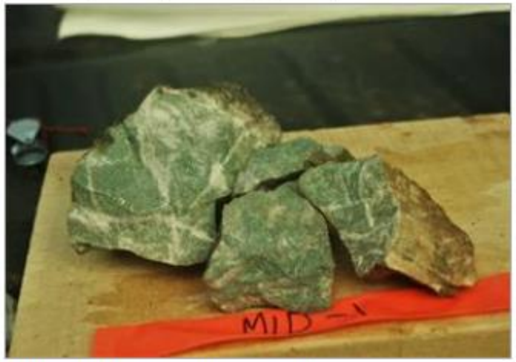
MID-17 (MID-8) 1,010 ppm Ni

MID-18 (MID-2) 691 ppm Ni

MID-19 (MID-3) 745 ppm Ni

MID-20 (MID-4) 1,100 ppm Ni

MID-21 (MID-7) 866 ppm Ni

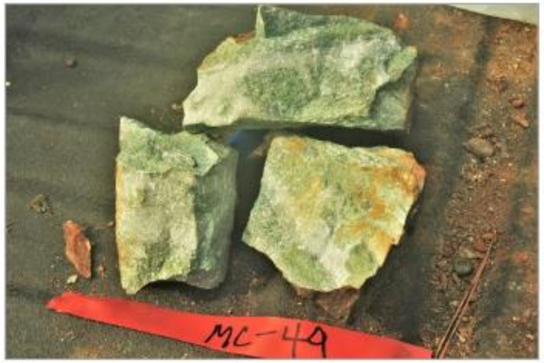


MID-22 (MID-1) 865 ppm Ni

MID-23 (ML-45) 1,700 ppm Ni

MID-24 (ML-6) 618 ppm Ni

MID-25 (ML-45) 892 ppm Ni



MID-26 (ML-49) 1,050 ppm Ni

MID-27 (ML-46) 799 ppm Ni

MID-28 (ML-47) 463 ppm Ni

MID-29 (ML-50) 435 ppm Ni

Petrographic and Electron Microprobe Methods

The samples were cut and 14 polished thin section were made. Samples were subsequently carbon coated and examined in transmitted and reflected light with a Zeiss petrographic microscope. Regions of interest were photographed using the petrographic microscope and circled with a diamond scribe to enable relocation of the selected areas when in the microprobe. Samples were examined in detail using the Oxford Instrument Energy Dispersive System (EDS) on the microprobe and relevant minerals analyzed using the EDS system. Backscattered electron detector images of relevant and interesting mineralogical and textural relationships were collected digitally. For each backscatter image a scale bar in microns is located at the bottom of each image which is useful in evaluating the grain sizes of the various minerals. All minerals were analyzed using a JEOL JXA 733 electron microprobe equipped with a Tracor Northern EDS and five wavelength spectrometers.

Results

The objective of the current study on 14 rock samples was to characterize the variety of sulphides present within the sample suite collected from around the Laroma Prospect. Assay results for these samples report gold mineralization with values ranging 0.072 ppm Au to 14.5 ppm (14.5 g/t) Au. What is most interesting is the compositionally diverse suite of Ni-Sb-Co-As minerals detected with the EDS system. All the samples were collected in the vicinity of the Laroma Prospect. The samples consisted of strong green carbonate alteration/ fuchsite with white and grey quartz stringers and traces of very minor fine to rarely coarse pyrite.

Interestingly, the samples contain a wide array of Ni-Sb-Co-Te-As-bearing phases. Below are details of the 14 rocks analyzed with photomicrographs, backscatter electron images, EDS spectra, and some EDS analyses. Closer evaluation of the geology of the area suggests that the property sits on the western extension of the Larder Lake Break which provides structure, faulting and shearing, permitting hydrothermal fluid migration into rocks around the Laroma Prospect.

Discussion

The presence of Cr-bearing fuchsitic mica (Cr-paragonite) suggests the precursor rock was likely a Cr-bearing ultramafic rock (i.e. komatiite). The intense fuchsite (green Cr-mica), and the compositionally zoned dolomite-ankerite solid solution carbonate and magnesite-siderite solid solution carbonate, and quartz are the most abundant minerals in this rock. Fuchsite occurs as contorted linear zones and as clots intergrown with quartz and zoned carbonates. Textural evidence suggests that the Cr-paragonite represent late-stage hydrothermal solution and alteration of a mafic Cr-rich volcanic protolith. The fuchsite contains Cr substituted in the muscovite structure for octahedral Al. A mafic or ultramafic source is suggested for the inclusion of Cr in muscovite. The presence of chromite is also important in these rocks to suggest an ultramafic precursor. Interestingly, the chromite grains are zoned in most samples with extremely zinc-rich margins, with over 10 wt% ZnO in some samples.

Carbonate is also relatively important in these samples. There are different carbonate series recognized in the samples: (1) dolomite-ankerite solid solution (s.s.), (2) dolomite, (3) magnesite-siderite s.s., and (4) calcite. The carbonates demonstrate chemical zonation from core to margin evident by dark and bright compositional variations in backscatter. Interestingly, the dolomite-ankerite s.s. carbonate and magnesite-siderite solid solution carbonates are associated with coarse domains of feathery Cr-green fuchsite + quartz + chromite + fine-medium grained disseminations of sulphides.

This mineralogical association of the different carbonate species is suggestive of bulk rock control and possible hydrothermal fluid influx. The dolomite-ankerite s.s. carbonates associated with Cr-paragonite and chromite suggests derivation from an ultramafic precursor. The later stage carbonate and quartz veinlets and Ni-sulphide species are associated with a later hydrothermal event. The significance of Cr-paragonite in these strained fuchsite-carbonate rocks are 2-fold: (a) Cr-bearing fractured, brecciated, and strained carbonate-quartz-fuchsite domains suggests the introduction of these elements from an external source. It is suggested that the source of Cr was probably a mafic or ultramafic intrusion at some depth. Because Cr is an immobile element, it is unlikely to have moved far from its source (the mafic-ultramafic intrusion), (b) Cr-rich micas are known to be associated with some Archean gold deposits such as Dome, Kerr Addison and Aquarious mines, where Cr has been derived from the host ultramafic rocks. Late metamorphic fluids also remobilized Cr from the ultramafic rocks at the Kidd Creek VMS deposit (Timmins, Ontario) and deposited it in the contact rhyolite as fuchsite (Schandl, 1989; Schandl and Wicks, 1993; Smith et al.,1993).

The fuchsite grains are paragonitic and indeed have a persistent and elevated content of sodium around 8 wt% Na_2O. End-member paragonite is defined as the most aluminous of all micas in that the octahedral sites are occupied essentially by aluminum only and does not contain either octahedral site Ti,Mg,Fe,Mn,Cr. Thus, the mica compositions from analyzed by EDS on these samples from the Midlothian Property do indeed contain analyses with elevated sodium. In this regard, it would be of some interest to establish the specific geological situation of the samples in the suite that approach true paragonitic muscovite that have only a minimal occupancy of cations in the octahedral site in addition to aluminum. It is not uncommon for a zone of paragonitic muscovite to be present at the direct margin of large gold deposits of hydrothermal origin. Known examples are the Ridgeway Gold deposit in South Carolina and the Con Mine in Yellowknife. In both situations, there is a rather significant zone of either true paragonite or paragonitic muscovite or both across a miscibility gap, at the direct interface between altered host rocks and domains of fluid-dominated hydrothermal assemblages and mineralization. The presence of Cr-paragonite muscovite in samples from the Laroma Prospect area might well be evidence that similar processes were operative in the area.

In terms of providing a rock name for the current suite of rocks investigated, the most appropriate name would be a Listwanite. Listwanite (listvenite, listvanite, or listwaenite) is a rock type that forms when the groundmass of ultramafic rocks (ex. Peridotites), is altered to carbonate minerals and cut by ubiquitous carbonate veins containing one or more of magnesite, calcite, dolomite, ankerite, and/or siderite. The original mafic minerals in the peridotite are commonly altered to Mg- or Ca-carbonate and hydrous Mg-silicates. Complete carbonate alteration of the pre-cursor rock means that every single atom of magnesium and calcium as well as some of the iron atoms have combined with CO_2 to form secondary carbonates like magnesite, calcite, and siderite, while the remaining silica, are found in quartz, serpentine, and talc. Thus, in terms of bulk mineralogy, listwanites consist primarily of quartz (often of a rusty red colour), carbonate, serpentine, talc, ± mariposite/fuchsite (i.e., Cr-muscovite) ± gold.

As explained in some detail by Buckman et al. (2010), Listwanites are host to world-class gold deposits, such as McLaughlin's Mine in California. Alteration commonly develops along faults that intersect bodies of serpentinized ultramafic rocks. Listwanites form as a result of the chemical reaction between serpentinite and CO2-rich fluids. These fluids usually migrate along faults or fractures along the contact of serpentinite and the adjacent country rocks. Freshly broken listwanites have a green-orange colour due to the presence of fuchsite and ferro-magnesium carbonates respectively. The weathered surface of listwanites usually has a gossanous boxwork texture and a brown-red colour due to the preferential breakdown of the ferro-magnesium carbonates. Other, less abundant minerals, commonly found in silica-carbonates include chlorite, fuchsite (Cr-rich mica), talc, fluorite, residual serpentine and chromite, and sulfides such as pyrite, chalcopyrite and arsenopyrite.

Buckman et al. (2010) also explain that ultramafic rocks (upper mantle peridotites) are believed to be the main source of gold (Pipino, 1980), which is contained within the accessory opaque minerals (sulfides, chromite, and magnetite). Gold contents in serpentinized mantle peridotite range between 3 and 5 ppb. Large-scale hydrothermal systems operating during the late stages of tectonic emplacement leach gold from the opaque minerals and transport it in a CO2-S-As-Cl-Na-K-B-rich solution as arsenic complexes. The hydrothermal fluids are focussed along tectonic contacts. As the system evolves the acid gold-bearing solutions precipitate silica-pyrite-arsenides and gold when entering into the reducing and alkaline carbonatized rocks. Silica-carbonates are on average 5 – 20 times more enriched in gold (average 0.02 – 0.1 ppm Au) than the surrounding ultramafic rocks (between 0.001-0.010 ppm) (Buisson and Leblanc, 1987). Economic grades of gold are usually associated with sulfides, sulfarsenides or arsenides (Buisson and Leblanc, 1987). The gold is usually bound to the sulfides, pyrite and Co-arsenides. Trace element analyses show strong positive correlations between Au and As, and quite commonly K. Elements such as Ba, Sb, B, Bi, Ag, and Cu may also be associated with high gold values.

Although the samples investigated in this study did not contain gold or silver in the polished sections, the Laroma Prospect has been investigated by a number of property holders for its gold content with many assays returning elevated Au. Interestingly, historic assessment reports have only ever documented gold grade and not base metal nor PGE potential. There were a number of different Ni-sulphides encountered through the investigation including: Ni-S (vaesite), As-Ni-Sb-S, As-Ni-Co-Sb-S, Sb-Ni-As-S, and Ni-As-S. Once these Ni-sulphides and sulphosalts were determined with the microprobe, the hand samples were tested with Ni-testing powder to confirm the observations. When the Ni-testing powder was added to the rock surface, there was an instant reaction which is evident by the purple-pink tinge shown in the following images.

Presented below is a table of Ni-bearing sulphides encountered in this investigation. Importantly, there are other critical elements identified that make the Laroma Prospect a highly desirable property for companies interested in green technology. As a preliminary discussion on the mineral inventory, the table below presents the elements present in each mineral and the possible mineral name association based on EDS data. A more determinative study involving WDS microprobe analysis and confirmation by micro-XRD is recommended to ascertain the exact mineral names.

Elements Detected by EDS	Possible Mineral Names
Ni-As-S	Gersdorffite
Ni-Sb-S	Ullmannite
Ni-Co-As-Sb-S	Vozhminite
Ni-Co-Fe-S	Siegenite
Ni-S	Millerite
As-Co-Ni-Fe-S	Langisite
Ni-Fe-S	Godlevskite
Ni-As-Co	Westerveldite
N-As-Sb-S	
Ni-Co-As-S	
Sb-Ni-Fe-As-S	
Ni-Co-S	

Conclusions

(1) The Laroma Prospect and the Midlothian Property should be considered for its Ni-Co-Sb-As content in addition to its gold tenor.

(2) Ni-Co-Sb arsenides are a result of late stage hydrothermal alteration of pre-existing ultramafic rocks of mantle origin.

(3) The Midlothian Property and the Laroma Prospect are located along the western extension of the Larder Break, a corridor of fluid access.

(4) The host rocks containing dominantly carbonate-quartz and Cr-paragonite on the Midlothian Property can be referred to as Listwanites.

(5) The dominant Ni-Co-Sb mineralogy is associated with the earlier alteration of dolomite-ankerite and magnesite siderite solid solution carbonate and Cr-green paragonitic mica.

(6) The late stage quartz-carbonate stringers do not carry significant sulphide.

Recommendations

In addition to further prospecting, ground magnetics, and VLF surveys, it is recommended that a further study of the carbonate and Cr-paragonite mineralogy be undertaken. A comprehensive investigation of the micas and the Cr-paragonite to establish if there are differing compositions including Cr-phengitic muscovite and whether there may be an association to the gold. Also interrogating the carbonate species may help vector toward higher grade Ni-Co-Sb contents and possibly gold.

Budget

Prospecting (2 Geologists)……………………………………………………………………$15,000
Assays and Geochemistry…………………………………………………………………………$3000
Trenching………………………………………………………………………………………………$8000
Ground Magnetometer Survey………………………………………………………………….$5000
VLF Survey………………………………………………………………………………………………$5000
Petrographic Investigation/WDS analysis…………………………………………$12,000
Micro-XRD analysis………………………………………………………………………………$5000

$53,000

Respectfully Submitted, Dr. Jim Renaud, P.Geo

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Buckman, Solomon & Ashley, Paul, 2010. Silica-carbonate (listwanites) related gold mineralisation associated with epithermal alteration of serpentinite bodies.

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Smith, P.E., Schandl, E.S. and York, D, 1993. Timing of metasomatic alteration of the Kidd Creek massive sulphide deposit, Ontario, using 40Ar739Ar laser dating of single crystals of fuchsite. Economic Geology, Special lssue: Abitibi Ore Deposits in a Modern Context, v. 88, p. 1636-1645.

Dr. Jim Renaud P.Geo, PhD.
Renaud Geological Consulting Ltd.
21272 Denfield Rd, London, Ontario, N6H-5L2
519-473-3766
rgcltd@execulink.com

CERTIFICATE of AUTHOR

I, Jim Renaud, **Professional Geologist**, do certify that:

1.I am the **President** and the holder of a **Certificate of Authorization** for:
Renaud Geological Consulting Ltd.,
21272 Denfield Rd
London, Ontario, Canada
N6H-5L2

2.That I have the degree of Bachelor of Science (Chemistry and Geology), 1999, from Western University; the degree of Honors Standing in Geology, 2000, from Western University; Masters of Science (Economic Geology), 2003, from Western University; and Doctor of Philosophy in Geology, 2014, from Western University;

3.I am an active member of:
Association of Professional Geoscientists of Ontario, APGO
Prospectors and Developers Association of Canada, PDAC

4.I have been a **licensed Prospector in Ontario** since 2000
.
5.I have worked continuously as a Geologist for 19 years.

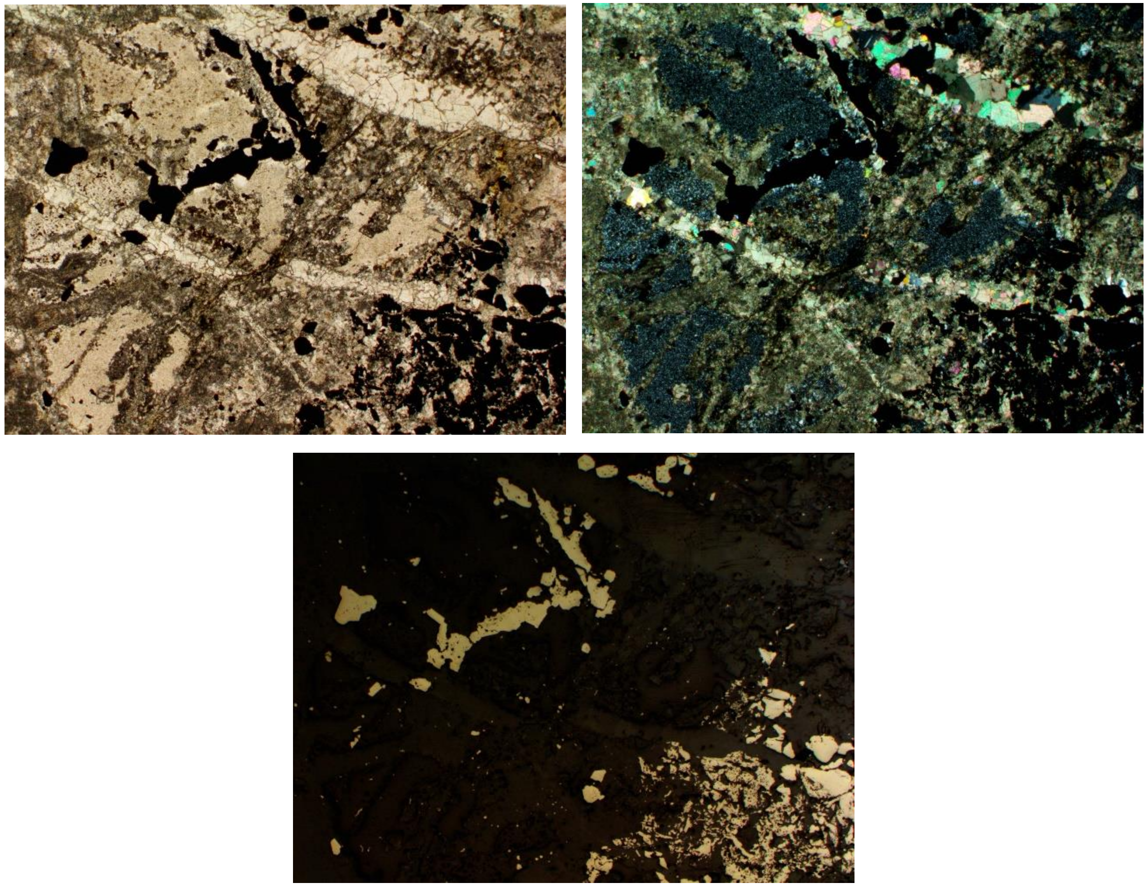
6.Unless stated otherwise, **I am responsible** for the preparation of all sections of the Assessment Report titled:
A Comprehensive Petrographic and Electron Microprobe Examination of Listwanite samples
from the Laroma Prospect, Midlothian Lake Property,
Larder Lake Mining Division, Midlothian Township, Ontario
7.I am not aware of any material fact or material change with respect to the subject matter of the Assessment Report that is not contained in the Assessment Report and its omission to disclose makes the Assessment Report misleading.
Dated this 30th day of June 2022

Appendix

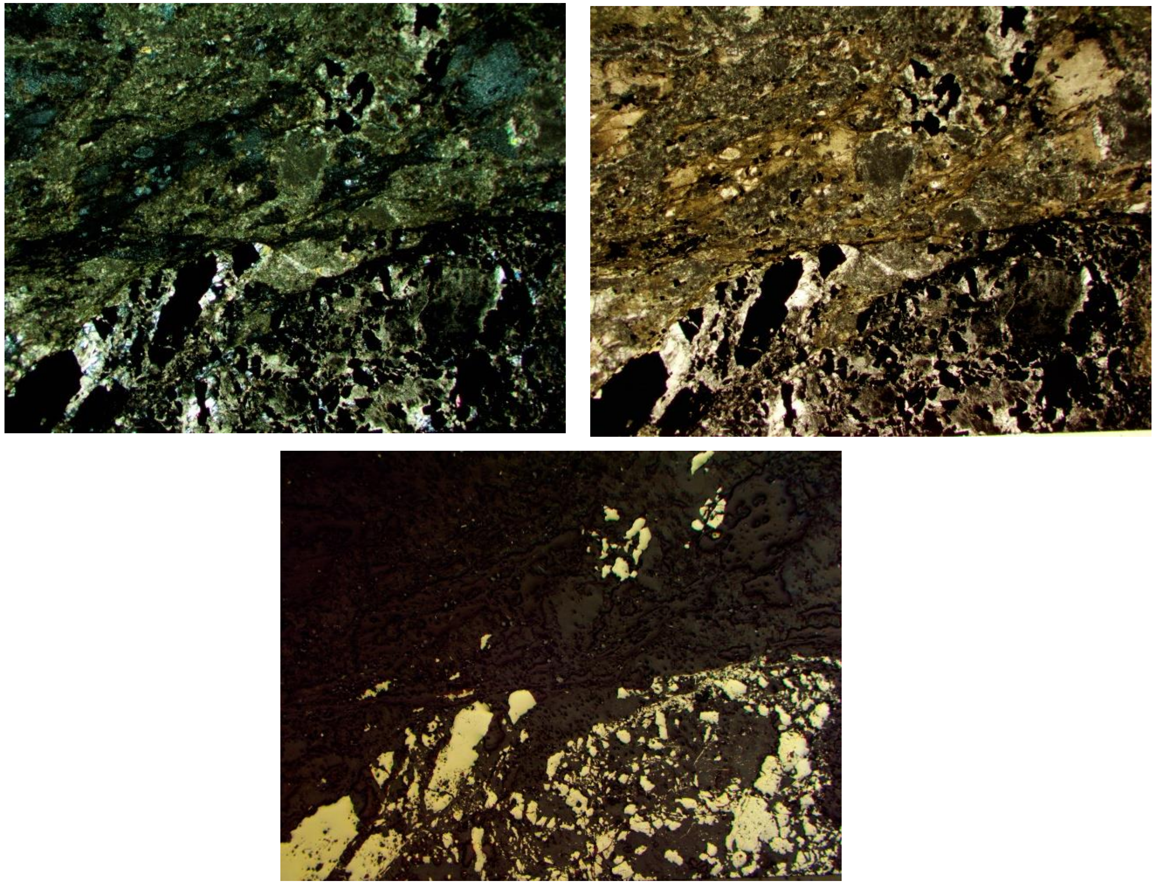
Specimen Notes for 'MID-11'

This rock was thin sectioned in an attempt to characterize the Pt-Pd values obtained in the assay results. Unfortunately, Pt-Pd minerals were not observed in thin section. This sample is from a boulder on the claim. The rock is described as a sheared mafic with 5% pyrite and quartz-carbonate alteration. In thin section, the rock appears to have undergone various stages of silicification, brecciation, and sealing. There is a fine-grained silicification which includes sulphides hosted within quartz fragments. This fine-grained quartz was brecciated and sealed by a later quartz-carbonate fluid hosting disseminated sulphides. The rock is cut by late Cr-chlorite, quartz, carbonate (dolomite-ankerite solid solution), and coarse sulphides.

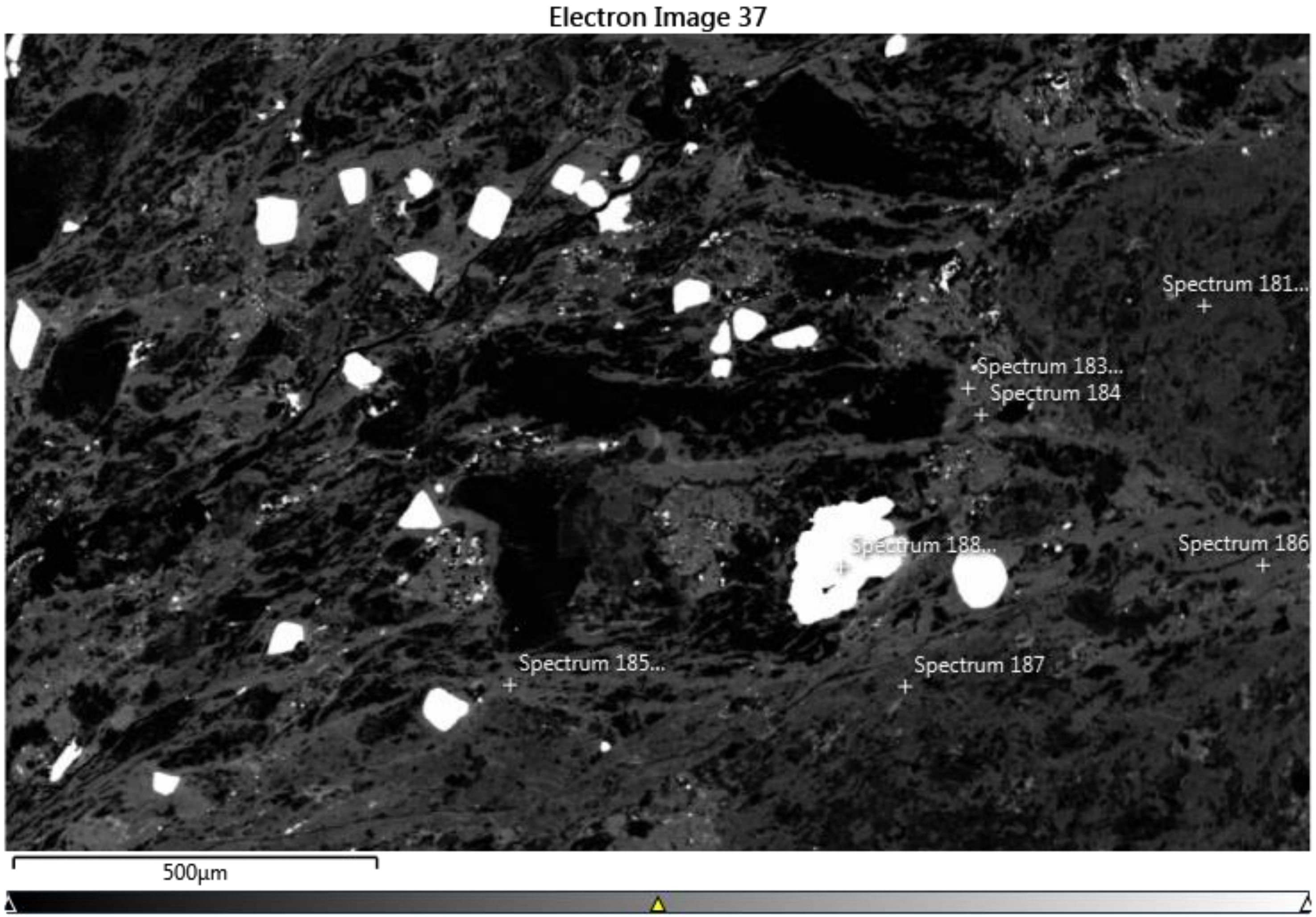
EDS determinations established that the rock contains strongly zoned chromite grains with Zn-bearing rinds. The sulphide inventory consists of pyrite, pyrrhotite, chalcopyrite, and Ni-Co-Fe-S minerals.



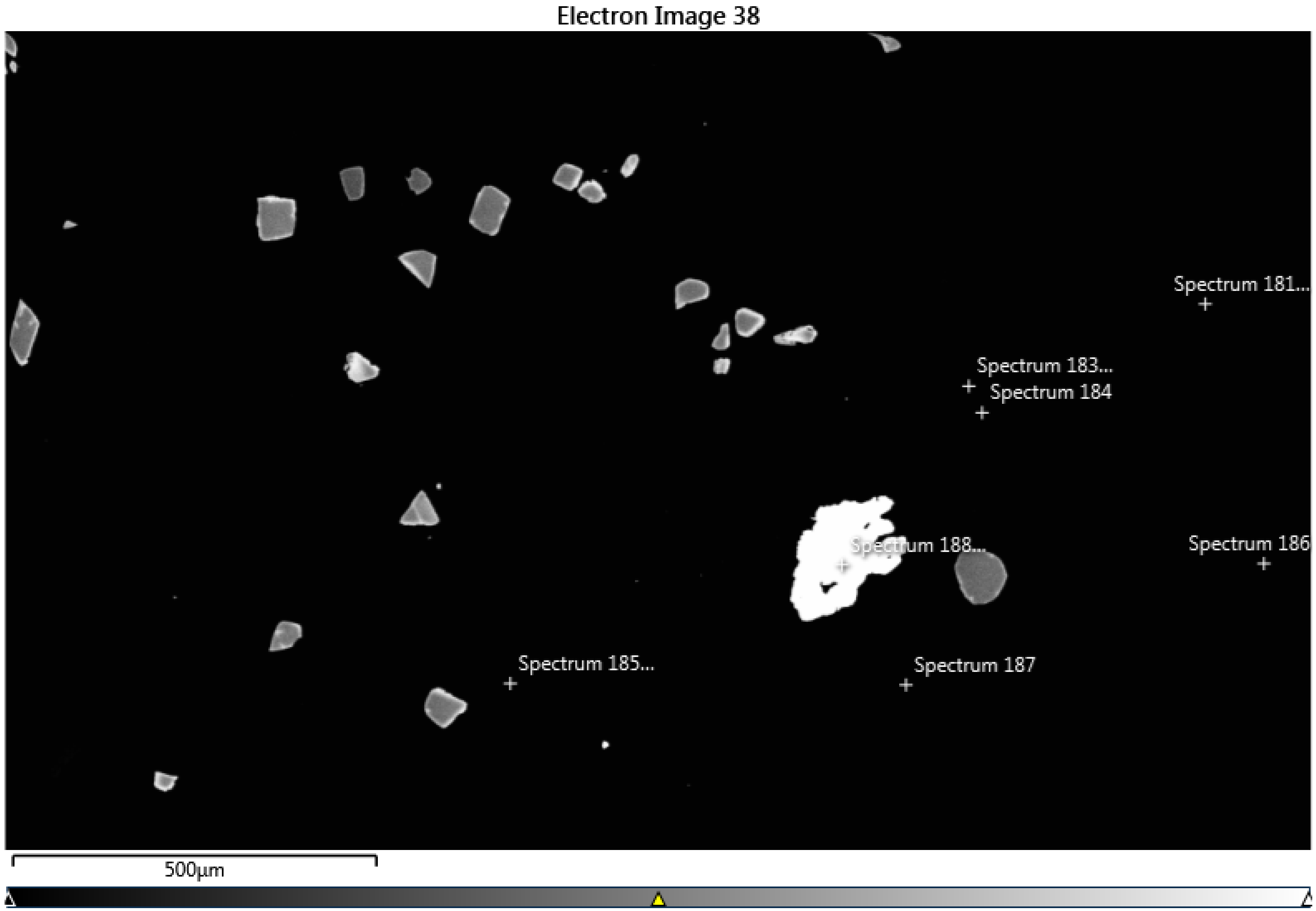
Plane light image (top left), crossed polarized light image (top right) and reflected light image (bottom) illustrating fragments of fine-grained cryptocrystalline sugary quartz sealed by polycrystalline carbonate and cut by late carbonate-chlorite veinlets. Field of view = 9mm



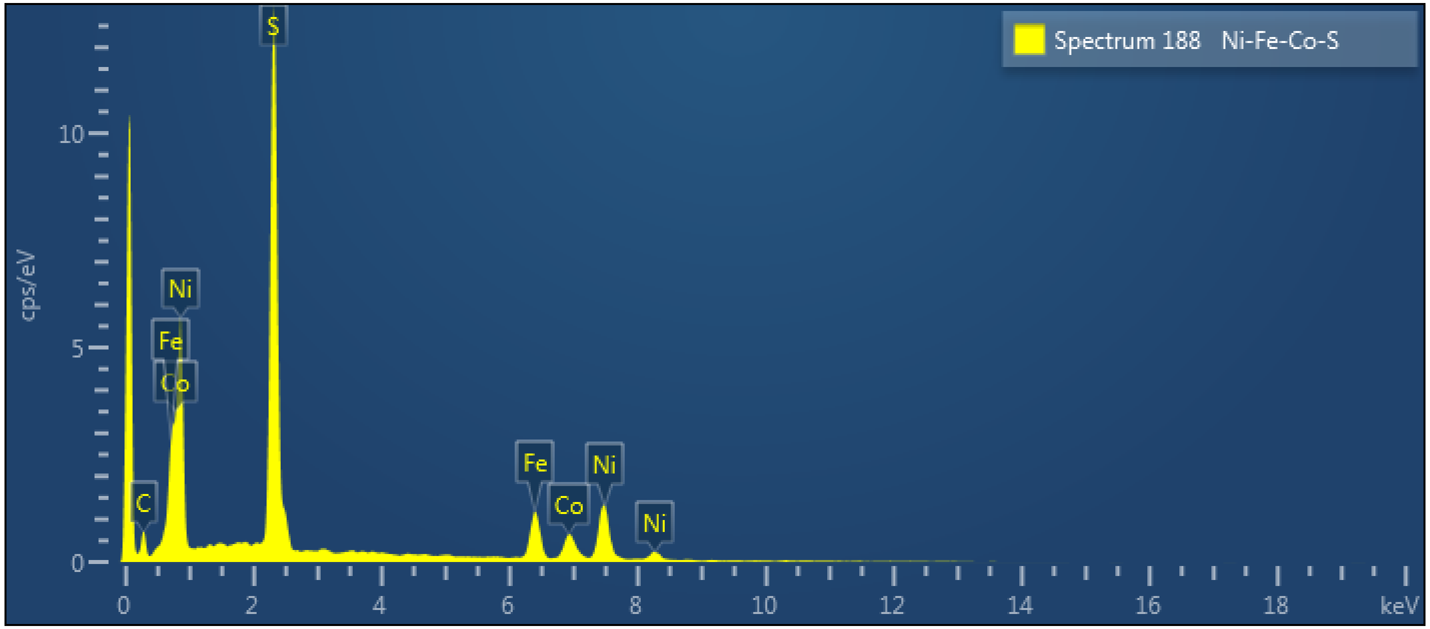
lane light image (top left), crossed polarized light image (top right) and reflected light image (bottom) illustrating late chlorite and sulphide growth. Field of view = 17mm



Backscatter image illustrating a Ni-Co-Fe-S mineral (spectrum 188) within quartz-chlorite-carbonate and associated chromites (cluster of bright grains at top of image).

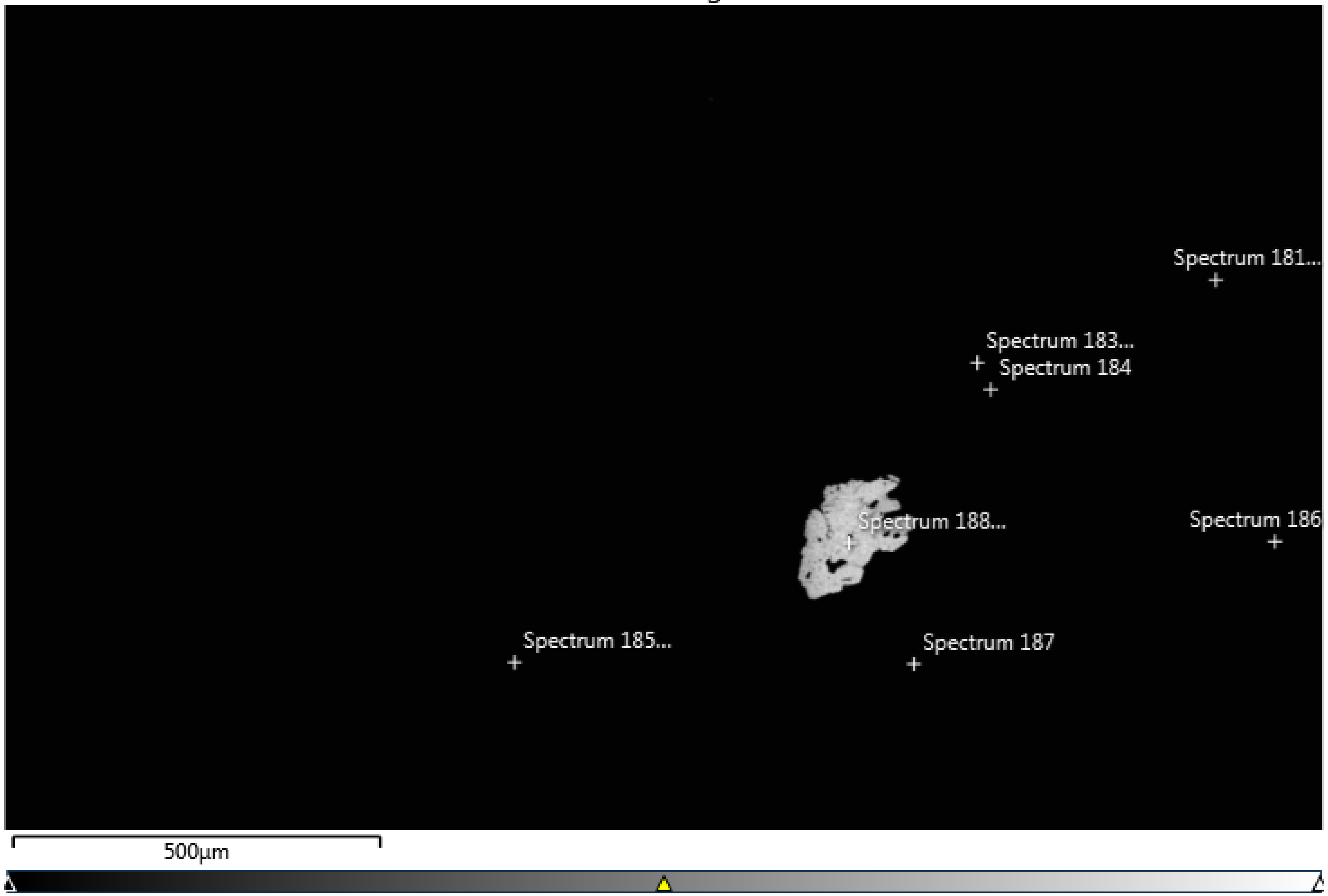


Same image as above with brightness reduced to illustrate the Ni-Co-Fe-S grains (spectrum 188) and the grains of chromite defined by dark cores and bright zincian rinds.



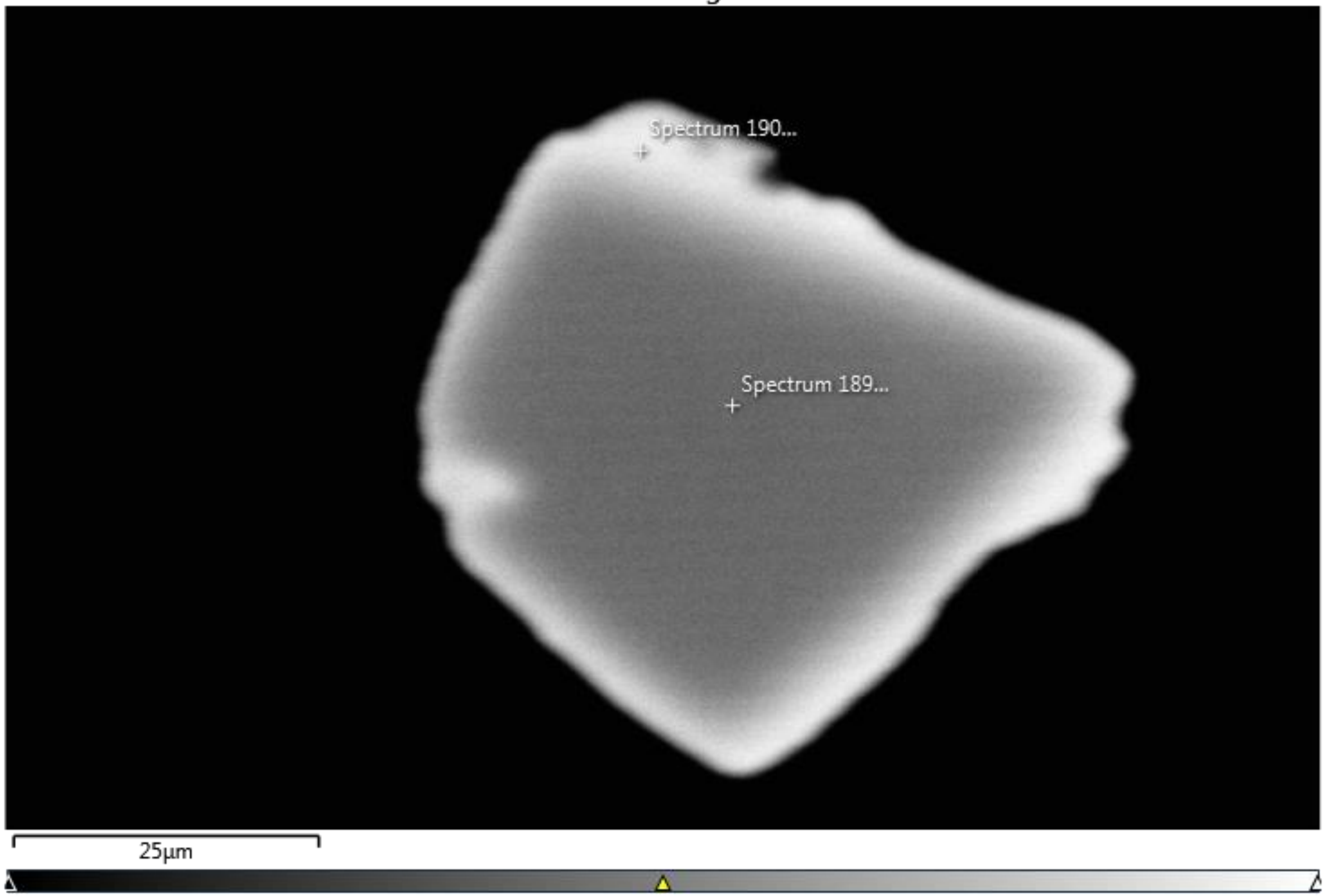
Spectrum 188 Ni-Fe-Co-S				
Element	Line Type	Weight %	Weight % Sigma	Atomic %
S	K series	46.95	0.91	61.52
Fe	K series	14.92	0.72	11.23
Co	K series	10.07	0.76	7.18
Ni	K series	28.05	0.96	20.07
Total		100.00		100.00

Electron Image 39

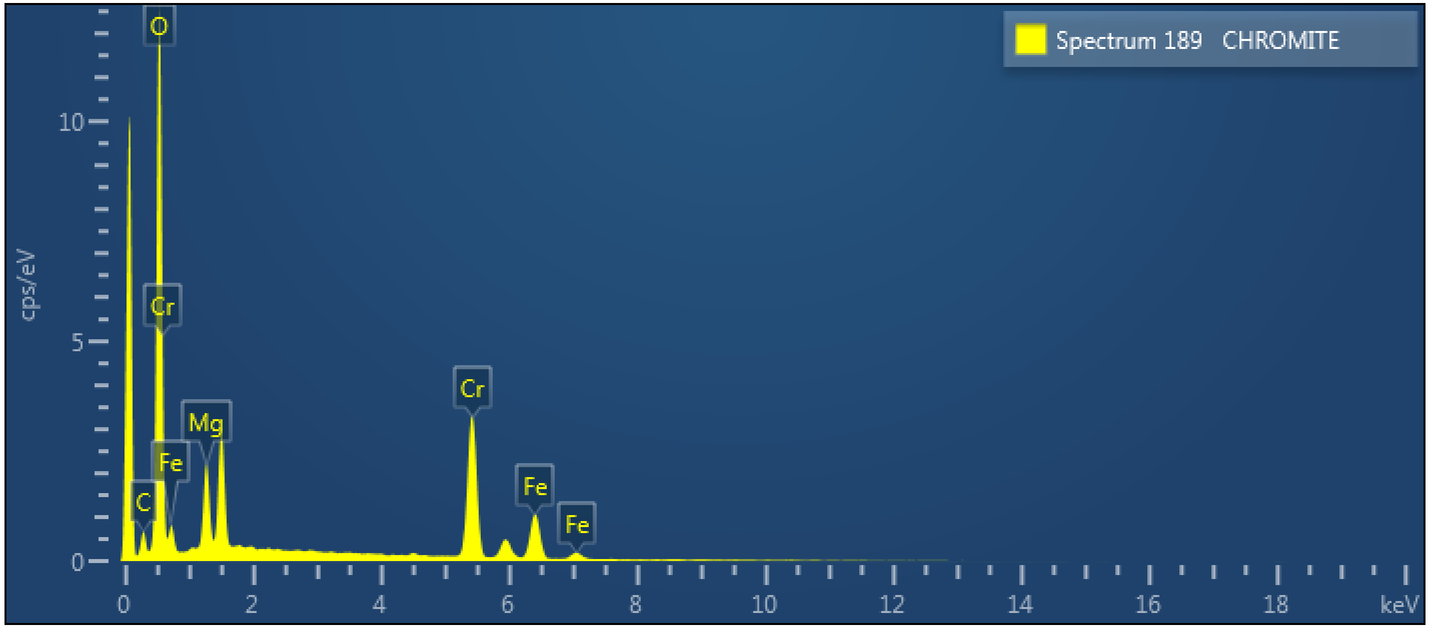


Brightness reduced to illustrate the Ni-Co-Fe-S grain (spectrum 188).

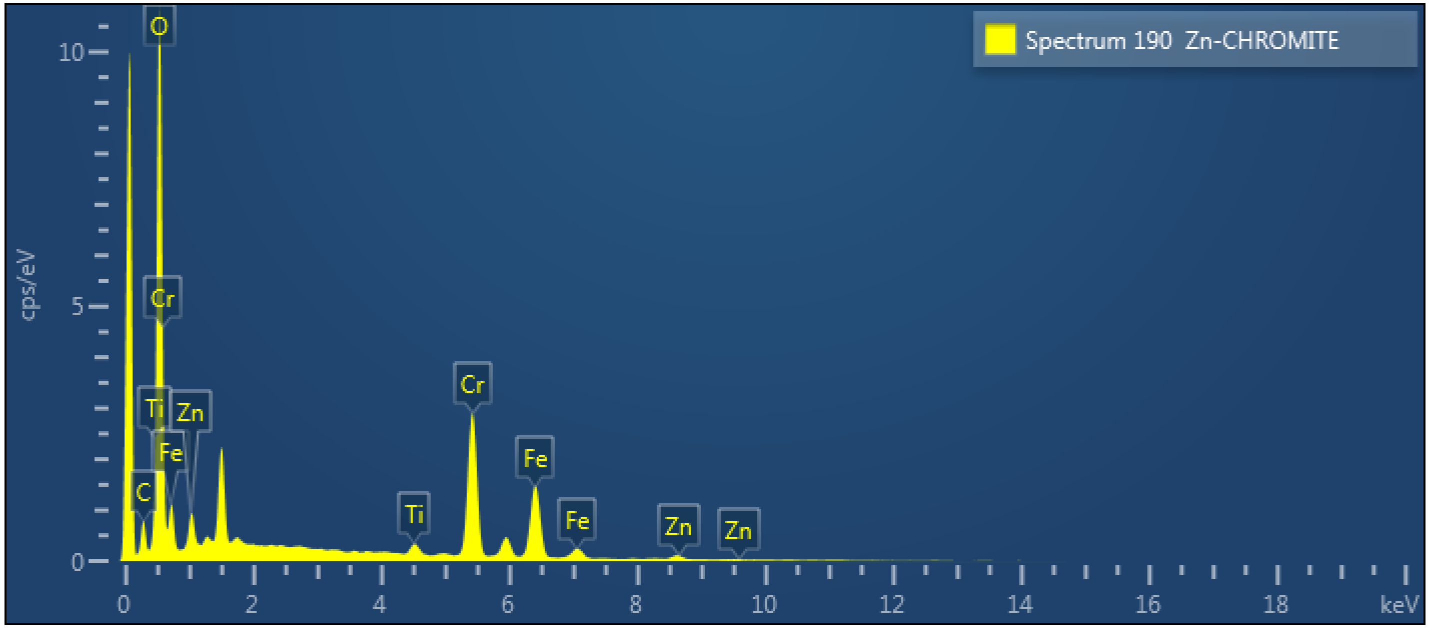
Electron Image 40



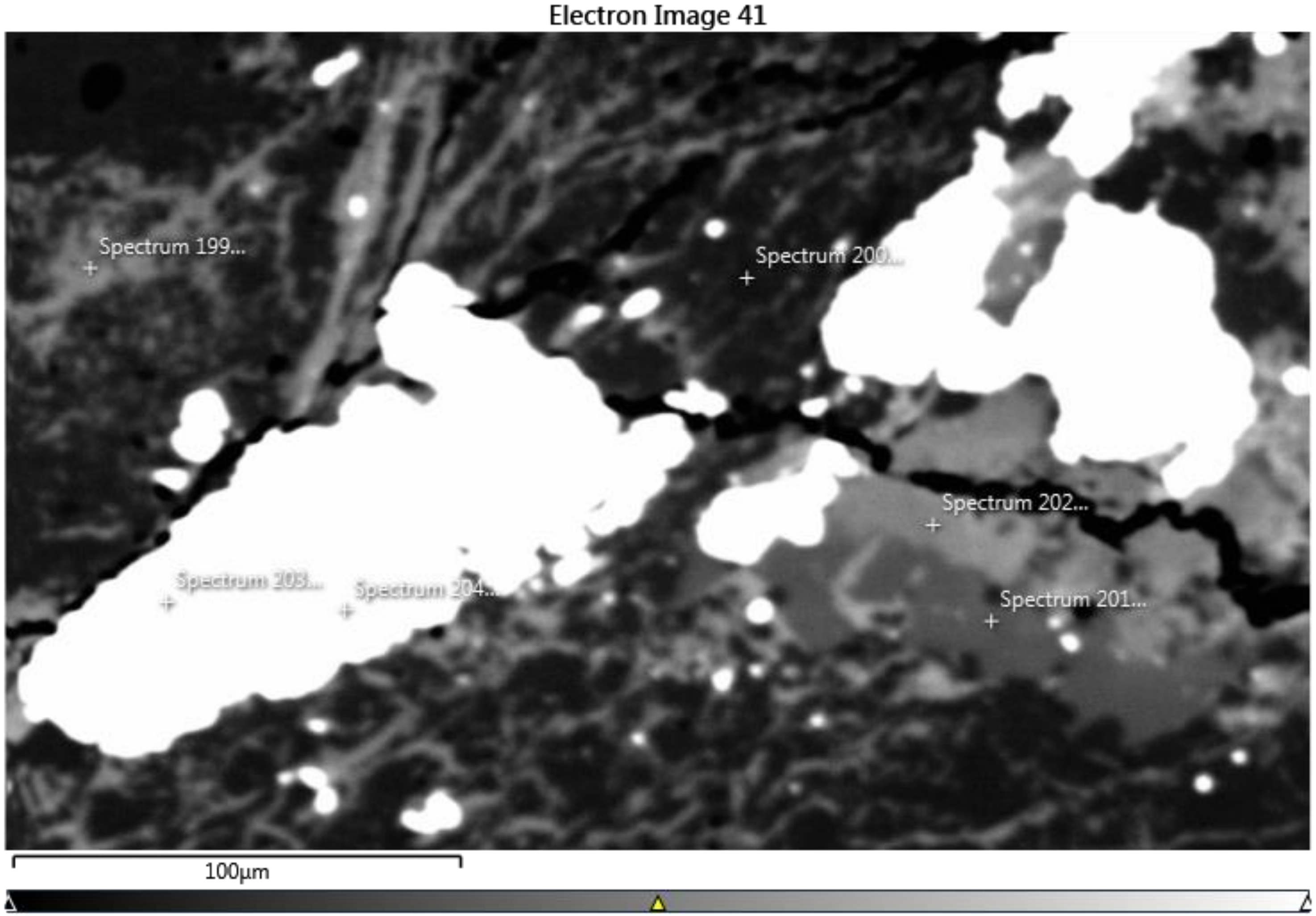
High magnification image of one of the chromite grains with a dark core and a bright zincian margin with up to 3.74 wt% ZnO.



Spectrum 189 CHROMITE							
Element	Line Type	Weight %	Weight % Sigma	Atomic %	Oxide	Oxide %	Oxide % Sigma
O	K series	34.15	0.61	56.68			
Mg	K series	8.69	0.38	9.49	MgO	14.41	0.64
Al	K series	10.94	0.37	10.76	Al2O3	20.67	0.71
Cr	K series	31.21	0.57	15.94	Cr2O3	45.62	0.84
Fe	K series	15.01	0.53	7.13	FeO	19.31	0.68
Total		100.00		100.00		100.00	

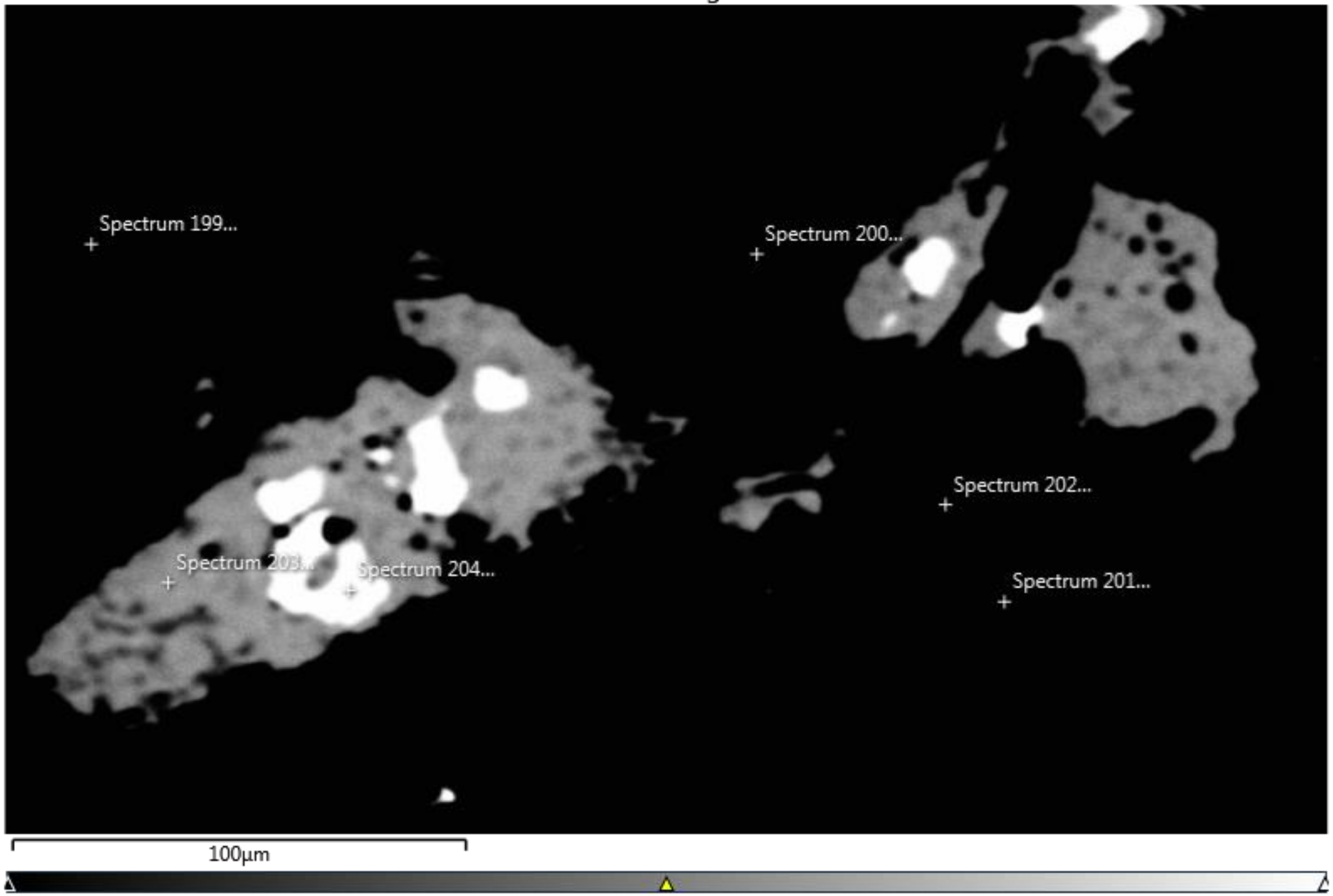


Spectrum 190 Zn-CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.31	0.58	57.45			
Al	K series	9.45	0.32	10.28	Al2O3	17.86	0.61
Ti	K series	1.61	0.19	0.99	TiO2	2.69	0.32
Cr	K series	31.09	0.54	17.56	Cr2O3	45.44	0.79
Fe	K series	23.53	0.56	12.37	FeO	30.27	0.72
Zn	K series	3.00	0.49	1.35	ZnO	3.74	0.60
Total		100.00		100.00		100.00	

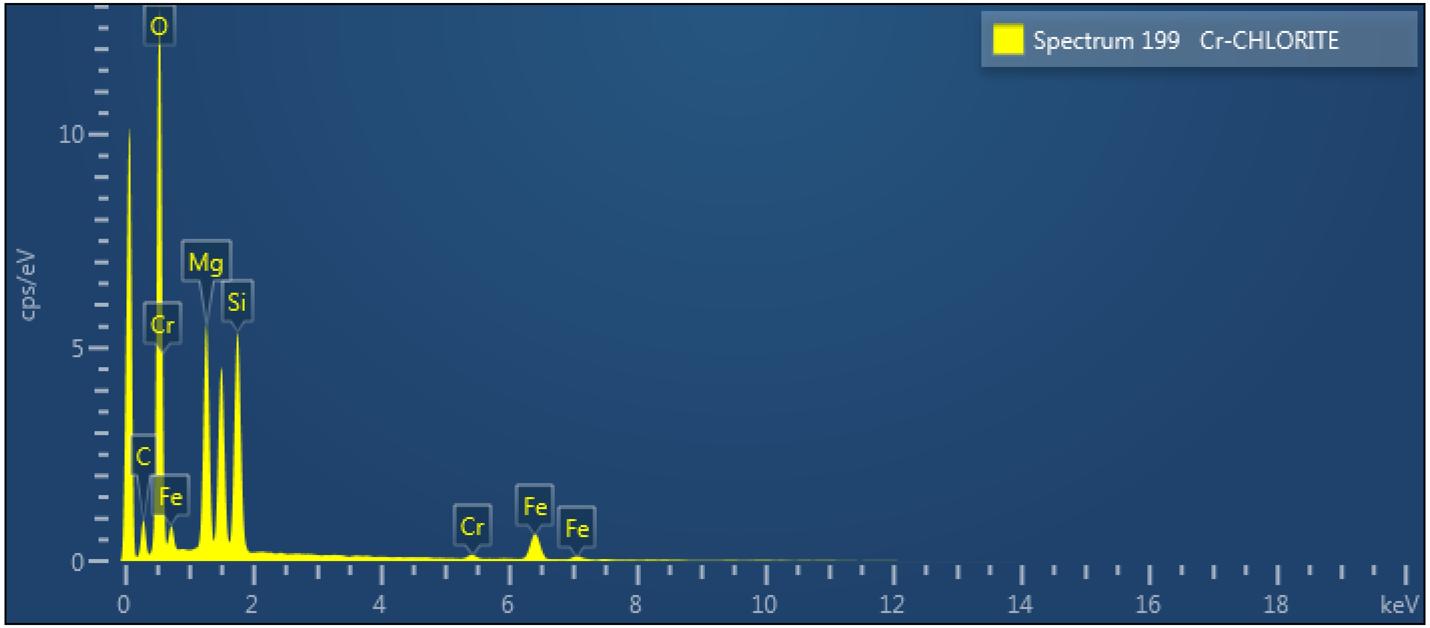


Backscatter image illustrating Cr-chlorite (spectrum 199), quartz (spectrum 200), and compositionally zoned dolomite-ankerite solid solution carbonate (spectrum 201) and Mn-bearing dolomite-ankerite solid solution carbonate hosting bright grains of Ni-Fe-Co-S (spectrum 203) and Ni-As-Co-Fe-S (spectrum 204).

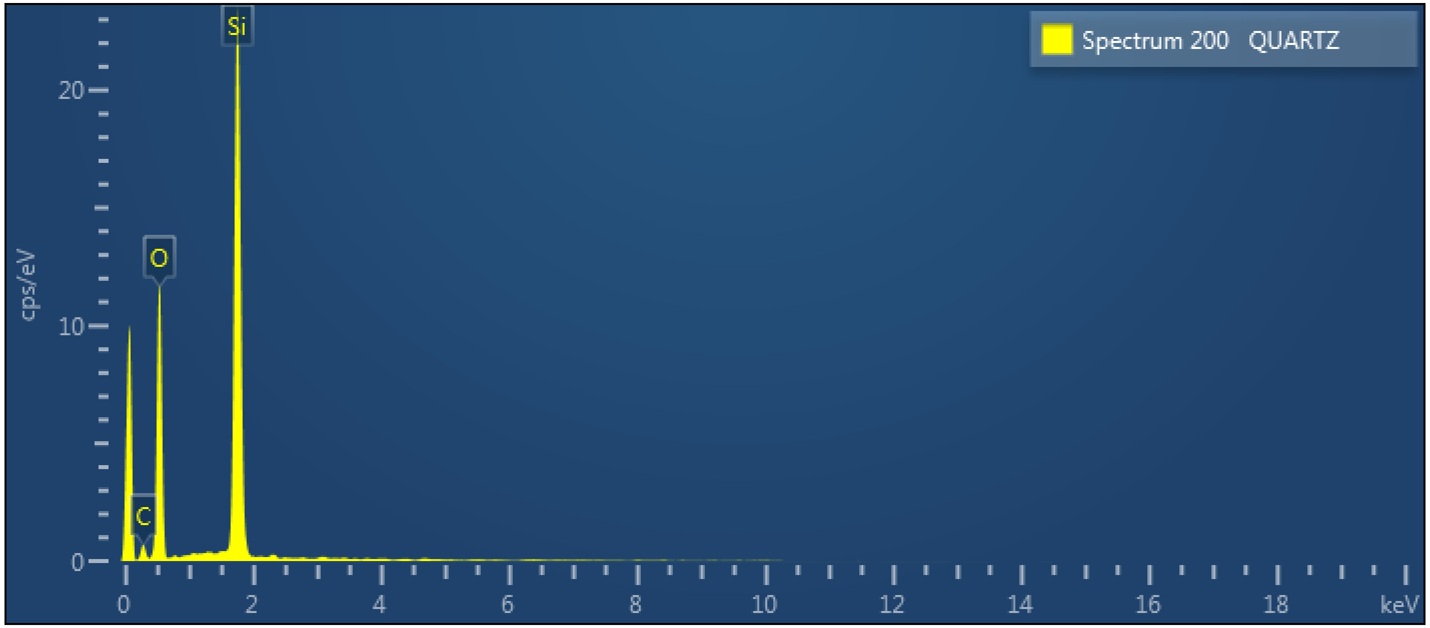
Electron Image 42



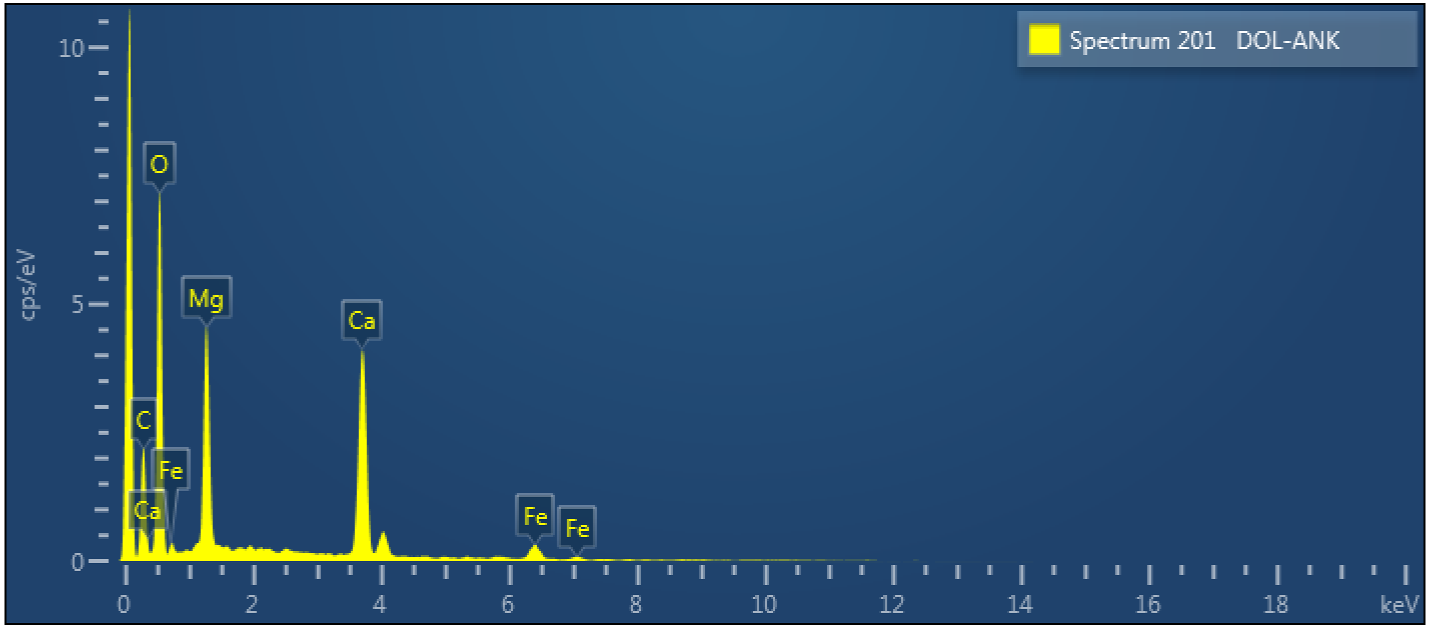
Same image as above with brightness reduced to illustrate the included grains of Ni-As-Fe-Co-S (spectrum 204) hosted within Ni-Fe-Co-S (spectrum 203).



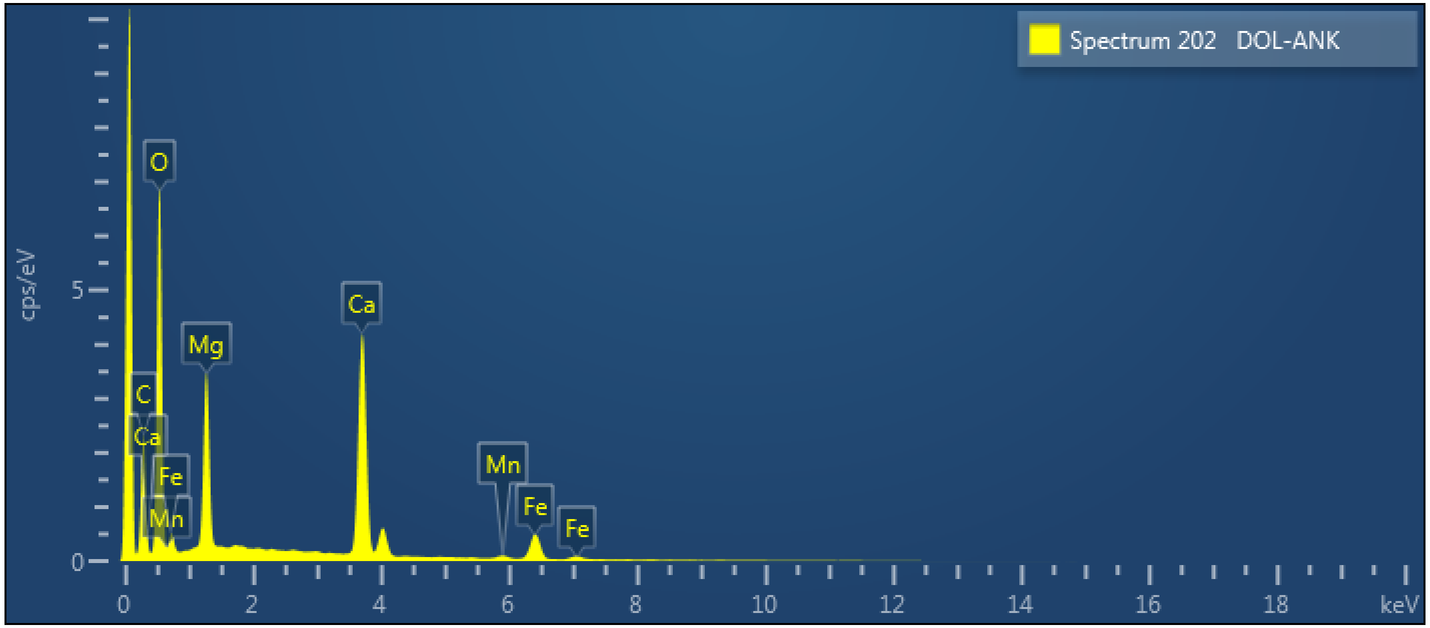
Spectrum 199 Cr-CHLORITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	44.63	0.41	59.18			
Mg	K series	15.87	0.28	13.85	MgO	26.31	0.46
Al	K series	13.79	0.28	10.84	Al2O3	26.06	0.53
Si	K series	16.90	0.29	12.76	SiO2	36.15	0.61
Fe	K series	7.94	0.31	3.02	FeO	10.22	0.39
Cr	K series	0.87	0.14	0.35	Cr2O3	1.27	0.20
Total		100.00		100.00		100.00	



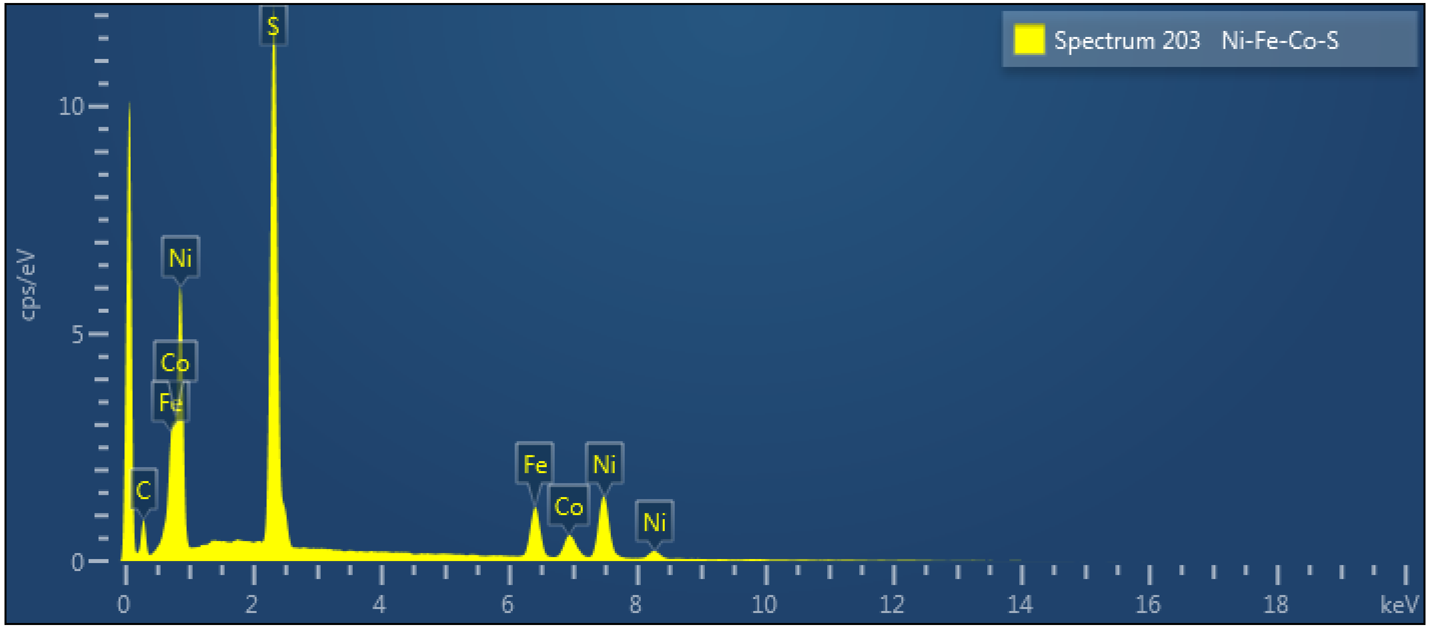
Spectrum 200 QUARTZ							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	53.26	0.64	66.67			
Si	K series	46.74	0.64	33.33	SiO2	100.00	1.36
Os	L series	0.00	0.88	0.00	OsO2	0.00	1.03
Total		100.00		100.00		100.00	

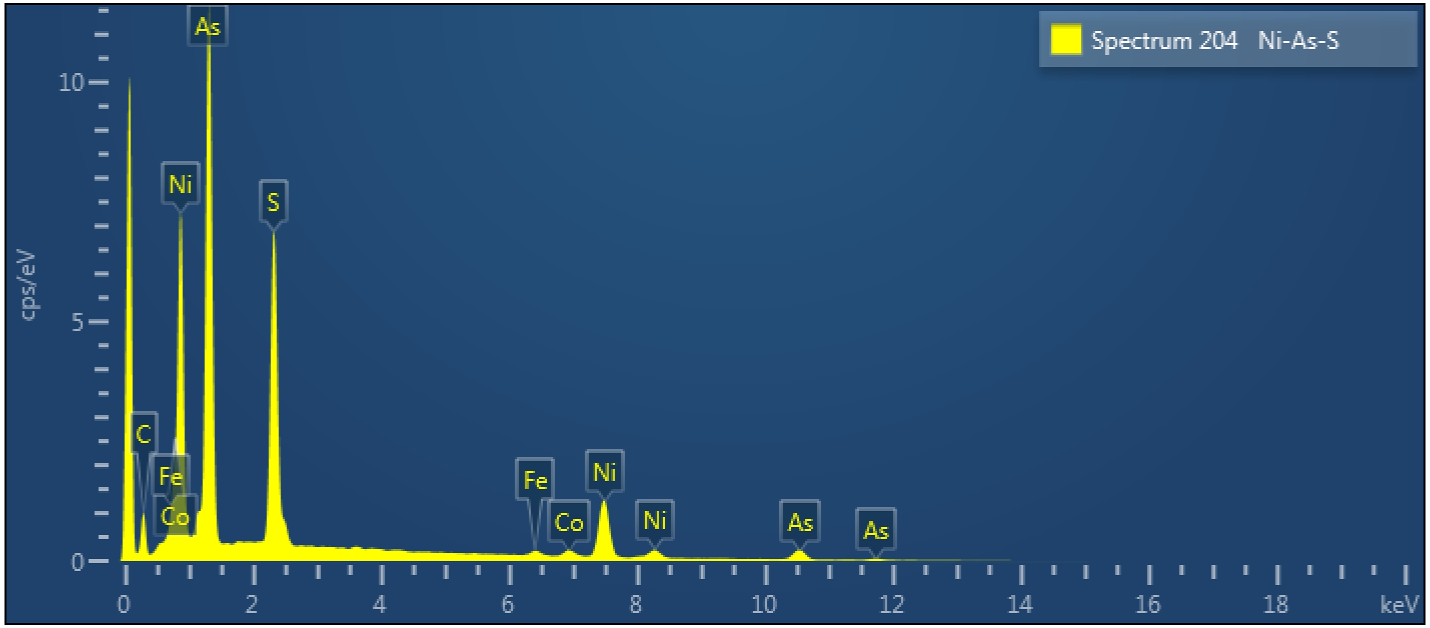


Spectrum 201 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	32.88	1.10	50.00			
Mg	K series	26.25	1.01	26.27	MgO	43.53	1.68
Ca	K series	34.62	1.05	21.01	CaO	48.44	1.47
Fe	K series	6.24	0.96	2.72	FeO	8.03	1.24
Total		100.00		100.00		100.00	



Spectrum 202 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.47	0.41	50.00			
Mg	K series	21.27	0.35	22.24	MgO	35.27	0.58
Ca	K series	34.89	0.39	22.13	CaO	48.82	0.54
Fe	K series	11.38	0.39	5.18	FeO	14.64	0.50
Mn	K series	0.99	0.22	0.46	MnO	1.28	0.28
Total		100.00		100.00		100.00	


Spectrum 203 Ni-Fe-Co-S
cps/eV
10
5
0
S
Ni
Co
Fe
C
Fe
Ni
Co
Ni
0
2
4
6
8
10
12
14
16
18
keV


Spectrum 204 Ni-As-S
cps/eV
10
5
0
As
Ni
S
C
Fe
Co
Fe
Ni
Co
Ni
As
As
0
2
4
6
8
10
12
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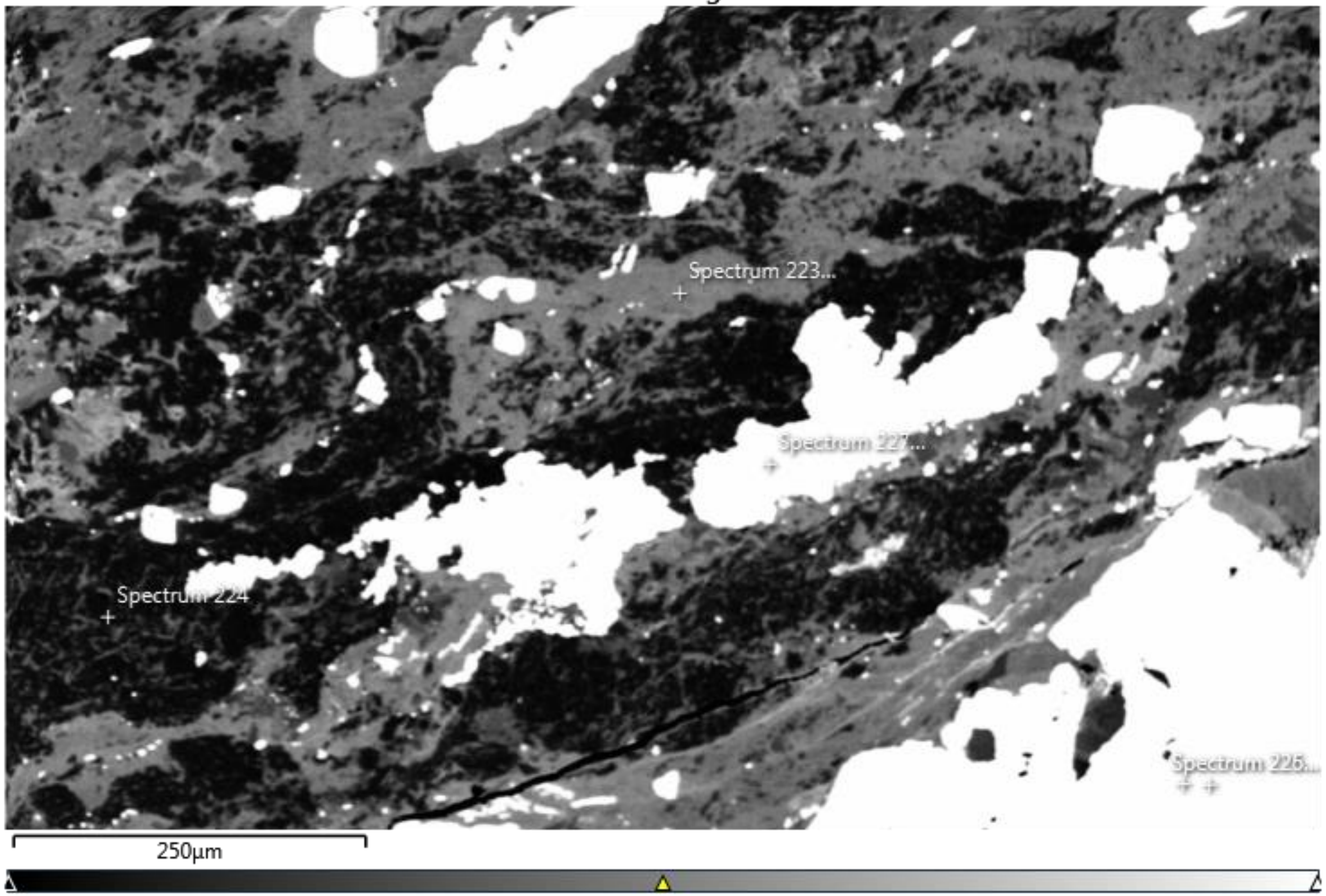
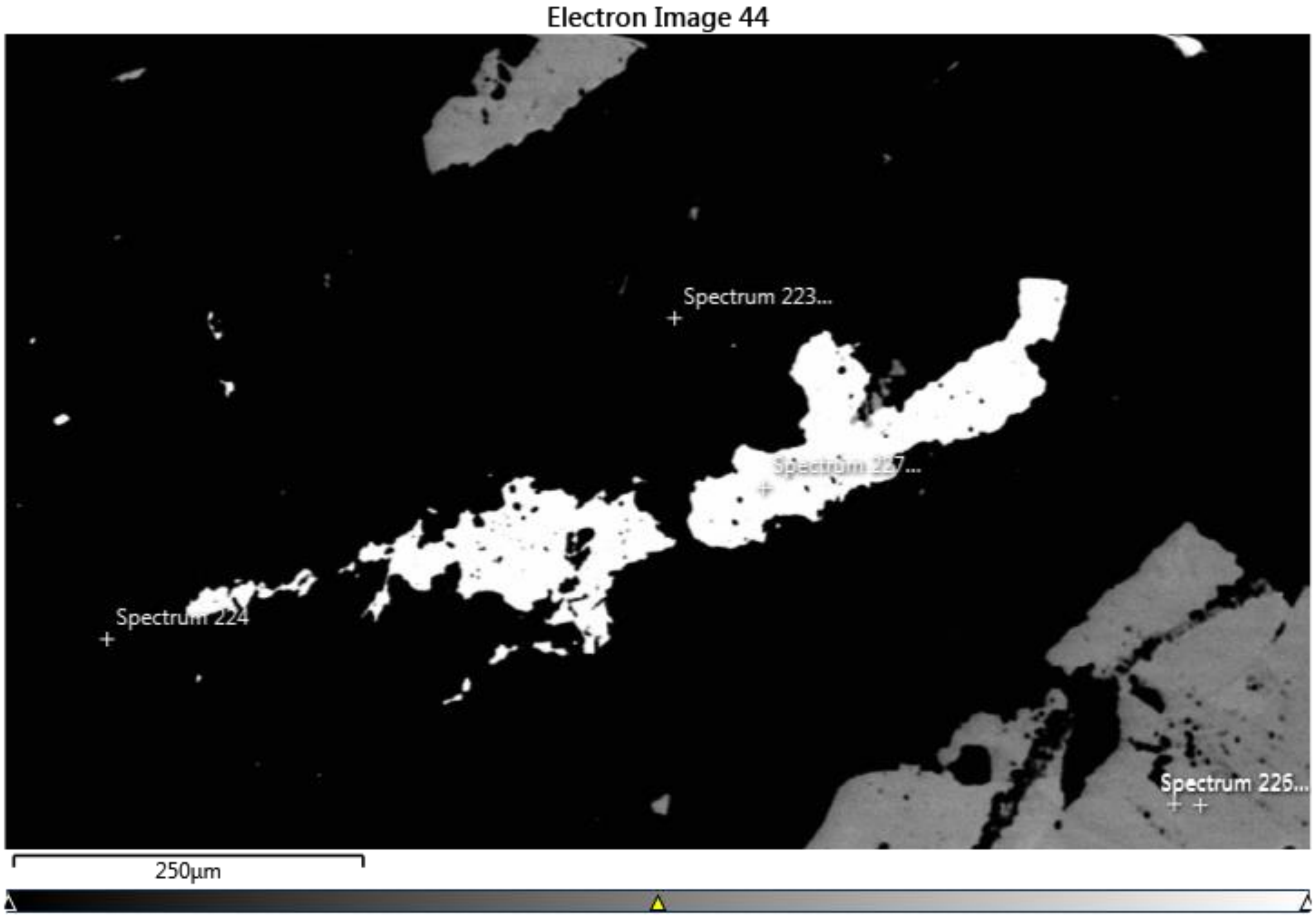
16
18
keV

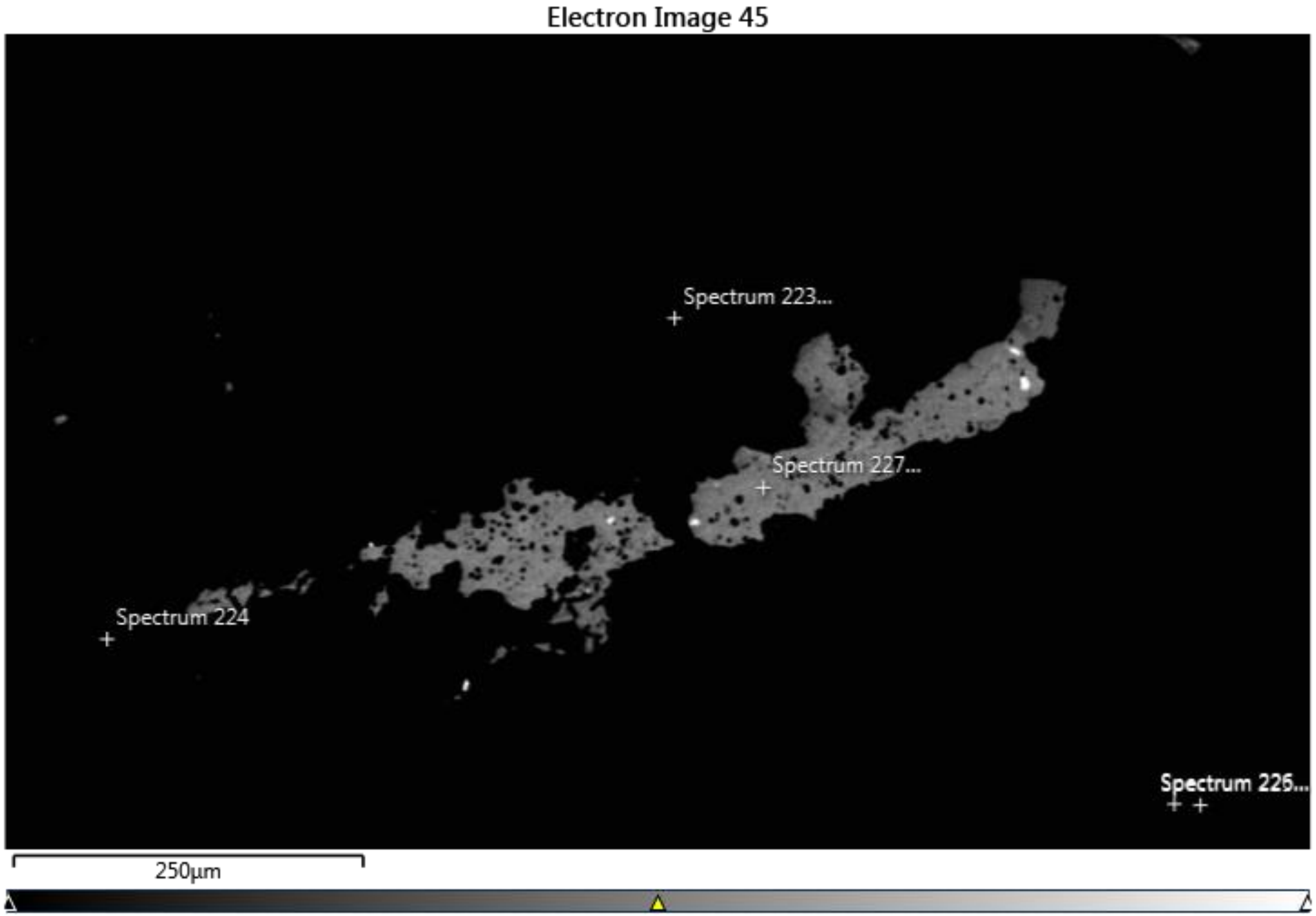
Electron Image 43



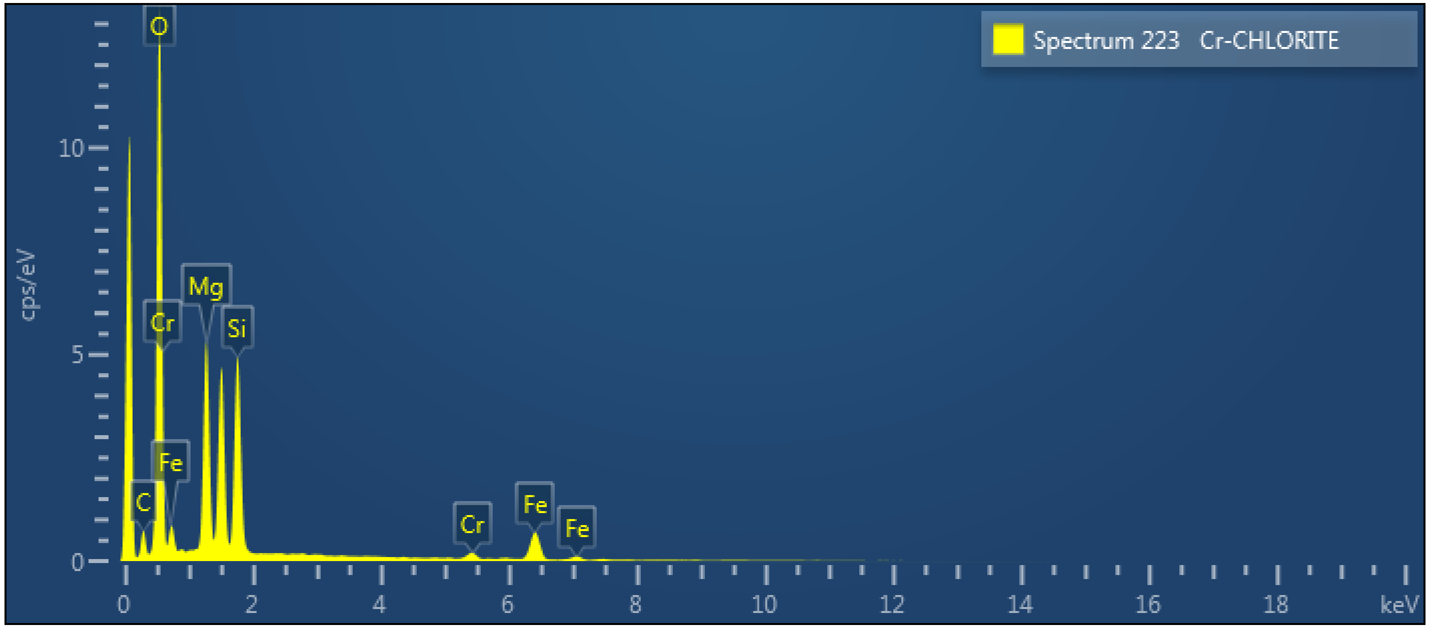
Backscatter image of Cr-chlorite (spectra 223, 224) hosting pyrite (spectra 225, 226) and Ni-Fe-Co-S (spectra 227).



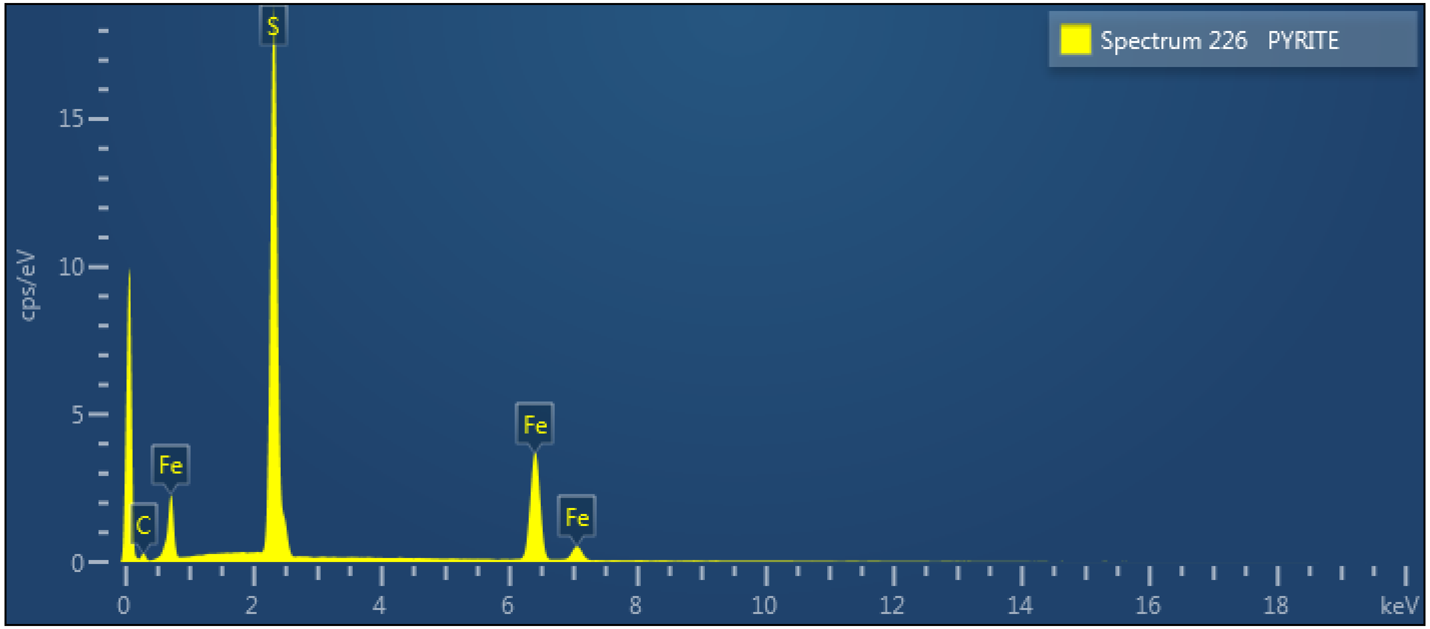
Same image as above with brightness reduced to illustrate the pyrite (spectrum 225) and the Ni-Fe-Co-S (spectrum 227).



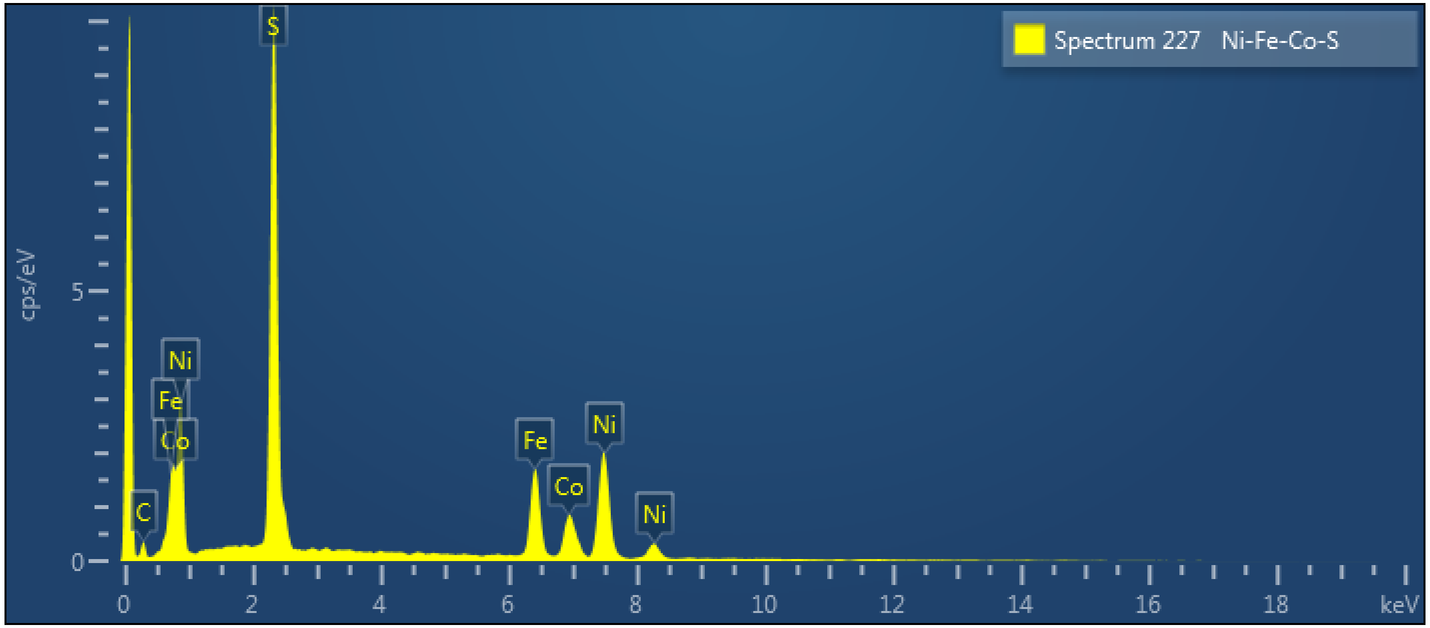
Backscatter image of the Ni-Co-Fe-S (spectrum 227) hosting inclusions of Ni-As-S (see images below).



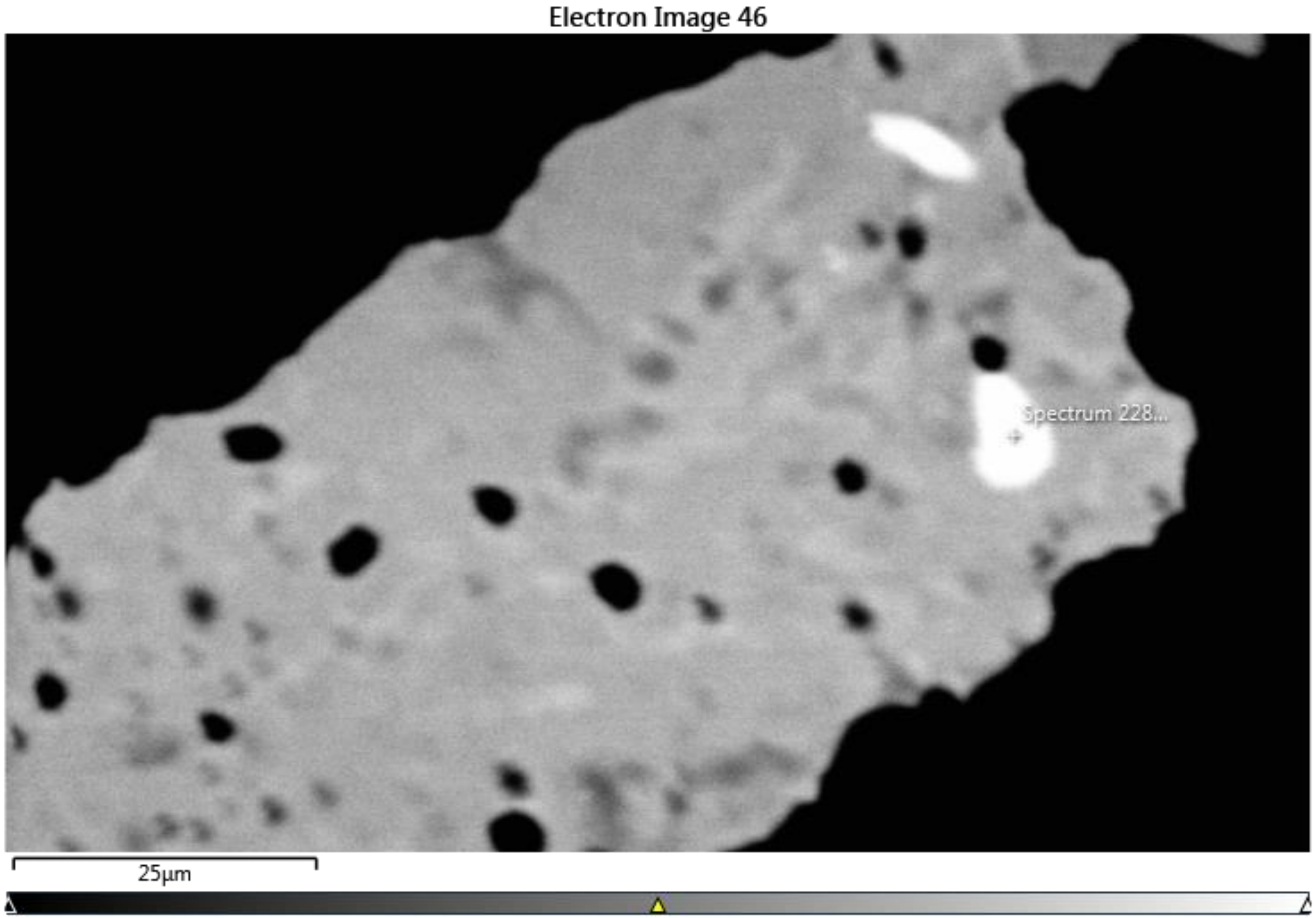
Spectrum 223 Cr-CHLORITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	44.16	0.45	59.04			
Mg	K series	15.33	0.30	13.49	MgO	25.42	0.50
Al	K series	14.47	0.31	11.47	Al2O3	27.33	0.58
Si	K series	15.84	0.31	12.06	SiO2	33.88	0.66
Fe	K series	8.86	0.34	3.39	FeO	11.40	0.44
Cr	K series	1.34	0.17	0.55	Cr2O3	1.96	0.24
Total		100.00		100.00		100.00	



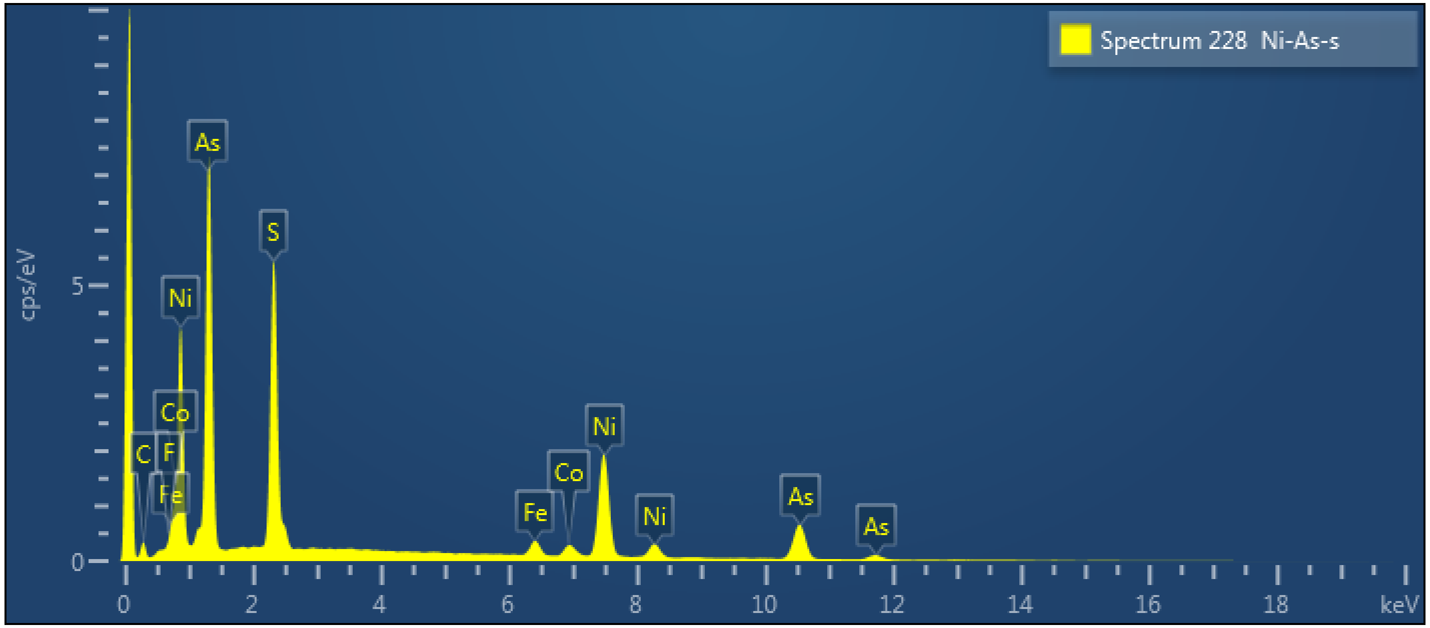
Spectrum 226 PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.75	0.34	67.82
Fe	K series	45.25	0.34	32.18
Total		100.00		100.00



Spectrum 227 Ni-Fe-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	33.73	0.66	47.90
Fe	K series	18.81	0.63	15.34
Co	K series	11.56	0.66	8.93
Ni	K series	35.89	0.85	27.83
Total		100.00		100.00



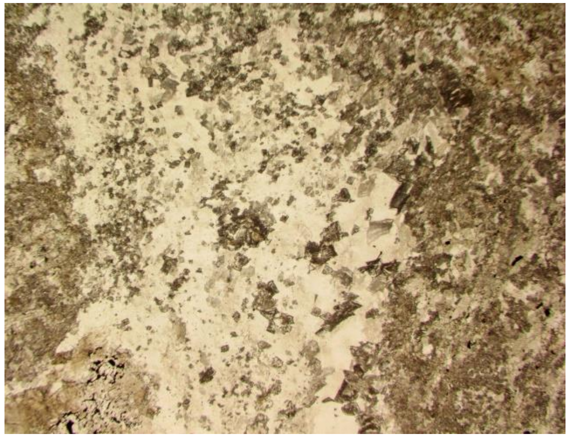
Higher magnification image of the Ni-Fe-Co-S (main grain) hosting minute inclusions of Ni-As-S (spectrum 228).

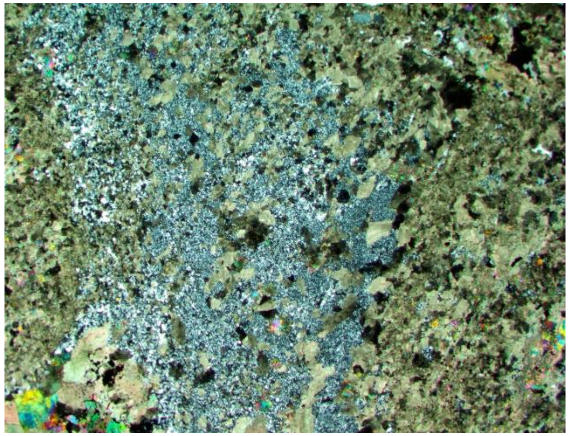


Spectrum 228 Ni-As-s				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.35	0.25	32.11
Ni	K series	30.35	0.39	27.51
As	L series	43.23	0.41	30.71
Fe	K series	2.71	0.17	2.58
Co	K series	2.71	0.20	2.45
F	K series	1.66	0.26	4.64
Total		100.00		100.00

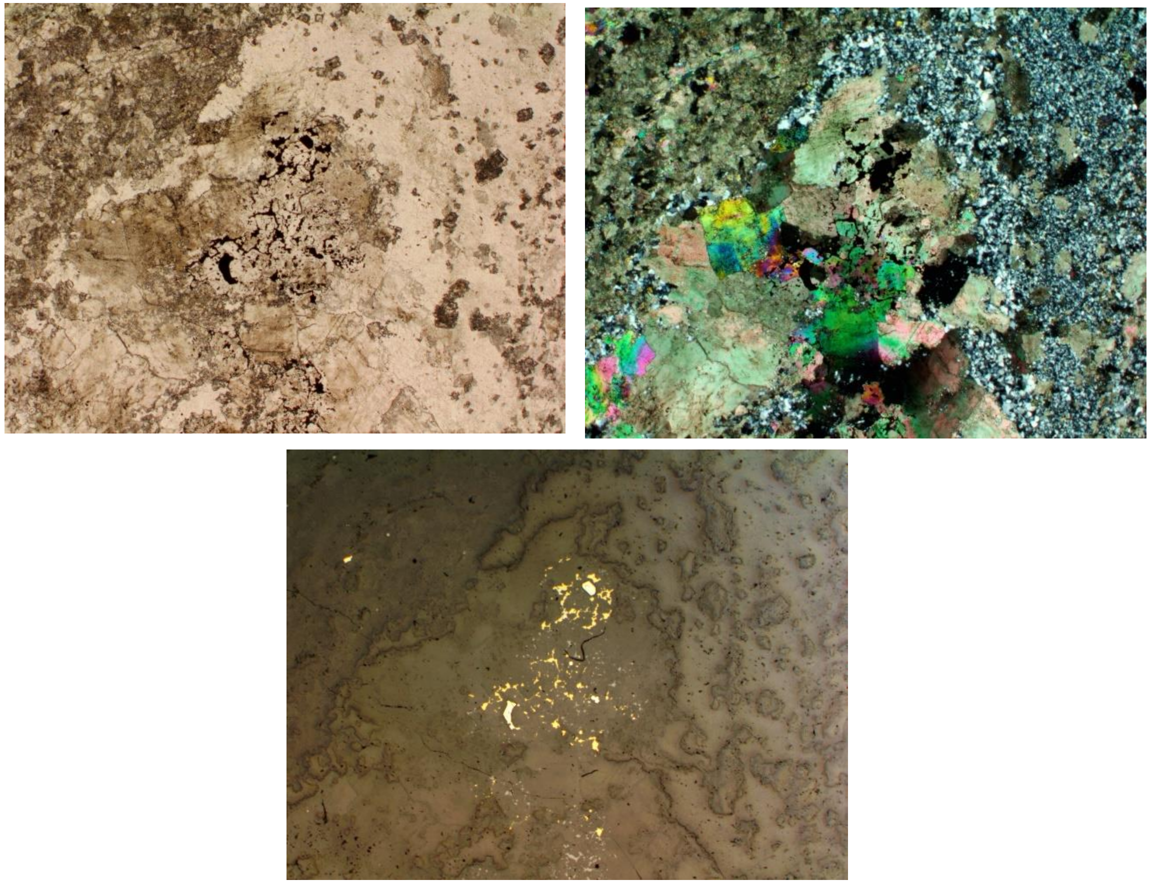
Specimen Notes for 'MID-12'

The sample was obtained from the large pit (Laroma prospect). It is a typical example of the listwanite rocks hosting Cr-rich micas (fuchsite) and compositionally variable dolomite-ankerite solid solution carbonates. The rock was cut across stockwork of quartz stringers defined by fine-grained sugary cryptocrystalline quartz. The rock is interpreted to represent a hydrothermally altered ultramafic subjected to numerous quartz-carbonate alteration events with associated sulphide development. Relict vestiges of the ultramafic mineralogy is still present as Cr-rich bearing minerals like Cr-chlorite, Cr-mica, and chromites. The chromite grains are zoned with zincian chromite rinds. The rock host a variety of metals and sulphides including disseminated Sr-barite, arsenian pyrite, Ni-Co-Fe-S, Ni-As-Co-S, Ni-As-Sb-S, Cu-Sb-Zn-As-S, Sb-Ni-S, Sb-Te-Ni-S, and Ni-S.

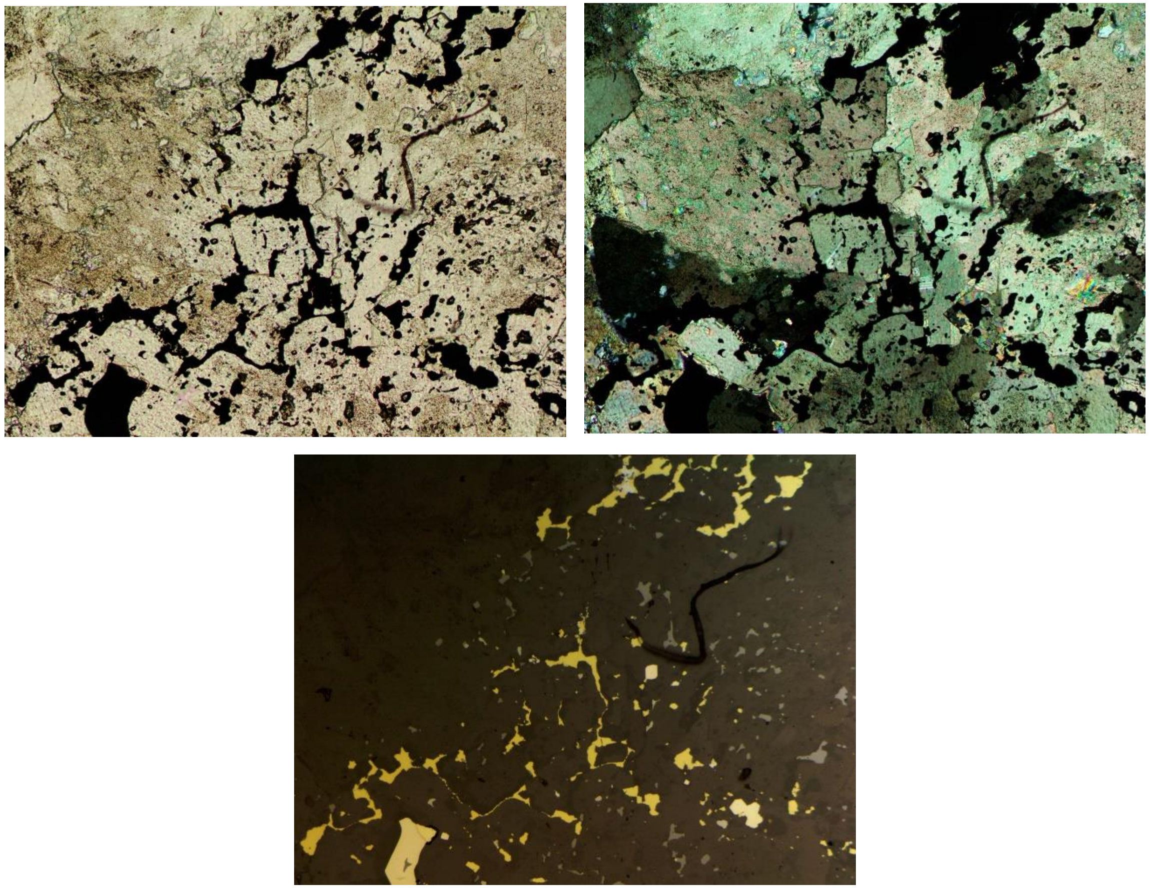




Plane light image (left) and crossed polarized light image (right) illustrating fine-grained first-order grey sugary quartz infiltrating a Cr-chlorite and carbonate domains. A later coarser-grained quartz-carbonate vein is visible (bottom left). Field of view = 17mm

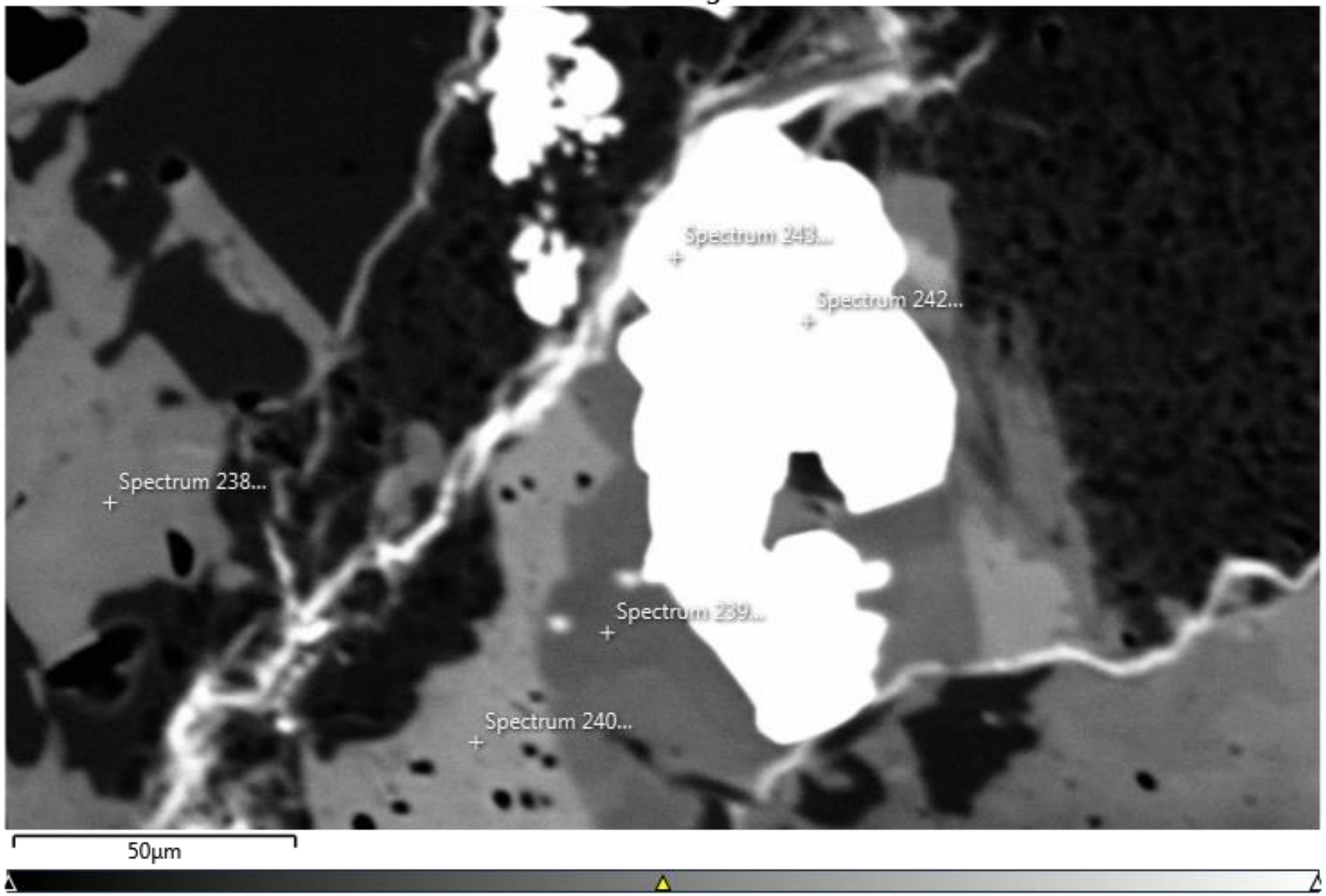


Plane light (top left), crossed polarized light image (top right), and reflected light image (bottom) illustrating a dolomite-ankerite solid solution carbonate pocket (highly birefringent) with associated sulphides. Field of view = 17mm



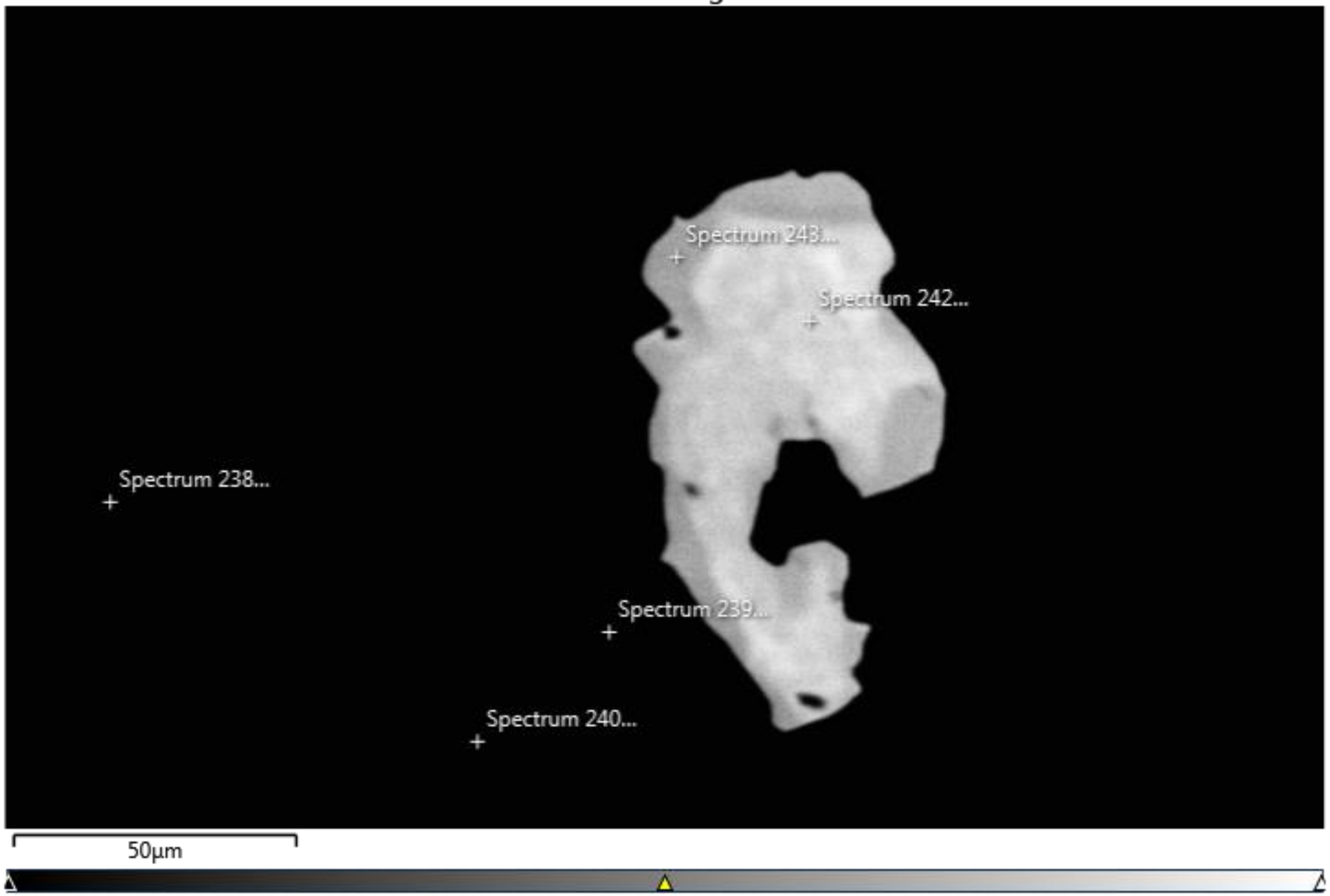
Plane light (top left), crossed polarized light image (top right), and reflected light image (bottom) illustrating a higher magnification view of the previous image. Note the various reflectivities of the sulphide minerals including Ni-Co-Fe-S, Ni-As-Co-S, Ni-As-Sb-S, Ni-S, and Cu-Sb-Zn-As-S.

Electron Image 48

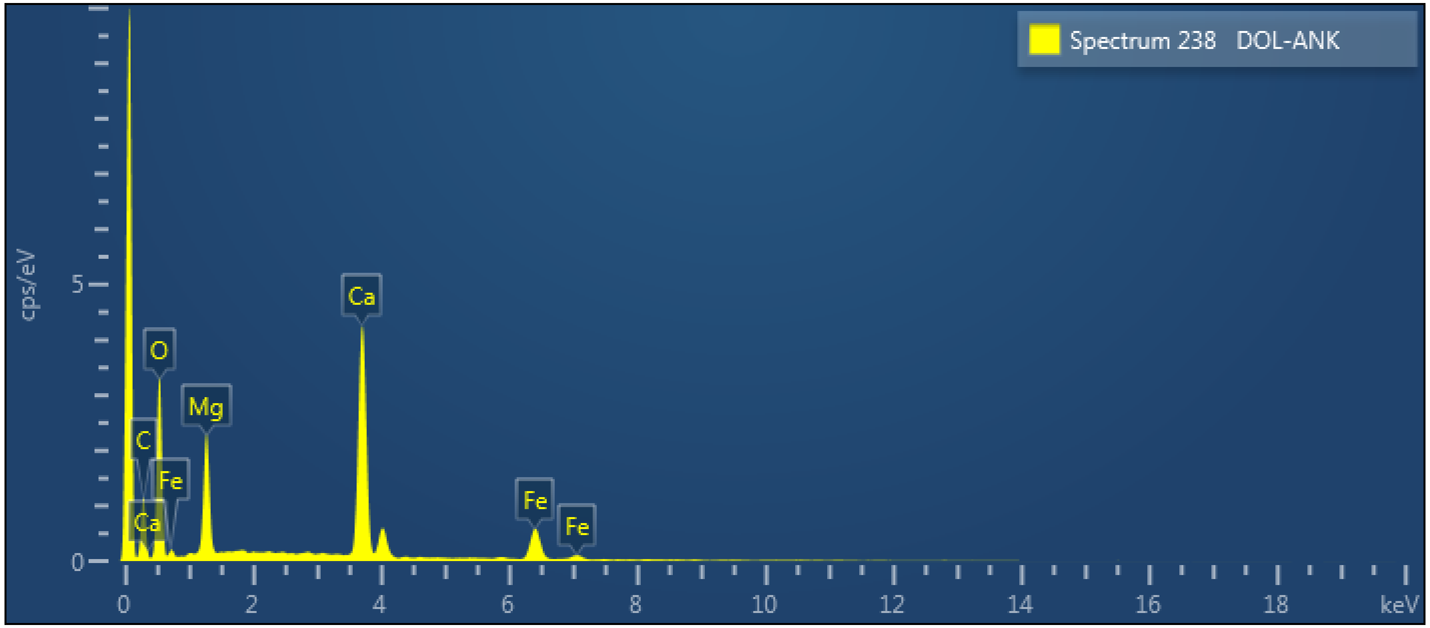


Backscatter image of a compositionally zoned Ni-As-Sb-S (spectrum 242) and Ni-As-Co-S (spectrum 243) hosted within a compositionally diverse carbonate minerals assemblage of dolomite-ankerite solid solution (spectra 238-241).

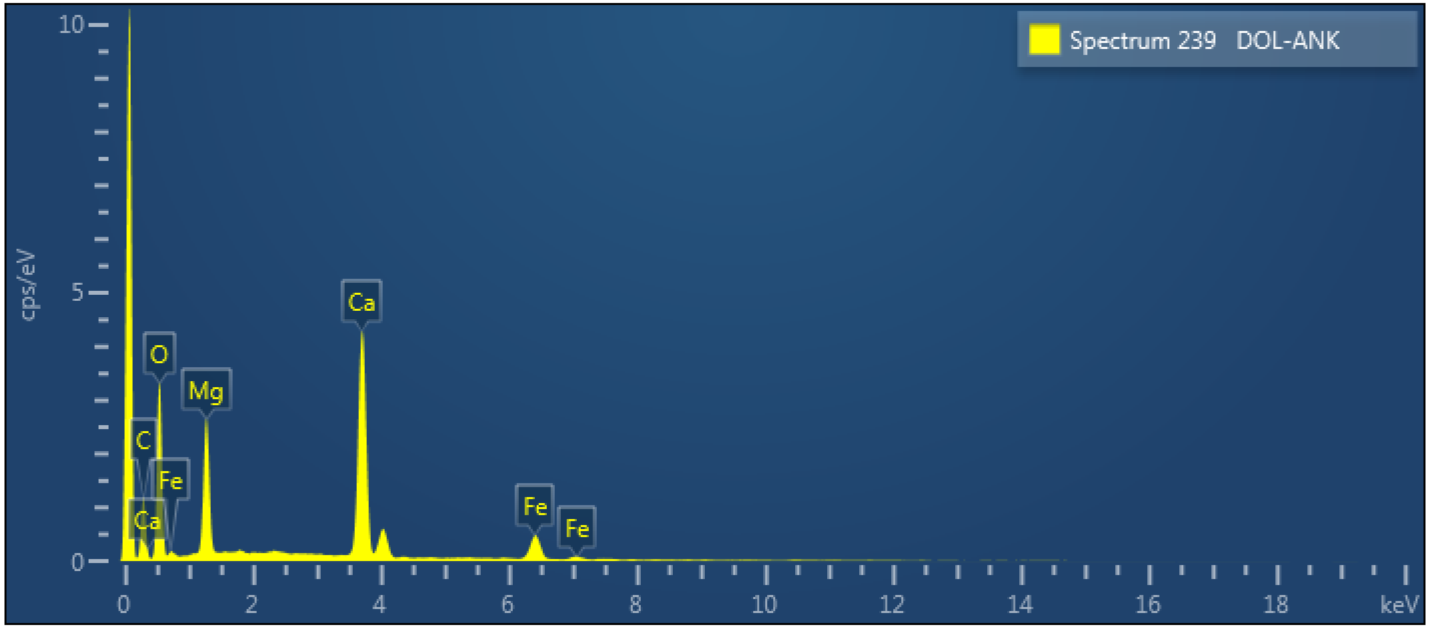
Electron Image 49



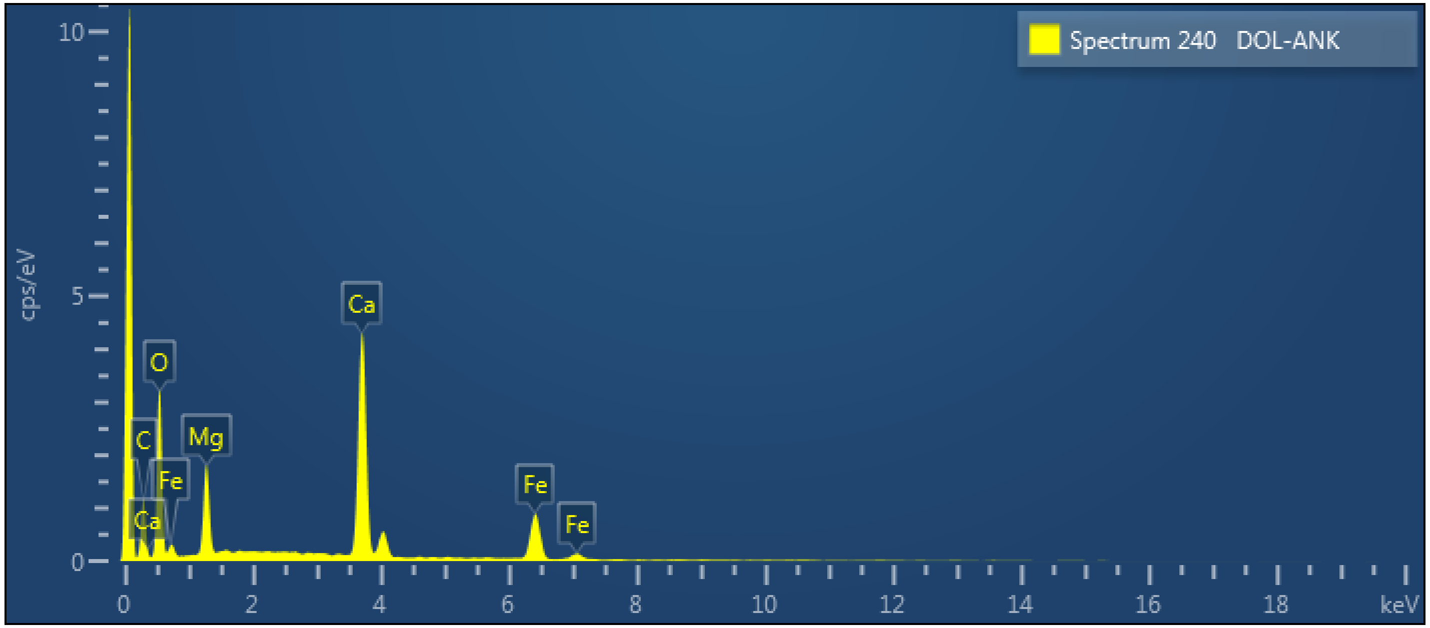
Same image as above with brightness reduced to illustrate the zoning within the sulphides. Spectrum 242 is a Ni-As-Sb-S phase. The brighter domains contain more Sb. Spectrum 243 is the Ni-As-Co-S phase representing the marginal composition of the sulphide assemblage.



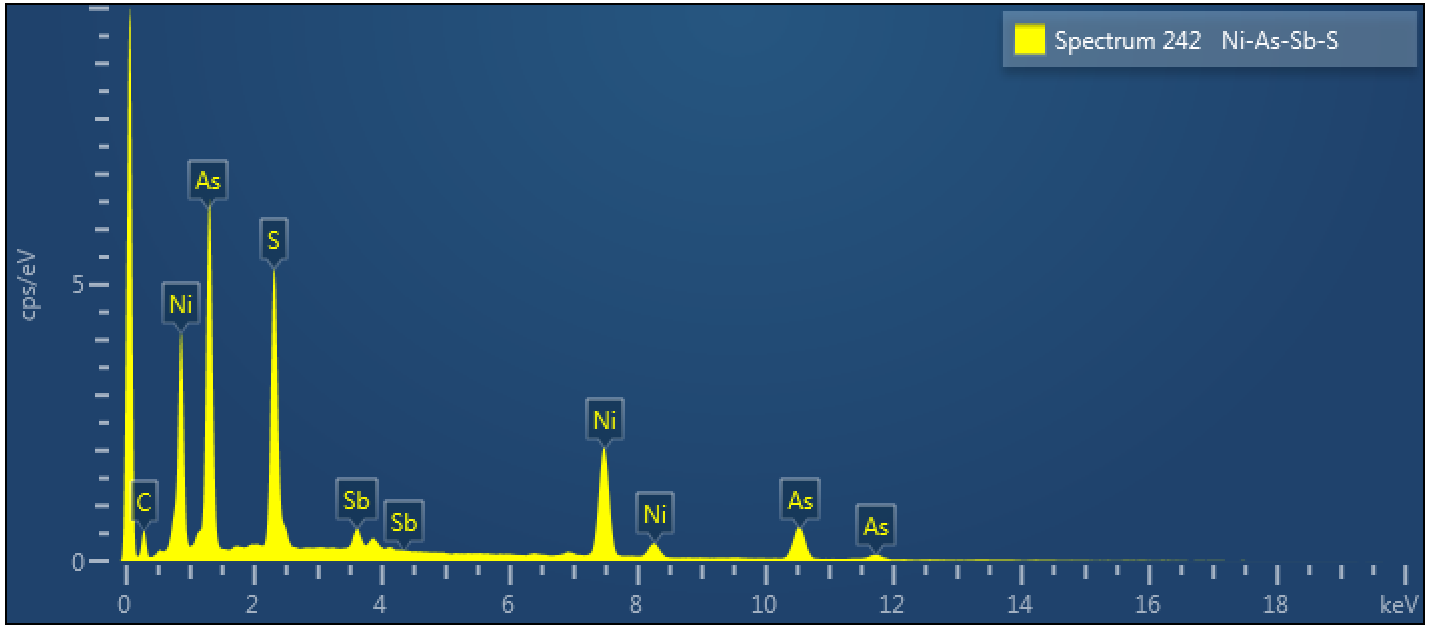
Spectrum 238 DOL-ANK				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
O	K series	55.63	0.78	74.23
Mg	K series	10.30	0.35	9.04
Ca	K series	24.59	0.51	13.10
Fe	K series	9.48	0.45	3.62
Total		100.00		100.00



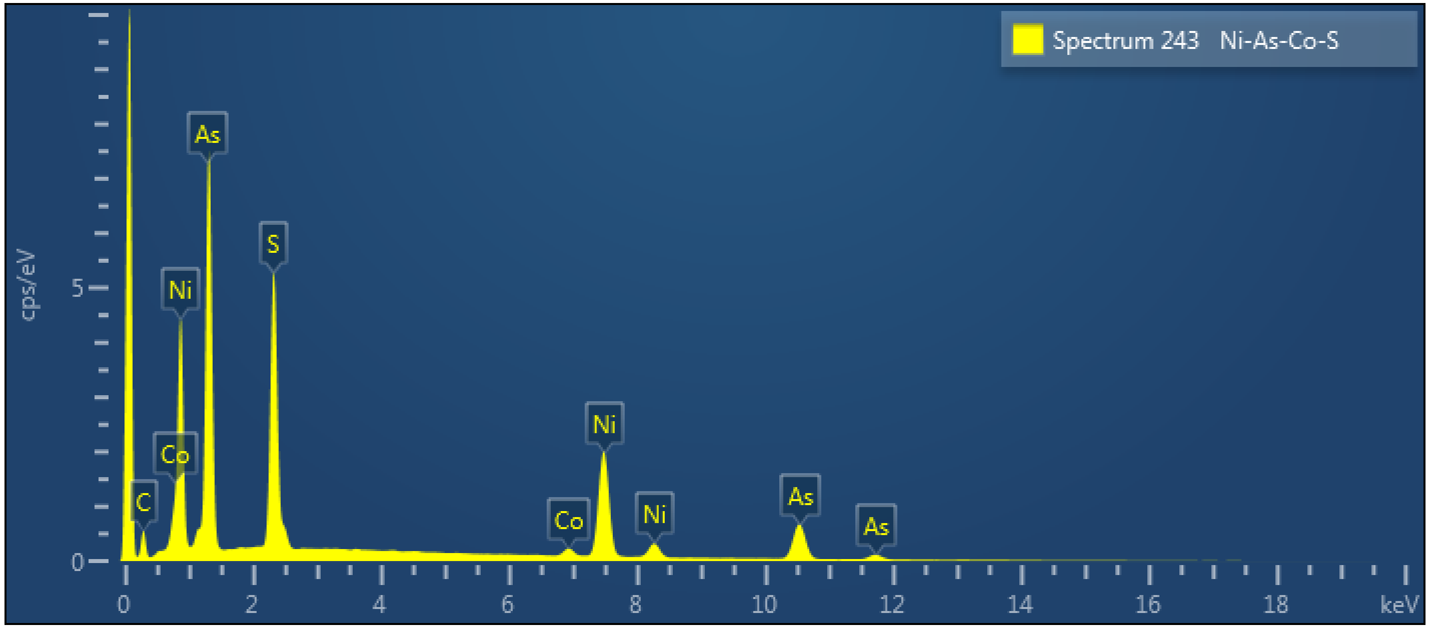
Spectrum 239 DOL-ANK				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
O	K series	56.10	0.79	73.97
Mg	K series	11.81	0.38	10.25
Ca	K series	24.63	0.53	12.96
Fe	K series	7.45	0.43	2.82
Total		100.00		100.00



Spectrum 240 DOL-ANK				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
O	K series	53.07	0.89	73.34
Mg	K series	8.45	0.36	7.68
Ca	K series	24.06	0.56	13.27
Fe	K series	14.42	0.58	5.71
Total		100.00		100.00

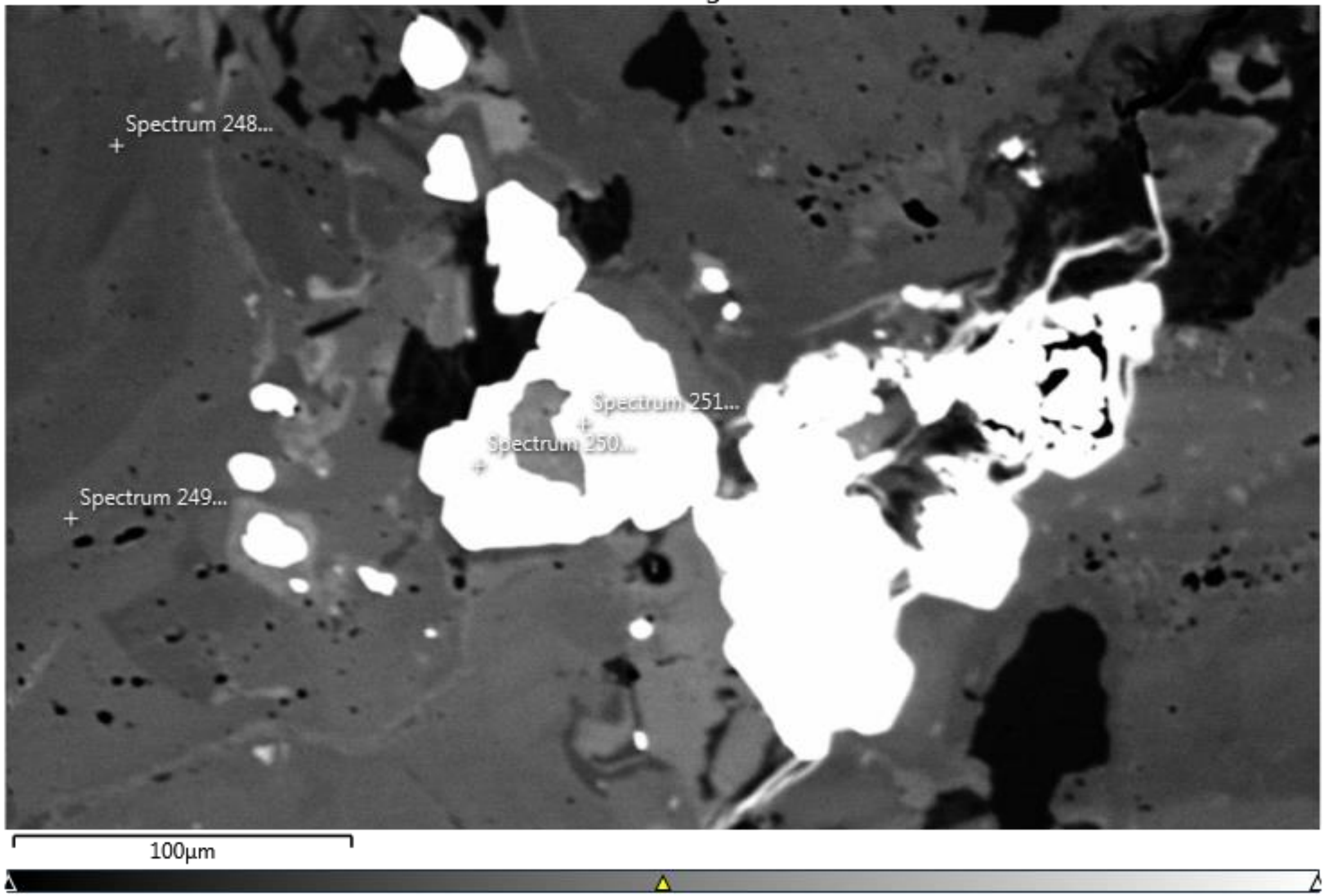


Spectrum 242 Ni-As-Sb-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.81	0.34	34.55
Ni	K series	33.76	0.53	32.16
As	L series	41.67	0.54	31.10
Sb	L series	4.76	0.34	2.19
Total		100.00		100.00



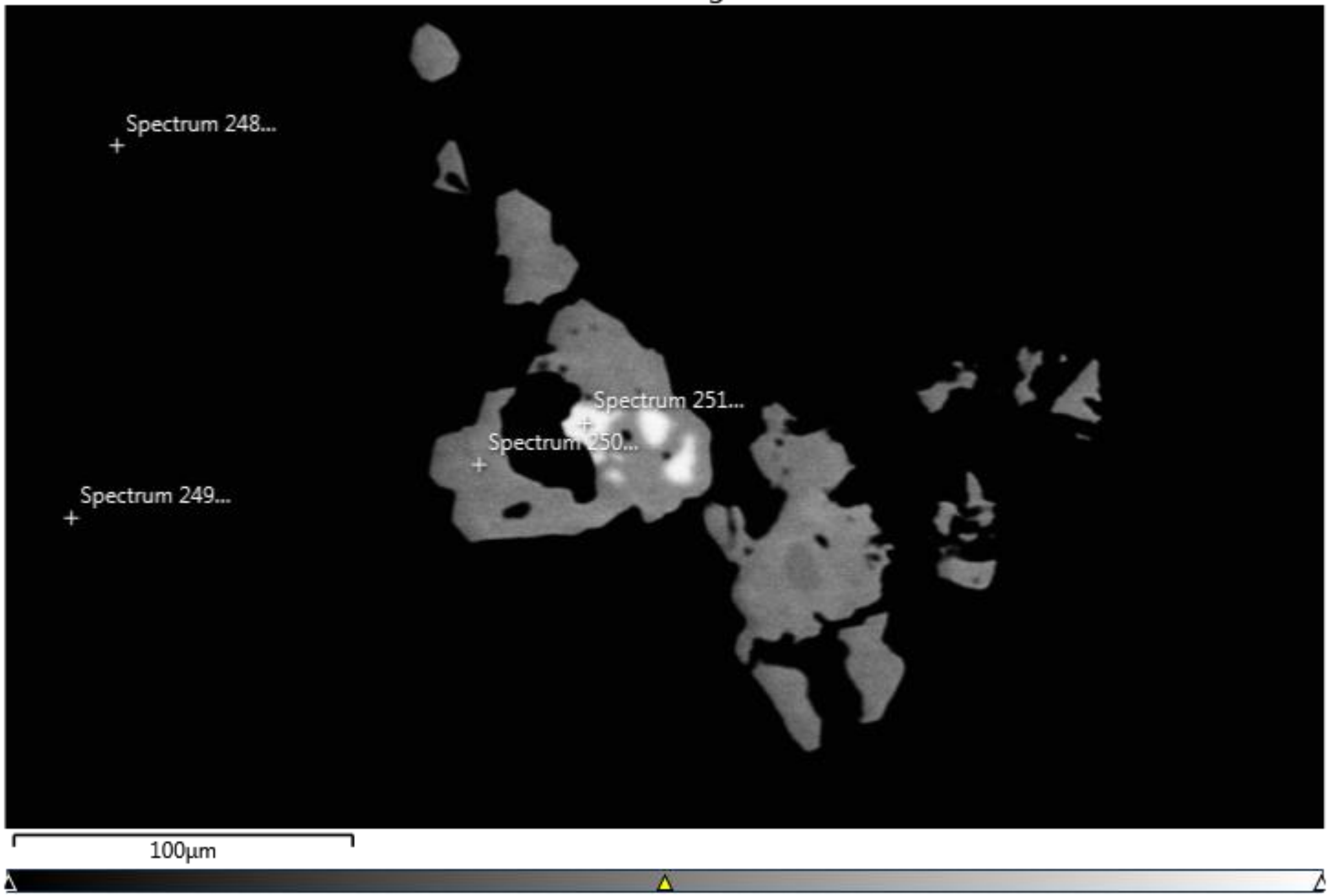
Spectrum 243 Ni-As-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.69	0.17	33.87
Ni	K series	32.46	0.26	30.50
As	L series	45.84	0.27	33.75
Co	K series	2.01	0.13	1.89
Total		100.00		100.00

Electron Image 50

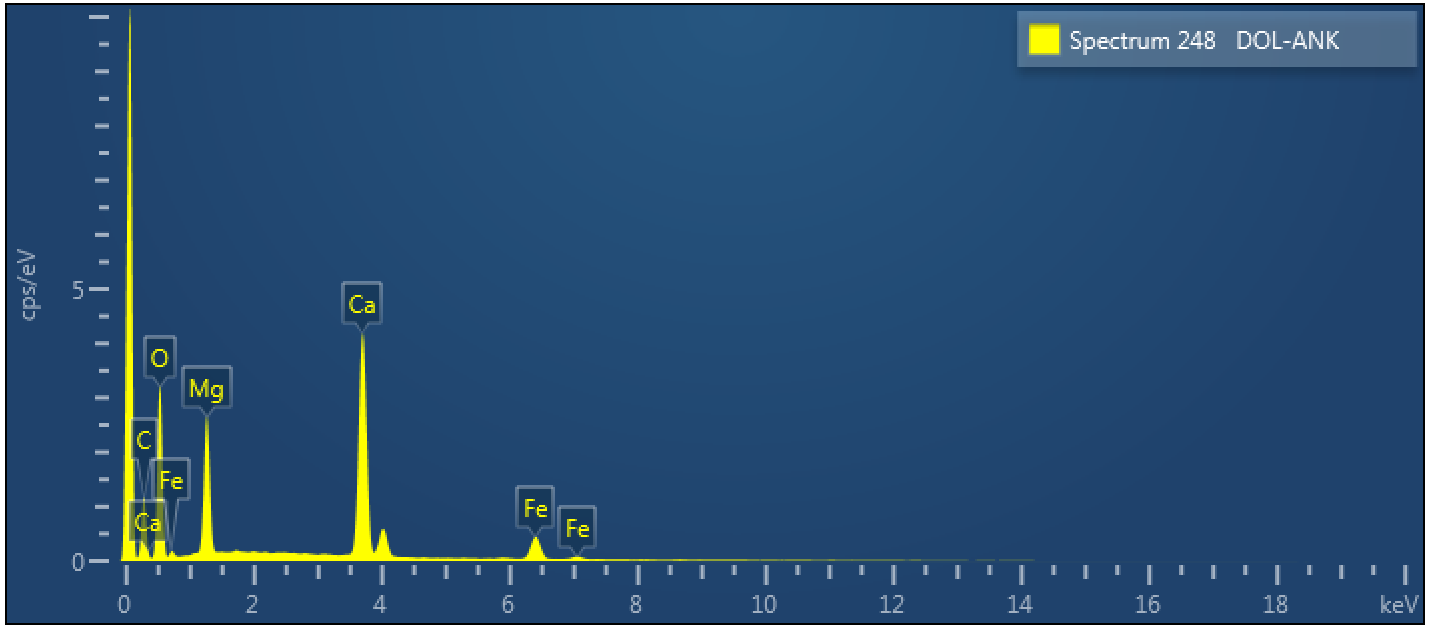


Backscatter image of dolomite-ankerite solid solution (spectra 248,249) hosting Ni-Co-Sb-As-S (spectrum 250) and Cu-Sb-Zn-Fe-S (spectrum 251).

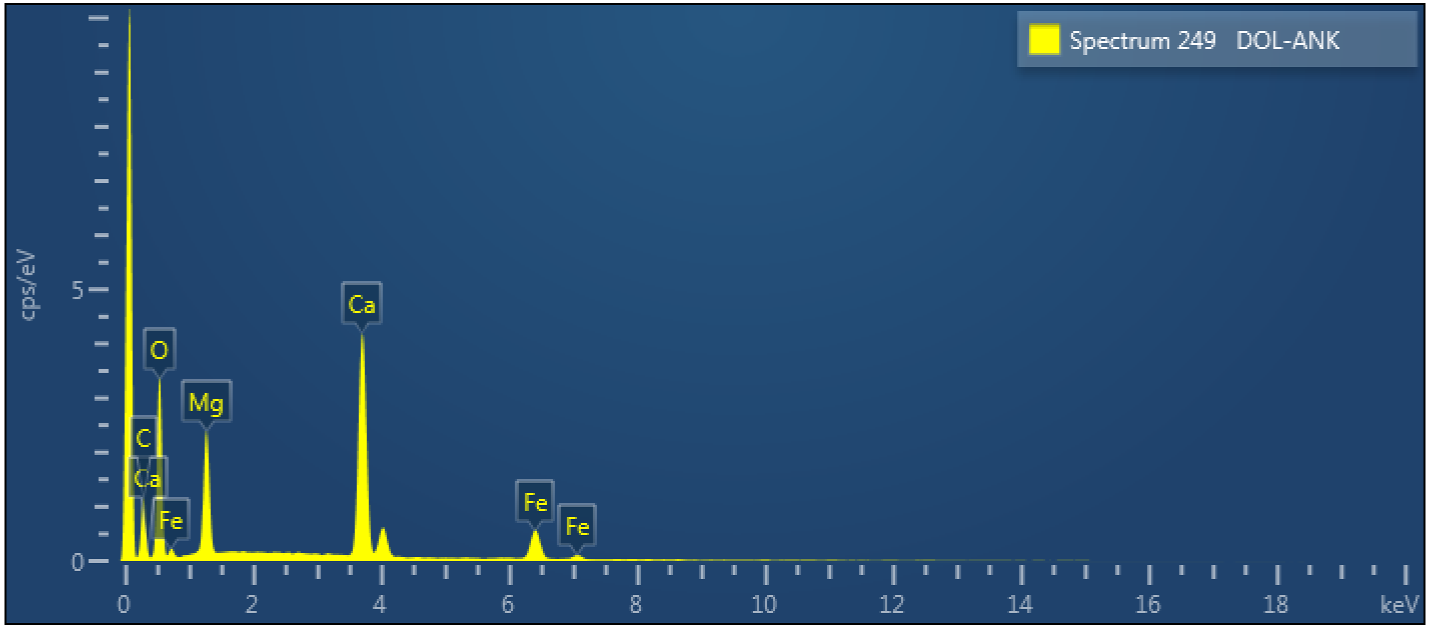
Electron Image 51



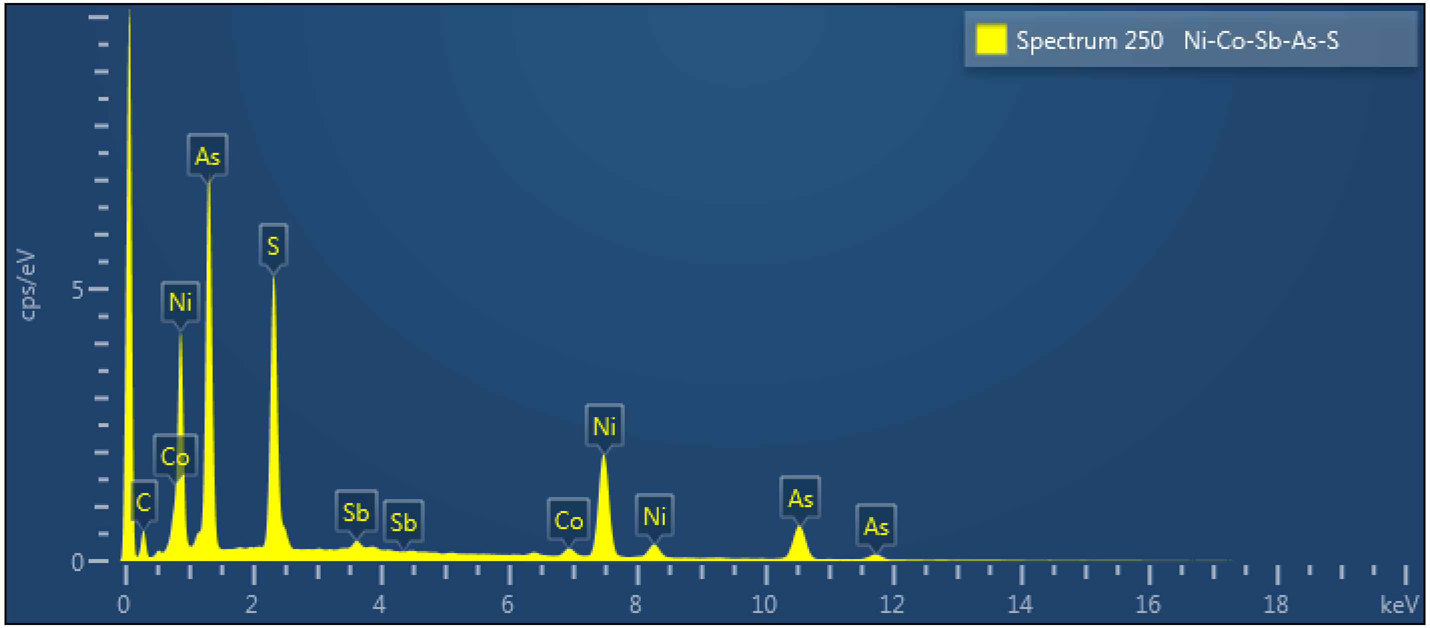
Same image as above with brightness reduced to illustrate The Cu-Sb-Zn-Fe-S (spectrum 251) inclusions within Ni-Co-Sb-As-S (spectrum 250).

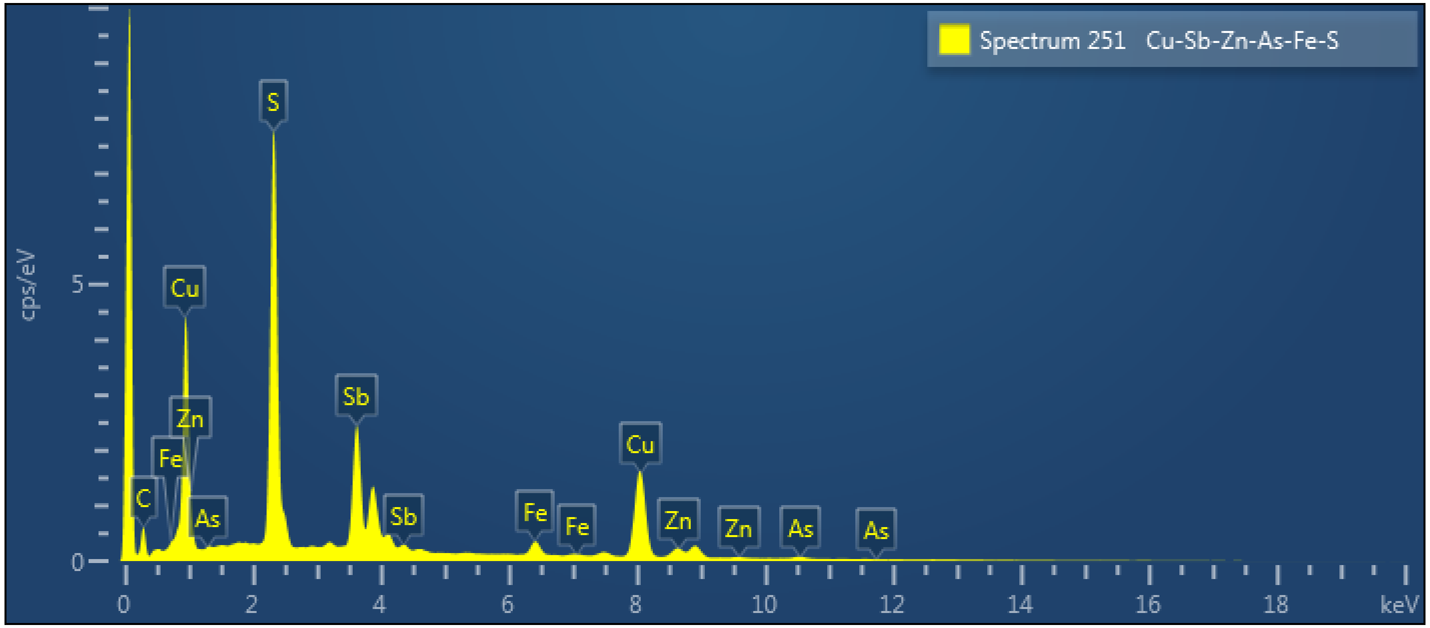


Spectrum 248 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.06	0.39	50.00			
Mg	K series	18.66	0.33	19.76	MgO	30.93	0.54
Ca	K series	38.82	0.39	24.95	CaO	54.32	0.55
Fe	K series	11.46	0.39	5.29	FeO	14.75	0.50
Total		100.00		100.00		100.00	

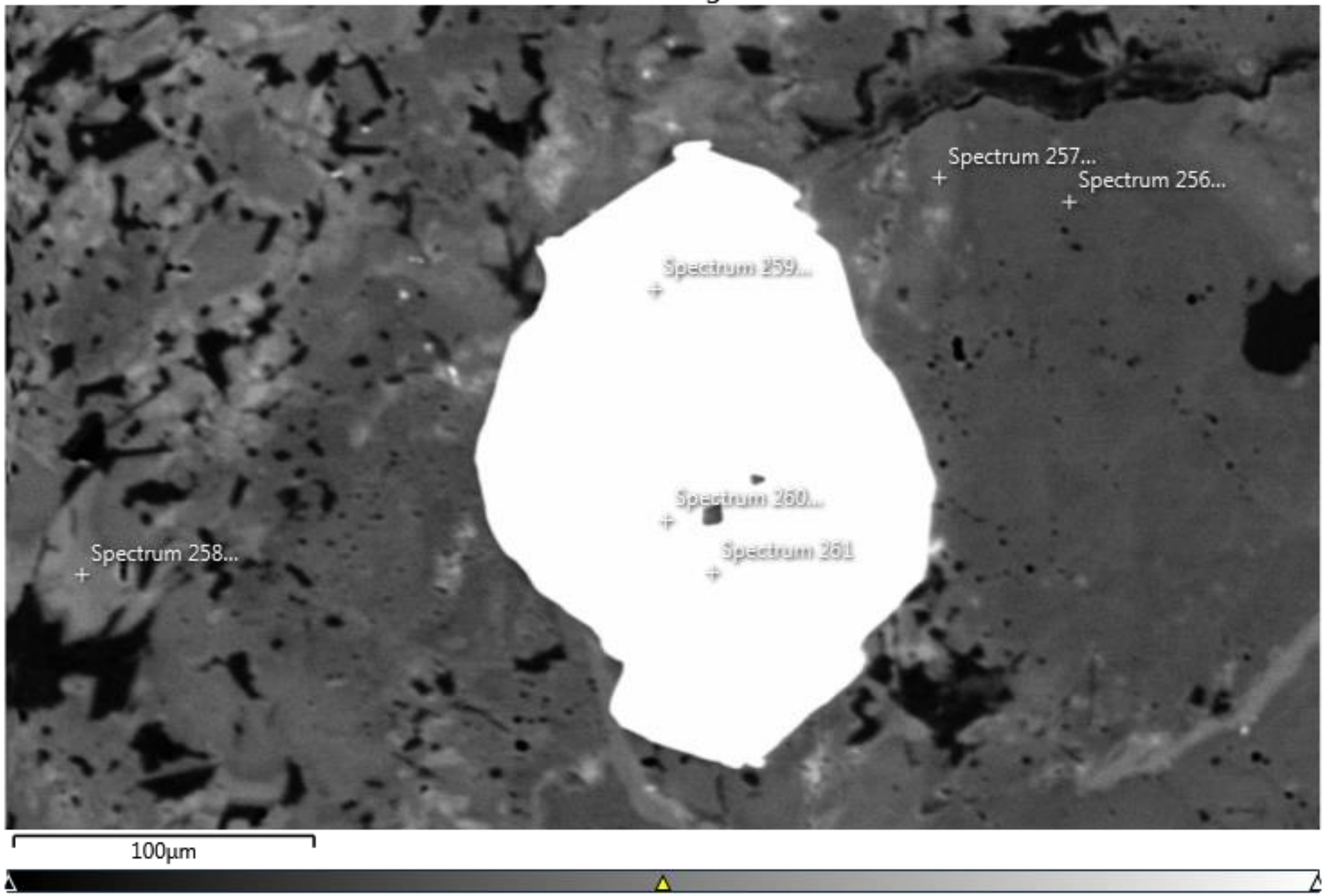


Spectrum 249 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.44	0.57	50.00			
Mg	K series	16.74	0.47	18.10	MgO	27.76	0.78
Ca	K series	38.03	0.57	24.94	CaO	53.22	0.80
Fe	K series	14.79	0.60	6.96	FeO	19.02	0.77
Total		100.00		100.00		100.00	

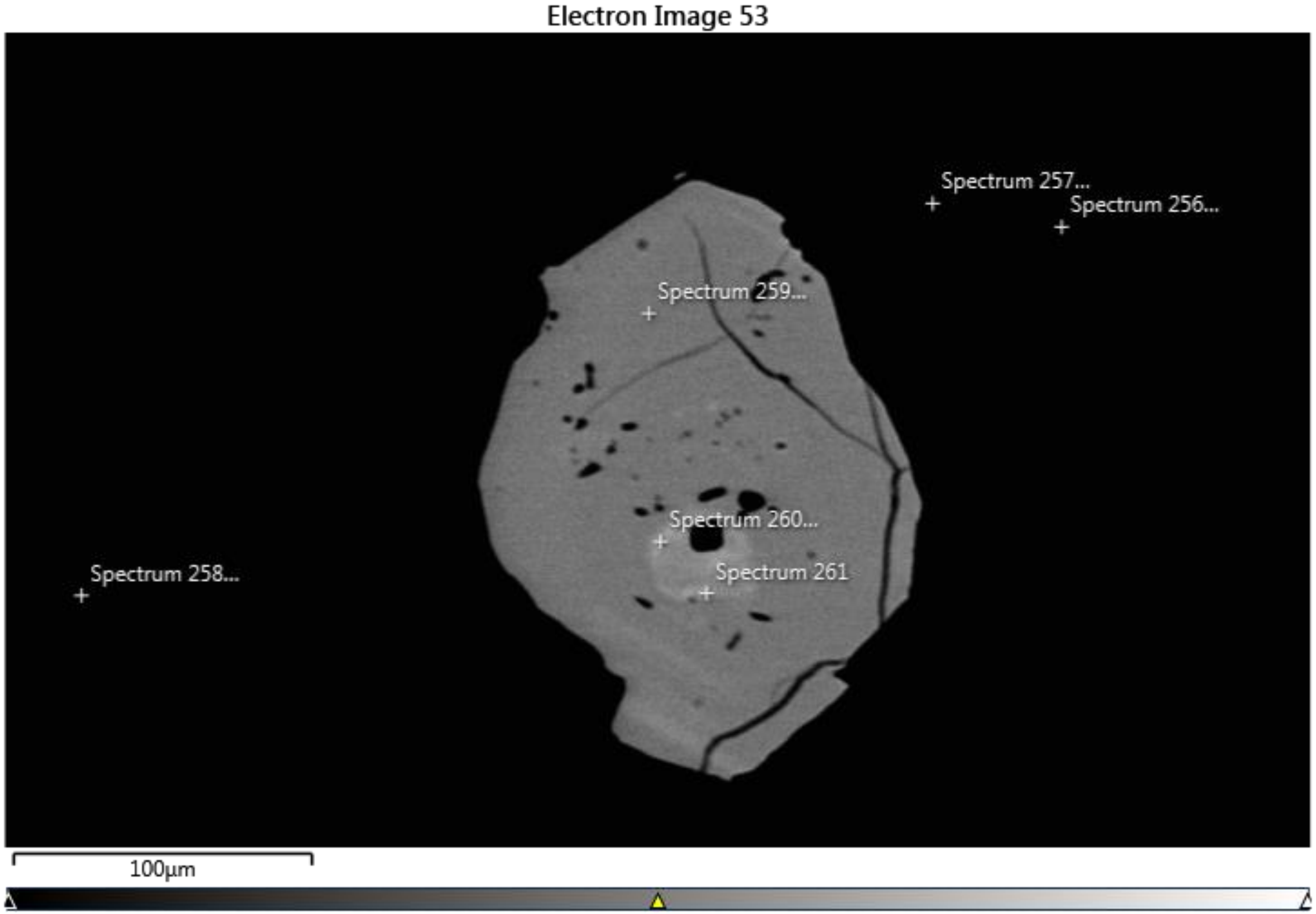

Spectrum 250 Ni-Co-Sb-As-S
cps/eV
5
0
As
S
Ni
Co
C
Sb
Sb
Co
Ni
Ni
As
As
0
2
4
6
8
10
12
14
16
18
keV


Spectrum 251 Cu-Sb-Zn-As-Fe-S
cps/eV
5
0
S
Cu
Zn
Fe
C
As
Sb
Sb
Fe
Fe
Cu
Zn
Zn
As
As
0
2
4
6
8
10
12
14
16
18
keV

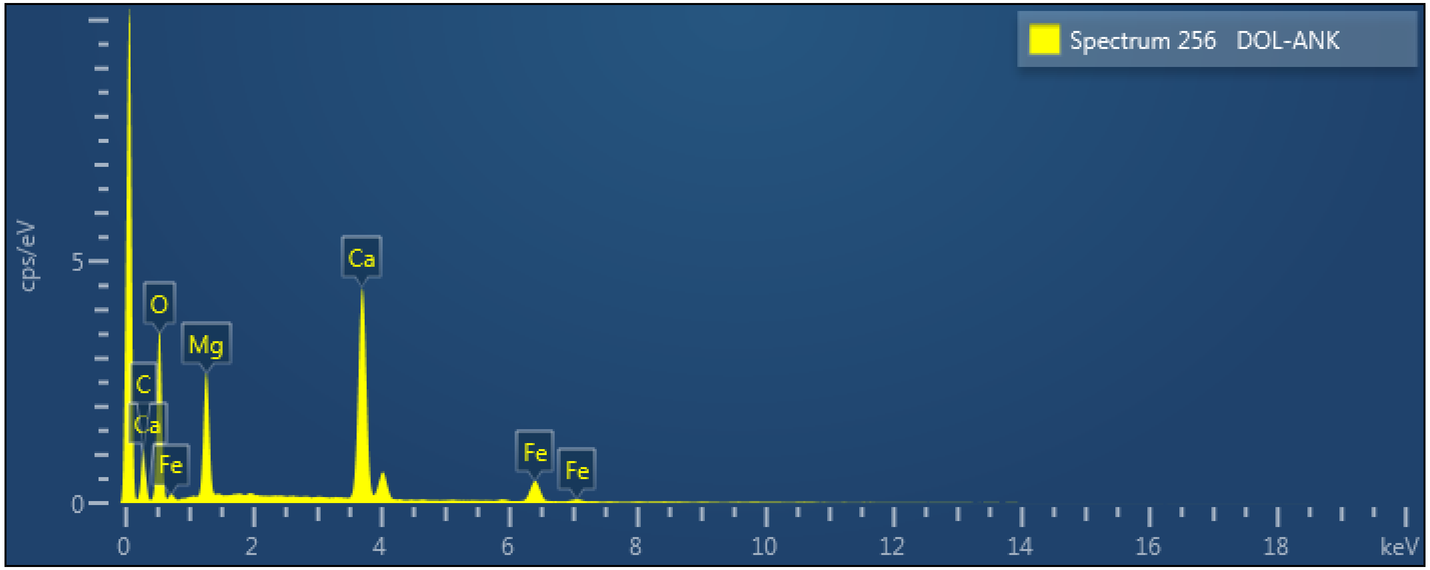
Electron Image 52



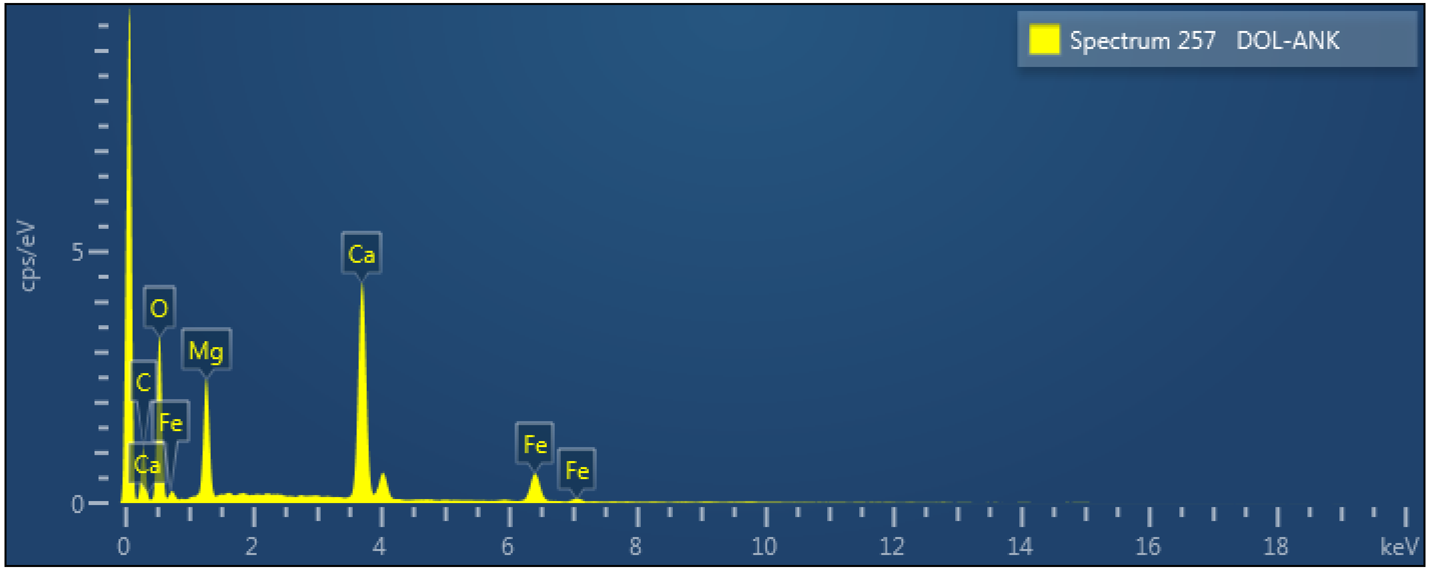
Backscatter image of a grain of arsenian pyrite (spectra 259-261) hosted within complexly zoned dolomite-ankerite solid solution carbonate (spectra 256-258). The bright arsenian pyrite domian (spectra 260) shows the presence of Ni in the pyrite structure.



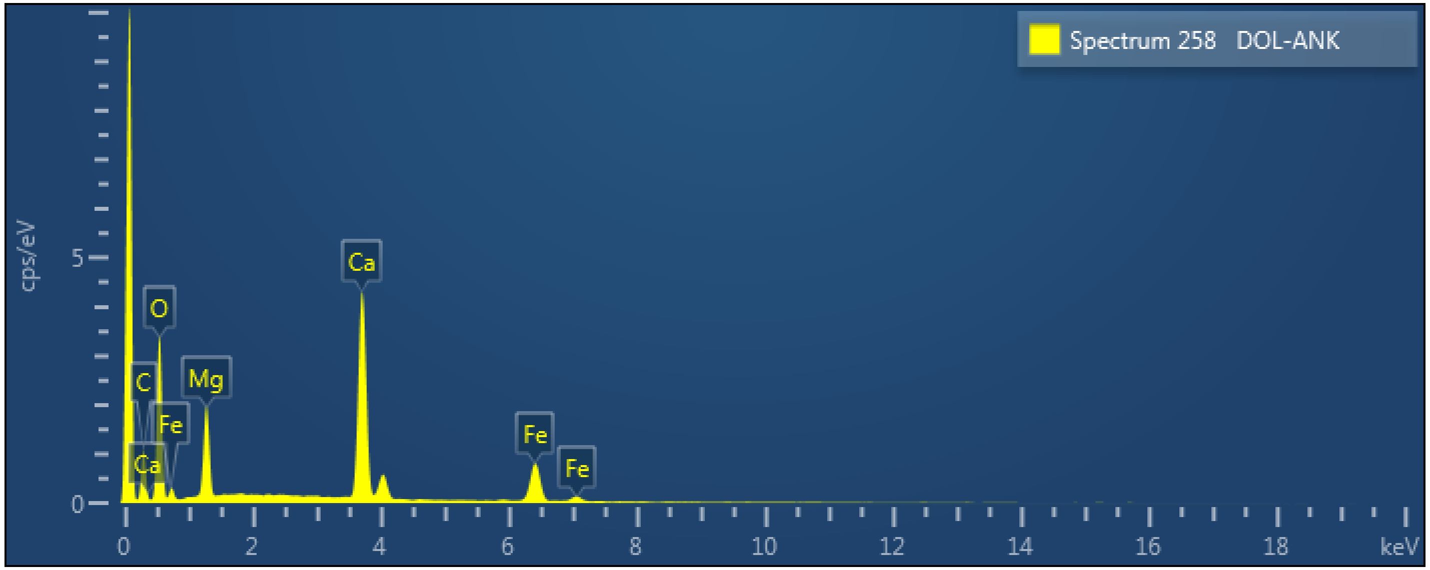
Same image as above wit7h brightness diminished showing arsenian pyrite (spectra 259-261) hosted within complexly zoned dolomite-ankerite solid solution carbonate (spectra 256-258). The bright arsenian pyrite domian (spectra 260) shows the presence of Ni in the pyrite structure which substitutes for Fe in the chemical structure.



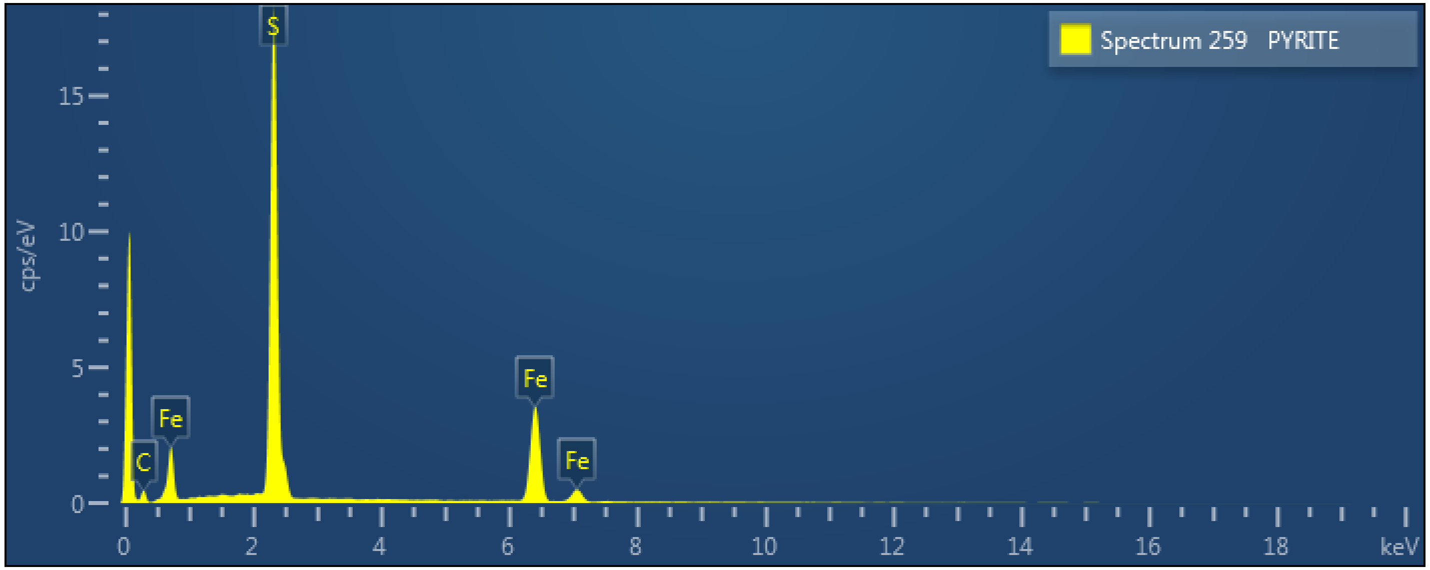
Spectrum 256 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.01	0.59	50.00			
Mg	K series	18.29	0.49	19.40	MgO	30.32	0.82
Ca	K series	39.52	0.60	25.44	CaO	55.30	0.84
Fe	K series	11.18	0.59	5.16	FeO	14.38	0.76
Total		100.00		100.00		100.00	



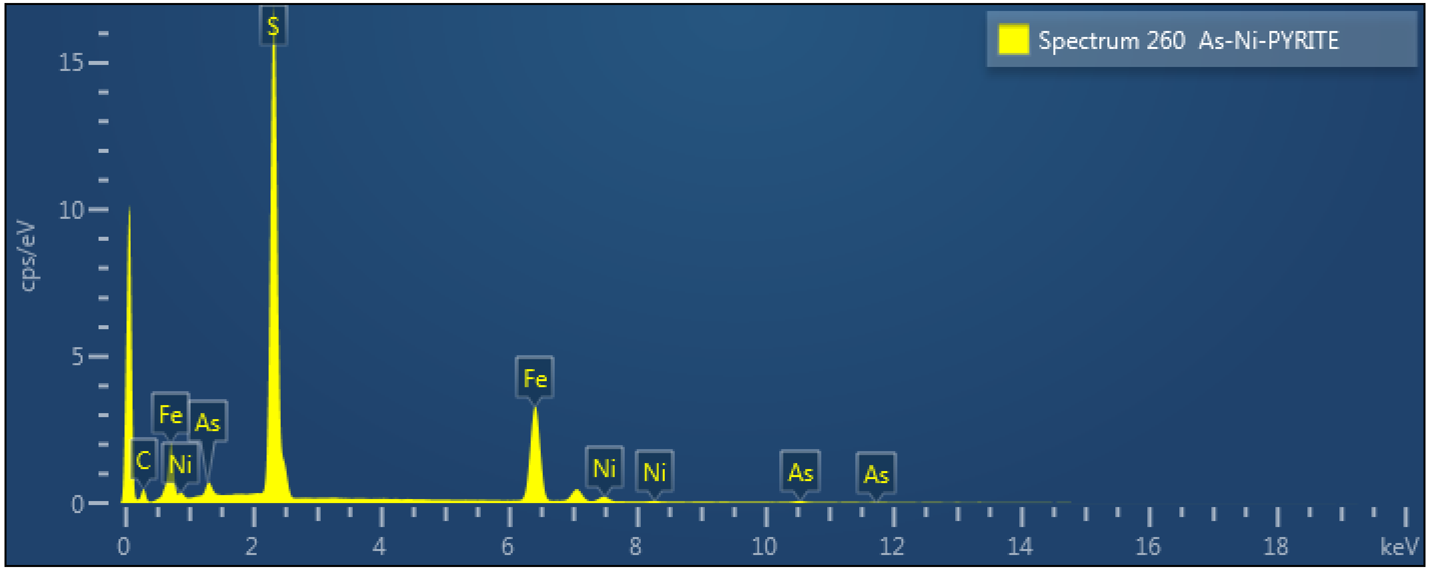
Spectrum 257 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.49	0.67	50.00			
Mg	K series	16.93	0.54	18.28	MgO	28.08	0.90
Ca	K series	37.97	0.66	24.86	CaO	53.12	0.93
Fe	K series	14.61	0.69	6.87	FeO	18.80	0.89
Total		100.00		100.00		100.00	



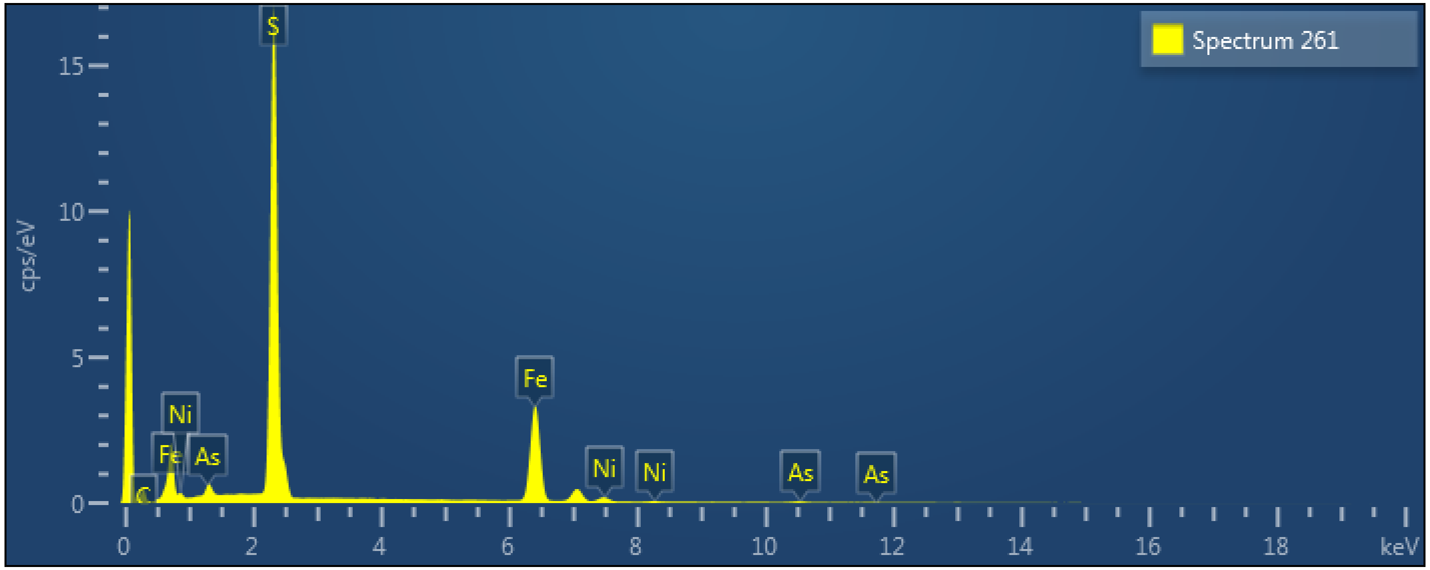
Spectrum 258 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.53	0.55	50.00			
Mg	K series	14.06	0.42	15.66	MgO	23.31	0.70
Ca	K series	36.58	0.54	24.72	CaO	51.18	0.76
Fe	K series	19.83	0.62	9.62	FeO	25.51	0.79
Total		100.00		100.00		100.00	



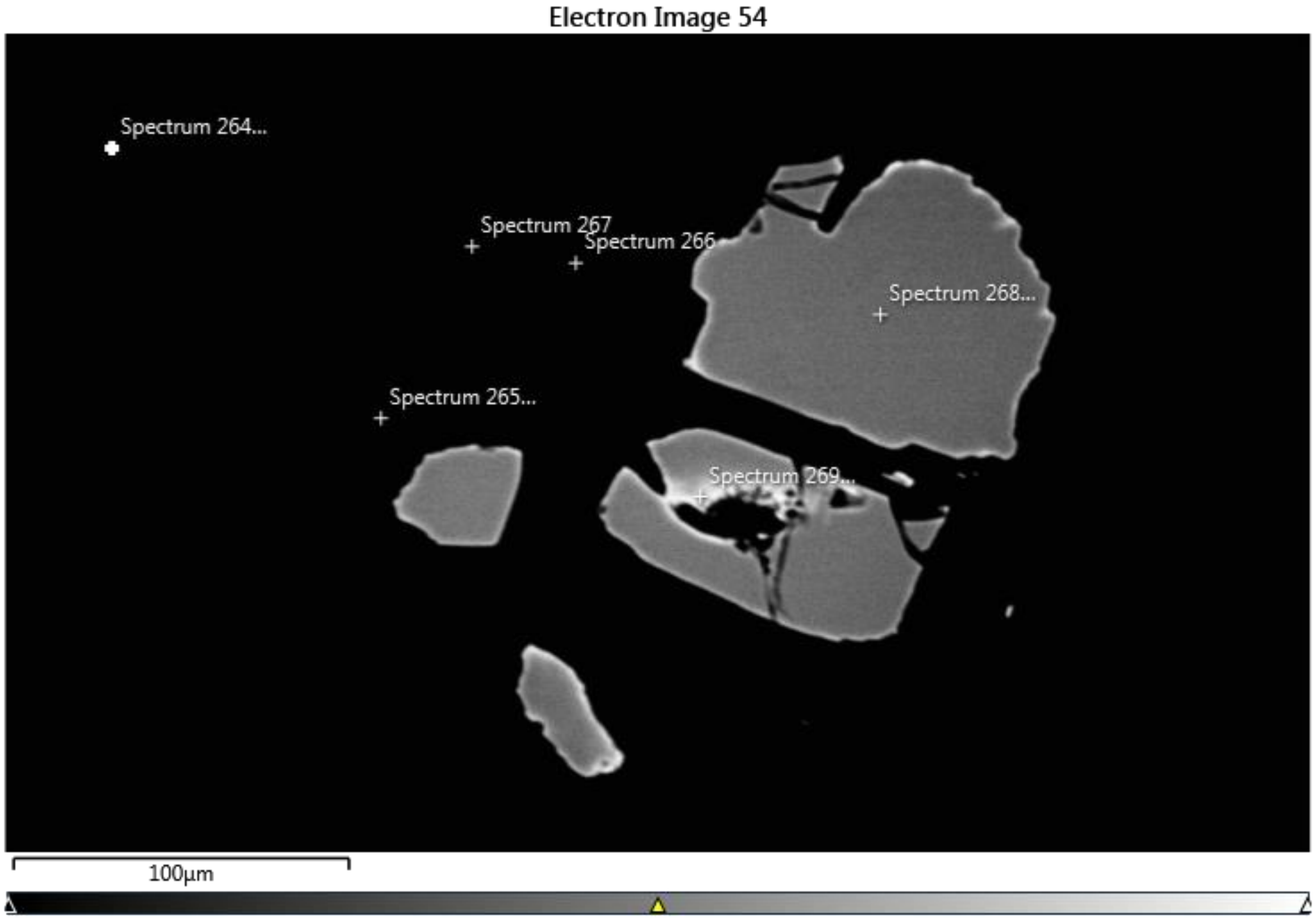
Spectrum 259 PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	55.04	0.51	68.07
Fe	K series	44.96	0.51	31.93
Total		100.00		100.00



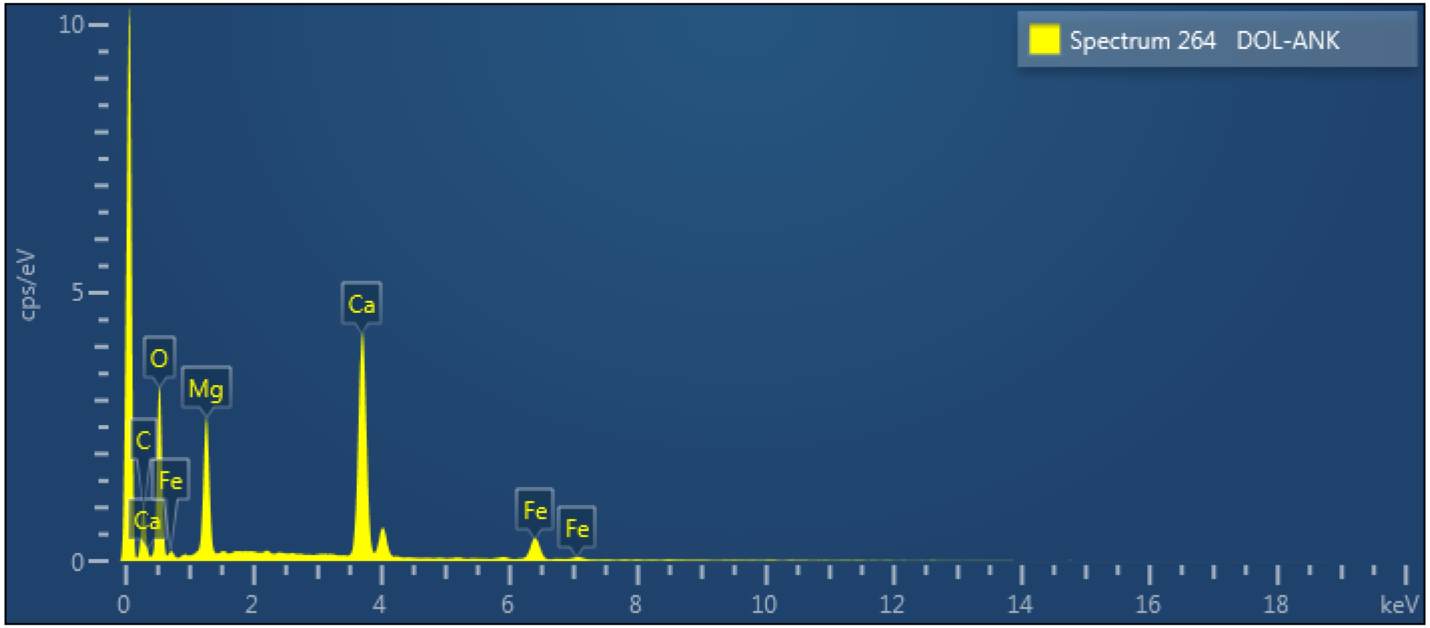
Spectrum 260 As-Ni-PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	52.33	0.28	66.10
Fe	K series	41.44	0.28	30.05
As	L series	3.00	0.18	1.62
Ni	K series	3.23	0.18	2.22
Total		100.00		100.00



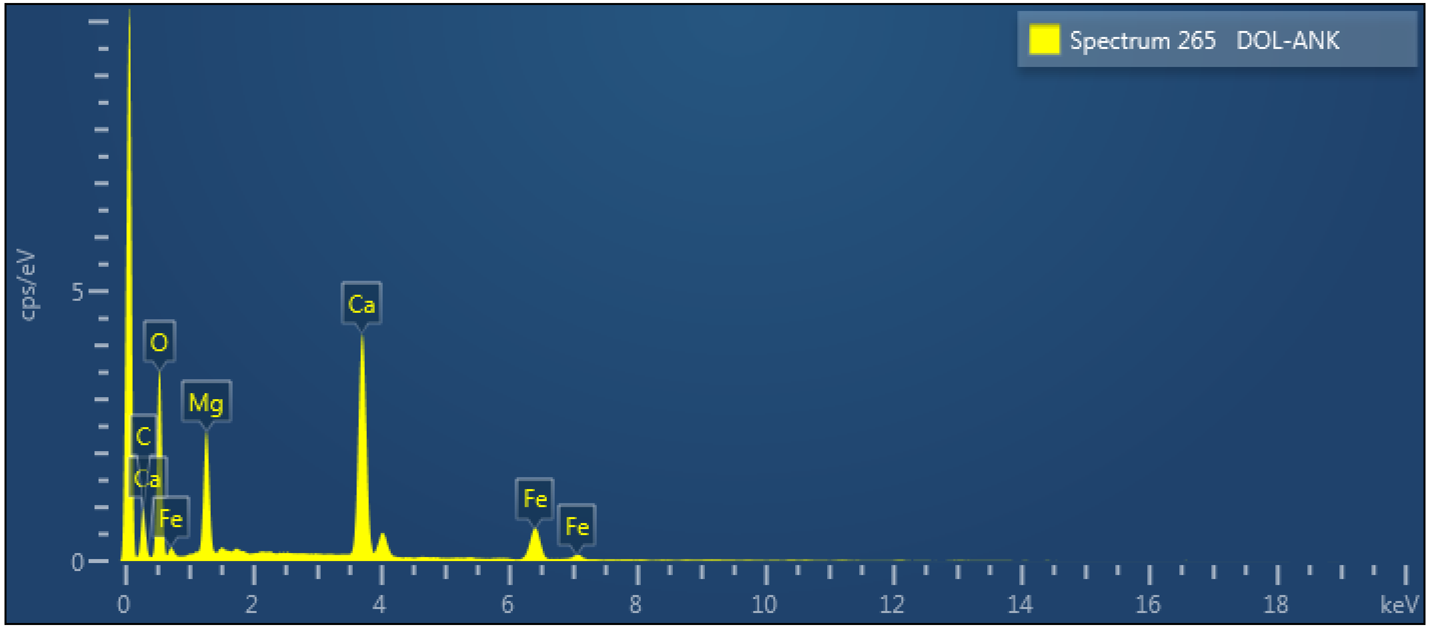
Spectrum 261				
Element	Line Type	Weight %	Weight % Sigma	Atomic %
S	K series	52.37	0.26	66.10
Fe	K series	41.98	0.25	30.42
As	L series	2.81	0.16	1.52
Ni	K series	2.84	0.16	1.96
Total		100.00		100.00



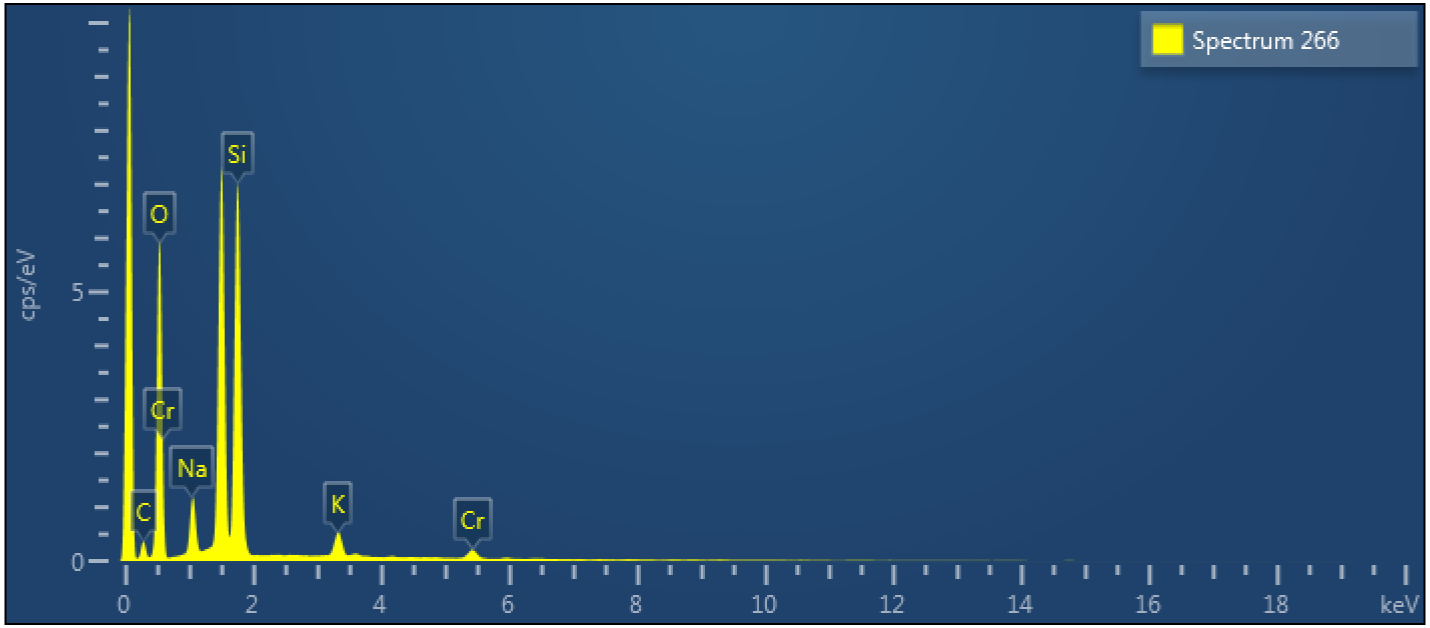
Backscatter image of the chromite grains (spectrum 268) up to 54.16 wt% Cr2O3) within a Cr-mica (spectra 266,267) and compositionally zoned dolomite-ankerite solid solution mass of carbonate (spectra 264,265). Note the bright zincian margins on the chromite grains with up to 10 wt% ZnO.



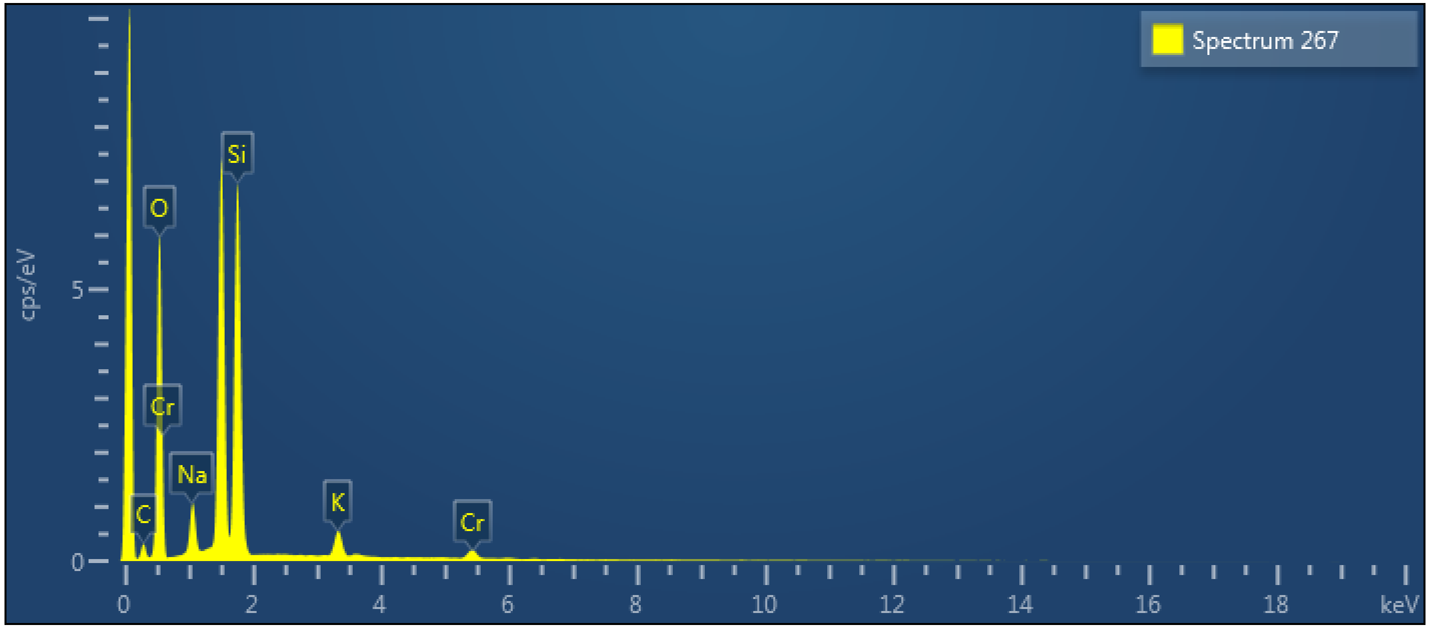
Spectrum 264 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.03	0.67	50.00			
Mg	K series	18.43	0.56	19.55	MgO	30.57	0.93
Ca	K series	39.23	0.68	25.24	CaO	54.90	0.95
Fe	K series	11.30	0.65	5.22	FeO	14.54	0.84
Total		100.00		100.00		100.00	



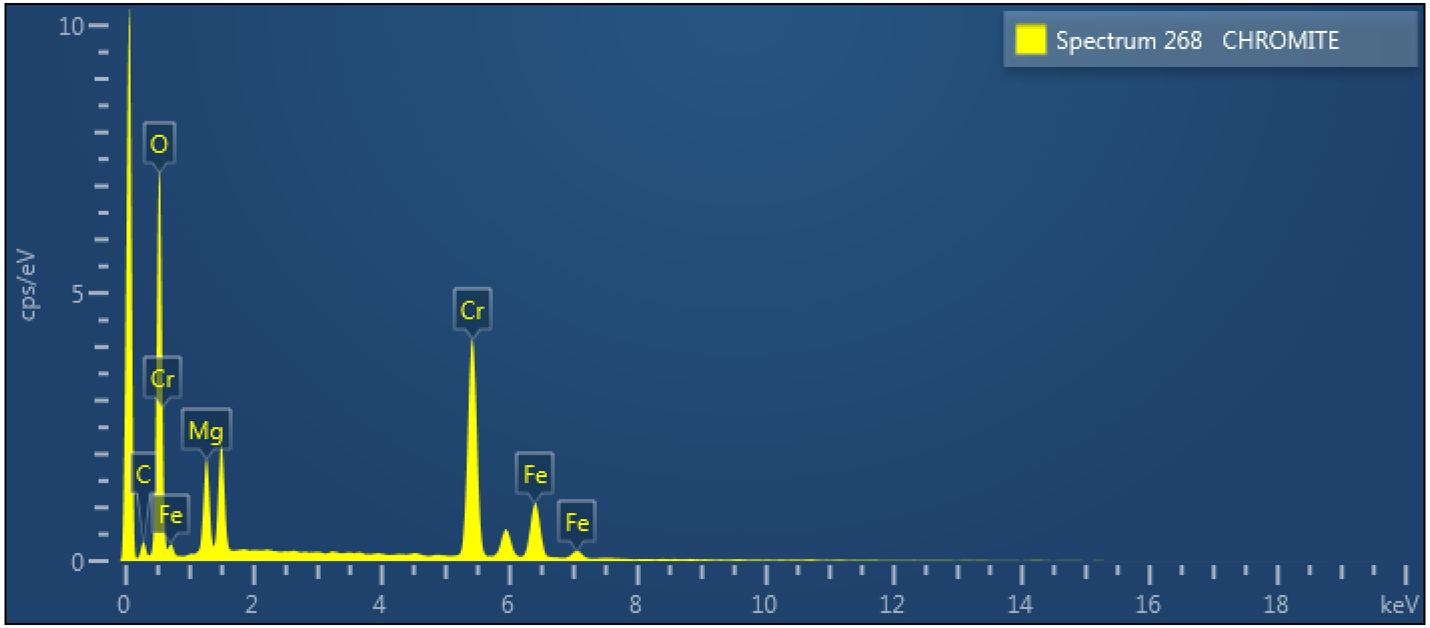
Spectrum 265 DOL-ANK				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
O	K series	55.94	0.84	74.34
Mg	K series	10.91	0.39	9.54
Ca	K series	23.33	0.54	12.38
Fe	K series	9.82	0.50	3.74
Total		100.00		100.00



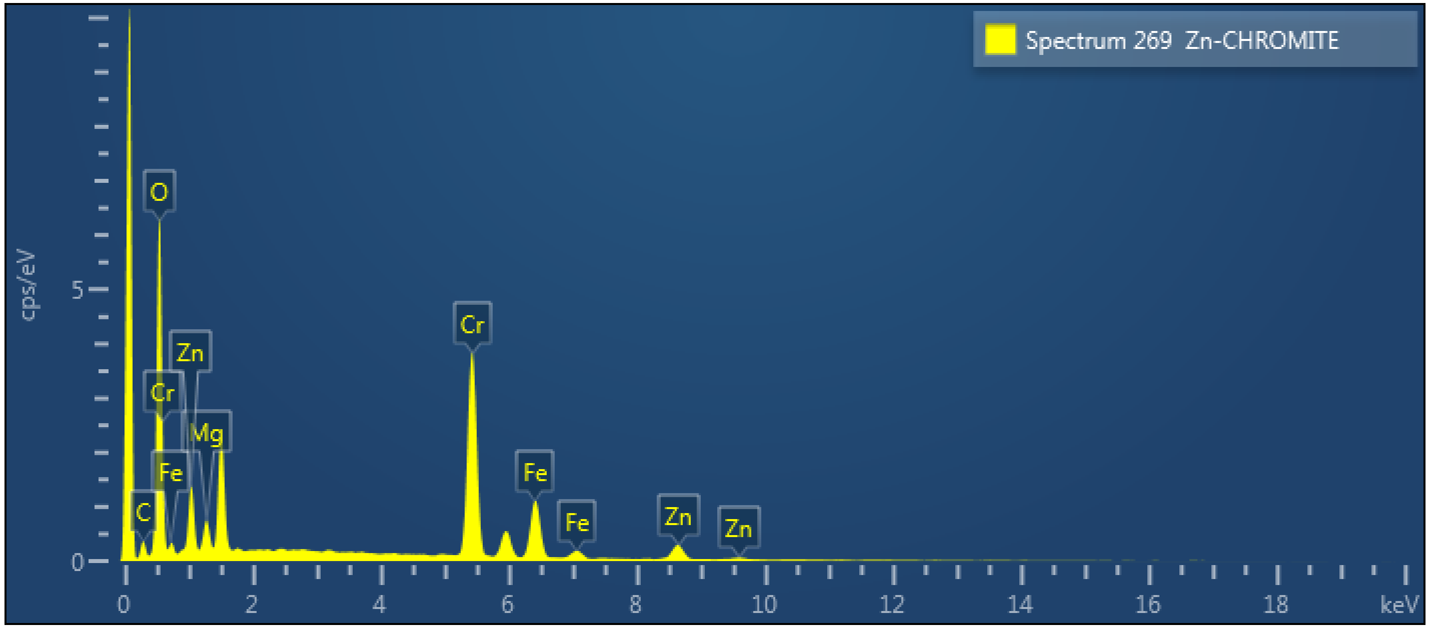
Spectrum 266				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
O	K series	50.40	0.54	63.87
Na	K series	4.31	0.19	3.81
Al	K series	19.64	0.31	14.76
Si	K series	21.98	0.34	15.87
K	K series	2.11	0.13	1.09
Cr	K series	1.55	0.16	0.61
Total		100.00		100.00



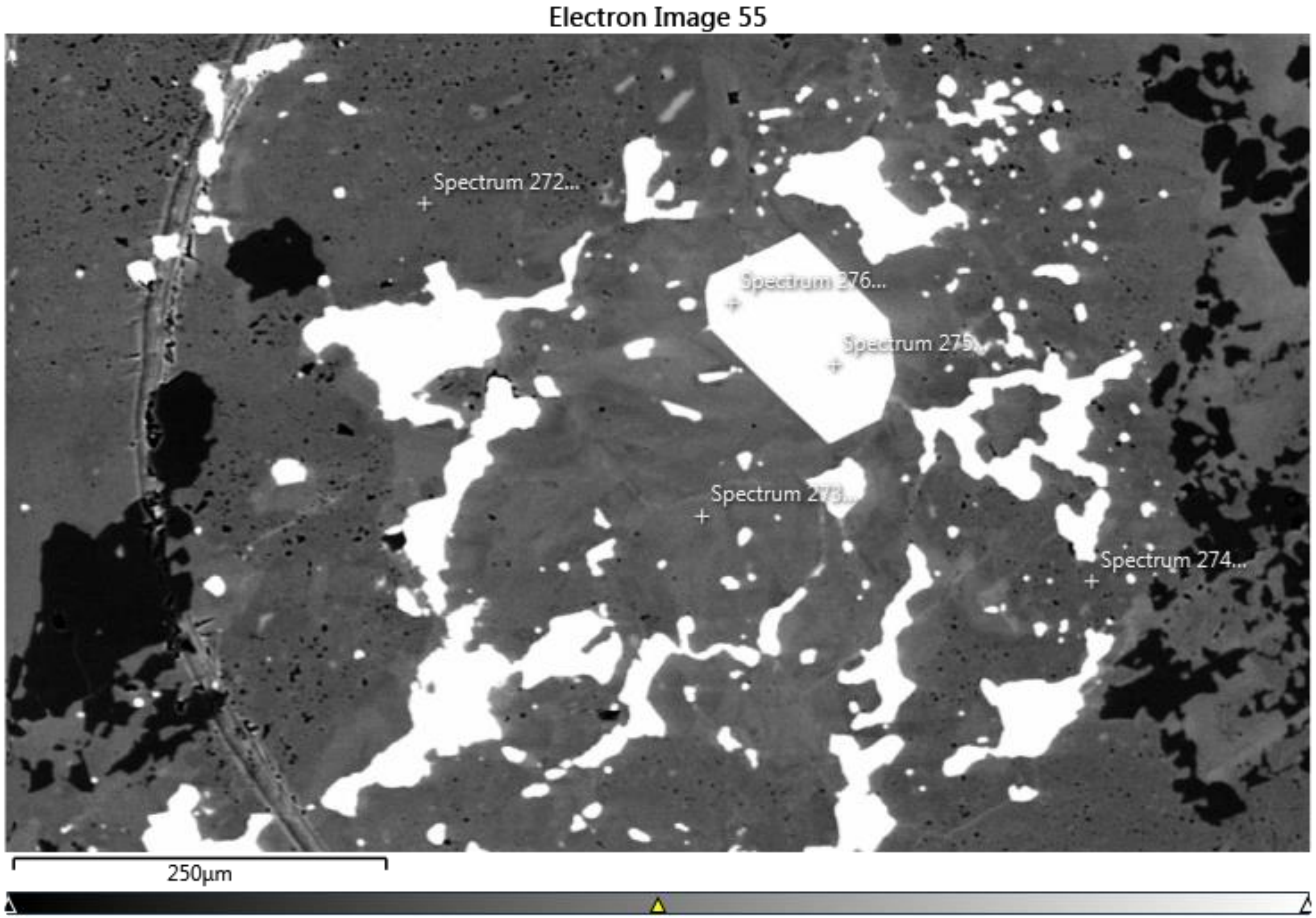
Spectrum 267							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	47.78	0.29	61.50			
Na	K series	3.93	0.15	3.52	Na2O	5.29	0.20
Al	K series	20.96	0.22	15.99	Al2O3	39.60	0.41
Si	K series	23.28	0.24	17.07	SiO2	49.80	0.51
K	K series	2.39	0.11	1.26	K2O	2.88	0.13
Cr	K series	1.66	0.13	0.66	Cr2O3	2.43	0.19
Total		100.00		100.00		100.00	



Spectrum 268 CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	33.20	0.50	56.87			
Mg	K series	7.72	0.30	8.70	MgO	12.80	0.49
Al	K series	7.80	0.27	7.92	Al2O3	14.74	0.50
Cr	K series	37.07	0.50	19.54	Cr2O3	54.18	0.73
Fe	K series	14.21	0.44	6.97	FeO	18.28	0.57
Total		100.00		100.00		100.00	

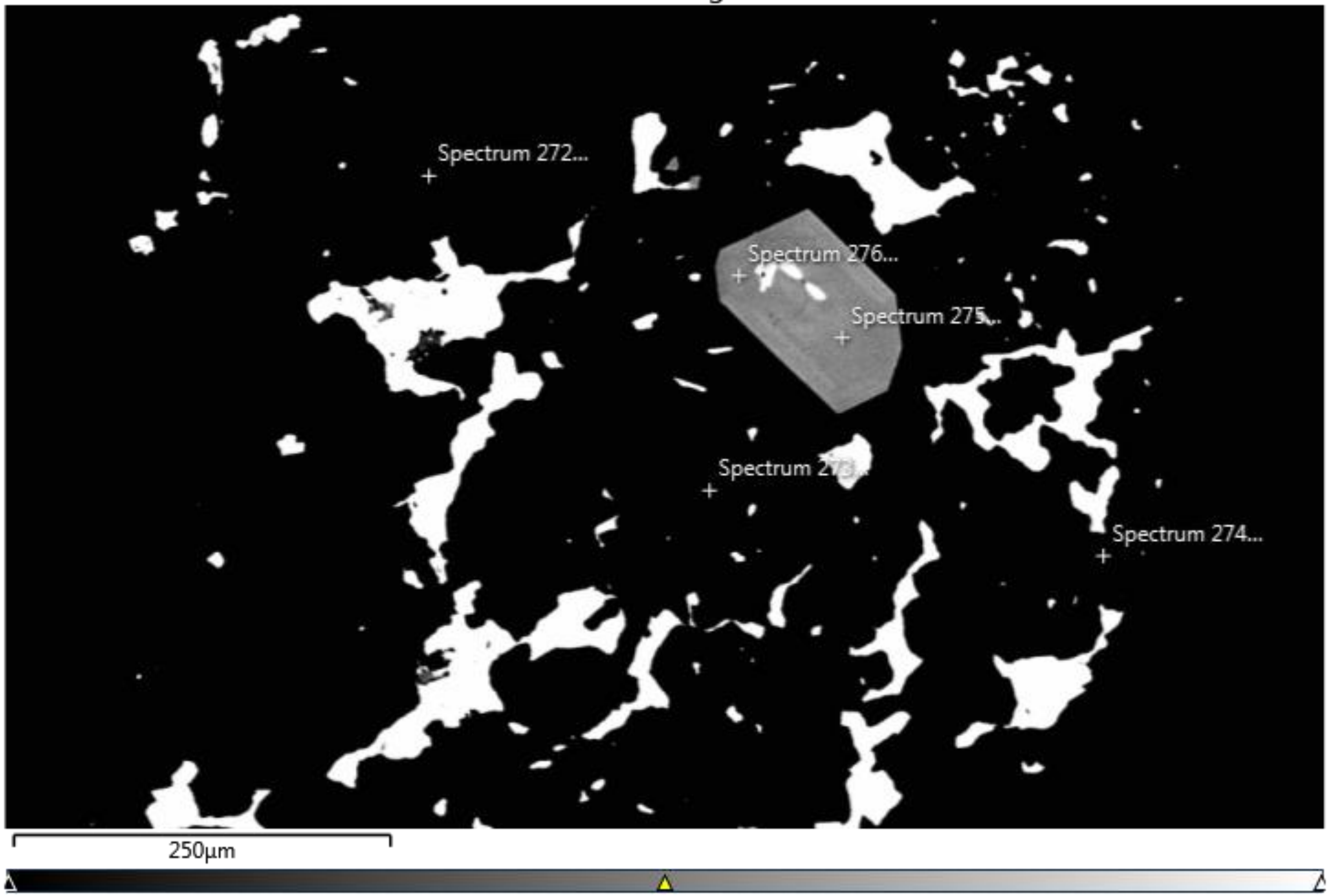


Spectrum 269 Zn-CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.60	0.52	57.11			
Mg	K series	2.79	0.23	3.32	MgO	4.62	0.38
Al	K series	8.86	0.27	9.50	Al2O3	16.74	0.50
Cr	K series	34.07	0.50	18.95	Cr2O3	49.79	0.73
Fe	K series	14.60	0.42	7.56	FeO	18.79	0.54
Zn	K series	8.08	0.53	3.57	ZnO	10.05	0.67
Total		100.00		100.00		100.00	

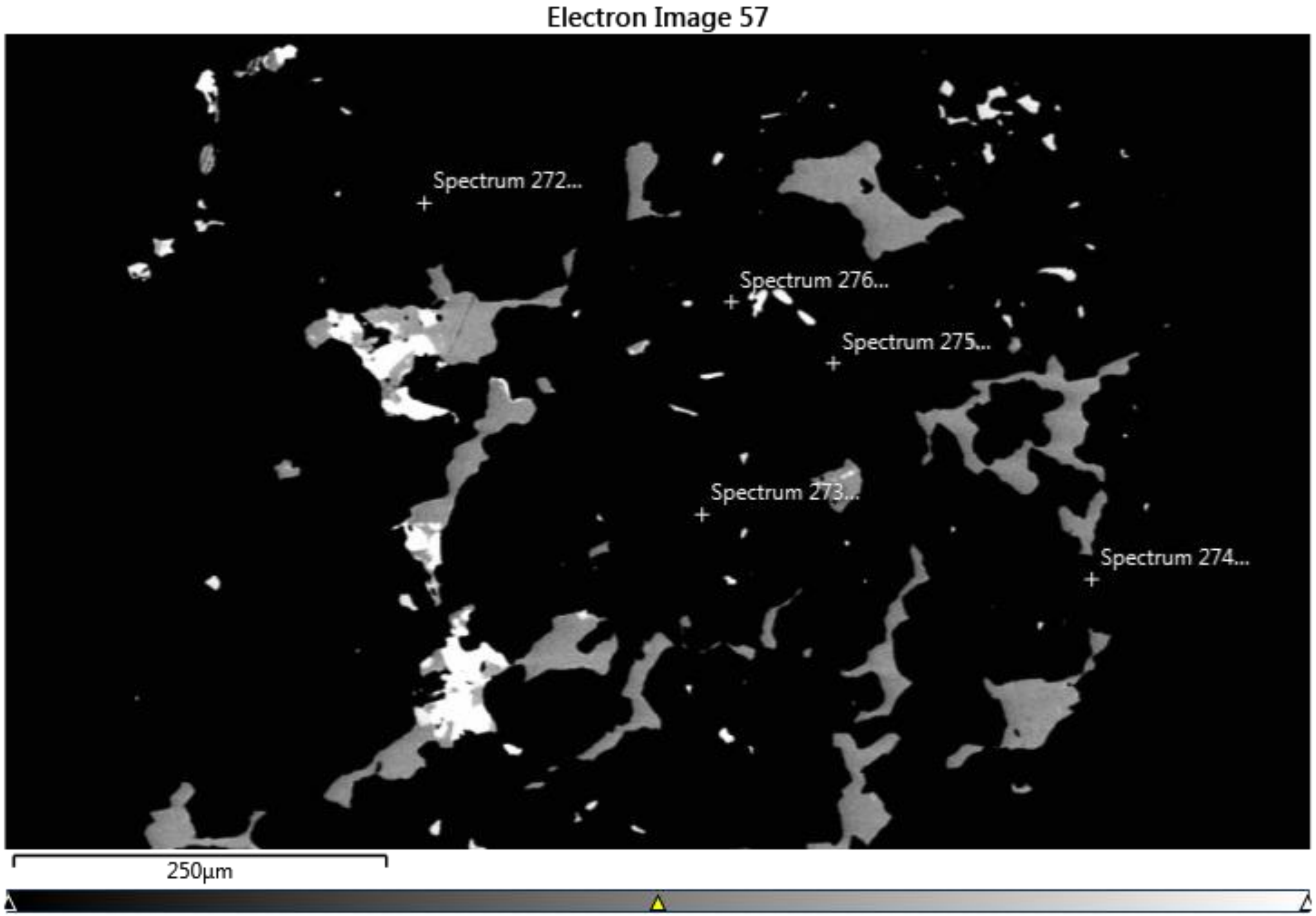


Backscatter image illustrating compositionally diverse sulphides within compositionally zoned dolomite-ankerite solid solution carbonate (spectrum 272,273) with a minor Mn-content. The sulphide inventory consists of arsenian pyrite (spectra 275,276) and a number of Ni-bearing sulphides detailed below.

Electron Image 56

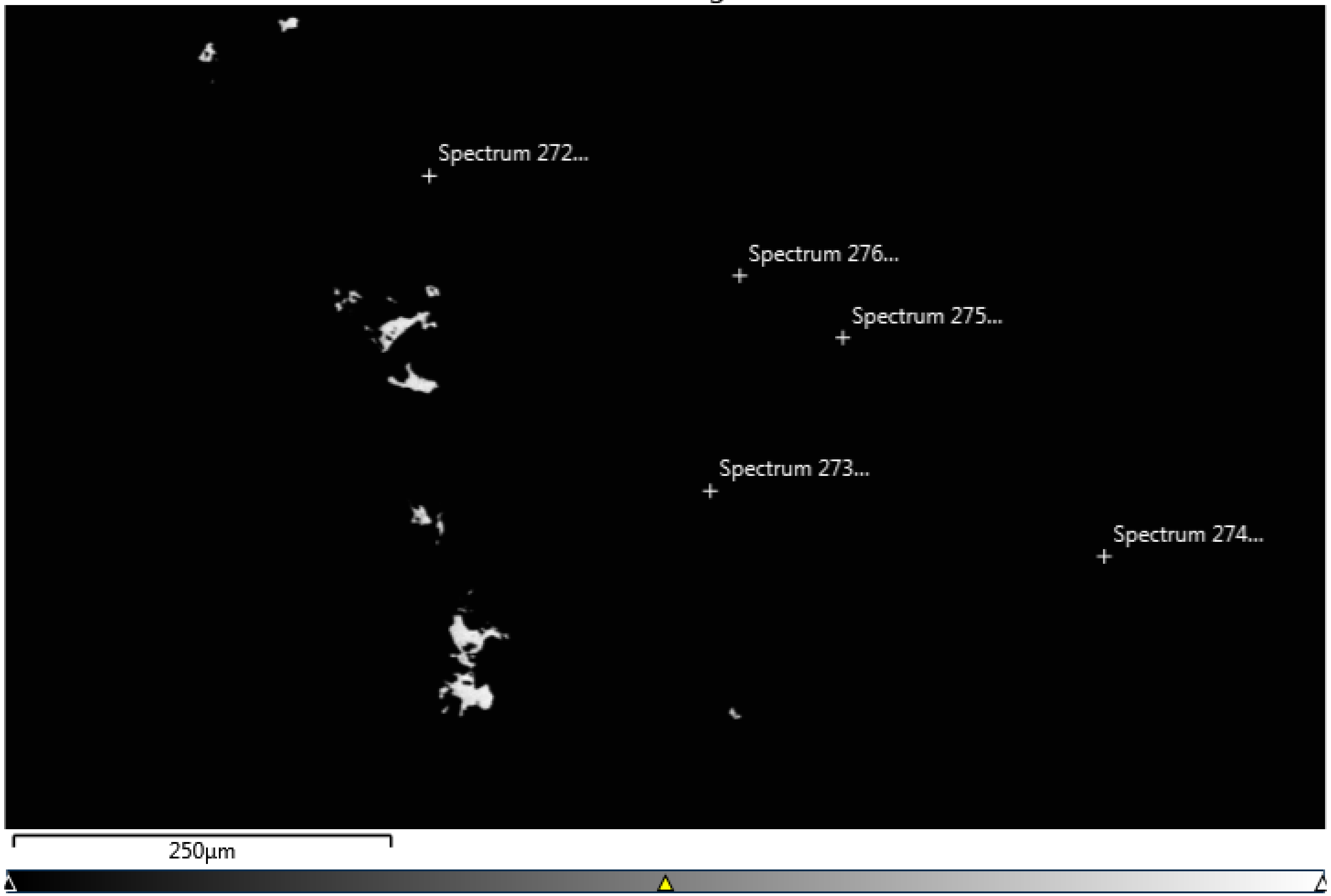


Same image as above with brightness reduced to illustrate the zoning in the arsenian pyrite (spectra 275,276) hosting bright inclusions of Cu-Sb-Fe-Zn-S.

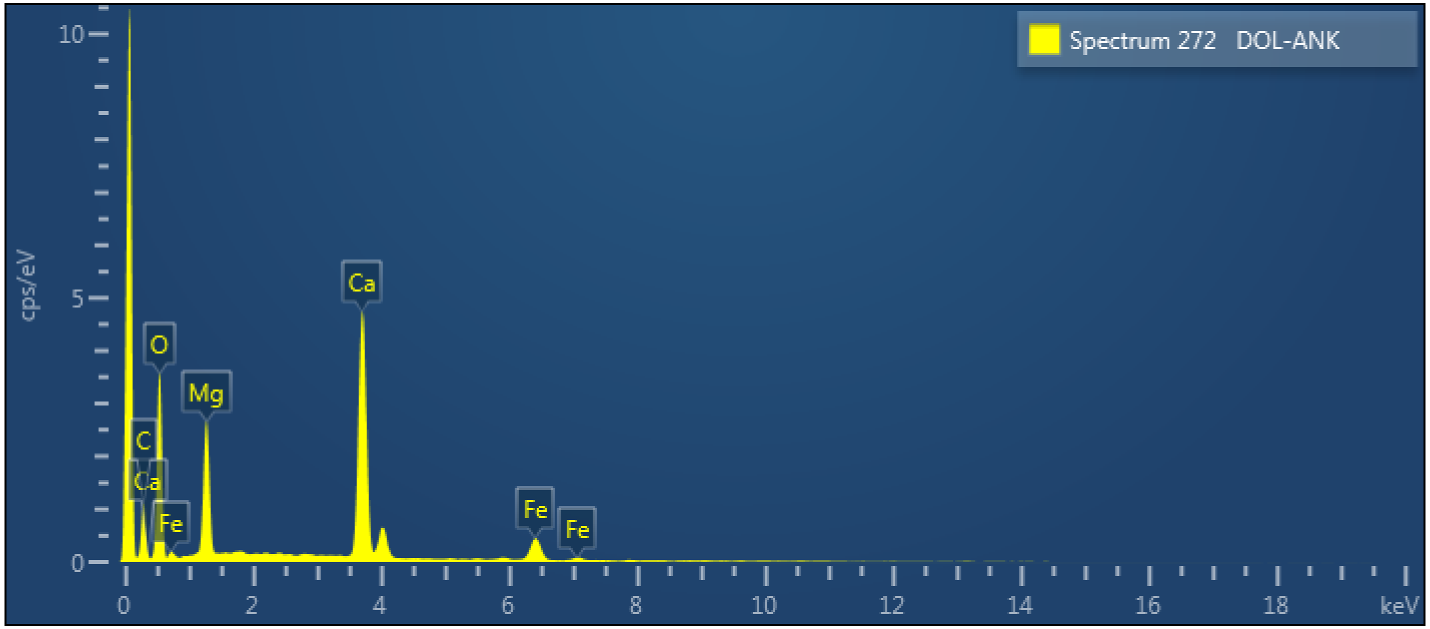


Brightness reduced further to illustrate the bright grains of Sb-Ni-S within chalcopyrite.

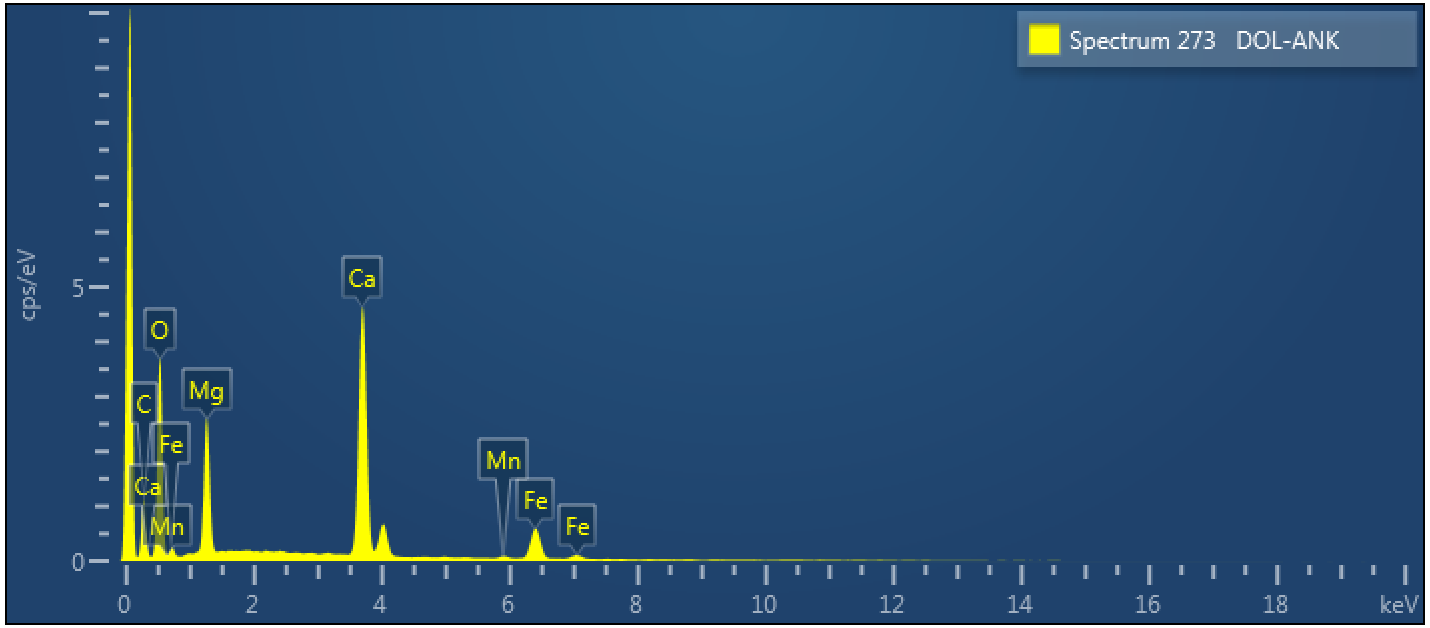
Electron Image 58



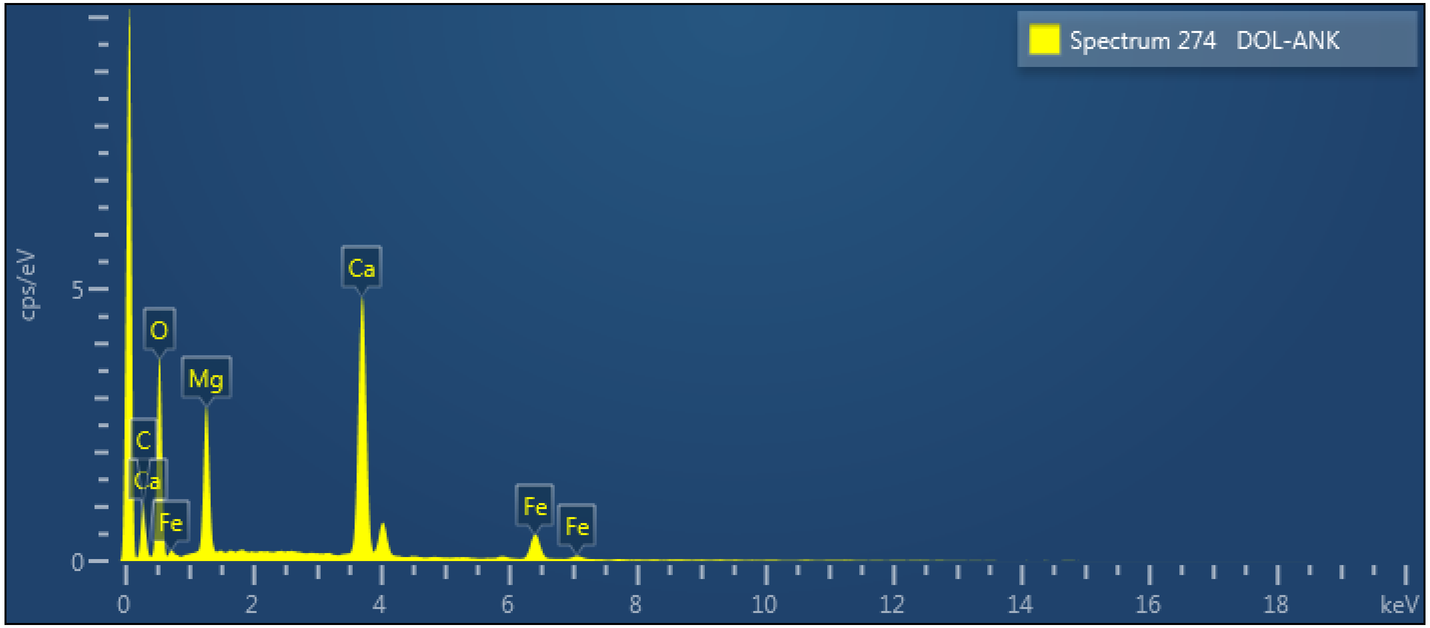
Brightness reduced further to illustrate the Sb-Ni-S grains.



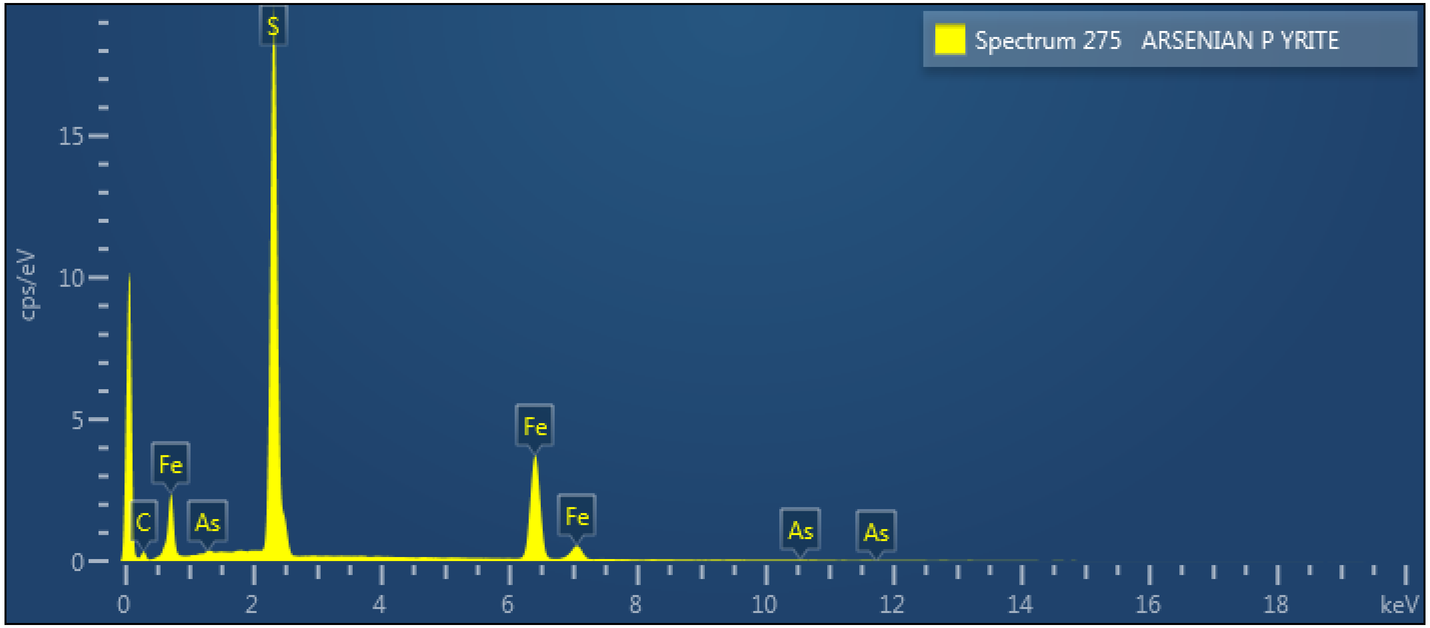
Spectrum 272 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.94	0.63	50.00			
Mg	K series	17.51	0.52	18.63	MgO	29.04	0.86
Ca	K series	41.22	0.65	26.59	CaO	57.68	0.91
Fe	K series	10.32	0.64	4.78	FeO	13.28	0.82
Total		100.00		100.00		100.00	



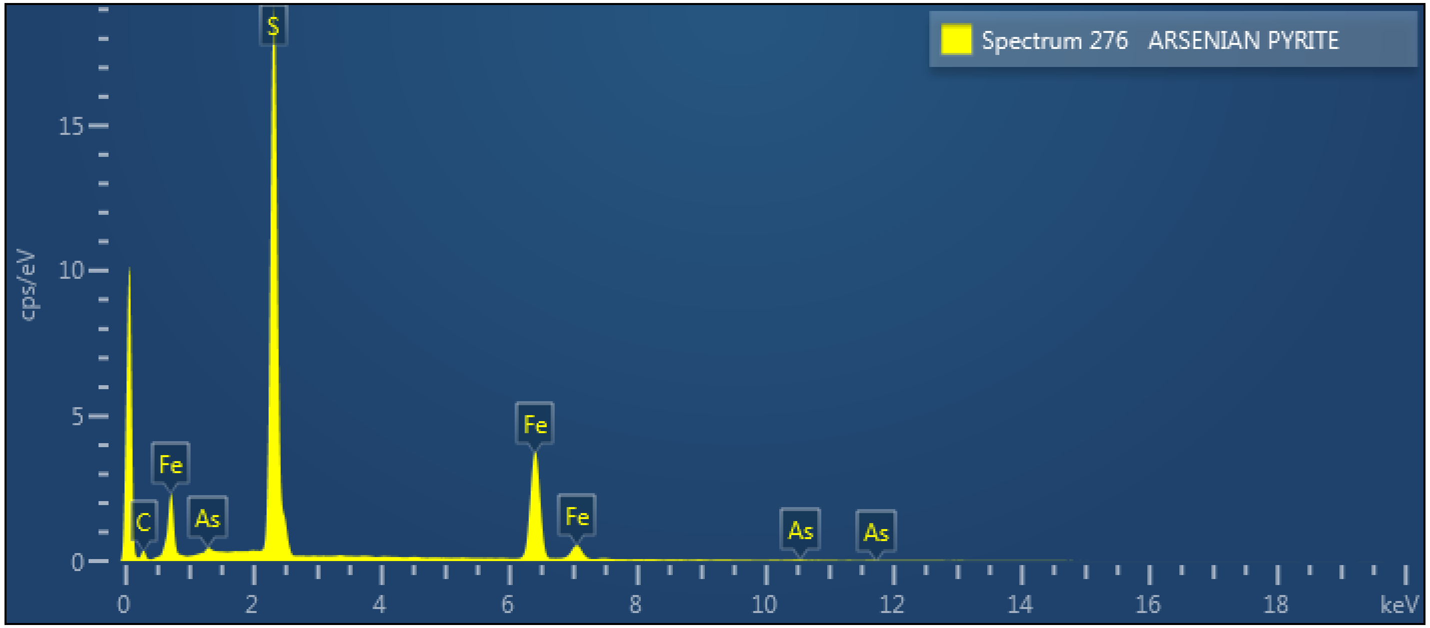
Spectrum 273 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.46	0.48	50.00			
Mg	K series	16.77	0.38	18.12	MgO	27.81	0.64
Ca	K series	38.15	0.48	25.00	CaO	53.38	0.67
Fe	K series	13.62	0.49	6.40	FeO	17.52	0.63
Mn	K series	1.00	0.25	0.48	MnO	1.30	0.32
Total		100.00		100.00		100.00	



Spectrum 274 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.87	0.55	50.00			
Mg	K series	17.69	0.45	18.86	MgO	29.34	0.75
Ca	K series	39.85	0.55	25.77	CaO	55.76	0.78
Fe	K series	11.58	0.54	5.37	FeO	14.90	0.69
Total		100.00		100.00		100.00	

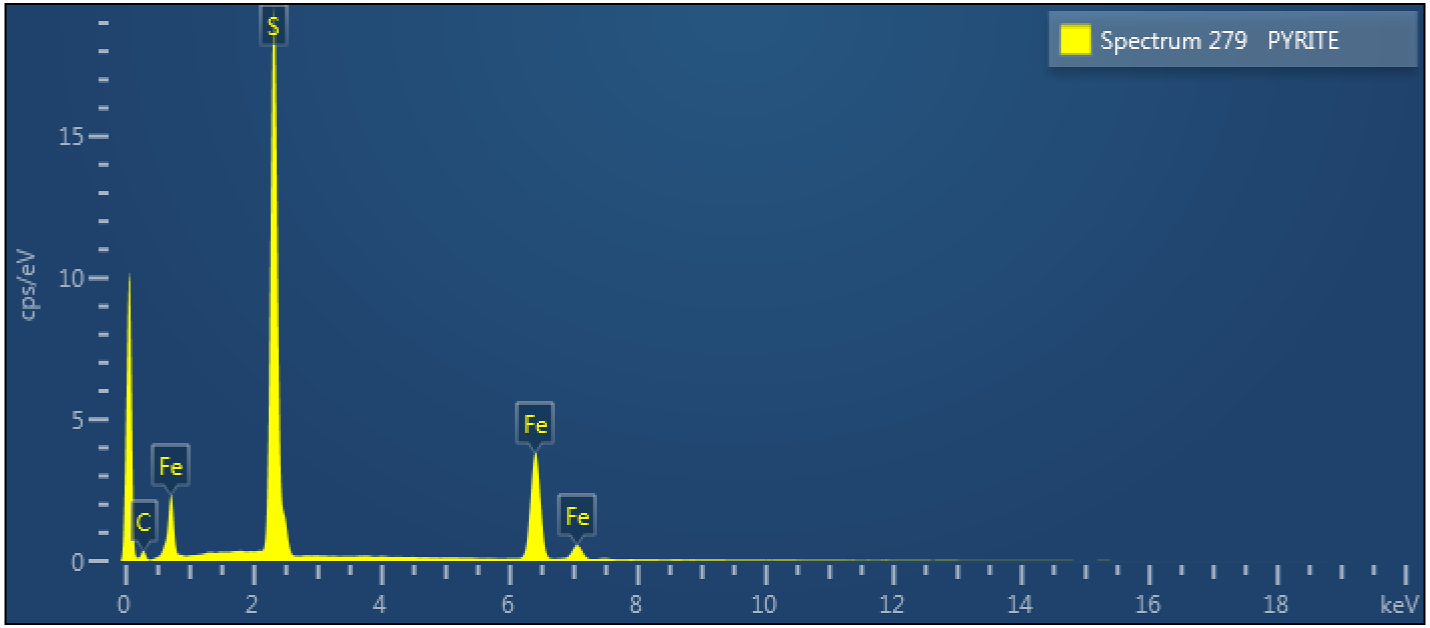


Spectrum 275 ARSENIAN P YRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	55.41	0.33	68.47
Fe	K series	43.98	0.32	31.21
As	L series	0.60	0.18	0.32
Total		100.00		100.00

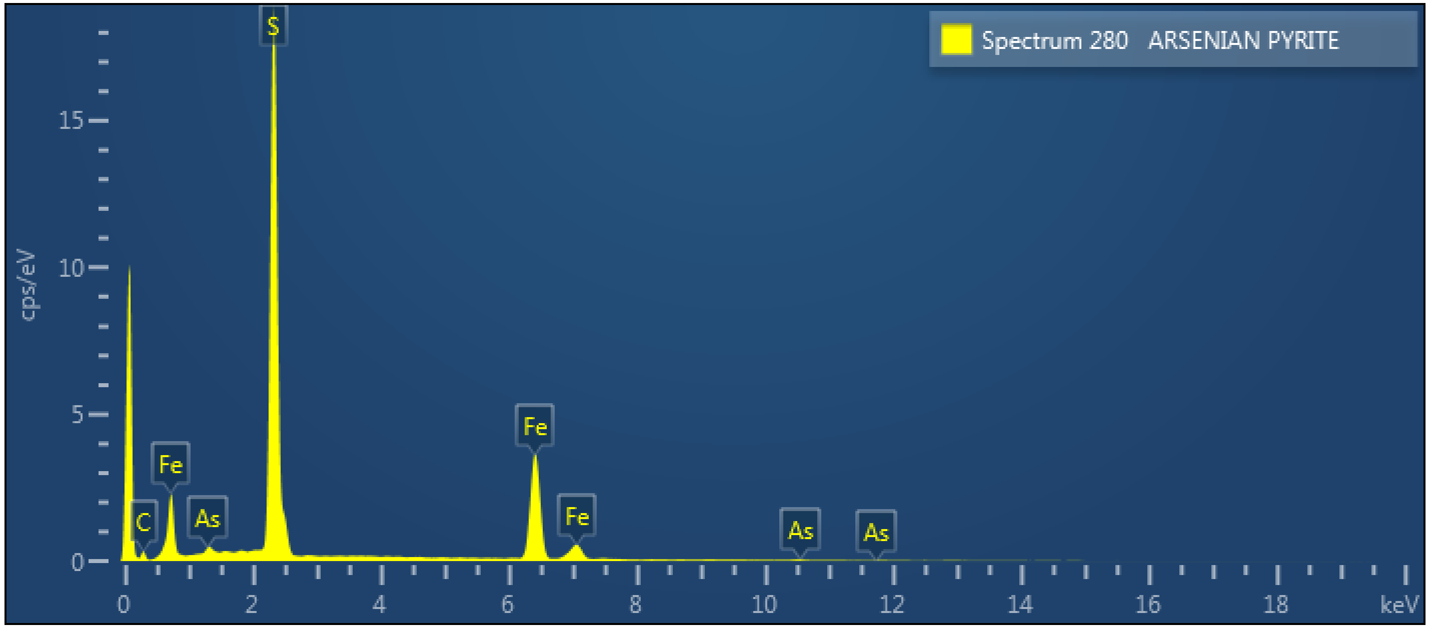


Spectrum 276 ARSENIAN PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.31	0.38	67.56
Fe	K series	44.65	0.37	31.89
As	L series	1.03	0.22	0.55
Total		100.00		100.00

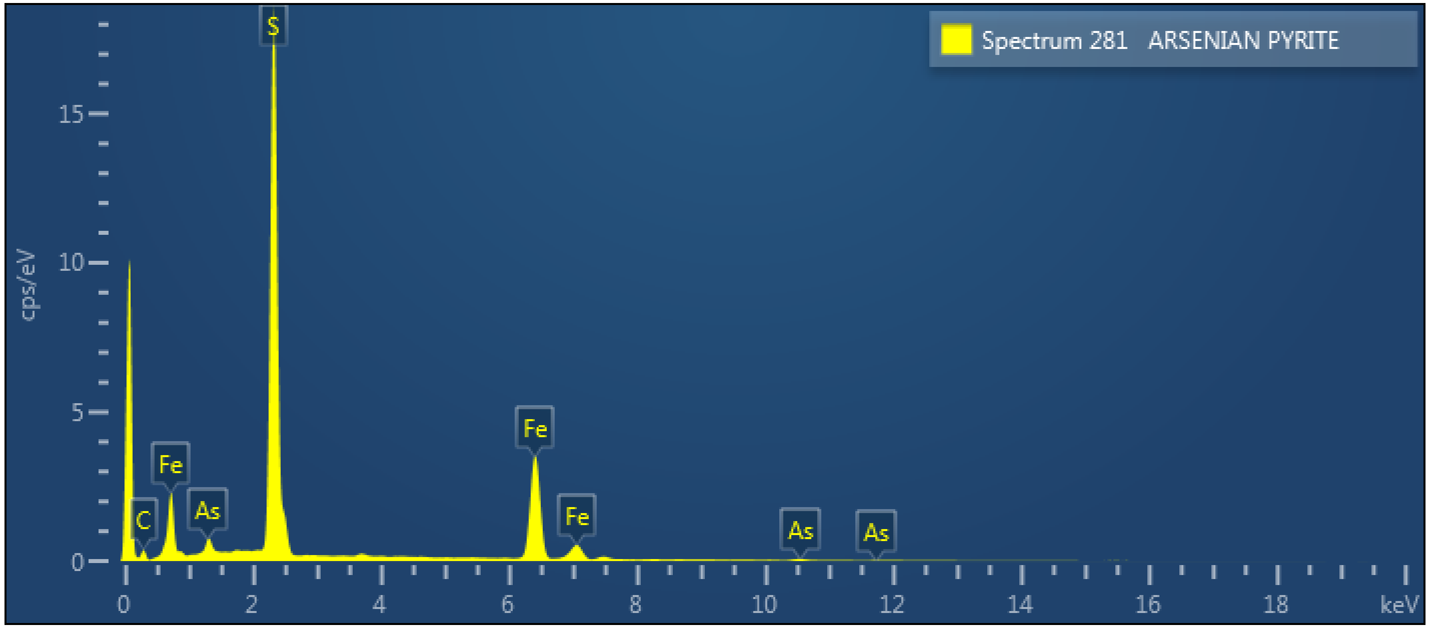
Arsenian zoned pyrite grains with brighter growth zones containing more As (spectra 279-282). Note the brightest inclusions of Cu-Sb-Fe-Zn-S (spectrum 284).



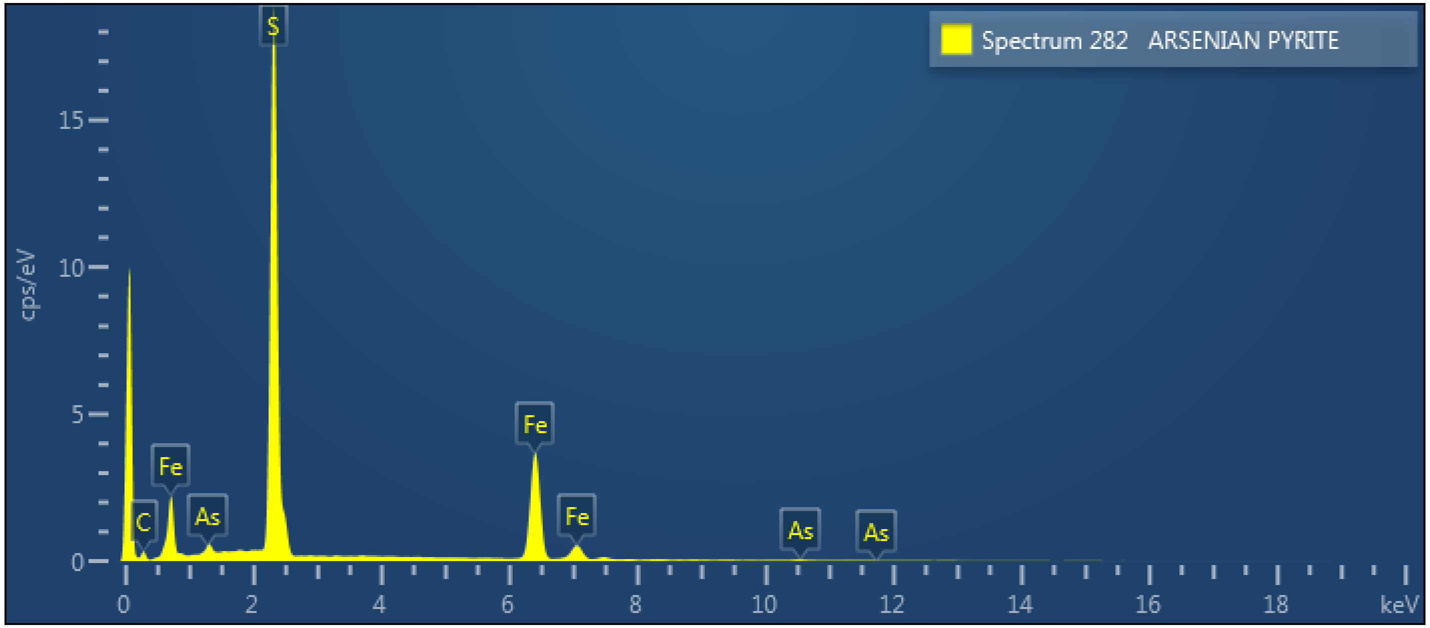
Spectrum 279 PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.83	0.29	67.89
Fe	K series	45.17	0.29	32.11
Total		100.00		100.00



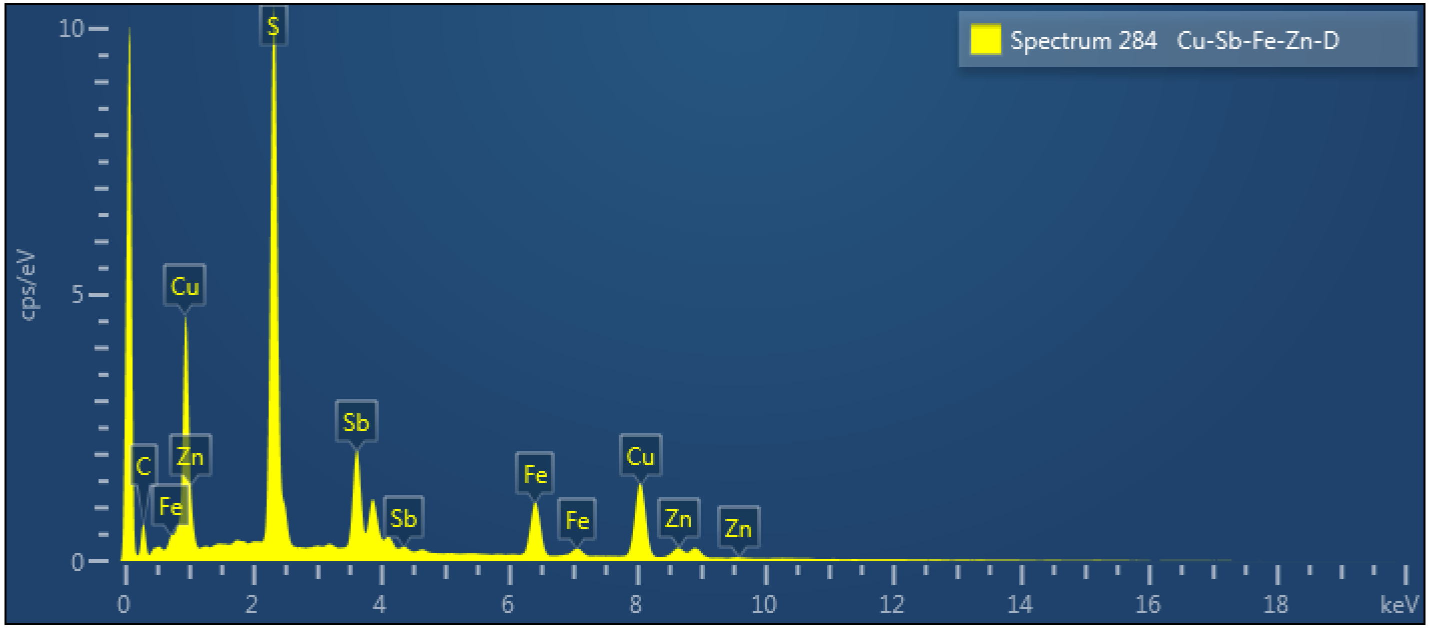
Spectrum 280 ARSENIAN PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.65	0.43	67.90
Fe	K series	43.98	0.43	31.37
As	L series	1.37	0.25	0.73
Total		100.00		100.00



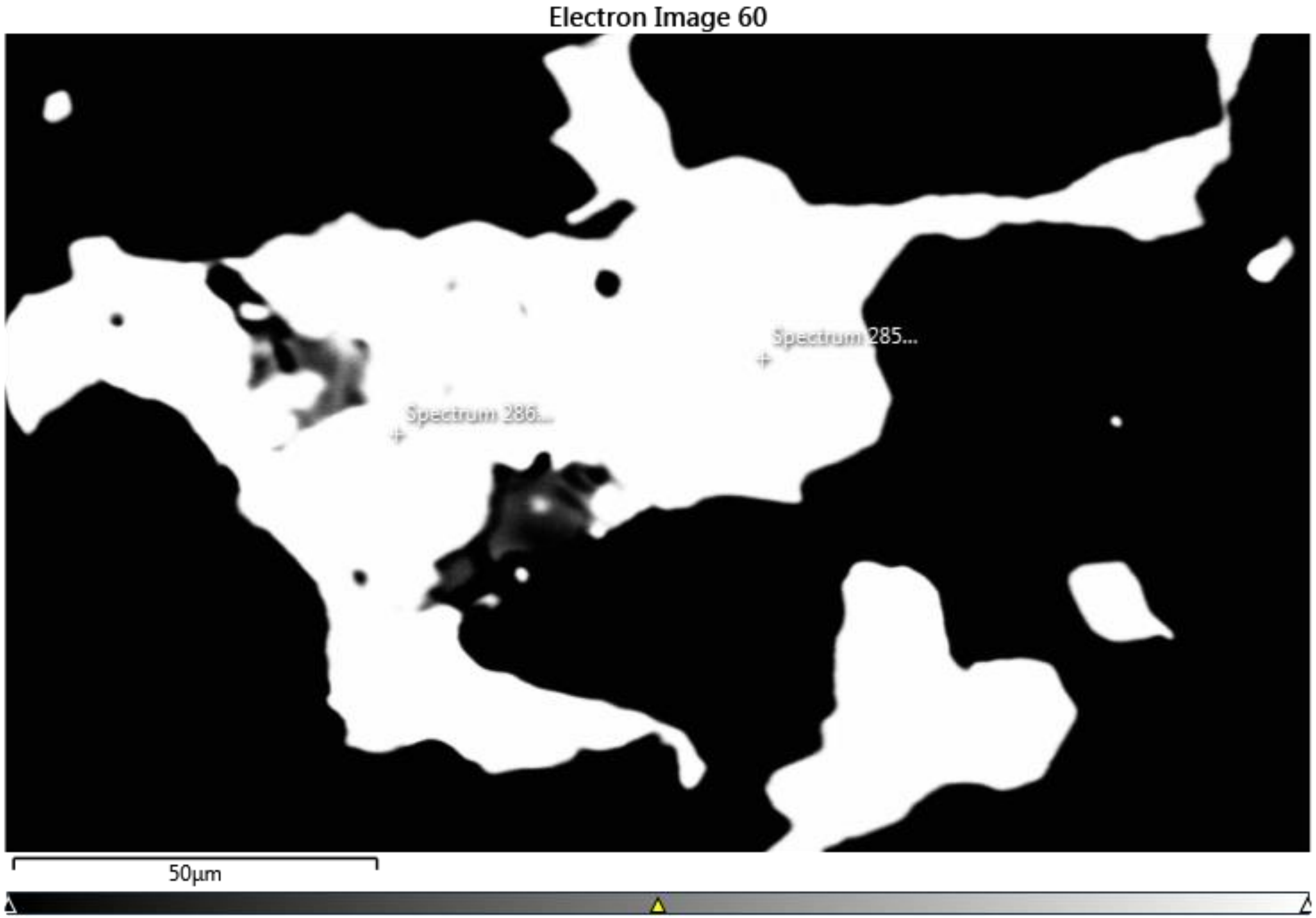
Spectrum 281 ARSENIAN PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.40	0.45	67.88
Fe	K series	42.58	0.44	30.51
As	L series	3.03	0.29	1.62
Total		100.00		100.00



Spectrum 282 ARSENIAN PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.40	0.42	67.75
Fe	K series	43.67	0.42	31.22
As	L series	1.93	0.25	1.03
Total		100.00		100.00

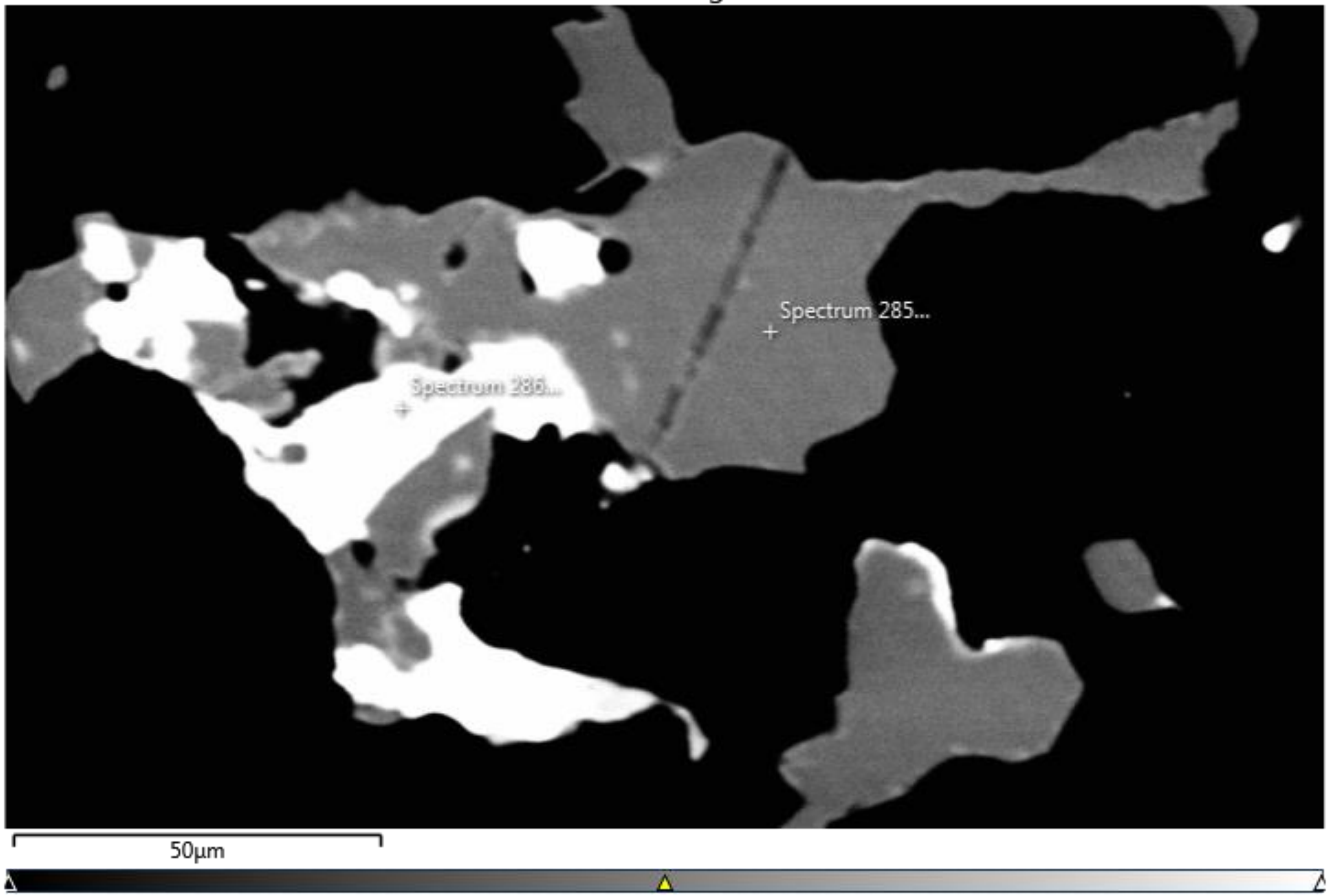


Spectrum 284 Cu-Sb-Fe-Zn-D				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	31.62	0.35	51.55
Fe	K series	11.23	0.28	10.51
Cu	K series	29.96	0.46	24.65
Sb	L series	22.81	0.39	9.79
Zn	K series	4.37	0.37	3.50
Total		100.00		100.00

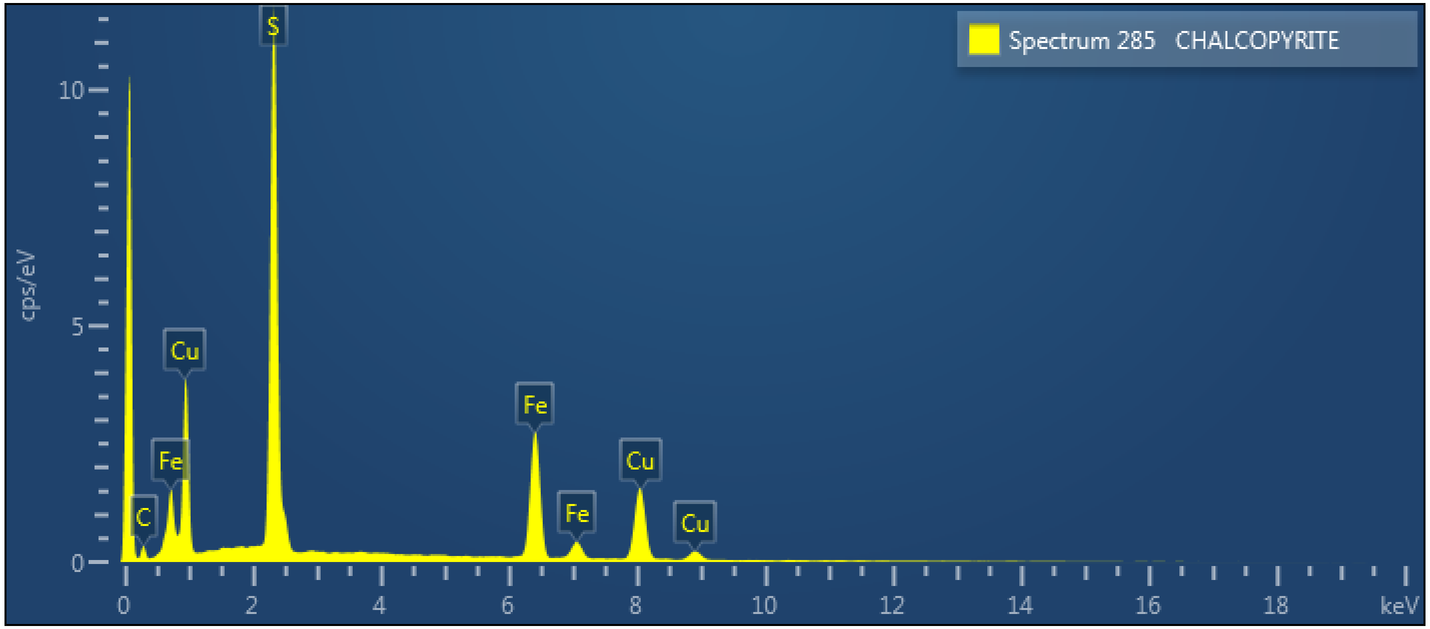


High magnification backscatter image of a grain of chalcopyrite hosting inclusions of Sb-bearing sulphides.

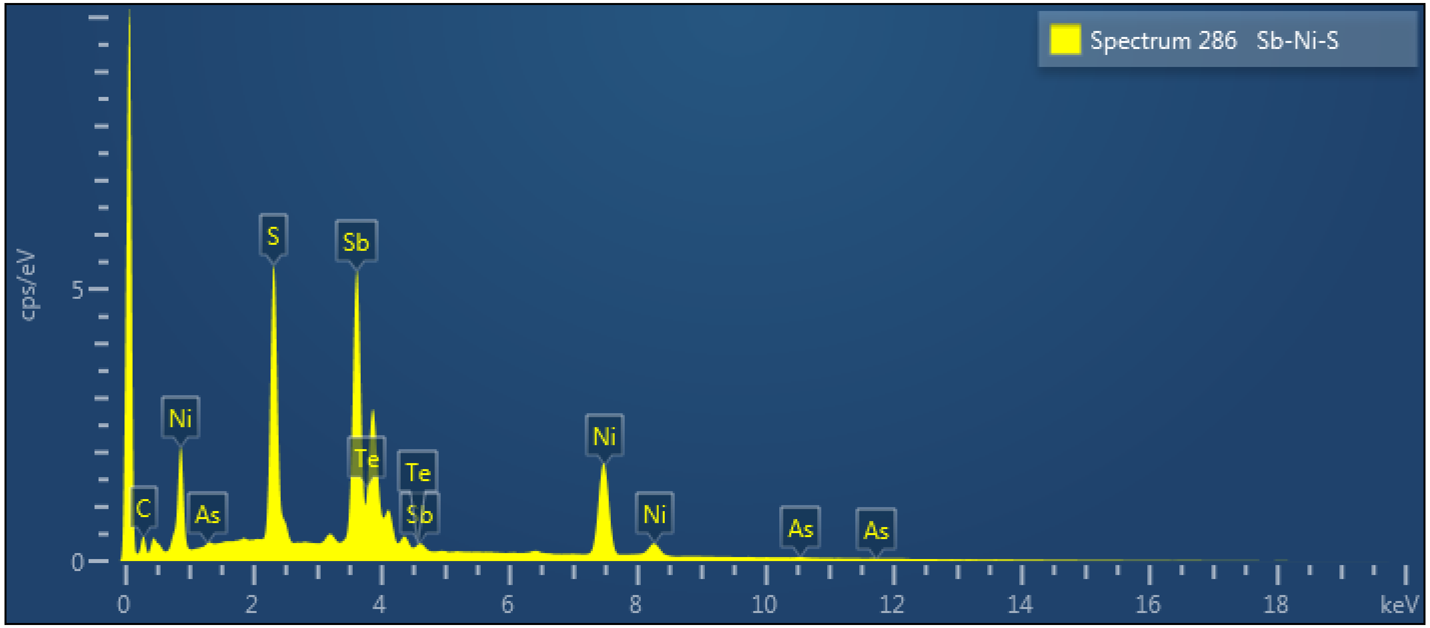
Electron Image 61



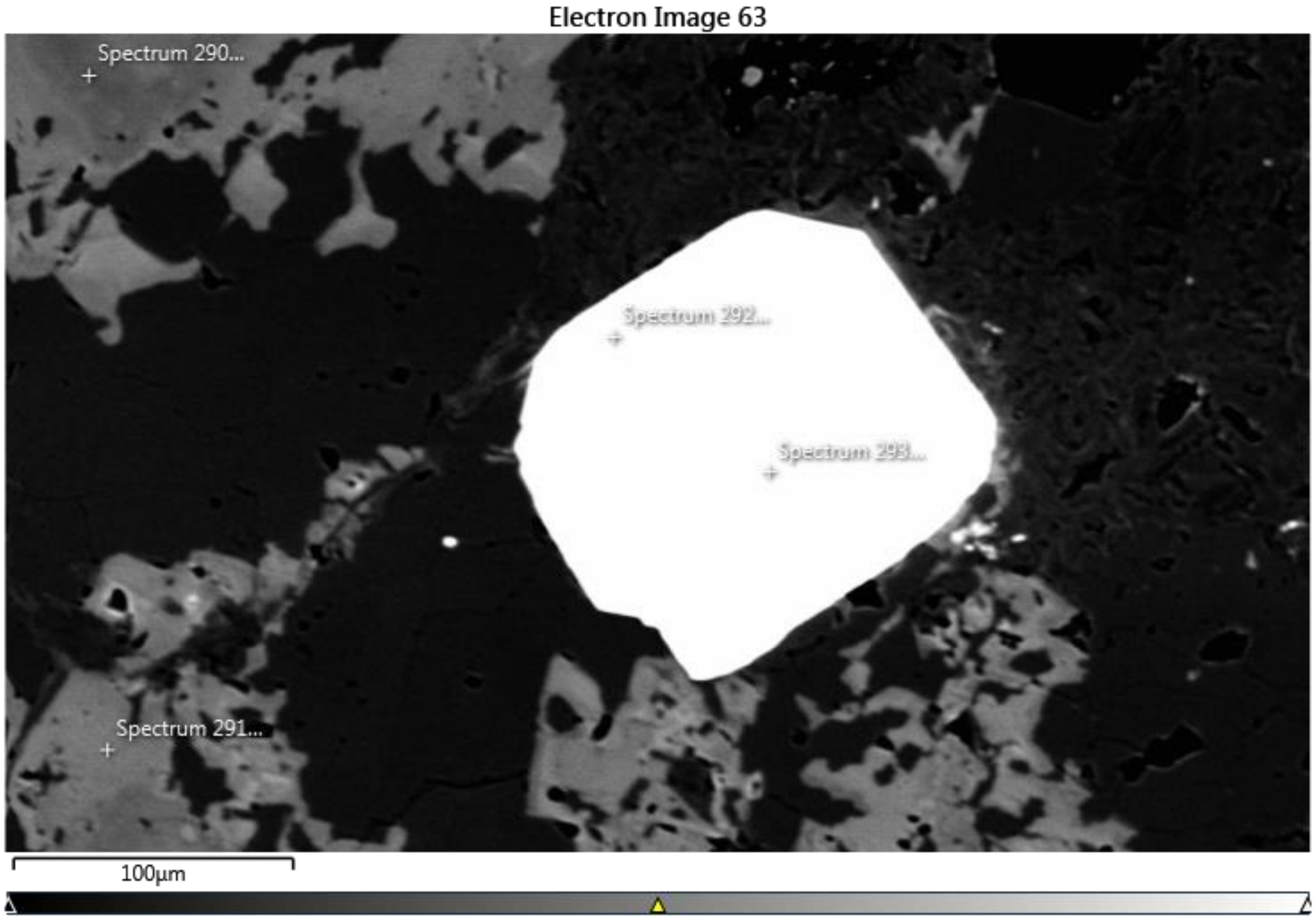
Brightness reduced to show the bright grains of Sb-Ni-Te-As-S (spectrum 286) within chalcopyrite (spectrum 285).



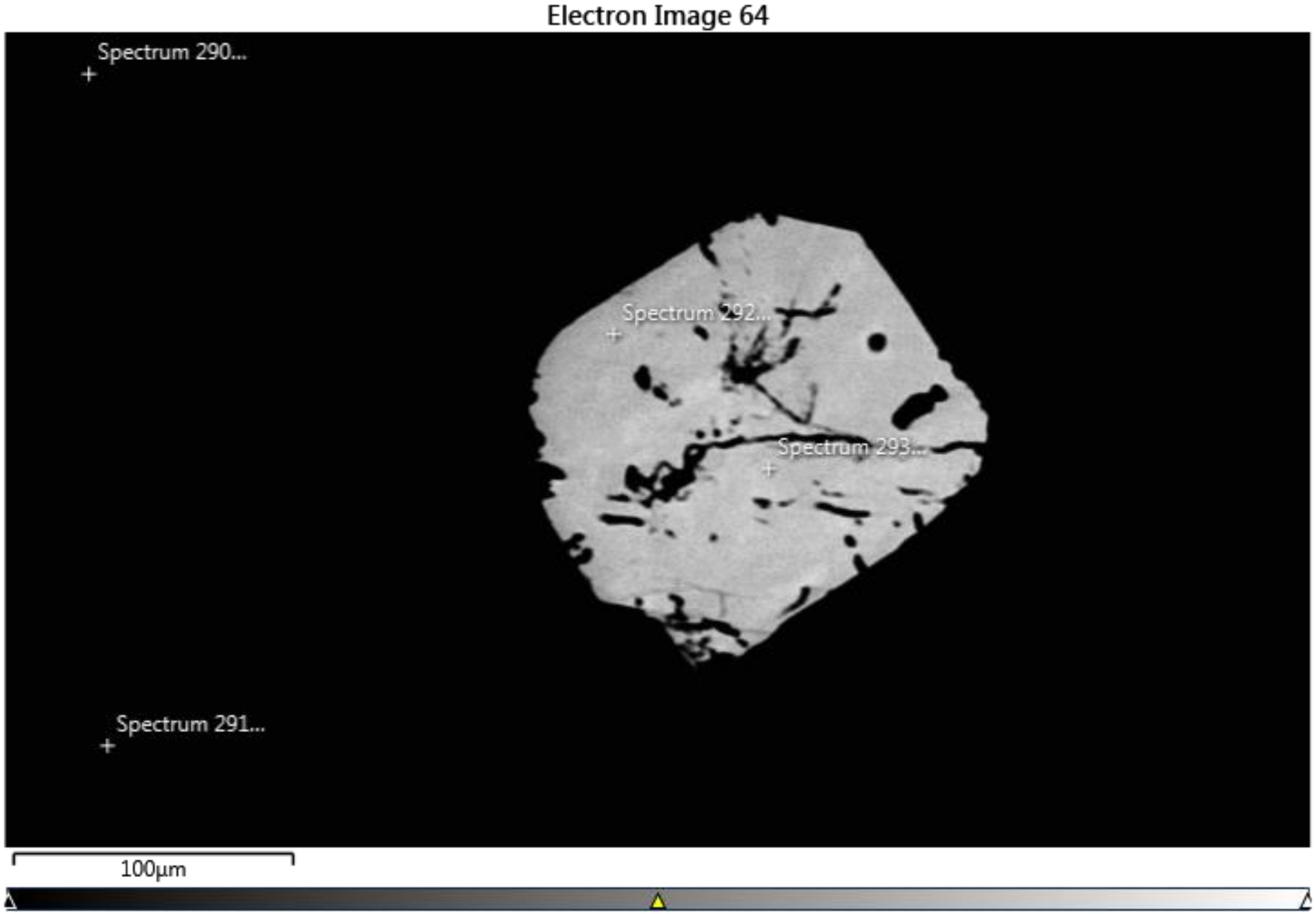
Spectrum 285 CHALCOPYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	36.48	0.47	51.65
Fe	K series	29.98	0.50	24.37
Cu	K series	33.55	0.62	23.97
Total		100.00		100.00



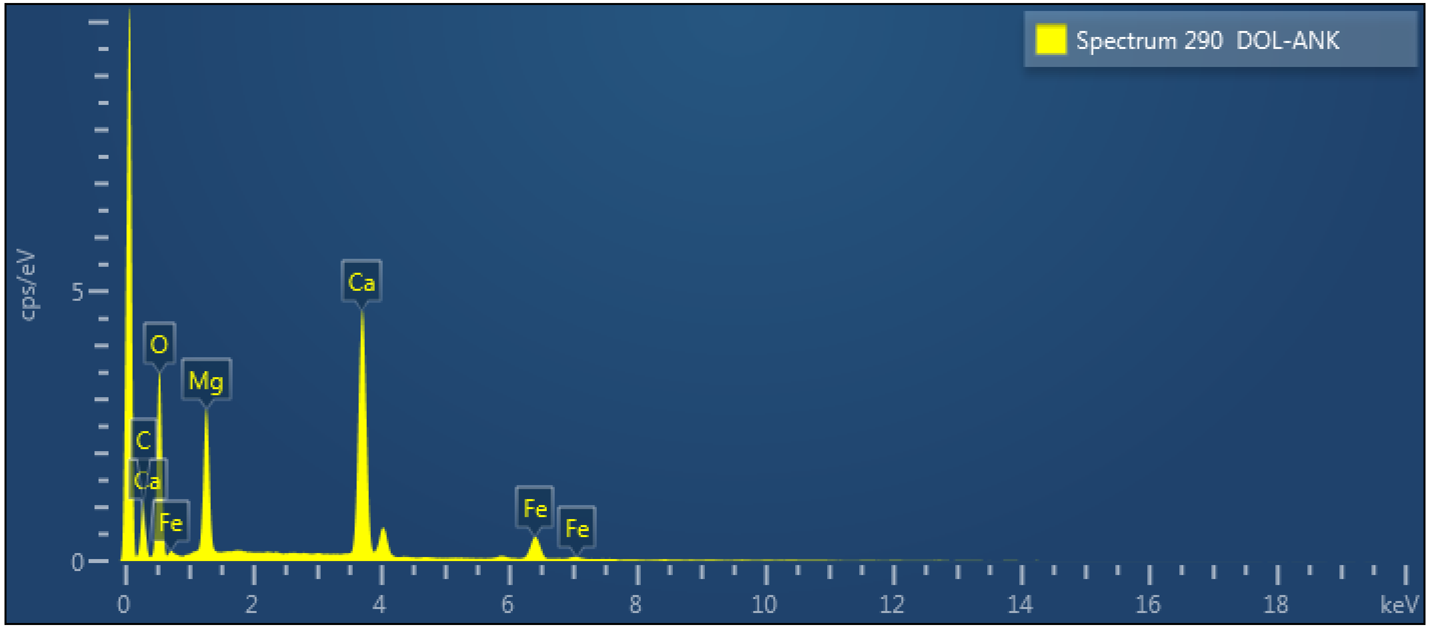
Spectrum 286 Sb-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	14.80	0.15	33.22
Ni	K series	25.73	0.27	31.54
Sb	L series	55.40	0.34	32.75
Te	L series	3.57	0.34	2.01
As	L series	0.50	0.15	0.48
Total		100.00		100.00



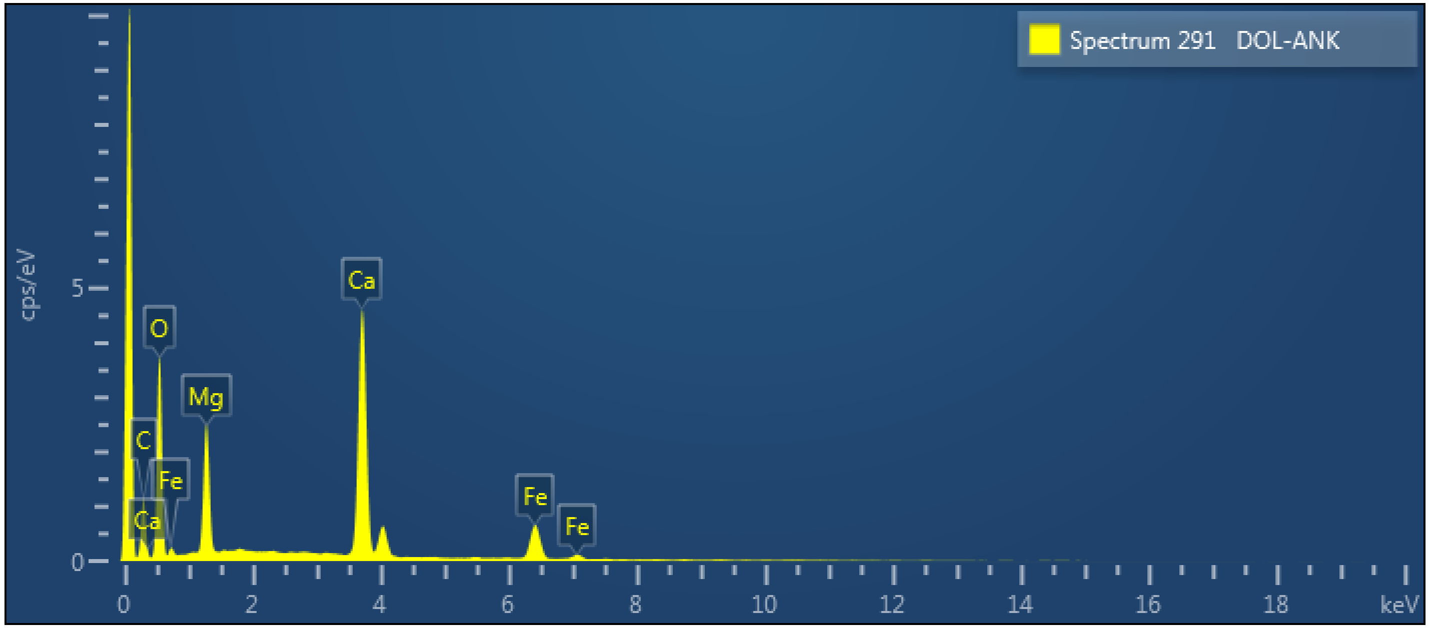
Backscatter image of a Ni-As-Sb-Co-S mineral (spectra 292,293) hosted in compositionally zoned dolomite-ankerite solid solution carbonate (spectrum 291).

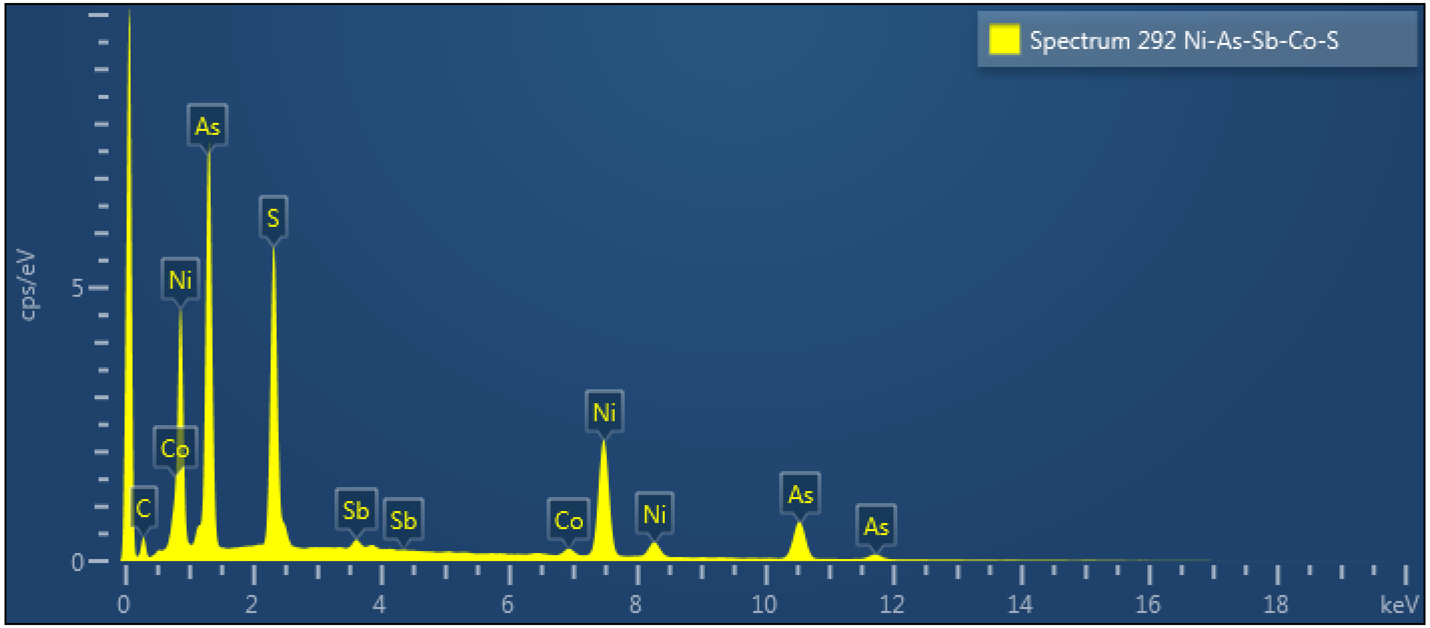


Same image with brightness reduced to show the domanial compositional variation within the grain of Ni-As-Sb-Co-S. The brighter areas (spectrum 293) have more elevated Co-Sb.

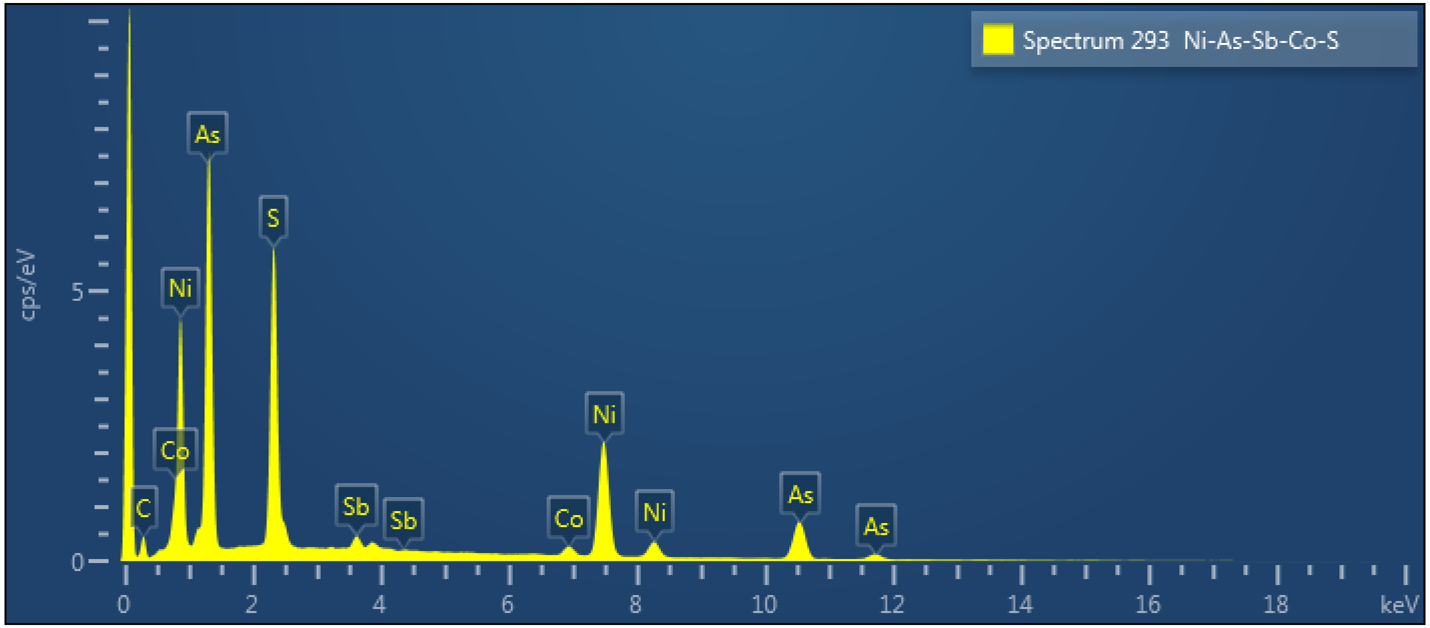


Spectrum 290 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.04	0.57	50.00			
Mg	K series	18.23	0.47	19.33	MgO	30.23	0.79
Ca	K series	39.98	0.57	25.71	CaO	55.94	0.80
Fe	K series	10.75	0.56	4.96	FeO	13.83	0.72
Total		100.00		100.00		100.00	


Spectrum 291 DOL-ANK
cps/eV
5
0
C
Ca
O
Fe
Mg
Ca
Fe
Fe
0
2
4
6
8
10
12
14
16
18
keV



Spectrum 292 Ni-As-Sb-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.72	0.22	34.07
Ni	K series	33.00	0.35	31.14
As	L series	43.85	0.36	32.42
Co	K series	1.67	0.16	1.57
Sb	L series	1.76	0.19	0.80
Total		100.00		100.00

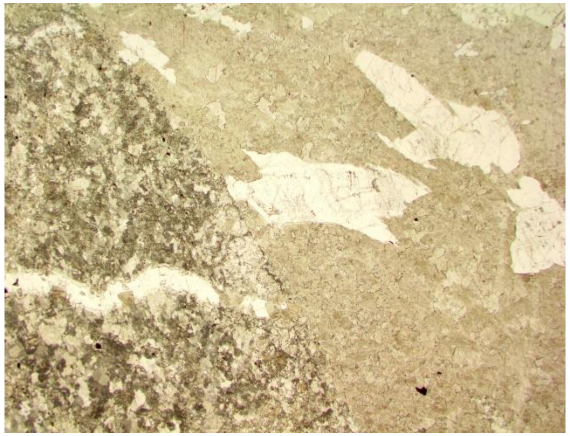
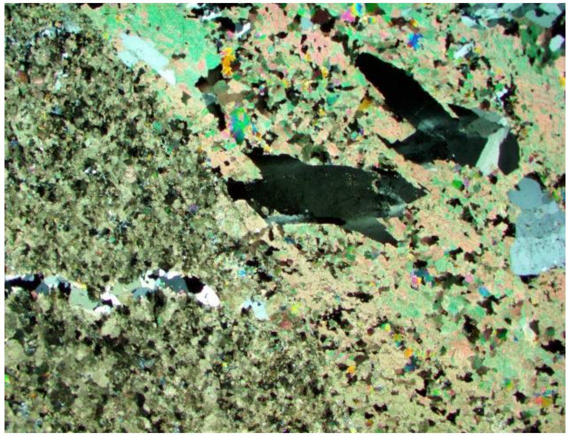


Spectrum 293 Ni-As-Sb-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.49	0.24	33.87
Ni	K series	32.29	0.37	30.64
As	L series	43.04	0.38	32.00
Co	K series	2.30	0.18	2.17
Sb	L series	2.88	0.21	1.32
Total		100.00		100.00

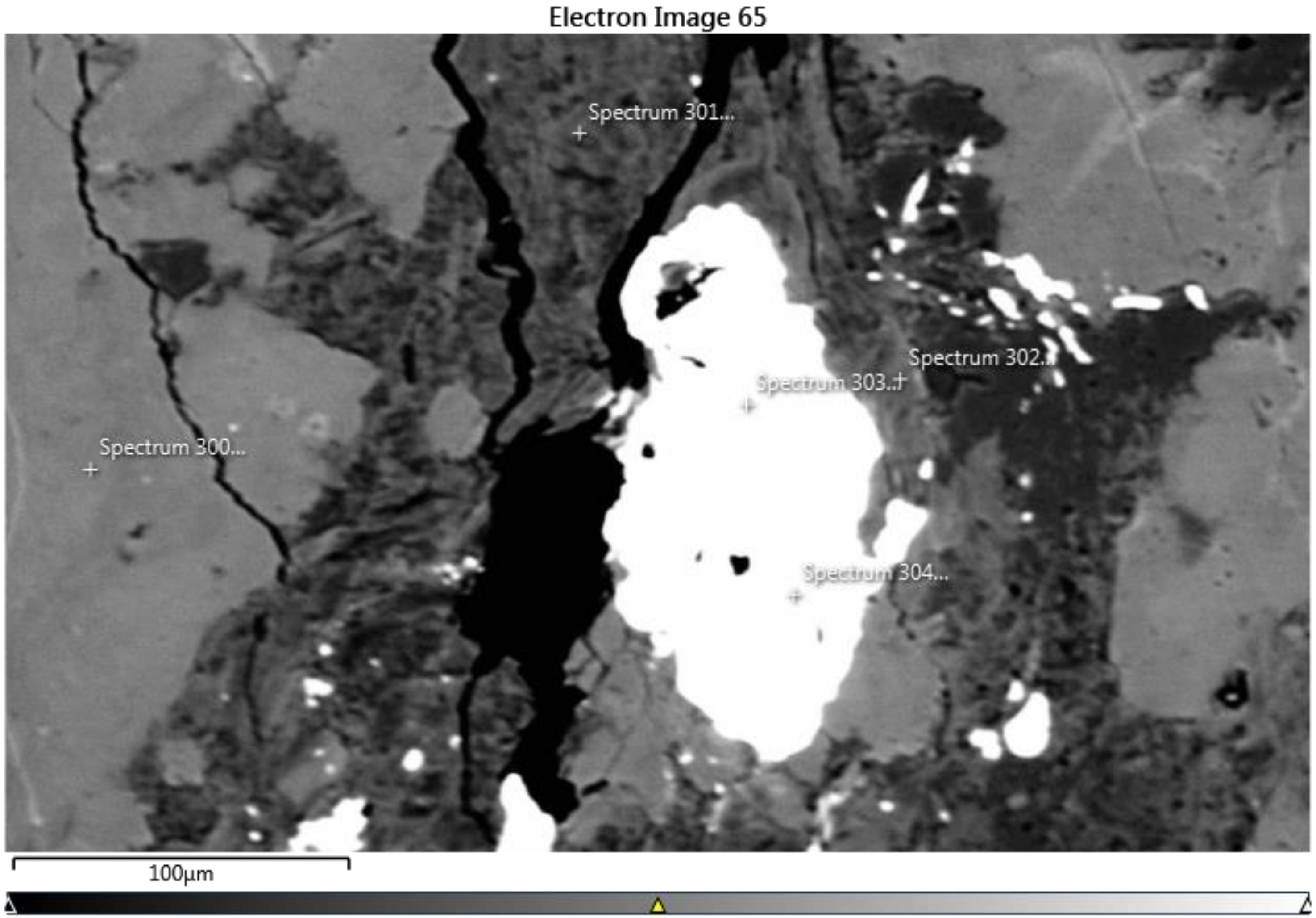
Specimen Notes for 'MID-13'

The rock sample was obtained from within the big pit (Laroma prospect). The rock is green in colour due to the presence of Cr-mica (fuchsite) in association with compositionally zoned dolomite-ankerite solid solution carbonate, and chromite with Zn-rich rinds. The rock is transected by stringers of quartz. The rock appears to contain an early generation of dolomite-ankerite solid solution carbonate cut by a coarser-grained dolomite-ankerite solid solution carbonate and coarse-grained multigranular quartz. It appears that the late quartz-carbonate veins lack sulphides. All the sulphides occur as disseminated grains within the earlier carbonate. Assay results of this specimen reported 24.6g/t Au.

In terms of sulphide inventory, this rock contains disseminate pyrite, chalcopyrite, Ni-As-Sb-S, and Sb-NiAs-Fe-Te-S.

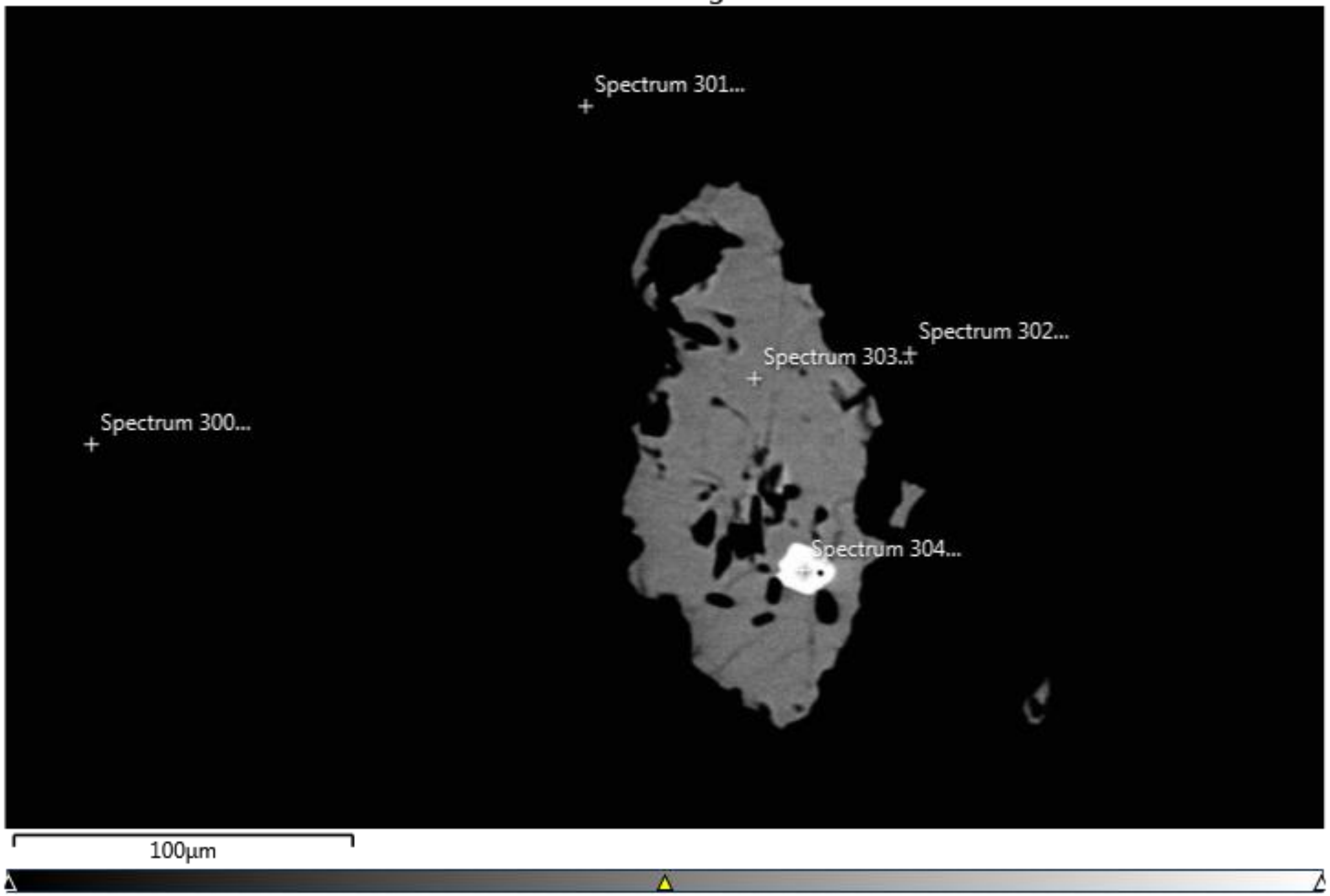



Plane light image (left) and crossed polarized light image (right) illustrating the sulphides dominantly associated with the earlier fine-grained carbonate. The later coarser-grained quartz-carbonate veins lack sulphide. Field of view = 17mm

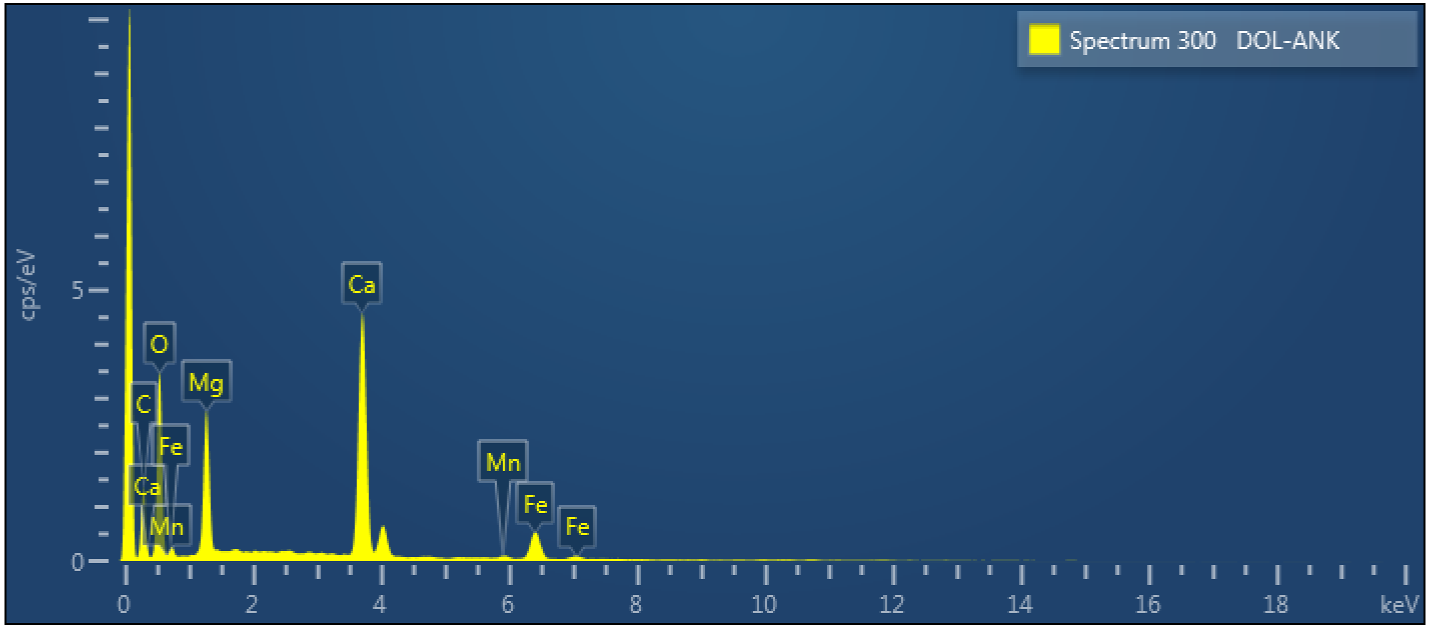


Backscatter image of dolomite-ankerite solid solution (spectrum 300) and Cr0-mica (spectrum 301) hosting coarse-grained chalcopyrite (spectrum 303) with inclusions of Sb-Ni-As-Fe-Te-S.

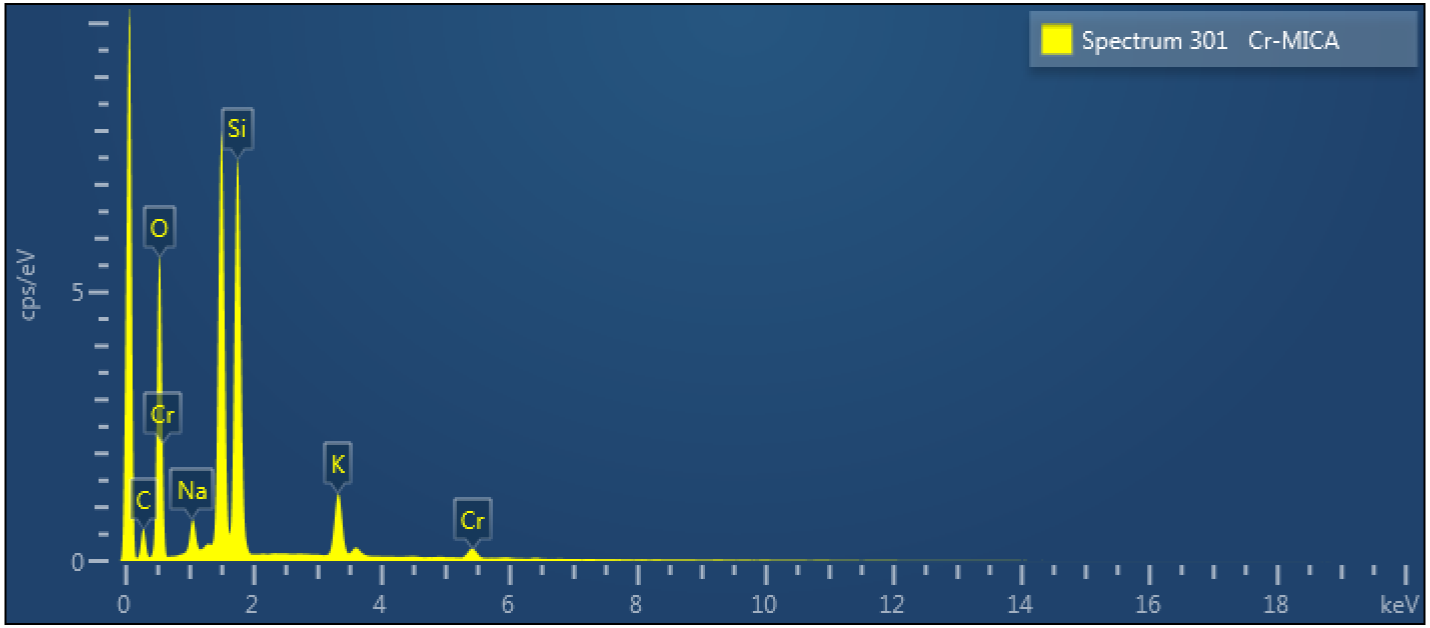
Electron Image 66



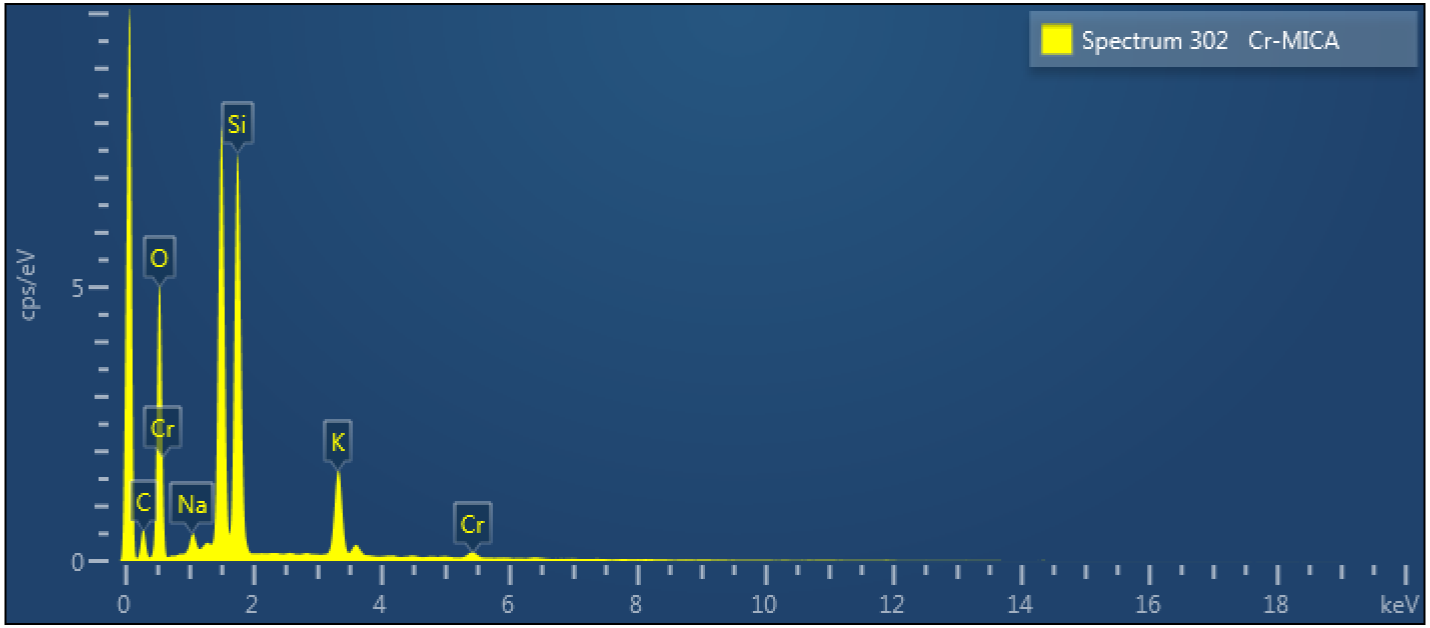
Same image with brightness reduced to show the inclusion of Sb-Ni-As-Fe-Te-S (spectrum 304) within chalcopyrite (spectrum 303).



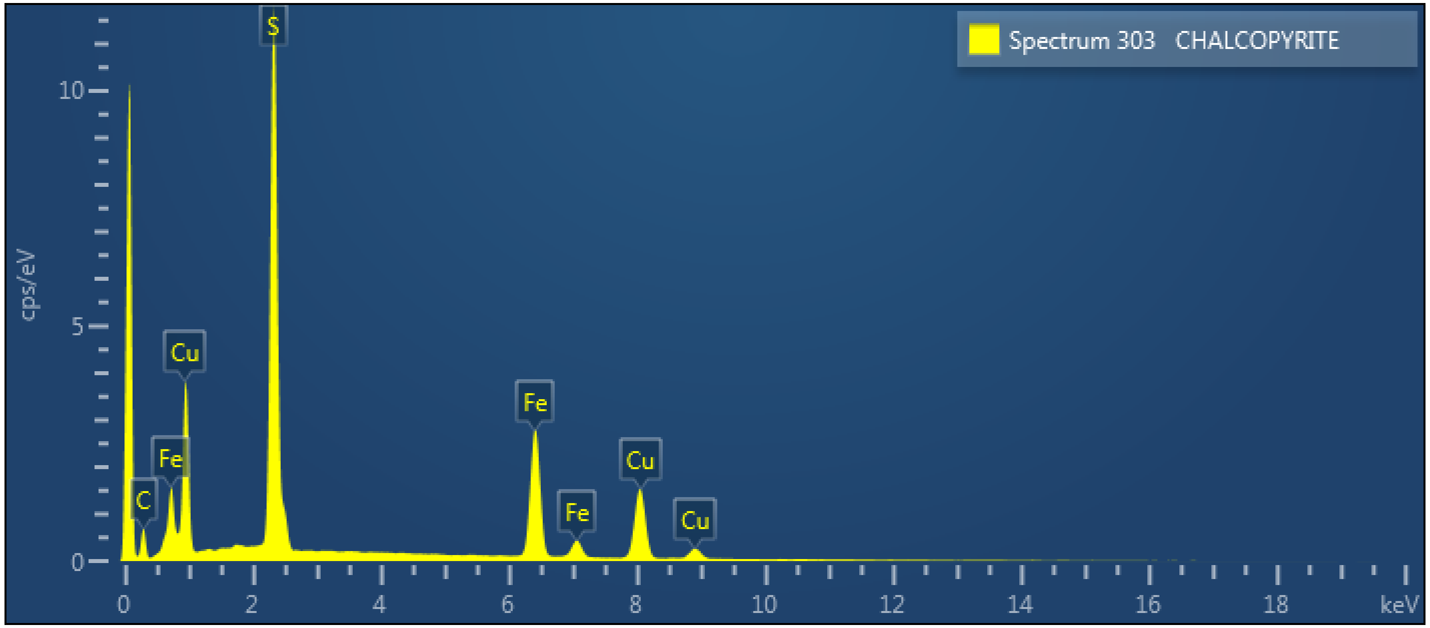
Spectrum 300 DOL-ANK							
Element	Line Type	Weight %	Weight % Sigma	Atomic %	Oxide	Oxide %	Oxide % Sigma
O	K series	30.72	0.68	50.00			
Mg	K series	17.67	0.55	18.92	MgO	29.29	0.91
Ca	K series	38.16	0.67	24.79	CaO	53.39	0.94
Fe	K series	12.35	0.67	5.76	FeO	15.88	0.86
Mn	K series	1.11	0.36	0.53	MnO	1.44	0.47
Total		100.00		100.00		100.00	



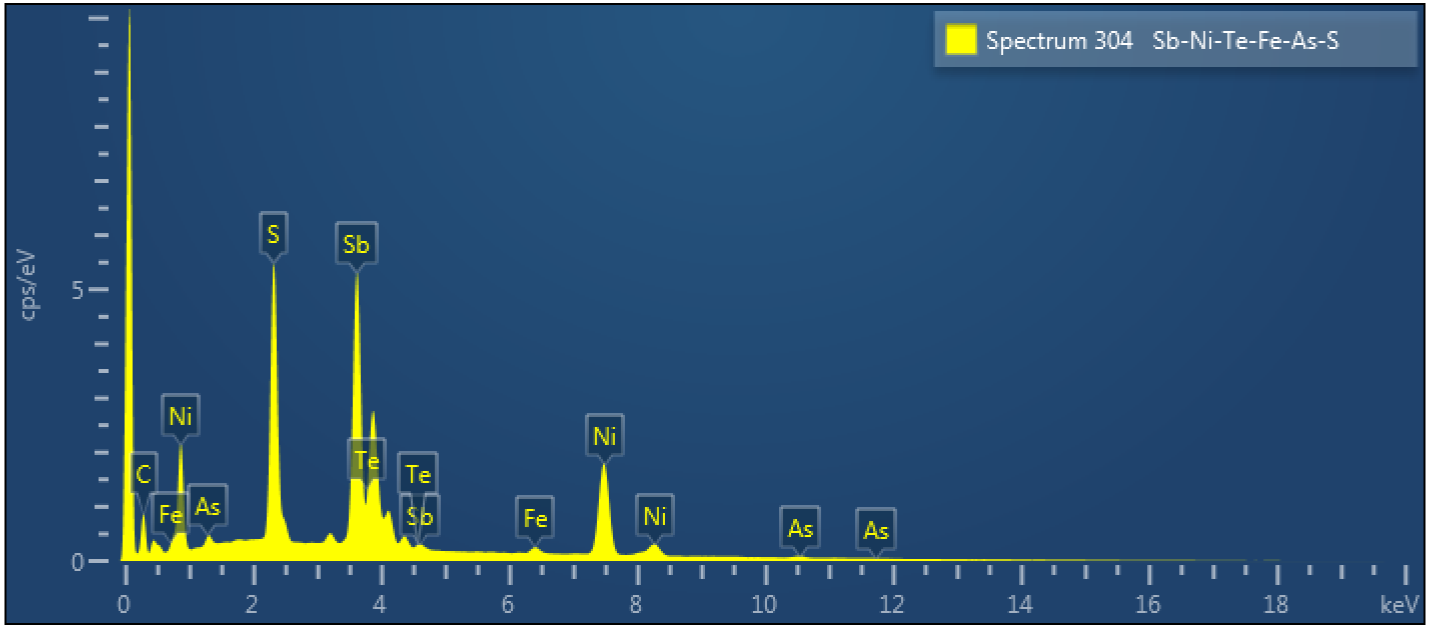
Spectrum 301 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	47.04	0.18	61.36			
Al	K series	20.53	0.13	15.88	Al2O3	38.78	0.25
Si	K series	22.83	0.15	16.97	SiO2	48.85	0.32
K	K series	5.42	0.09	2.89	K2O	6.52	0.10
Na	K series	2.43	0.08	2.20	Na2O	3.27	0.11
Cr	K series	1.76	0.08	0.71	Cr2O3	2.58	0.12
Total		100.00		100.00		100.00	



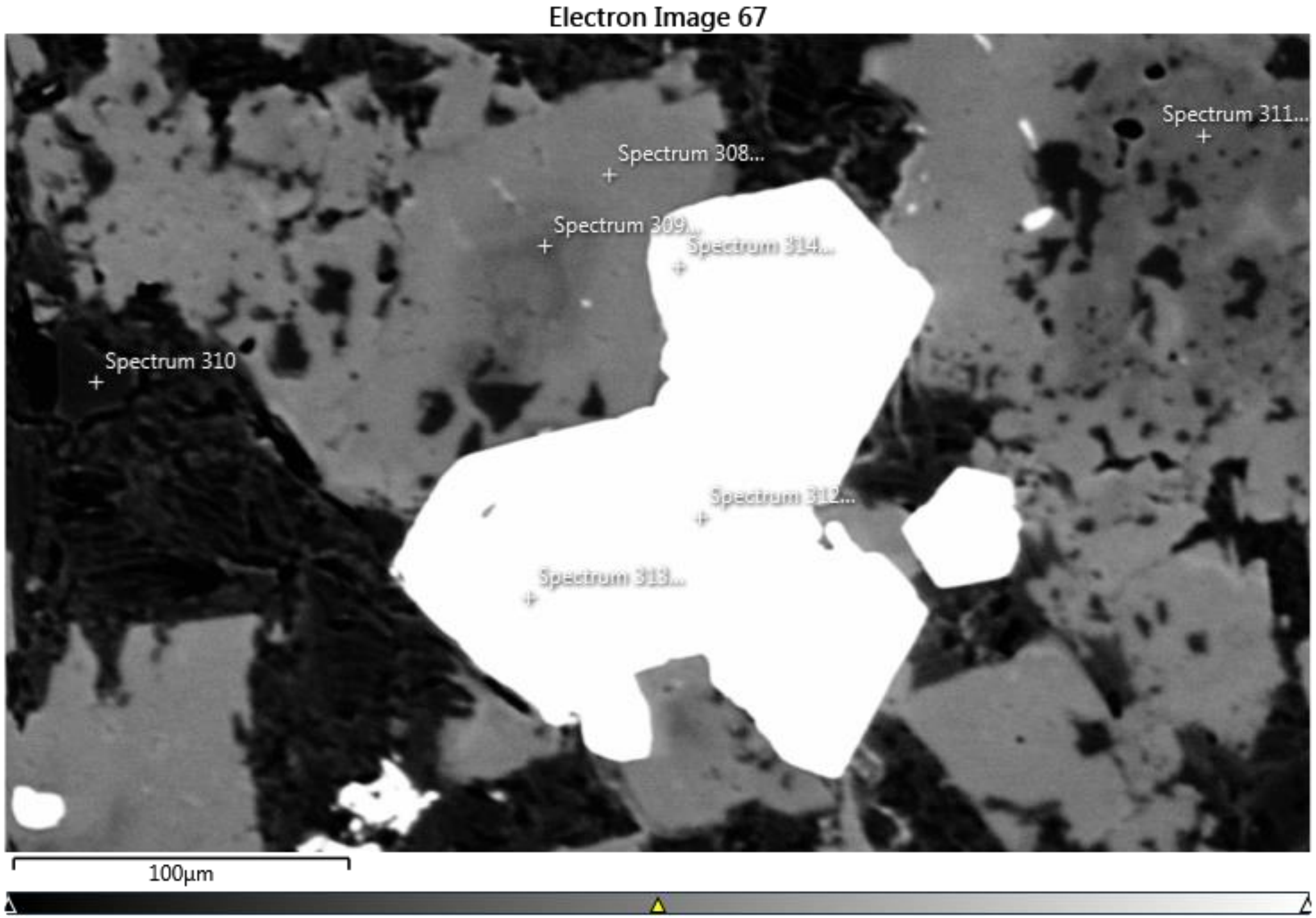
Spectrum 302 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	46.78	0.29	61.31			
Al	K series	20.51	0.22	15.94	Al2O3	38.76	0.42
Si	K series	22.88	0.24	17.08	SiO2	48.94	0.52
K	K series	7.45	0.16	3.99	K2O	8.97	0.19
Na	K series	1.38	0.12	1.26	Na2O	1.86	0.16
Cr	K series	1.01	0.13	0.41	Cr2O3	1.47	0.19
Total		100.00		100.00		100.00	



Spectrum 303 CHALCOPYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	36.41	0.37	51.56
Fe	K series	30.41	0.40	24.73
Cu	K series	33.18	0.48	23.71
Total		100.00		100.00

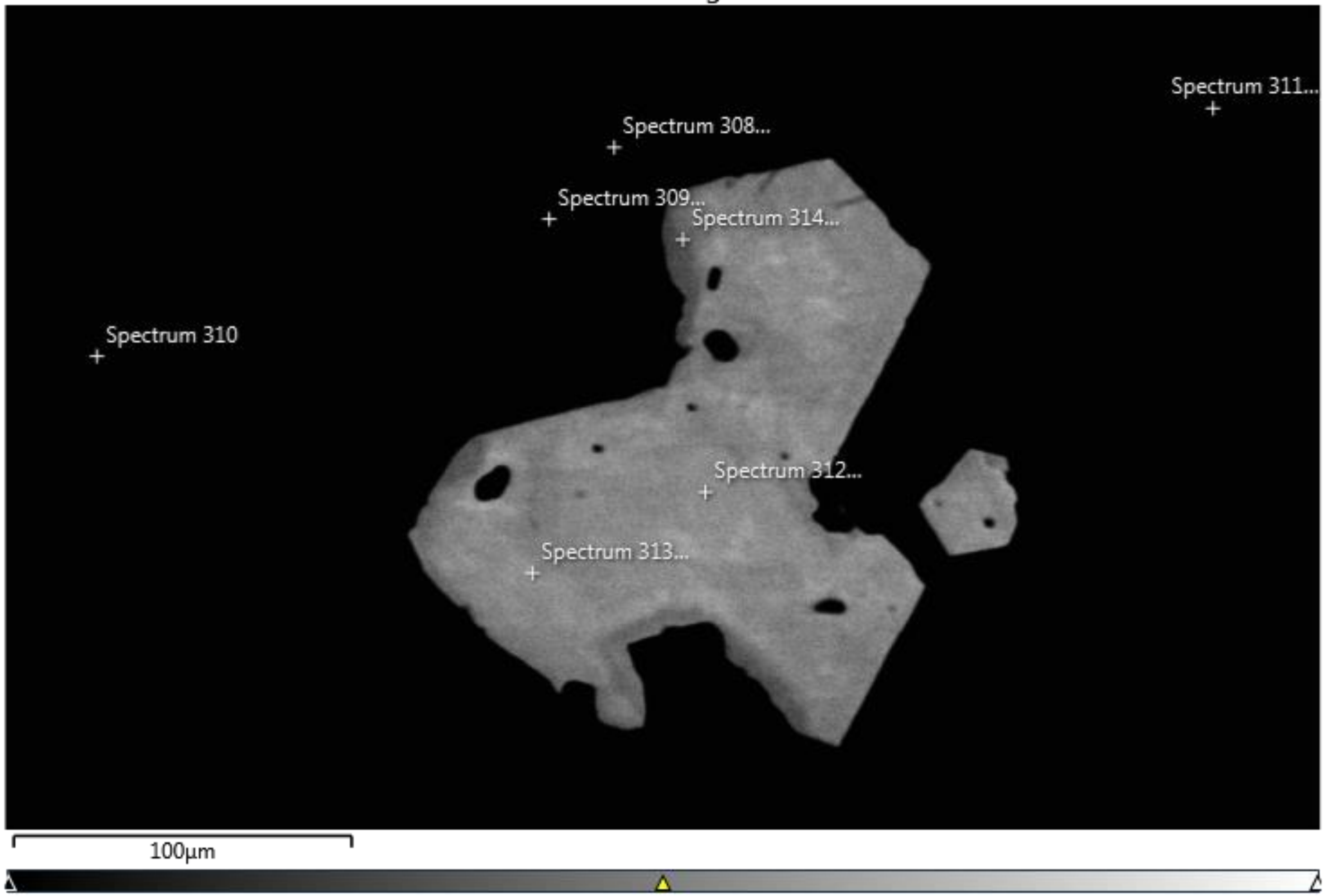


Spectrum 304 Sb-Ni-Te-Fe-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	14.79	0.15	32.94
Ni	K series	25.01	0.27	30.42
Sb	L series	54.24	0.34	31.82
Fe	K series	1.24	0.11	1.59
As	L series	1.51	0.17	1.44
Te	L series	3.21	0.34	1.80
Total		100.00		100.00

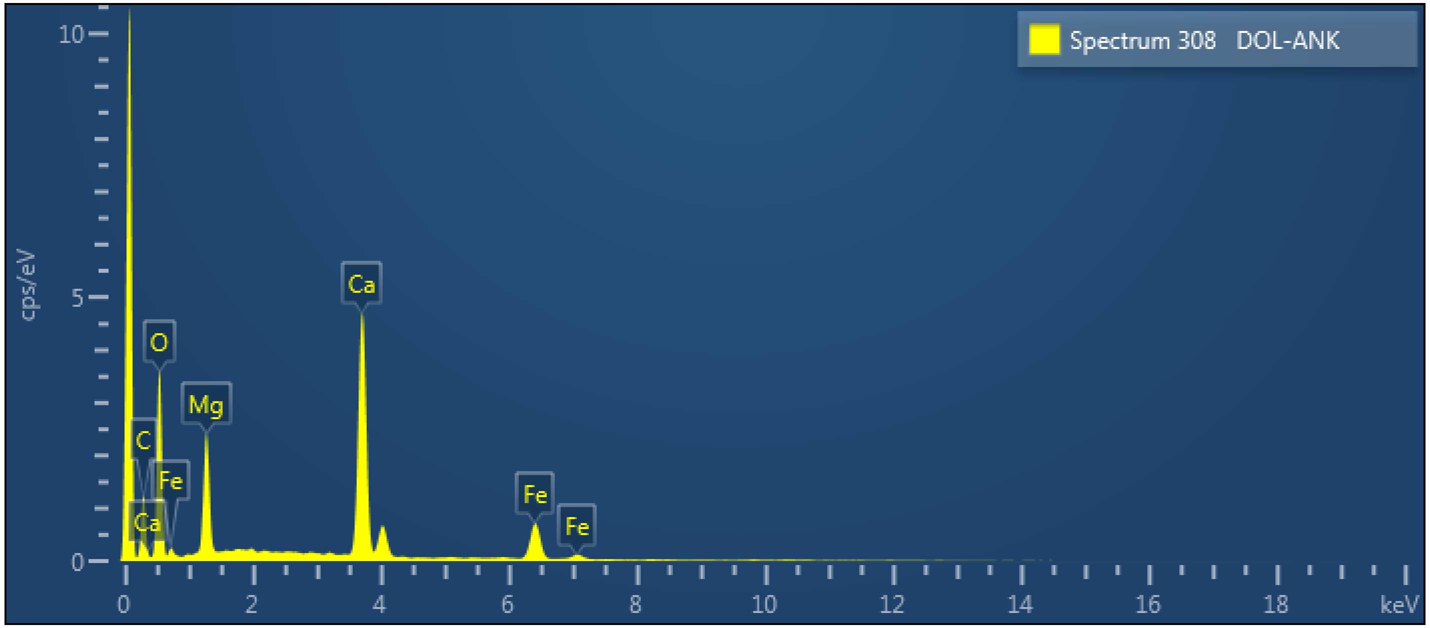


Backscatter image of a coarse-grained Ni-As-Sb-S (spectra 312-314) hosted within compositionally zoned dolomite-ankerite solid solution carbonate grains (spectra 308,309,311).

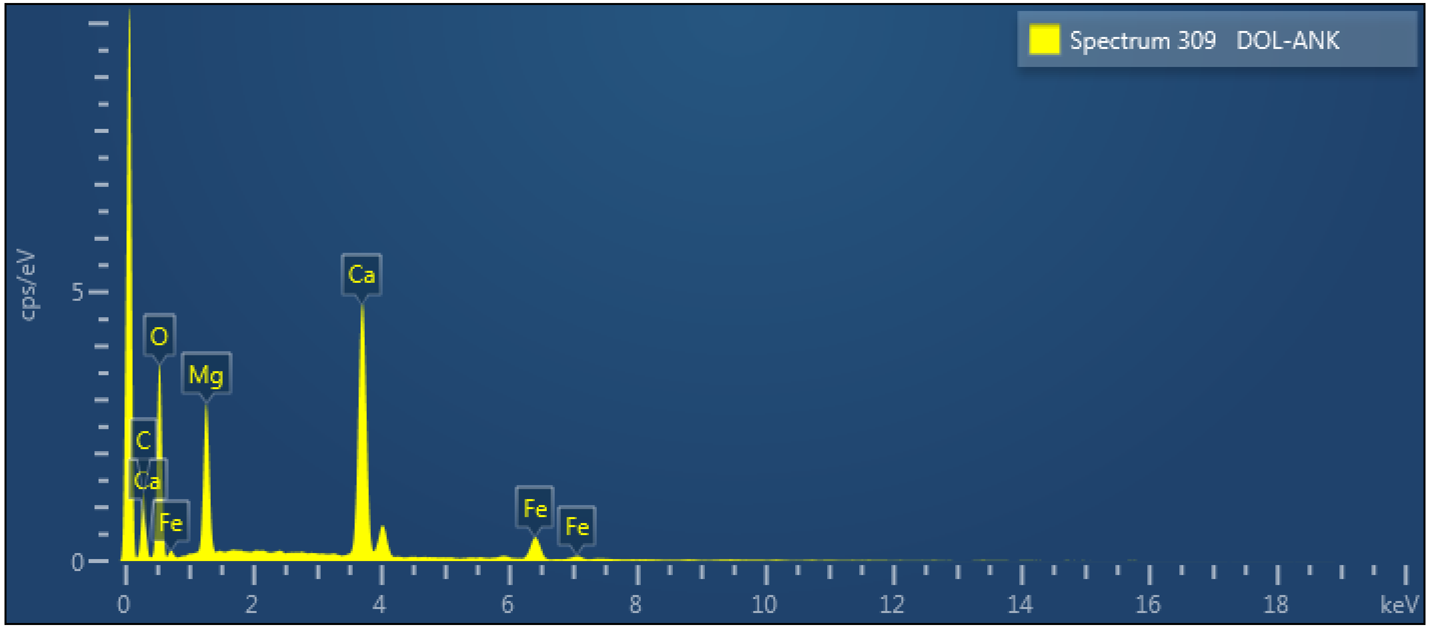
Electron Image 68



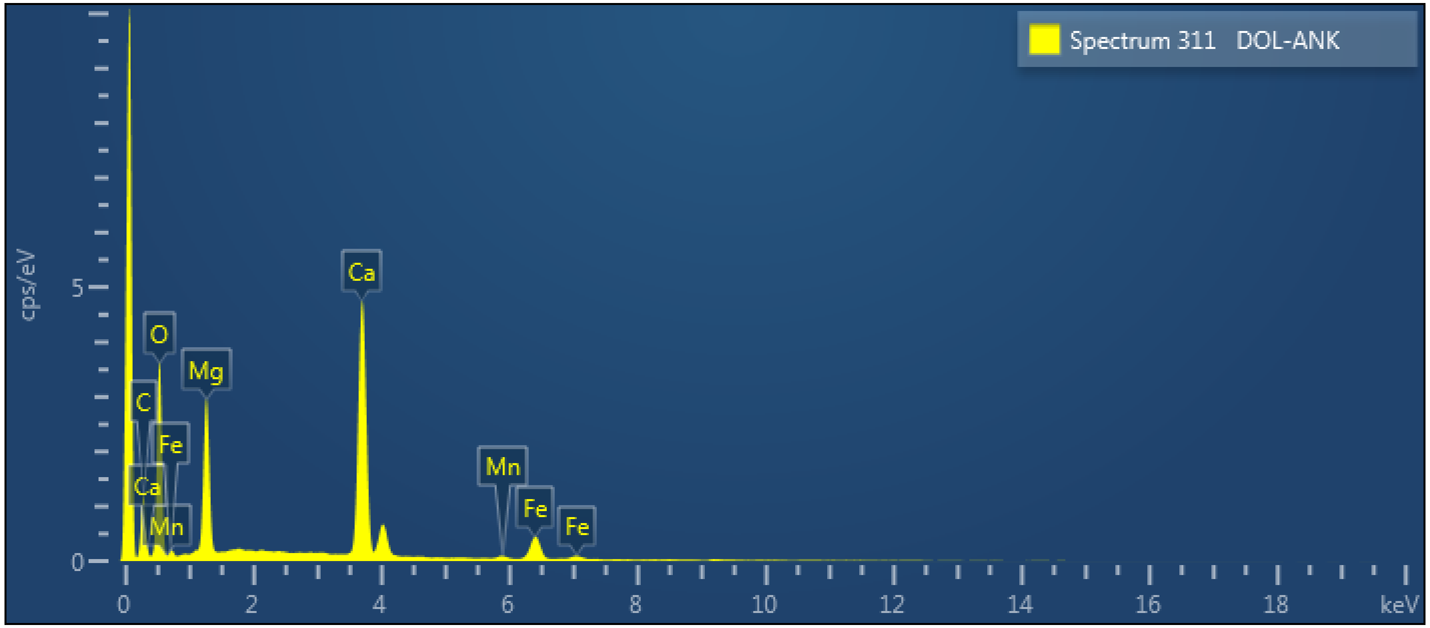
Same image as above with brightness reduced to illustrate the domanial compositions within the Ni-As-Sb-S grain. Note that the brighter domains are more enriched in Sb than the darker domains.



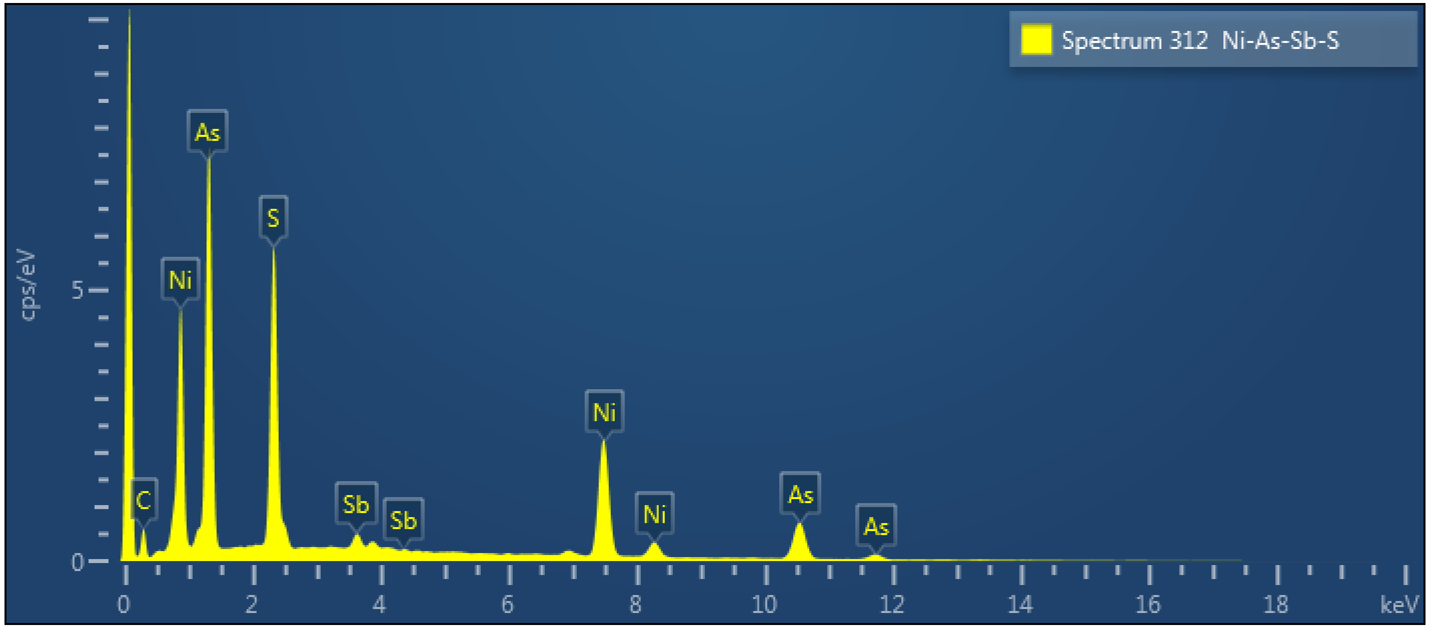
Spectrum 308 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.09	0.57	50.00			
Mg	K series	15.55	0.45	17.01	MgO	25.79	0.75
Ca	K series	38.04	0.57	25.23	CaO	53.23	0.79
Fe	K series	16.31	0.61	7.76	FeO	20.98	0.79
Total		100.00		100.00		100.00	



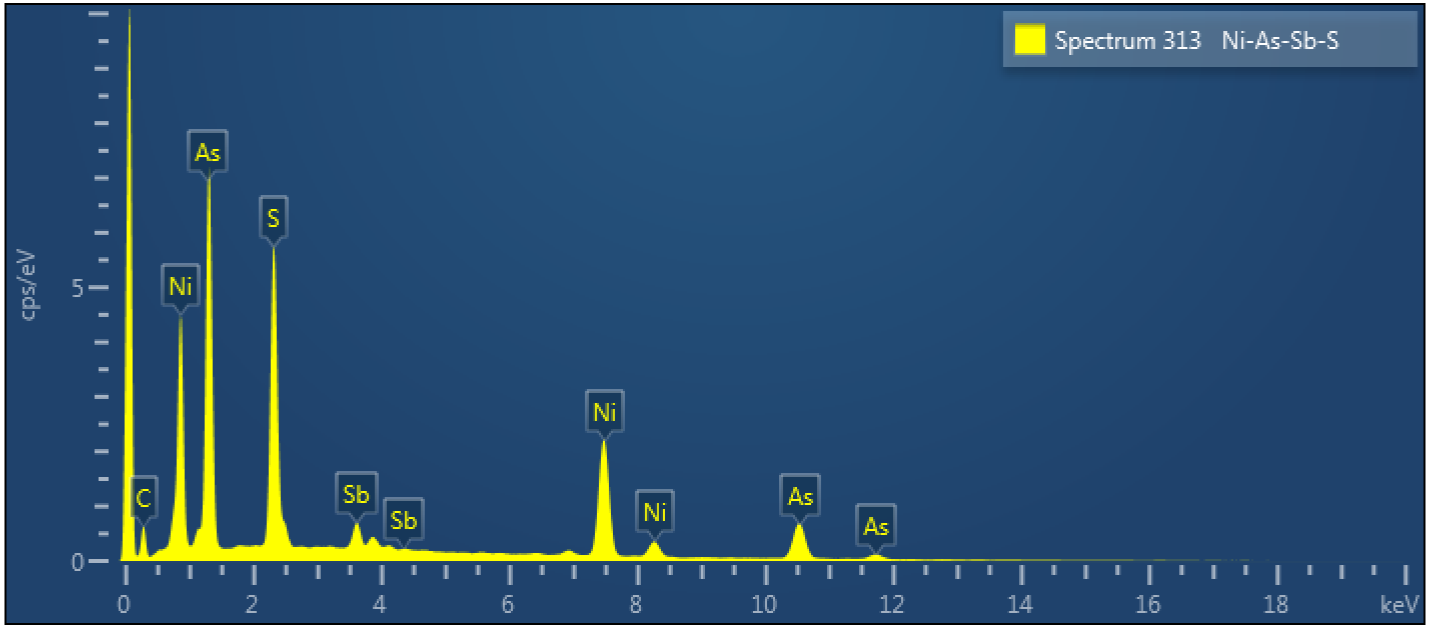
Spectrum 309 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.06	0.61	50.00			
Mg	K series	18.30	0.51	19.39	MgO	30.34	0.85
Ca	K series	39.99	0.62	25.70	CaO	55.95	0.87
Fe	K series	10.66	0.59	4.91	FeO	13.71	0.76
Total		100.00		100.00		100.00	



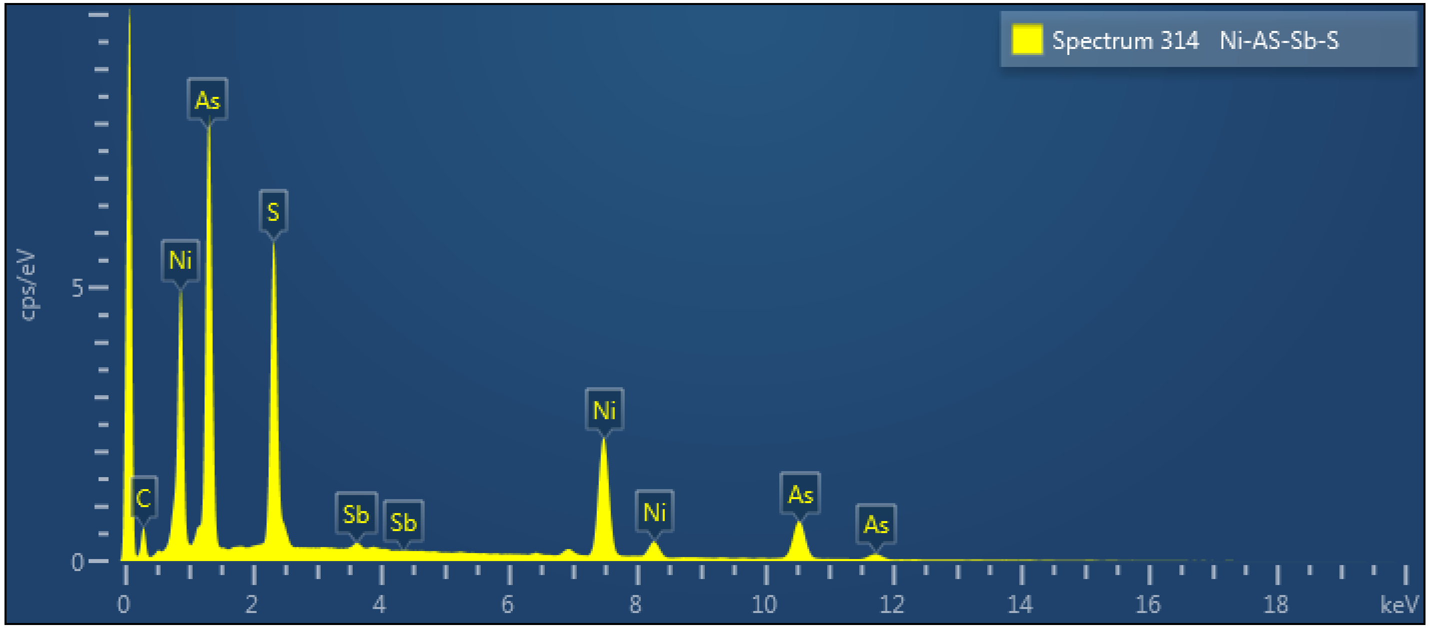
Spectrum 311 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.07	0.57	50.00			
Mg	K series	18.54	0.47	19.64	MgO	30.75	0.78
Ca	K series	39.25	0.58	25.22	CaO	54.92	0.81
Fe	K series	10.09	0.55	4.65	FeO	12.98	0.70
Mn	K series	1.05	0.30	0.49	MnO	1.35	0.39
Total		100.00		100.00		100.00	



Spectrum 312 Ni-As-Sb-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.82	0.28	34.45
Ni	K series	33.33	0.43	31.64
As	L series	43.55	0.44	32.40
Sb	L series	3.30	0.26	1.51
Total		100.00		100.00



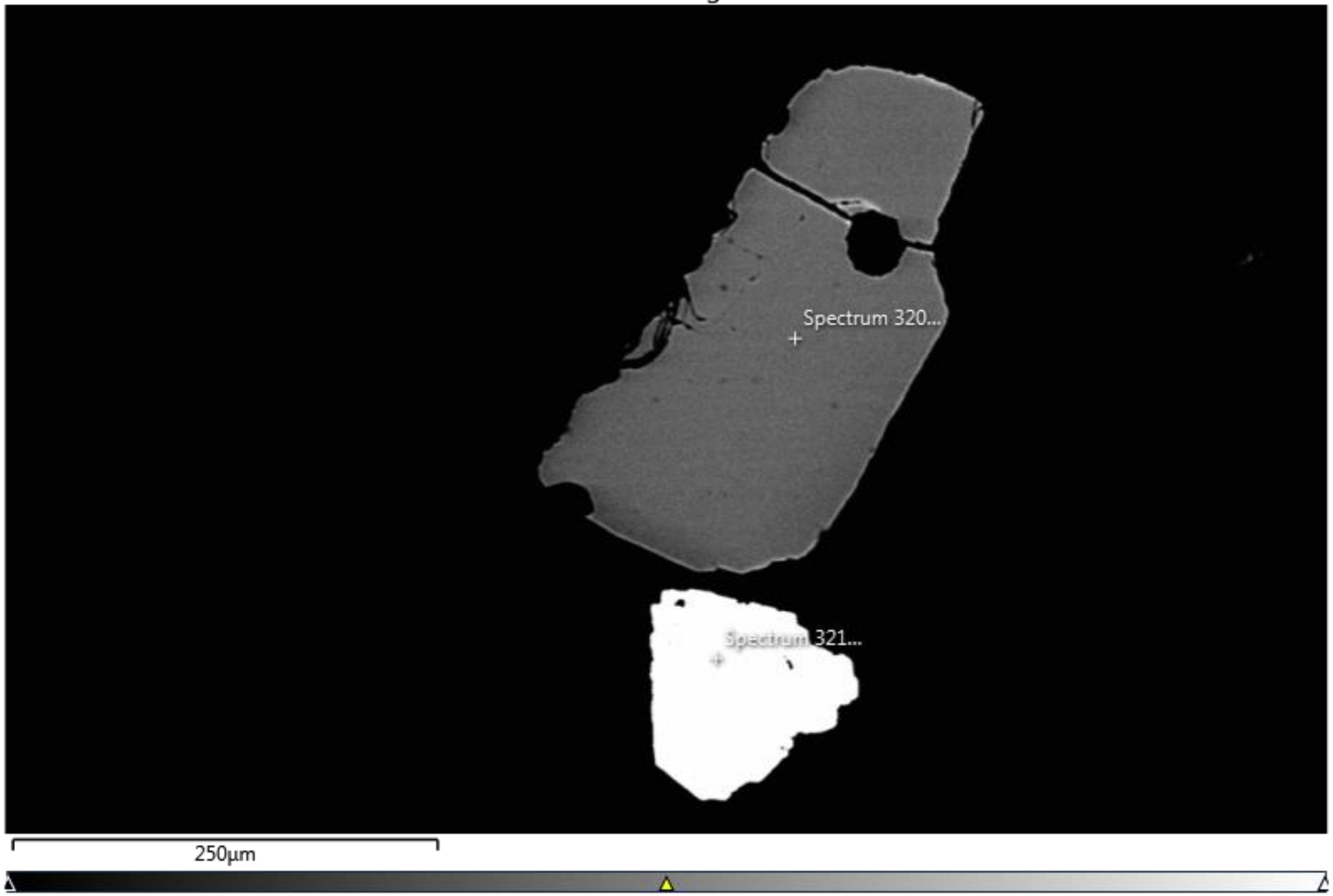
Spectrum 313 Ni-As-Sb-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.54	0.25	34.29
Ni	K series	33.07	0.39	31.70
As	L series	41.90	0.40	31.47
Sb	L series	5.50	0.26	2.54
Total		100.00		100.00



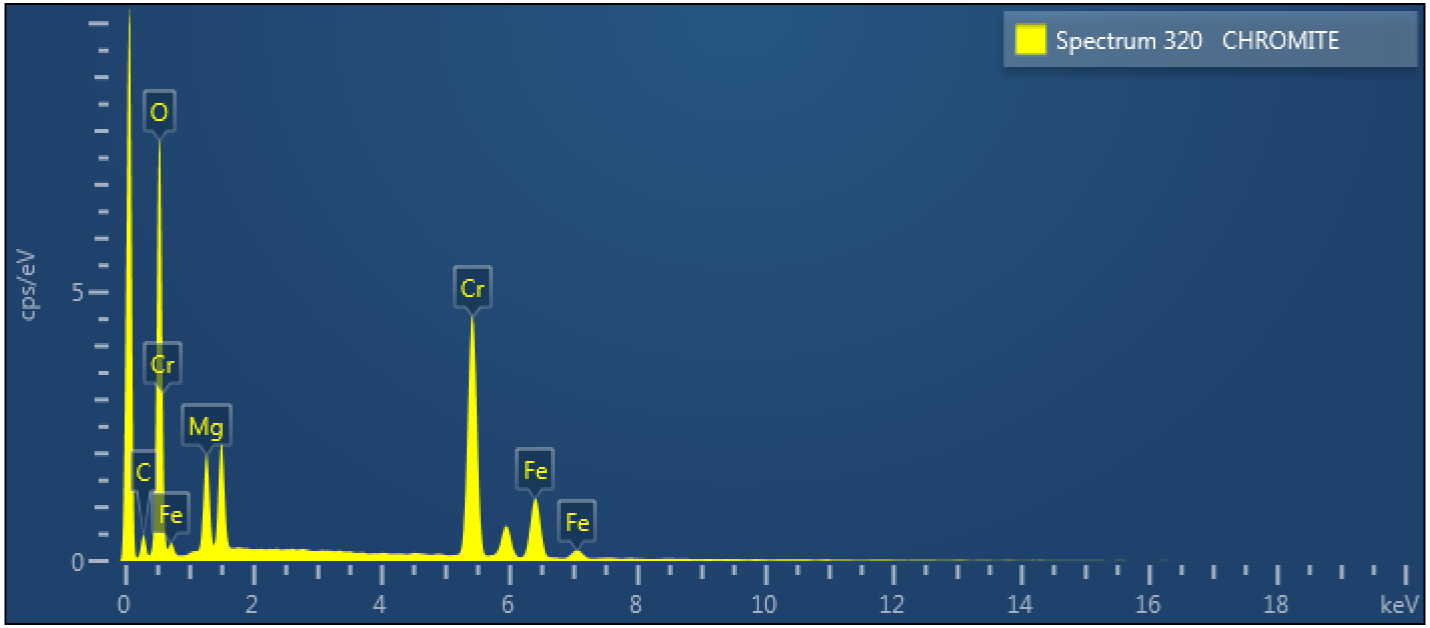
Spectrum 314 Ni-AS-Sb-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.92	0.29	34.38
Ni	K series	33.40	0.45	31.48
As	L series	45.52	0.46	33.62
Sb	L series	1.15	0.24	0.52
Total		100.00		100.00

Backscatter image illustrating a groundmass of compositionally variable dolomite-ankerite solid solution carbonate hosting grains of chromite (spectrum 320) and Ni-As-Sb-Co-S (spectrum 321).

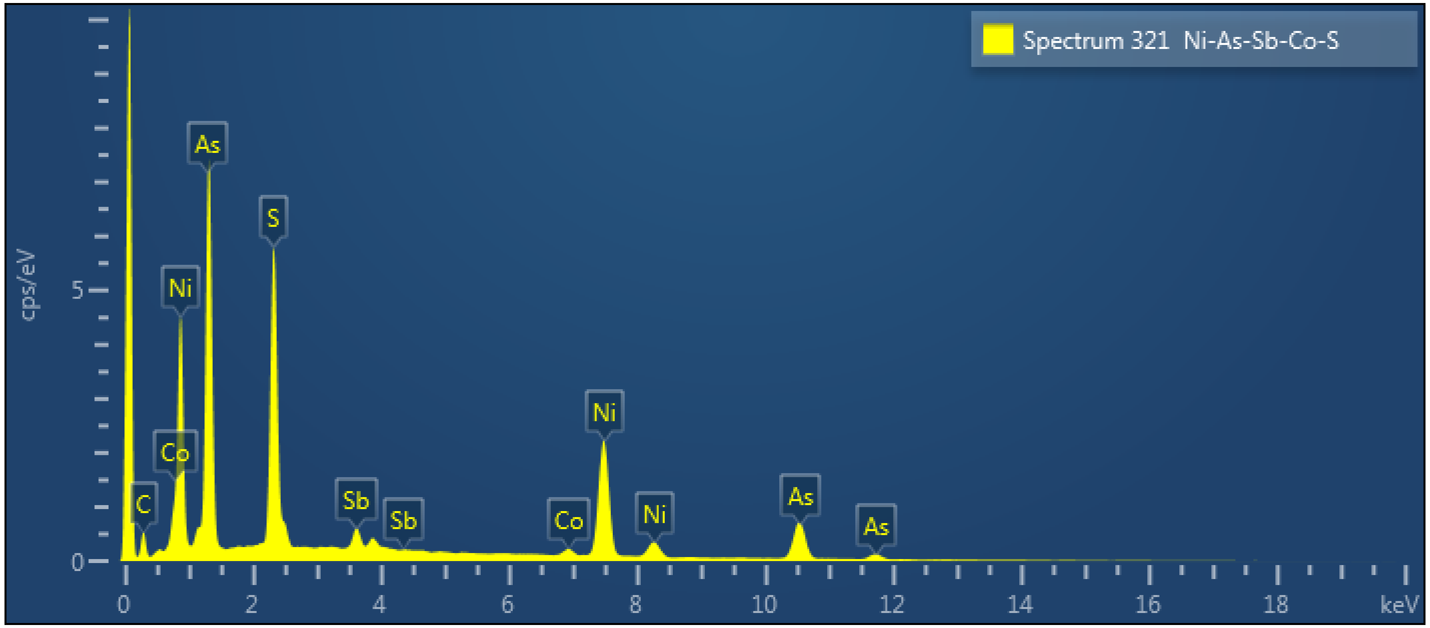
Electron Image 70



Same image with brightness reduced to show the chromite grain (spectrum 320) with a bright Zn-rich rind and the brighter grain of Ni-As-Sb-Co-S (spectrum 321).



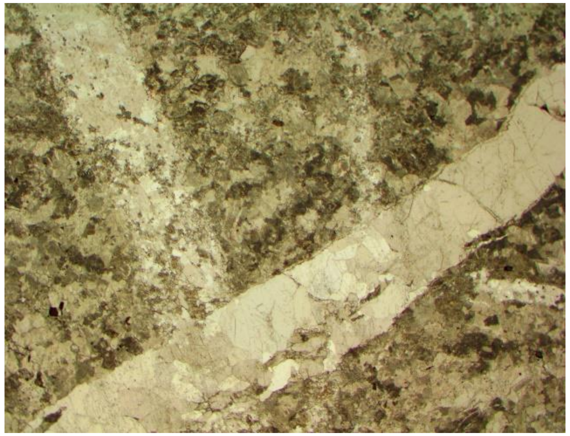
Spectrum 320 CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	33.01	0.40	56.89			
Mg	K series	7.52	0.24	8.53	MgO	12.48	0.39
Al	K series	7.25	0.21	7.41	Al2O3	13.70	0.39
Cr	K series	37.97	0.40	20.14	Cr2O3	55.50	0.59
Fe	K series	14.25	0.35	7.04	FeO	18.33	0.46
Total		100.00		100.00		100.00	

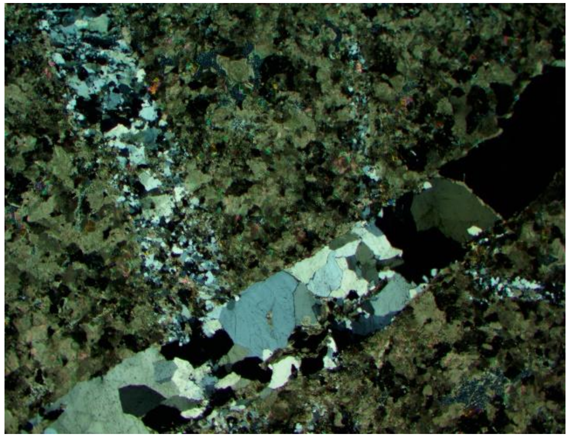


Spectrum 321 Ni-As-Sb-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.42	0.29	33.97
Ni	K series	32.35	0.45	30.90
As	L series	42.18	0.46	31.57
Sb	L series	4.47	0.28	2.06
Co	K series	1.58	0.20	1.50
Total		100.00		100.00

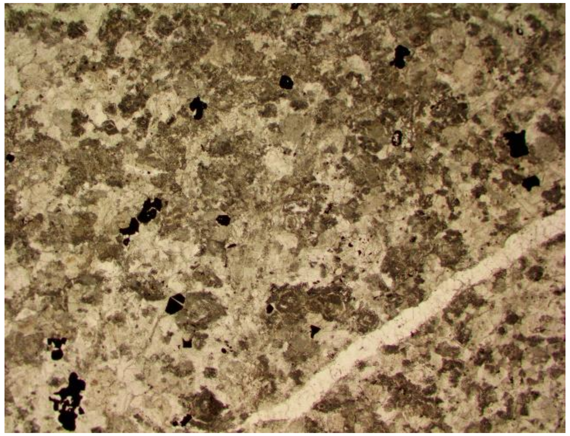
Specimen Notes for 'MID-16'

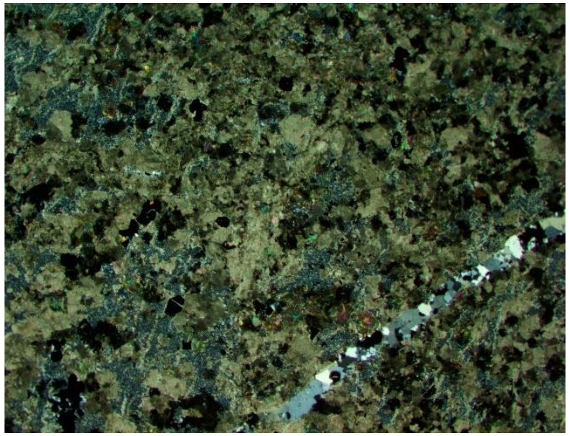
This sample was obtained from within the big pit at the Laroma prospect. The rock is strongly carbonate altered by dolomite-ankerite solid solution carbonate, green coloured Cr-mica cut by late-stage grey-white quartz stringers averaging 3cm in width. The rock contains 1-5% sulphide within the host rock. There are multiple quartz generations within the rock with an earlier fine-grained cryptocrystalline sugary textured quartz cut by medium-grained polycrystalline quartz subsequently cut by coarse-grained multigranular quartz.
The sulphide inventory is comprised of disseminated arsenian pyrite, Ni-S, Ni-As-Co-Sb-S, and Sb-Ni-Fe-S.

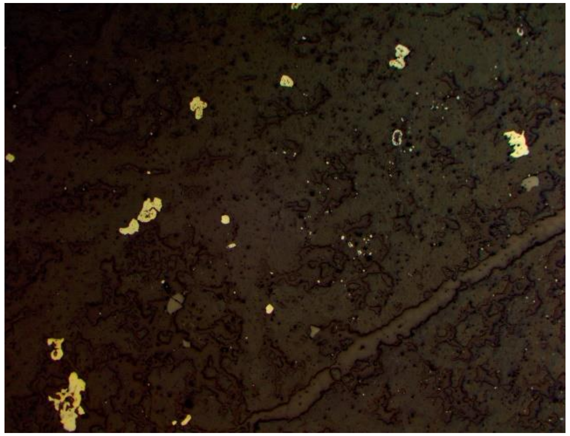




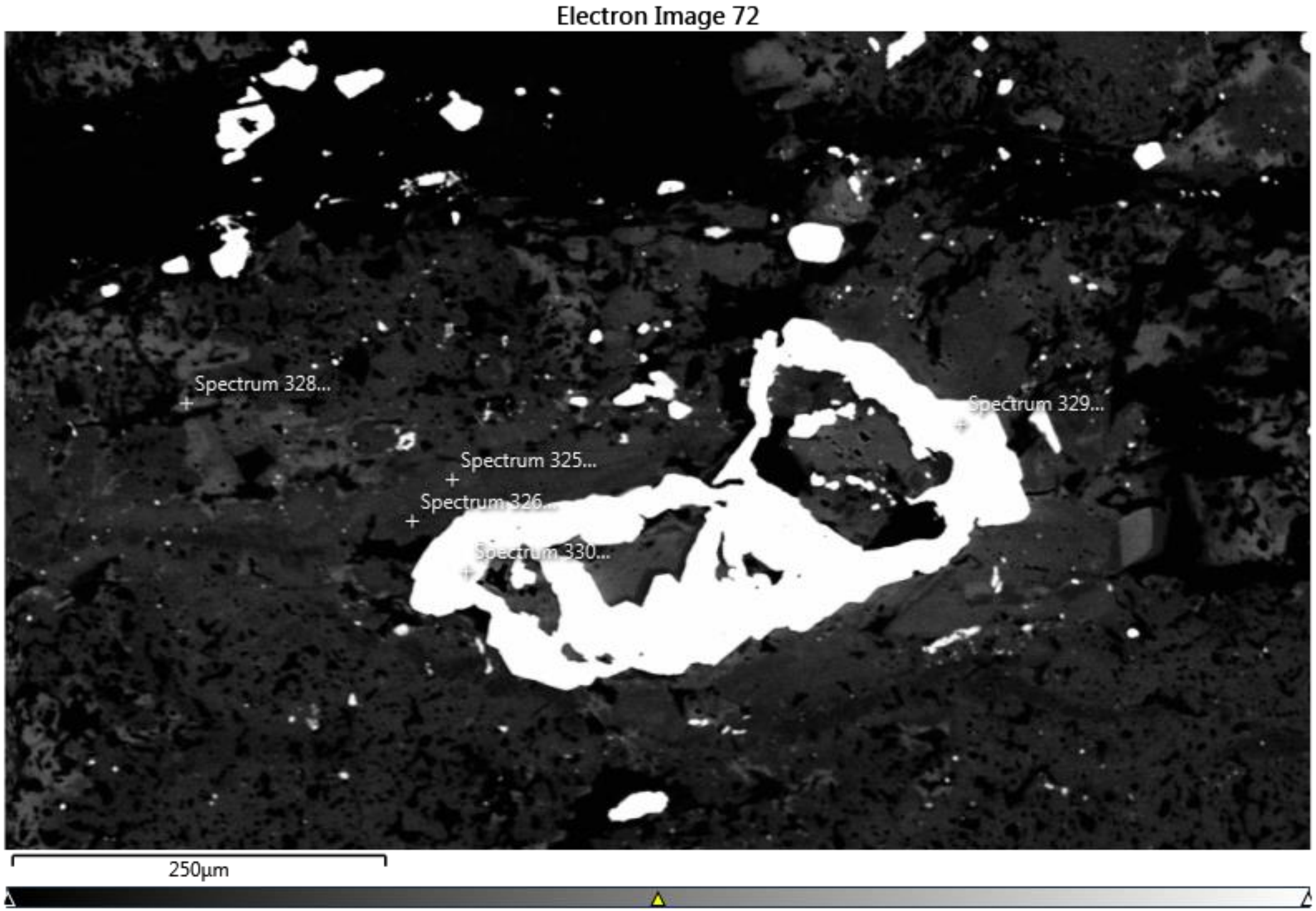
Plane light image (left) and crossed polarized light image (right) showing the multiple cross-cutting textural varieties of quartz. The groundmass is dominated by polycrystalline birefringent dolomite-ankerite solid solution carbonate and quartz cut by a medium-grained polycrystalline quartz vein subsequently cut by a coarse-grained multigranular quartz vein. Field of view = 17mm





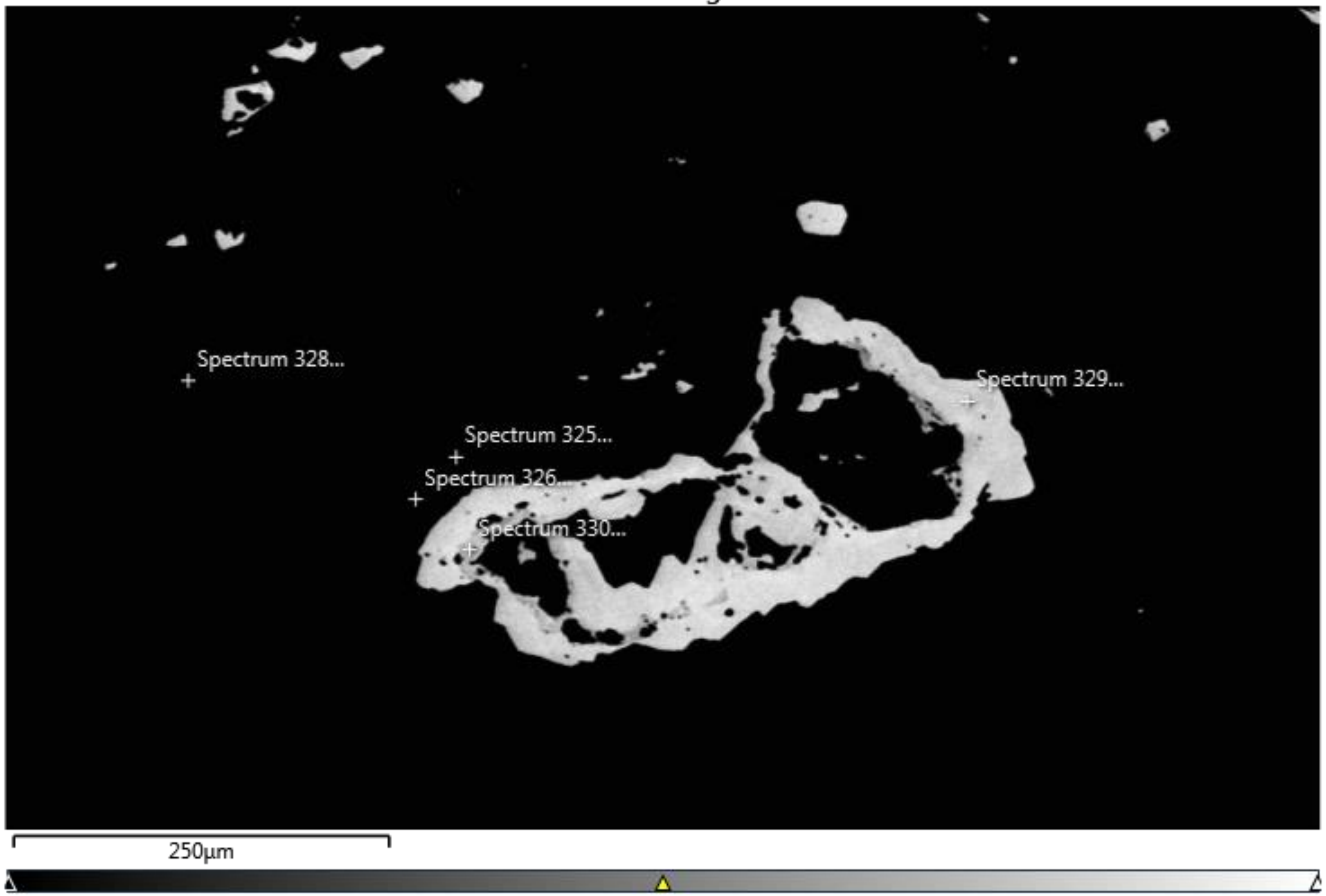


Plane light image (left), crossed polarized light image (right) and reflected light image (bottom) showing the birefringent carbonate intergrown with cryptocrystalline (birefringent blue-grey) quartz in the groundmass cut by a later medium0grained polycrystalline quartz vein. Note that the sulphides are dominantly associated with the earlier quartz-carbonate groundmass phases. Field of view = 17mm

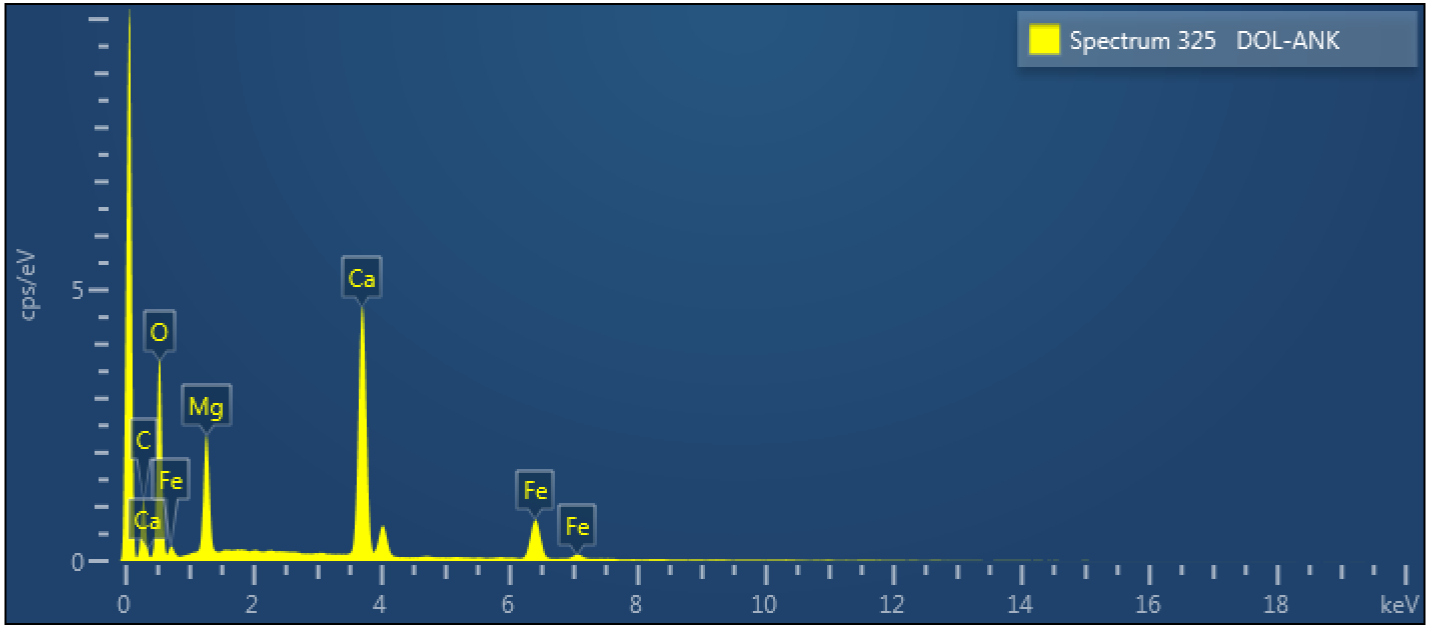


Backscatter image illustrating a groundmass dominated by compositionally zoned dolomite-ankerite solid solution carbonate (spectra 325,326) and Cr-mica (spectrum 328) hosting Ni-Co-As-S (spectrum 329) and Ni-Co-As-Sb-S (spectrum 330).

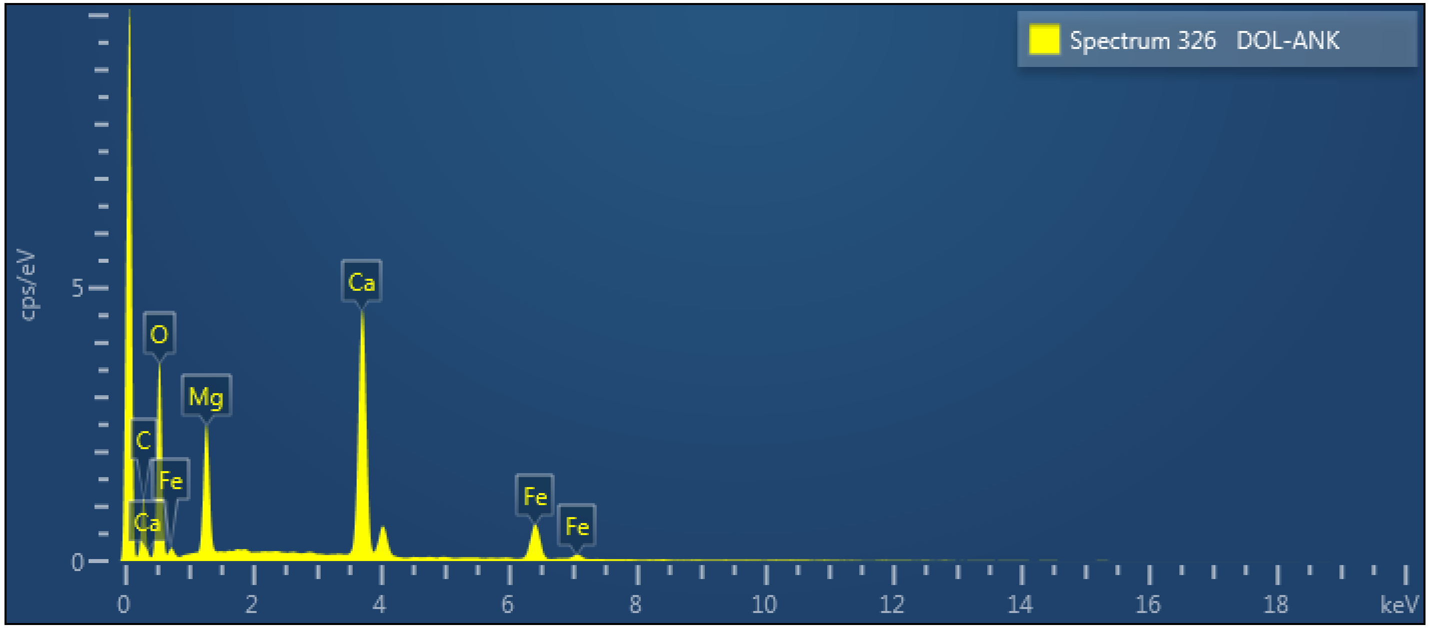
Electron Image 73



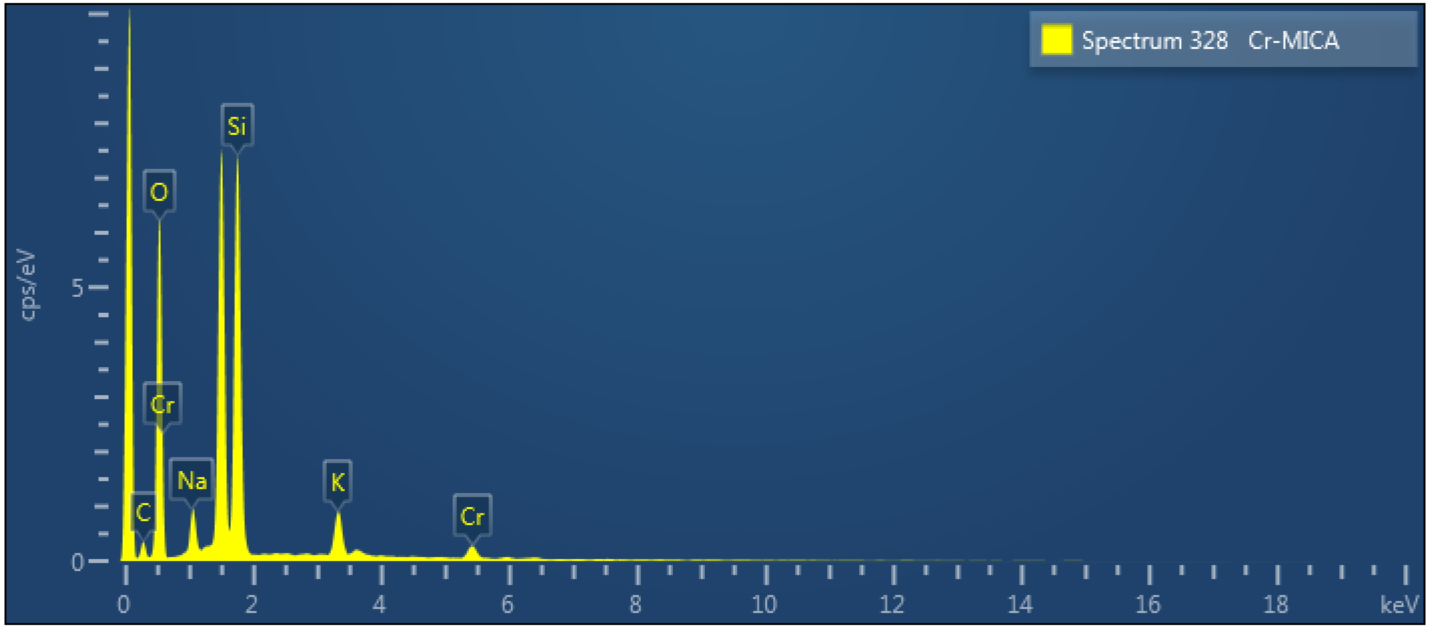
Same image as above with brightness reduced to show the compositional zoning within the sulphide grain.



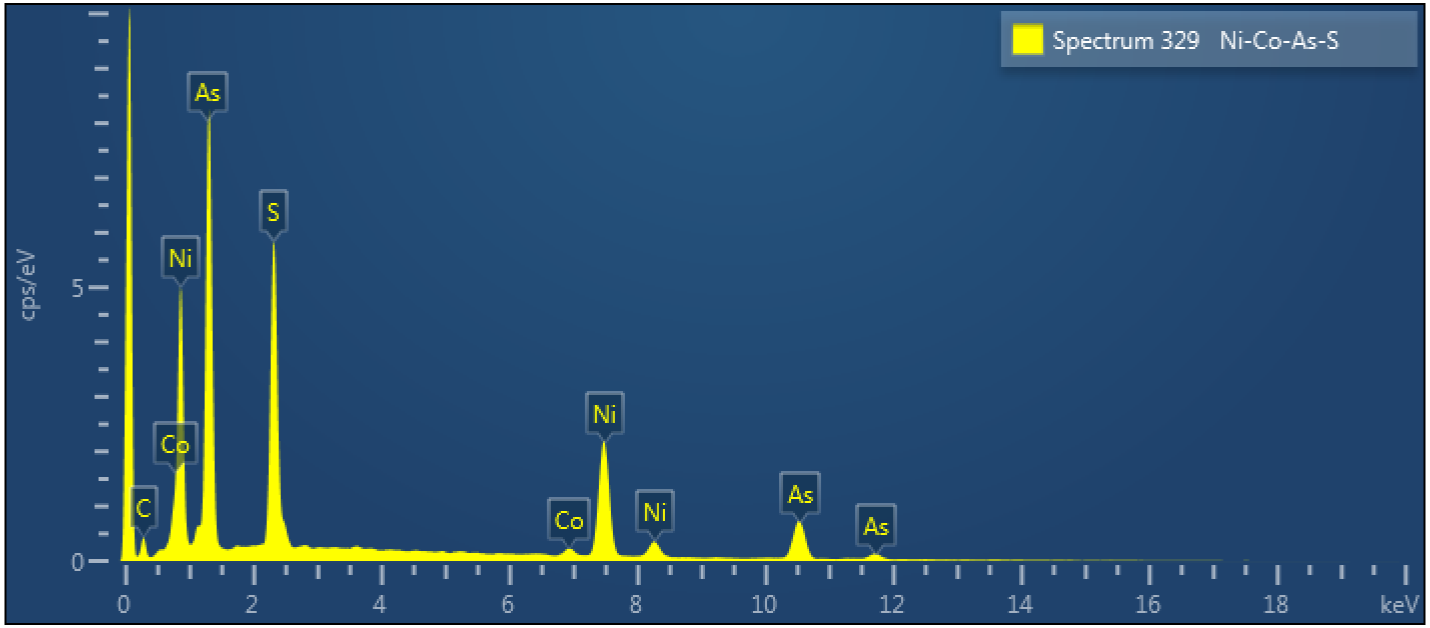
Spectrum 325 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.88	0.50	50.00			
Mg	K series	14.88	0.39	16.39	MgO	24.67	0.65
Ca	K series	37.81	0.49	25.26	CaO	52.91	0.69
Fe	K series	17.43	0.54	8.36	FeO	22.42	0.70
Total		100.00		100.00		100.00	



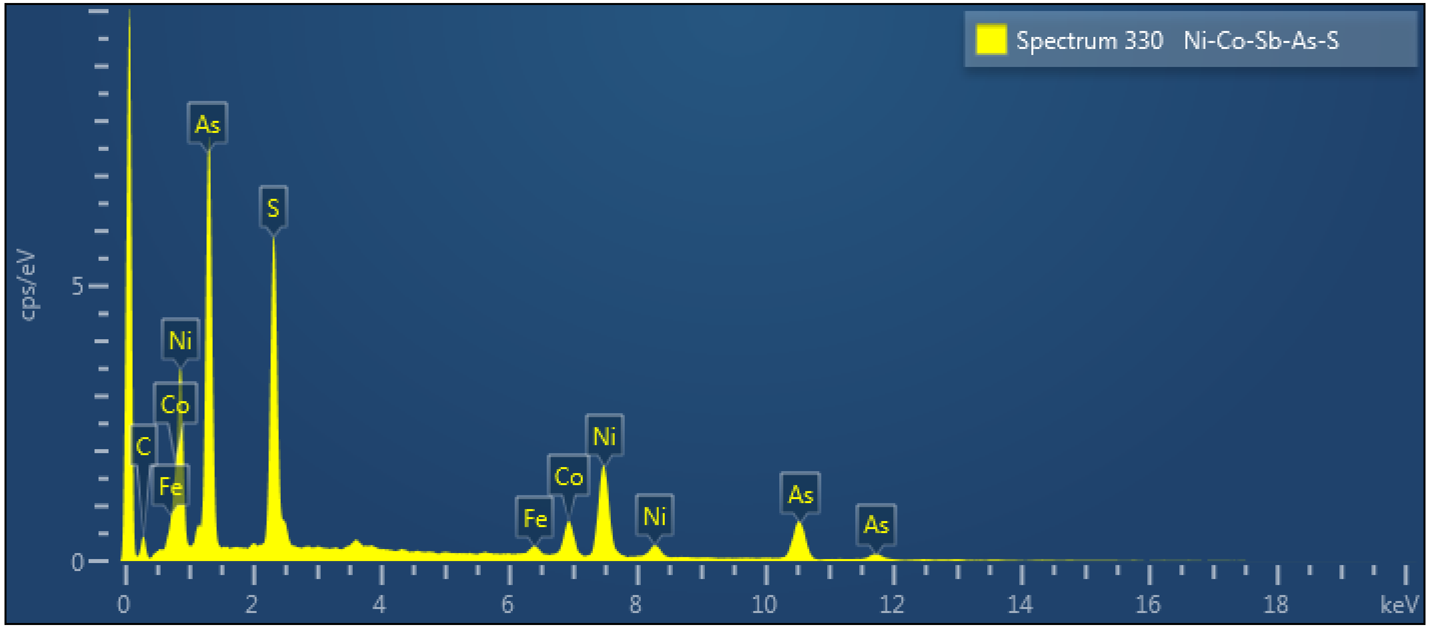
Spectrum 326 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.19	0.53	50.00			
Mg	K series	16.02	0.43	17.46	MgO	26.56	0.72
Ca	K series	37.57	0.53	24.84	CaO	52.57	0.74
Fe	K series	16.23	0.56	7.70	FeO	20.88	0.71
Total		100.00		100.00		100.00	



Spectrum 328 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	47.22	0.43	61.40			
Al	K series	19.96	0.32	15.39	Al2O3	37.72	0.60
Si	K series	23.18	0.35	17.17	SiO2	49.58	0.75
K	K series	3.93	0.18	2.09	K2O	4.74	0.22
Cr	K series	2.41	0.21	0.96	Cr2O3	3.52	0.31
Na	K series	3.30	0.21	2.98	Na2O	4.44	0.28
Total		100.00		100.00		100.00	

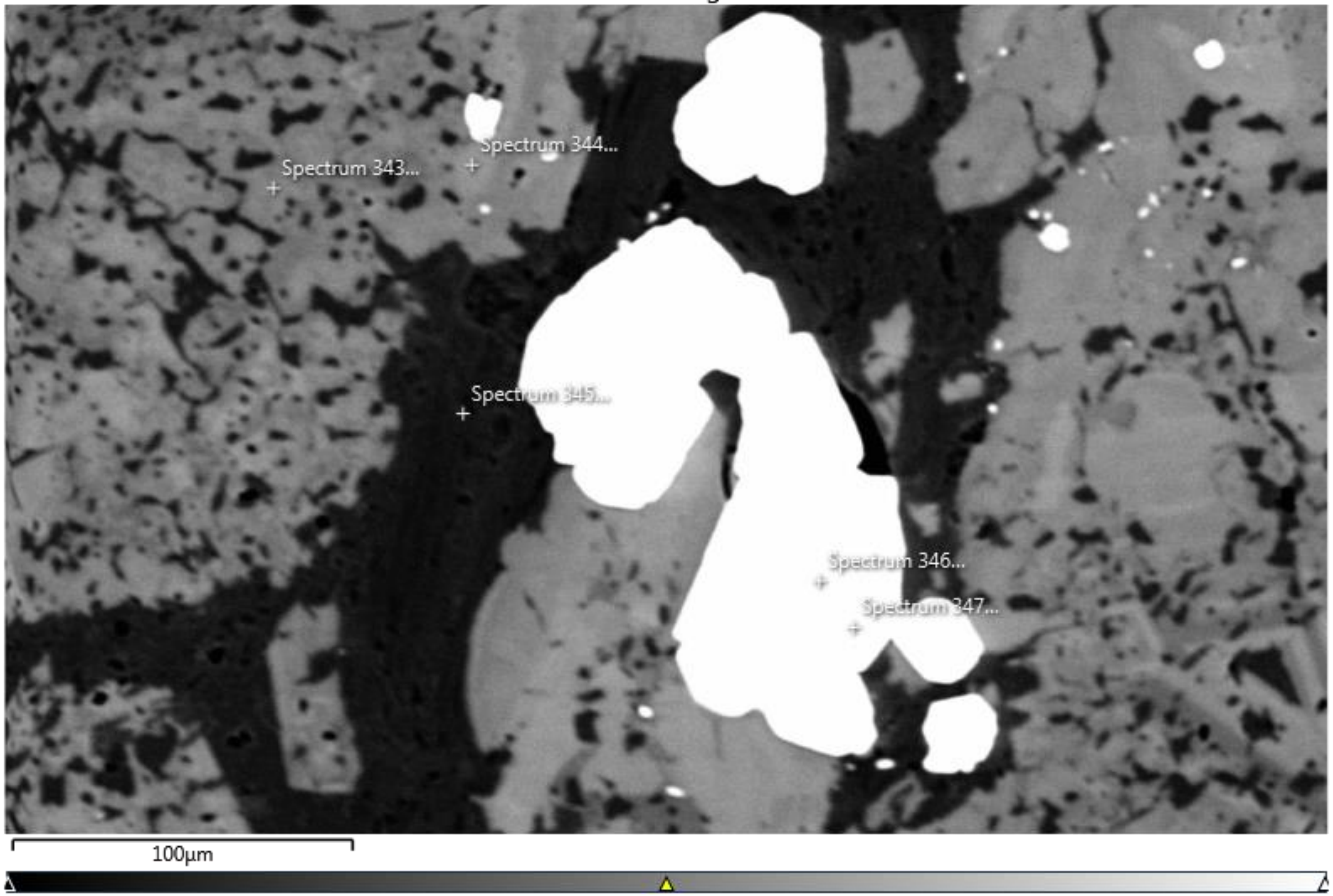


Spectrum 329 Ni-Co-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.99	0.34	34.32
Ni	K series	32.28	0.51	30.26
As	L series	45.95	0.52	33.76
Co	K series	1.77	0.24	1.66
Total		100.00		100.00

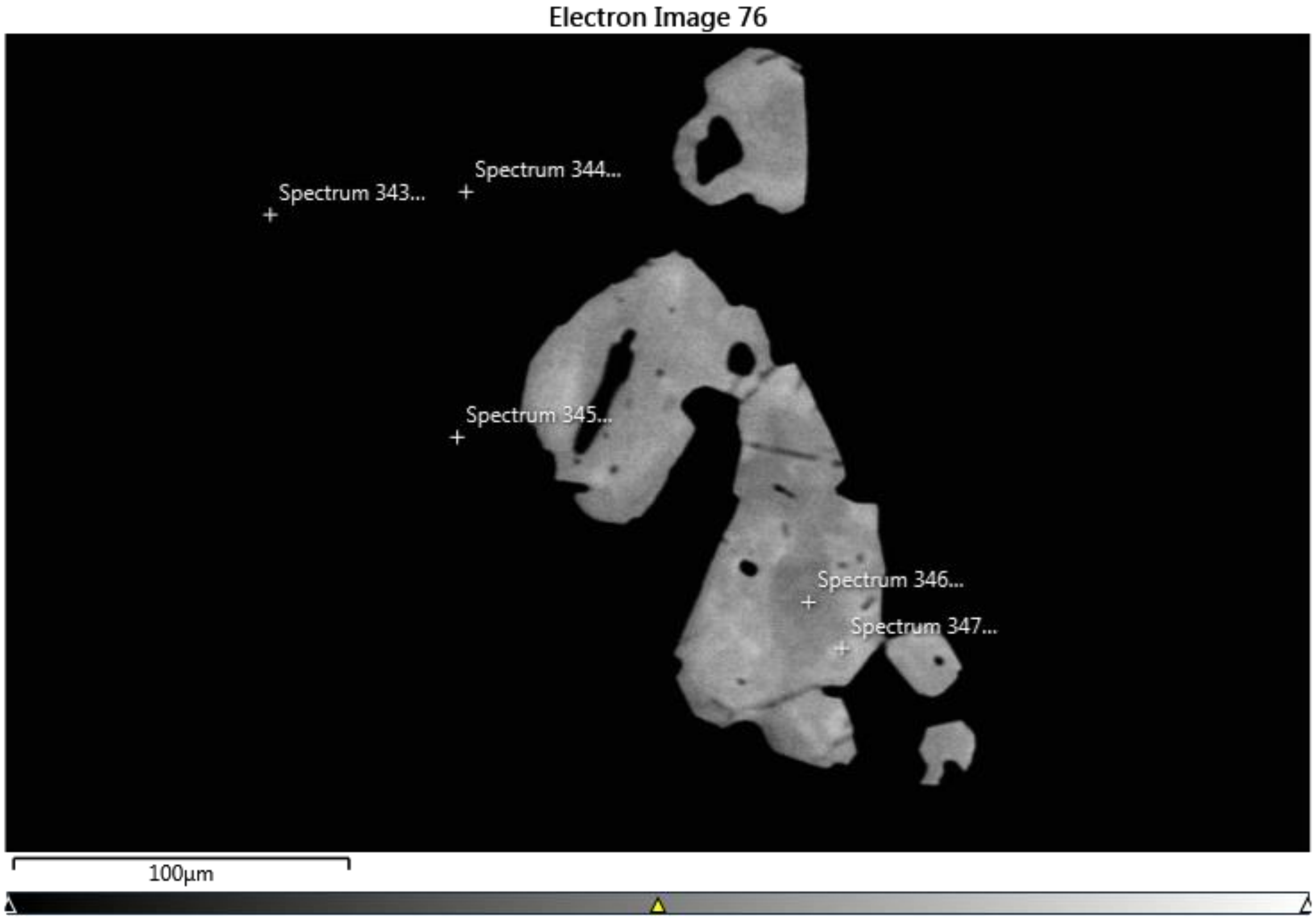


Spectrum 330 Ni-Co-Sb-As-S				
Element	Line Type	Weight %	Weight % Sigma	Atomic %
S	K series	20.41	0.50	34.74
Co	K series	8.48	0.51	7.85
Ni	K series	25.84	0.74	24.03
As	L series	43.70	0.78	31.84
Fe	K series	1.56	0.30	1.53
Total		100.00		100.00

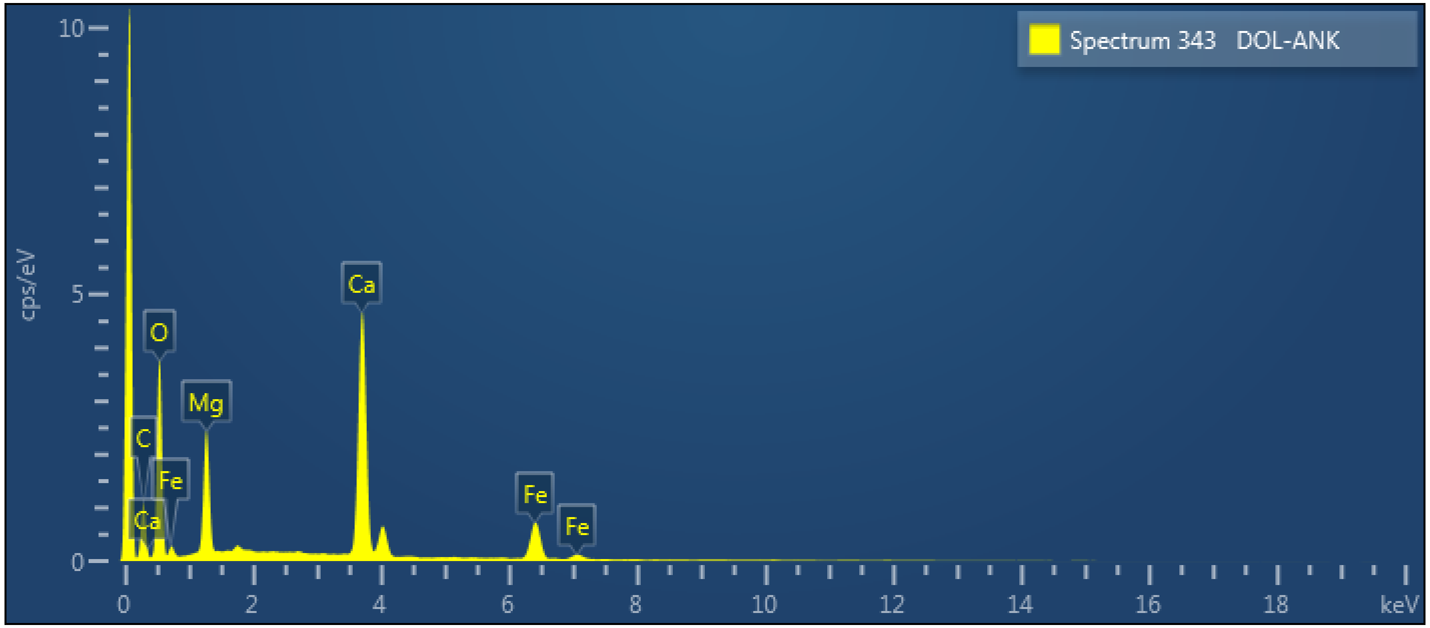
Electron Image 75



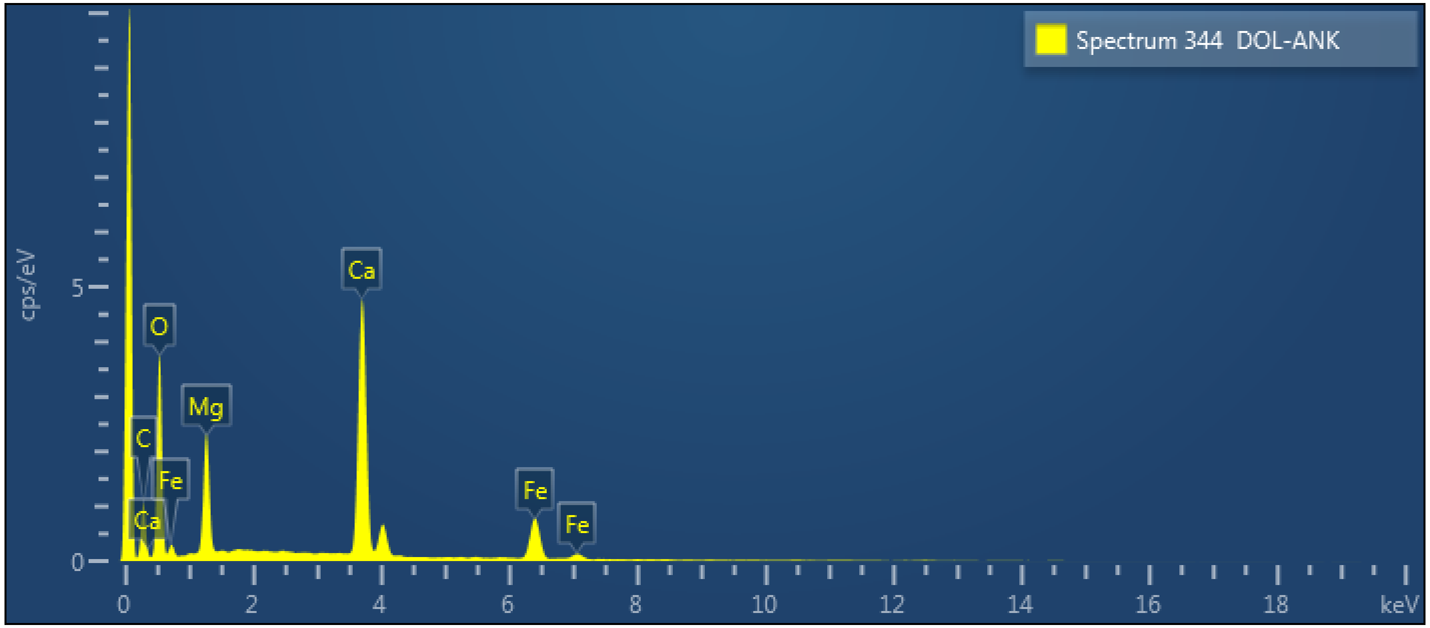
Backscatter image of compositionally diverse dolomite-ankerite solid solution carbonate hosting coarse-grained Ni-As-S (346) and Ni-As-Sb-S (spectrum 347).



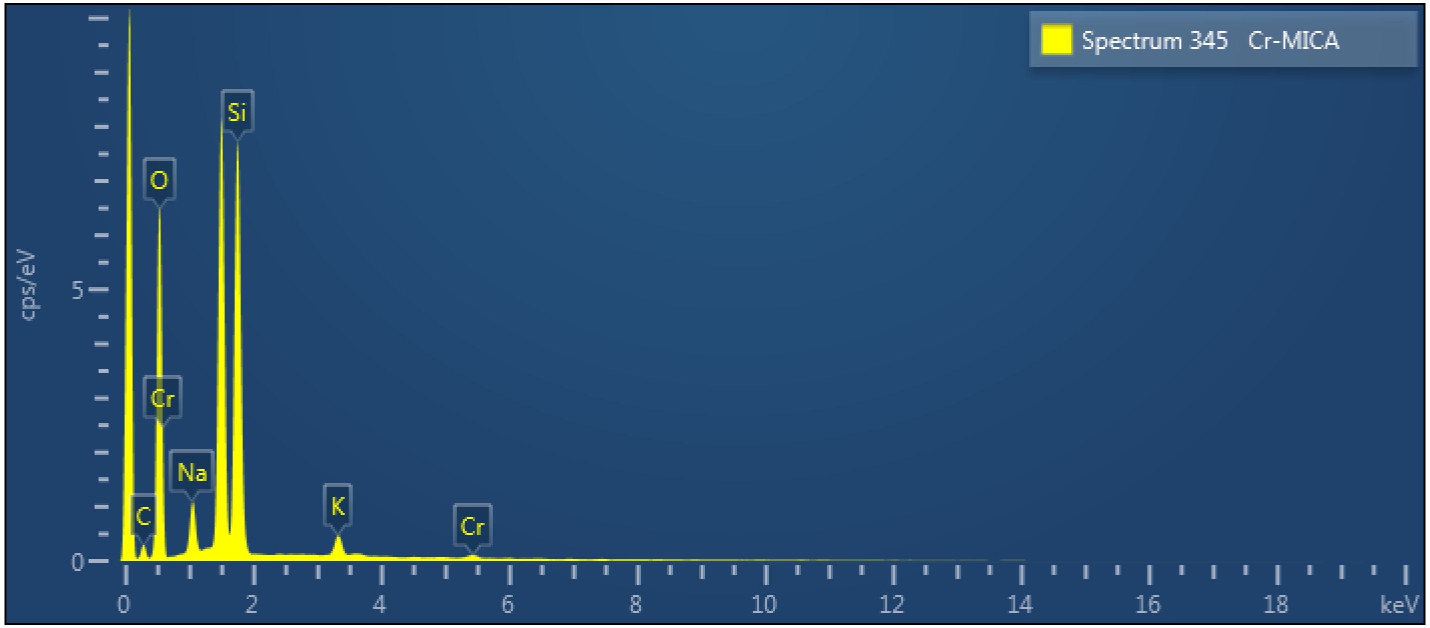
Same image as above with brightness reduced to illustrate the domanial compositional variation in Ni, Sb, and As.



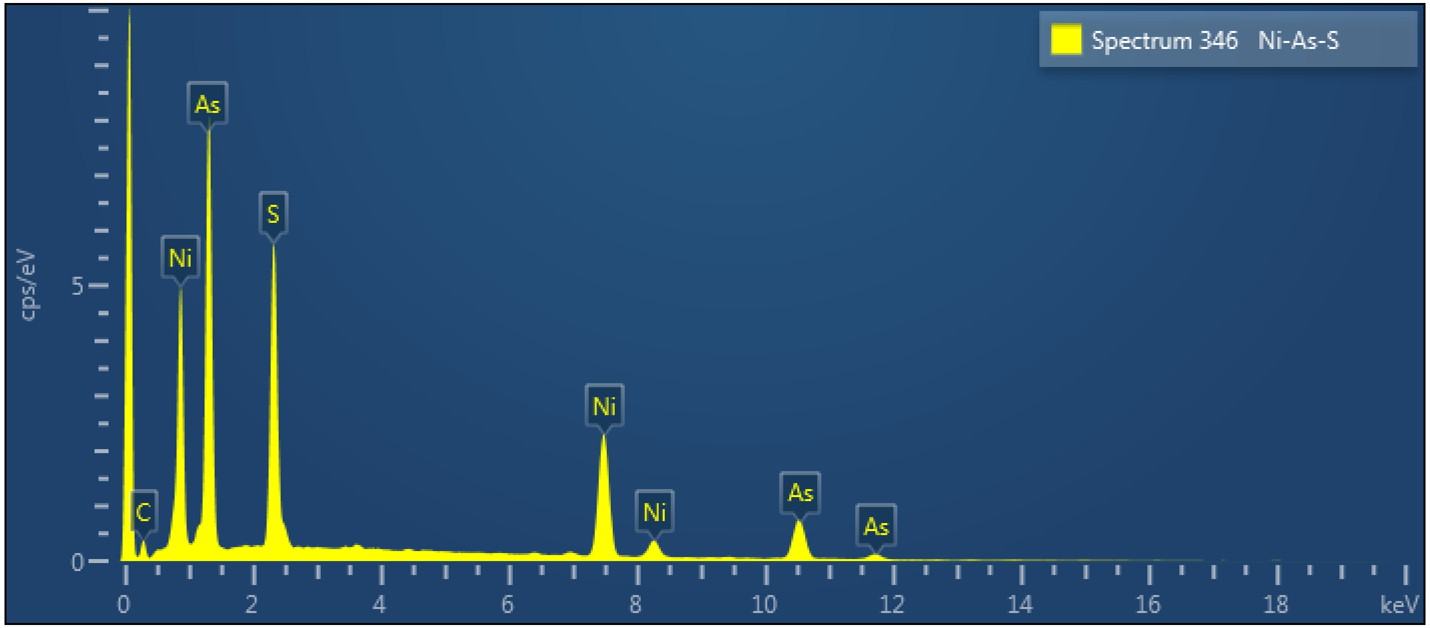
Spectrum 343 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.08	0.47	50.00			
Mg	K series	15.75	0.37	17.22	MgO	26.11	0.61
Ca	K series	37.27	0.46	24.73	CaO	52.15	0.64
Fe	K series	16.90	0.50	8.05	FeO	21.74	0.65
Total		100.00		100.00		100.00	

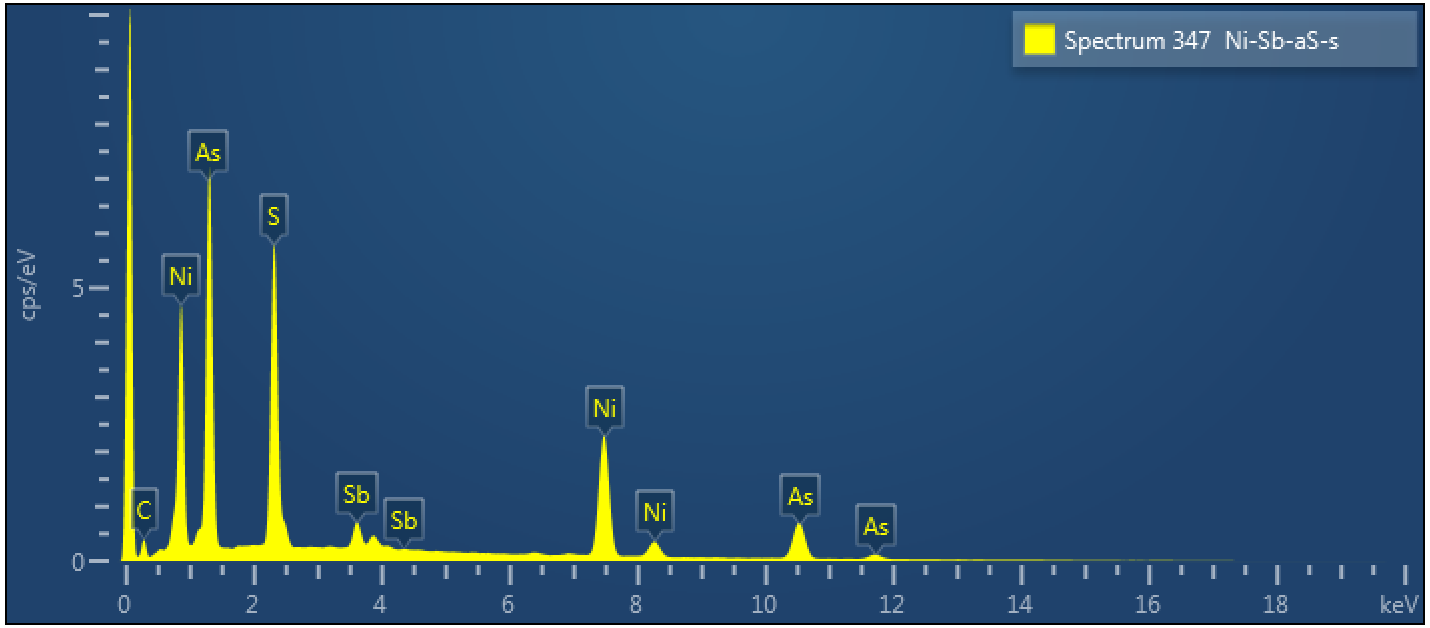


Spectrum 344 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.84	0.53	50.00			
Mg	K series	14.77	0.42	16.29	MgO	24.50	0.69
Ca	K series	37.68	0.53	25.21	CaO	52.72	0.74
Fe	K series	17.71	0.58	8.50	FeO	22.78	0.74
Total		100.00		100.00		100.00	

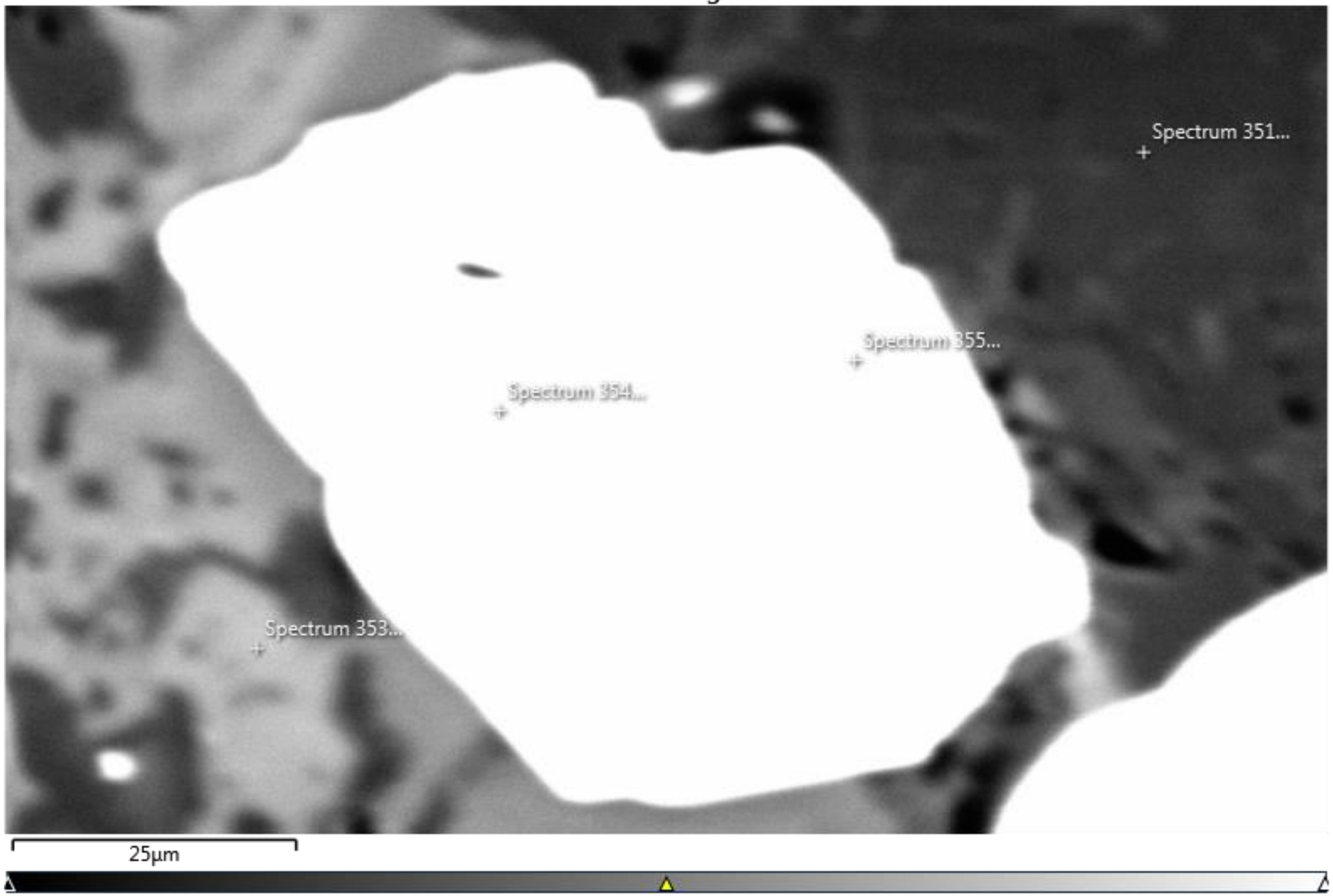


Spectrum 345 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	48.43	0.26	61.82			
Al	K series	21.39	0.20	16.19	Al2O3	40.42	0.38
Si	K series	24.14	0.22	17.55	SiO2	51.64	0.48
Na	K series	3.69	0.13	3.28	Na2O	4.98	0.18
K	K series	1.79	0.09	0.93	K2O	2.15	0.11
Cr	K series	0.56	0.10	0.22	Cr2O3	0.81	0.15
Total		100.00		100.00		100.00	


Spectrum 346 Ni-As-S
cps/eV
5
0
C
Ni
As
S
Ni
Ni
As
As
0
2
4
6
8
10
12
14
16
18
keV


Spectrum 347 Ni-Sb-aS-s
cps/eV
5
0
As
S
Ni
C
Sb
Sb
Ni
Ni
As
As
0
2
4
6
8
10
12
14
16
18
keV

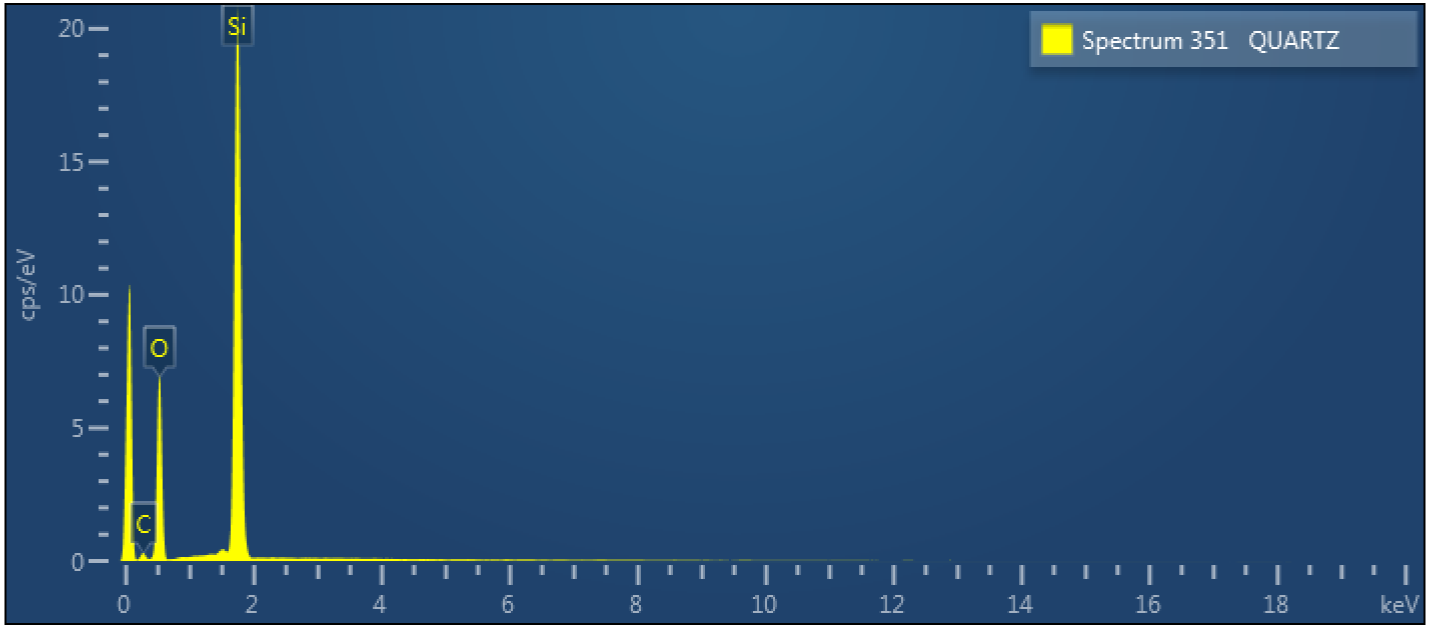
Electron Image 77



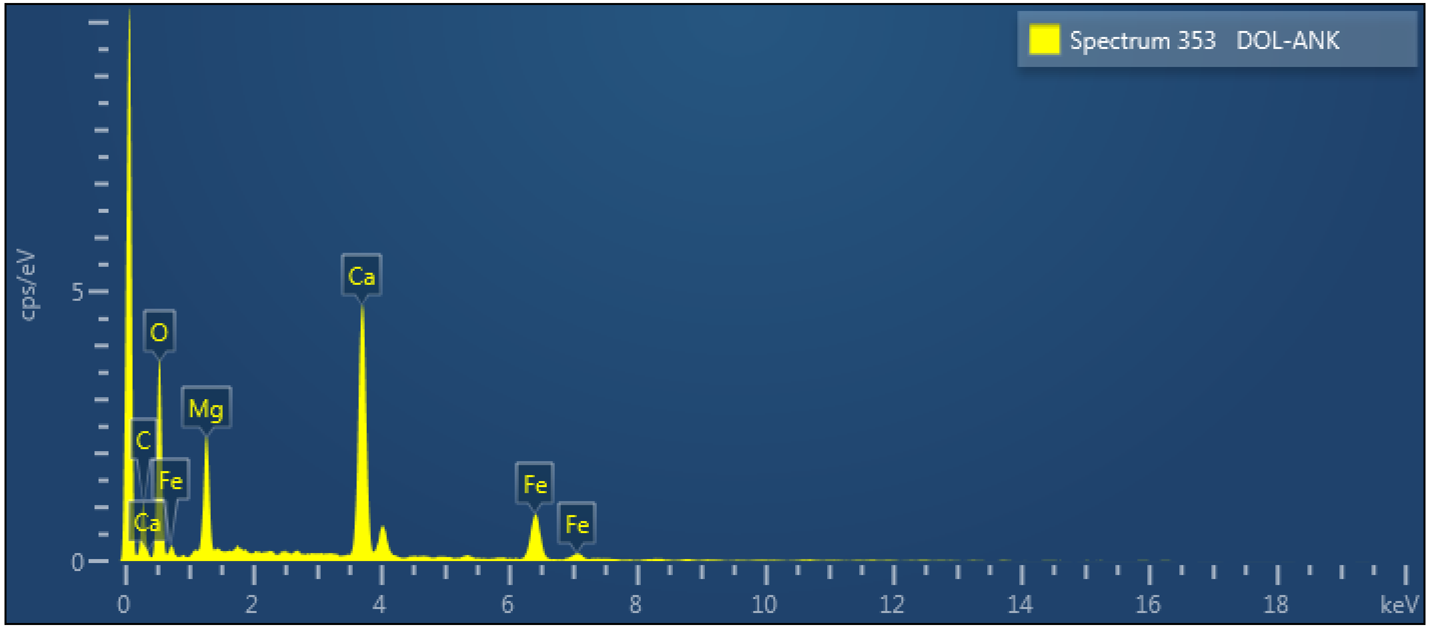
Backscatter image of a Ni-As-Sb-S (spectra 354,355) associated with quartz (spectrum 351) and dolomite-ankerite solid solution (spectra 351,353).

Electron Image 78

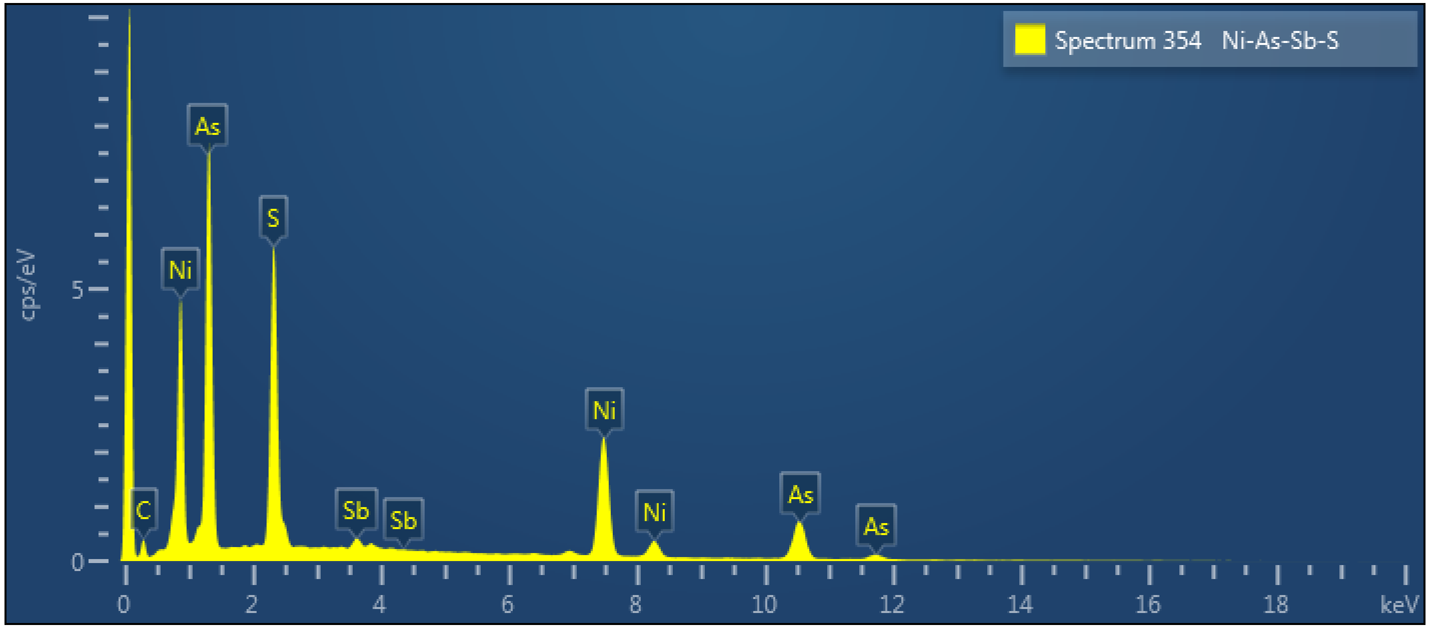
Same image as above with brightness reduced to illustrate the compositional variation in Ni-As-Sb. Note the really bright phase is an Sb-Ni-As-S (see images below at higher magnification).

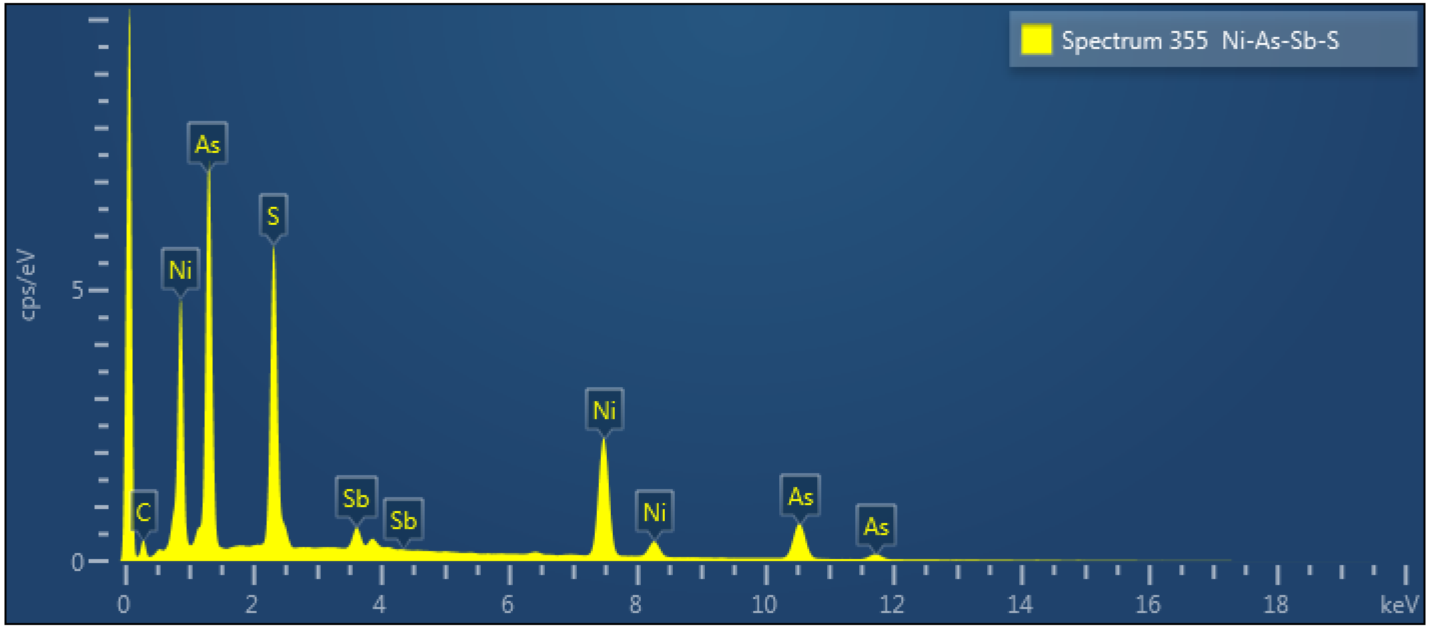


Spectrum 351 QUARTZ							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	53.26	0.32	66.67			
Si	K series	46.74	0.32	33.33	SiO2	100.00	0.67
Total		100.00		100.00		100.00	

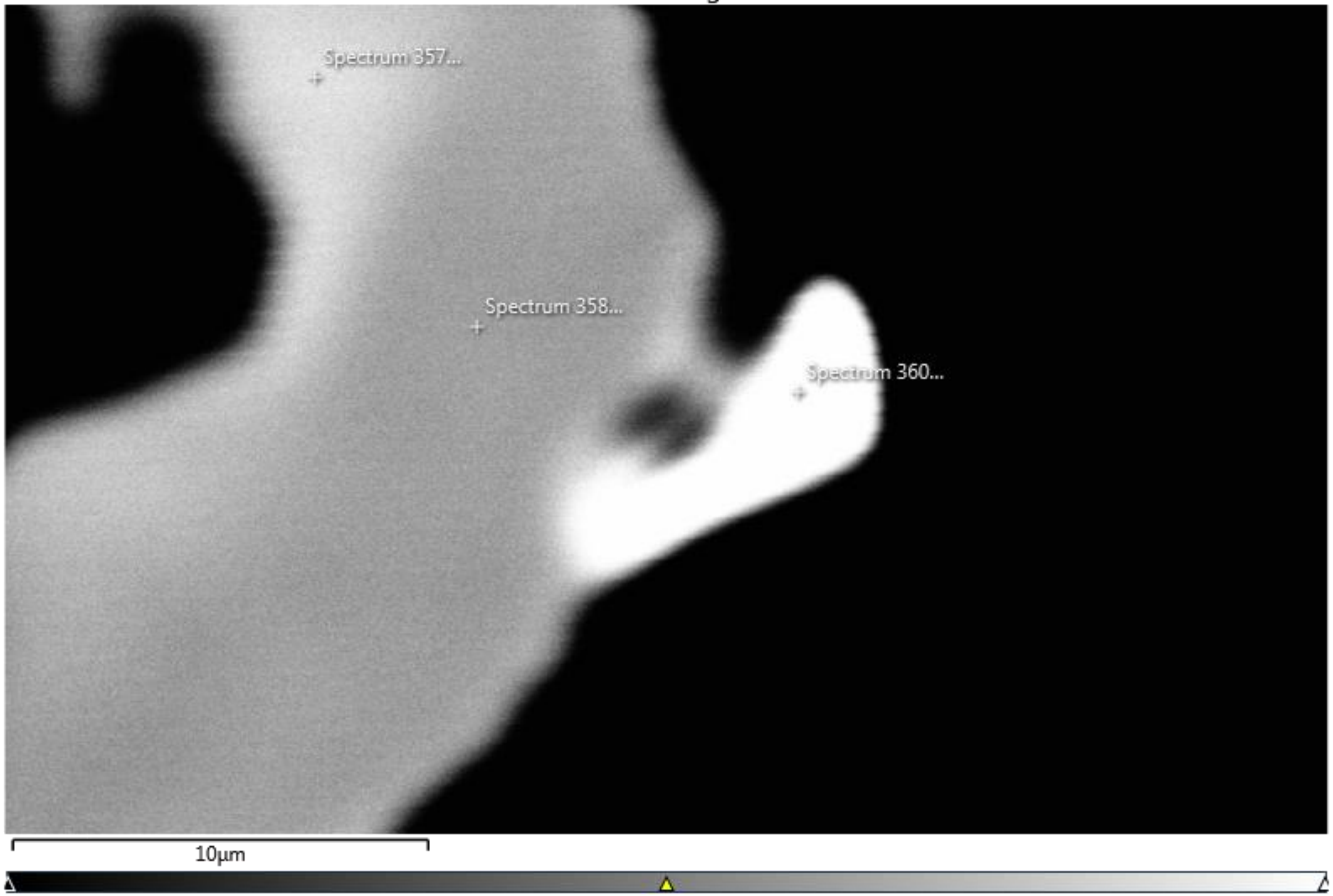


Spectrum 353 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.69	1.00	50.00			
Mg	K series	14.64	0.78	16.22	MgO	24.27	1.30
Ca	K series	36.49	0.98	24.53	CaO	51.06	1.37
Fe	K series	19.18	1.10	9.25	FeO	24.67	1.41
Total		100.00		100.00		100.00	

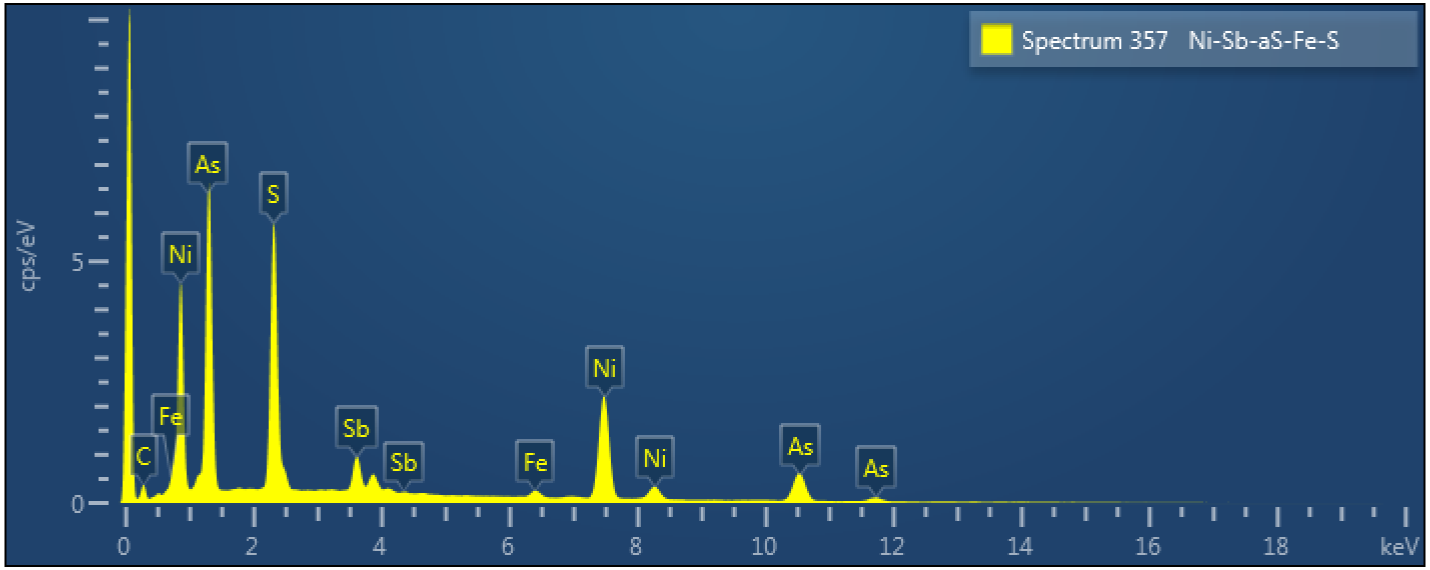

Spectrum 354 Ni-As-Sb-S
cps/eV
5
0
C
Ni
As
S
Sb
Sb
Ni
Ni
As
As
0
2
4
6
8
10
12
14
16
18
keV


Spectrum 355 Ni-As-Sb-S
cps/eV
5
0
C
Ni
As
S
Sb
Sb
Ni
Ni
As
As
0
2
4
6
8
10
12
14
16
18
keV

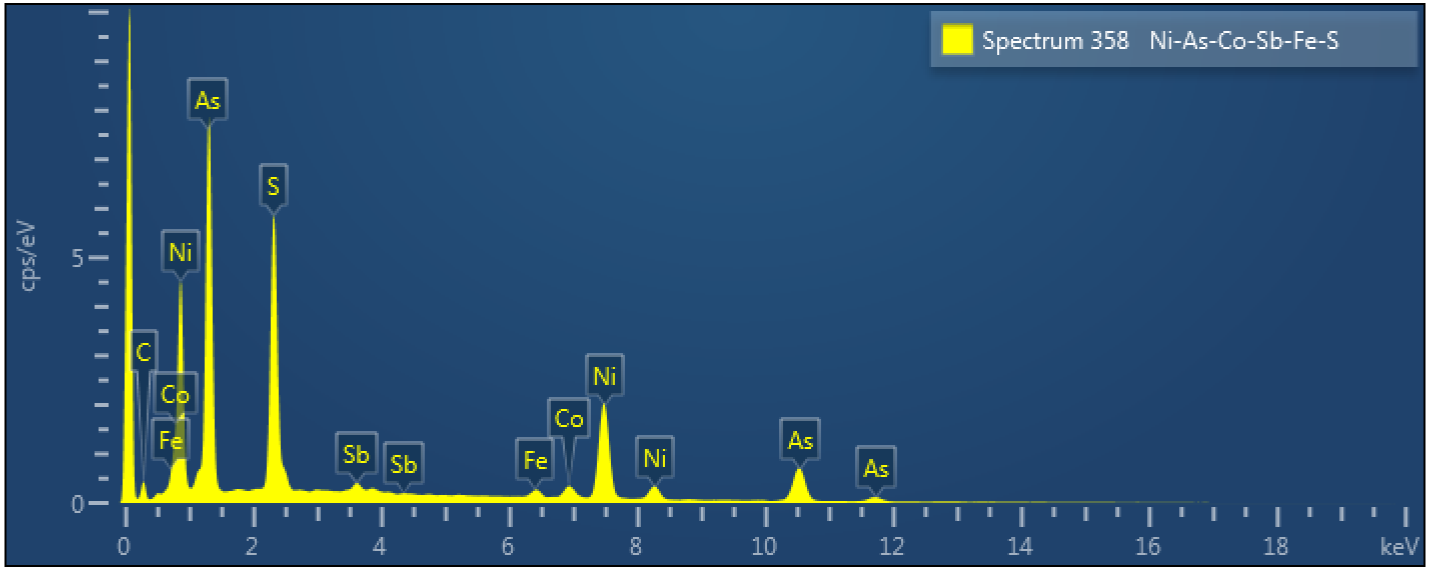
Electron Image 79



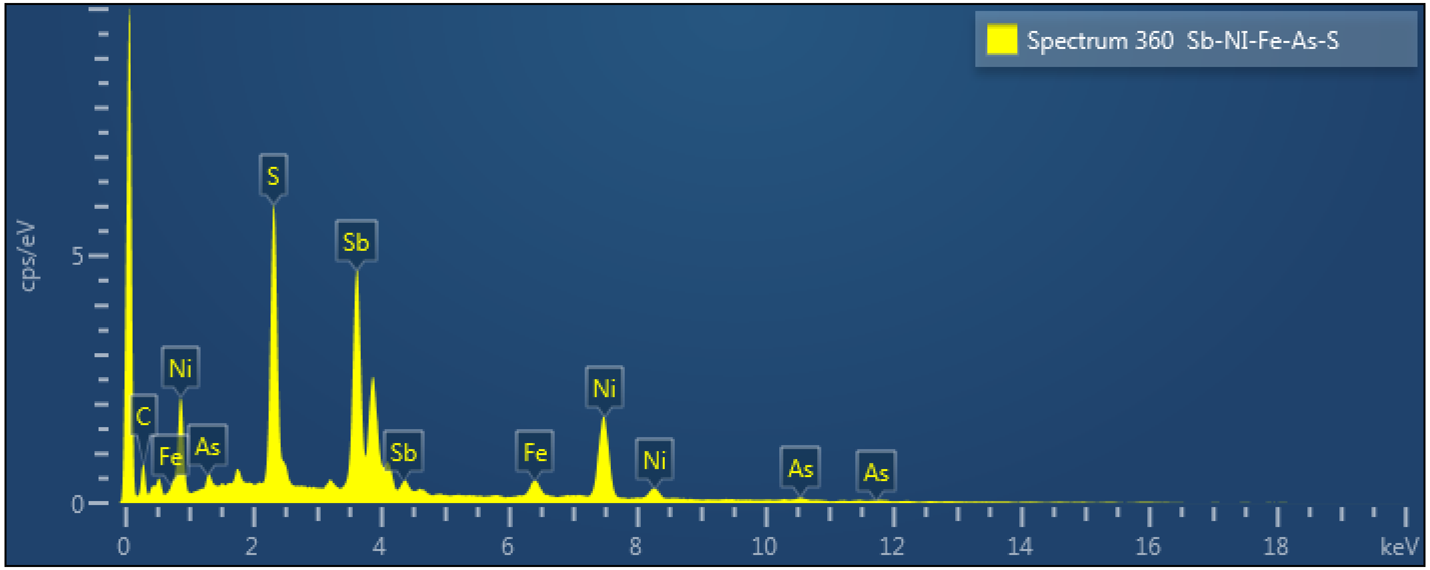
Higher magnification of the image above showing the Sb-Ni-As-S (spectrum 360) on the margin of Ni-As-Co-Sb-S (spectrum 358).



Spectrum 357 Ni-Sb-aS-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	18.97	0.27	33.71
Ni	K series	32.40	0.42	31.45
As	L series	38.64	0.44	29.39
Sb	L series	8.59	0.30	4.02
Fe	K series	1.39	0.16	1.42
Total		100.00		100.00



Spectrum 358 Ni-As-Co-Sb-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.72	0.24	34.04
Ni	K series	30.20	0.37	28.47
As	L series	43.75	0.39	32.32
Fe	K series	1.56	0.14	1.55
Co	K series	3.01	0.20	2.83
Sb	L series	1.75	0.21	0.79
Total		100.00		100.00

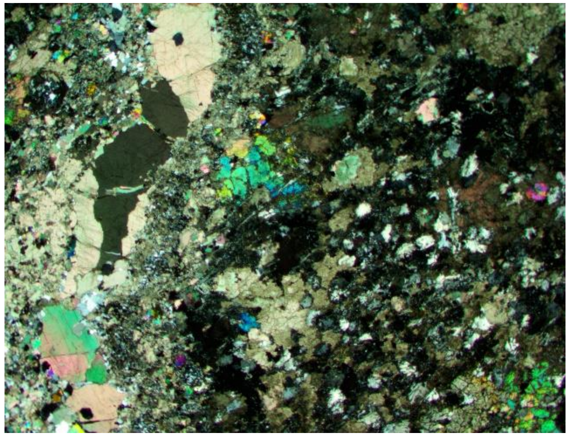


Spectrum 360 Sb-NI-Fe-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	17.52	0.53	36.49
Fe	K series	3.25	0.47	3.89
Ni	K series	25.91	0.89	29.48
Sb	L series	50.72	0.96	27.83
As	L series	2.59	0.60	2.31
Total		100.00		100.00

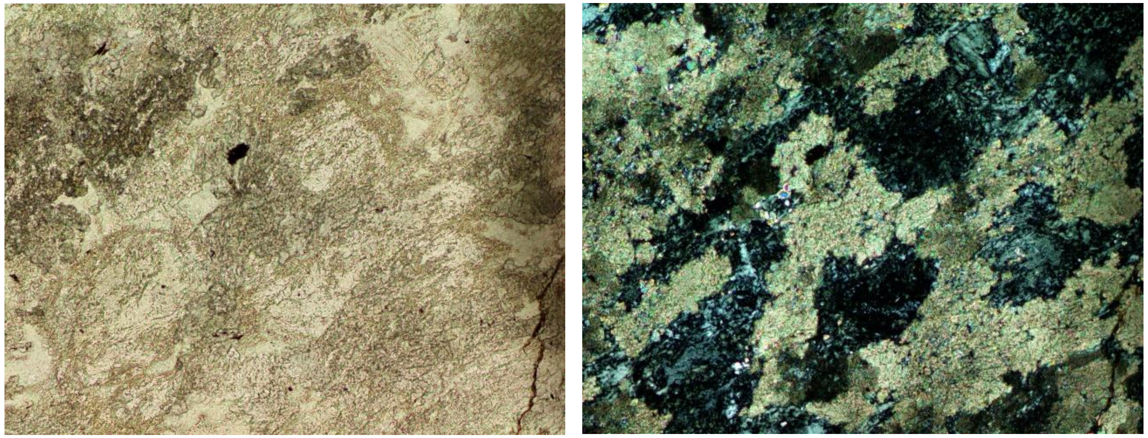
Specimen Notes for 'MID-14'

The rock was obtained from the Laroma Prospect. It is described as a weakly carbonated ultramafic with grey quartz stringers. Petrographic investigation reveals that there are multiple generations of quartz and carbonate alteration dominated by dolomite-ankerite solid solution. The rock was altered from an ultramafic precursor to a green Cr-mica (fuchsite) + dominantly magnesite-siderite solid solution + fine-grained quartz. The rock was then brecciated and sealed by a subsequent Cr-chlorite, dolomite-ankerite solid solution carbonate, magnesite-siderite solid solution carbonate, and then cut by late stage coarse-grained dolomite-ankerite solid solution carbonate + quartz stringers. The rock host disseminated rutile throughout and a host of Ni-Sb-Co-sulphides. The late stringers do not appear to carry sulphides.

The sulphide inventory is comprised of: Ni-Fe-Co-S with exsolution lamellae of Ni-S-Co-Fe; Co-Ni-As-S; Ni-As-Co-Sb-Sb-S; Sb-Ni-S; and As-Co-Ni-Fe-S.

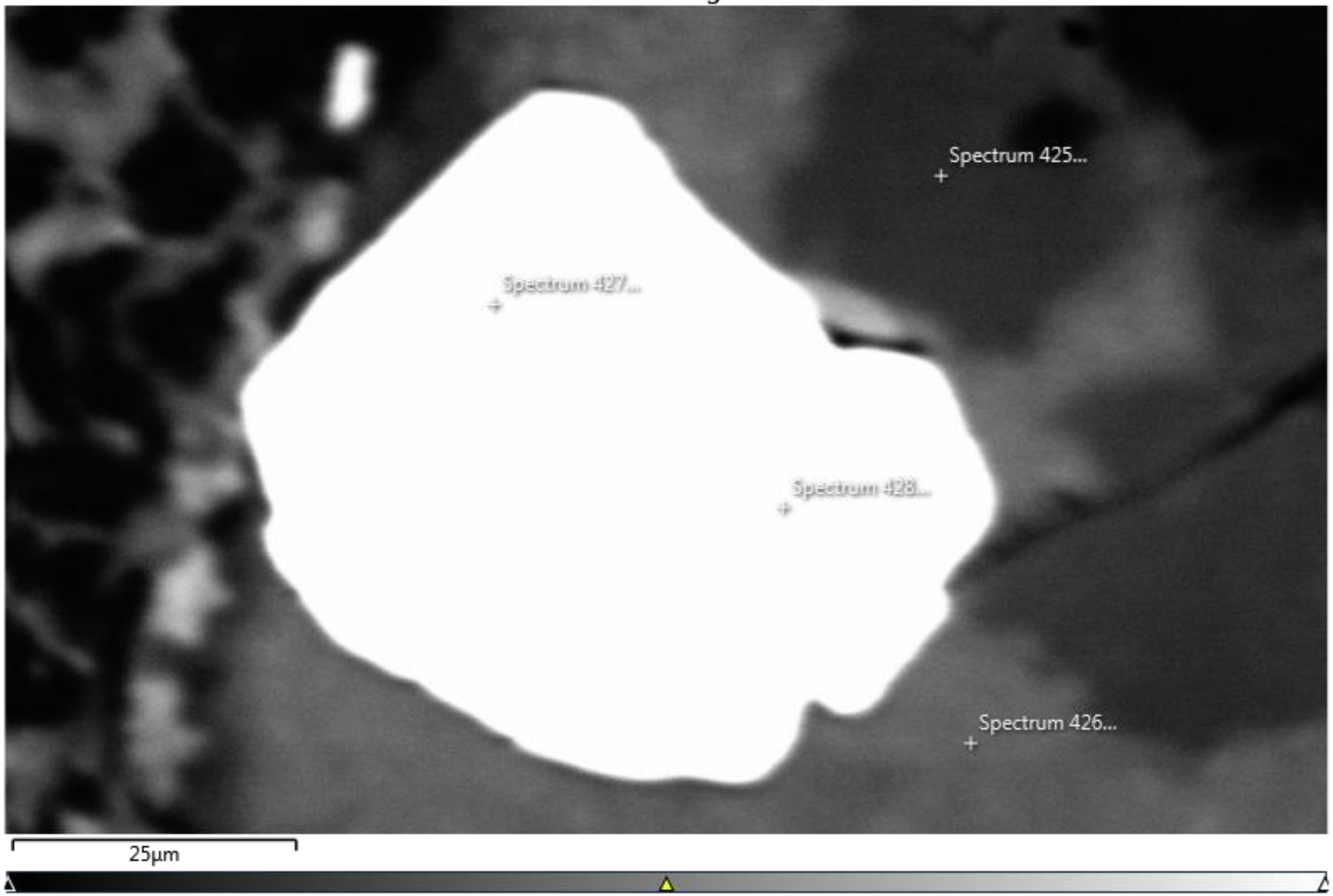



Plane light image (left) and crossed polarized light image (right) illustrating the quartz, carbonate (magnesite-siderite solid solution), Cr-mica (fuchsite) in the groundmass cut by late-stage coarse-grained birefringent quartz-carbonate (dolomite-ankerite solid solution) veinlets. Field of view = 17mm



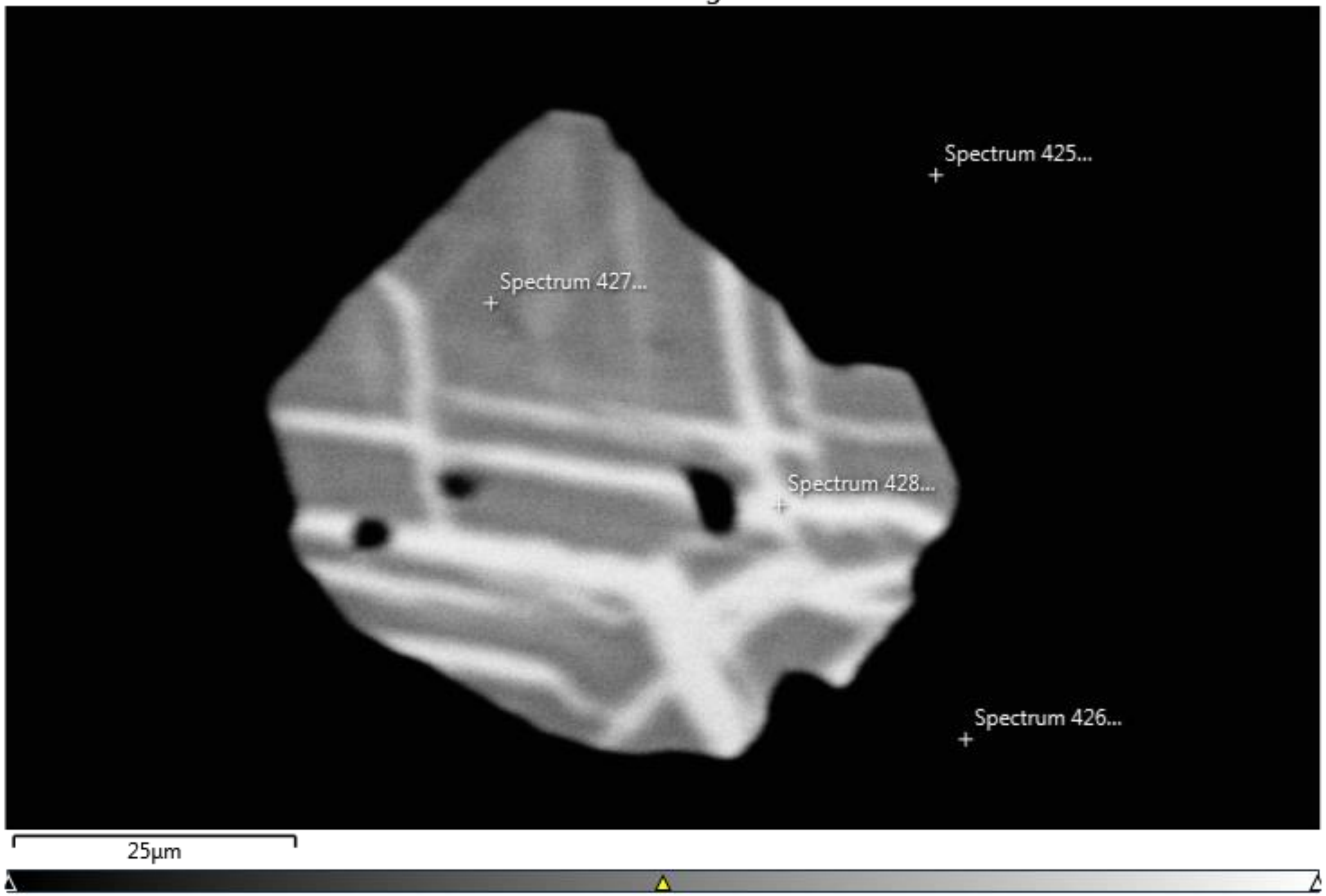
Plane light image (left) and crossed-polarized light image (right) illustrating the earlier alteration comprised of first order grey-blue fine-grained sugary quartz intergrown with magnesite-siderite solid solution. Field of view = 2.2mm

Electron Image 98

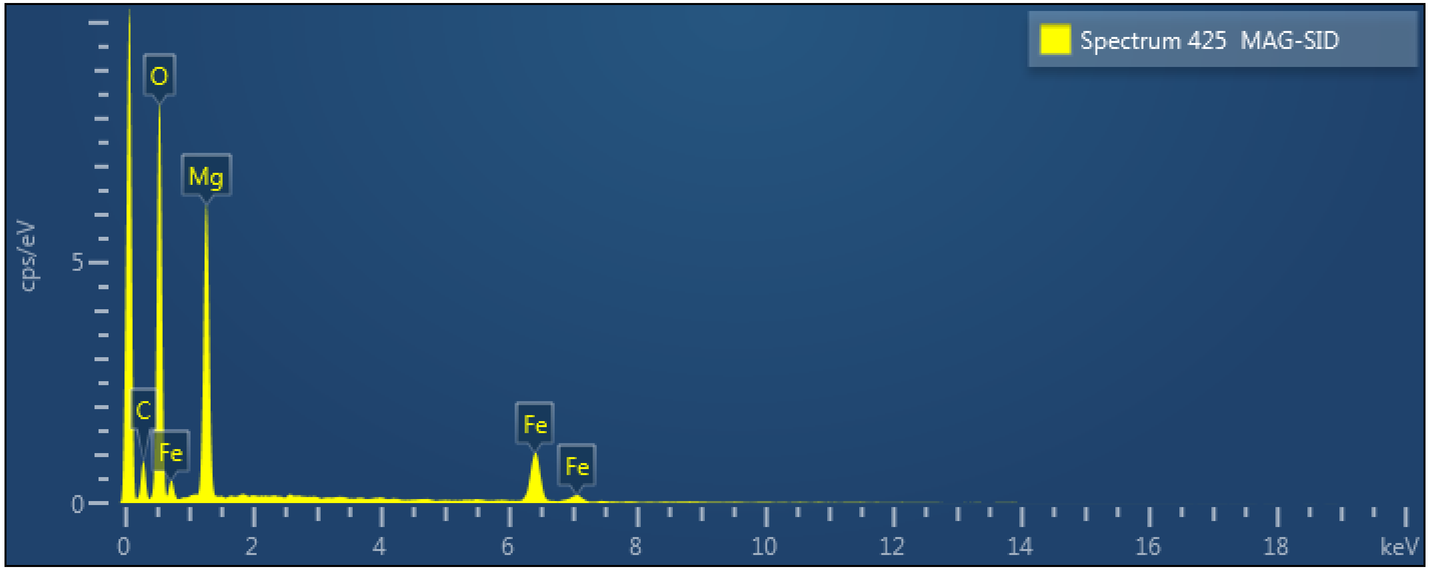


Backscatter image of magnesite-siderite solid solution carbonate (spectra 425) intergrown with Cr-chlorite (spectra 426) hosting Ni-Co-Fe-S (spectra 427,428).

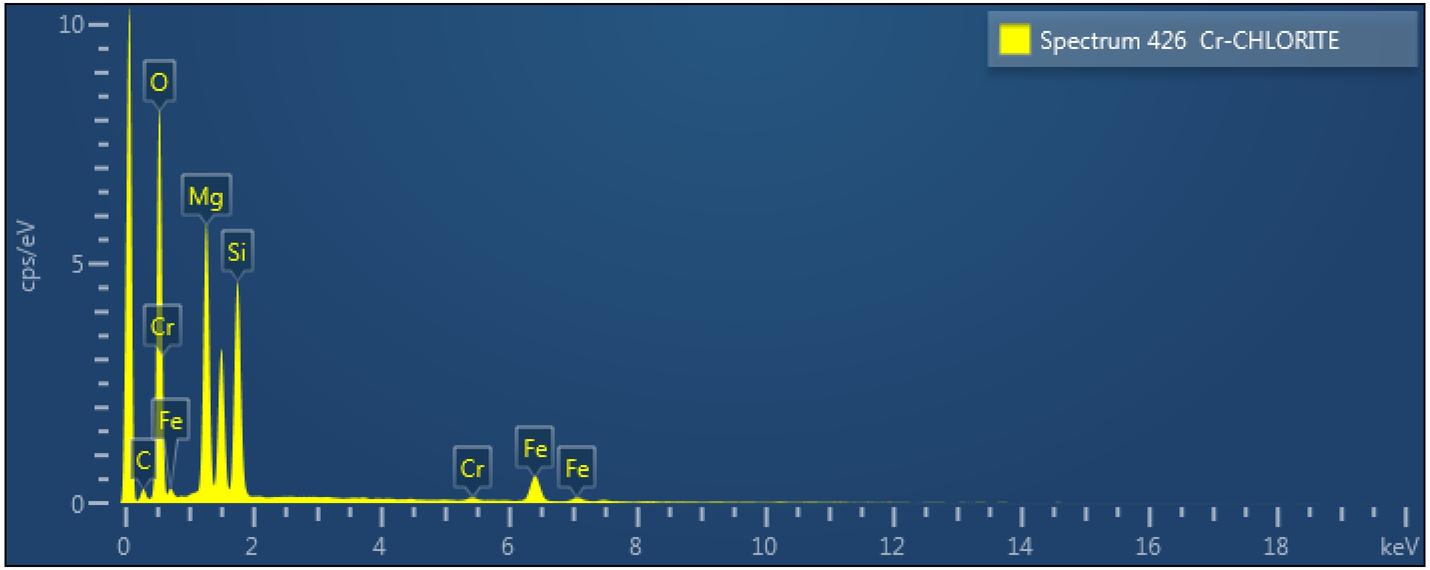
Electron Image 99



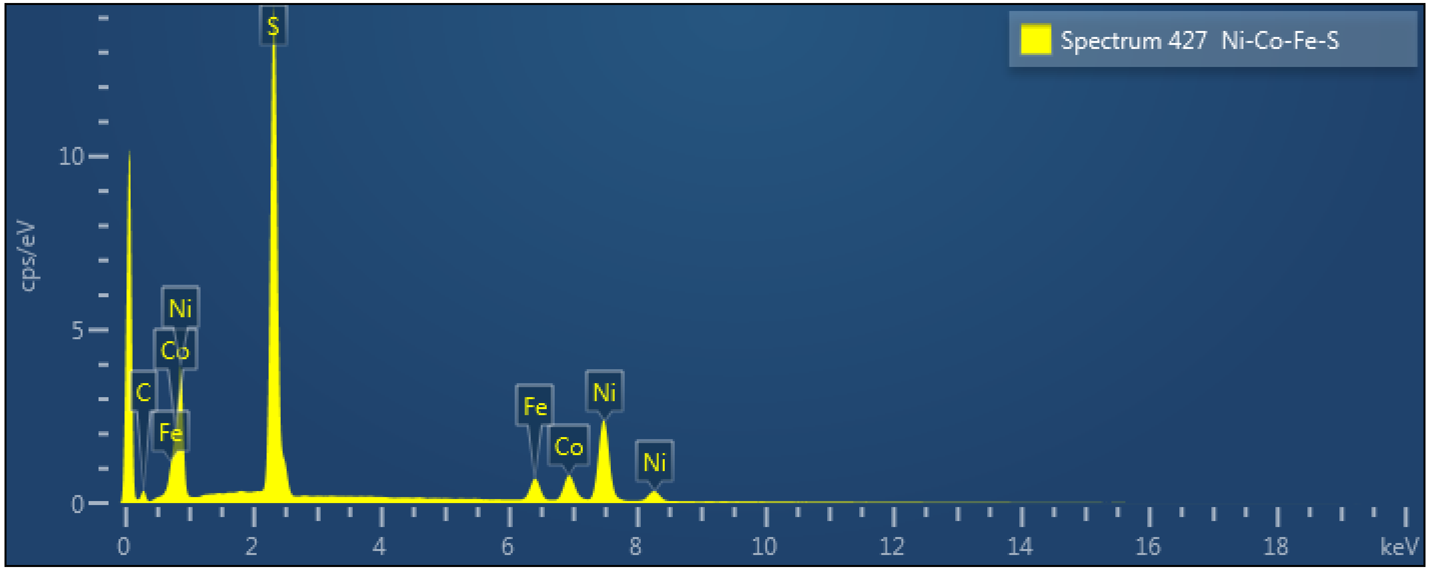
Same image as above with brightness reduced to illustrate the exsolution of more nickeliferous Ni-Co-Fe-S (spectrum 428) from the more cobaltian Ni-Co-Fe-S (spectrum 427).



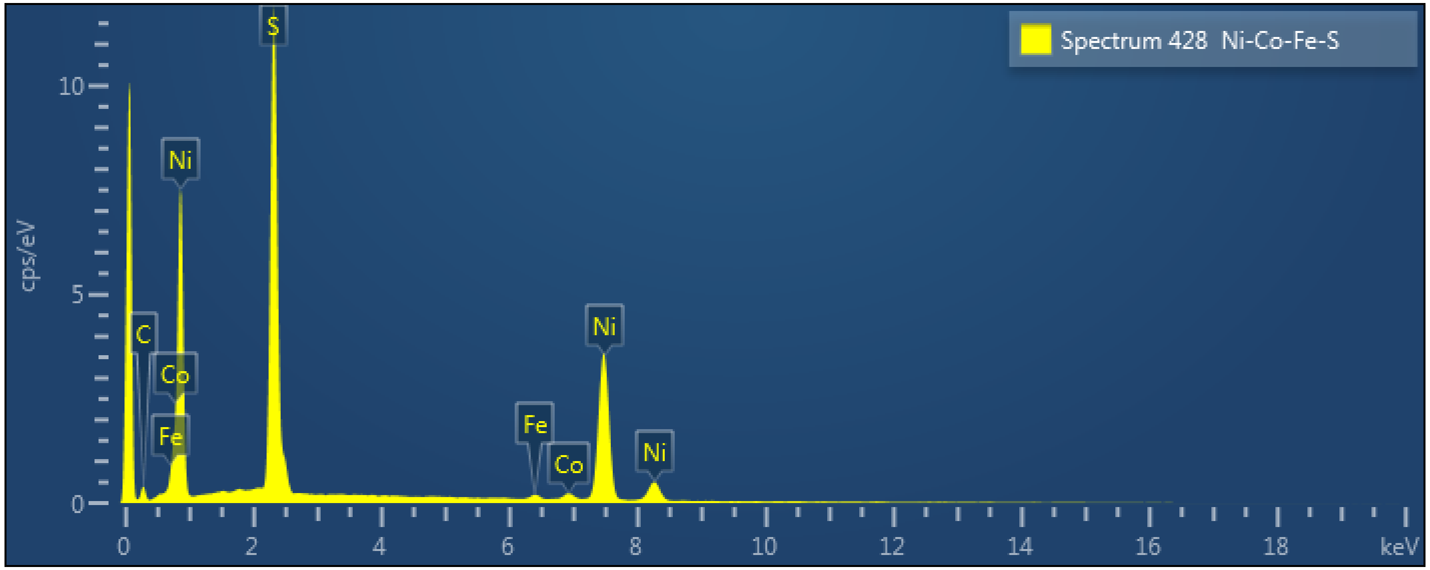
Spectrum 425 MAG-SID							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	34.04	0.90	50.00			
Mg	K series	40.75	0.92	39.39	MgO	67.56	1.52
Fe	K series	25.22	1.00	10.61	FeO	32.44	1.28
Total		100.00		100.00		100.00	



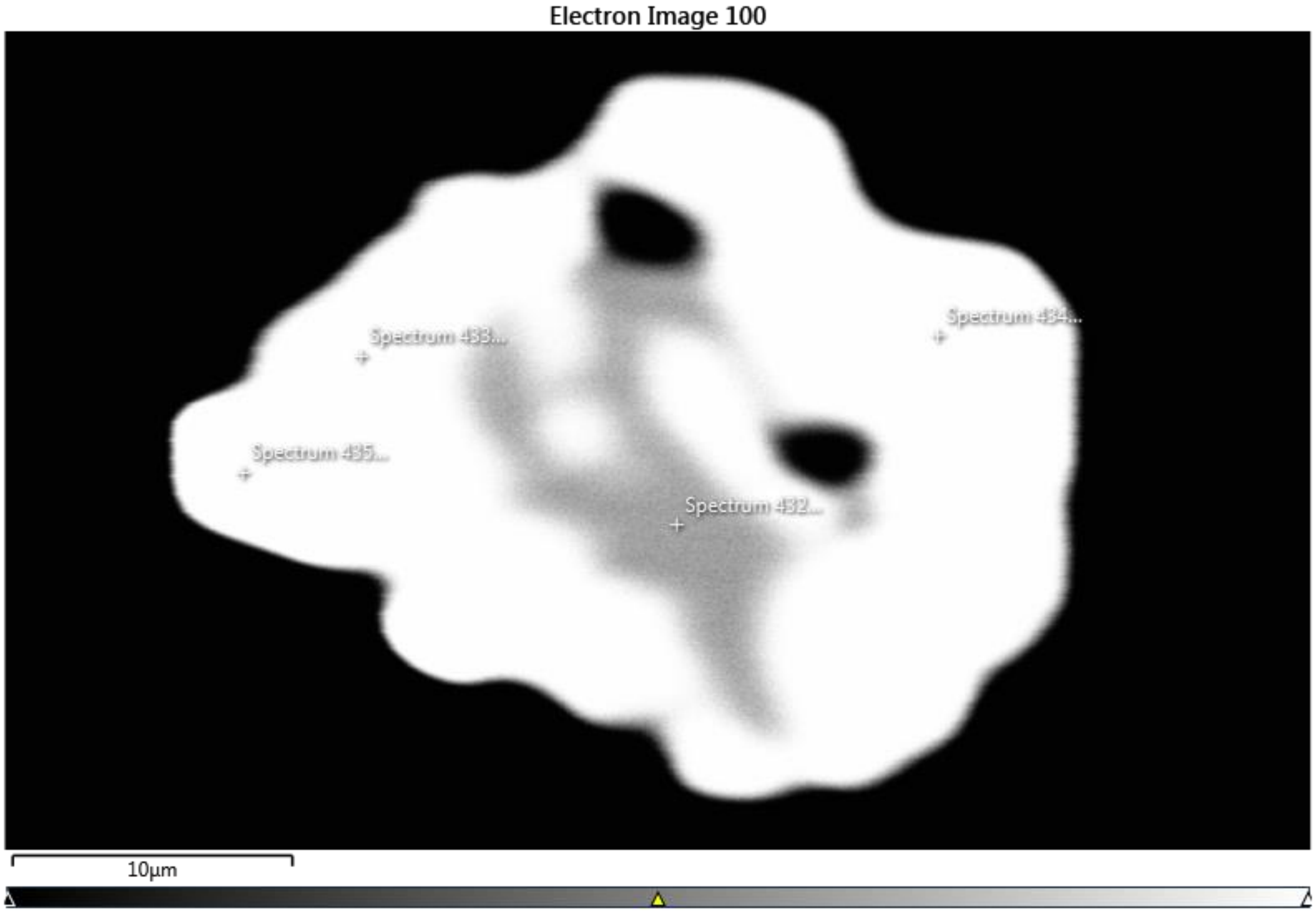
Spectrum 426 Cr-CHLORITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	44.31	0.43	58.61			
Mg	K series	19.05	0.31	16.58	MgO	31.59	0.51
Al	K series	11.47	0.28	8.99	Al2O3	21.66	0.53
Si	K series	16.72	0.30	12.60	SiO2	35.77	0.64
Fe	K series	7.85	0.33	2.98	FeO	10.10	0.42
Cr	K series	0.60	0.14	0.24	Cr2O3	0.88	0.21
Total		100.00		100.00		100.00	



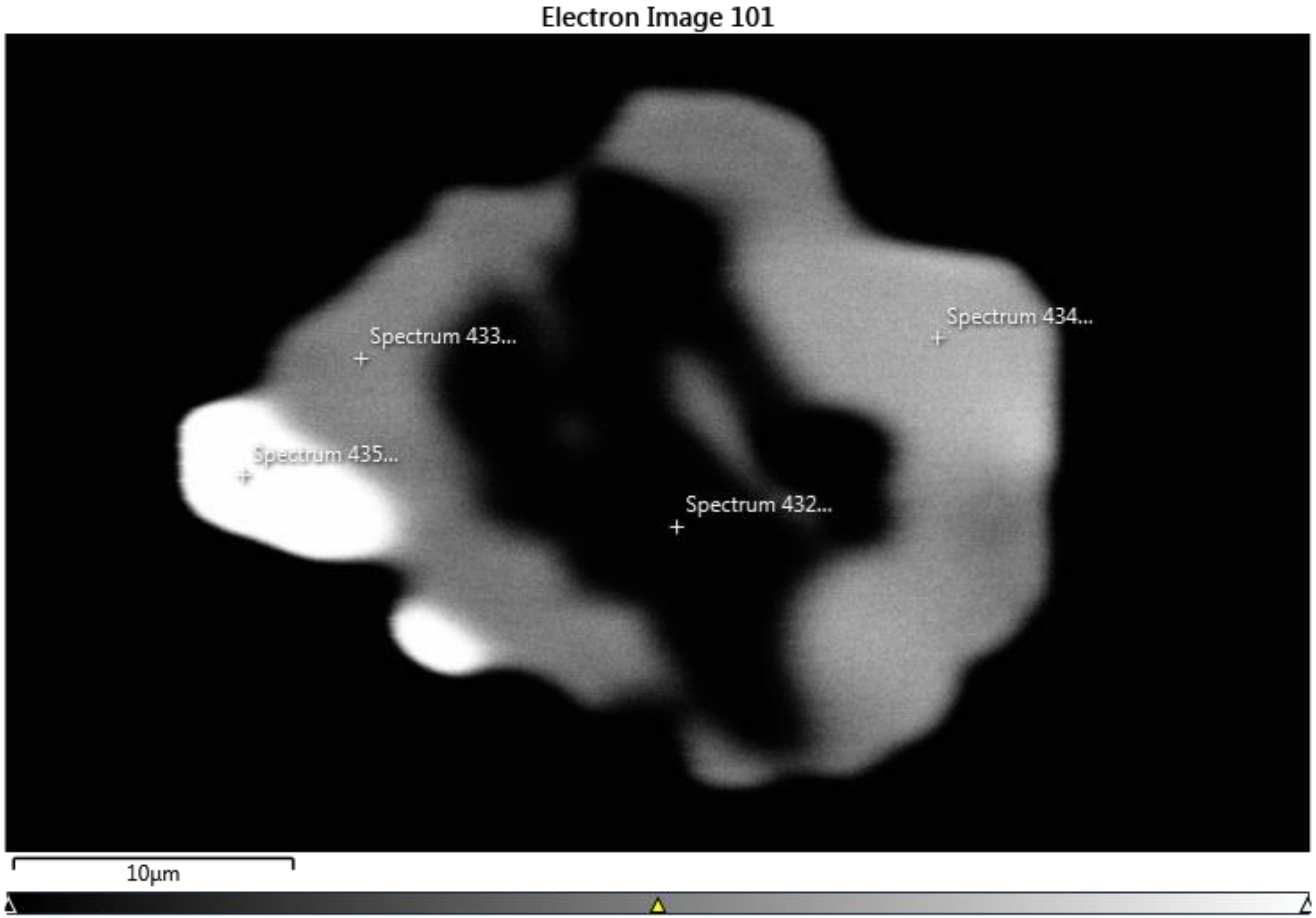
Spectrum 427 Ni-Co-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	43.47	0.31	58.34
Fe	K series	6.58	0.19	5.07
Co	K series	10.28	0.26	7.50
Ni	K series	39.67	0.35	29.08
Total		100.00		100.00



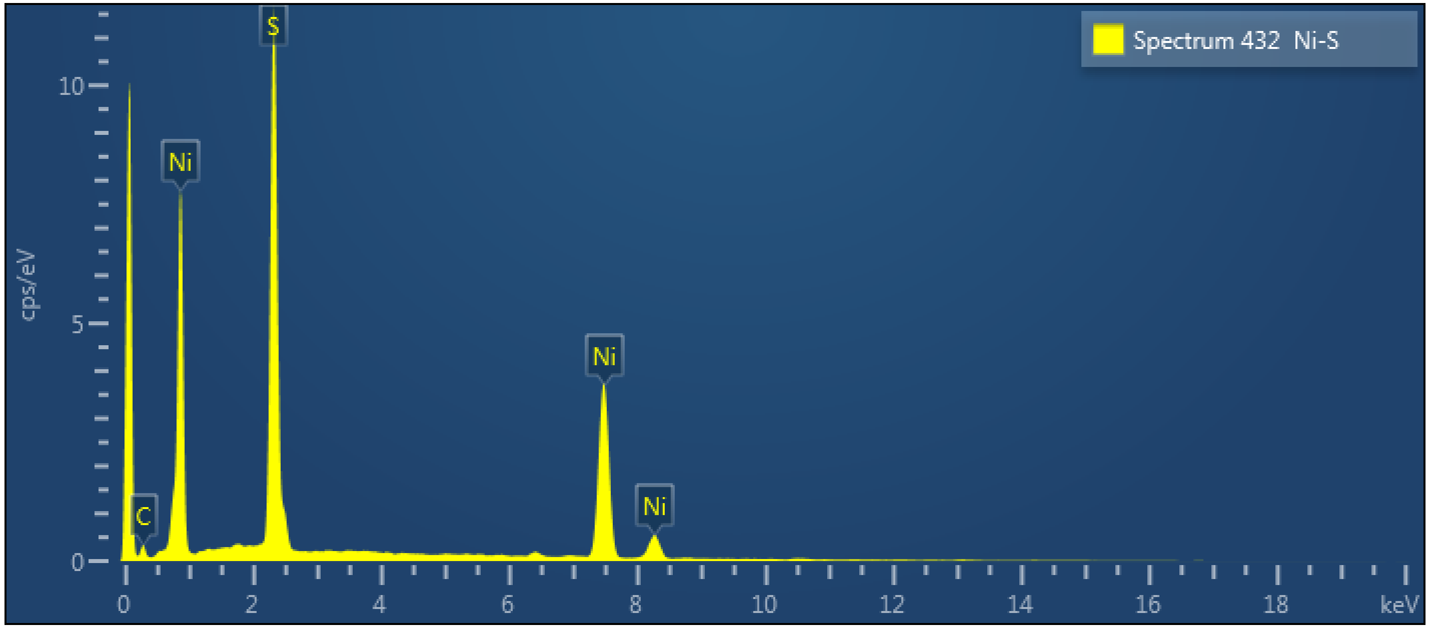
Spectrum 428 Ni-Co-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	37.45	0.43	52.28
Ni	K series	59.28	0.47	45.19
Co	K series	2.13	0.26	1.62
Fe	K series	1.14	0.18	0.91
Total		100.00		100.00



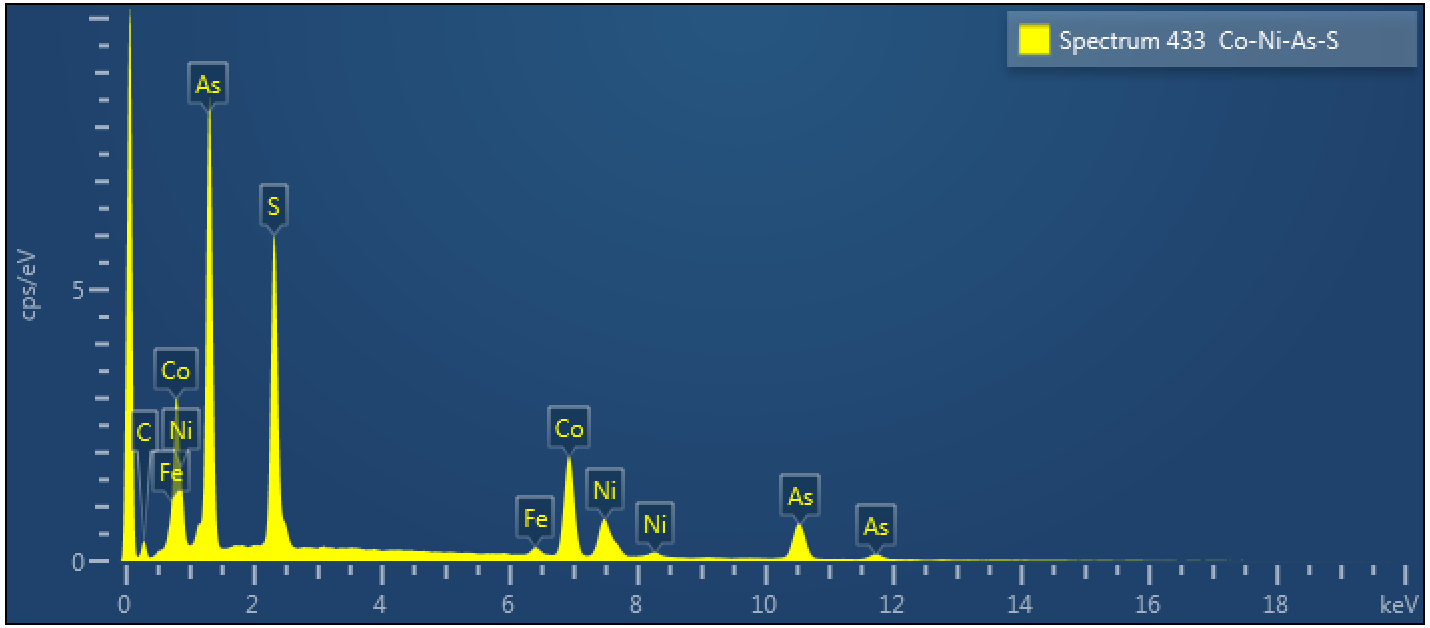
Backscatter image of a complicated intergrowth of Ni-Co-Sb-bear phases including Ni-S (spectrum 432), Co-Ni-As-S (spectrum 433), Ni-As-Co-Sb-S (spectrum 434), and Sb-Ni-S (spectrum 435).



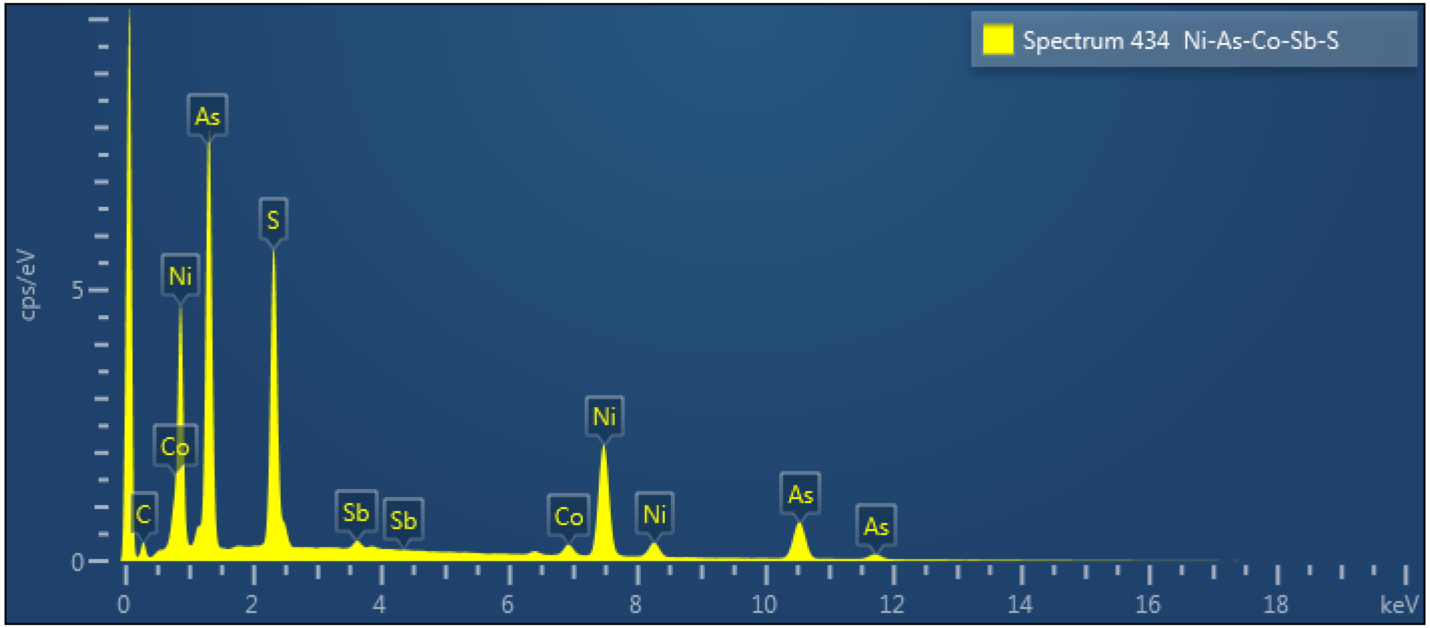
Same image as above with brightness reduced to illustrate the various Ni-Co-Sb-bear phases including: Ni-S (spectrum 432), Co-Ni-As-S (spectrum 433), Ni-As-Co-Sb-S (spectrum 434), and Sb-Ni-S (spectrum 435),



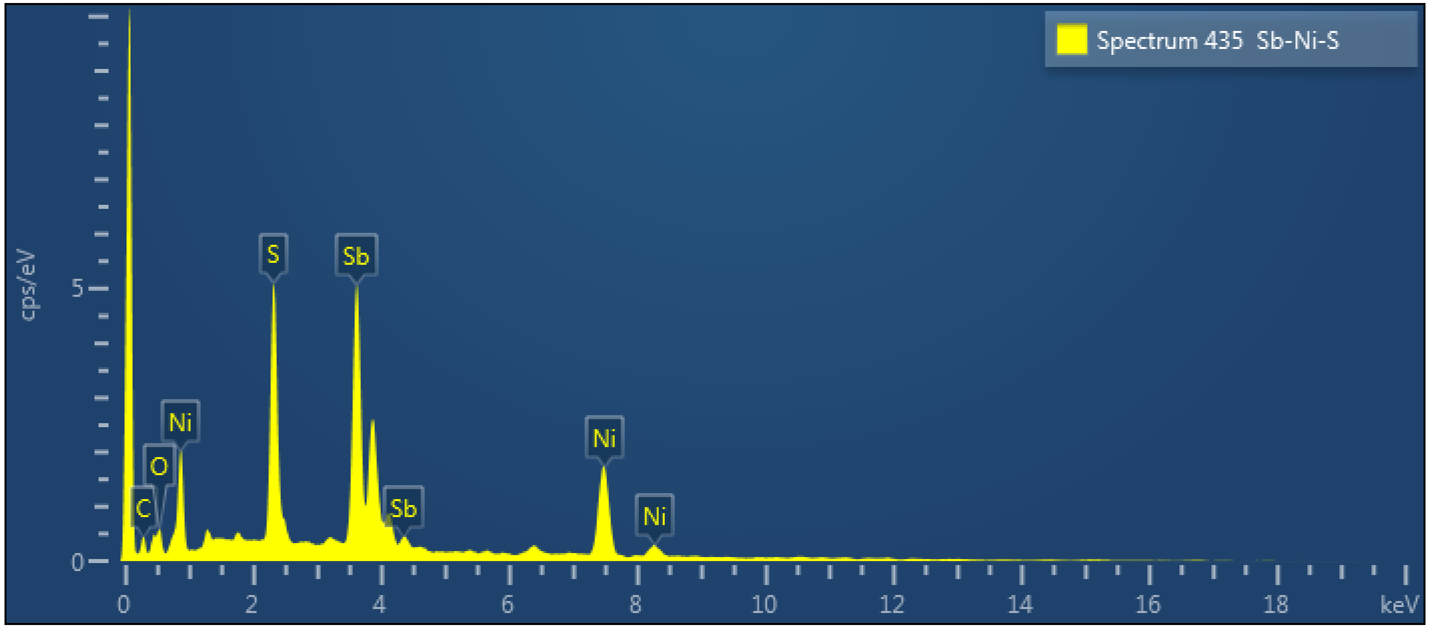
Spectrum 432 Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	36.97	0.51	51.79
Ni	K series	63.03	0.51	48.21
Total		100.00		100.00



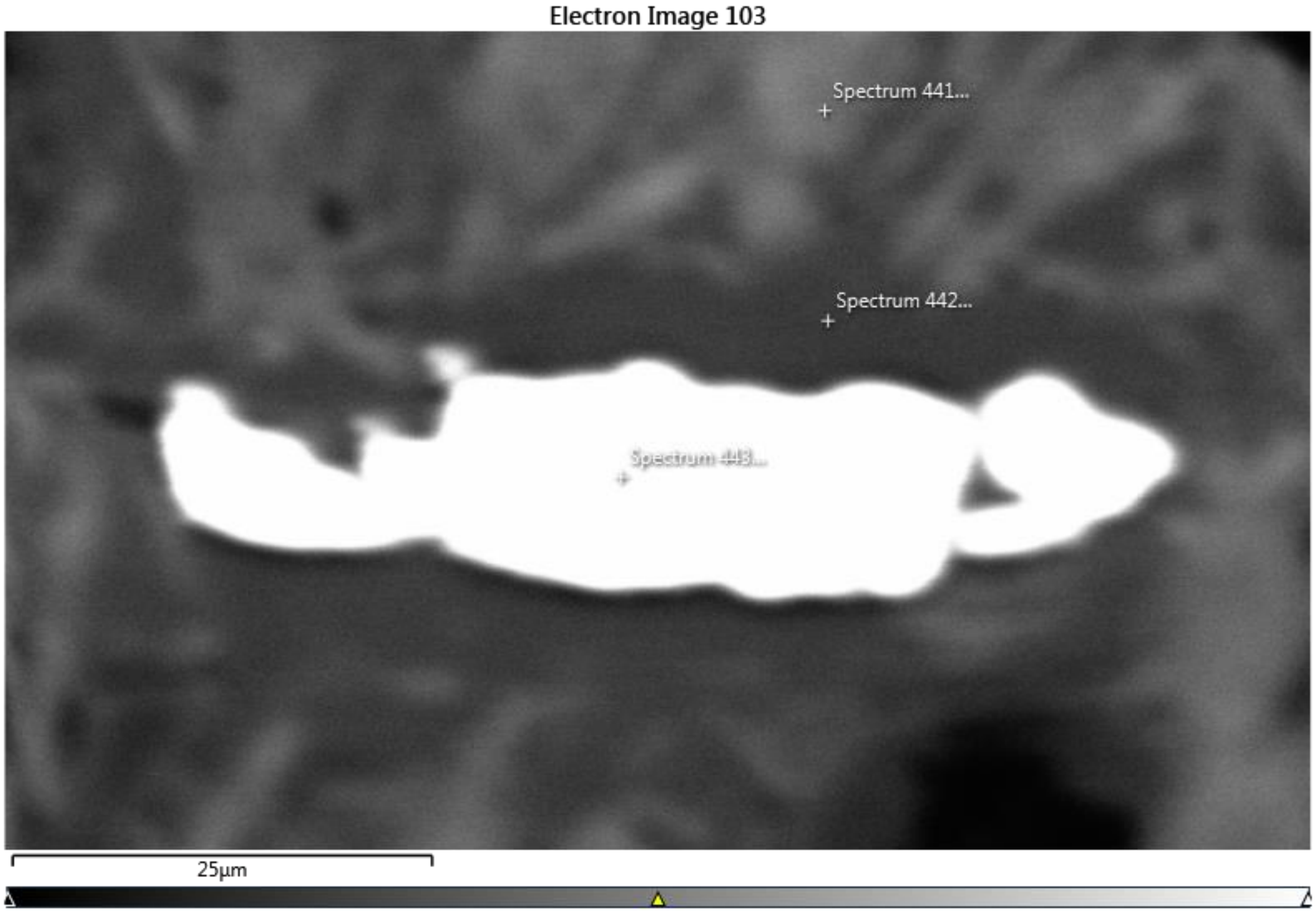
Spectrum 433 Co-Ni-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.84	0.31	34.03
Co	K series	23.79	0.44	22.21
Ni	K series	9.92	0.39	9.29
As	L series	45.01	0.50	33.05
Fe	K series	1.44	0.19	1.42
Total		100.00		100.00



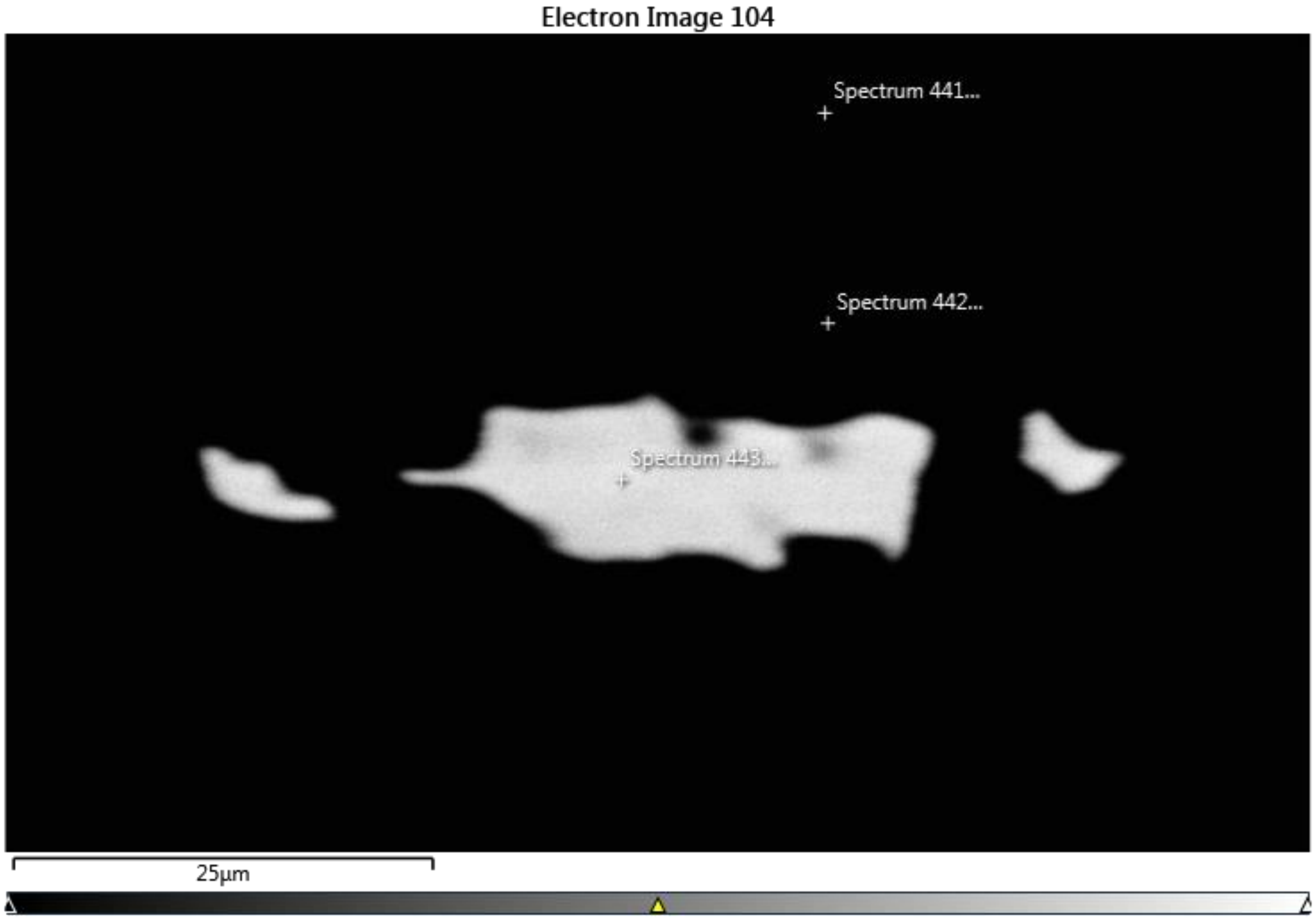
Spectrum 434 Ni-As-Co-Sb-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.60	0.18	33.91
Ni	K series	31.68	0.27	29.93
As	L series	44.70	0.28	33.09
Co	K series	2.55	0.14	2.40
Sb	L series	1.47	0.15	0.67
Total		100.00		100.00



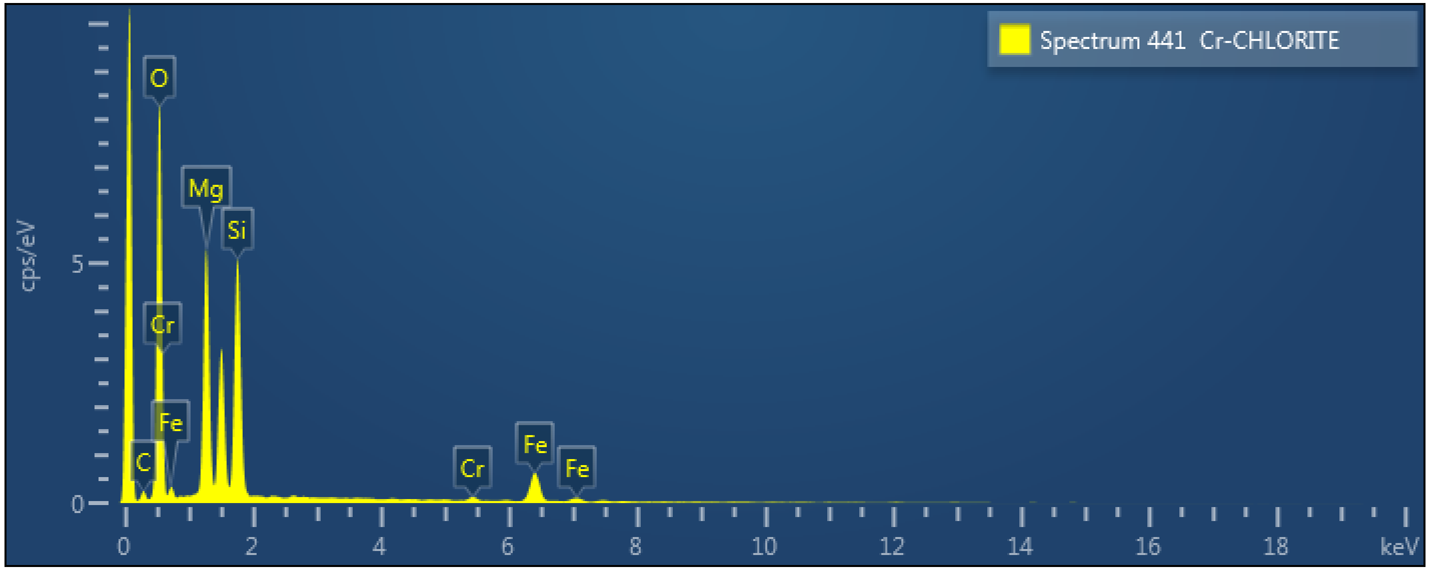
Spectrum 435 Sb-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	14.86	0.52	29.34
Ni	K series	26.81	0.94	28.91
Sb	L series	55.00	1.00	28.60
O	K series	3.32	0.60	13.15
Total		100.00		100.00



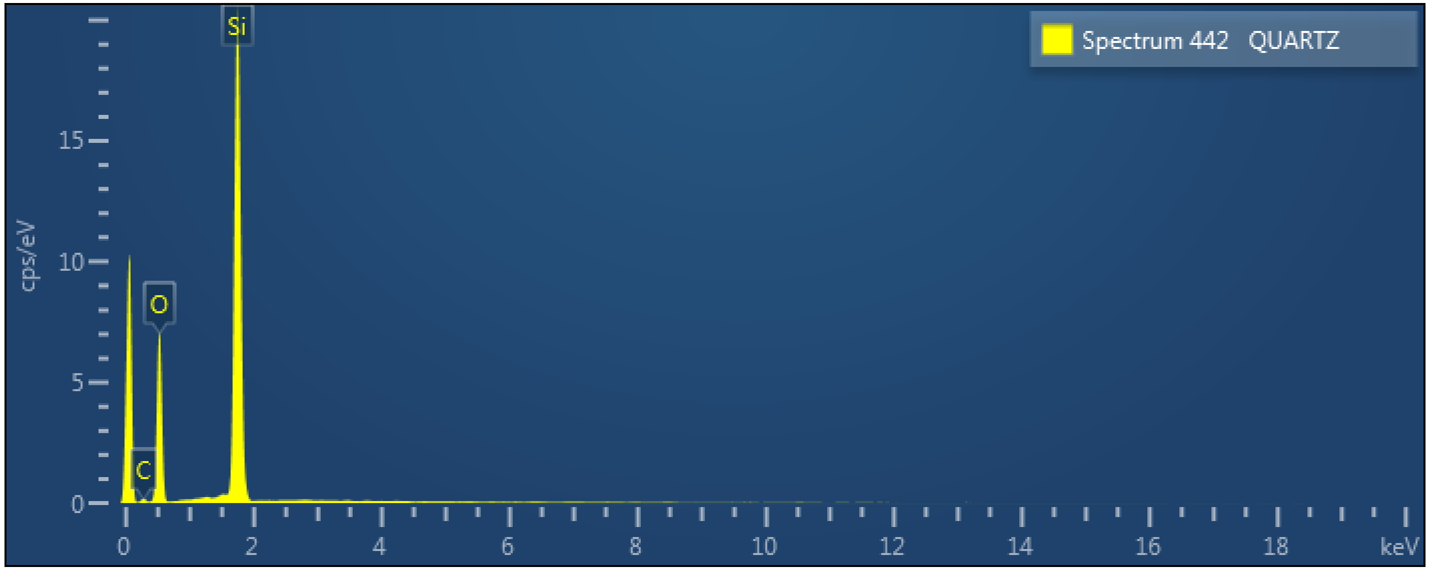
Backscatter image illustrating Cr-chlorite (spectrum 441) and quartz (spectrum 442) hosting As-Co-Ni-Fe-S (spectrum 443).



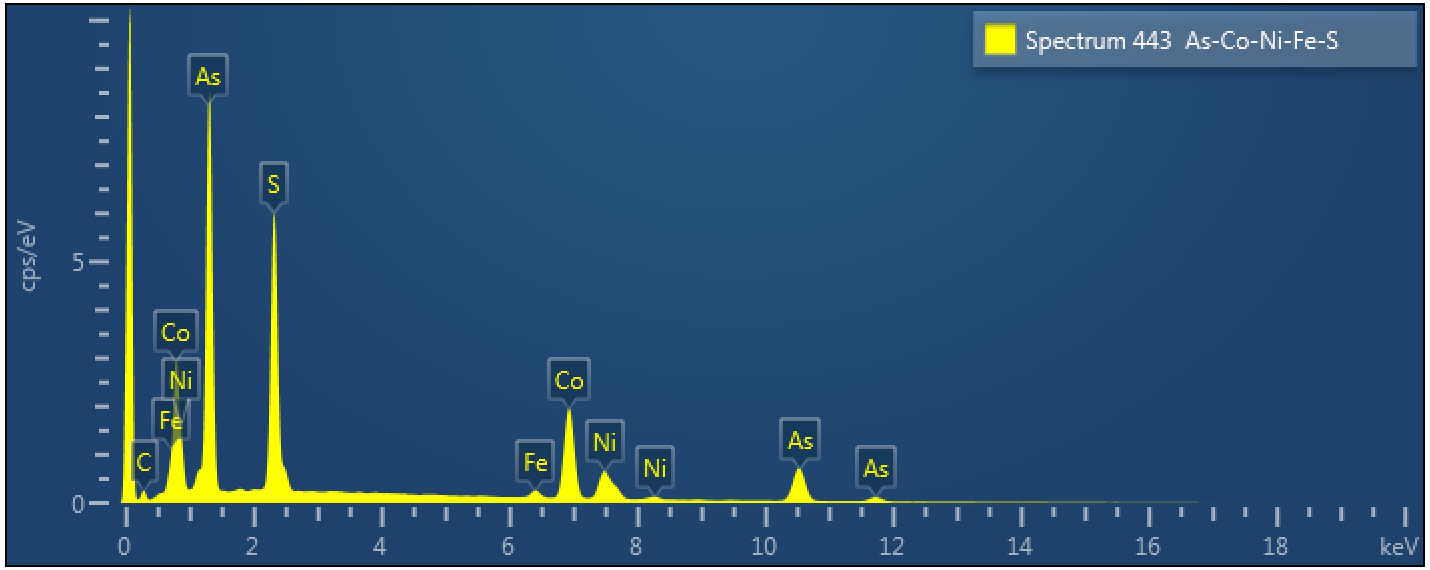
Same image as above with brightness reduced to better illustrate the As-Co-Ni-Fe-S phase.



Spectrum 441 Cr-CHLORITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	44.38	0.50	59.05			
Mg	K series	17.15	0.35	15.02	MgO	28.44	0.58
Al	K series	11.05	0.32	8.72	Al2O3	20.88	0.61
Si	K series	17.89	0.36	13.56	SiO2	38.26	0.76
Fe	K series	8.62	0.39	3.29	FeO	11.09	0.50
Cr	K series	0.91	0.17	0.37	Cr2O3	1.32	0.24
Total		100.00		100.00		100.00	



Spectrum 442 QUARTZ							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	53.26	0.35	66.67			
Si	K series	46.74	0.35	33.33	SiO2	100.00	0.75
Total		100.00		100.00		100.00	

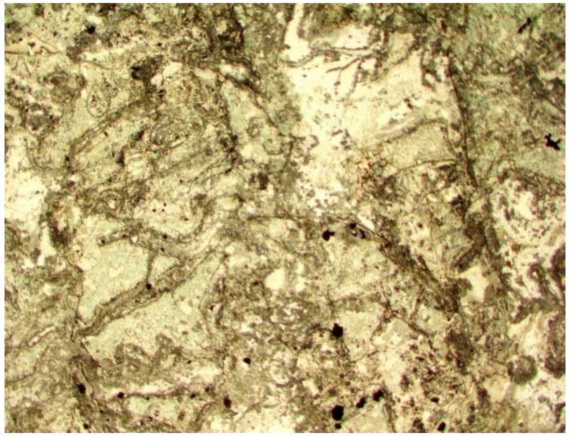


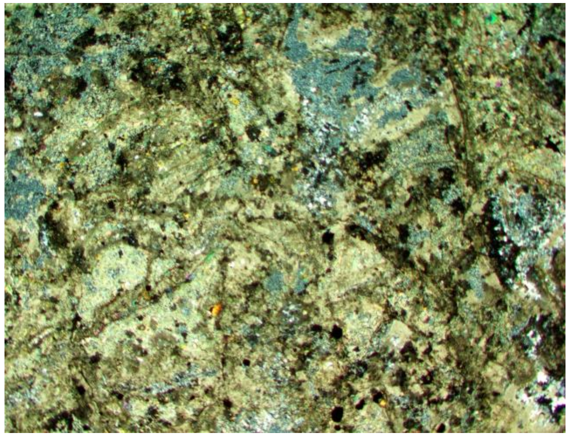
Spectrum 443 As-Co-Ni-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	20.19	0.21	34.55
Co	K series	24.72	0.30	23.03
Ni	K series	8.27	0.25	7.73
As	L series	45.26	0.33	33.16
Fe	K series	1.56	0.13	1.53
Total		100.00		100.00

Specimen Notes for 'MID-15'

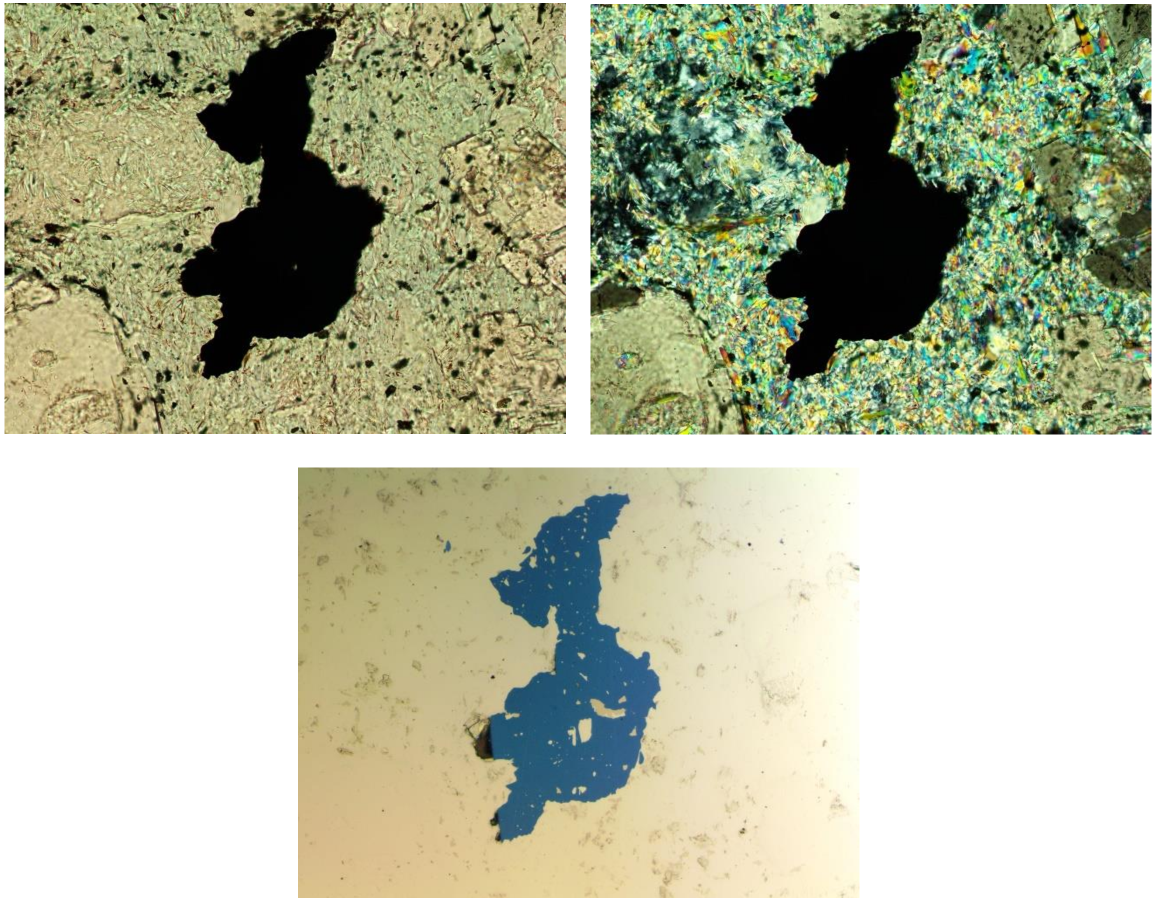
The rock is described as an altered ultramafic with strong carbonate and Cr-mica alteration obtained close to diabase dike. The rock has been silicified and shows evidence of trace disseminated pyrite with growth zones of arsenian pyrite. The metal inventory is associated with compositionally zoned dolomite-ankerite solid solution carbonate.

In terms of metal inventory, the rock hosts disseminated pyrite, arsenian pyrite, chalcopyrite, Ni-S, and As-Fe-Co-Ni-S.

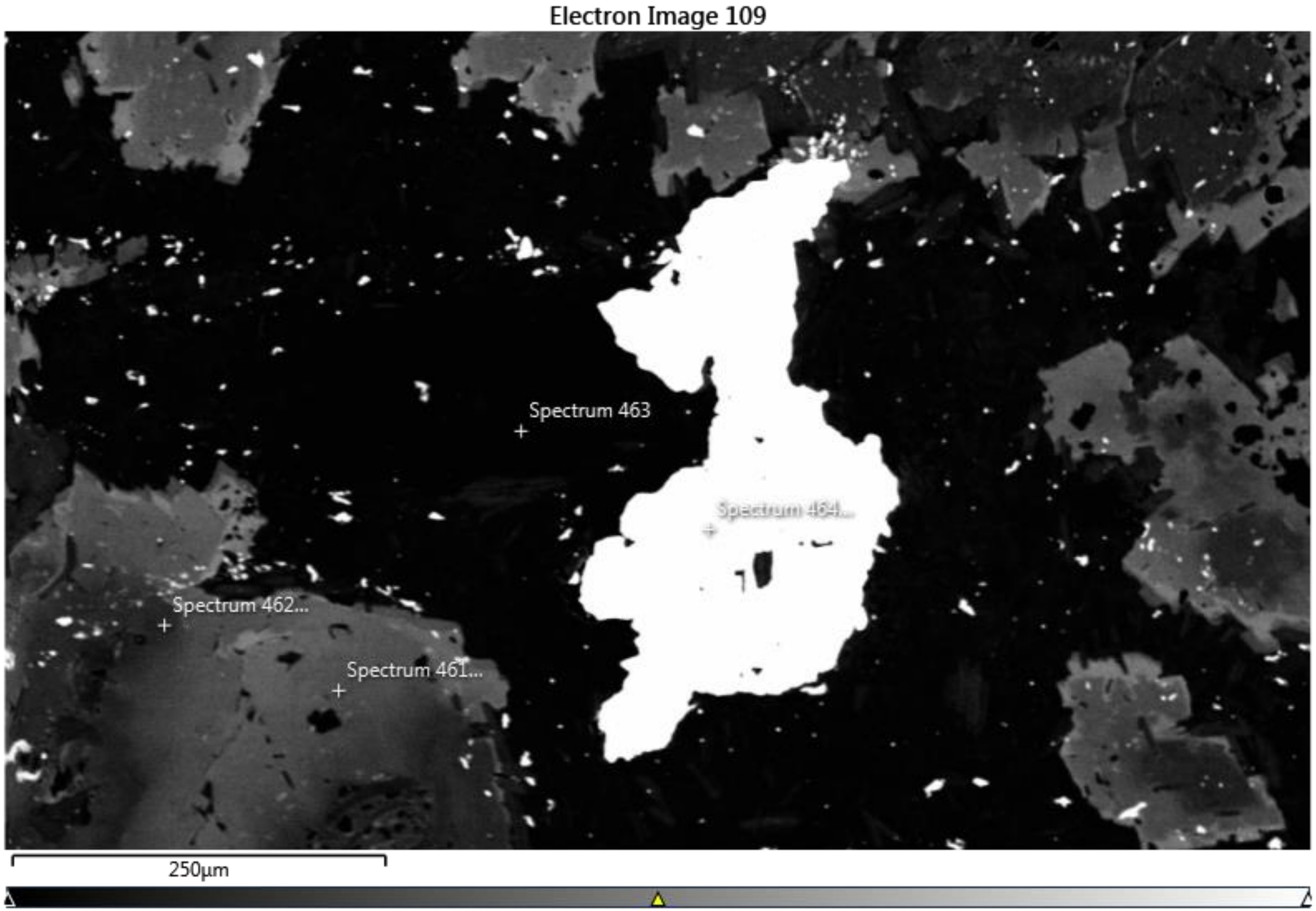




Plane light image (left) and crossed polarized light image (right) illustrating the hydrothermal breccia texture defined by angular fragments of dolomite-ankerite solid solution carbonate and cryptocrystalline fine-grained blue-grey quartz sealed by later solutions of dolomite-ankerite solid solution carbonate. Field of view = 17mm

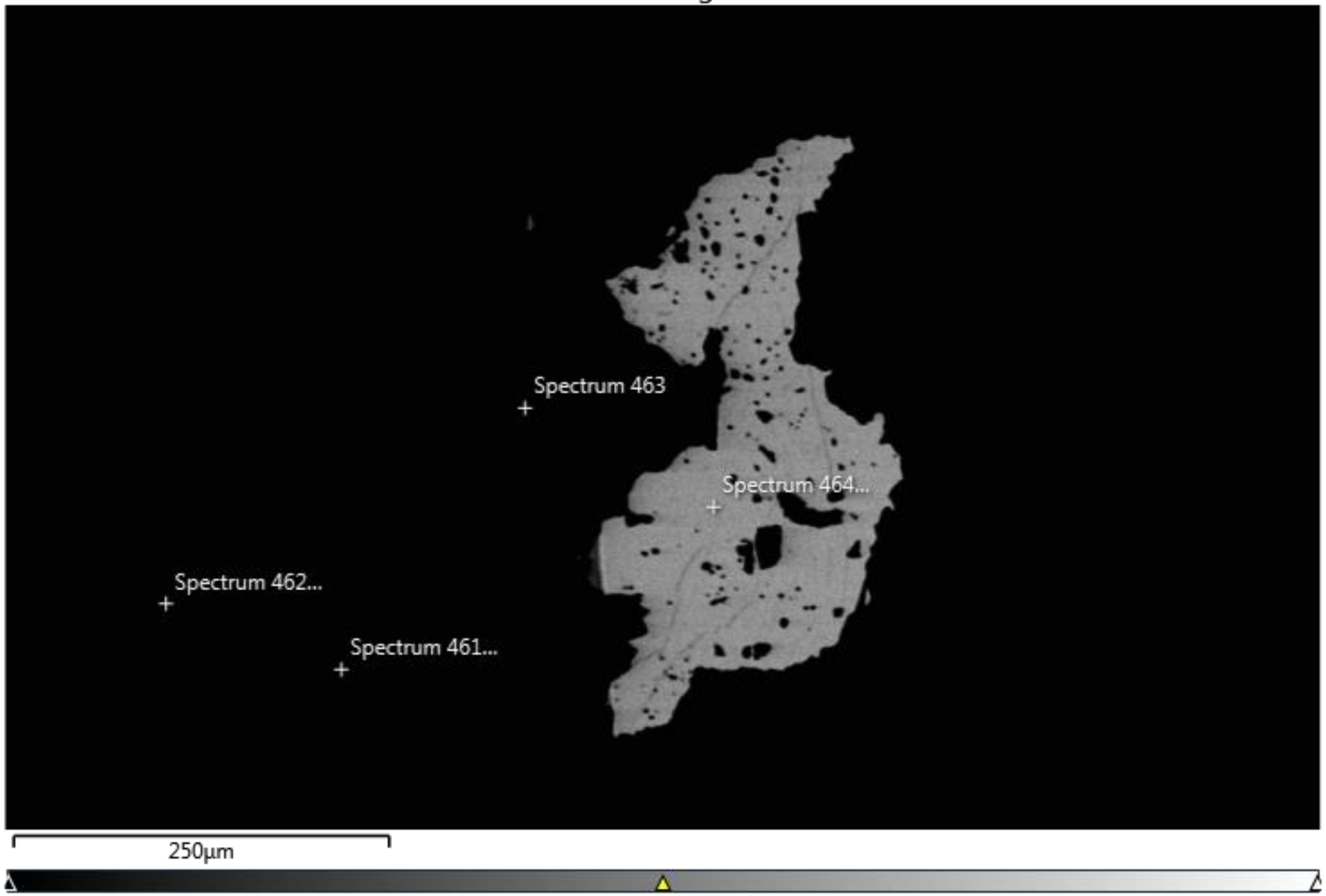


Plane light image (top left) crossed polarized light image (top right) and reflected light image (bottom) illustrating a Ni-S grain within a fragment of dolomite-ankerite solid solution carbonate and quartz. A backscatter image of this field of view is presented below. Field of view = 1.2mm

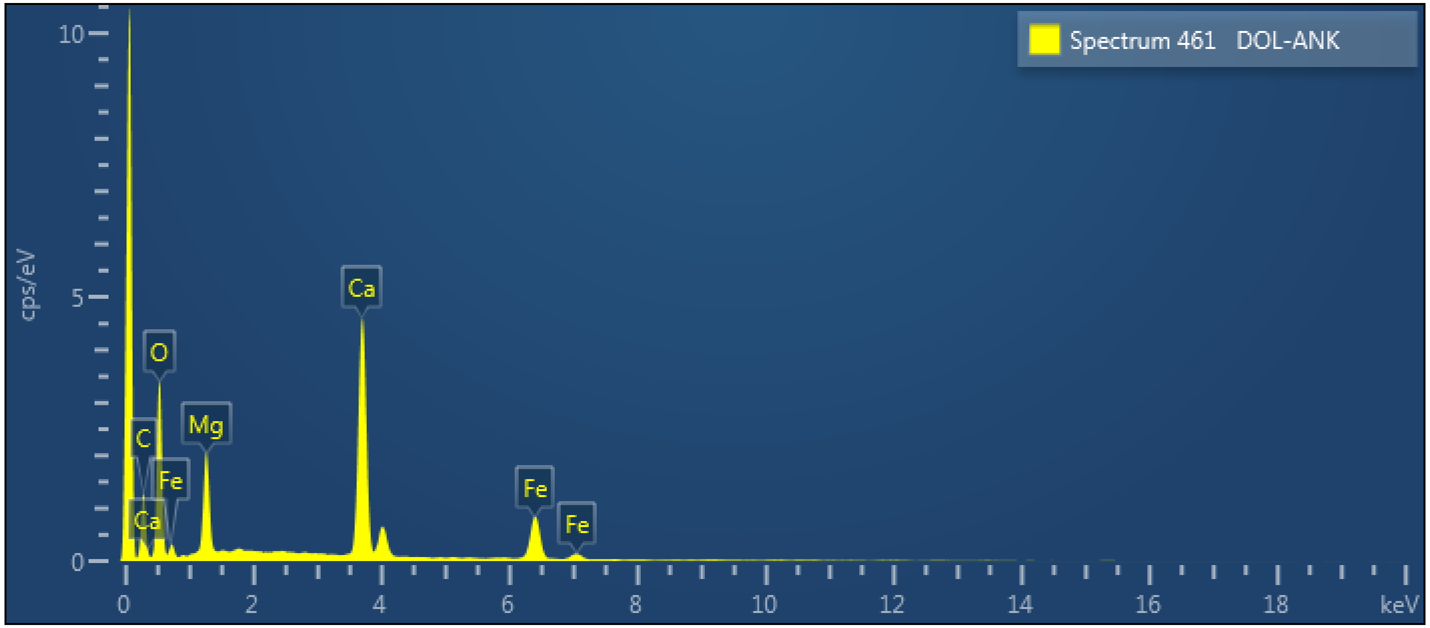


Backscatter image showing the compositional variation of the dolomite-ankerite solid solution carbonate (spectra 461,462) intergrown with fine-grained quartz (spectrum 463) with disseminated grains of Ni-S (spectrum 464).

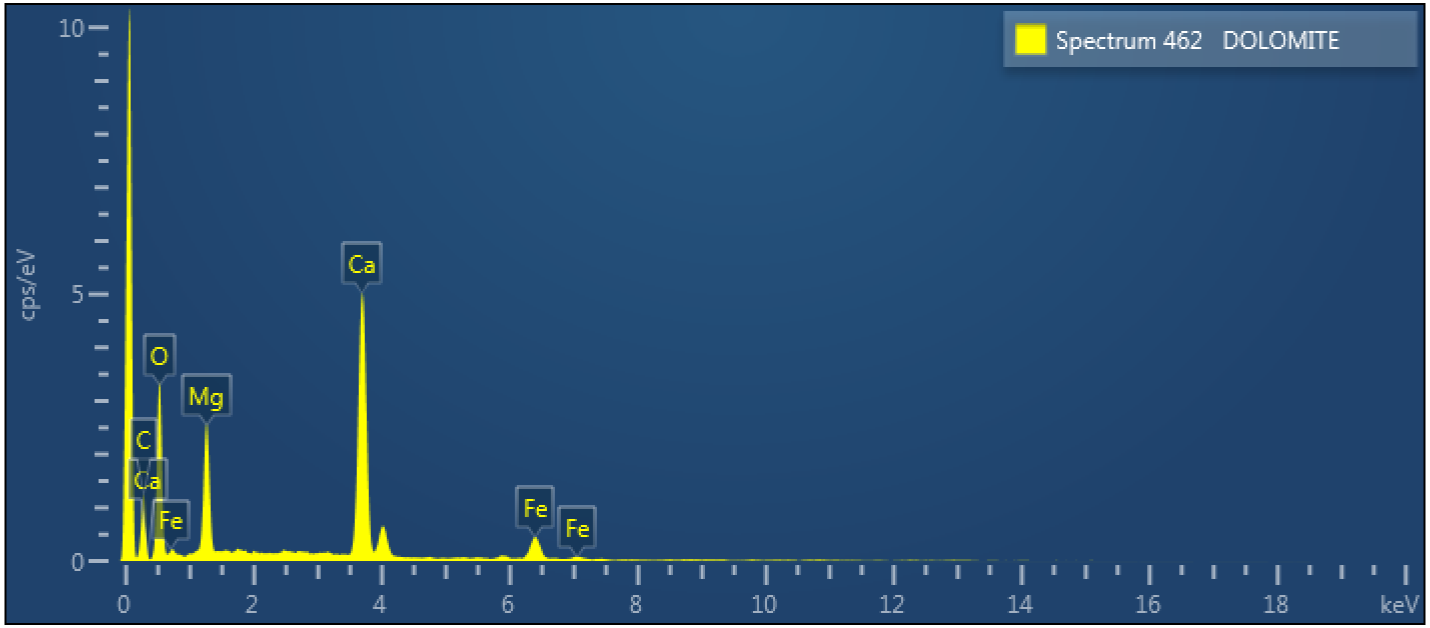
Electron Image 110



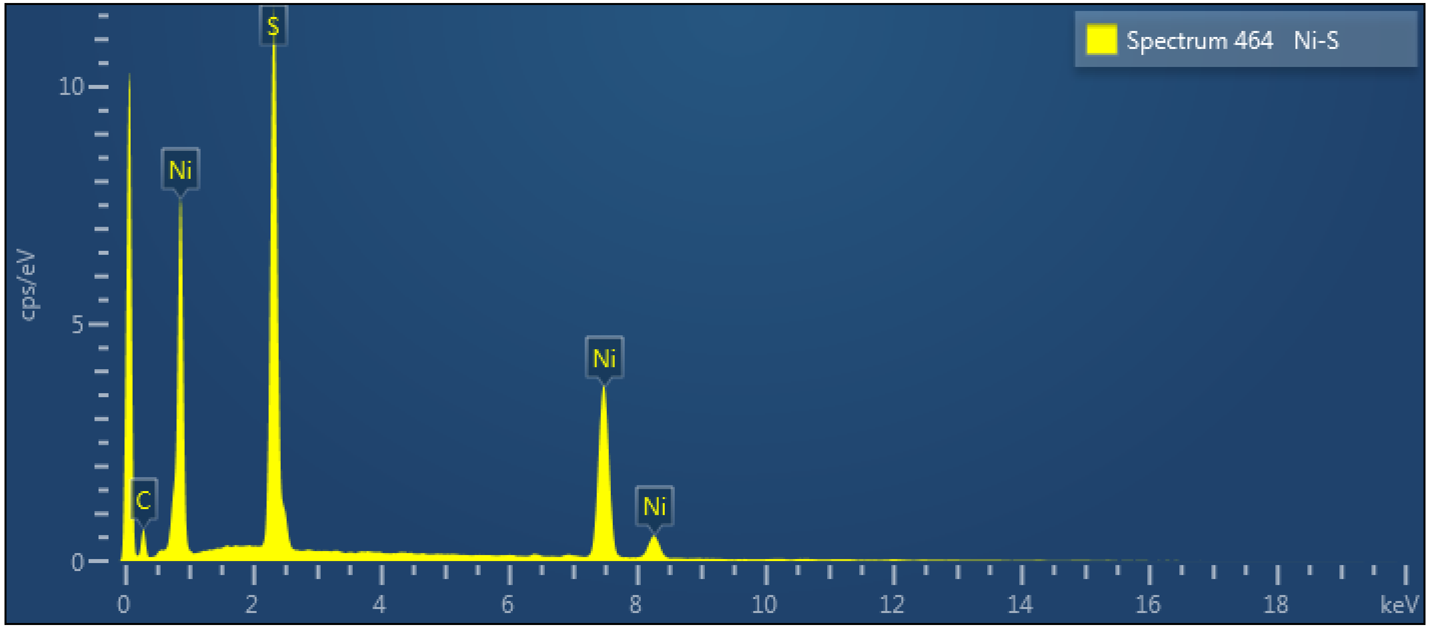
Same image as above illustrating the Ni-S grain.



Spectrum 461 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.43	0.60	50.00			
Mg	K series	13.48	0.46	15.07	MgO	22.35	0.76
Ca	K series	37.33	0.59	25.32	CaO	52.23	0.82
Fe	K series	19.76	0.66	9.61	FeO	25.42	0.84
Total		100.00		100.00		100.00	

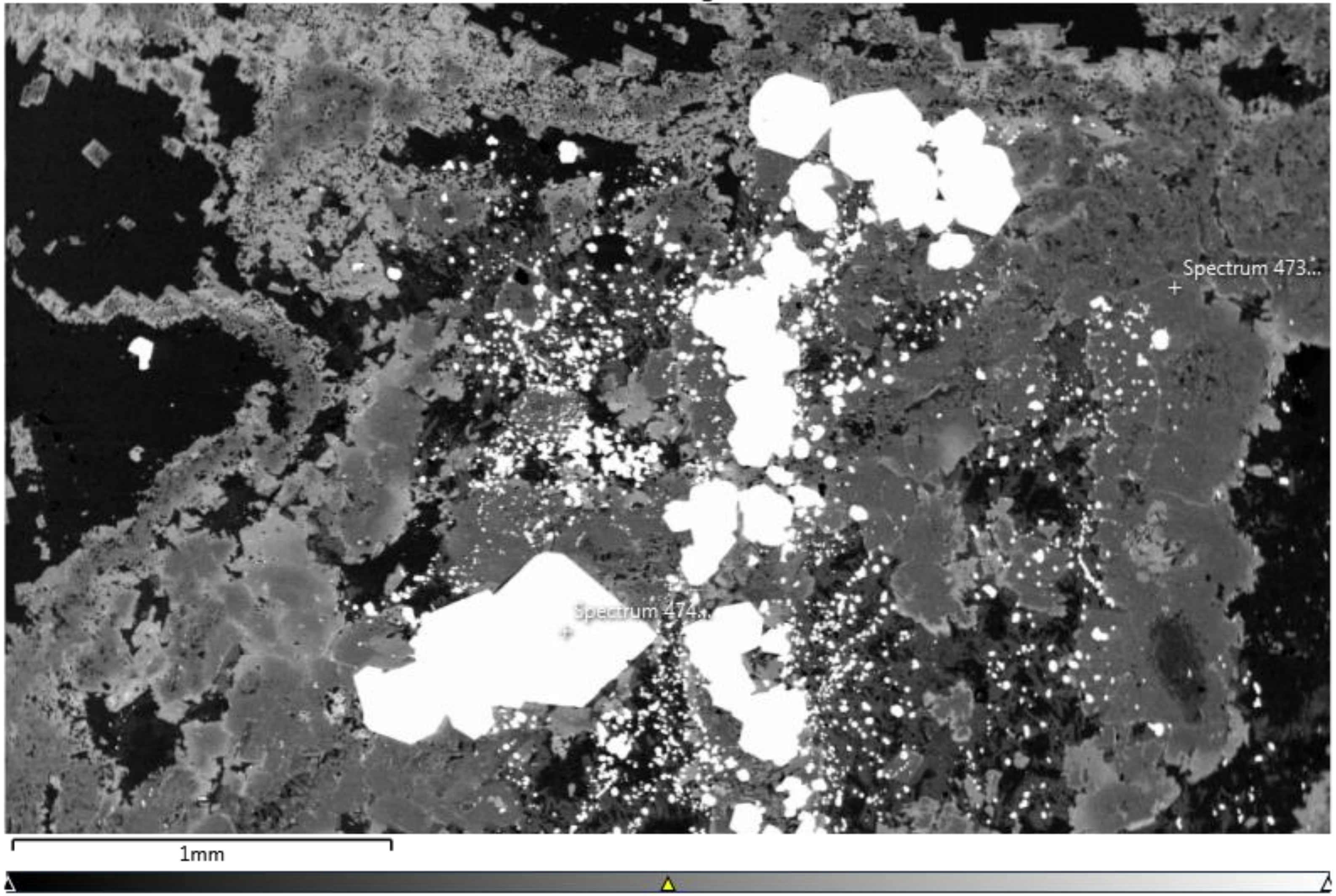


Spectrum 462 DOLOMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.79	0.99	50.00			
Mg	K series	16.74	0.80	17.89	MgO	27.76	1.32
Ca	K series	42.09	1.02	27.28	CaO	58.89	1.43
Fe	K series	10.37	0.98	4.82	FeO	13.34	1.26
Total		100.00		100.00		100.00	

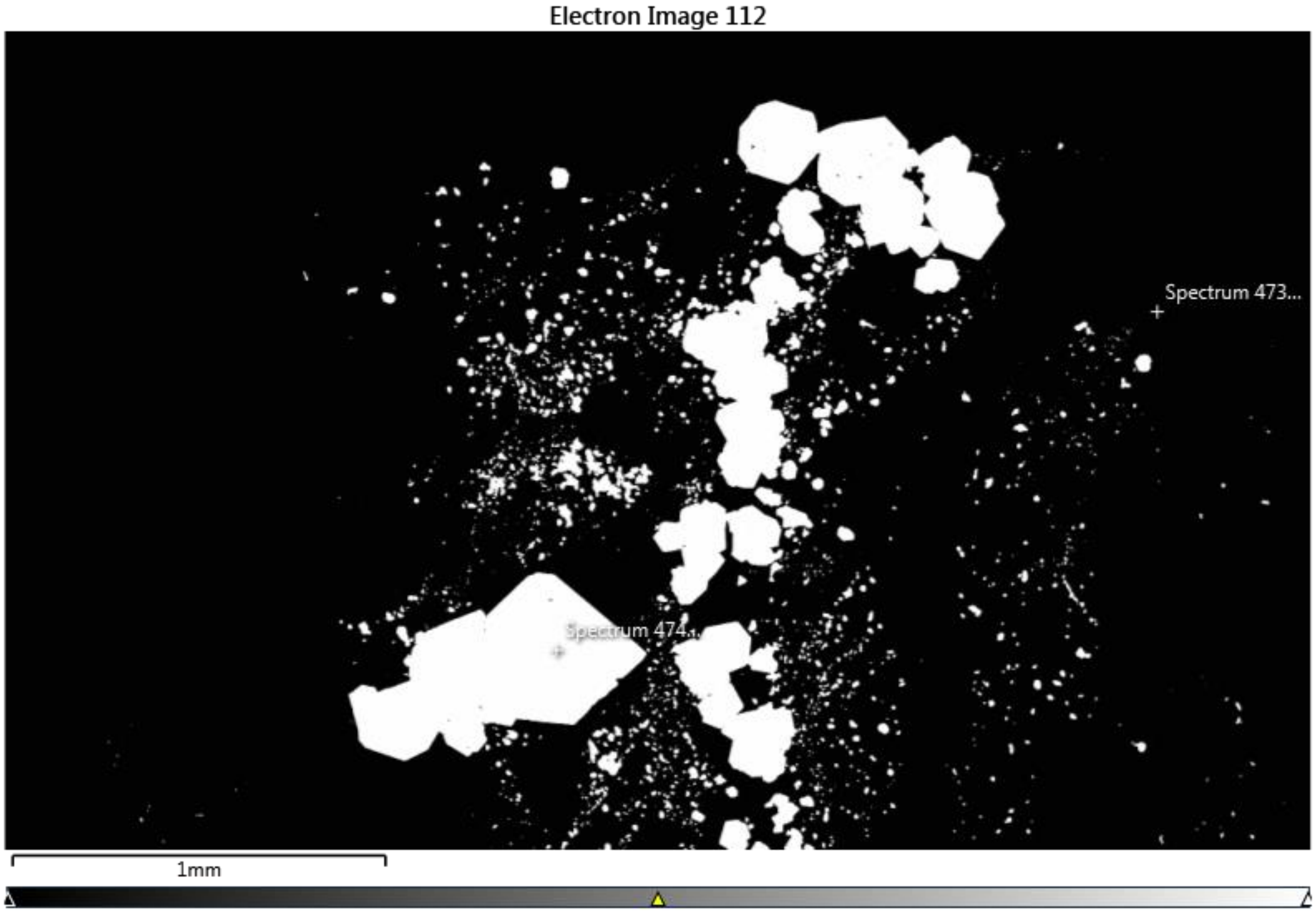


Spectrum 464 Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	37.49	0.49	52.34
Ni	K series	62.51	0.49	47.66
Total		100.00		100.00

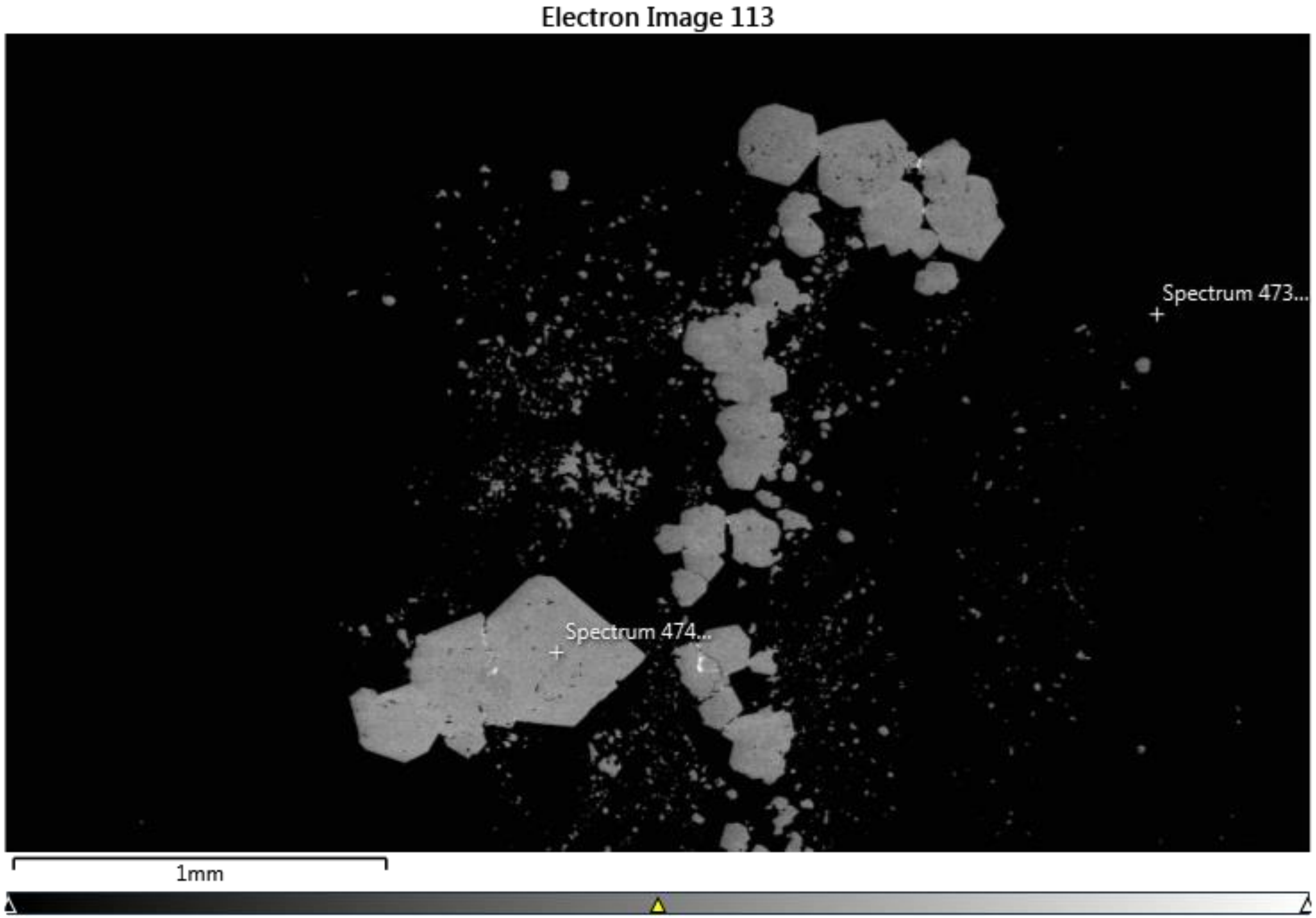
Electron Image 111



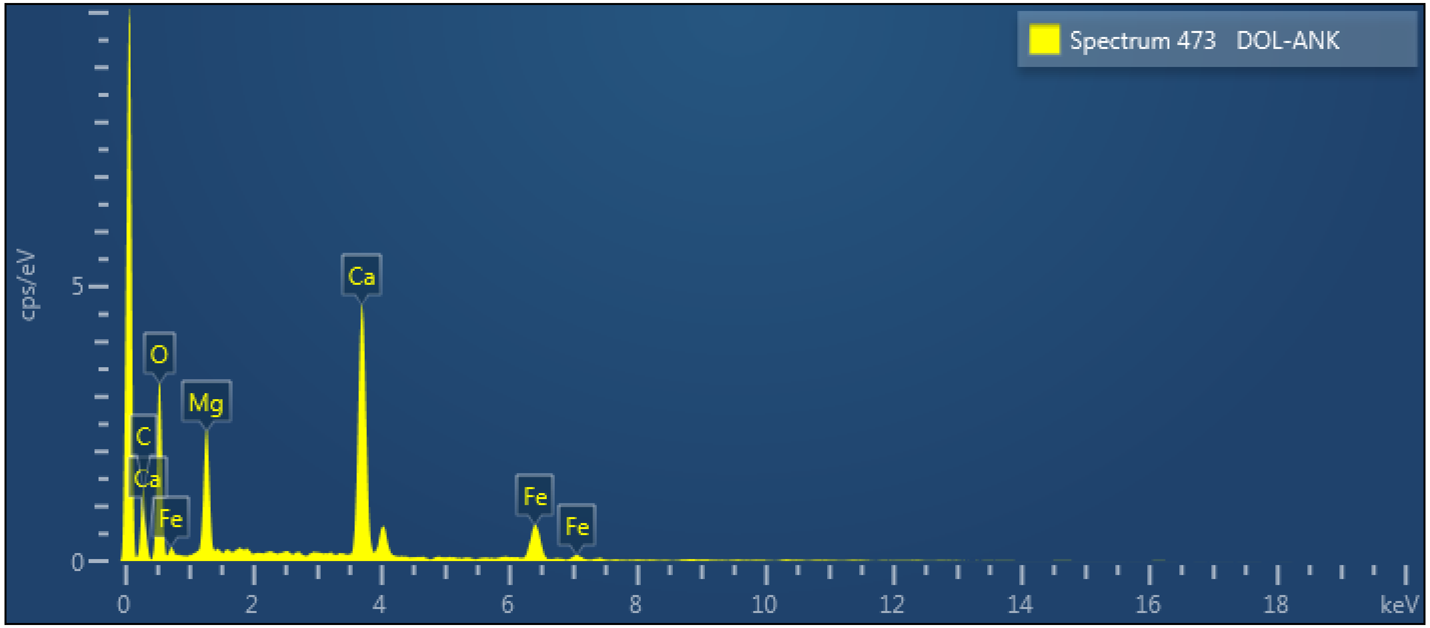
Backscatter image illustrating dolomite-ankerite solid solution carbonate (spectrum 473) associated with fine- to coarse-grained pyrite (spectrum 474).



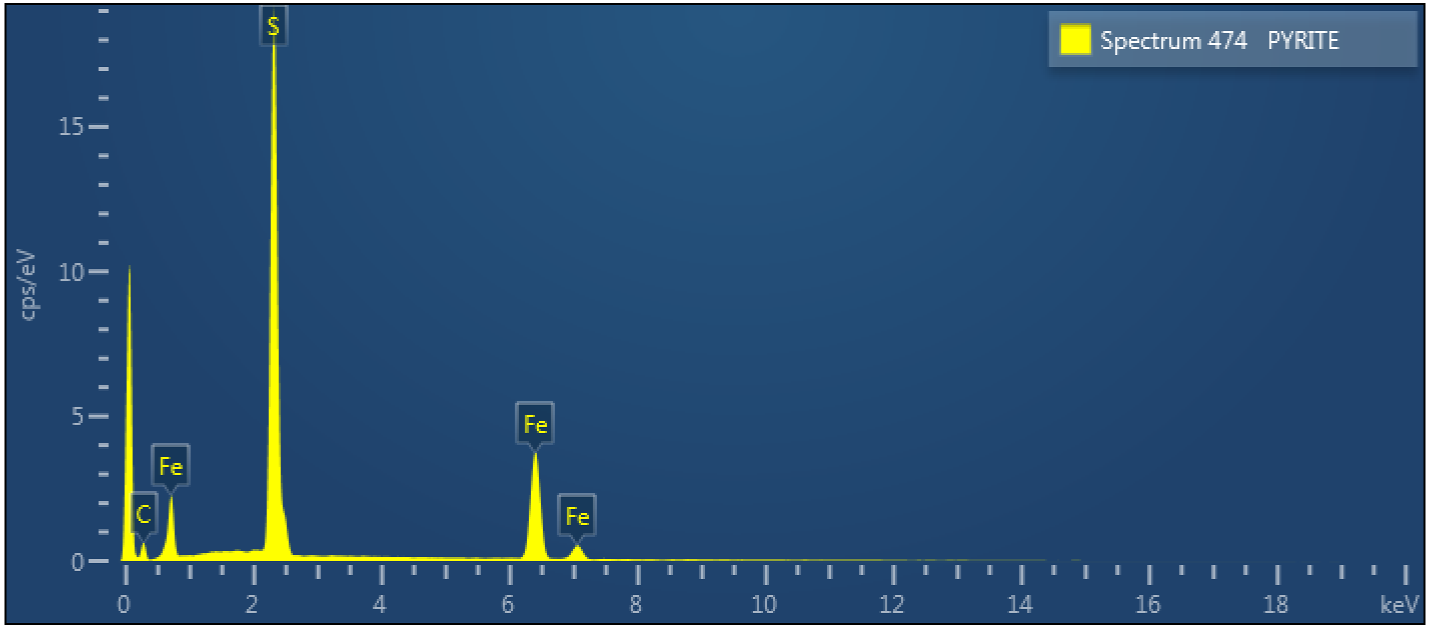
Backscatter image with brightness reduced.



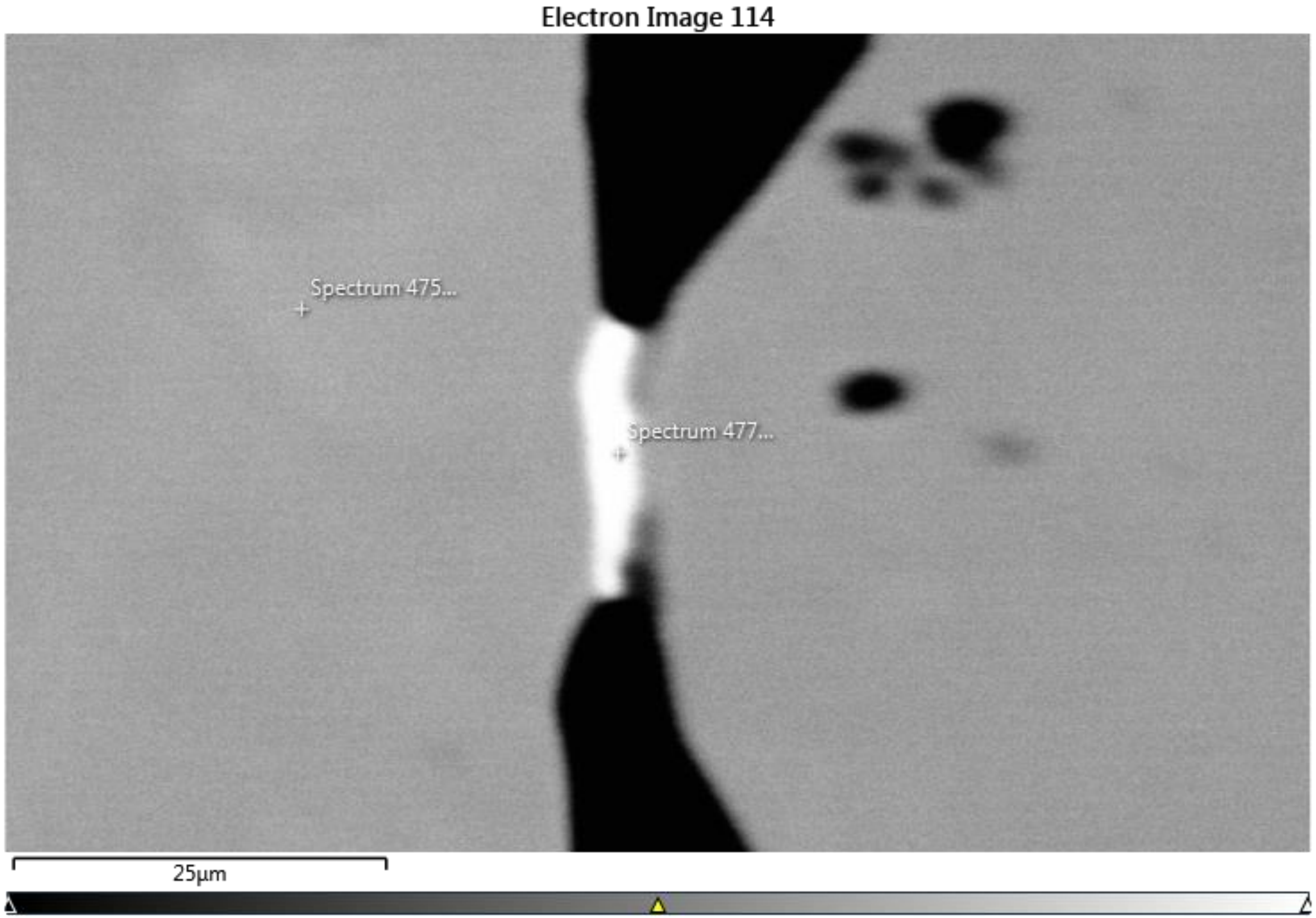
Backscatter image with brightness reduced to illustrate pyrite grains (spectrum 474) with arsenian growth zones hosting bright included grains of As-Fe-Co-Ni-S.



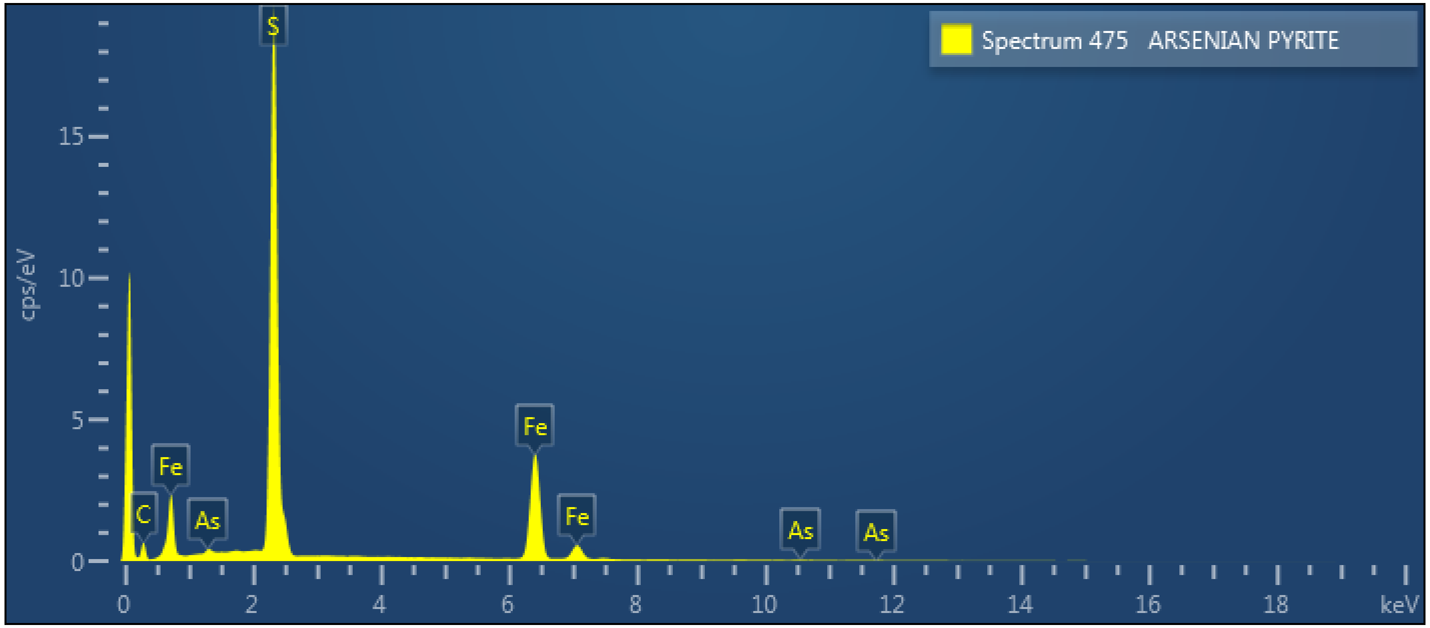
Spectrum 473 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.17	1.01	50.00			
Mg	K series	15.77	0.82	17.20	MgO	26.14	1.35
Ca	K series	38.21	1.01	25.27	CaO	53.46	1.41
Fe	K series	15.86	1.08	7.53	FeO	20.40	1.39
Total		100.00		100.00		100.00	



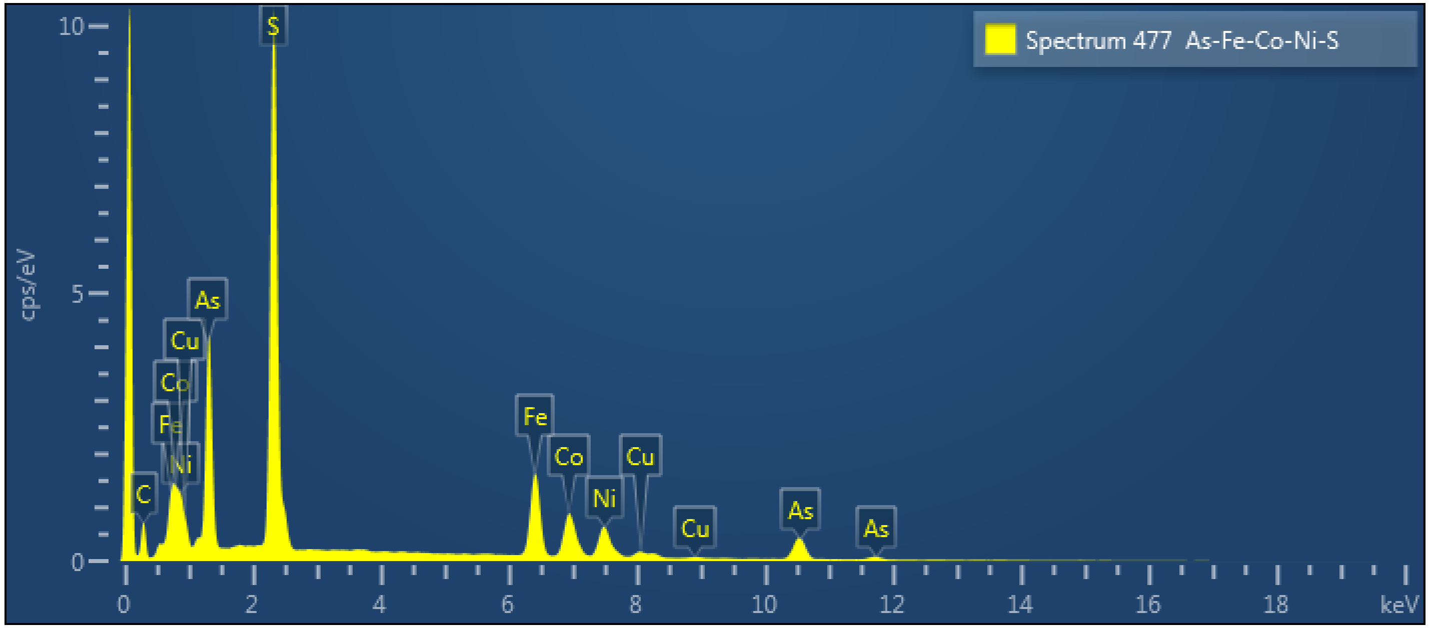
Spectrum 474 PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.94	0.42	67.98
Fe	K series	45.06	0.42	32.02
Total		100.00		100.00



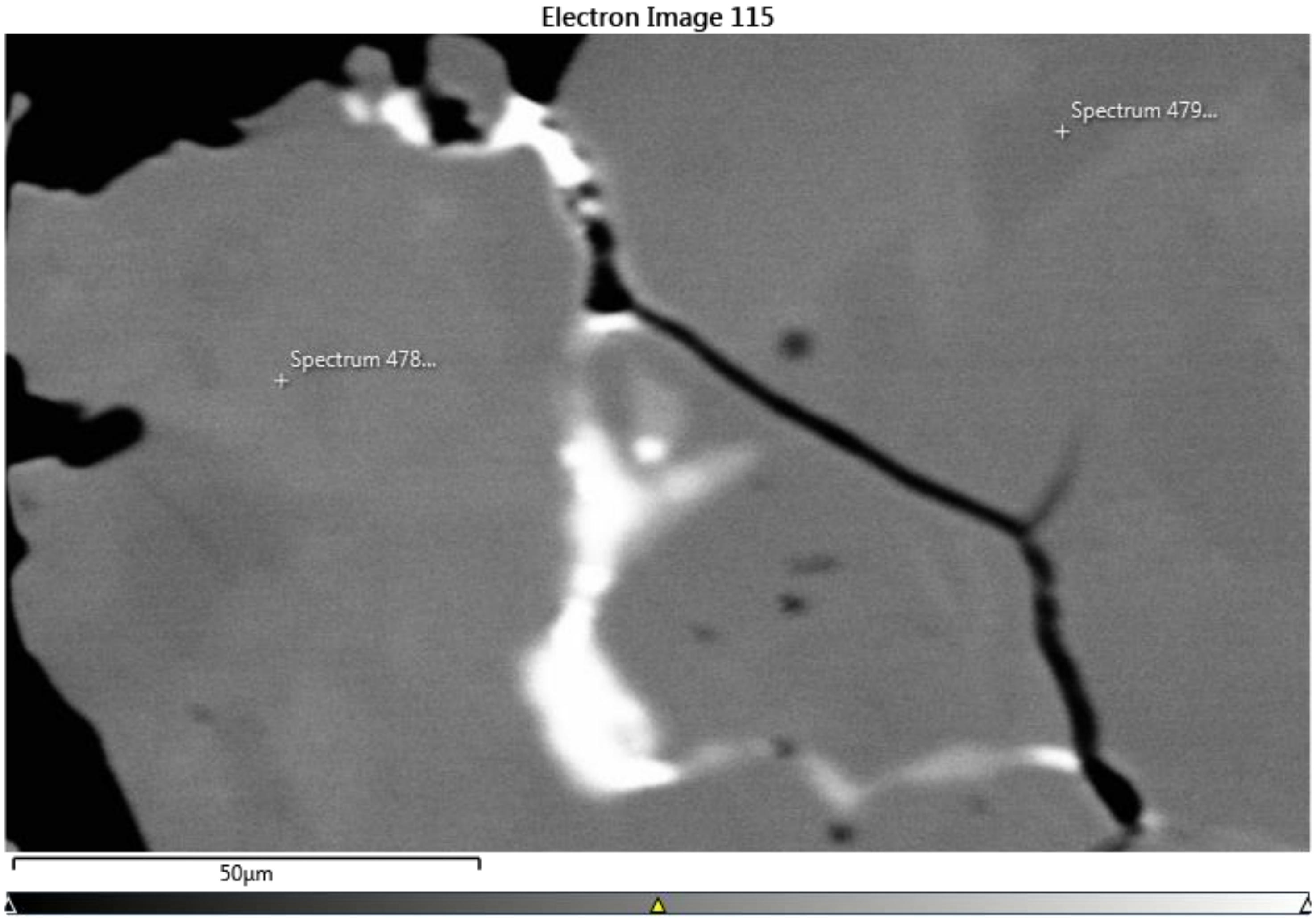
Higher magnification image of arsenian pyrite (spectrum 475) grains with included bright grain of As-Fe-Co-Ni-S (spectrum 477).



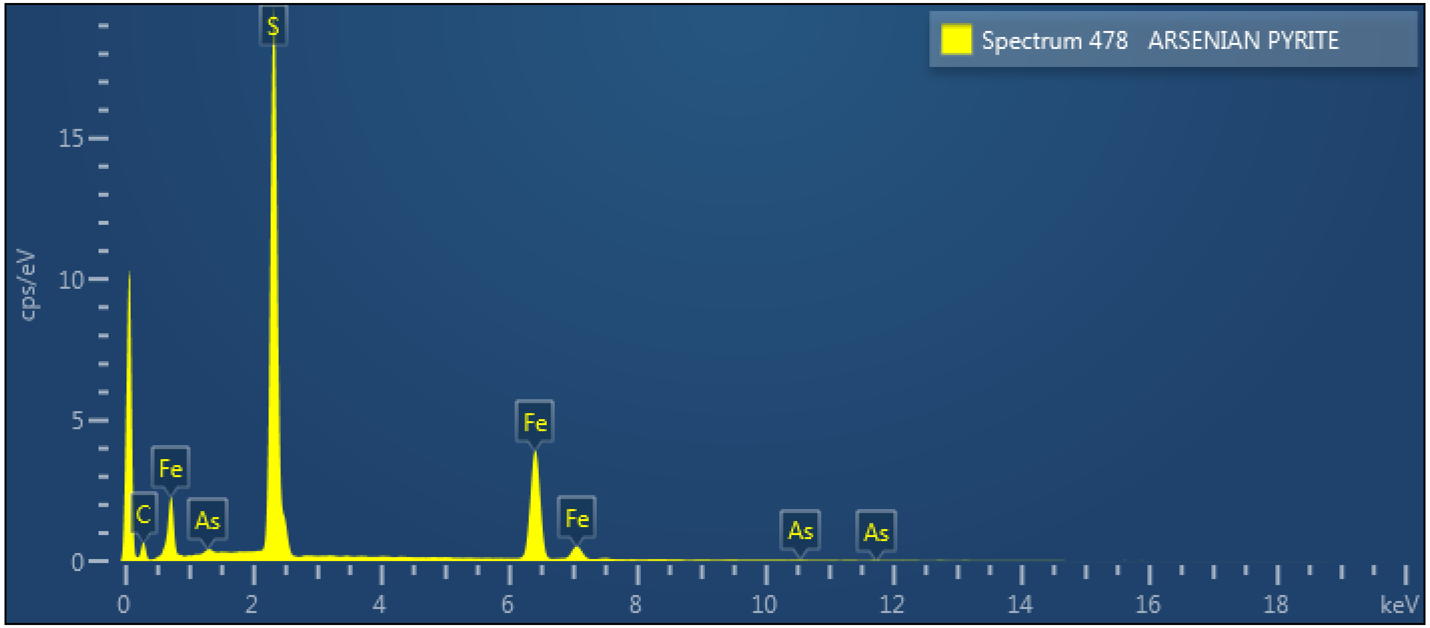
Spectrum 475 ARSENIAN PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.75	0.32	67.94
Fe	K series	44.26	0.32	31.54
As	L series	0.98	0.18	0.52
Total		100.00		100.00



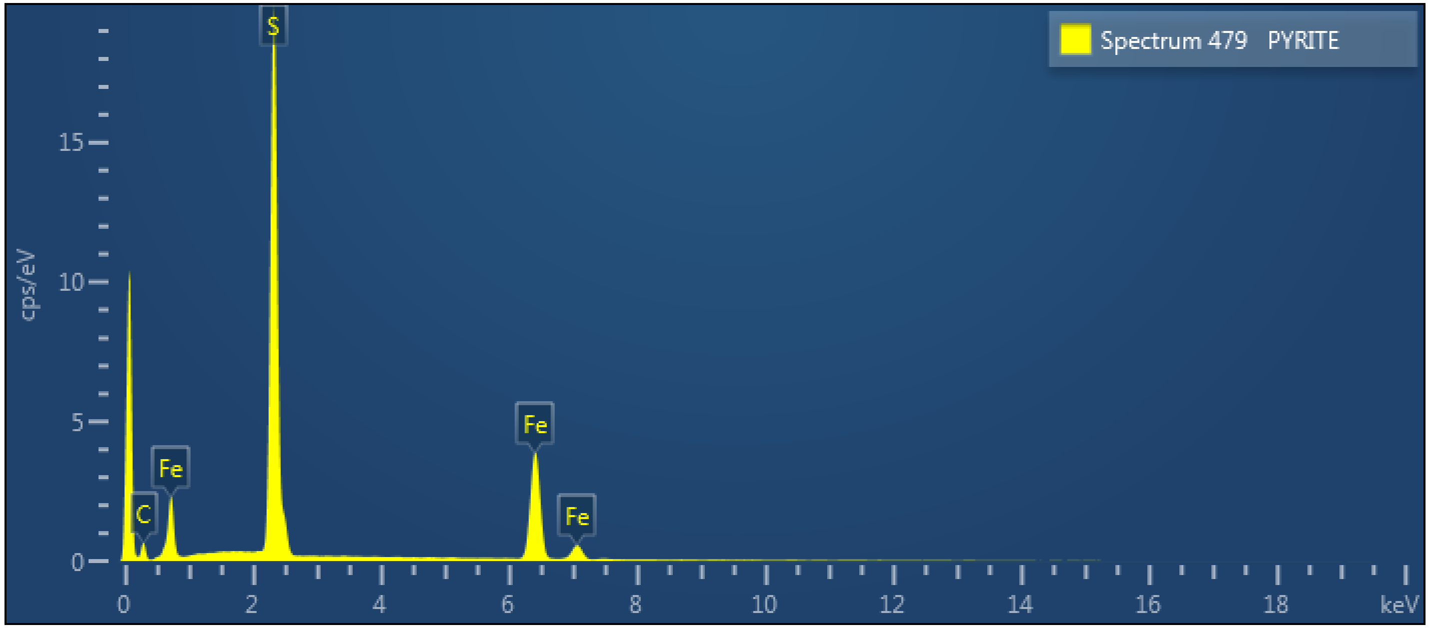
Spectrum 477 As-Fe-Co-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	34.14	0.32	50.58
Fe	K series	17.69	0.30	15.04
Co	K series	11.16	0.30	8.99
Ni	K series	9.56	0.31	7.73
As	L series	25.23	0.36	16.00
Cu	K series	2.22	0.26	1.66
Total		100.00		100.00



Backscatter image of pyrite (spectrum 479) and arsenian pyrite (spectrum 478) with included grains As-Co-Ni-S grains.

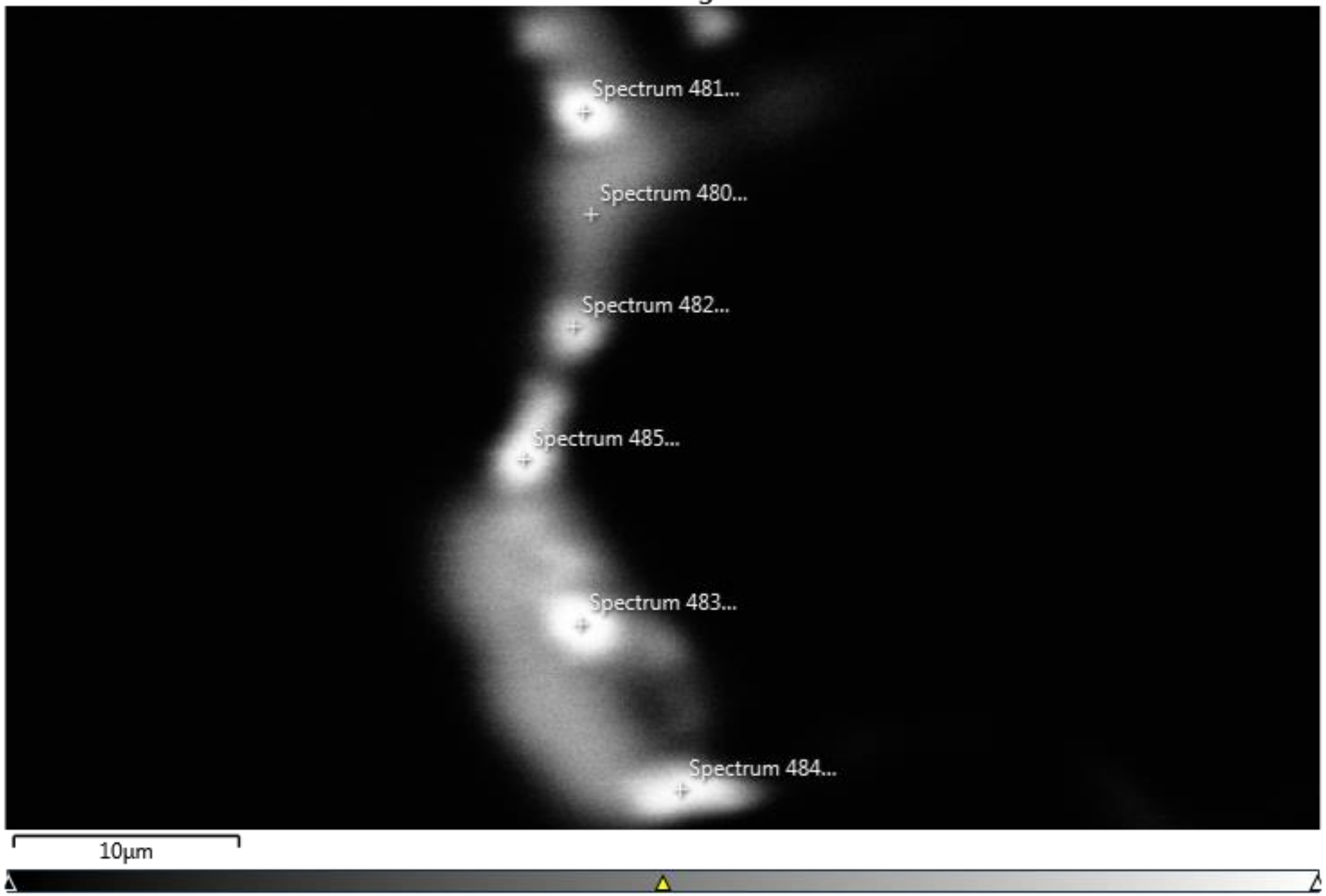


Spectrum 478 ARSENIAN PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	53.96	0.41	67.22
Fe	K series	45.28	0.40	32.38
As	L series	0.75	0.23	0.40
Total		100.00		100.00

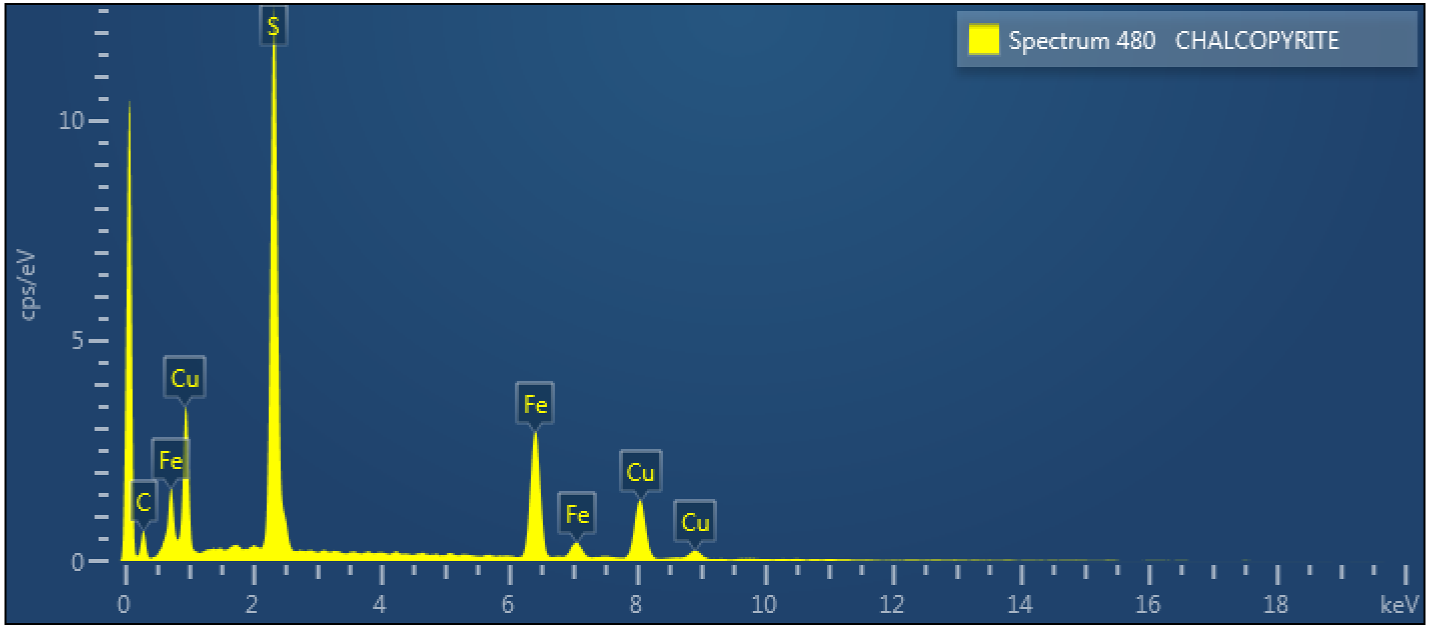


Spectrum 479 PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.71	0.39	67.78
Fe	K series	45.29	0.39	32.22
Total		100.00		100.00

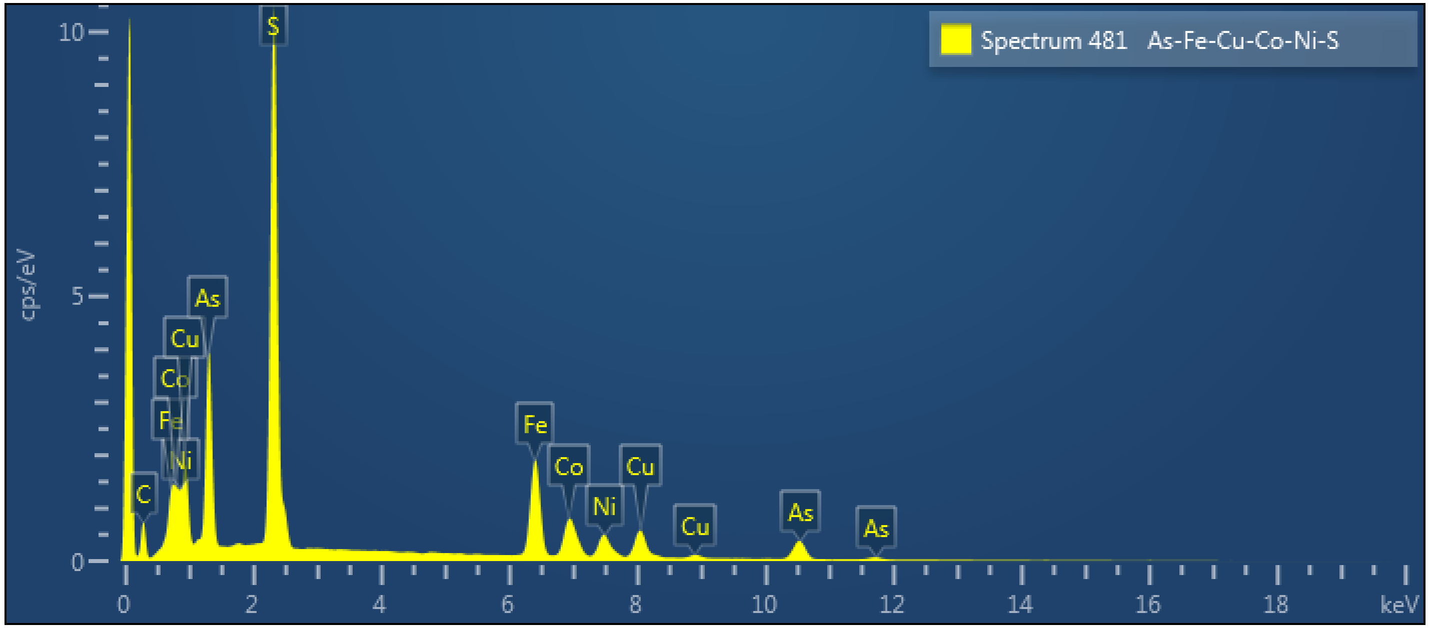
Electron Image 116



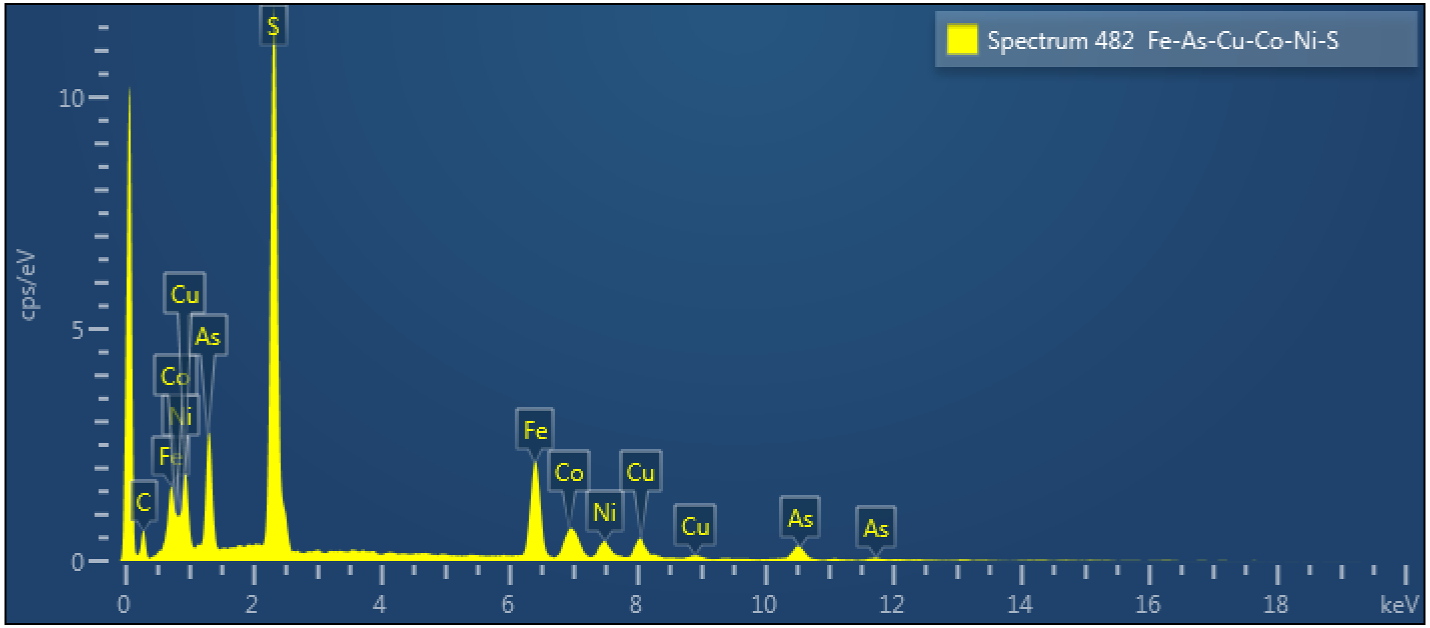
Same image as above with brightness reduced to illustrate chalcopyrite grain (spectrum 480) hosting minute inclusions of As-Co-Ni-S. Unfortunately, the Cu-Fe peaks are due to beam spill-over onto the adjacent chalcopyrite grain.



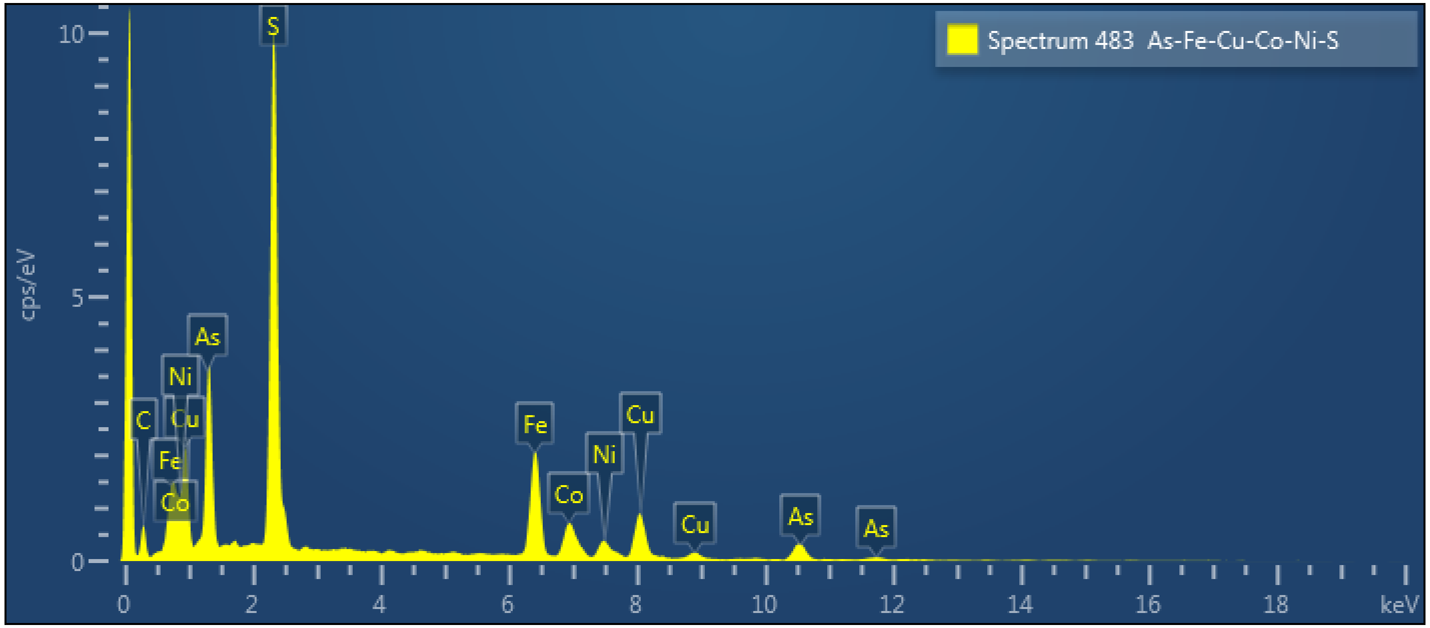
Spectrum 480 CHALCOPYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	38.54	0.82	53.68
Fe	K series	32.20	0.86	25.75
Cu	K series	29.27	1.05	20.57
Total		100.00		100.00



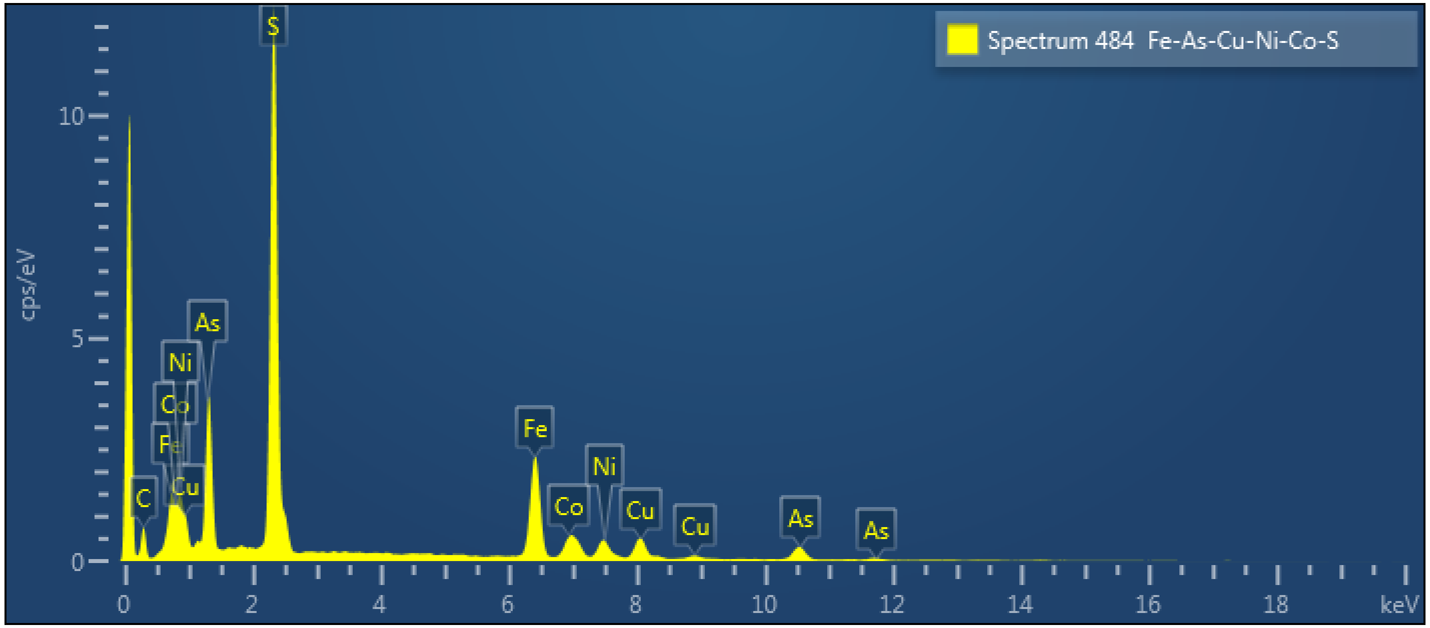
Spectrum 481 As-Fe-Cu-Co-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	32.09	0.24	48.22
Fe	K series	19.13	0.23	16.51
Co	K series	8.76	0.21	7.16
Ni	K series	6.54	0.20	5.37
Cu	K series	10.47	0.25	7.94
As	L series	23.01	0.27	14.80
Total		100.00		100.00



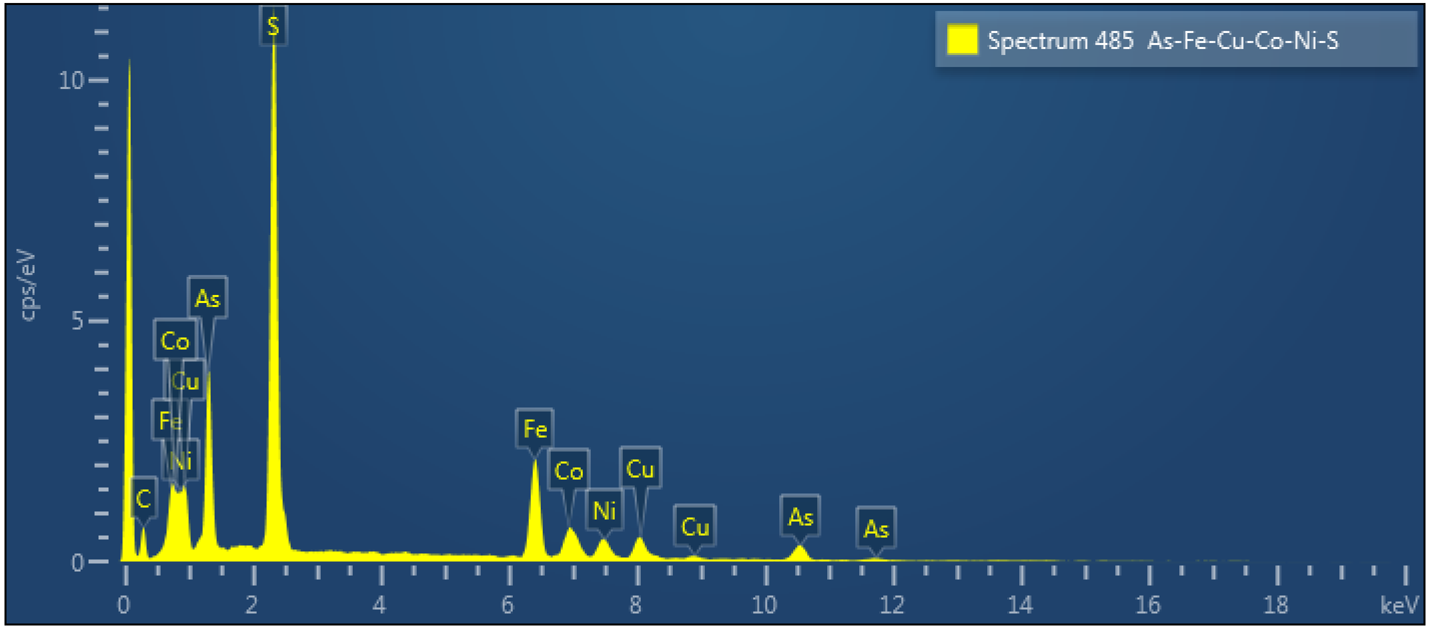
Spectrum 482 Fe-As-Cu-Co-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	37.31	0.94	53.48
Fe	K series	22.93	0.90	18.87
As	L series	17.11	0.92	10.50
Co	K series	6.97	0.79	5.44
Ni	K series	6.38	0.74	4.99
Cu	K series	9.29	0.92	6.72
Total		100.00		100.00



Spectrum 483 As-Fe-Cu-Co-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	29.69	0.77	45.42
Fe	K series	19.65	0.77	17.26
Co	K series	7.62	0.67	6.34
Cu	K series	16.61	0.94	12.82
As	L series	21.61	0.93	14.14
Ni	K series	4.82	0.62	4.02
Total		100.00		100.00



Spectrum 484 Fe-As-Cu-Ni-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	36.26	0.66	52.62
Fe	K series	23.00	0.64	19.16
Cu	K series	9.36	0.64	6.85
As	L series	20.40	0.68	12.67
Co	K series	5.12	0.50	4.04
Ni	K series	5.87	0.53	4.65
Total		100.00		100.00

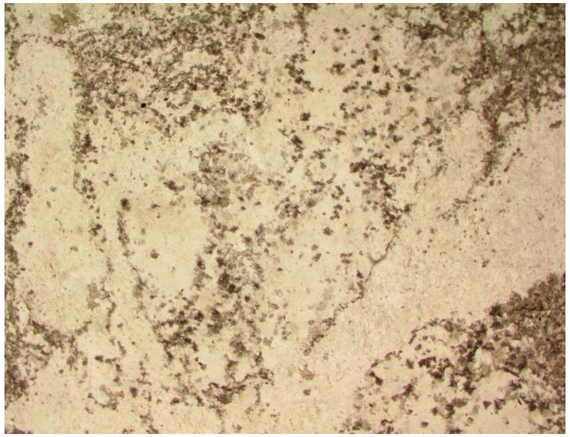


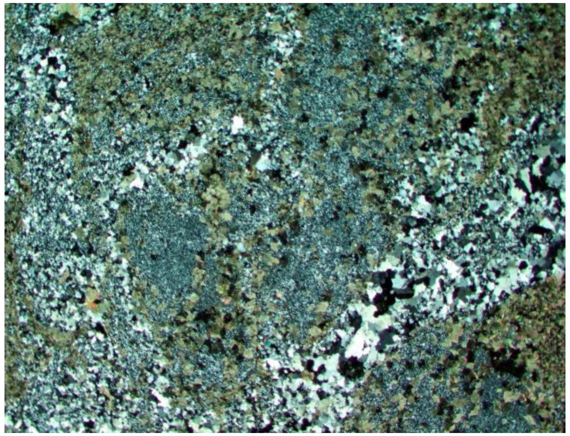
Spectrum 485 As-Fe-Cu-Co-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	34.47	0.79	50.80
Fe	K series	21.59	0.76	18.26
Ni	K series	6.29	0.65	5.06
Cu	K series	8.70	0.80	6.47
As	L series	22.22	0.86	14.01
Co	K series	6.73	0.67	5.40
Total		100.00		100.00

Specimen Notes for 'MID-17'

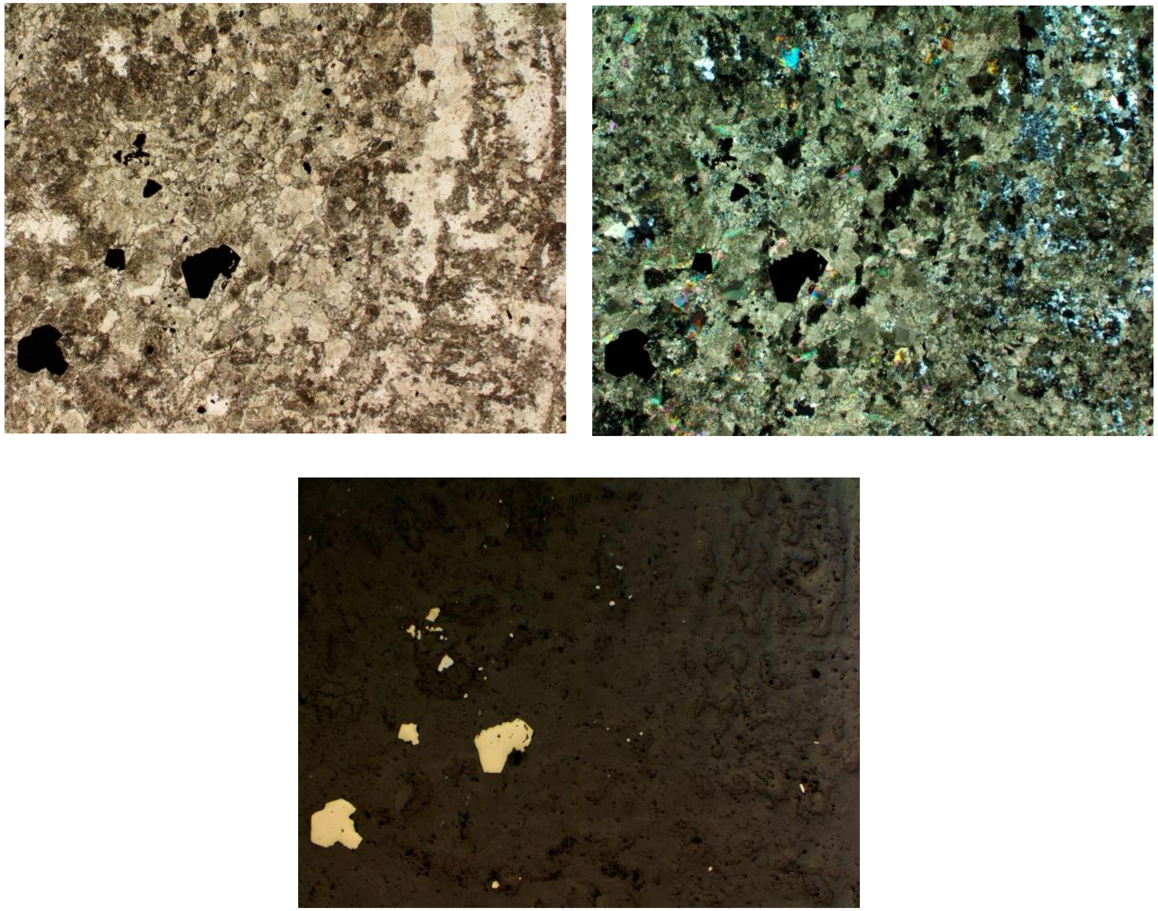
The rock was obtained from the bottom of the Laroma Prospect. The rock is an altered ultramafic which has undergone numerous brecciation and sealing events. The rock is dominated by fragments of dolomite-ankerite solid solution carbonate and fine-grained sugary cryptocrystalline quartz. The fragments are sealed by dolomite-ankerite solid solution carbonate subsequently brecciated and resealed by coarse-grained quartz. The fine- to medium grained sulphides are associated with the earlier carbonate alteration.

The metal inventory is comprised of pyrite and arsenian pyrite, Ni-As-S, Ni-As-Sb-Co-S, and Ni-As-Co-S.



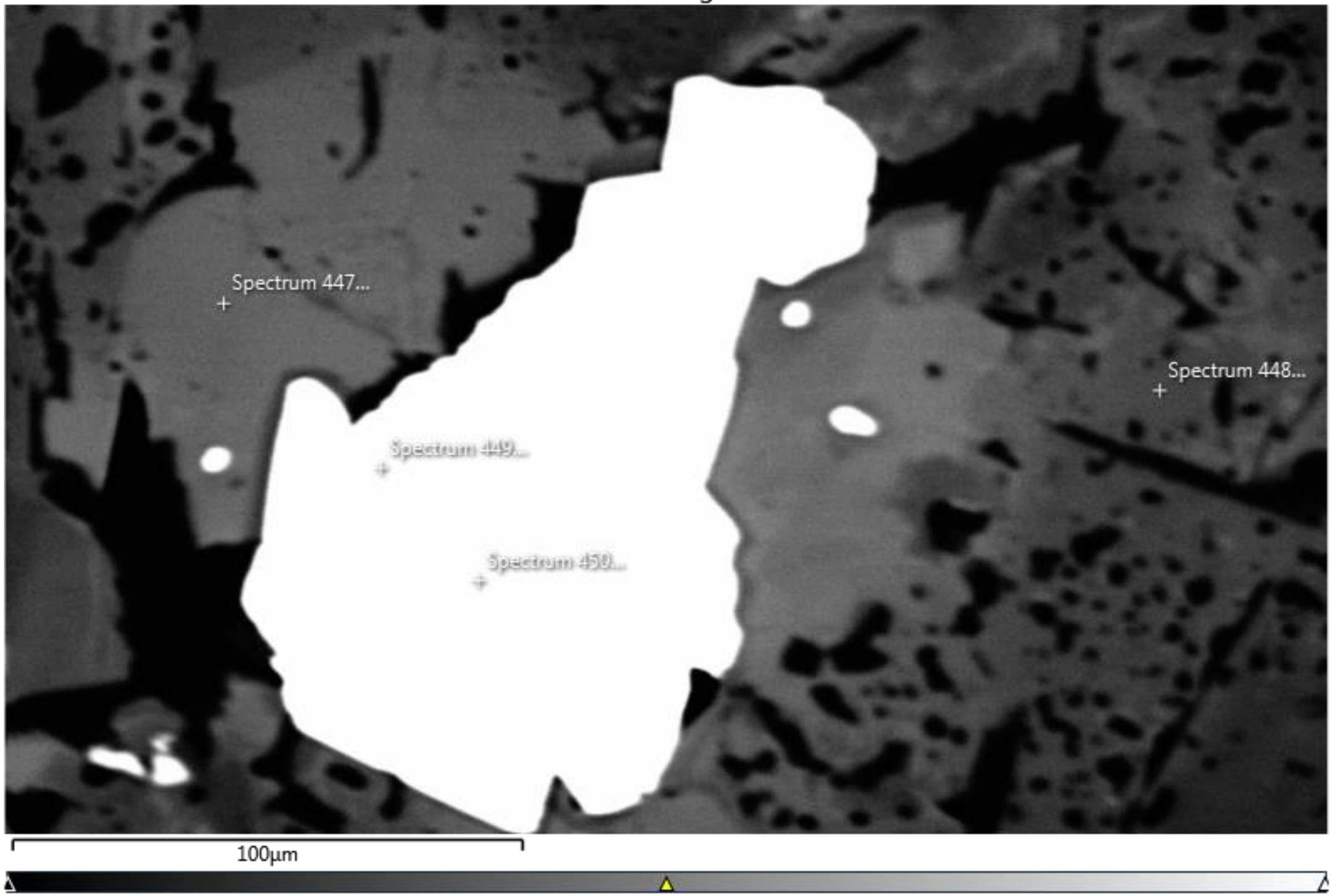


Plane light image (left) and crossed polarized light image (right) illustrating fragments of fine-grained birefringent grey-blue quartz sealed by an early dolomite ankerite solid solution carbonate hosting sulphides. The rock was subsequently re-brecciated and sealed by a coarser-grained multigranular first-order birefringent quartz. Field of view = 17mm



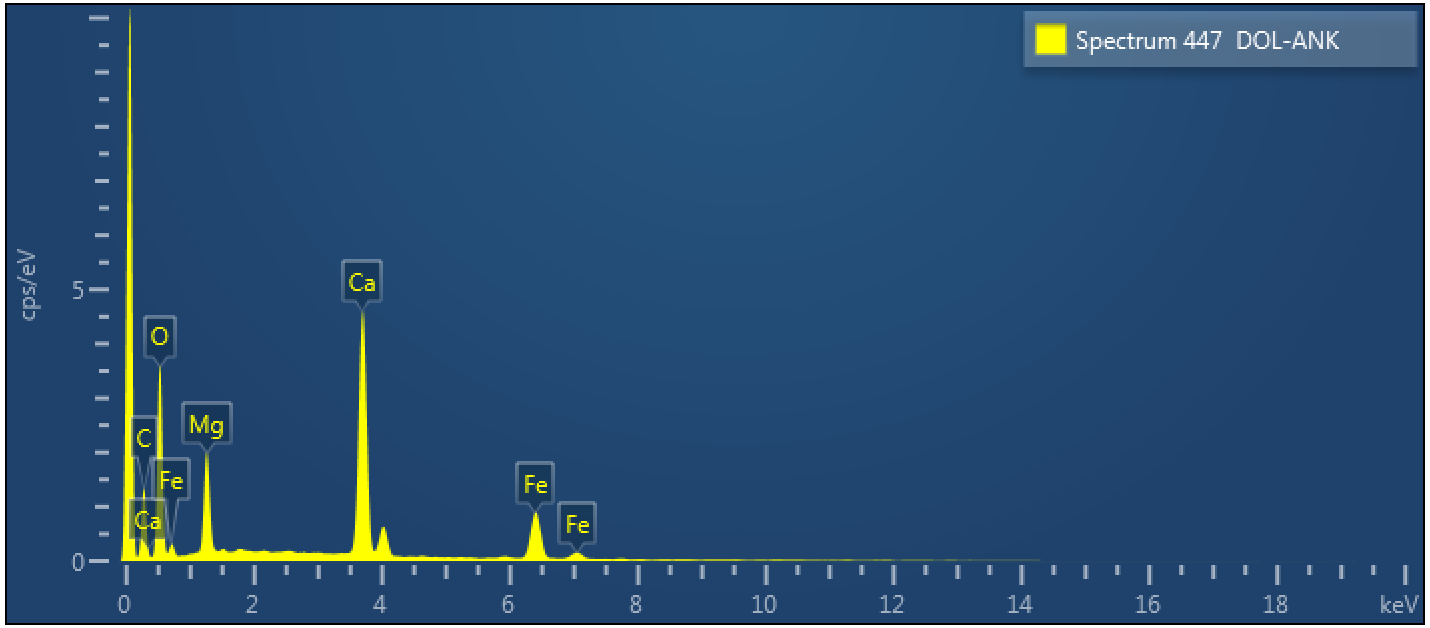
Plane light image (top left) crossed polarized light image (top right), and reflected light image (bottom) illustrating the sulphide association with the earlier dolomite-ankerite solid solution carbonate. Field of view = 9mm

Electron Image 105

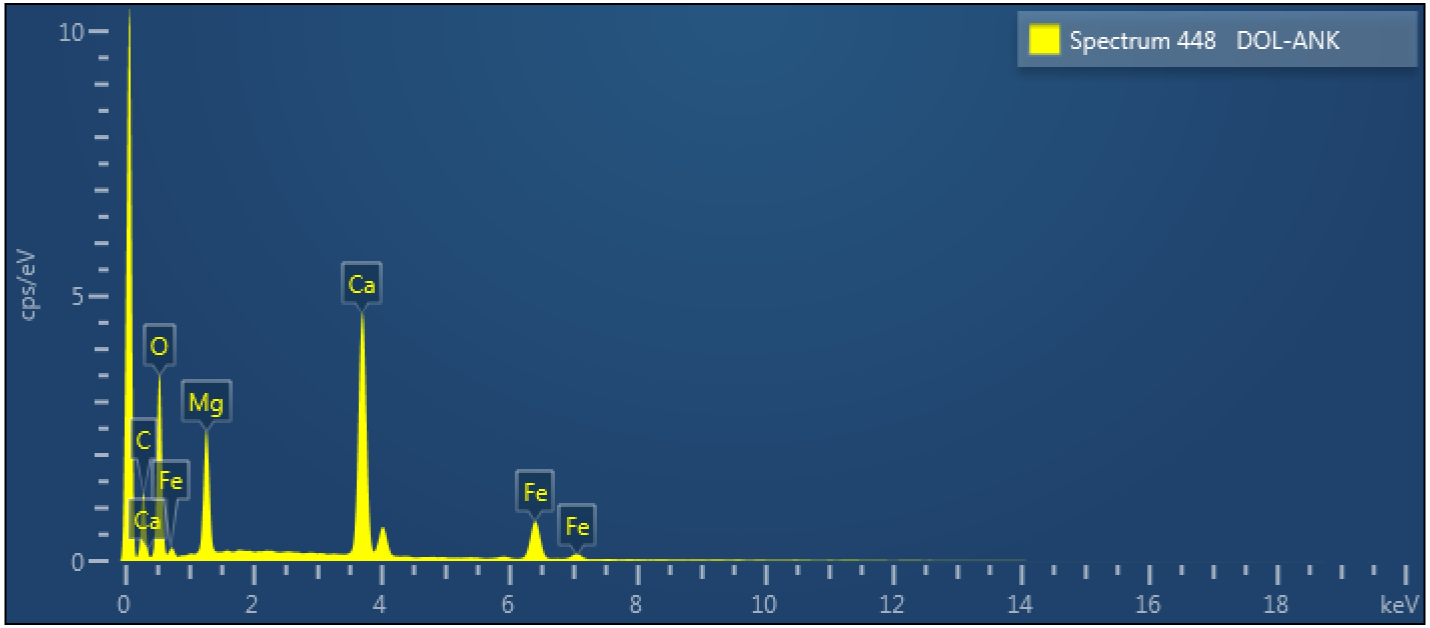


Backscatter image of dolomite-ankerite solid solution carbonate (spectra 447, 448) hosting disseminated grains of Ni-As-Co-S (spectrum 449) and Ni-As-Sb-Co-S (spectrum 450).

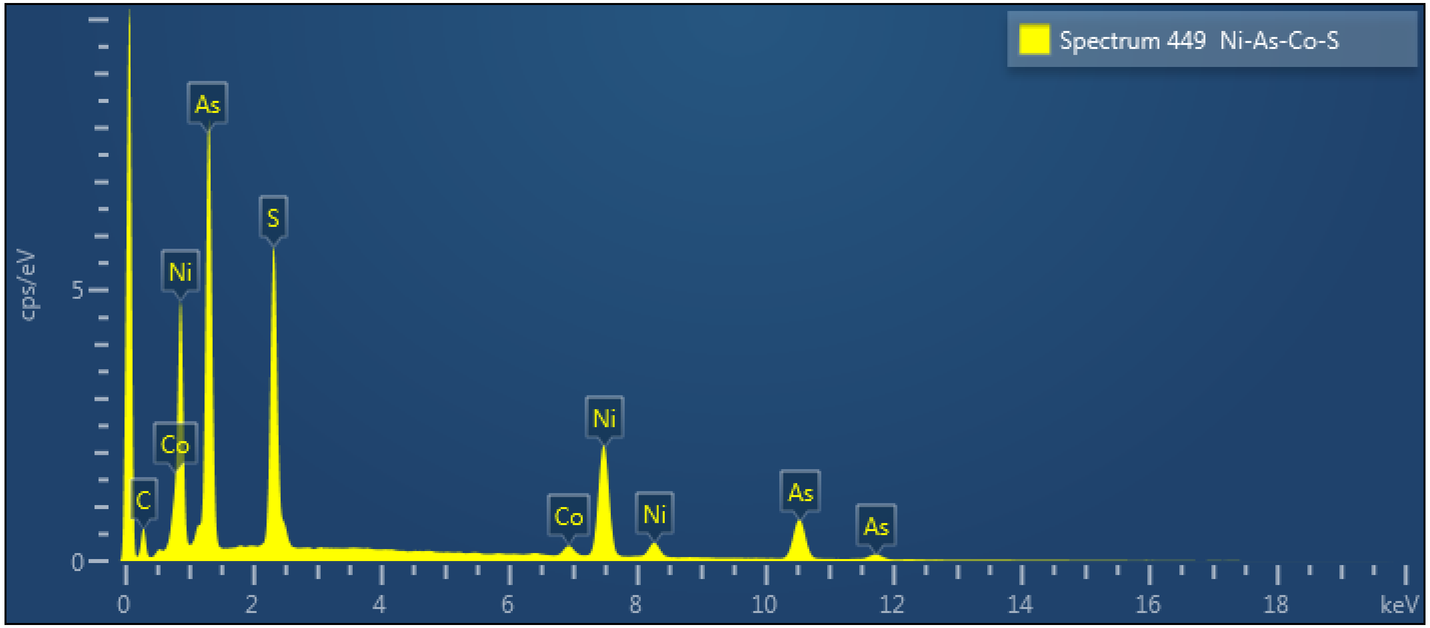
Same image as above with brightness reduced to illustrate the compositional variation within the sulphide grain with areas of Ni-As-Co-S (spectrum 449) and Ni-As-Sb-Co-S (spectrum 450).



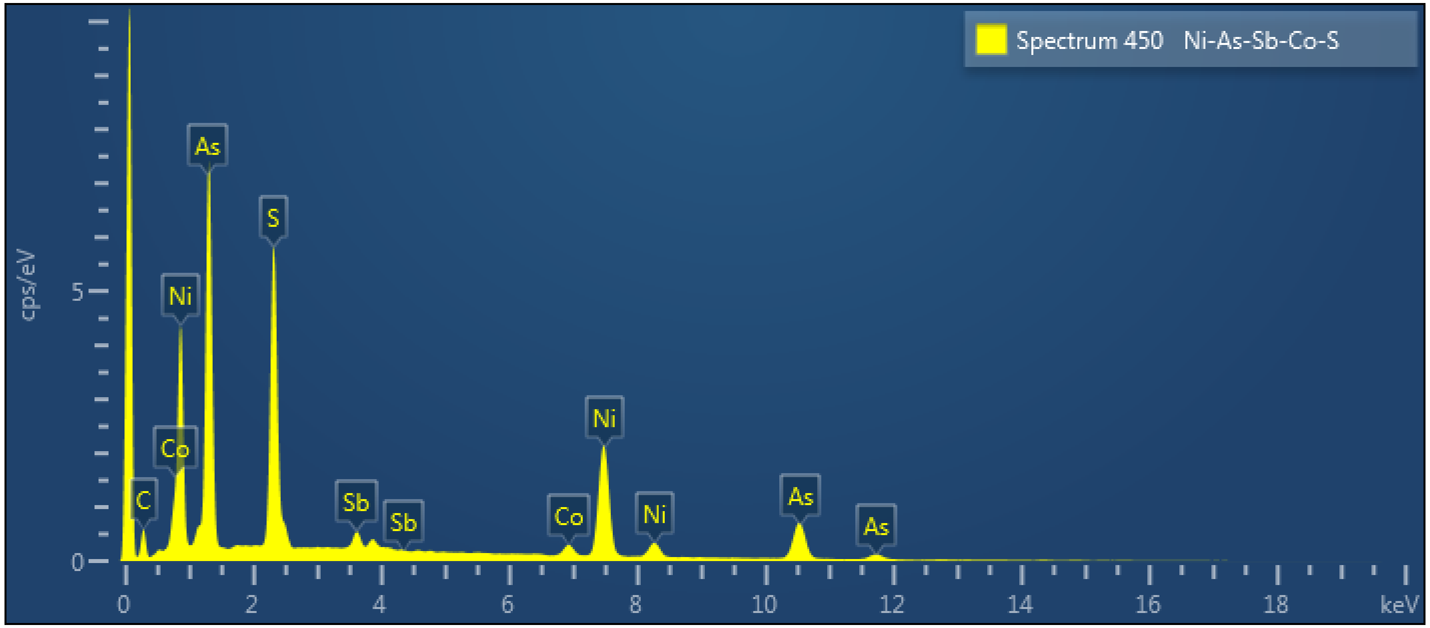
Spectrum 447 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.32	0.57	50.00			
Mg	K series	13.30	0.43	14.93	MgO	22.06	0.72
Ca	K series	36.66	0.56	24.95	CaO	51.30	0.79
Fe	K series	20.71	0.64	10.12	FeO	26.64	0.83
Total		100.00		100.00		100.00	



Spectrum 448 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.04	0.41	50.00			
Mg	K series	15.64	0.33	17.13	MgO	25.93	0.54
Ca	K series	37.16	0.41	24.69	CaO	51.99	0.57
Fe	K series	17.16	0.44	8.18	FeO	22.08	0.57
Total		100.00		100.00		100.00	

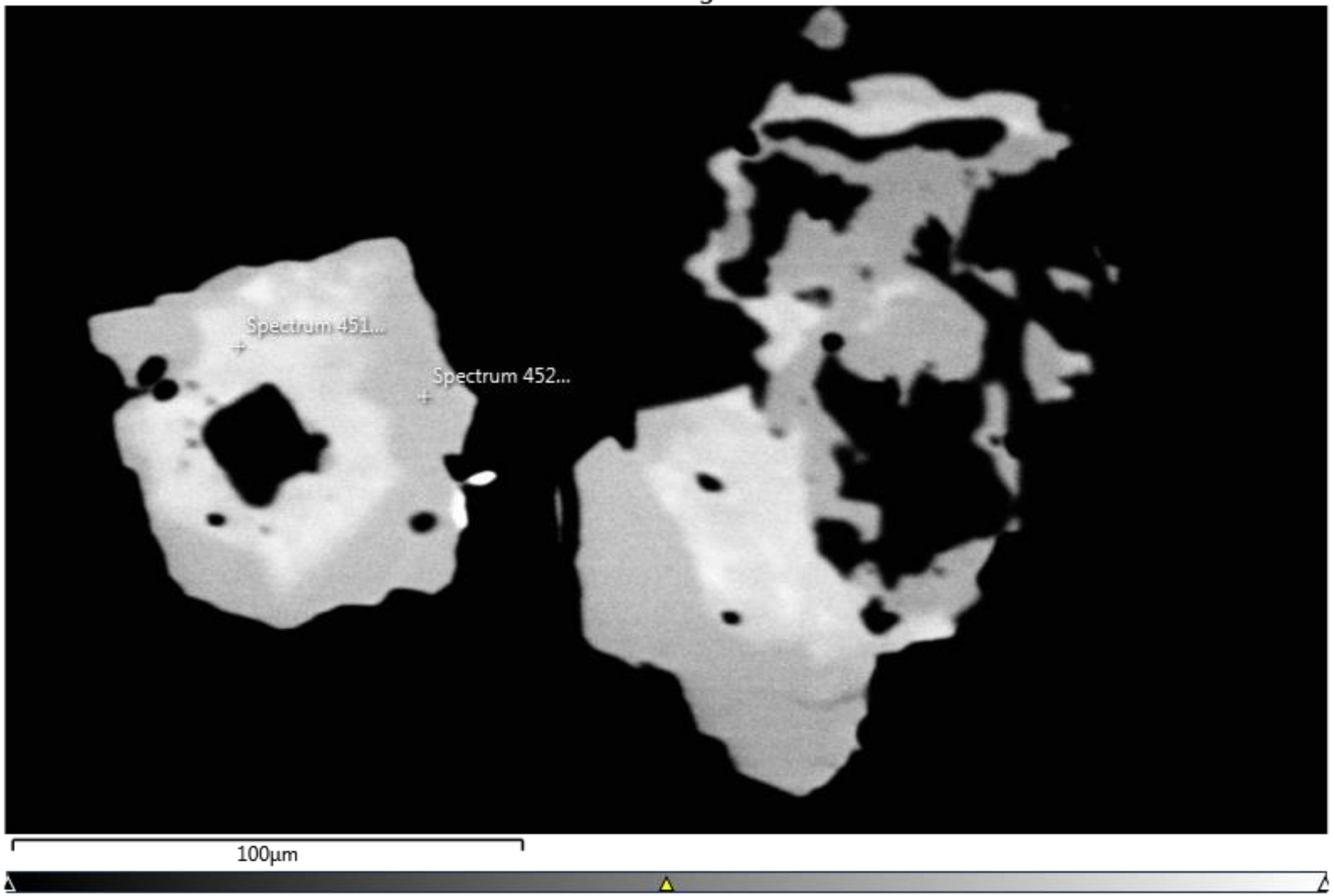


Spectrum 449 Ni-As-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	20.01	0.24	34.33
Ni	K series	32.01	0.36	29.99
As	L series	45.63	0.37	33.50
Co	K series	2.34	0.18	2.19
Total		100.00		100.00



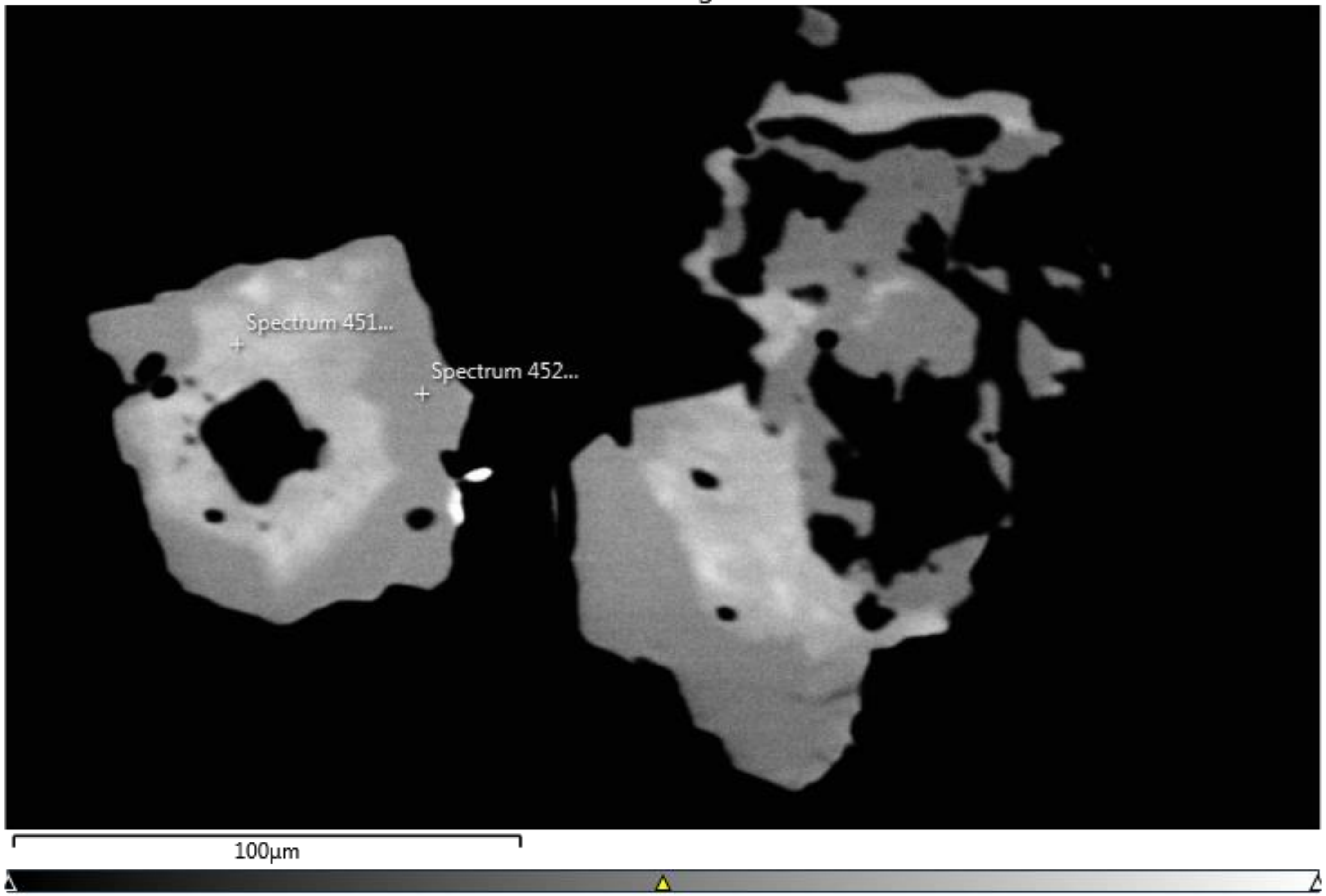
Spectrum 450 Ni-As-Sb-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.51	0.26	34.01
Ni	K series	31.67	0.41	30.15
As	L series	42.32	0.42	31.58
Co	K series	2.59	0.20	2.45
Sb	L series	3.92	0.25	1.80
Total		100.00		100.00

Electron Image 107

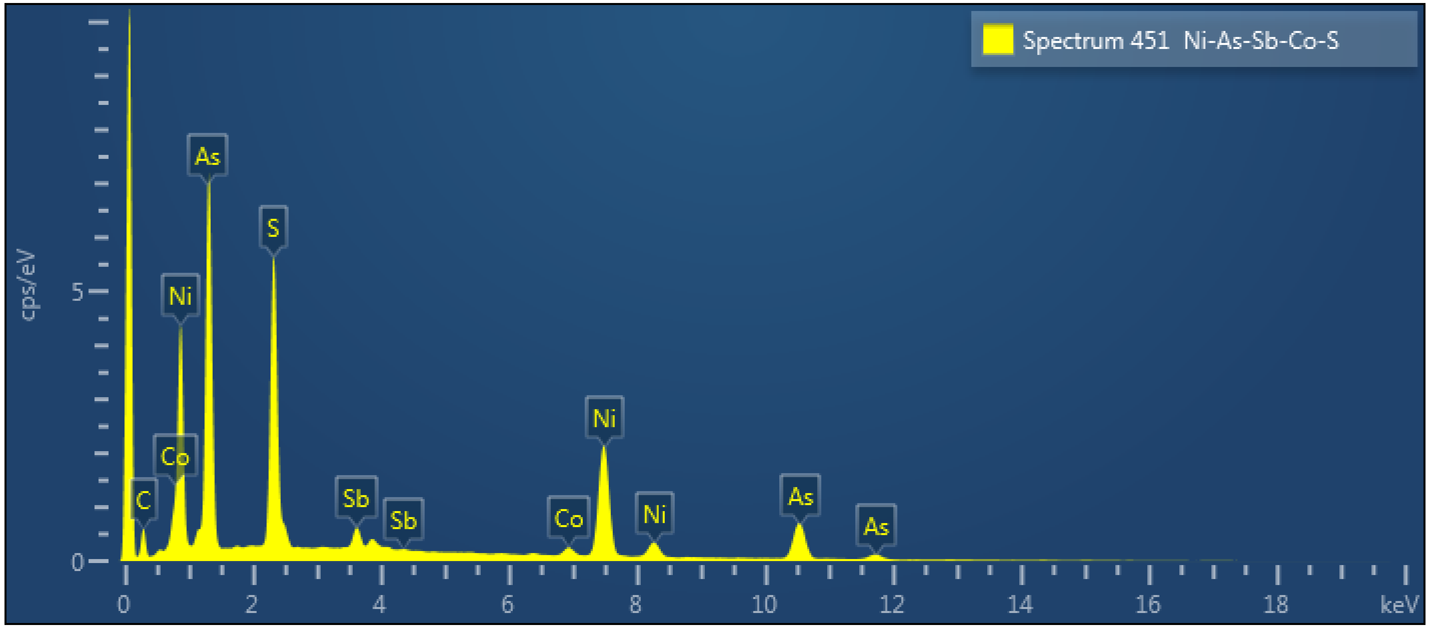


Backscatter image showing multiple grains of Ni-As-Sb-Co-S phases (spectrum 451,452) hosted within dolomite-ankerite solid solution carbonate.

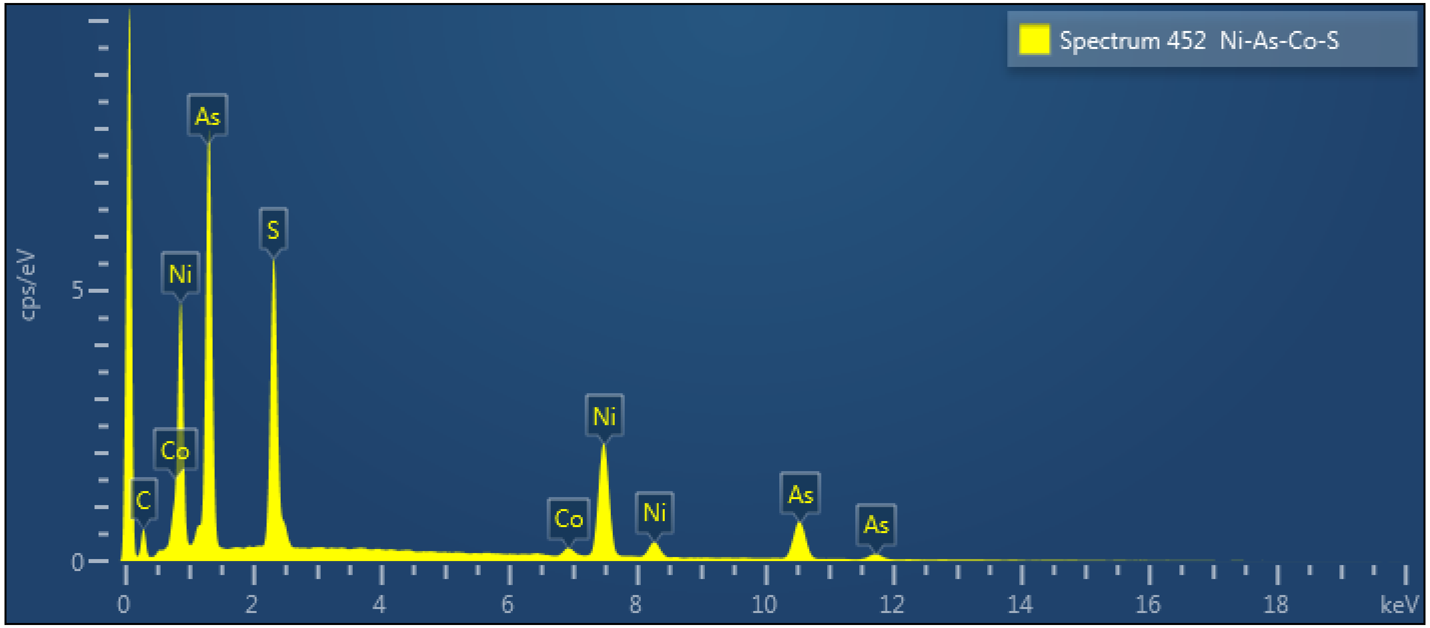
Electron Image 108



Brightness reduced further to illustrate the brightest zones which contain more elevated Sb and Co relative to the darker phases.



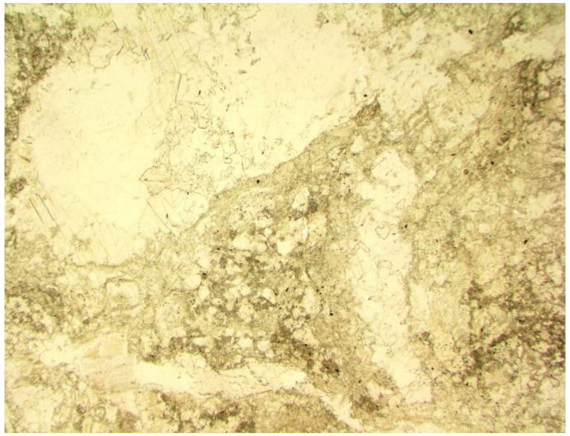
Spectrum 451 Ni-As-Sb-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.24	0.25	33.71
Ni	K series	32.23	0.39	30.84
As	L series	41.85	0.40	31.39
Sb	L series	4.70	0.24	2.17
Co	K series	1.98	0.18	1.89
Total		100.00		100.00

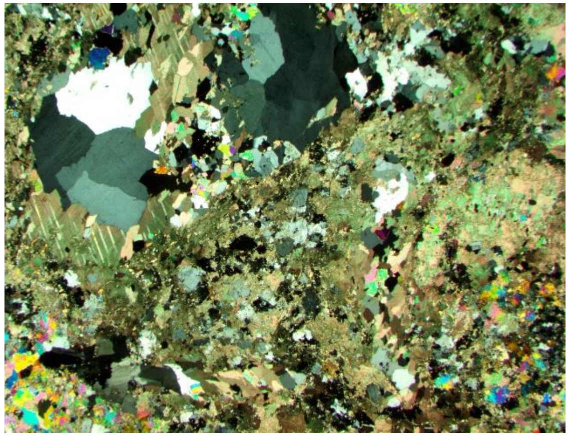


Spectrum 452 Ni-As-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.39	0.28	33.42
Ni	K series	33.13	0.43	31.18
As	L series	45.52	0.44	33.57
Co	K series	1.95	0.20	1.83
Total		100.00		100.00

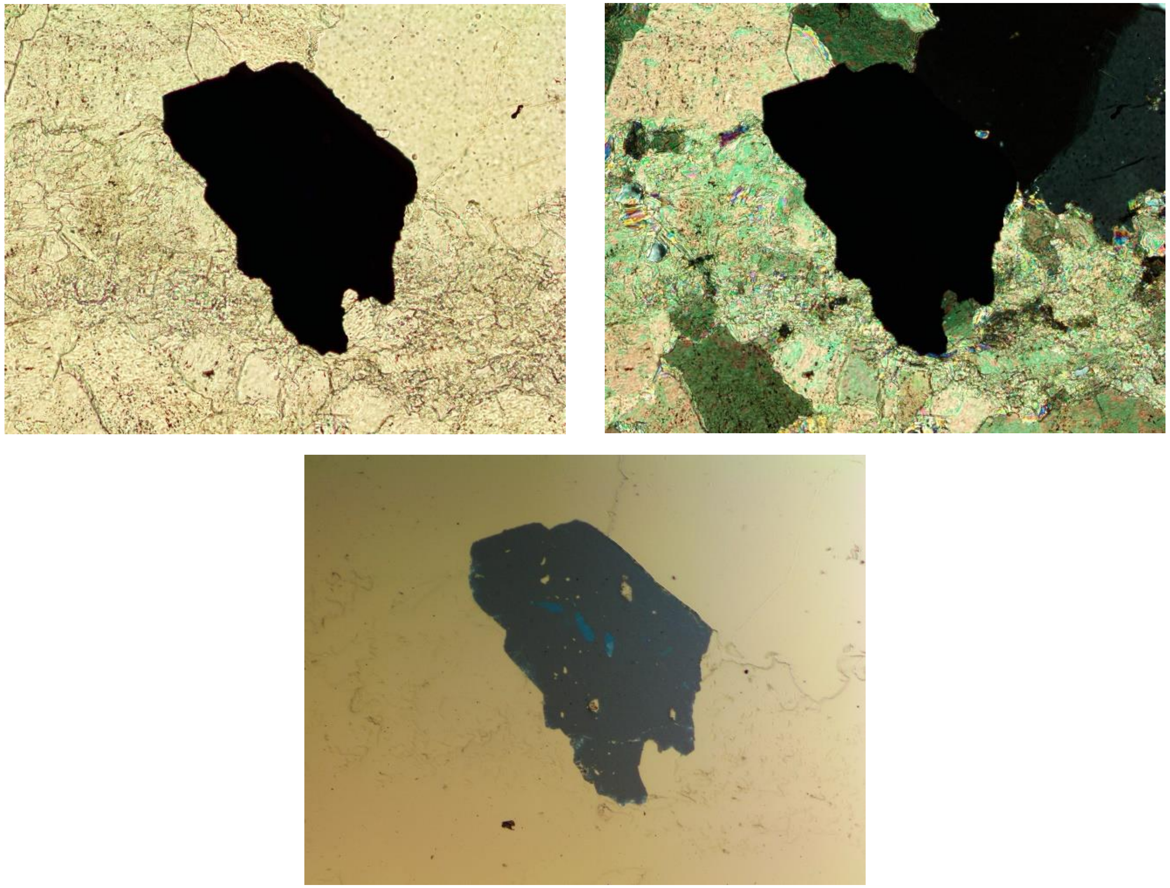
Specimen Notes for 'MID-18'

This sample was obtained from within a small pit or trench. The sample is a multi-generational breccia and displays strong green Cr-mica (fuchsite) alteration with dolomite-ankerite solid solution carbonate development. There are multiple generations of grey and white quartz stringers. The rock hosts trace (~3%) cubic pyrite within the host rock. The late quartz stringers do not host sulphides.
The metal inventory is comprised of pyrite, Ni-S, Ni-Co-As-Sb-S, Ni-Co-Sb-As-S, and Ni-As-Sb-S.



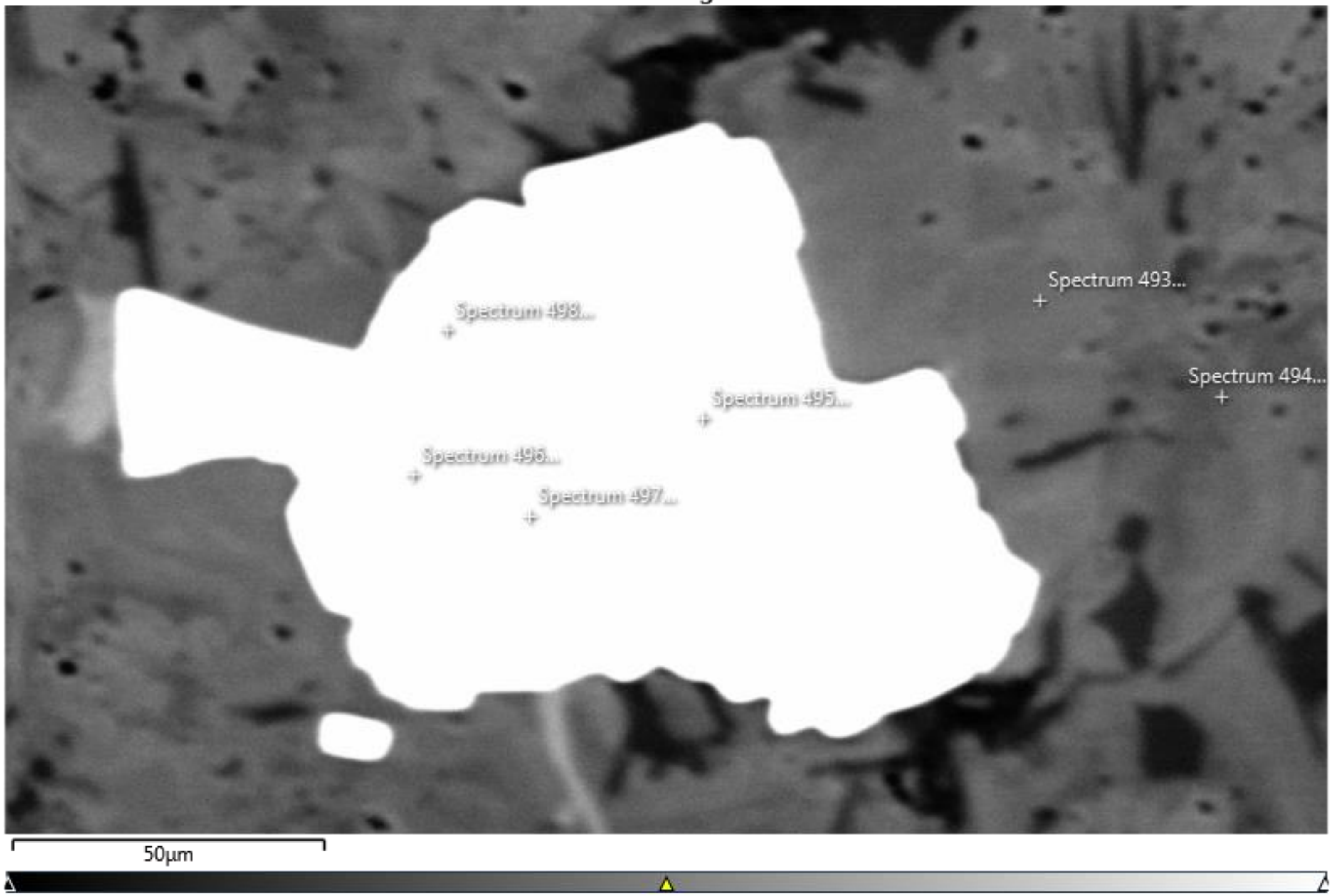


Plane light image (left) and crossed-polarized light image (right) showing fragments of quartz-carbonate sealed by multiple generations of birefringent dolomite-ankerite solid solution carbonate, fibrous Cr-mica (fuchsite), and quartz. Field of view = 1.2mm

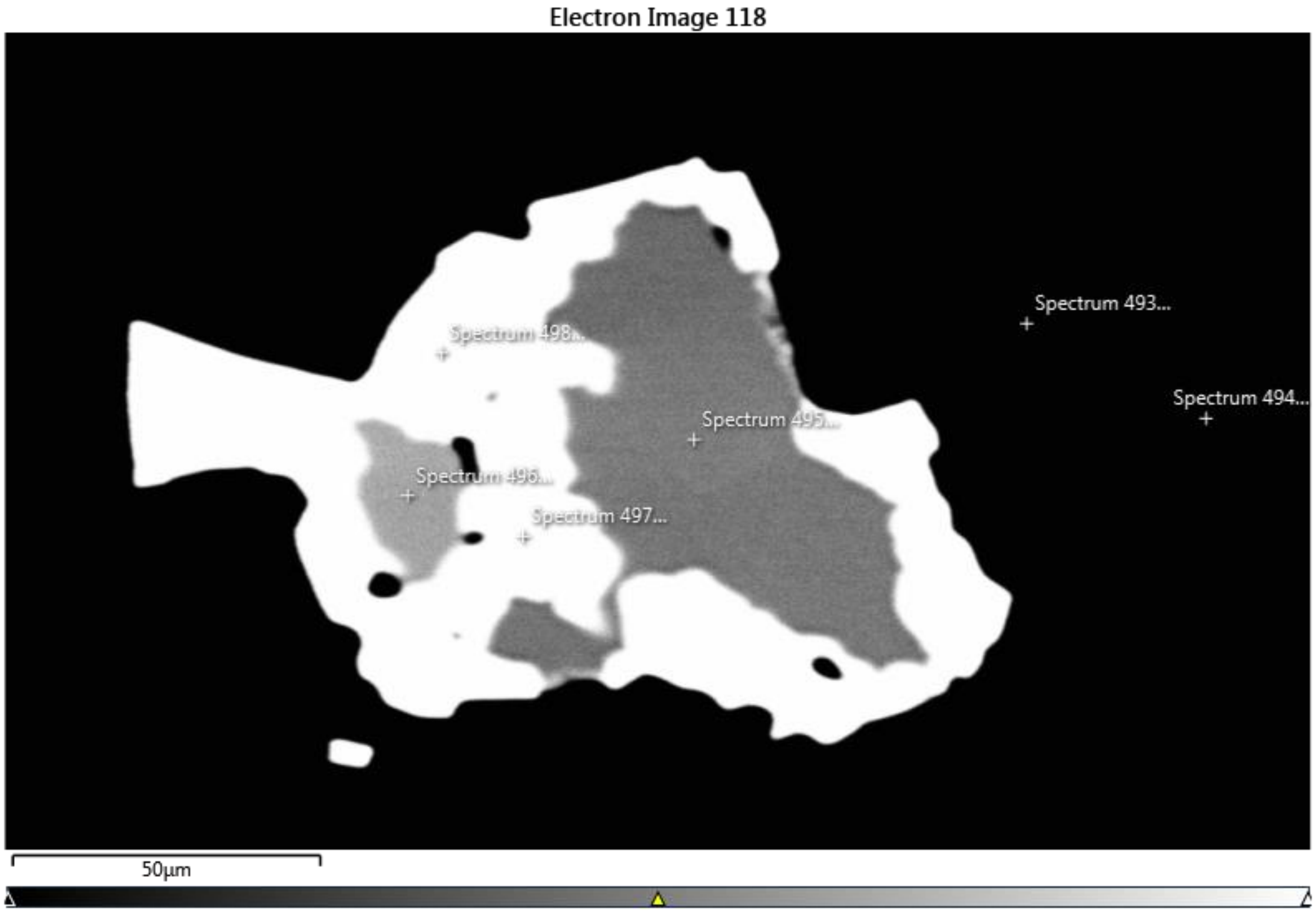


Plane light image (left), crossed polarized light image (right), and reflected light image (bottom) illustrating the Ni-Co-Sb-bearing sulphide intergrowths associated with carbonate and Cr-micas. Field of view = 1.2mm

Electron Image 117

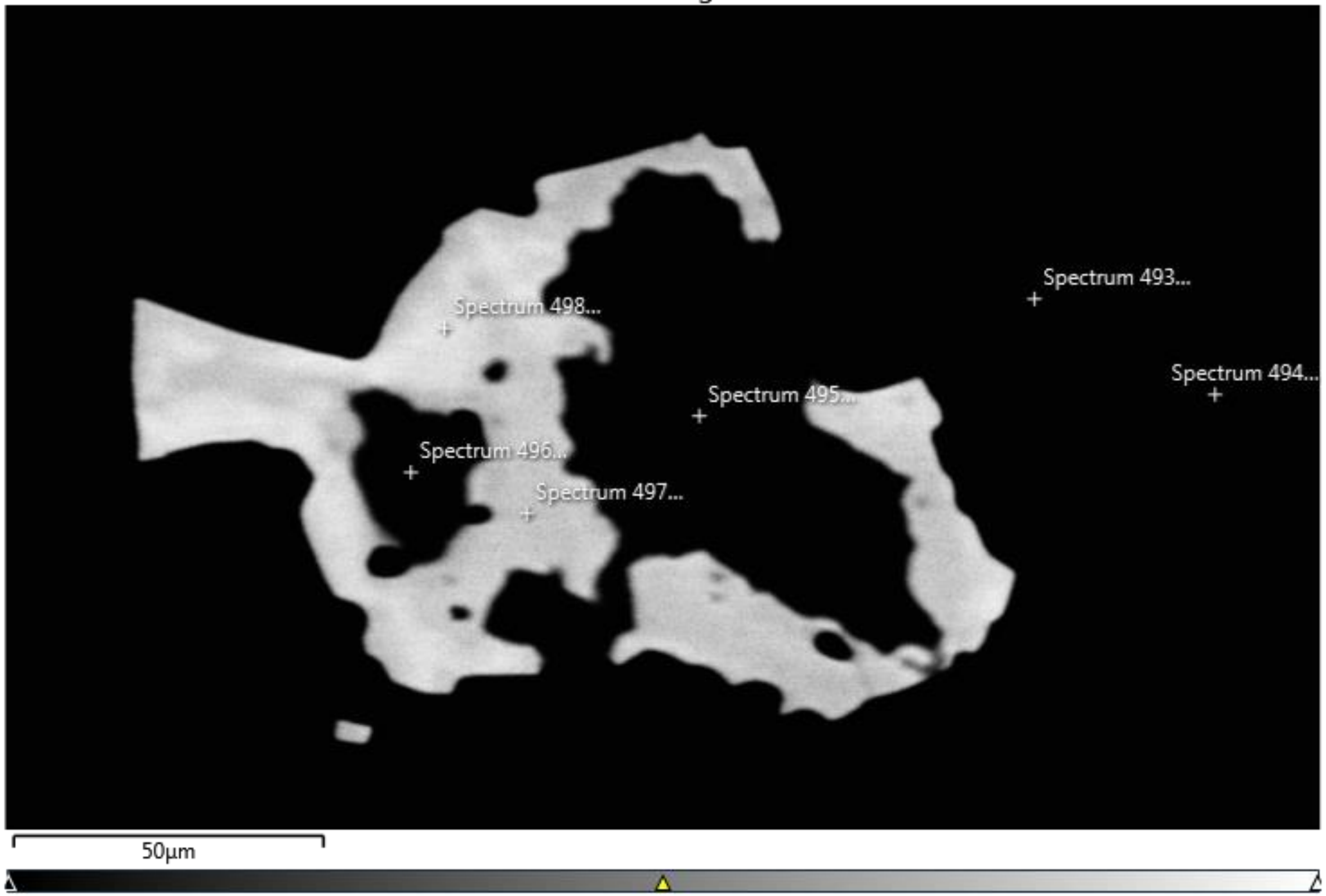


Backscatter image of dolomite-ankerite solid solution carbonate (spectra 493,494) hosting a bright grain of chalcopyrite with included grains of Ni-Sb-Co-As-sulphides.

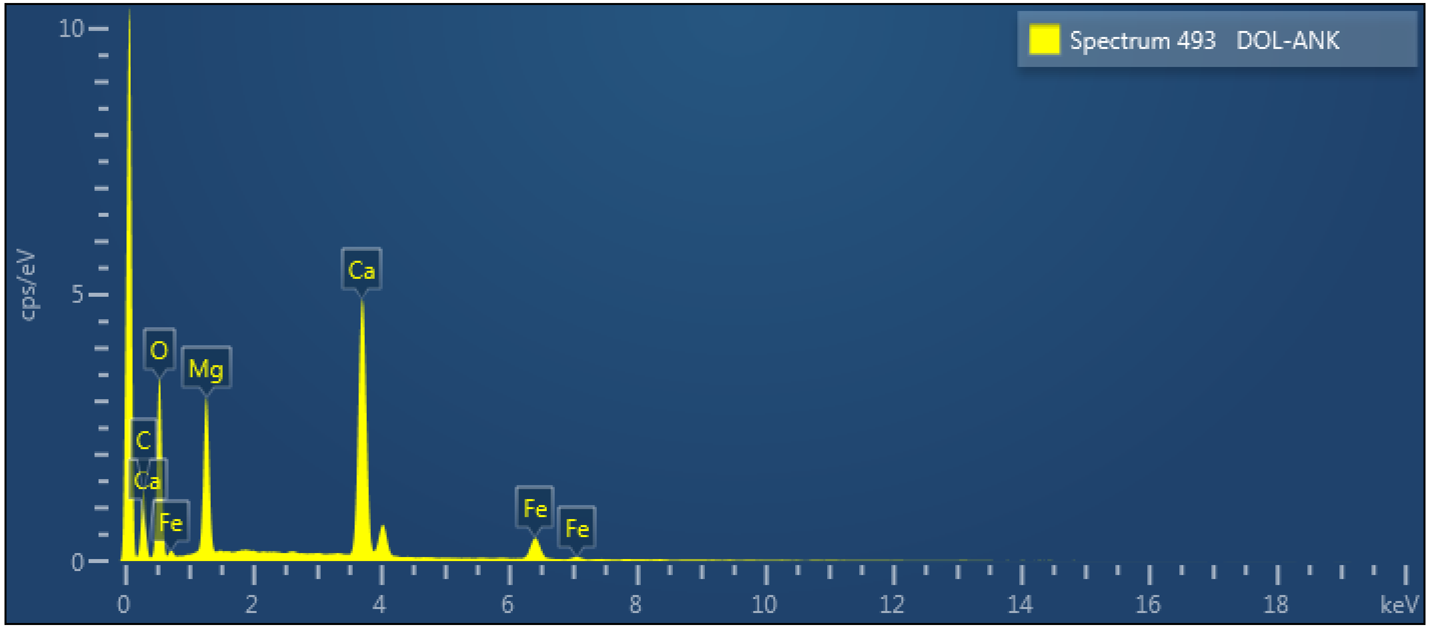


Same image as above with brightness reduced to illustrate the intergrowth of chalcopyrite (spectrum 495), Ni-S (spectrum 496), Ni-Co-Sb-As-S (spectrum 497) and Ni-As-Sb-S (spectrum 498).

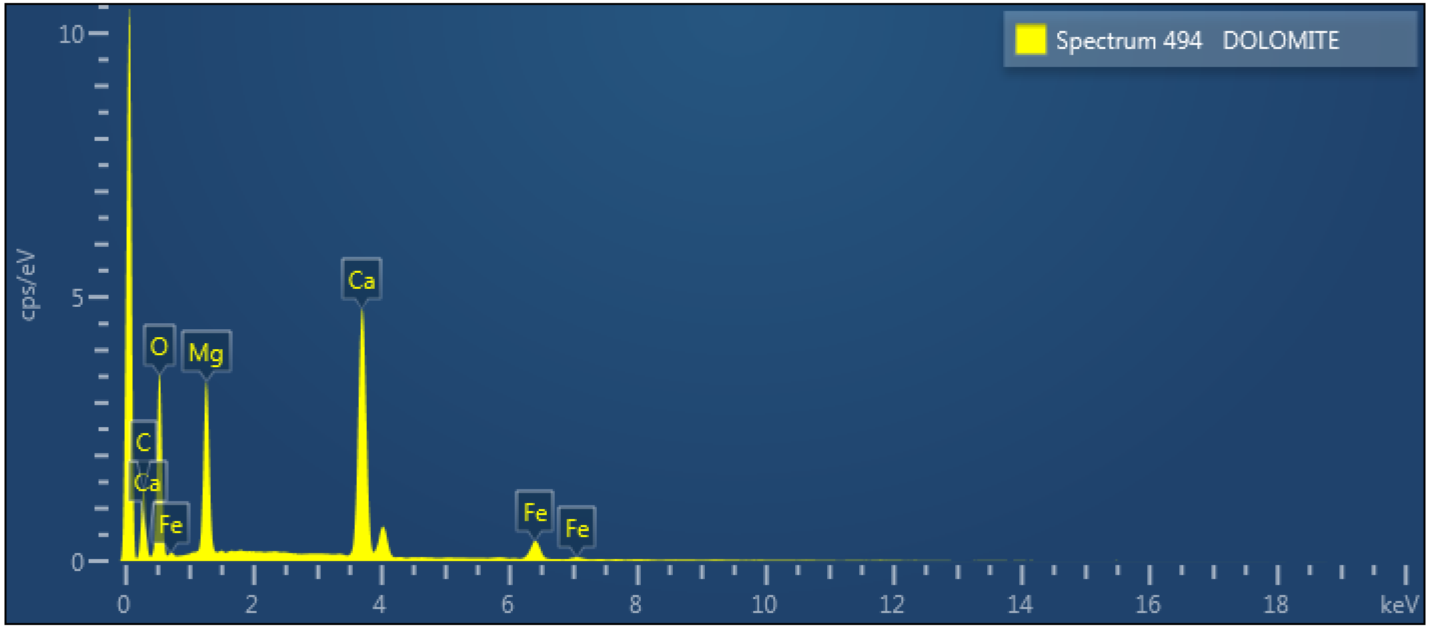
Electron Image 119



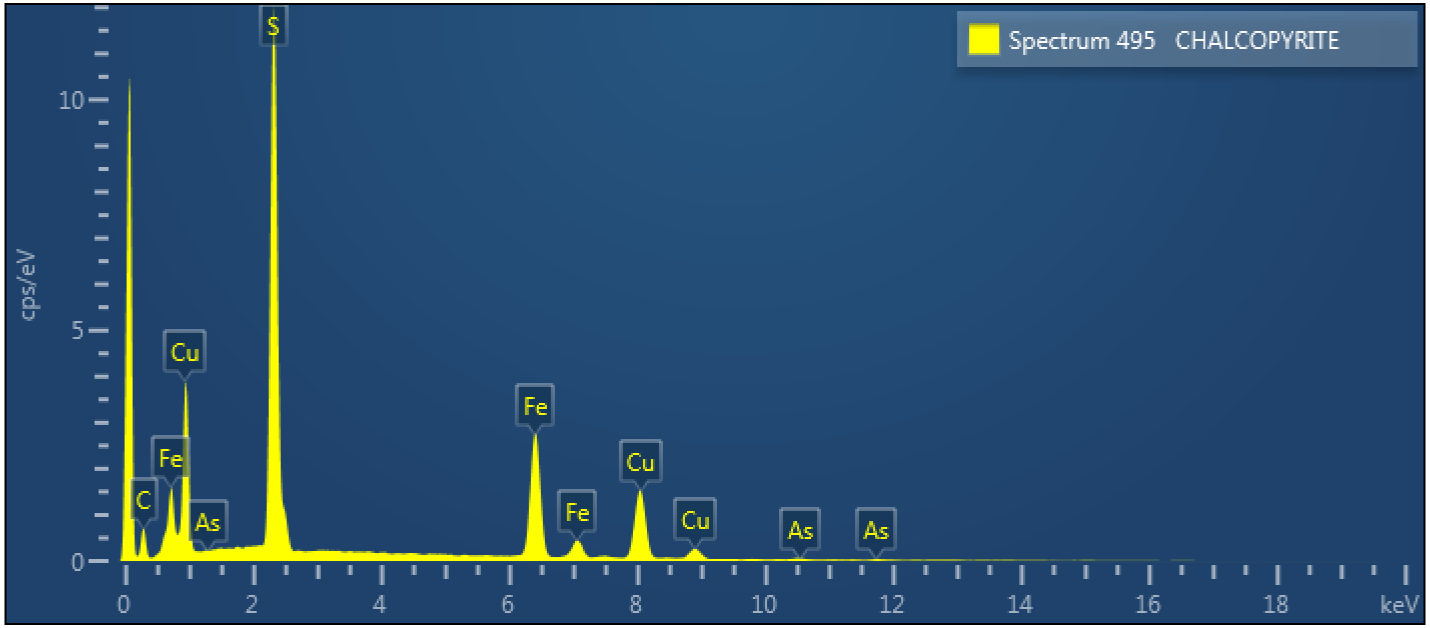
Brightness reduced to better visualize the domanial compositions within the various intergrowths.

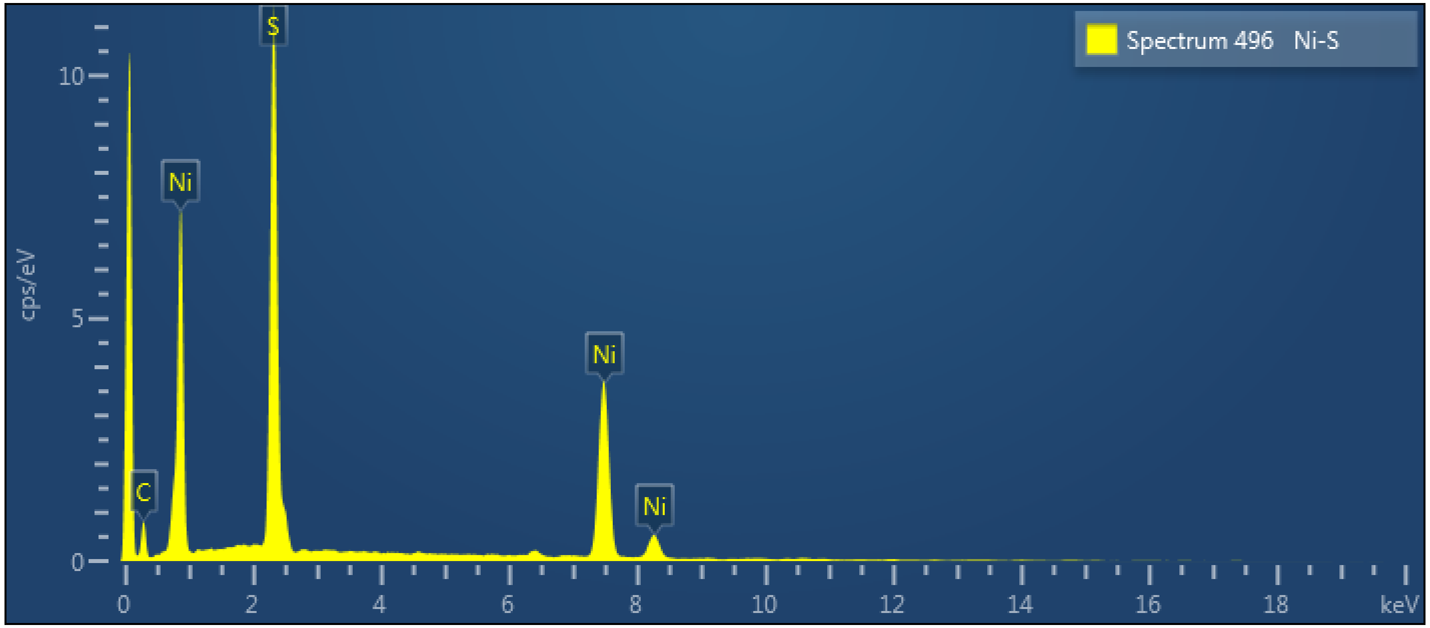


Spectrum 493 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.22	0.48	50.00			
Mg	K series	18.79	0.40	19.80	MgO	31.16	0.66
Ca	K series	40.26	0.49	25.74	CaO	56.34	0.68
Fe	K series	9.72	0.46	4.46	FeO	12.51	0.59
Total		100.00		100.00		100.00	

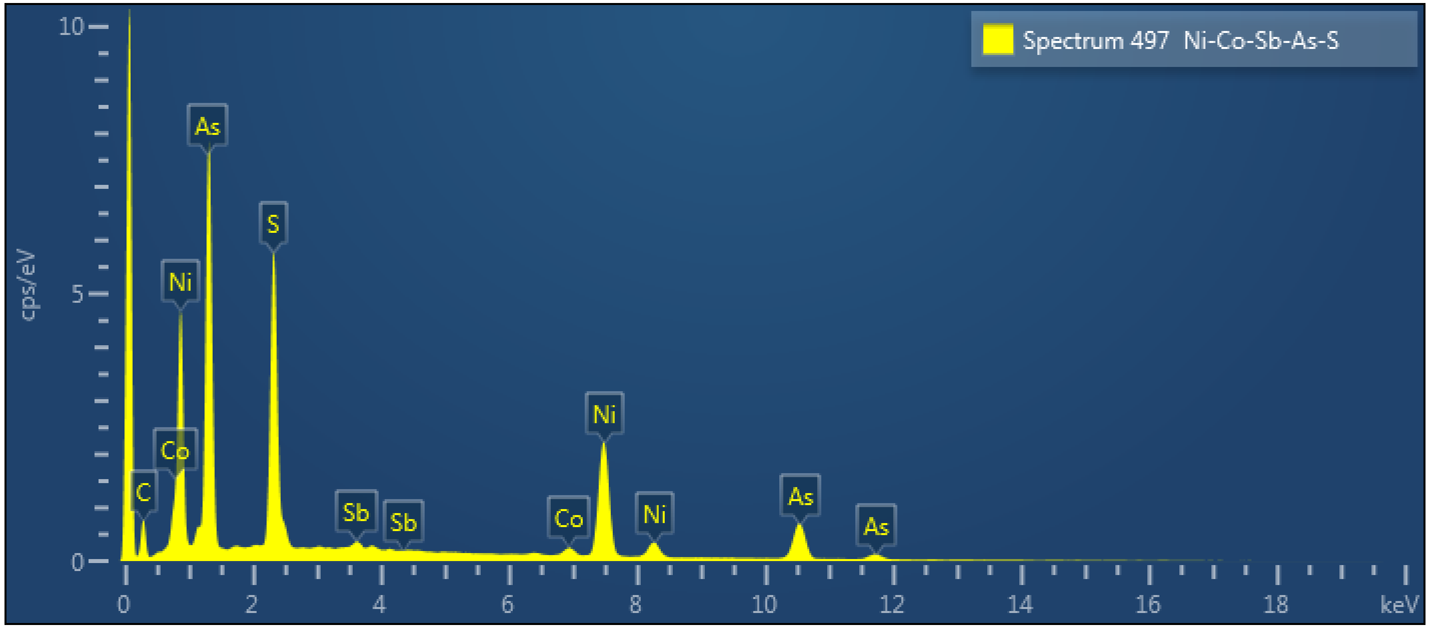


Spectrum 494 DOLOMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.67	0.45	50.00			
Mg	K series	20.62	0.39	21.42	MgO	34.18	0.65
Ca	K series	39.30	0.46	24.77	CaO	54.99	0.64
Fe	K series	8.42	0.42	3.81	FeO	10.83	0.54
Total		100.00		100.00		100.00	

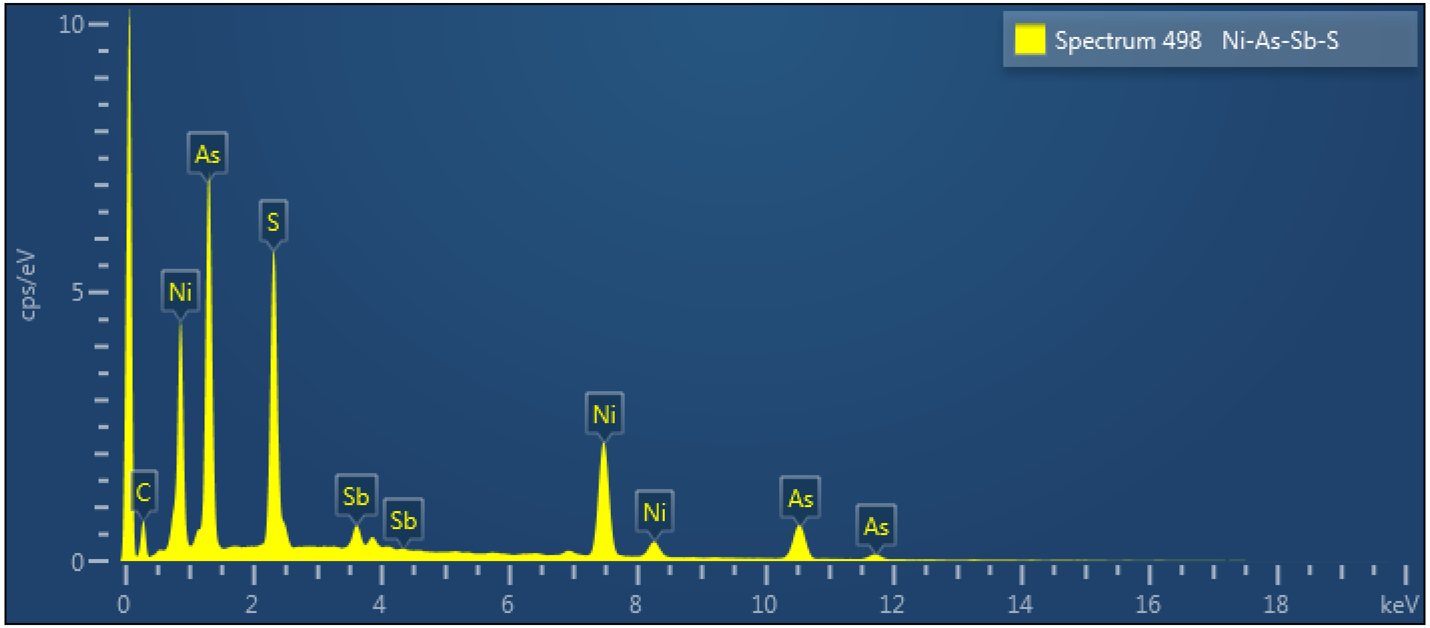

Spectrum 495 CHALCOPYRITE
cps/eV
10
5
0
S
Cu
Fe
C
As
Fe
Fe
Cu
Cu
As
As
0
2
4
6
8
10
12
14
16
18
keV



Spectrum 496 Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	36.94	0.73	51.75
Ni	K series	63.06	0.73	48.25
Total		100.00		100.00

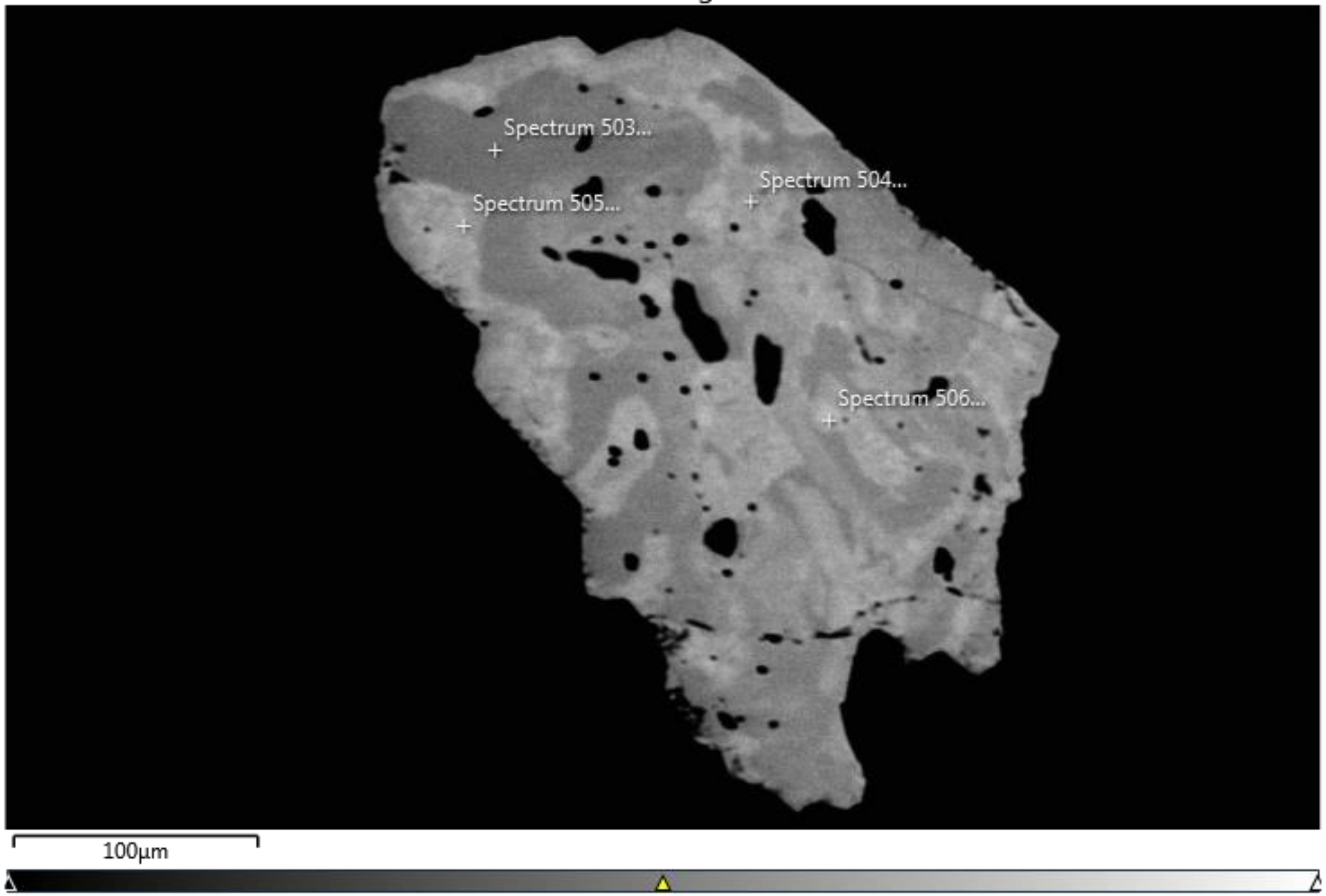


Spectrum 497 Ni-Co-Sb-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.47	0.27	33.71
Ni	K series	32.84	0.43	31.06
As	L series	44.30	0.44	32.83
Co	K series	1.78	0.20	1.68
Sb	L series	1.60	0.23	0.73
Total		100.00		100.00

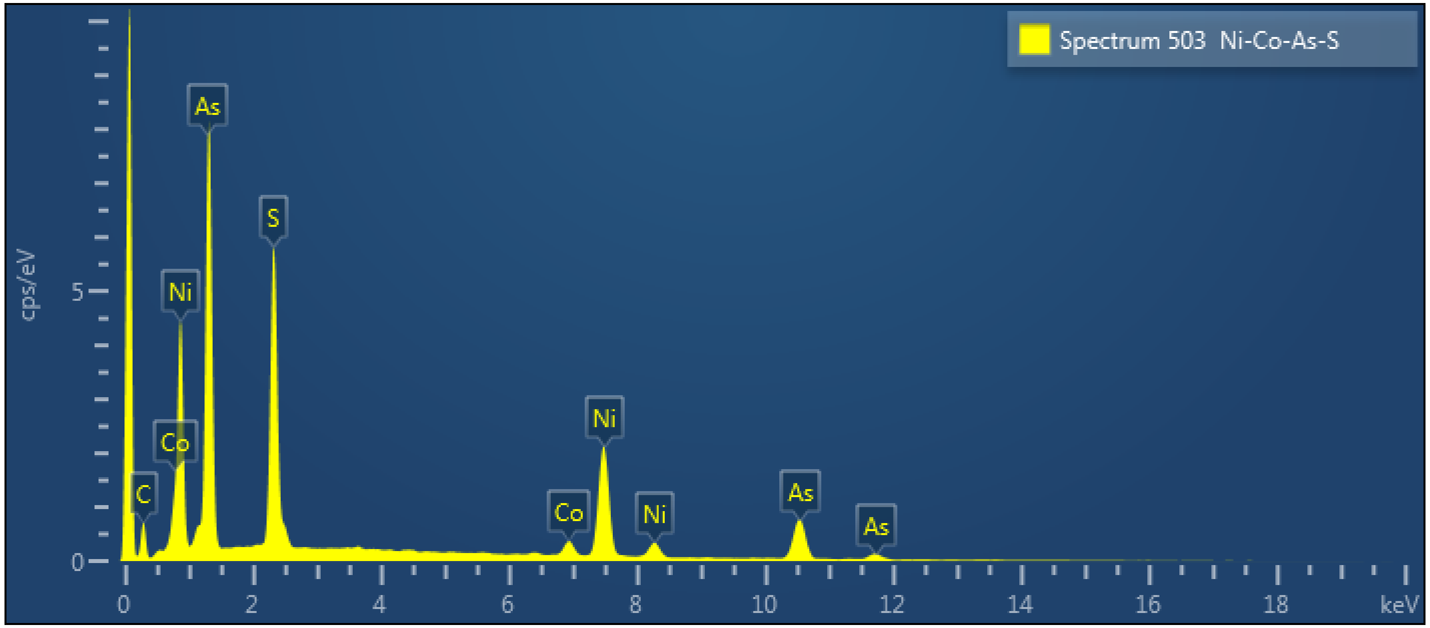


Spectrum 498 Ni-As-Sb-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.76	0.28	34.54
Ni	K series	33.31	0.43	31.80
As	L series	41.90	0.44	31.34
Sb	L series	5.02	0.28	2.31
Total		100.00		100.00

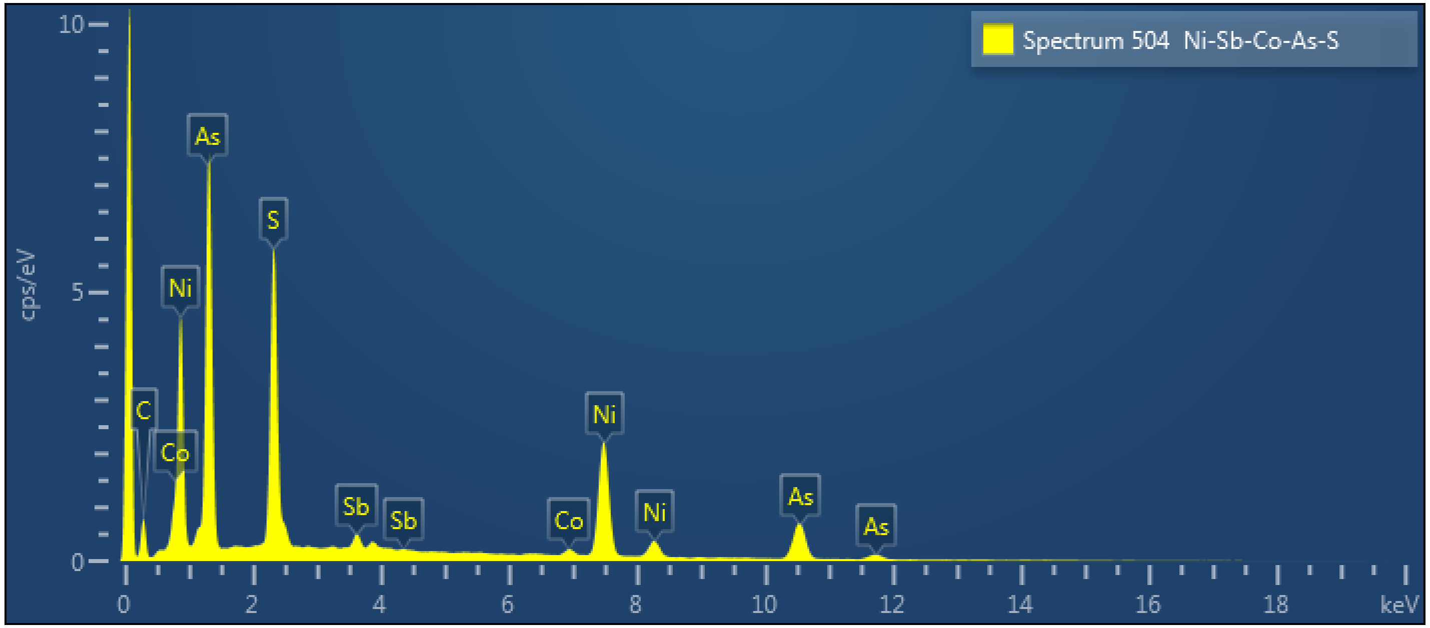
Electron Image 120



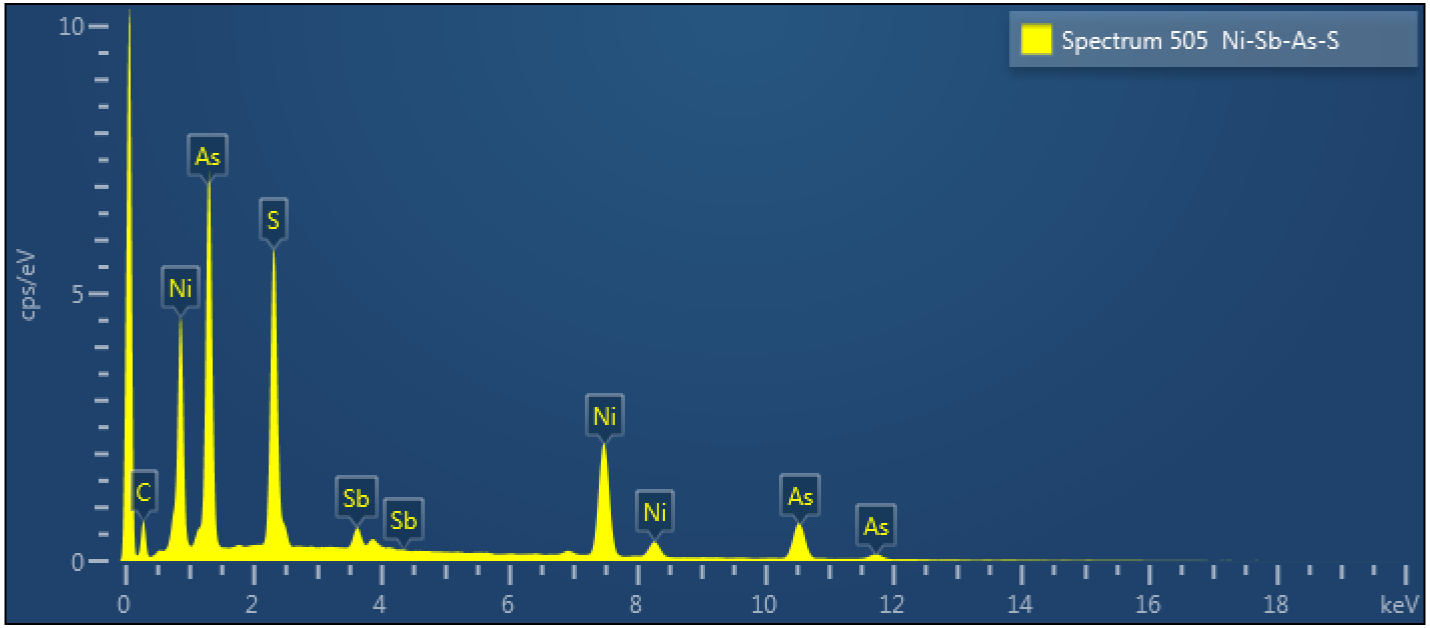
Backscatter image of a compositionally domanial sulphide including Ni-Co-As-S (spectrum 503), Ni-Sb-Co-As-S (spectrum 504), Ni-Sb-As-S (spectra 505,506).



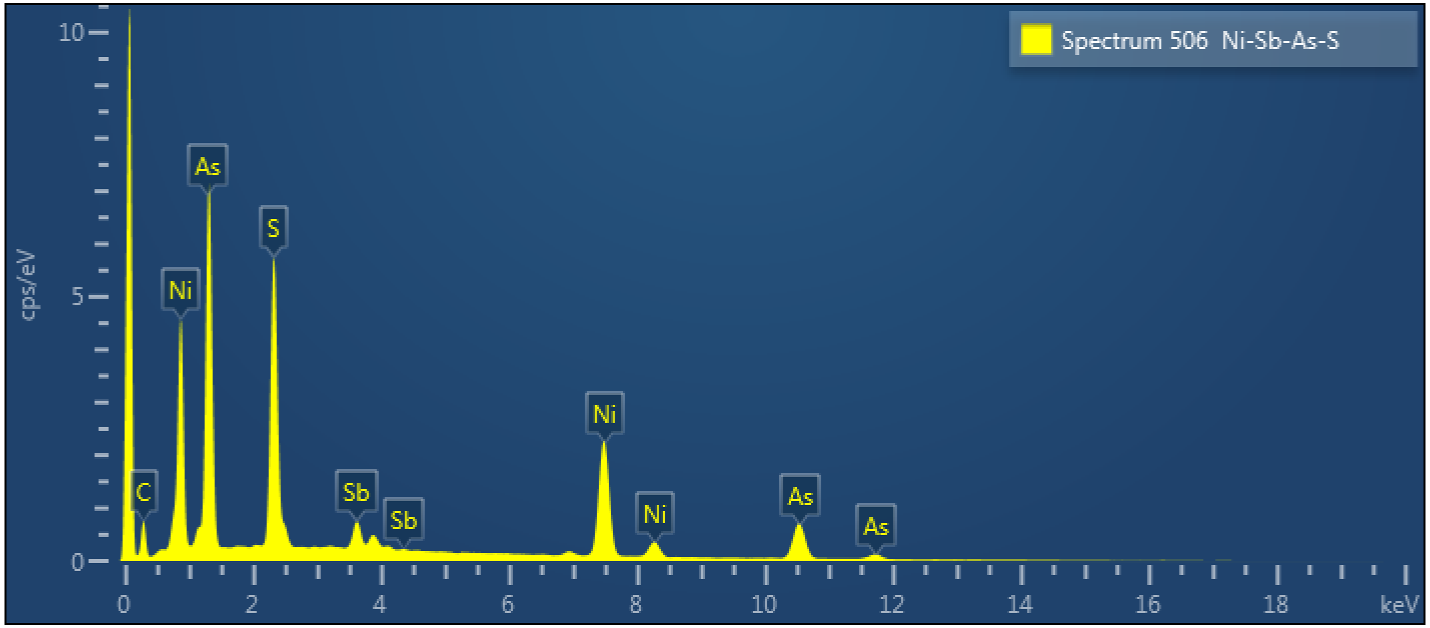
Spectrum 503 Ni-Co-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.74	0.27	33.91
Co	K series	3.48	0.23	3.25
Ni	K series	31.50	0.42	29.55
As	L series	45.28	0.43	33.28
Total		100.00		100.00



Spectrum 504 Ni-Sb-Co-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.43	0.29	33.85
Ni	K series	32.60	0.45	31.03
As	L series	42.95	0.47	32.03
Sb	L series	3.40	0.26	1.56
Co	K series	1.61	0.21	1.53
Total		100.00		100.00



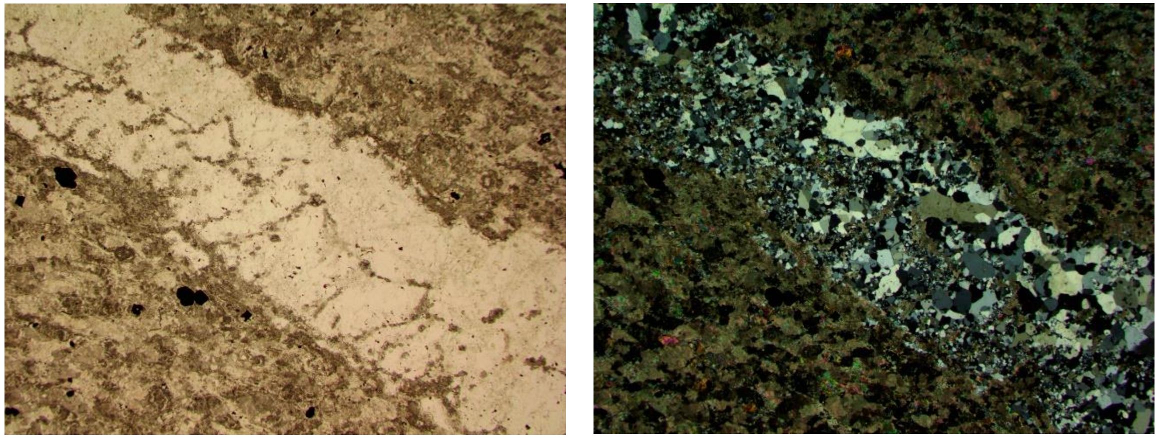
Spectrum 505 Ni-Sb-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	20.07	0.27	34.93
Ni	K series	33.14	0.42	31.50
As	L series	42.26	0.43	31.49
Sb	L series	4.53	0.27	2.08
Total		100.00		100.00



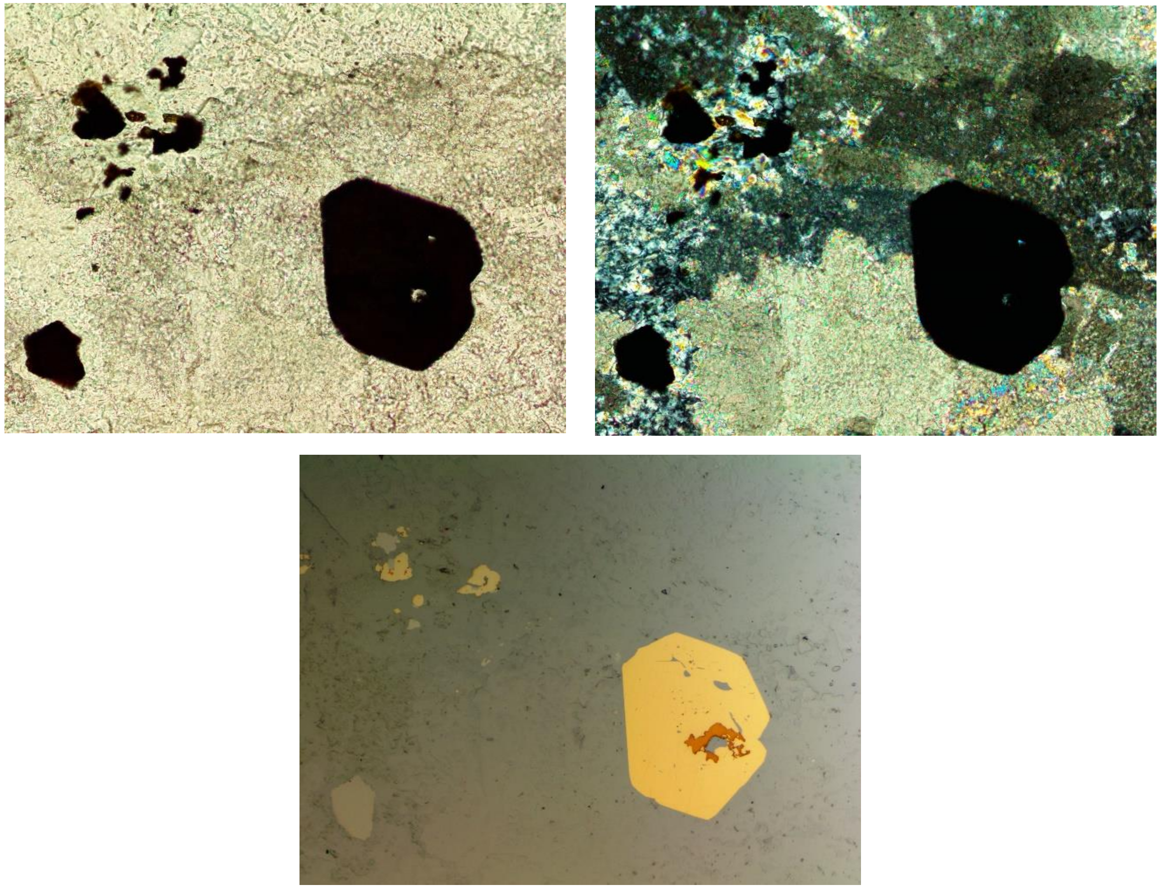
Spectrum 506 Ni-Sb-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.17	0.24	33.79
Ni	K series	33.55	0.38	32.30
As	L series	41.23	0.39	31.10
Sb	L series	6.05	0.26	2.81
Total		100.00		100.00

Specimen Notes for 'MID-19'

The sample was obtained from the Laroma Prospect. It is an altered ultramafic which has been strongly altered to green Cr-mica (fuchsite) and manganoan dolomite-ankerite solid solution carbonate hosting fine-grained disseminated sulphides and chromite grains. The chromites are zoned to more Zn-bearing margins. The rock has stockwork grey and white quartz stringers.
The metal inventory is comprised of fine grained pyrite, Ni-Co-Sb-As-S, Ni-Sb-As-Mo-S, Ni-Sb-As-S, and Sb-Ni-As-S.

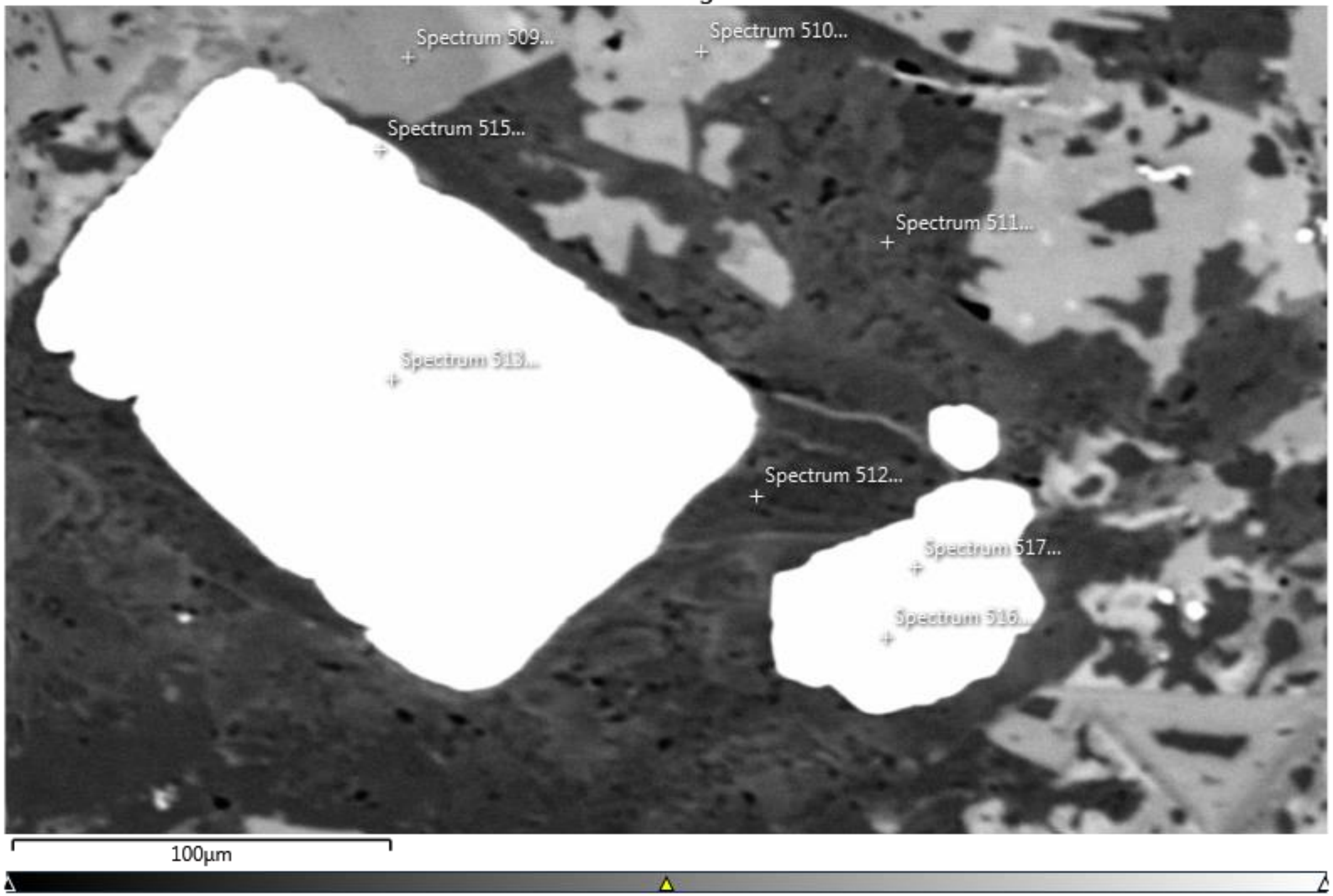


Plane light image (left) and crossed polarized light image (right) illustrating earlier dolomite-ankerite solid solution carbonate hosting sulphides cut by later multigranular quartz. Note the late quartz veins lack sulphide. Field of view = 17mm



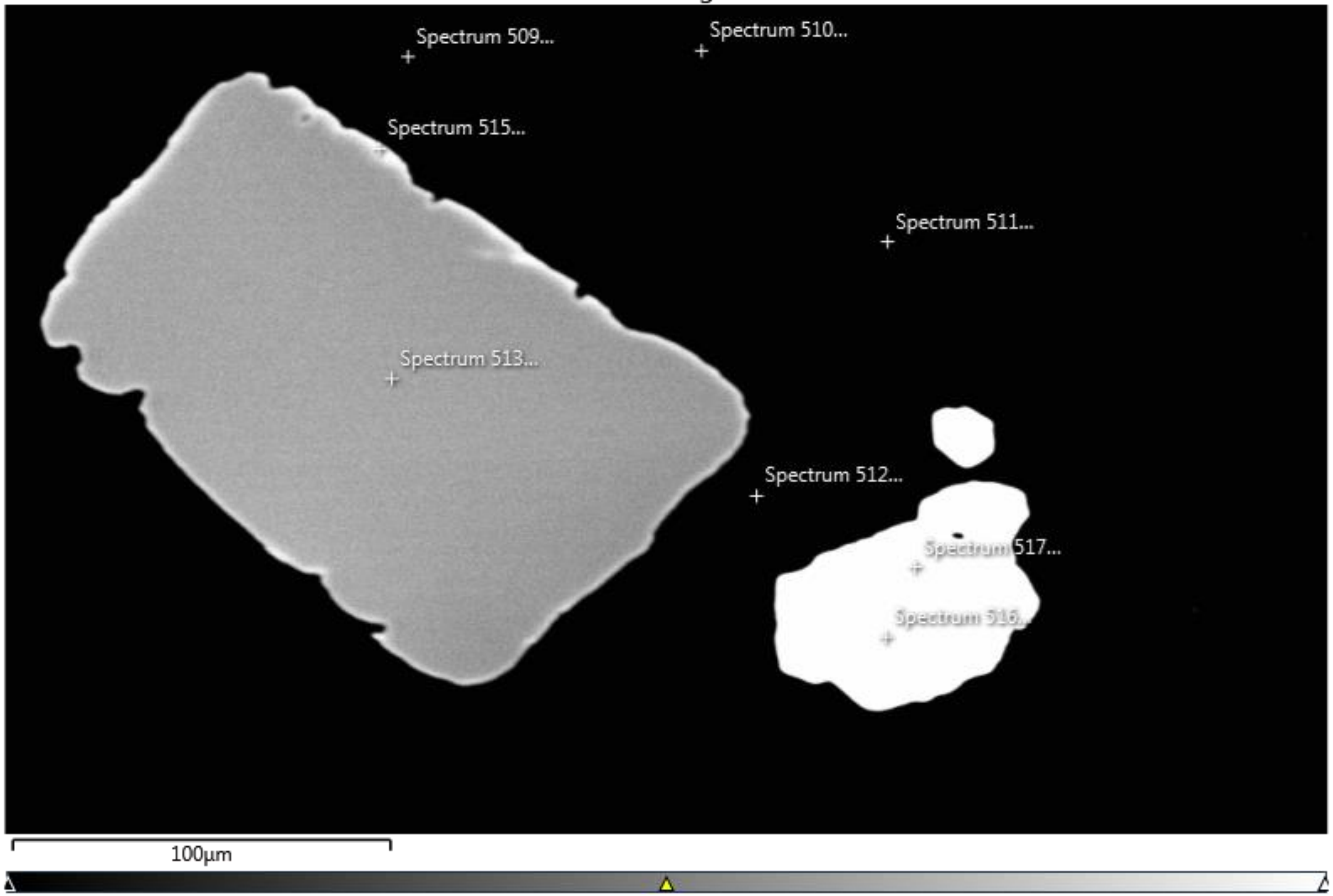
Plane light image (left), crossed polarized light image (right), and reflected light image (bottom) illustrating dolomite-ankerite solid solution carbonate, Cr-mica (fuchsite), and quartz hosting chalcopyrite grains with inclusions of Ni-Co-Sb-bearing sulphides. Field of view = 1.2mm

Electron Image 121



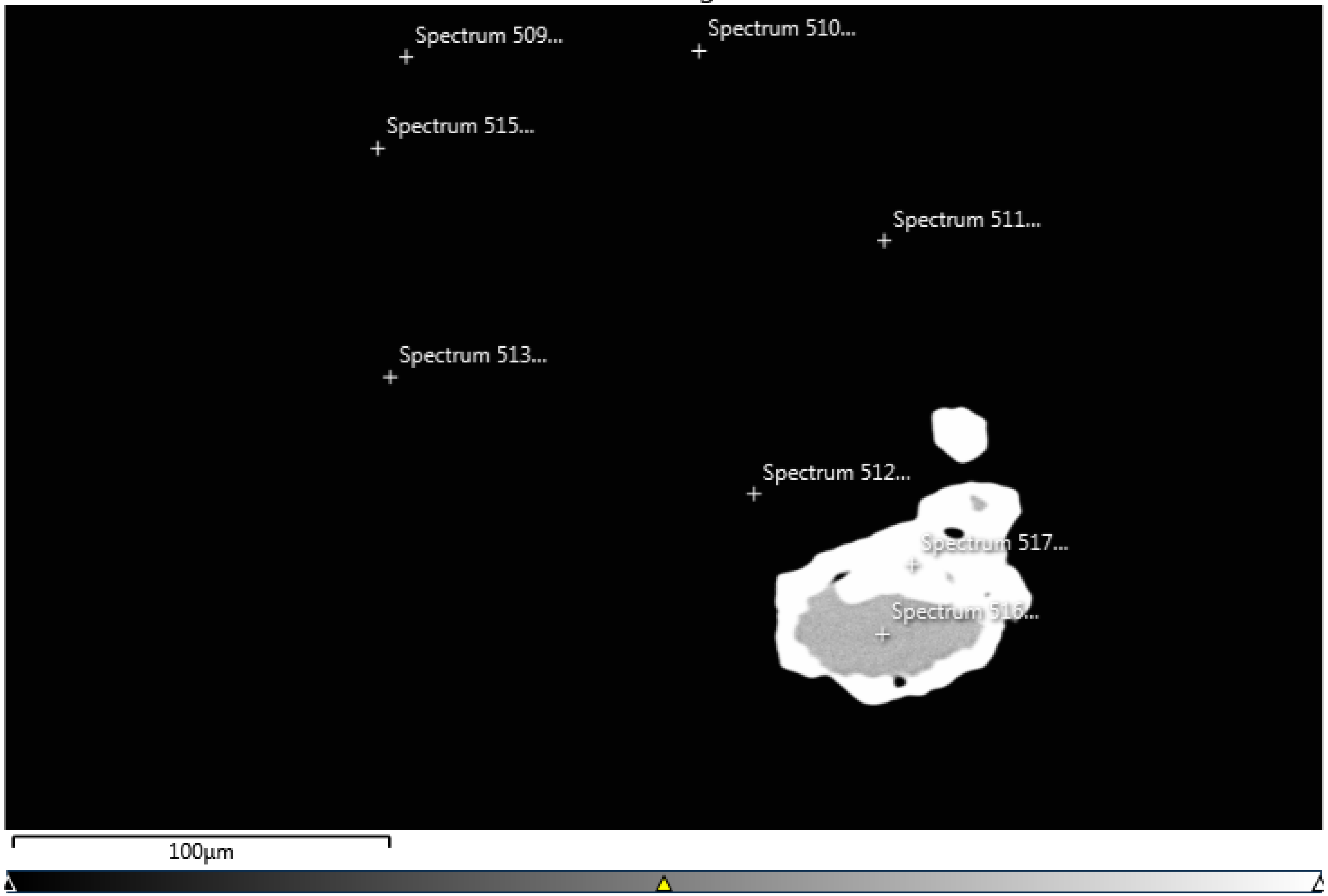
Backscatter image of Mn-dolomite-ankerite solid solution carbonate (spectra 509,510) intergrown with Cr-mica (fuchsite). The Cr-micas vary in greyscale representing the variation in Cr-content within the mica (spectra 511,512).

Electron Image 122

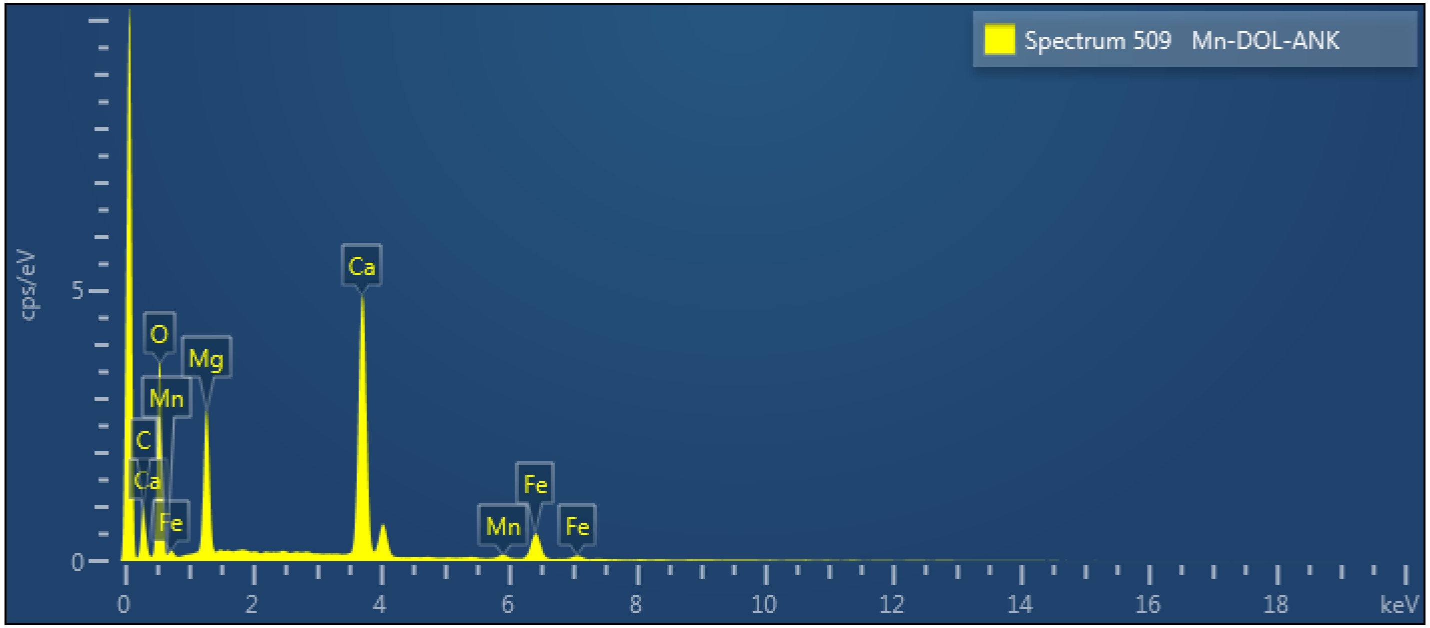


Brightness reduced to illustrate the zoning within the chromite (spectra 513) demonstrating the brighter more zincian outer rind on the chromite grain (spectra 515).

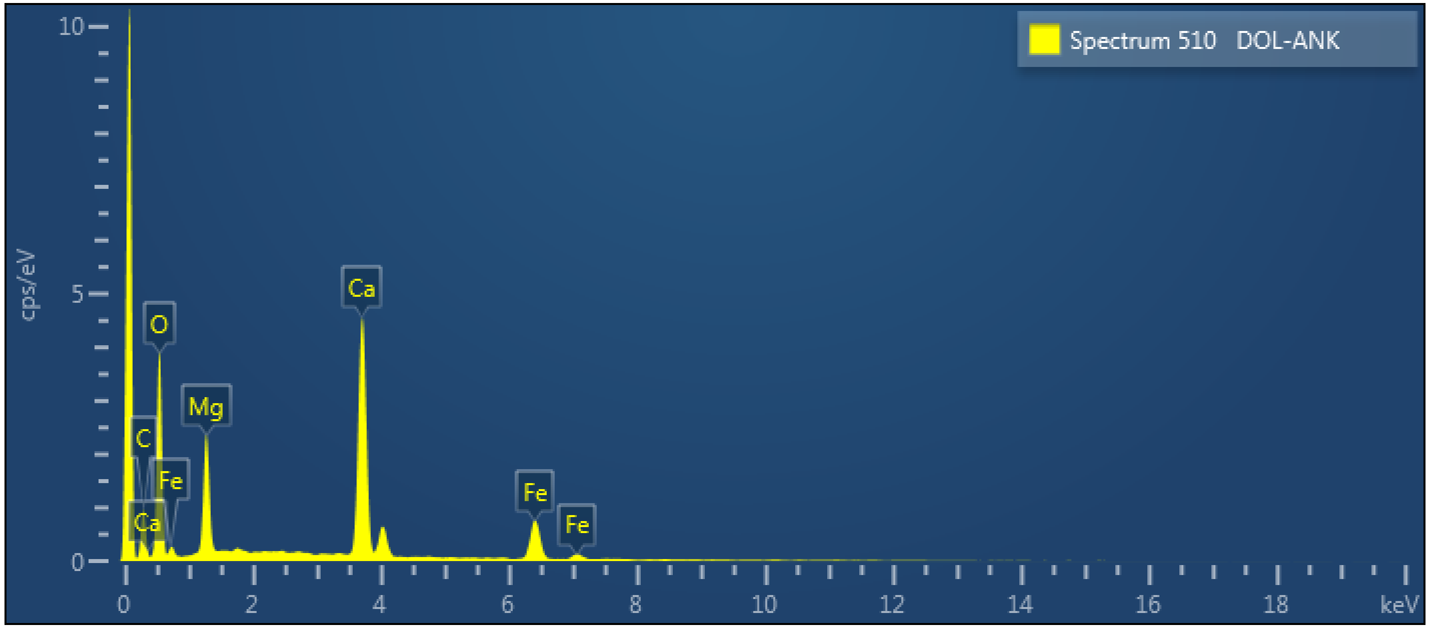
Electron Image 123



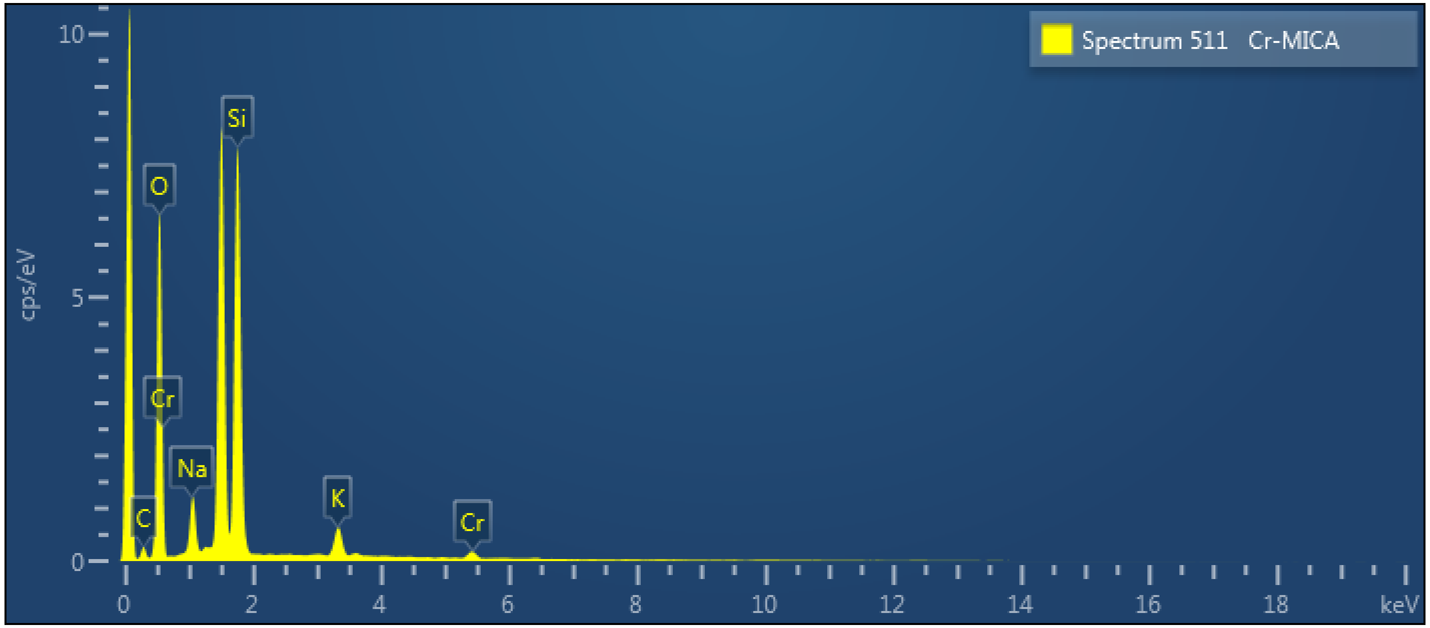
With brightness reduced, the chalcopyrite (spectrum 516) intergrowth with Ni-Co-Sb-As-S (spectrum 517) is better visualized.



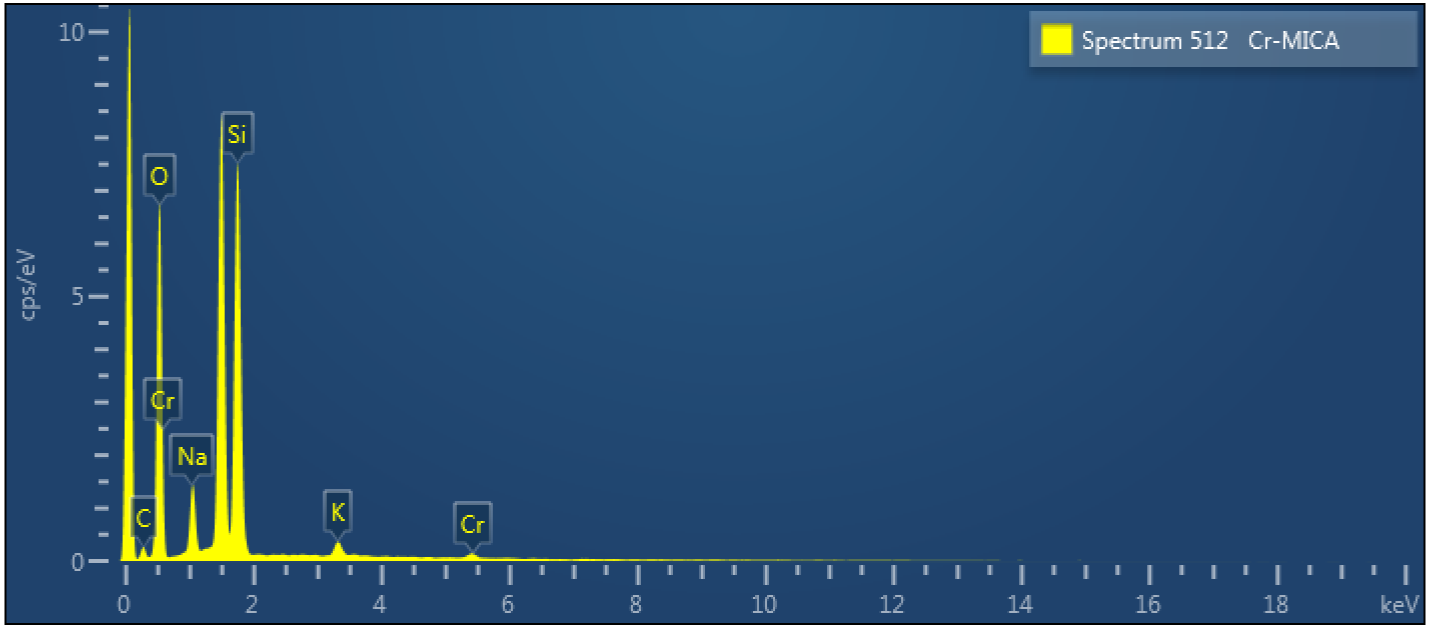
Spectrum 509 Mn-DOL-ANK							
Element	Line Type	Weight %	Weight % Sigma	Atomic %	Oxide	Oxide %	Oxide % Sigma
O	K series	30.69	0.47	50.00			
Mg	K series	17.22	0.38	18.46	MgO	28.56	0.63
Ca	K series	39.30	0.47	25.56	CaO	54.99	0.66
Fe	K series	11.47	0.45	5.35	FeO	14.75	0.58
Mn	K series	1.32	0.26	0.63	MnO	1.71	0.34
Total		100.00		100.00		100.00	



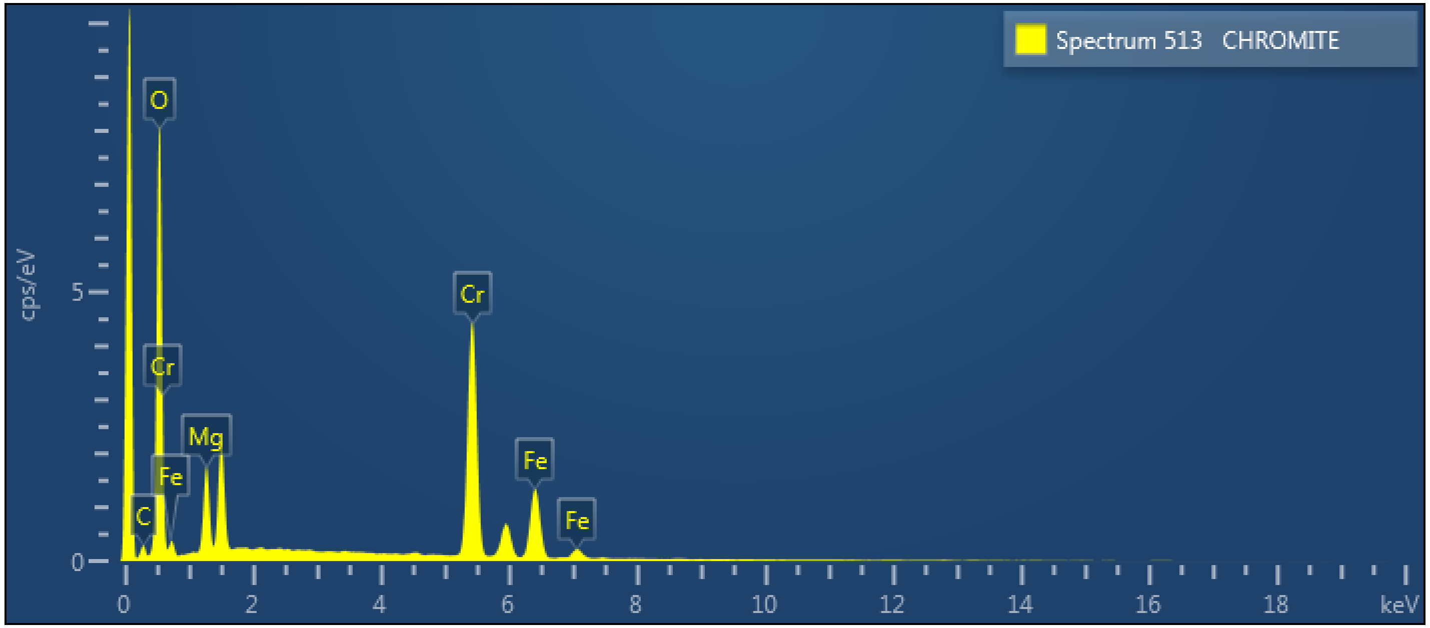
Spectrum 510 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.91	0.59	50.00			
Mg	K series	15.26	0.47	16.79	MgO	25.31	0.77
Ca	K series	36.94	0.58	24.65	CaO	51.69	0.81
Fe	K series	17.88	0.63	8.56	FeO	23.00	0.81
Total		100.00		100.00		100.00	



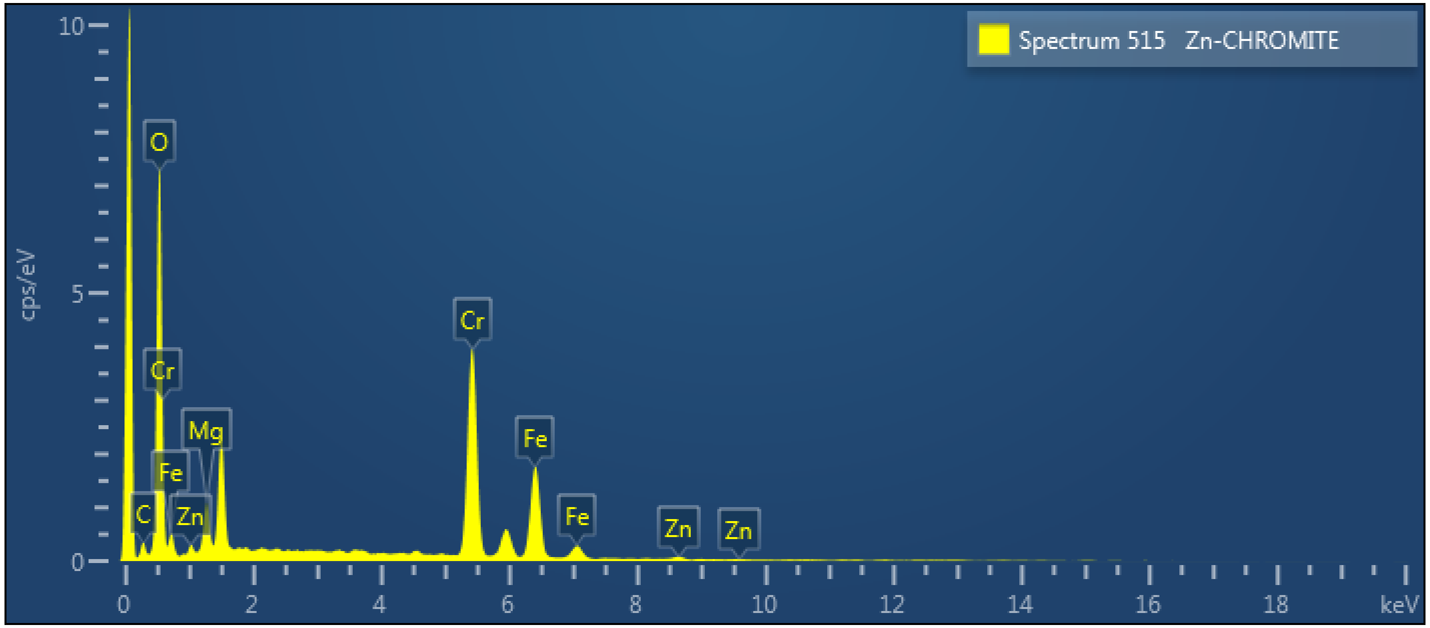
Spectrum 511 Cr-MICA							
Element	Line Type	Weight %	Weight % Sigma	Atomic %	Oxide	Oxide %	Oxide % Sigma
O	K series	47.81	0.37	61.45			
Na	K series	4.16	0.19	3.72	Na2O	5.61	0.26
Al	K series	20.60	0.28	15.70	Al2O3	38.92	0.53
Si	K series	23.62	0.31	17.30	SiO2	50.54	0.66
K	K series	2.48	0.14	1.30	K2O	2.98	0.17
Cr	K series	1.33	0.15	0.53	Cr2O3	1.95	0.22
Total		100.00		100.00		100.00	



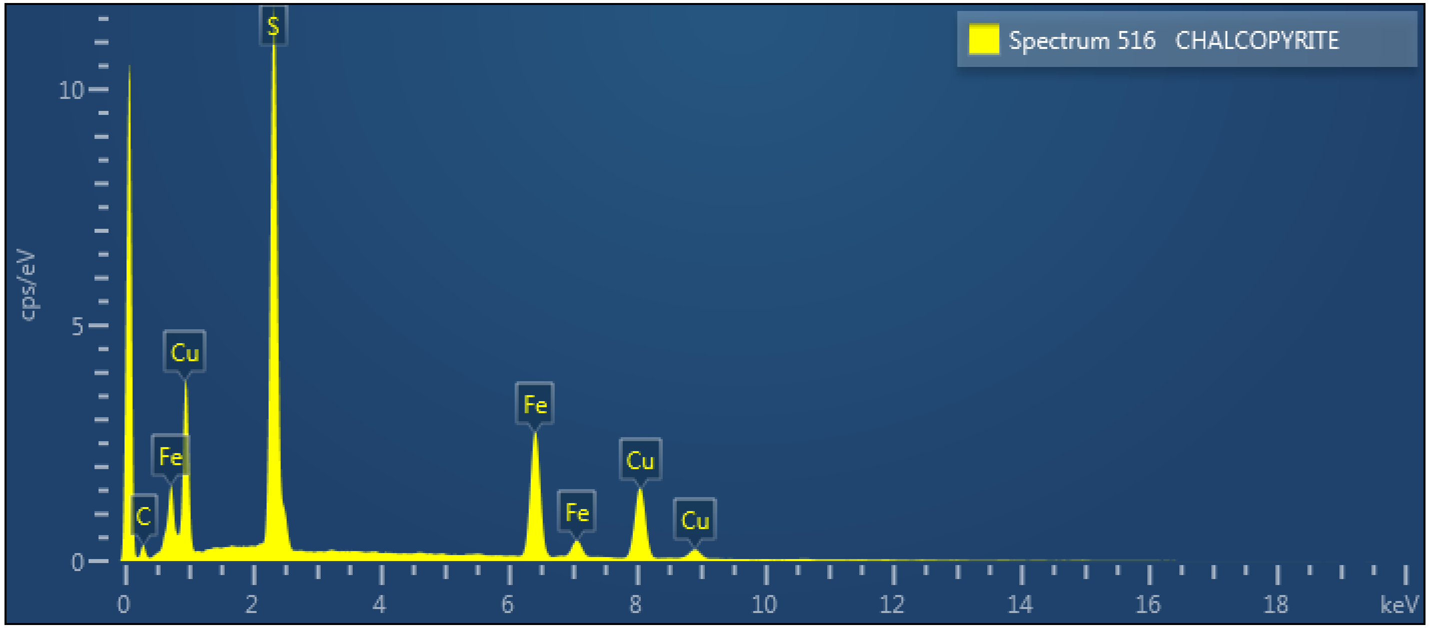
Spectrum 512 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	48.07	0.33	61.32			
Na	K series	5.07	0.18	4.50	Na2O	6.83	0.24
Al	K series	21.69	0.26	16.41	Al2O3	40.98	0.48
Si	K series	23.17	0.28	16.83	SiO2	49.56	0.59
K	K series	1.19	0.10	0.62	K2O	1.44	0.12
Cr	K series	0.82	0.13	0.32	Cr2O3	1.19	0.19
Total		100.00		100.00		100.00	



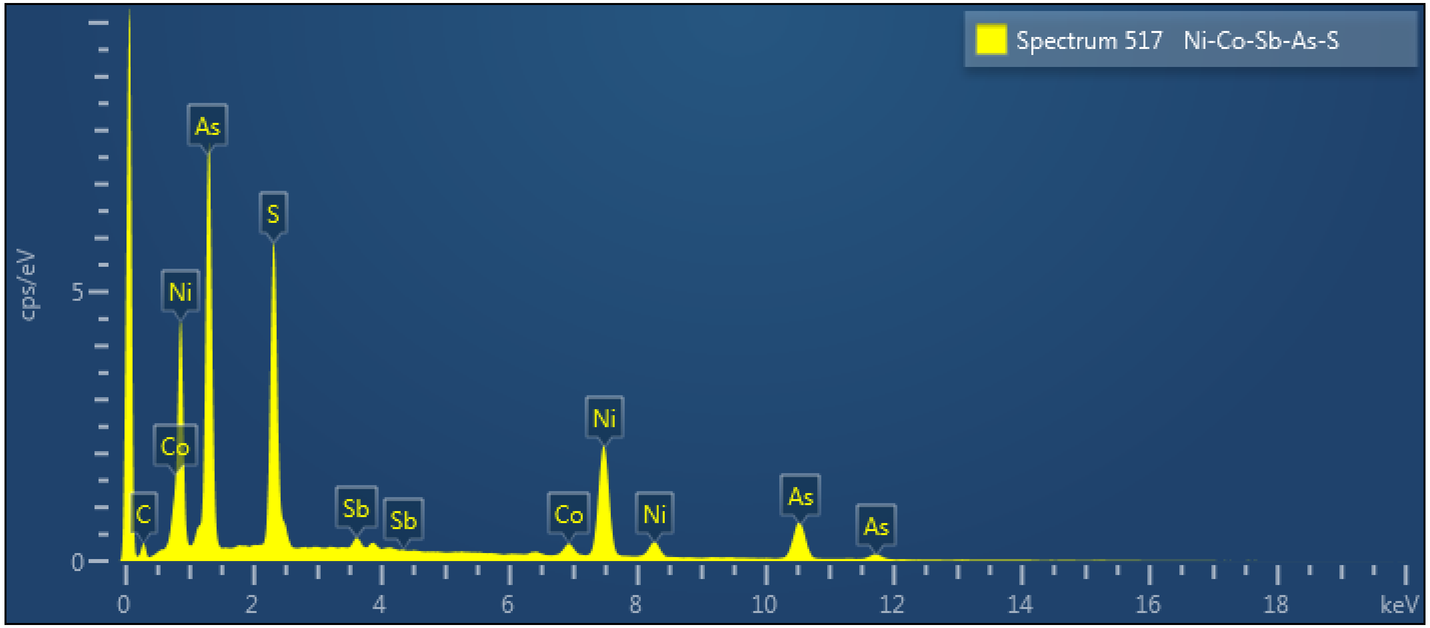
Spectrum 513 CHROMITE							
Element	Line Type	Weight %	Weight % Sigma	Atomic %	Oxide	Oxide %	Oxide % Sigma
O	K series	32.64	0.42	56.79			
Mg	K series	6.83	0.24	7.82	MgO	11.33	0.40
Al	K series	7.25	0.22	7.48	Al2O3	13.70	0.42
Cr	K series	36.77	0.42	19.68	Cr2O3	53.74	0.62
Fe	K series	16.50	0.39	8.22	FeO	21.23	0.50
Total		100.00		100.00		100.00	



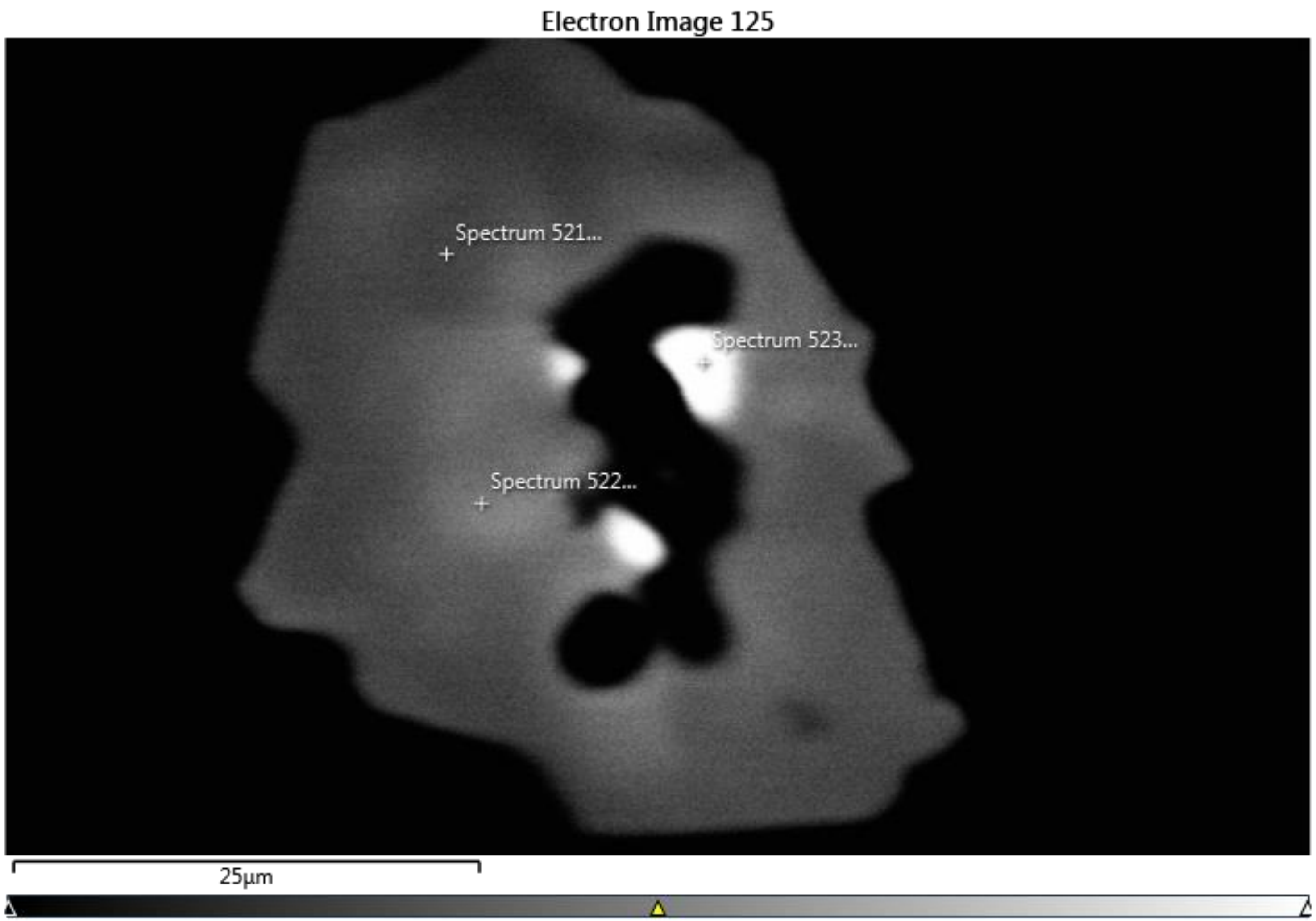
Spectrum 515 Zn-CHROMITE							
Element	Line Type	Weight %	Weight % Sigma	Atomic %	Oxide	Oxide %	Oxide % Sigma
O	K series	31.51	0.64	56.61			
Al	K series	7.90	0.33	8.41	Al2O3	14.92	0.63
Cr	K series	32.61	0.62	18.03	Cr2O3	47.66	0.90
Fe	K series	22.34	0.61	11.50	FeO	28.73	0.79
Mg	K series	4.00	0.31	4.72	MgO	6.63	0.52
Zn	K series	1.65	0.45	0.73	ZnO	2.06	0.56
Total		100.00		100.00		100.00	



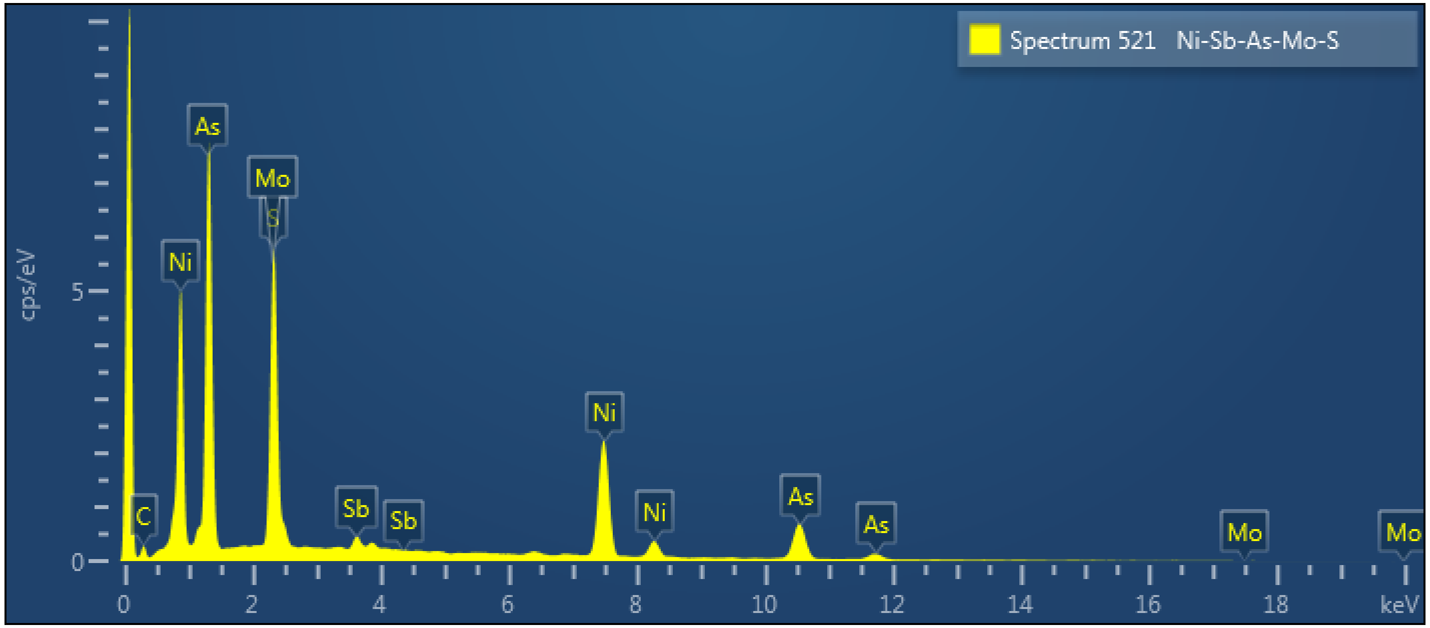
Spectrum 516 CHALCOPYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	36.20	0.48	51.37
Fe	K series	29.99	0.51	24.43
Cu	K series	33.80	0.62	24.20
Total		100.00		100.00



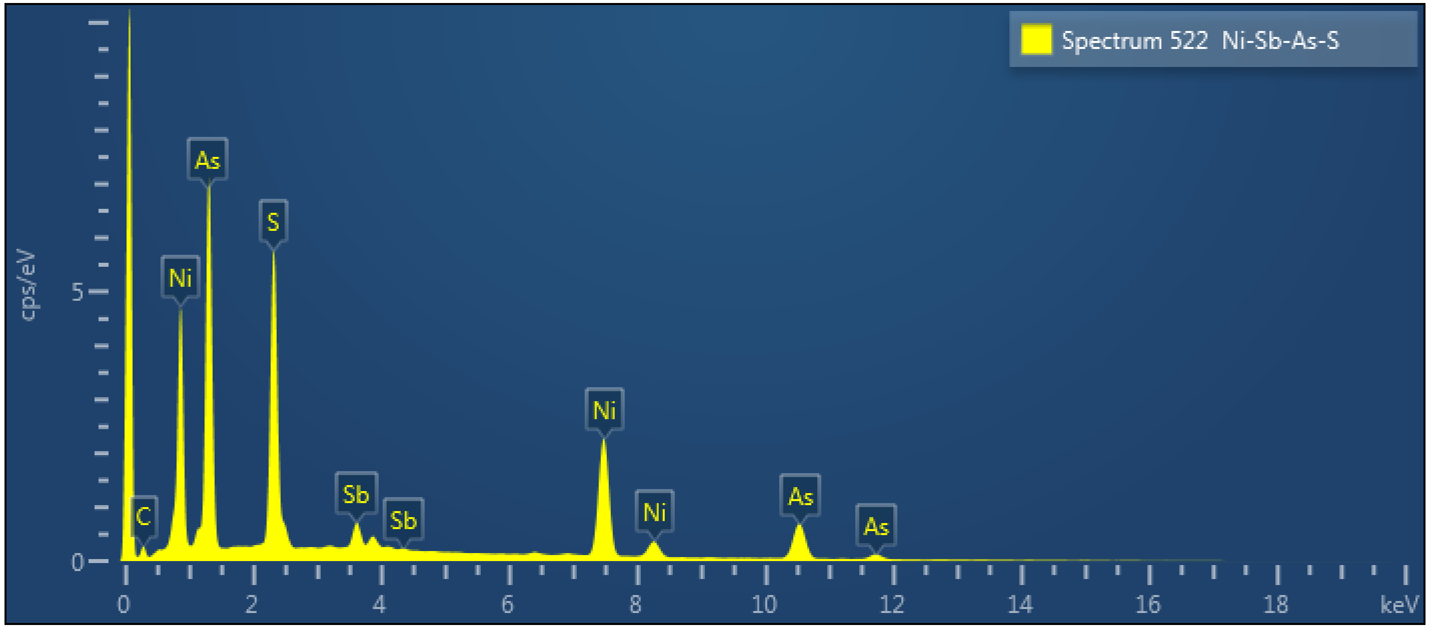
Spectrum 517 Ni-Co-Sb-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.72	0.29	34.19
Ni	K series	31.62	0.45	29.94
As	L series	43.26	0.46	32.09
Co	K series	2.71	0.23	2.56
Sb	L series	2.68	0.26	1.22
Total		100.00		100.00



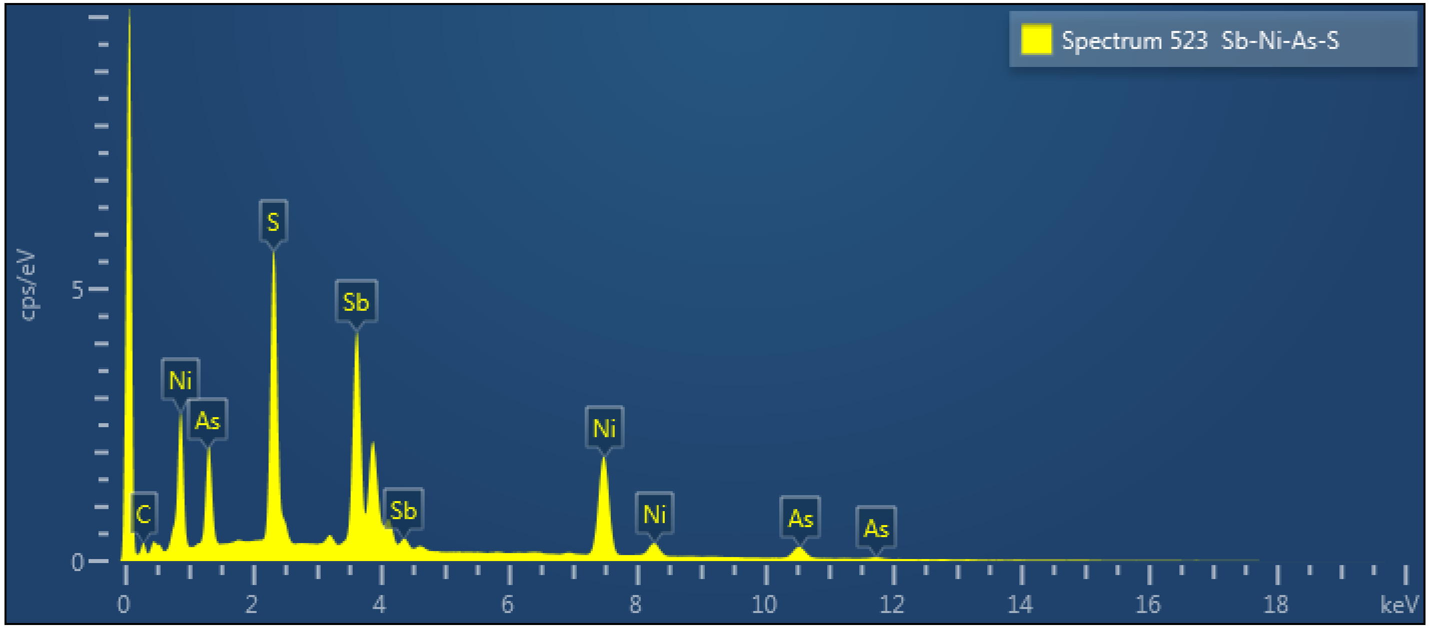
Backscatter image of an intergrowth of sulphides including Ni-Sb-As-Mo-S (spectrum 521), Ni-Sb-As-S (spectrum 522), Sb-Ni-As-S (spectrum 523)



Spectrum 521 Ni-Sb-As-Mo-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	17.18	0.51	30.95
Ni	K series	32.26	0.66	31.75
As	L series	42.58	0.78	32.84
Sb	L series	2.76	0.28	1.31
Mo	L series	5.21	1.30	3.14
Total		100.00		100.00



Spectrum 522 Ni-Sb-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.39	0.19	34.06
Ni	K series	33.61	0.29	32.24
As	L series	41.37	0.30	31.10
Sb	L series	5.63	0.19	2.61
Total		100.00		100.00

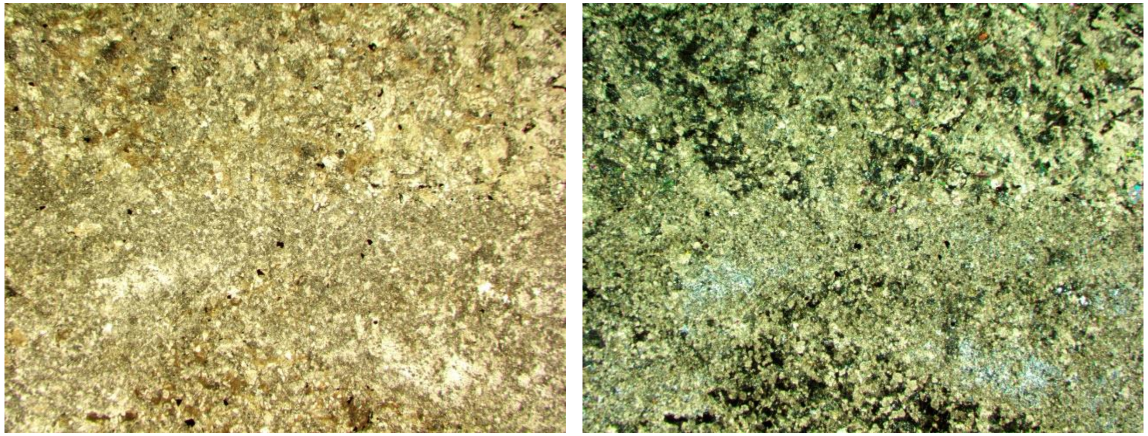


Spectrum 523 Sb-Ni-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	16.41	0.18	33.95
Ni	K series	27.27	0.31	30.81
As	L series	13.36	0.28	11.82
Sb	L series	42.96	0.32	23.41
Total		100.00		100.00

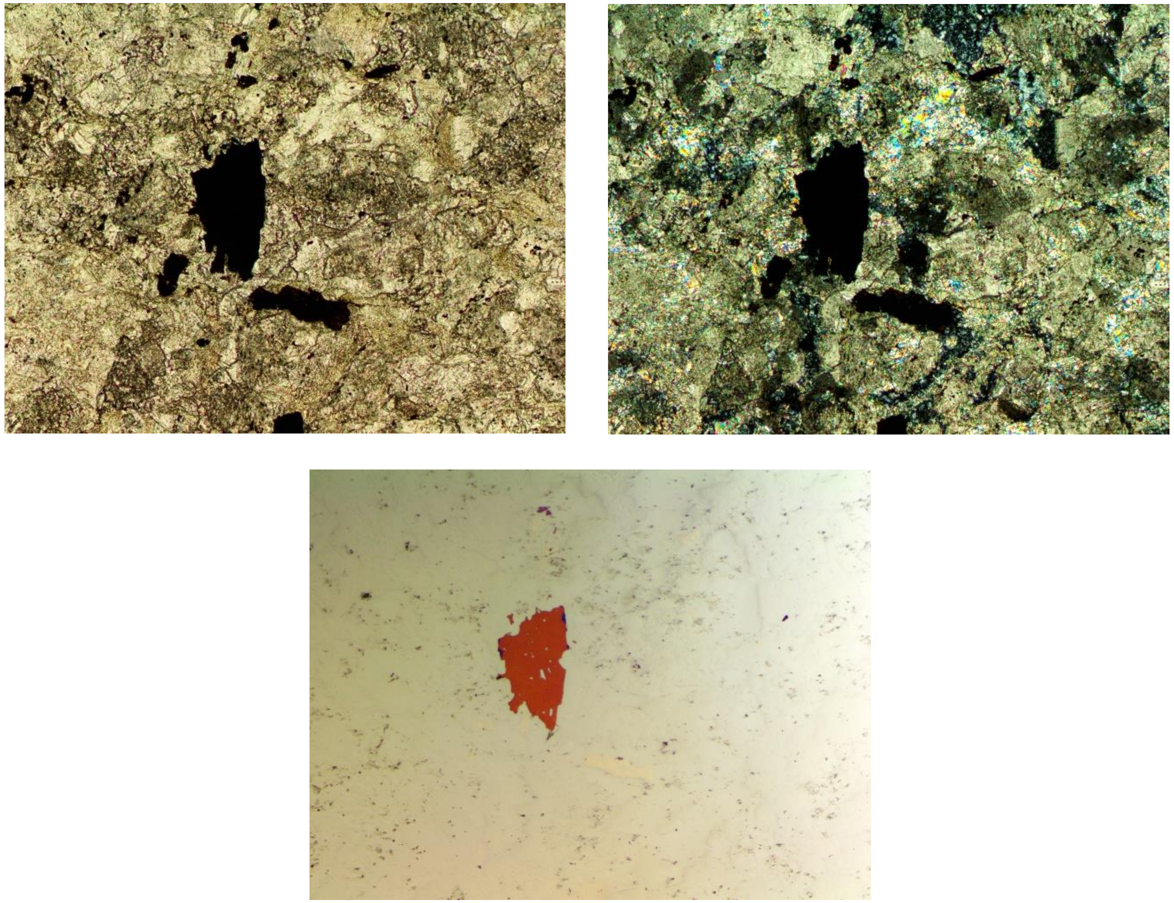
Specimen Notes for 'MID-20'

The rock sample was collected from the Laroma Prospect. It is an altered ultramafic with moderate dolomite-ankerite solid solution carbonate, magnesite-siderite solid solution carbonate, intense Cr-mica (fuchsite), and Cr-chlorite hosting 1-5% fine-grained sulphides. The rock is cut by later stockwork veinlets of grey-white quartz veins.

In terms of metals inventory, the groundmass is dominated by fine-grained pyrite, Ni-Co-S, Ni-Co-As-Fe-S, Ni-Sb-As-S, Ni-Fe-S, and Ni-As-Sb-S.

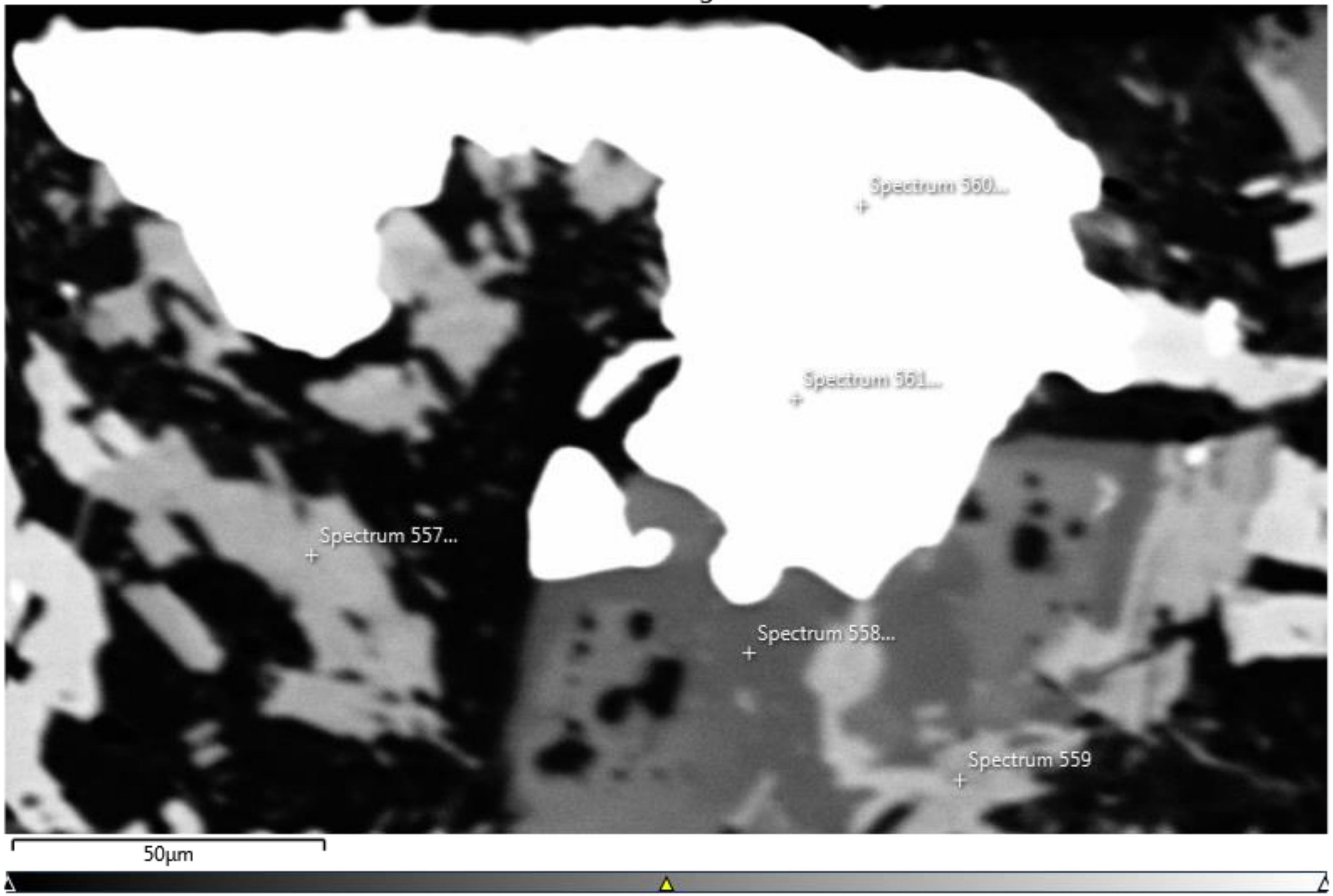


Plane light image (left) and crossed polarized light image (right) illustrating a pervasive dolomite-ankerite solid solution carbonate replacement of the pre-existing ultramafic rock. This pervasive alteration is then cut by later finer-grained quartz-carbonate anastomosing veinlets. Field of view = 17mm

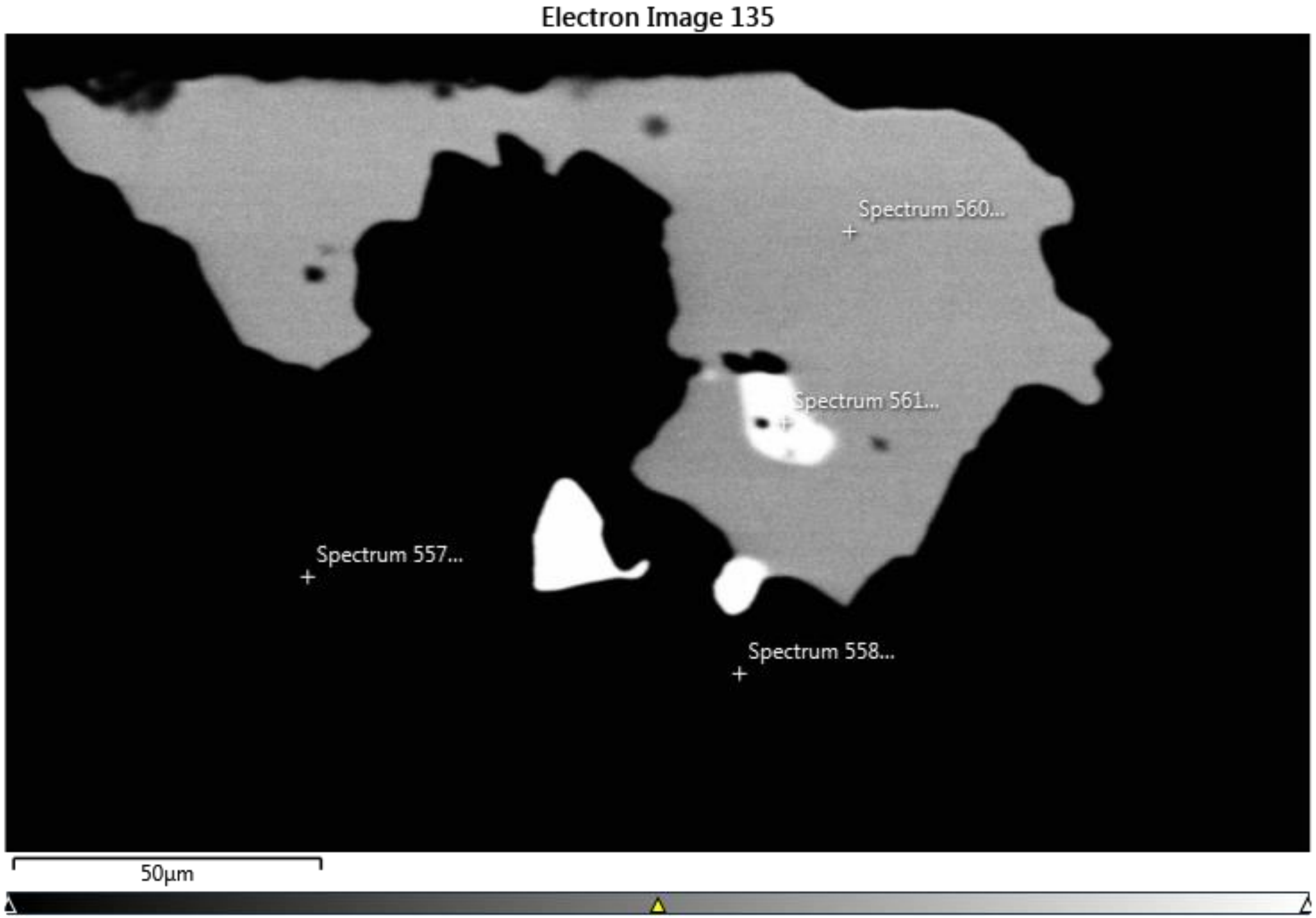


Plane light image (top left) crossed polarized light image (top right), and reflected light image (bottom) illustrating a Ni-Sb-bearing sulphide hosted within dolomite-ankerite solid solution carbonate and Cr-bearing paragonitic micas. Field of view = 2.2mm

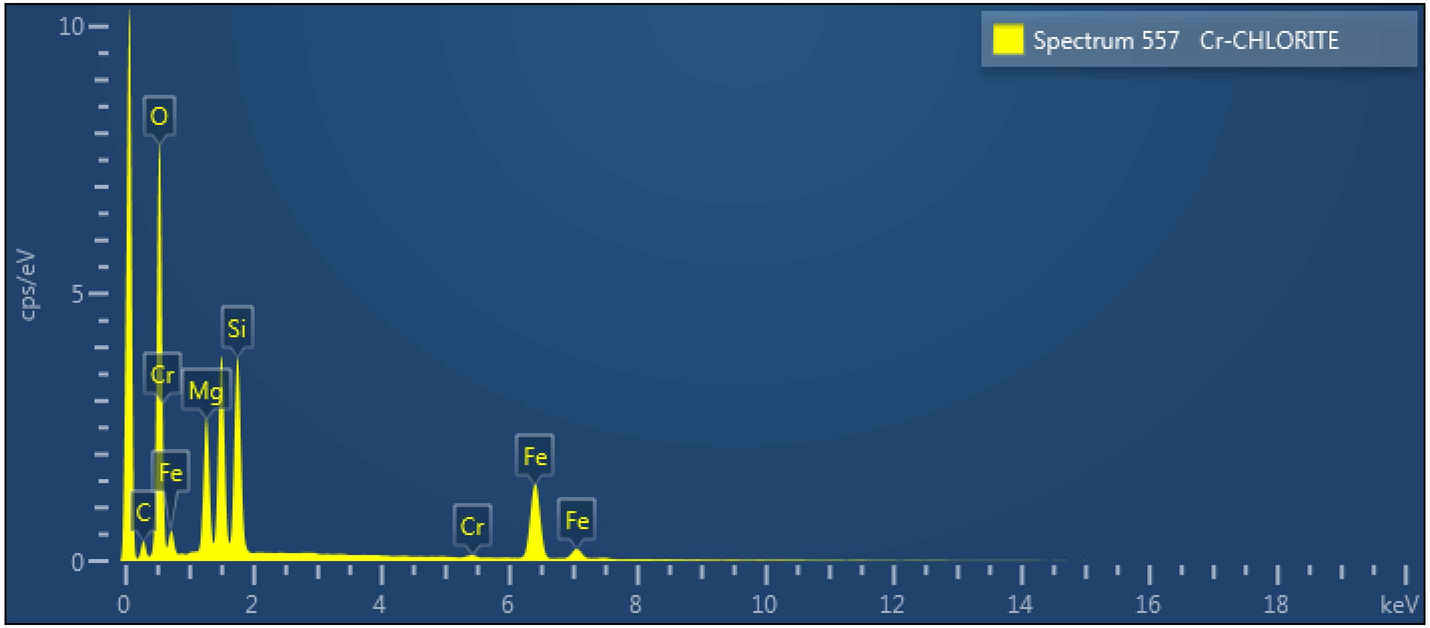
Electron Image 134



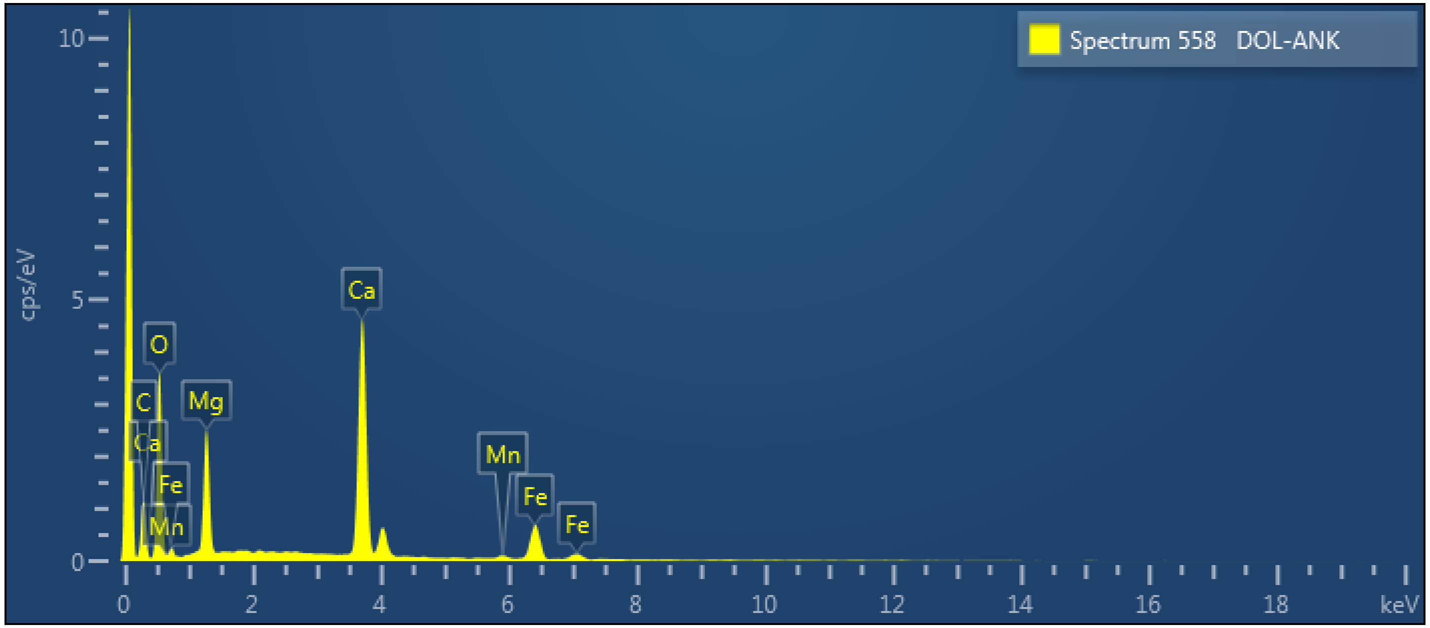
Backscatter image illustrating Cr-chlorite (spectra 557,559) intergrown with dolomite-ankerite solid solution (spectrum 558) hosting Ni-Co-S (spectrum 560) and Ni-Co-As-Fe-S (spectrum 561).



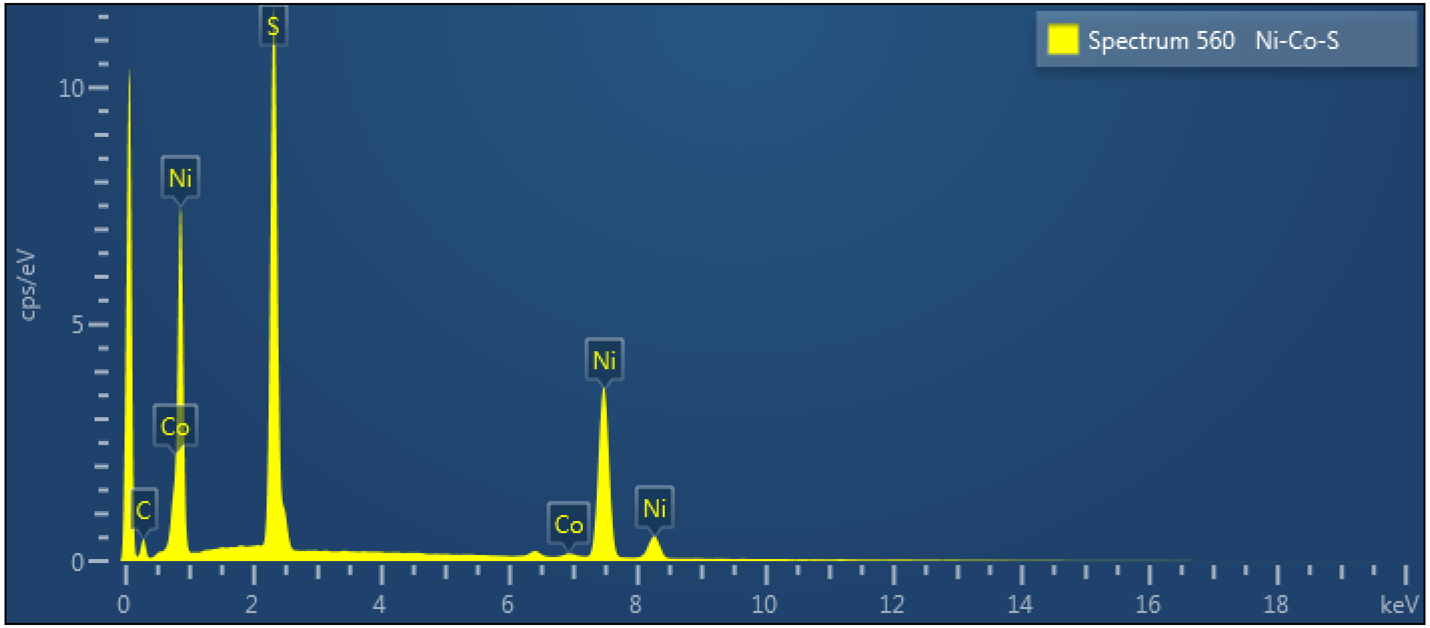
Same image as above with brightness reduced to illustrate the intergrowth of Ni-Co-S (spectrum 560) and Ni-Co-As-Fe-S (spectrum 561).



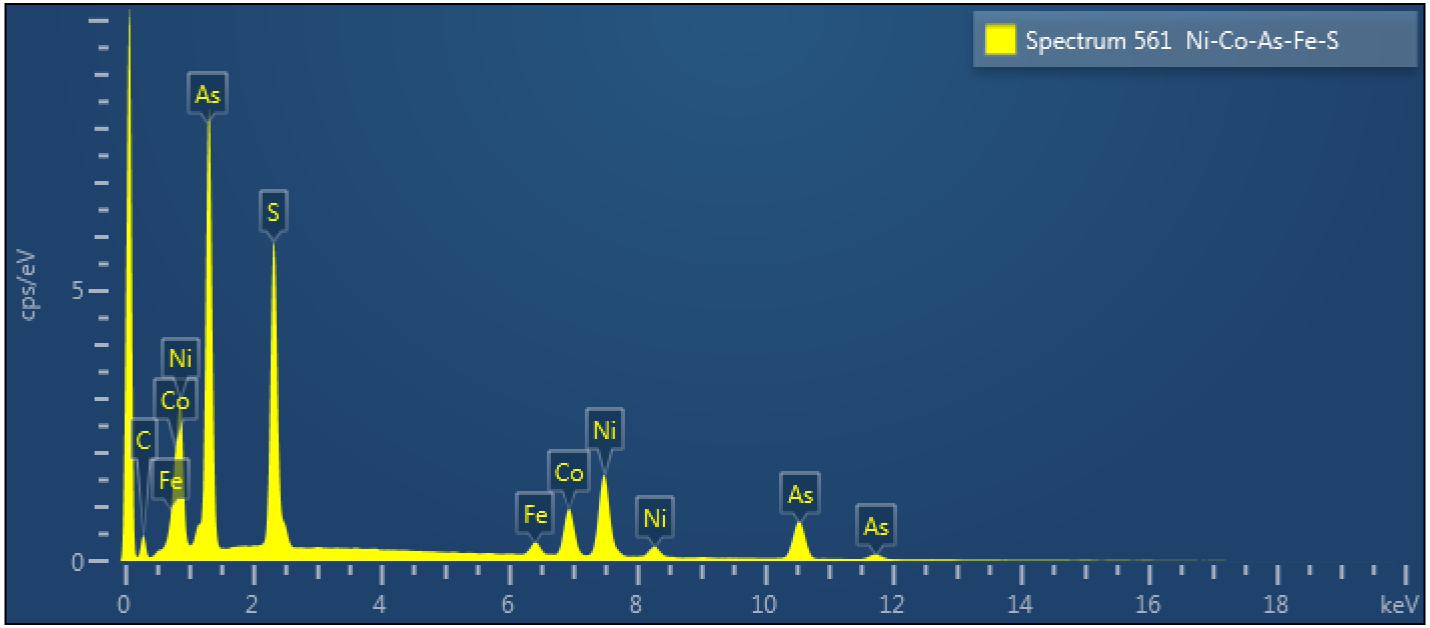
Spectrum 557 Cr-CHLORITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	40.85	0.28	58.62			
Mg	K series	10.09	0.16	9.53	MgO	16.73	0.27
Al	K series	13.79	0.18	11.73	Al2O3	26.06	0.34
Si	K series	13.78	0.17	11.26	SiO2	29.48	0.37
Fe	K series	20.99	0.27	8.63	FeO	27.00	0.34
Cr	K series	0.50	0.08	0.22	Cr2O3	0.74	0.12
Total		100.00		100.00		100.00	



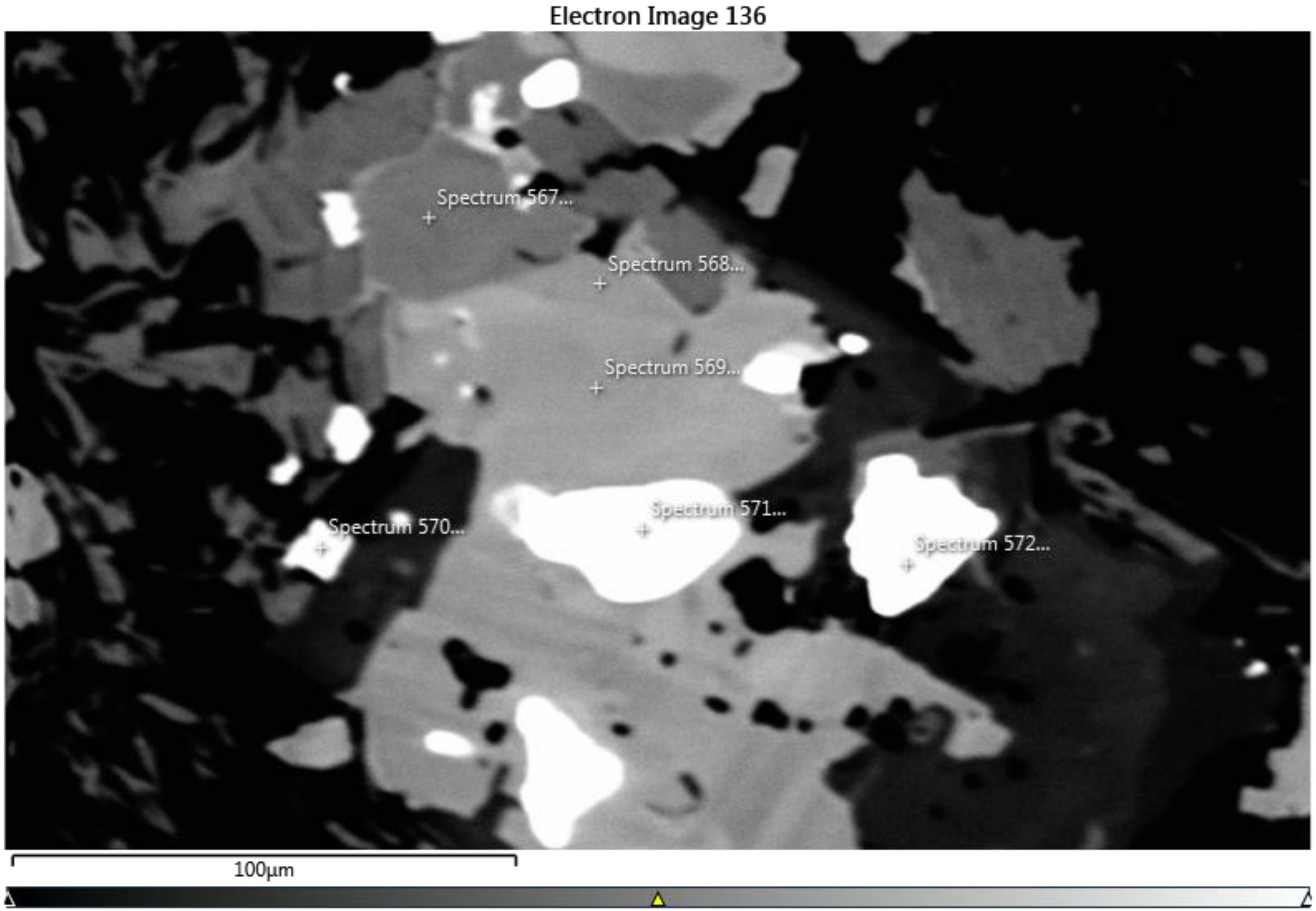
Spectrum 558 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.13	0.63	50.00			
Mg	K series	16.14	0.49	17.62	MgO	26.76	0.81
Ca	K series	36.53	0.61	24.19	CaO	51.11	0.85
Fe	K series	16.00	0.65	7.61	FeO	20.58	0.83
Mn	K series	1.20	0.34	0.58	MnO	1.54	0.43
Total		100.00		100.00		100.00	



Spectrum 560 Ni-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	37.39	0.23	52.23
Ni	K series	61.80	0.24	47.15
Co	K series	0.82	0.12	0.62
Total		100.00		100.00

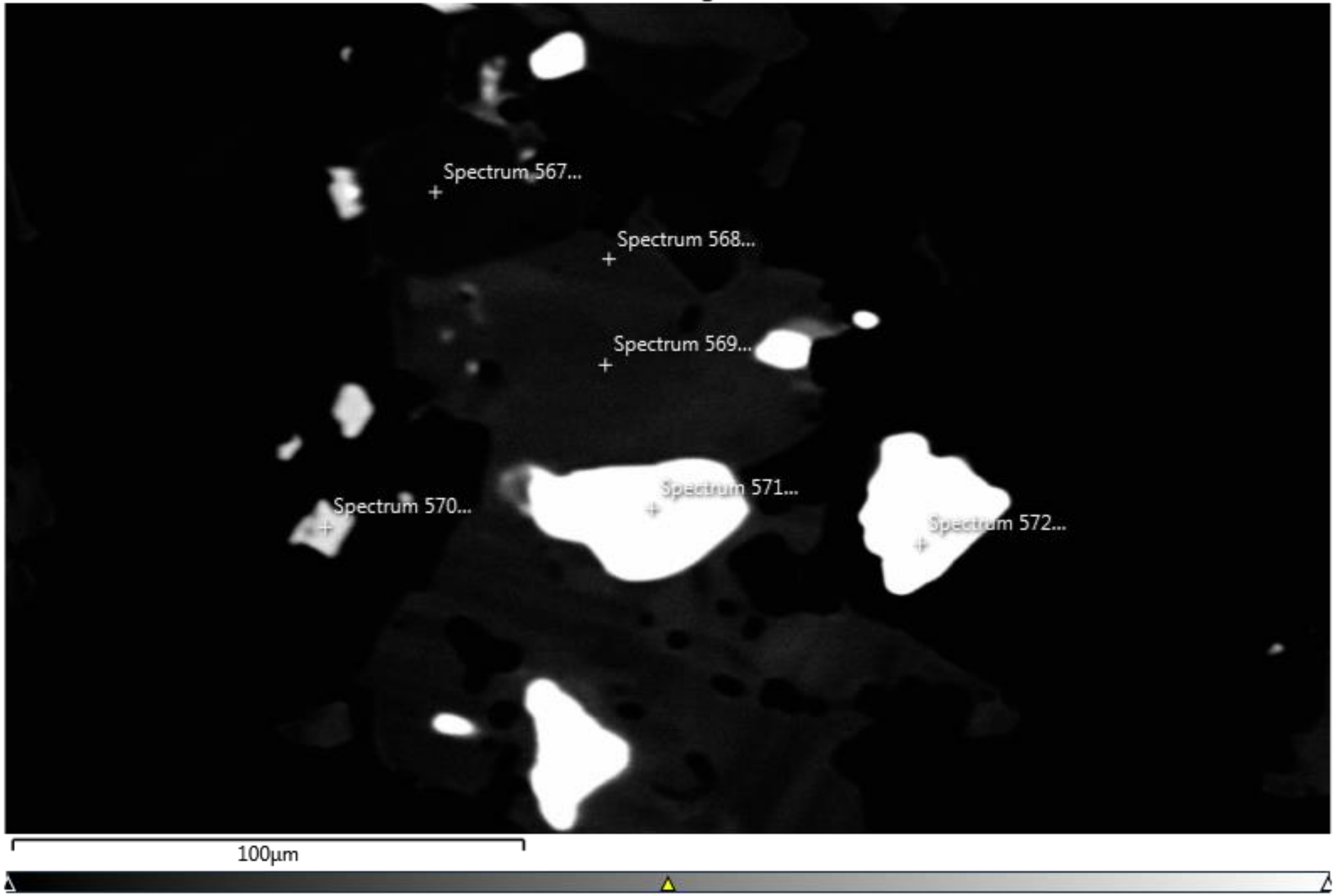


Spectrum 561 Ni-Co-As-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.45	0.22	33.43
Co	K series	11.16	0.25	10.44
Ni	K series	22.27	0.32	20.91
As	L series	44.89	0.35	33.02
Fe	K series	2.23	0.14	2.21
Total		100.00		100.00



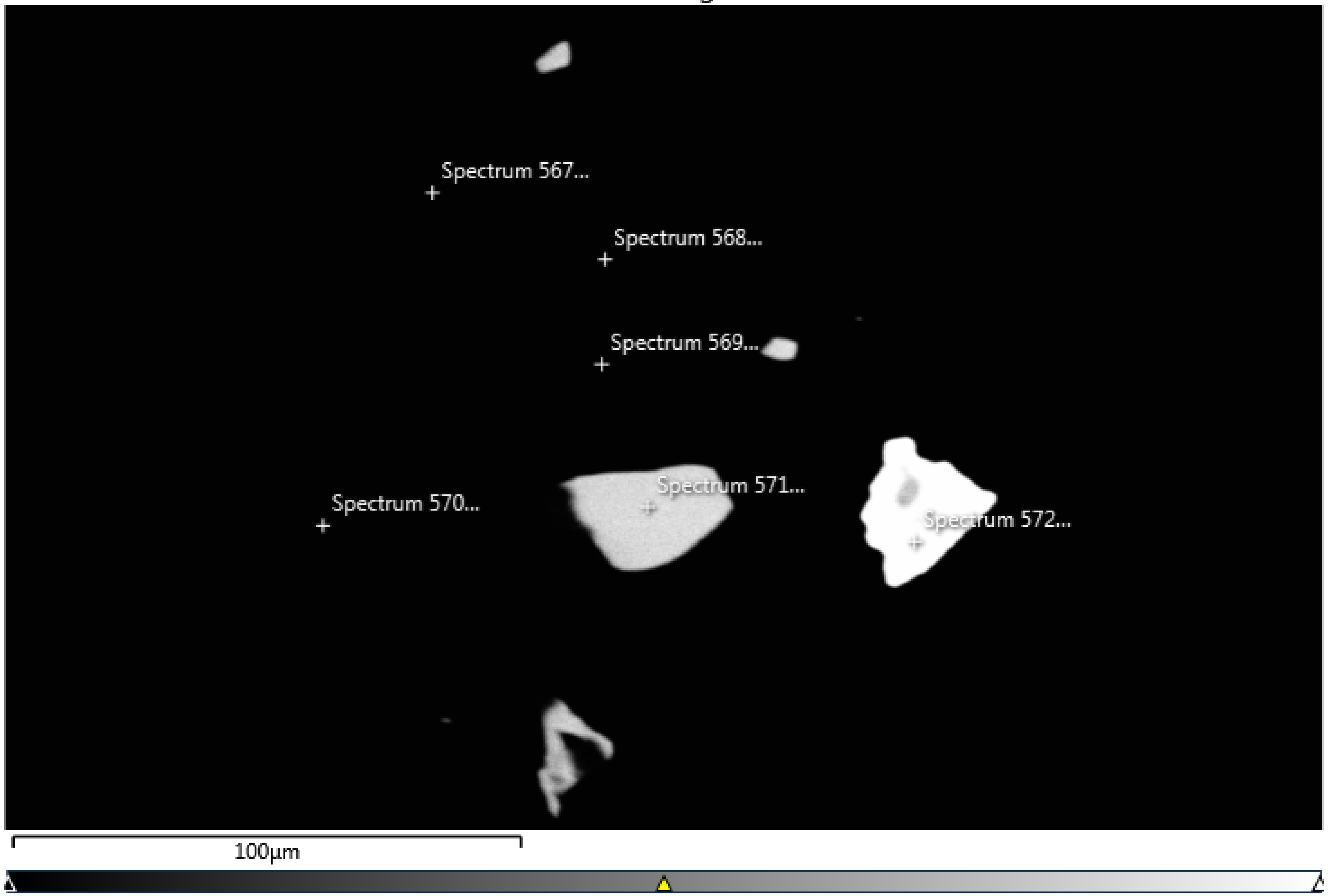
Backscatter illustrating the complicated compositional zoning of magnesite-siderite solid solution carbonate (spectra 567-569) hosting grains of altered rutile/sphene (spectrum 570) and multiple grains of Ni-Fe-S (spectrum 571) and Ni-As-Sb-S (spectrum 572).

Electron Image 137

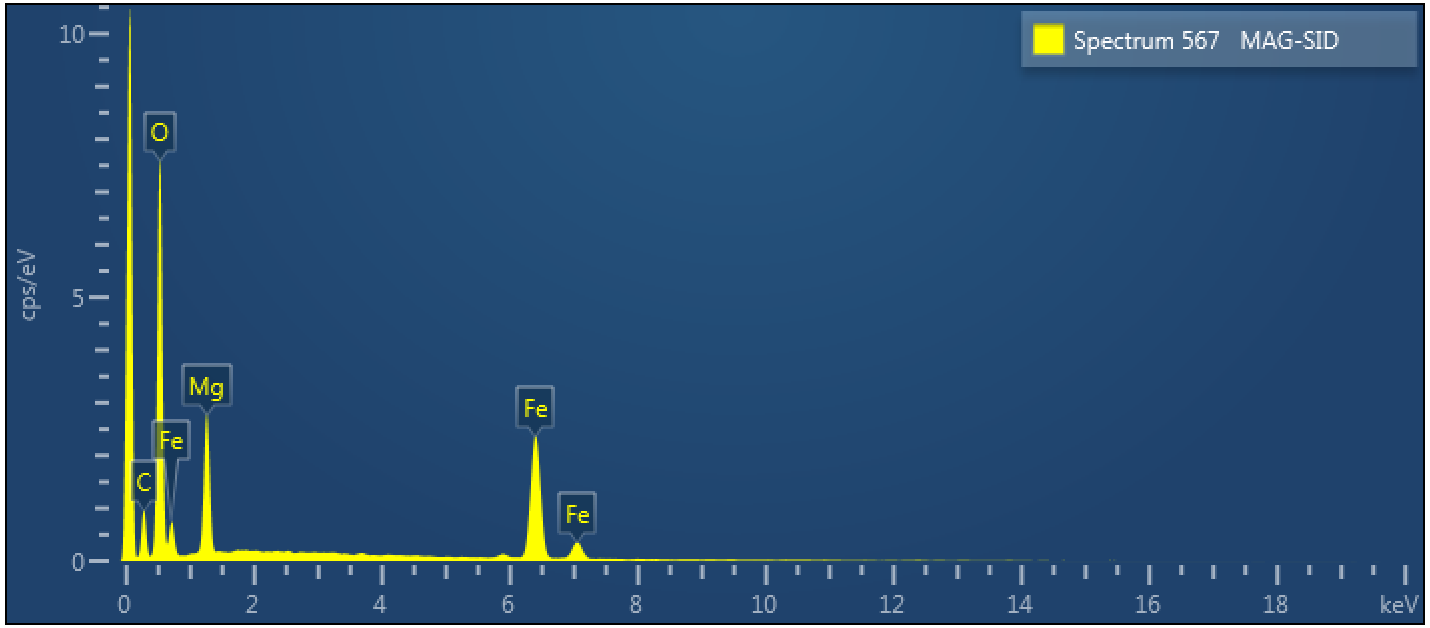


Brightness diminished to show the Ni-Fe-S (spectrum 571) and Ni-As-Sb-S (spectrum 572).

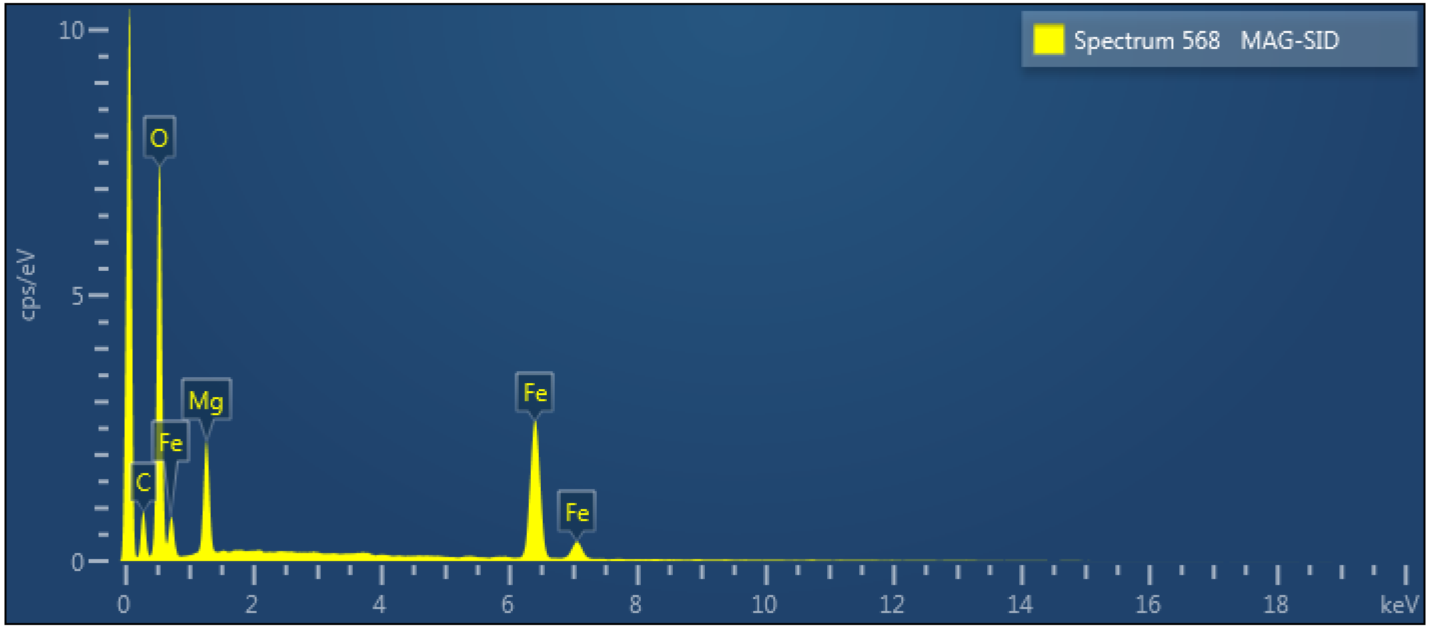
Electron Image 138



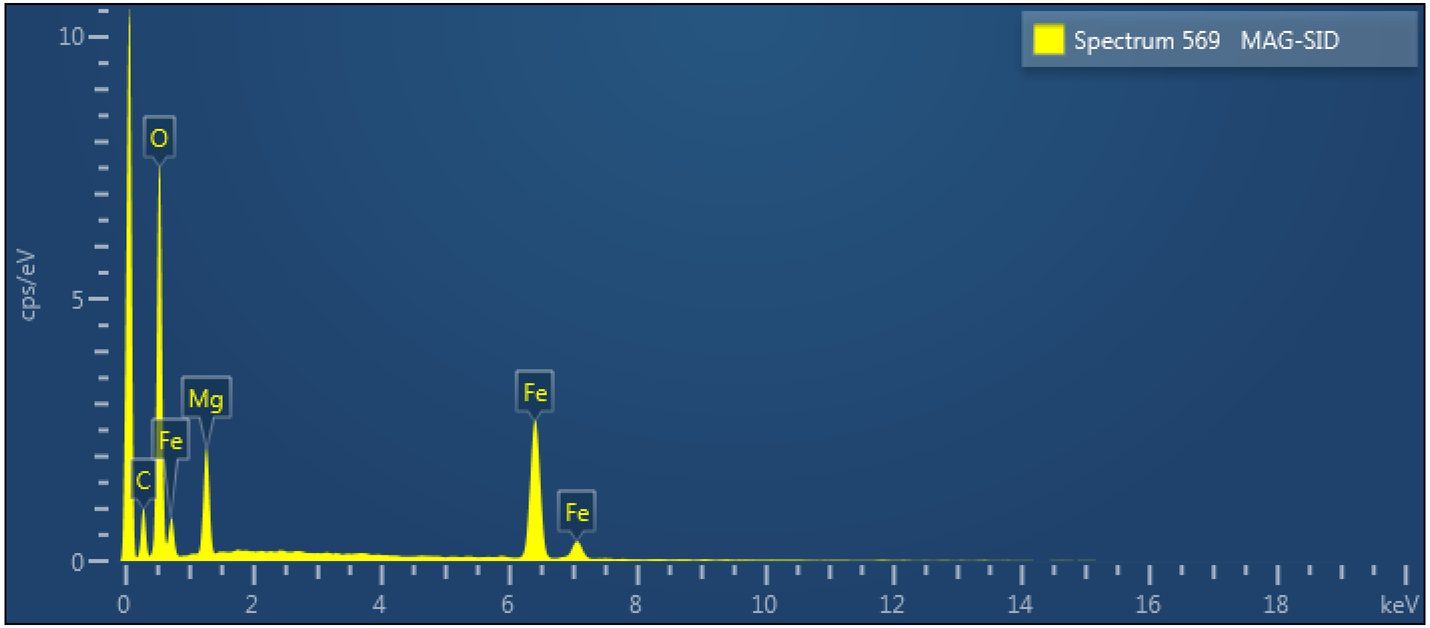
Brightness diminished further to show Ni-Fe-S (spectrum 571) and Ni-As-Sb-S (spectrum 572).



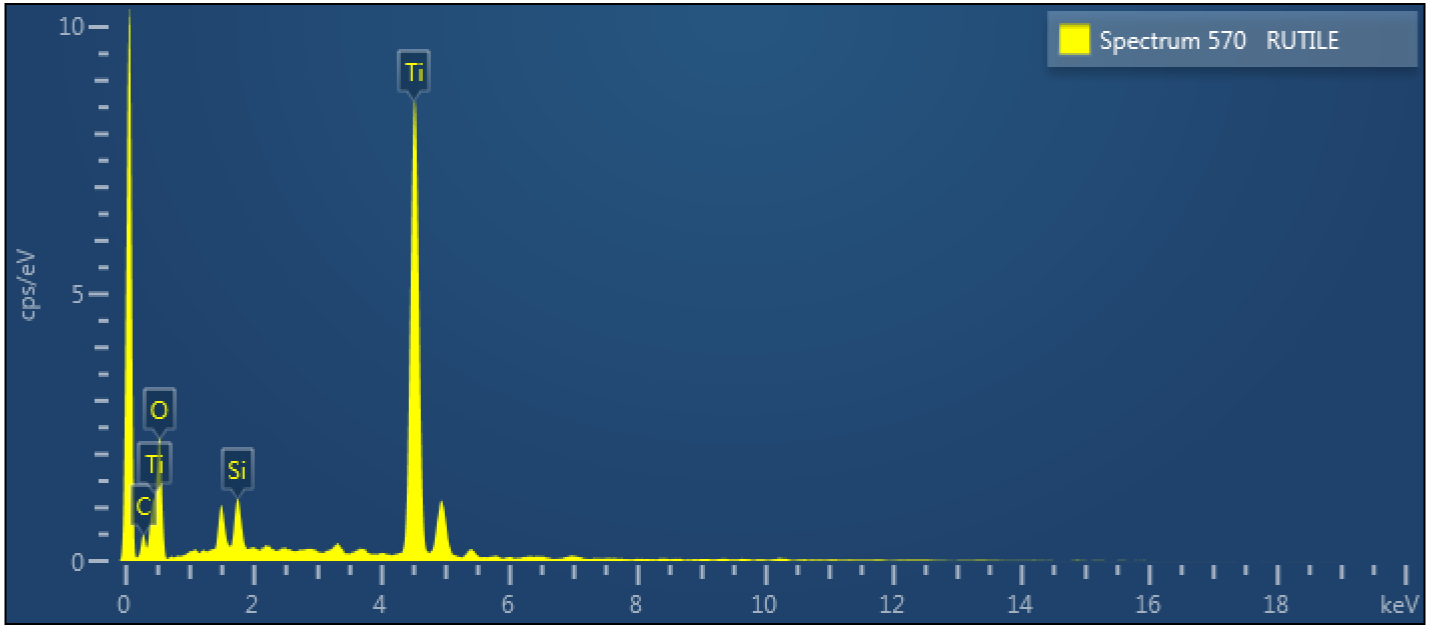
Spectrum 567 MAG-SID							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	28.34	0.52	50.00			
Mg	K series	21.03	0.45	24.41	MgO	34.87	0.74
Fe	K series	50.63	0.58	25.59	FeO	65.13	0.75
Total		100.00		100.00		100.00	



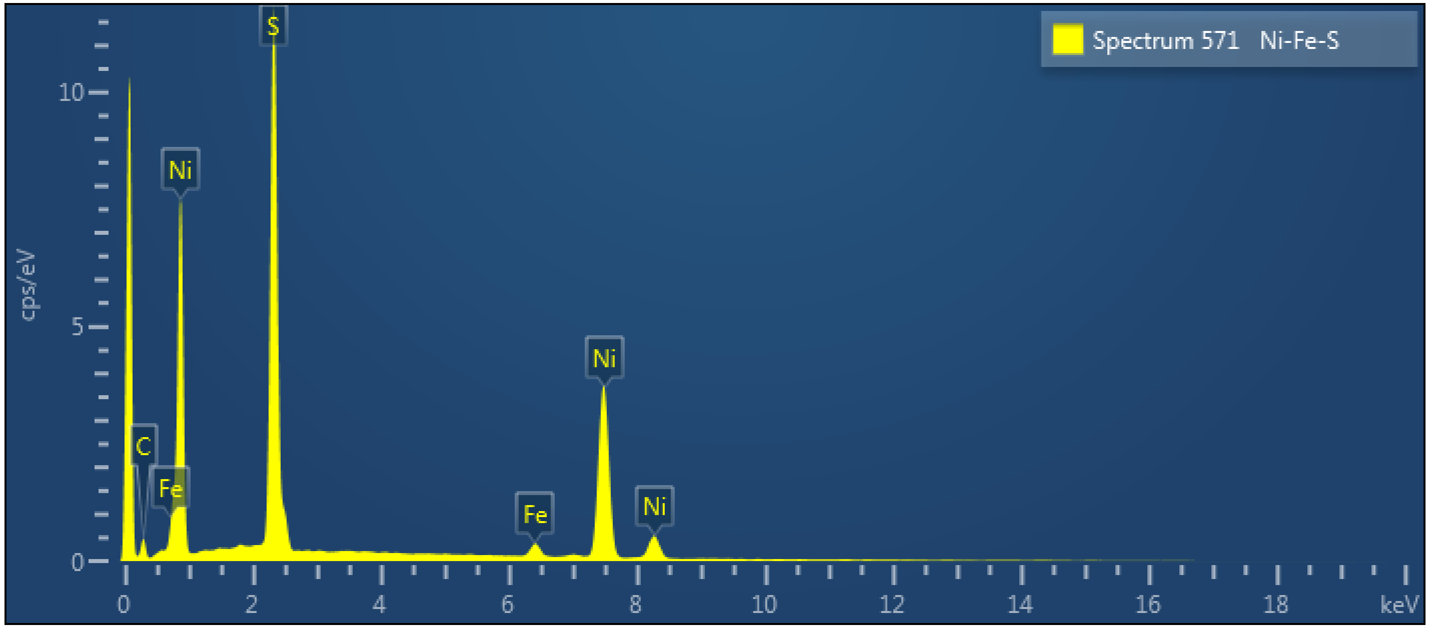
Spectrum 568 MAG-SID							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	27.30	0.60	50.00			
Mg	K series	17.41	0.50	20.99	MgO	28.87	0.82
Fe	K series	55.29	0.68	29.01	FeO	71.13	0.87
Total		100.00		100.00		100.00	



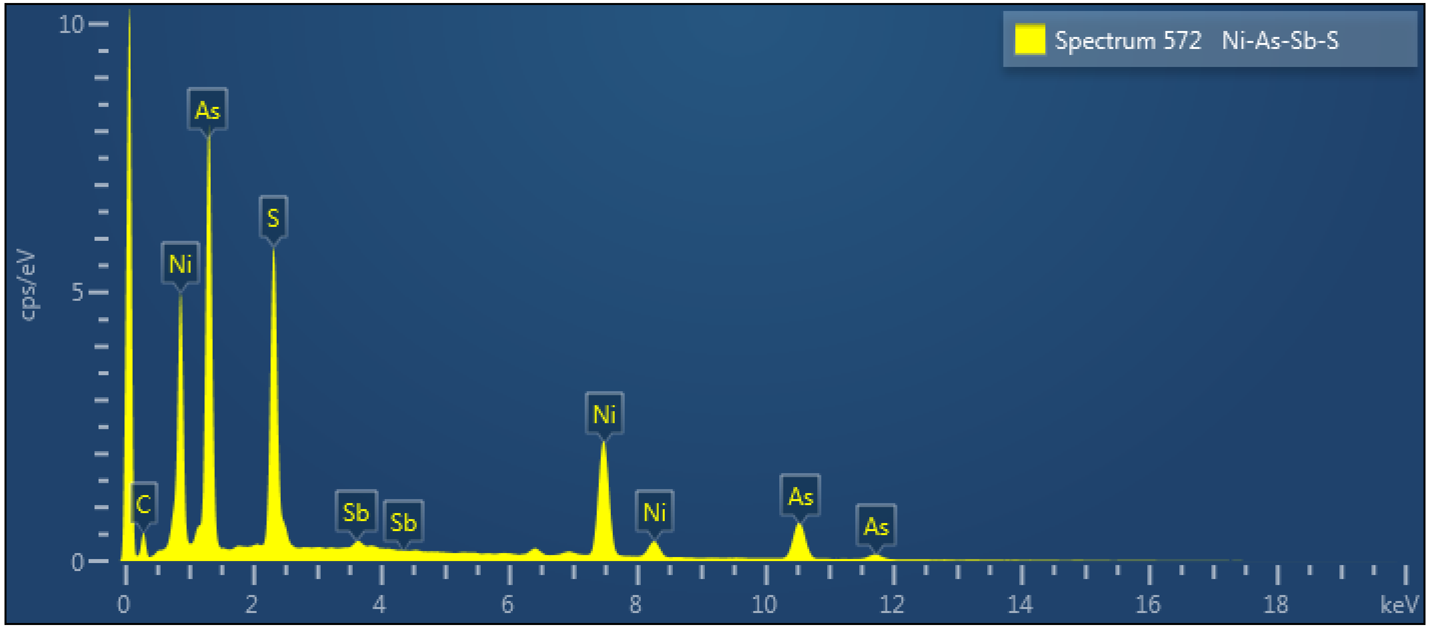
Spectrum 569 MAG-SID							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	27.15	0.66	50.00			
Mg	K series	16.89	0.54	20.47	MgO	28.01	0.89
Fe	K series	55.96	0.74	29.53	FeO	71.99	0.95
Total		100.00		100.00		100.00	



Spectrum 570 RUTILE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	41.07	0.78	66.27			
Ti	K series	54.01	0.80	29.11	TiO2	90.08	1.33
Al	K series	2.46	0.29	2.36	Al2O3	4.66	0.55
Si	K series	2.46	0.27	2.26	SiO2	5.26	0.59
Total		100.00		100.00		100.00	



Spectrum 571 Ni-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	36.65	0.37	51.39
Fe	K series	2.64	0.19	2.12
Ni	K series	60.71	0.39	46.49
Total		100.00		100.00

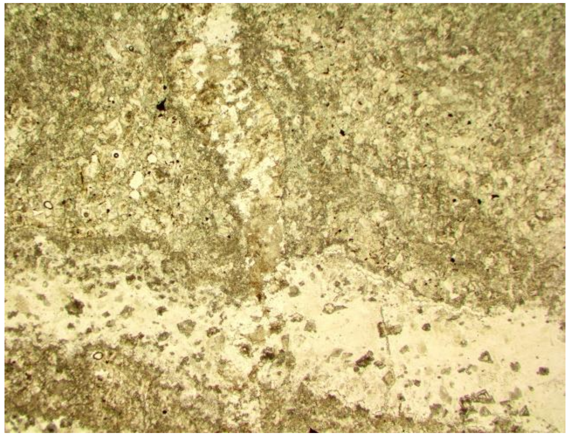


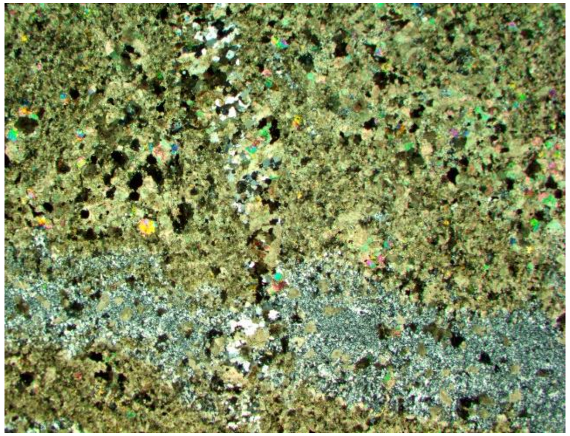
Spectrum 572 Ni-As-Sb-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	19.98	0.24	34.45
Ni	K series	33.47	0.38	31.53
As	L series	45.37	0.38	33.49
Sb	L series	1.18	0.21	0.54
Total		100.00		100.00

Specimen Notes for 'MID-21'

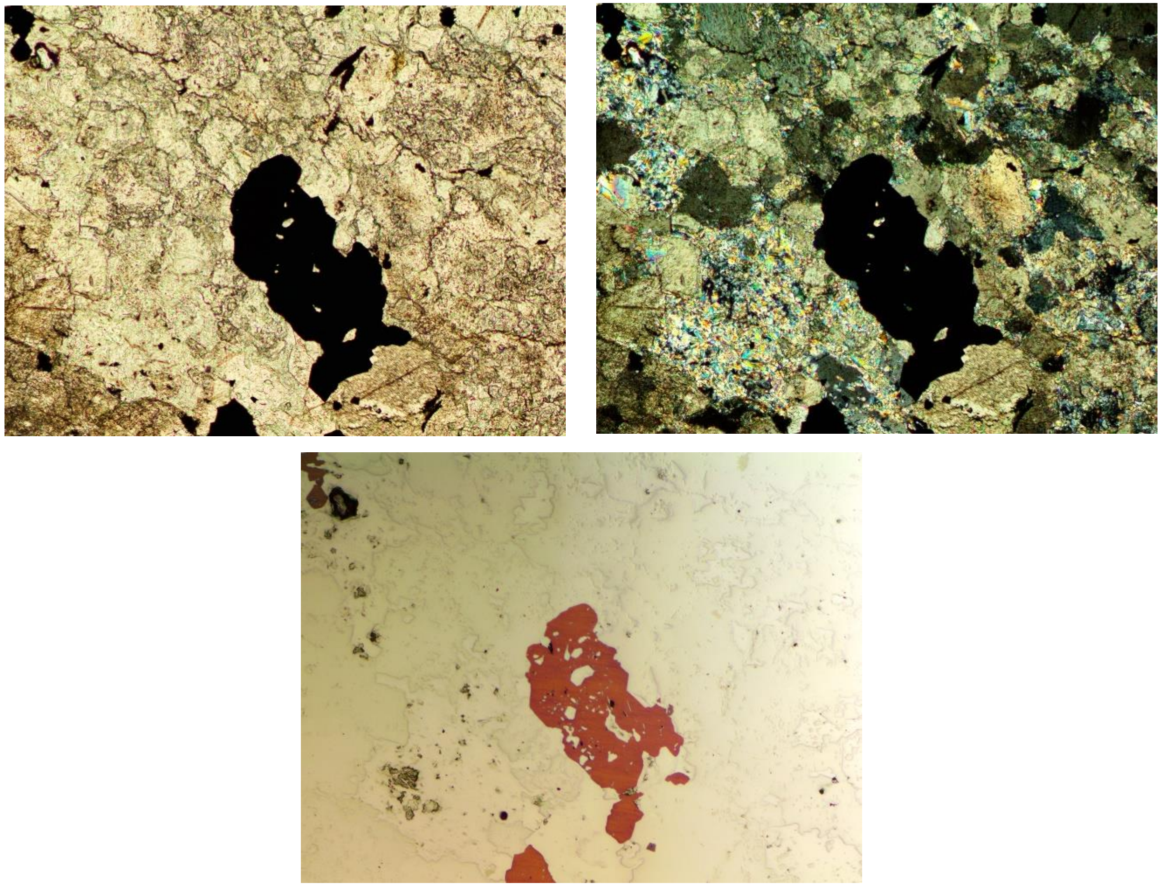
The sample was collected from the base of the pit on the Laroma Prospect. The rock displays a strong green colour attributed to the Cr-mica (fuchsite). It is also characterized by early fine-grained cryptocrystalline quartz and dolomite-ankerite solid solution carbonate. The host rock contains sulphides (~ 3%) comprised of pyrite, malachite, bornite, and various Ni-Co-Sb-bearing minerals. The rock is then cut by stockwork quartz veining of multiple generations which lack sulphide.

In terms of metal inventory, EDS determinations include: Ni-Co-As-S, Ni-As-Sb-S; Cu-Sb-Zn-Fe-S; Ni-As-Co; Ni-As-Sb-Co-S.

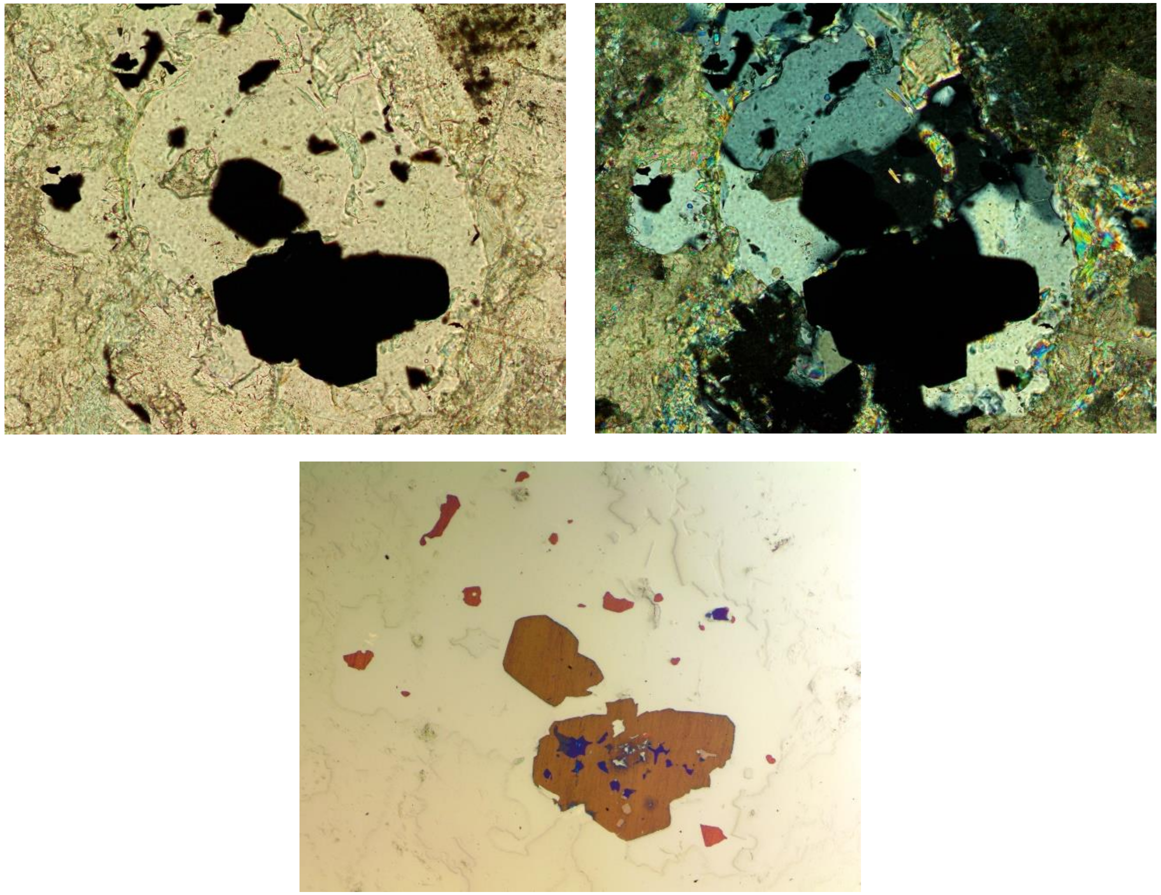




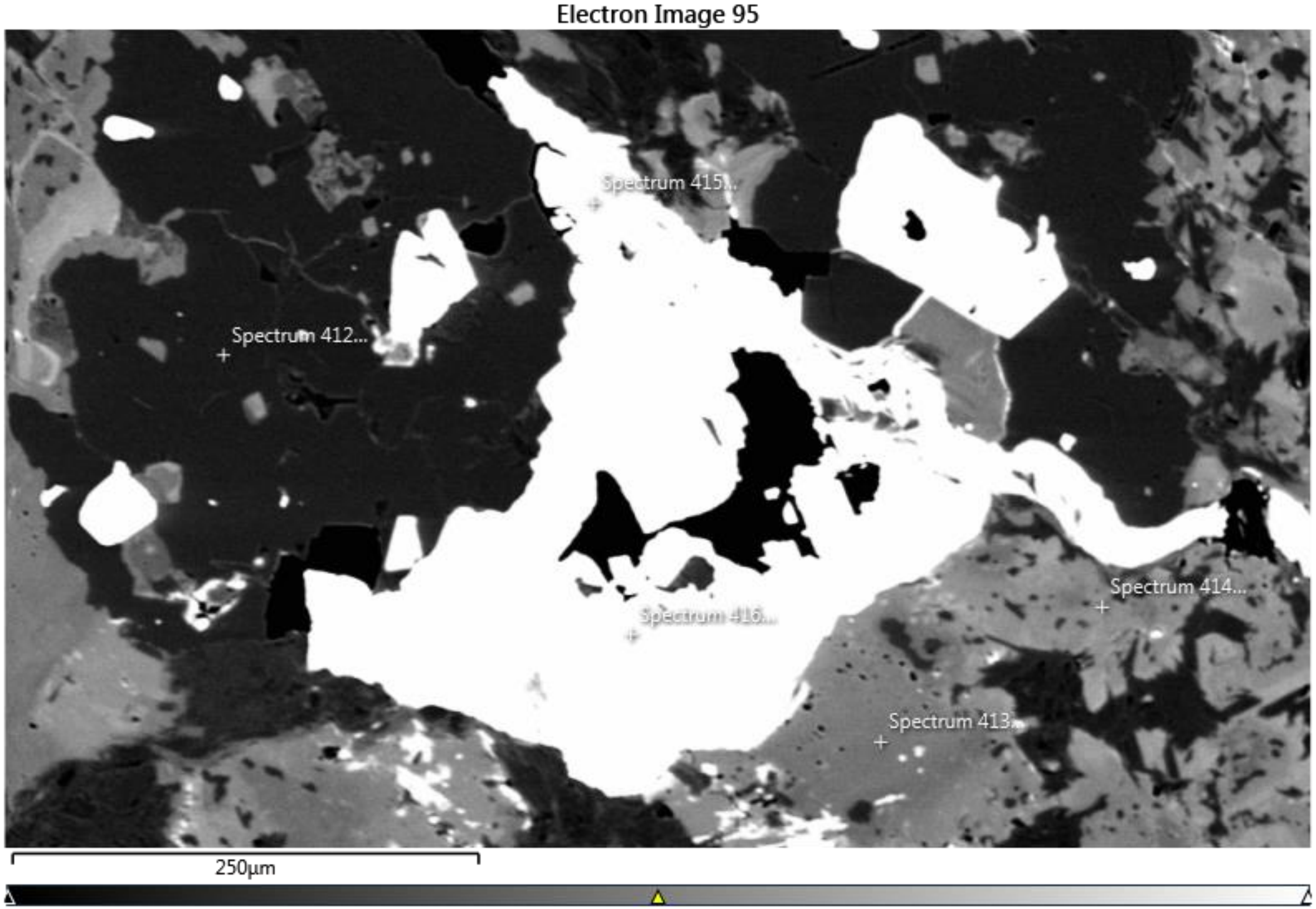
Plane light image (left) and crossed polarized light image (right) illustrating an intensely altered rock consisting of dolomite-ankerite solid solution brecciated, sealed and cut by multiple generations of quartz. Field of view = 17mm



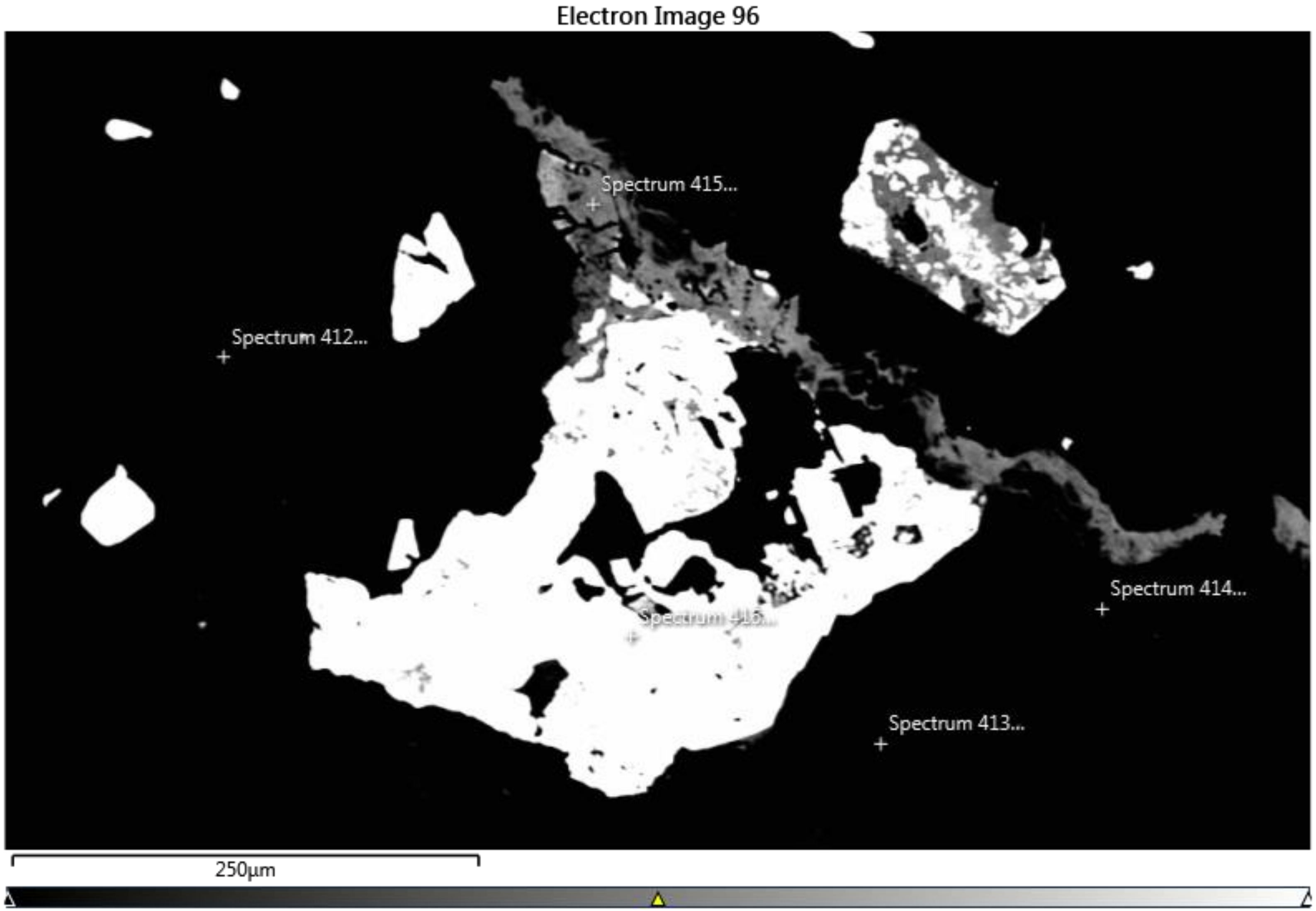
Plane light image (top left) crossed polarized light image (right), and reflected light image (bottom) of Ni-bearing sulphides associated with dolomite-ankerite solid solution carbonate, and strongly birefringent Cr-mica (fuchsite). Field of view = 1.2mm



Plane light image (top left), crossed polarized light image (right), and reflected light image (bottom) of Ni-bearing sulphides hosting minute inclusions of Ni-Sb-Co-bearing sulphides associated with dolomite-ankerite solid solution carbonate, and strongly birefringent Cr-mica (fuchsite). Field of view = 1.2mm

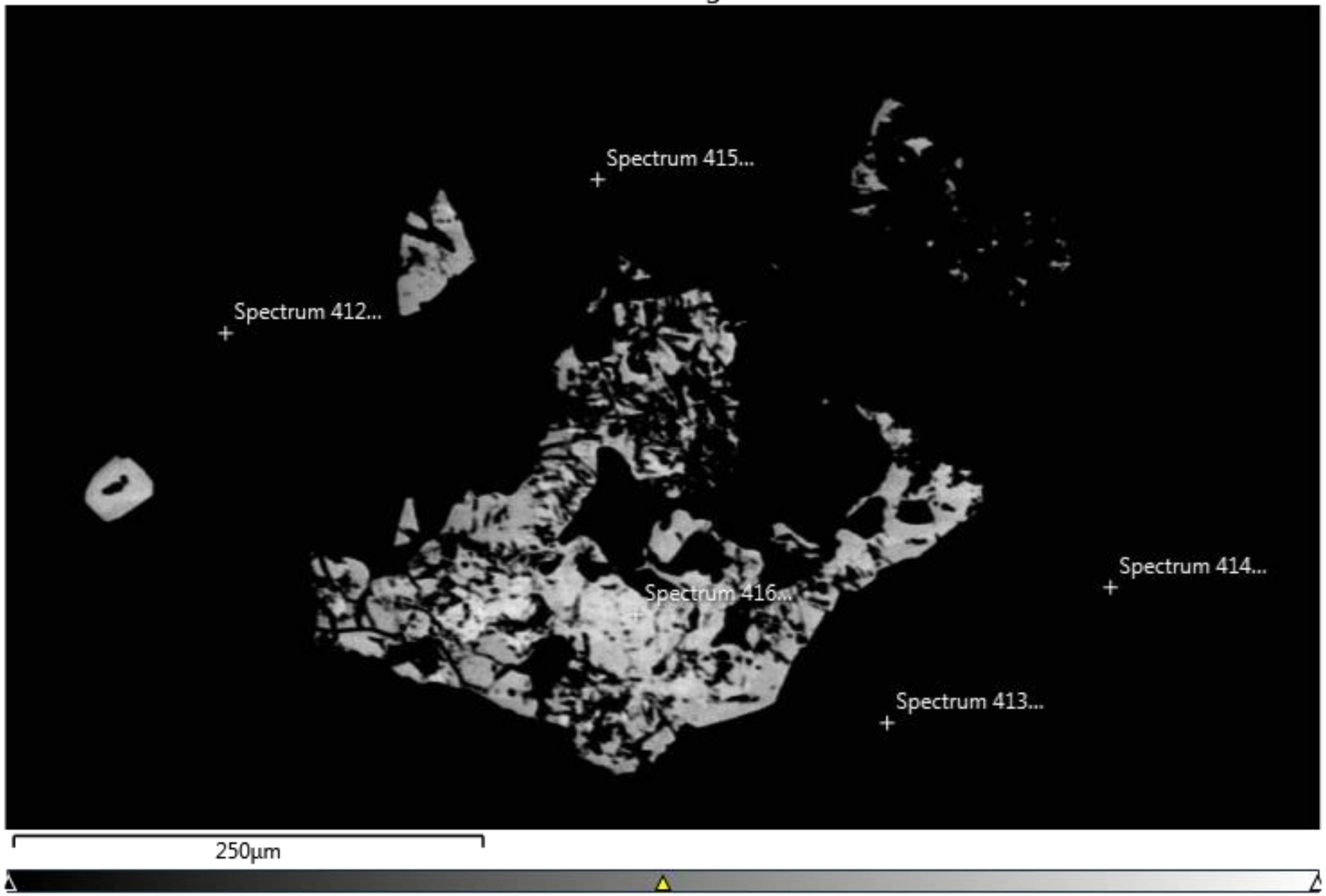


Backscatter image of dolomite-ankerite solid solution carbonate (spectra 413,414) and quartz (spectrum 412) hosting Ni-As-Co (spectrum 415) and Ni-As-Sb-Co-S (spectrum 416).



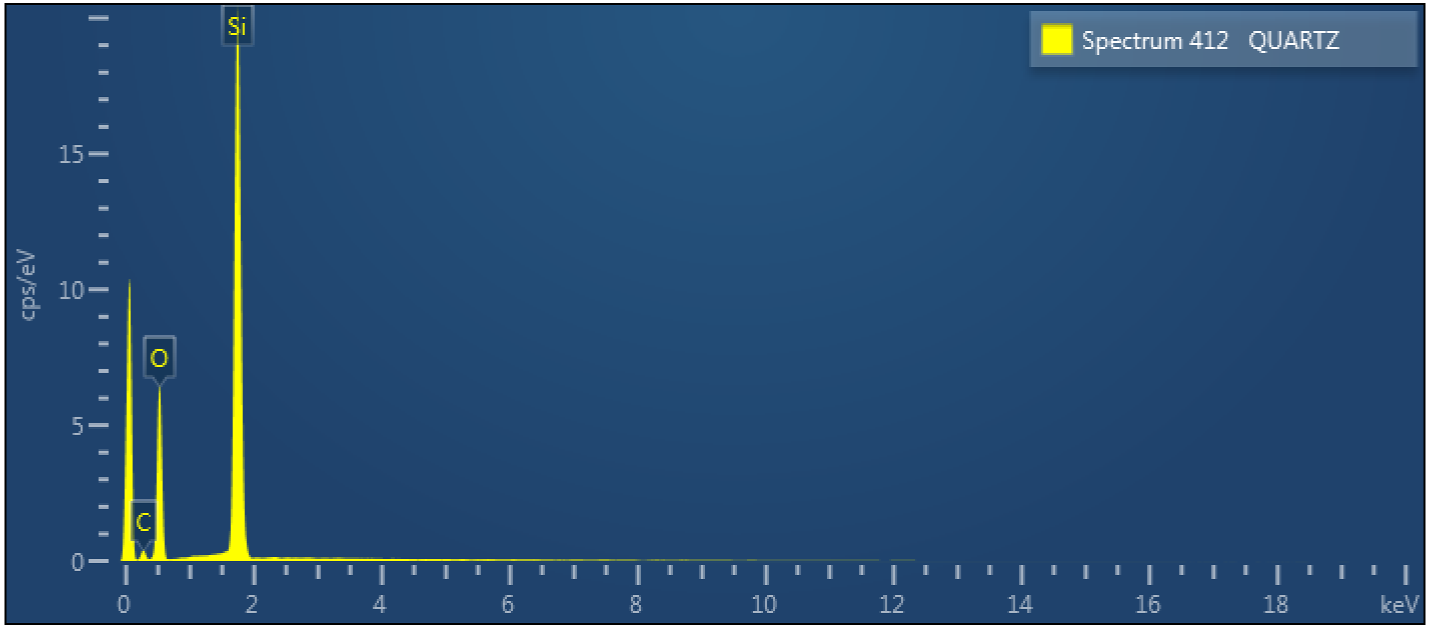
Same image as above with brightness reduced to illustrate the Ni-As-Co phase (spectrum 415).

Electron Image 97

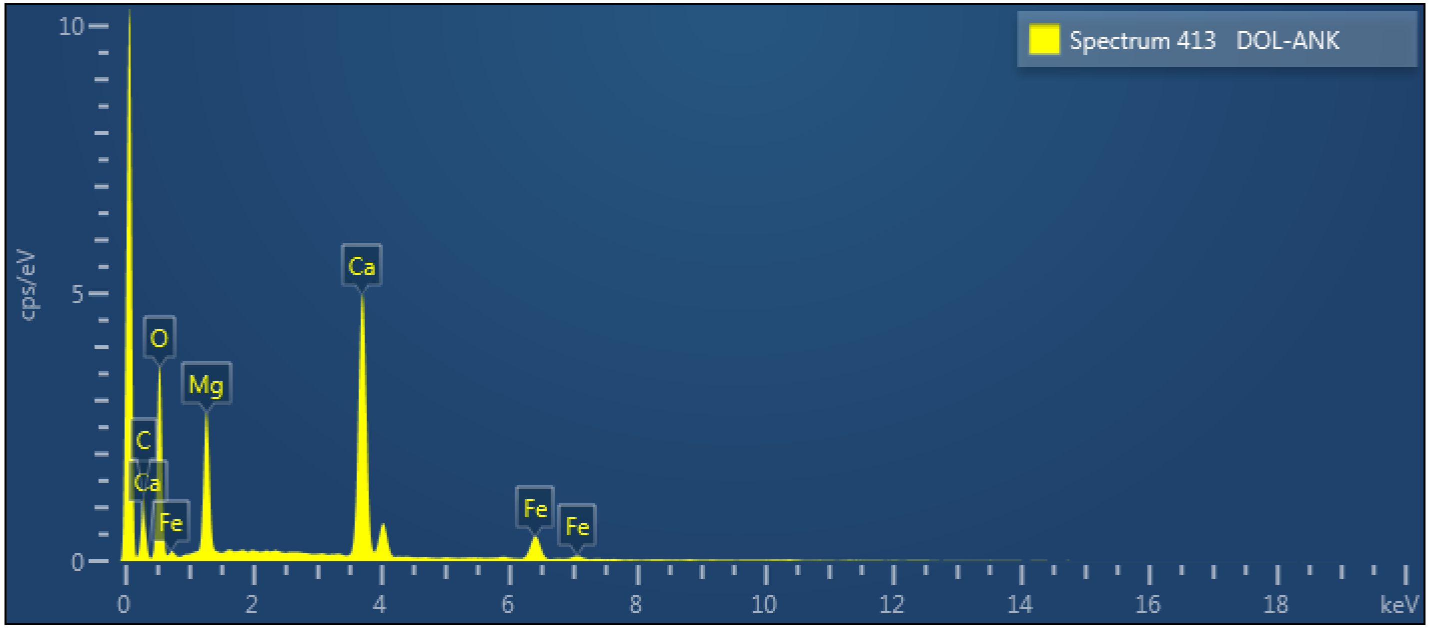


Brightness reduced further to illustrate the complicated compositional zoning of the Ni-As-Sb-Co-S phases (spectrum 416).

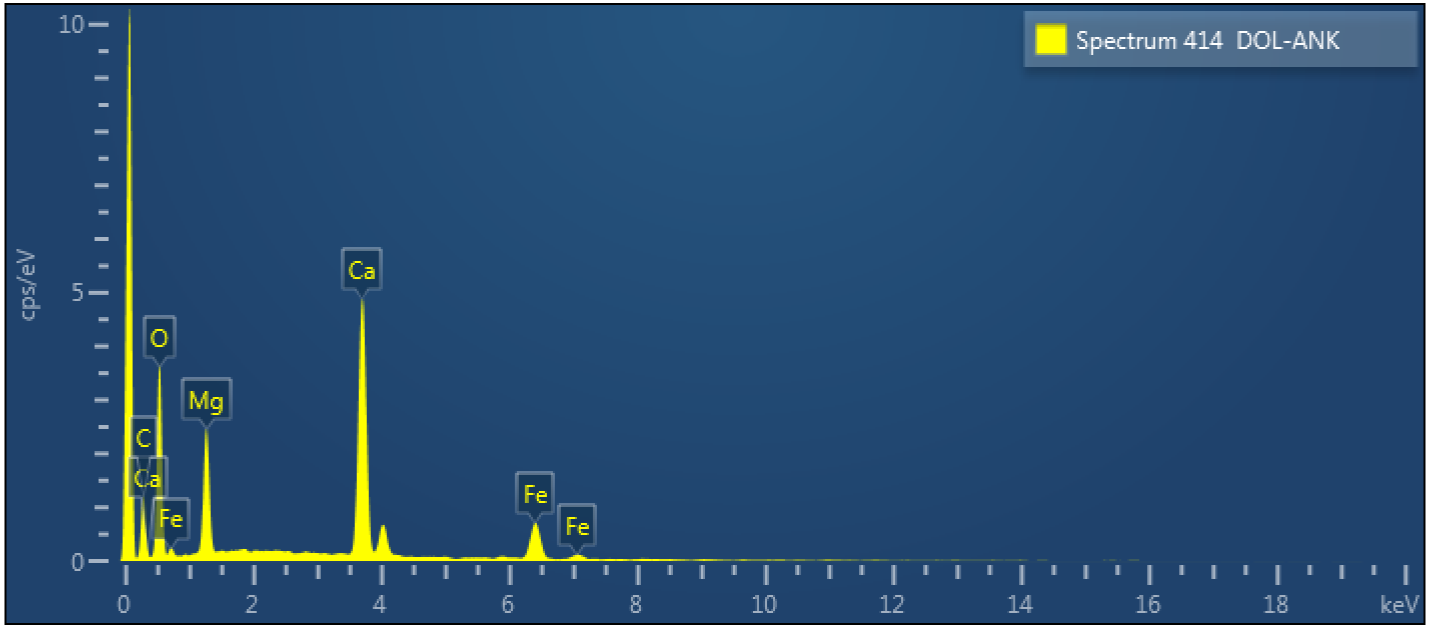
Brighter phases contain more Sb.



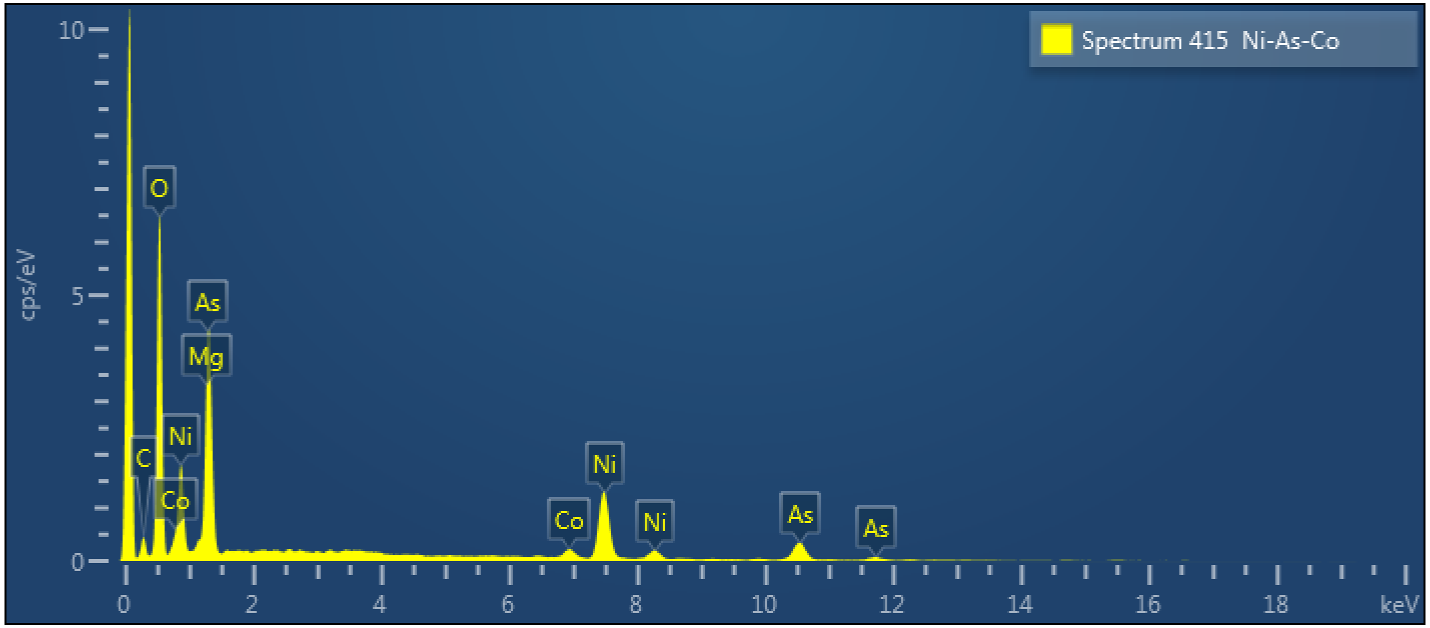
Spectrum 412 QUARTZ							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	53.26	0.26	66.67			
Si	K series	46.74	0.26	33.33	SiO2	100.00	0.55
Total		100.00		100.00		100.00	



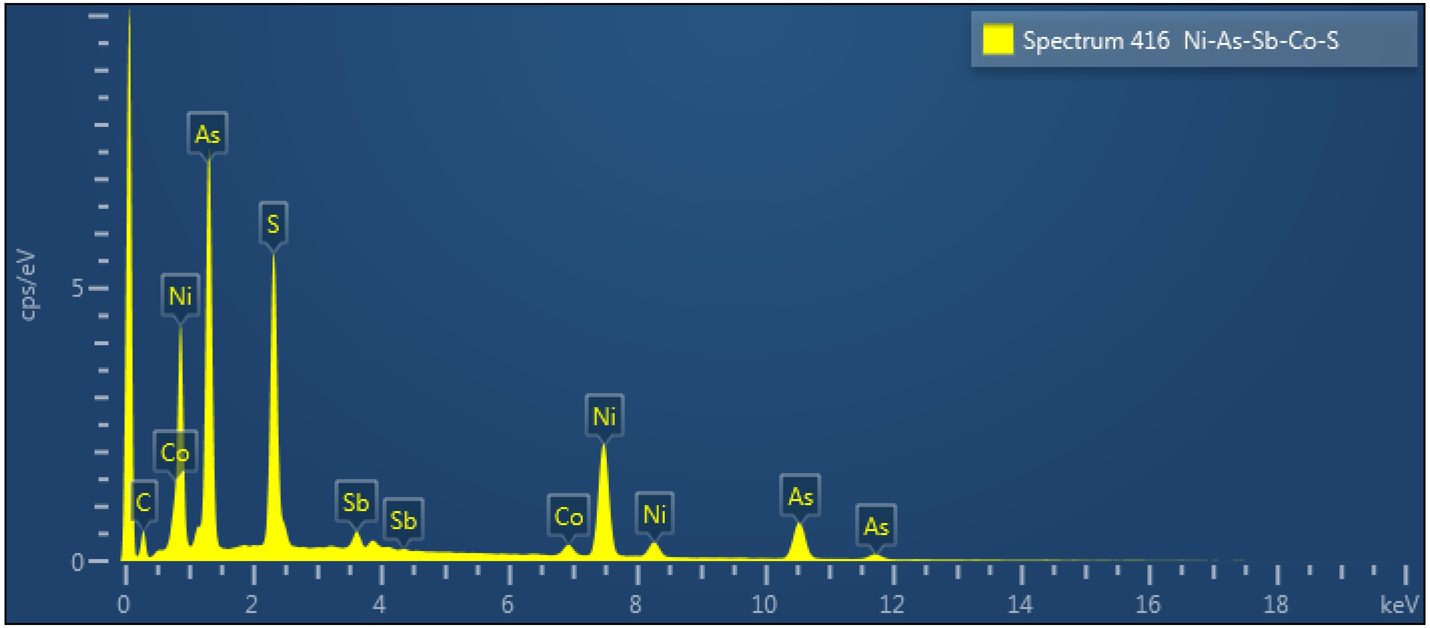
Spectrum 413 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.86	0.57	50.00			
Mg	K series	17.32	0.47	18.47	MgO	28.72	0.78
Ca	K series	40.92	0.58	26.47	CaO	57.26	0.82
Fe	K series	10.91	0.56	5.06	FeO	14.03	0.72
Total		100.00		100.00		100.00	



Spectrum 414 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.12	0.73	50.00			
Mg	K series	15.48	0.58	16.91	MgO	25.67	0.96
Ca	K series	38.63	0.73	25.60	CaO	54.05	1.03
Fe	K series	15.76	0.79	7.50	FeO	20.28	1.01
Total		100.00		100.00		100.00	



Spectrum 415 Ni-As-Co				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
O	K series	44.75	1.03	75.46
Ni	K series	23.45	0.88	10.78
As	L series	26.71	0.98	9.62
Co	K series	2.32	0.44	1.06
Mg	K series	2.77	0.61	3.07
Total		100.00		100.00

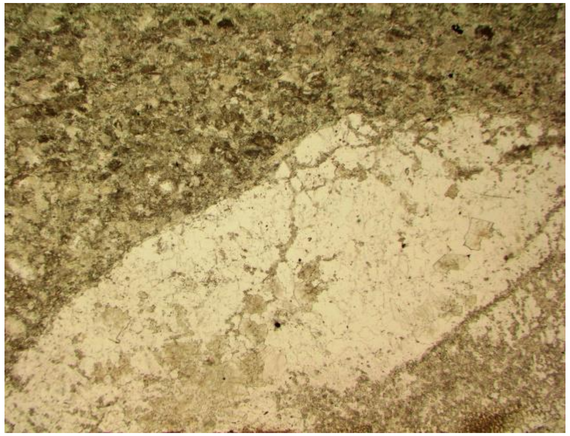


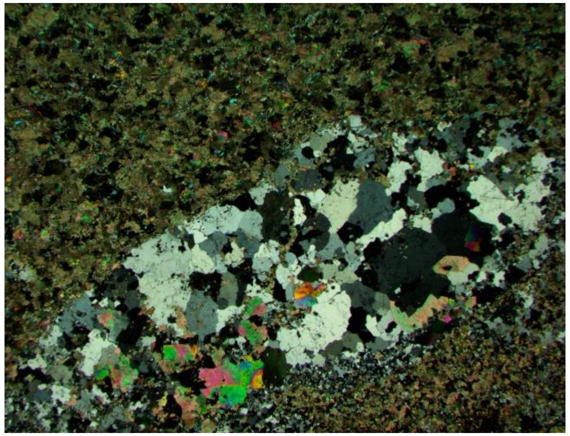
Spectrum 416 Ni-As-Sb-Co-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	18.81	0.27	33.01
Ni	K series	31.95	0.42	30.62
As	L series	43.06	0.43	32.33
Sb	L series	3.75	0.25	1.73
Co	K series	2.42	0.21	2.31
Total		100.00		100.00

Specimen Notes for 'MID-22'

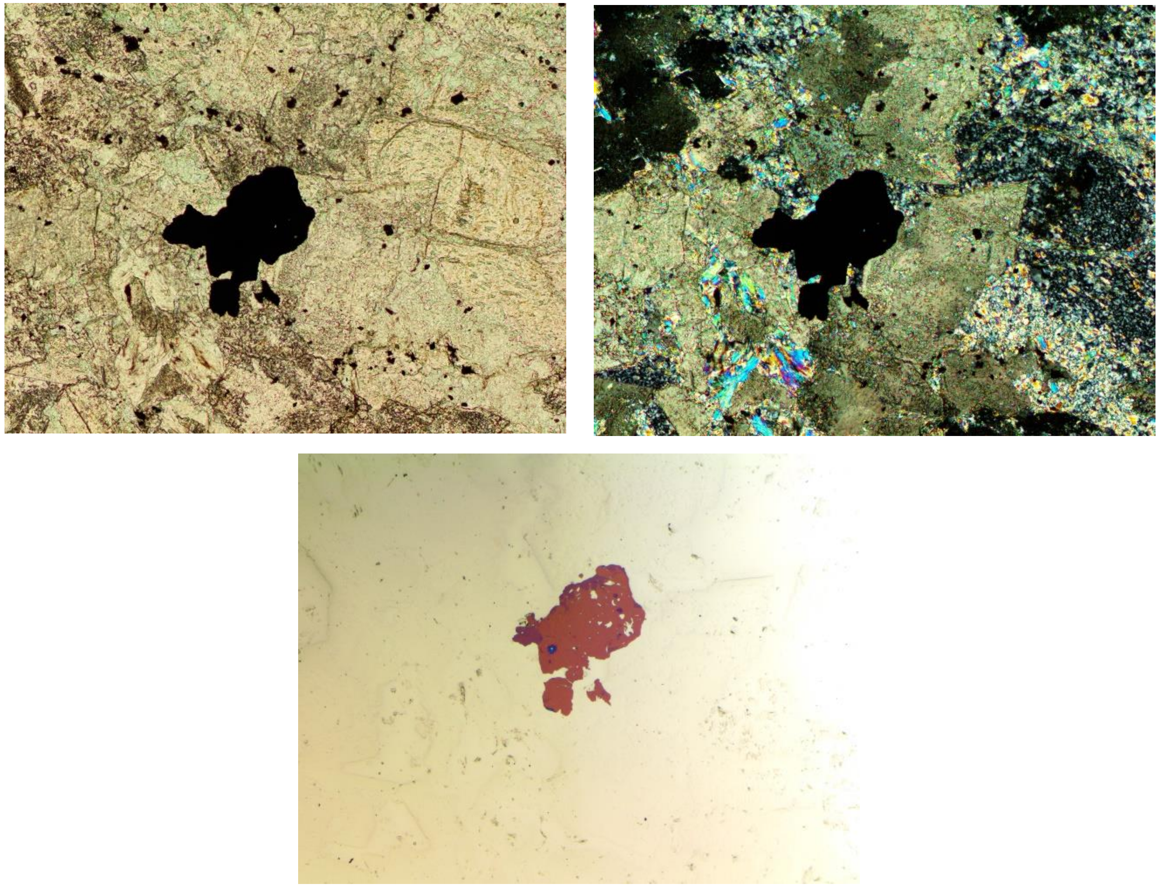
The rock is an altered ultramafic obtained from a small pit east of the Laroma Prospect. The alteration is evident as strong Cr-green mica (fuchsite), fine-grained quartz, and intense dolomite-ankerite solid solution carbonate which hosts a variety of Ni-Co-Sb-sulphides. The rock is cross-cut by a stockwork of anastomosing grey-white quartz veins which lack significant sulphides.

In terms of metal inventory, the rock hosts disseminated grains of rutile, chalcopyrite, Ni-S, Ni-Fe-S, Ni-Co-As-Fe-S, and Sb-Ni-S.

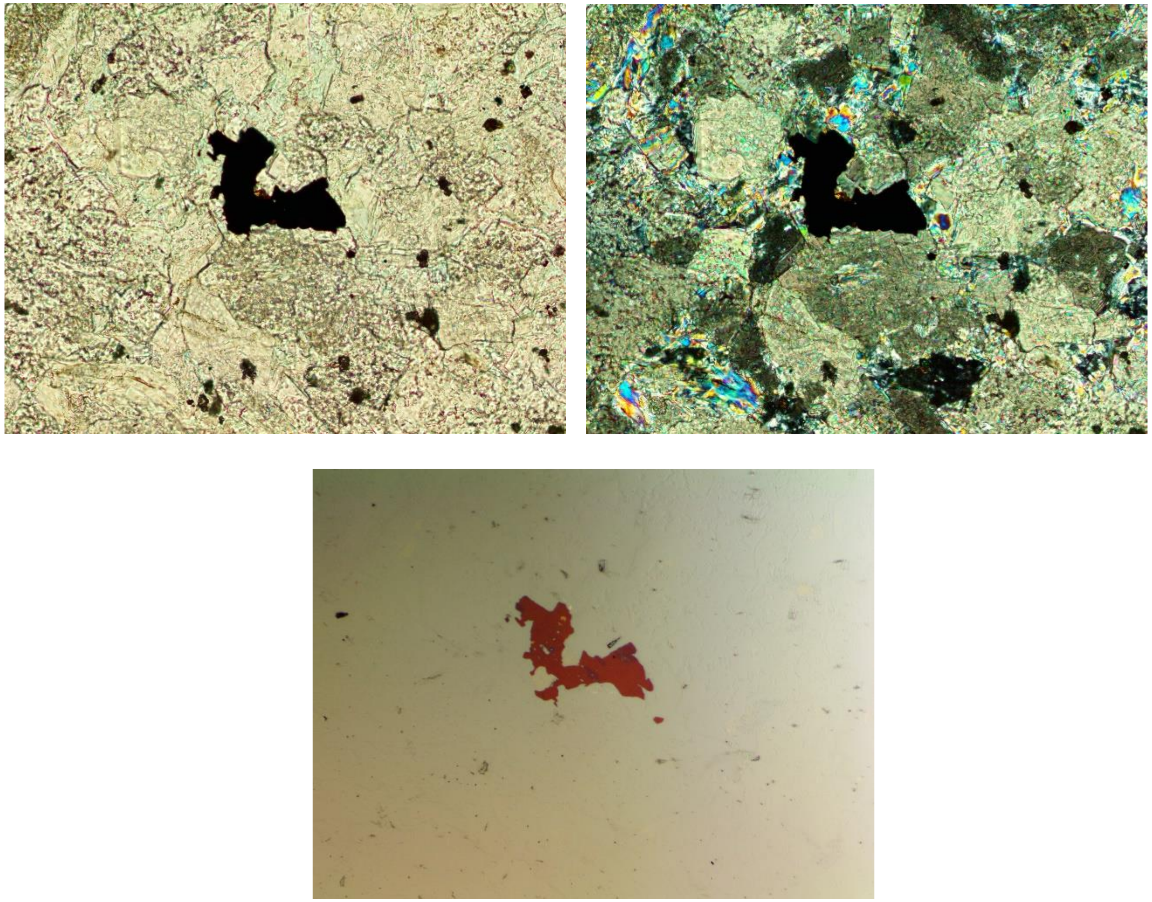




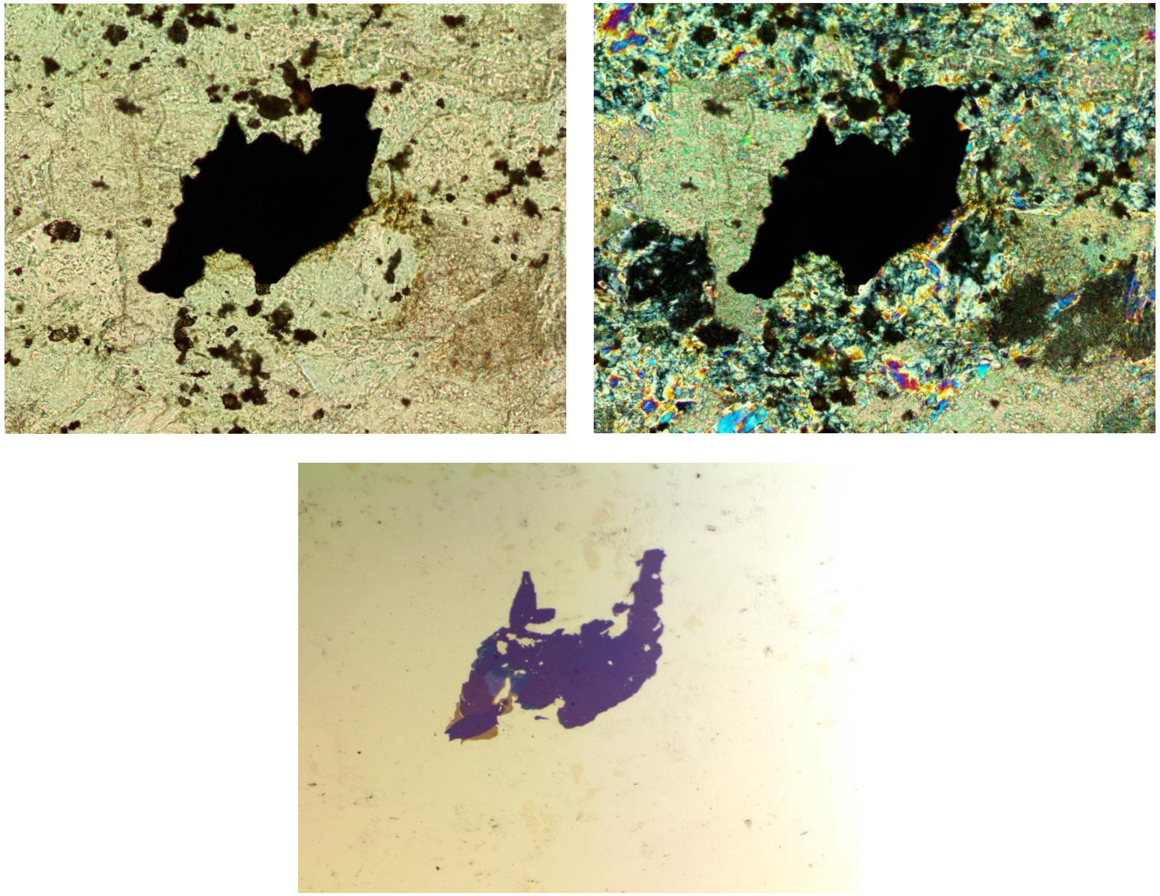
Plane light image (left) and crossed polarized light image (right) showing an intensely carbonate altered rock of essentially dolomite-ankerite solid solution intergrown with Cr-green mica (fuchsite) with possible fragments of coarser-grained quartz-carbonate. Field of view = 17mm



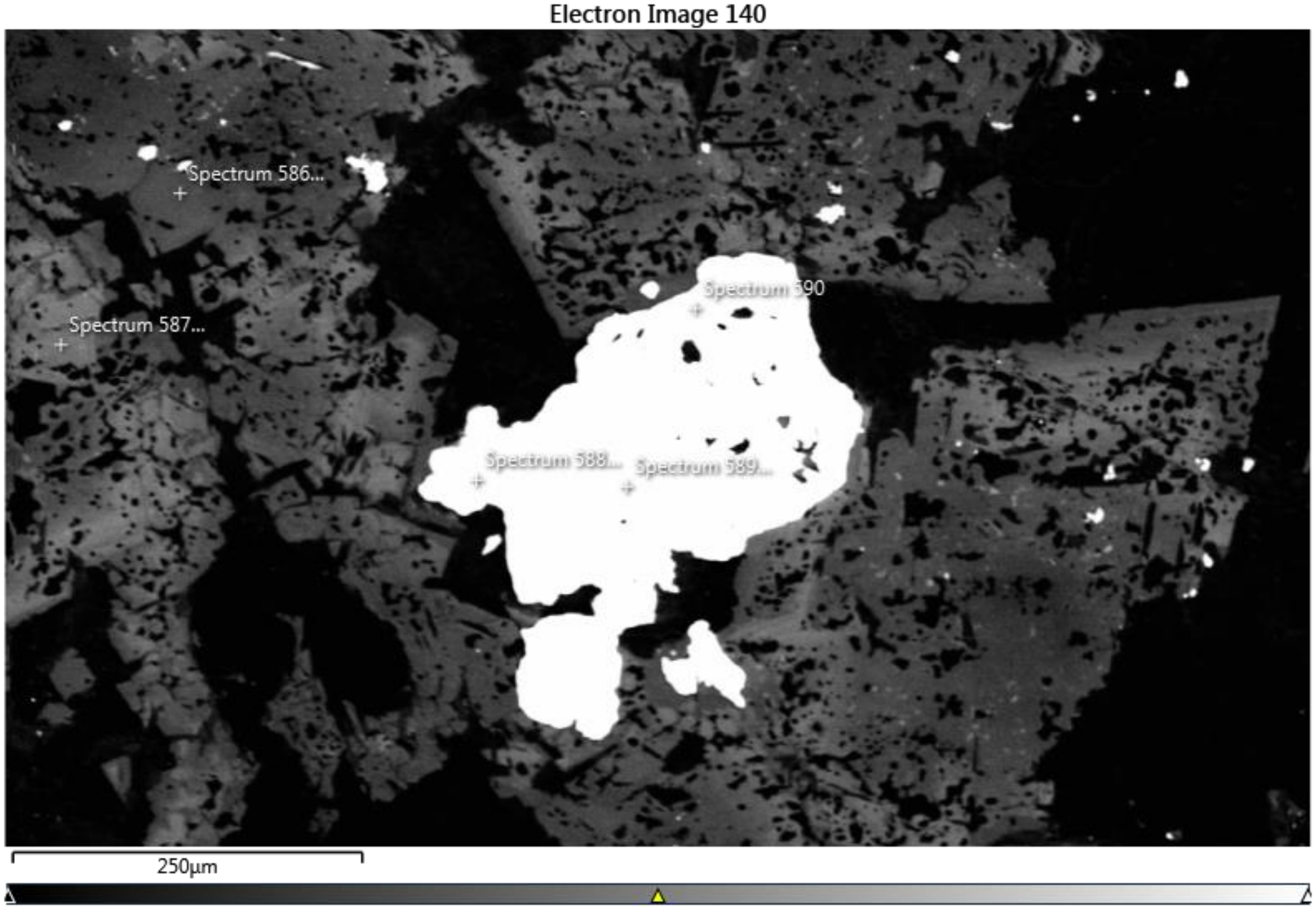
Plane light image (top left), crossed polarized light image (top right), and reflected light image (bottom) illustrating a groundmass of dolomite-ankerite solid solution carbonate intergrown with highly birefringent Cr-paragonite (fuchsite) histing disseminated Ni-S grains. Field of view = 2.2mm.



Plane light image (top left), crossed polarized light image (top right), and reflected light image (bottom) illustrating a groundmass of dolomite-ankerite solid solution carbonate intergrown with highly birefringent Cr-paragonite (fuchsite) histing disseminated Ni-Co-As grains. Field of view = 1.2mm.

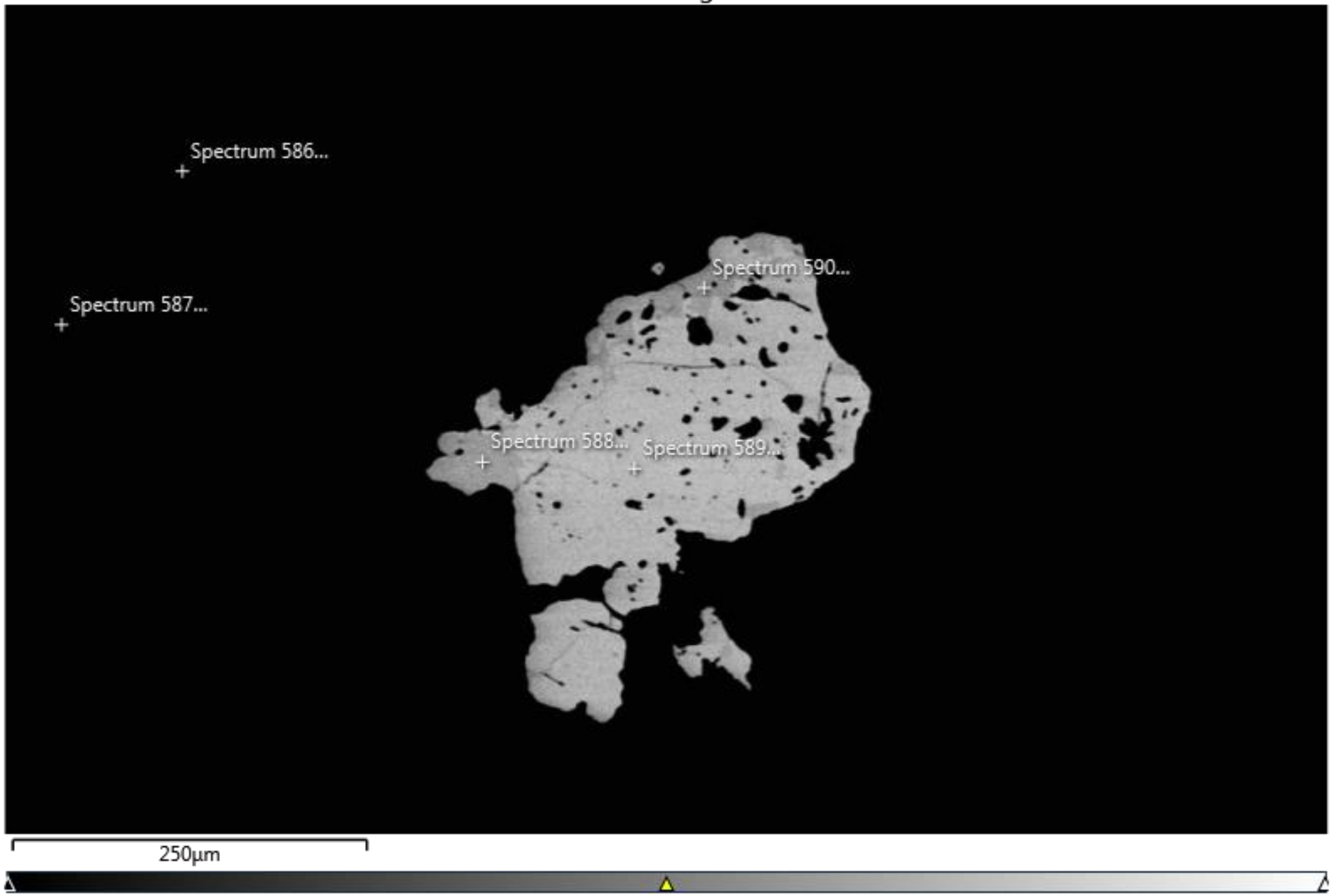


Plane light image (top left), crossed polarized light image (top right), and reflected light image (bottom) illustrating a groundmass of dolomite-ankerite solid solution carbonate intergrown with highly birefringent Cr-paragonite (fuchsite) histing disseminated Sb-Ni-S grains. Field of view = 1.2mm.

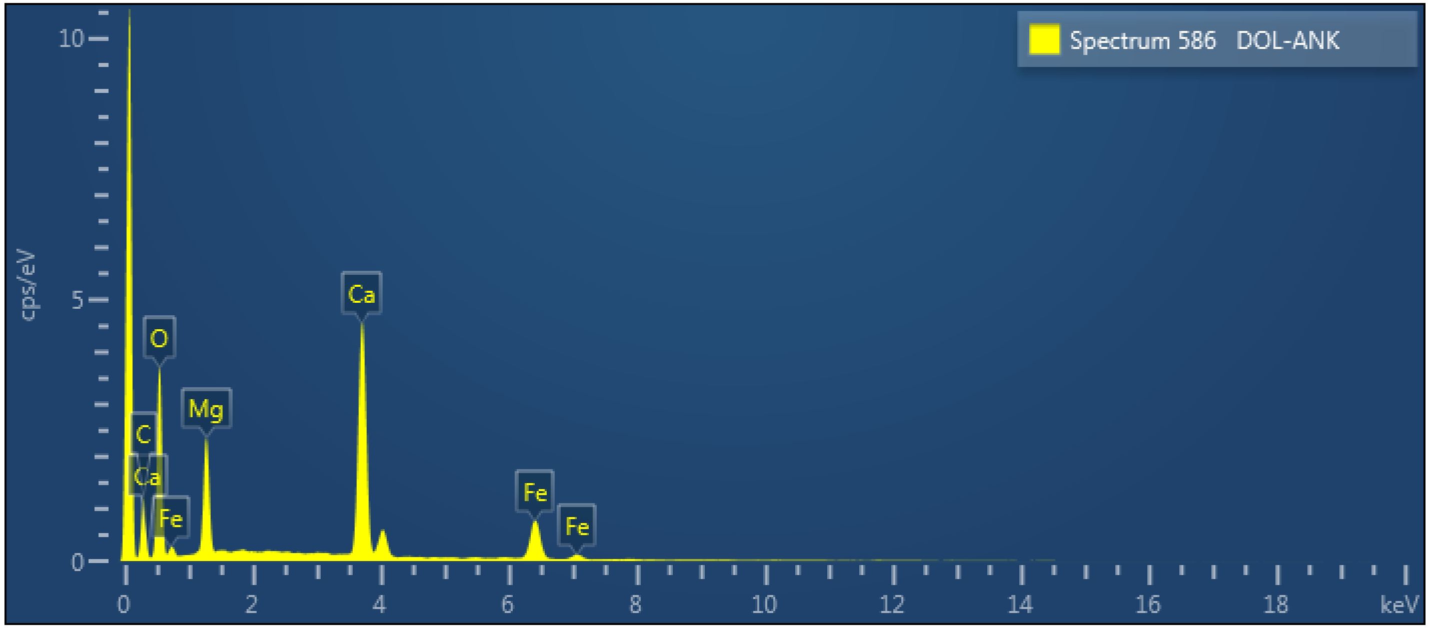


Backscatter image of dolomite-ankerite solid solution carbonate (spectra 586,587) hosting Ni-S (spectrum 589) and Ni-Fe-S (spectrum 588).

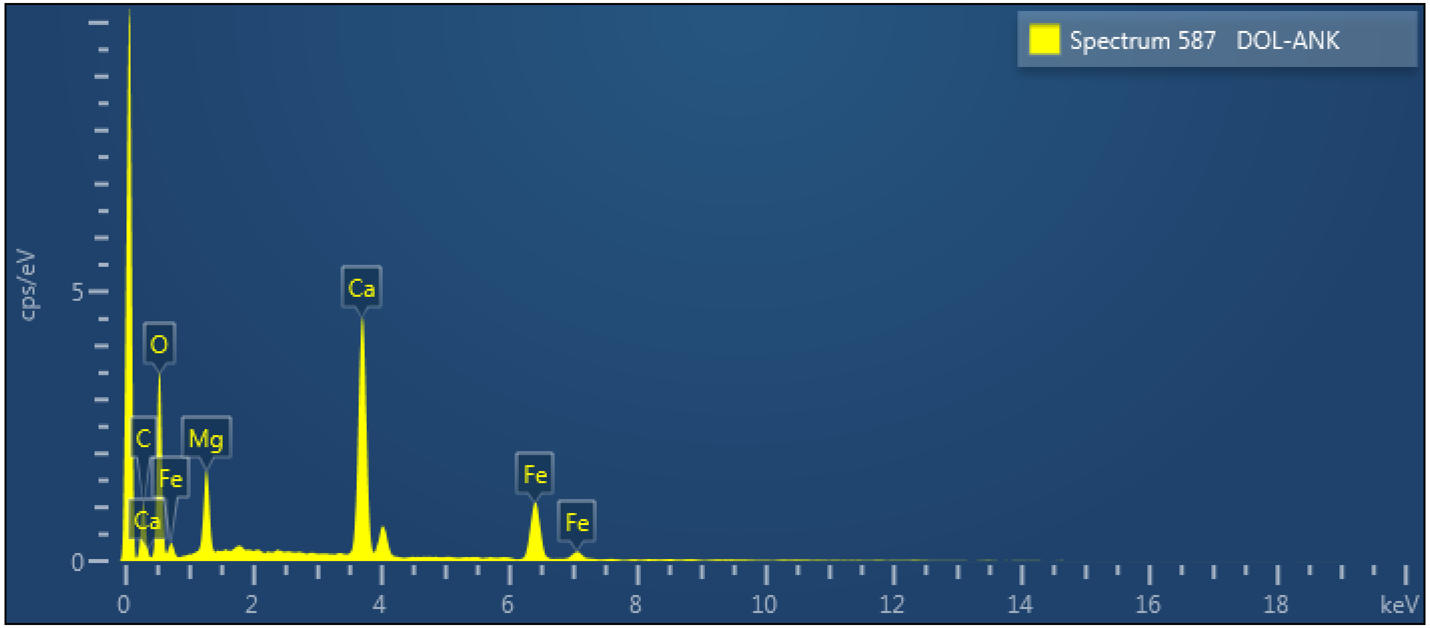
Electron Image 141



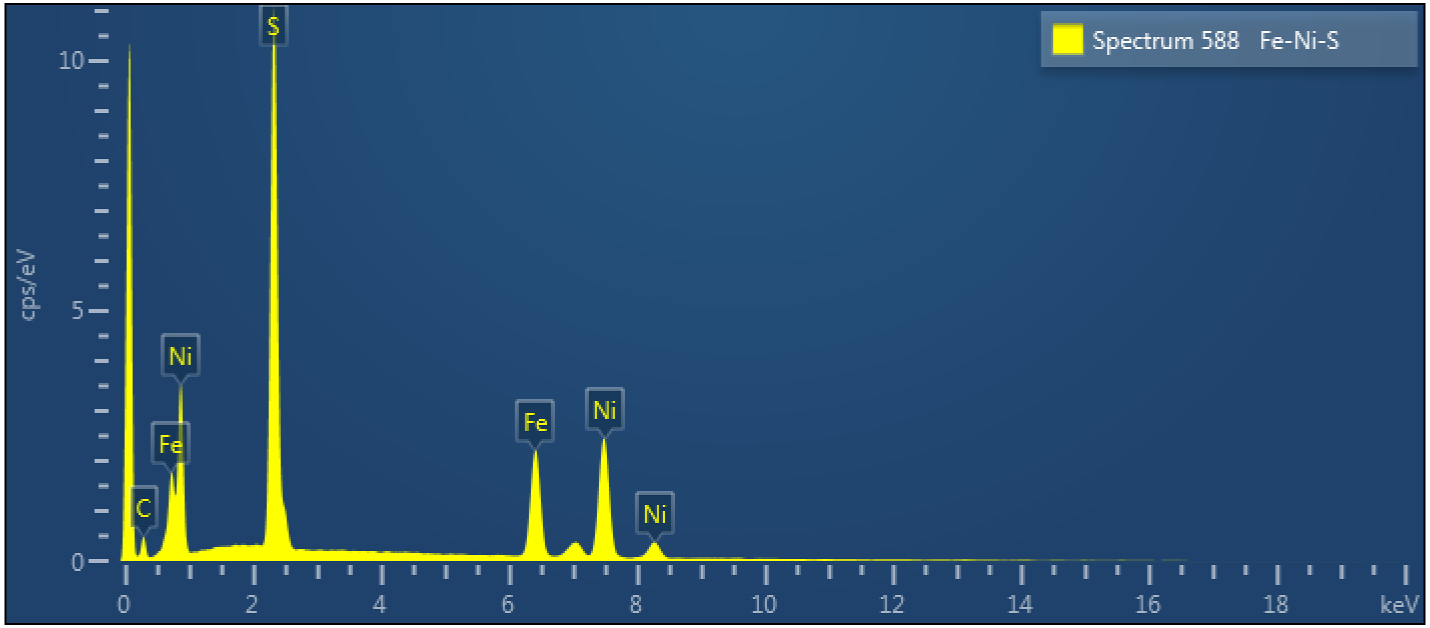
Brightness reduced to illustrate the compositional variation between Ni-S (spectrum 589) and Ni-Fe-S (spectrum 588).



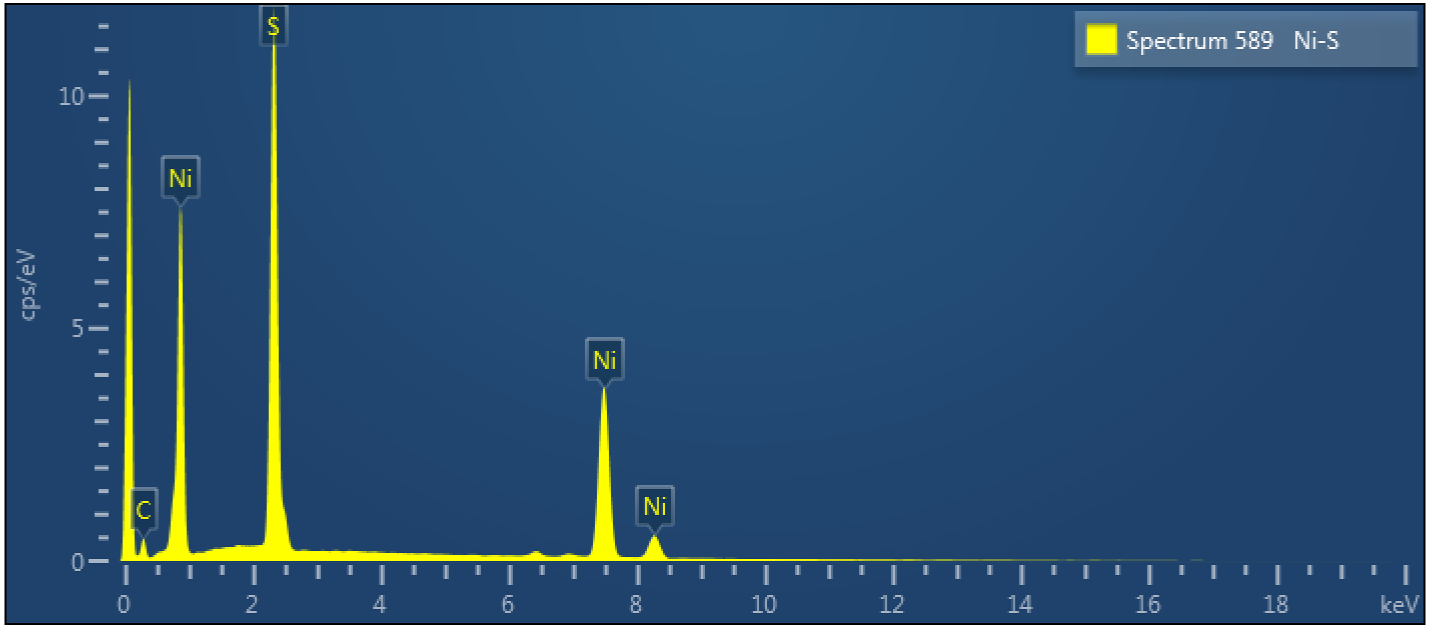
Spectrum 586 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.98	0.58	50.00			
Mg	K series	15.58	0.45	17.11	MgO	25.84	0.75
Ca	K series	36.62	0.57	24.38	CaO	51.23	0.80
Fe	K series	17.82	0.64	8.52	FeO	22.93	0.82
Total		100.00		100.00		100.00	



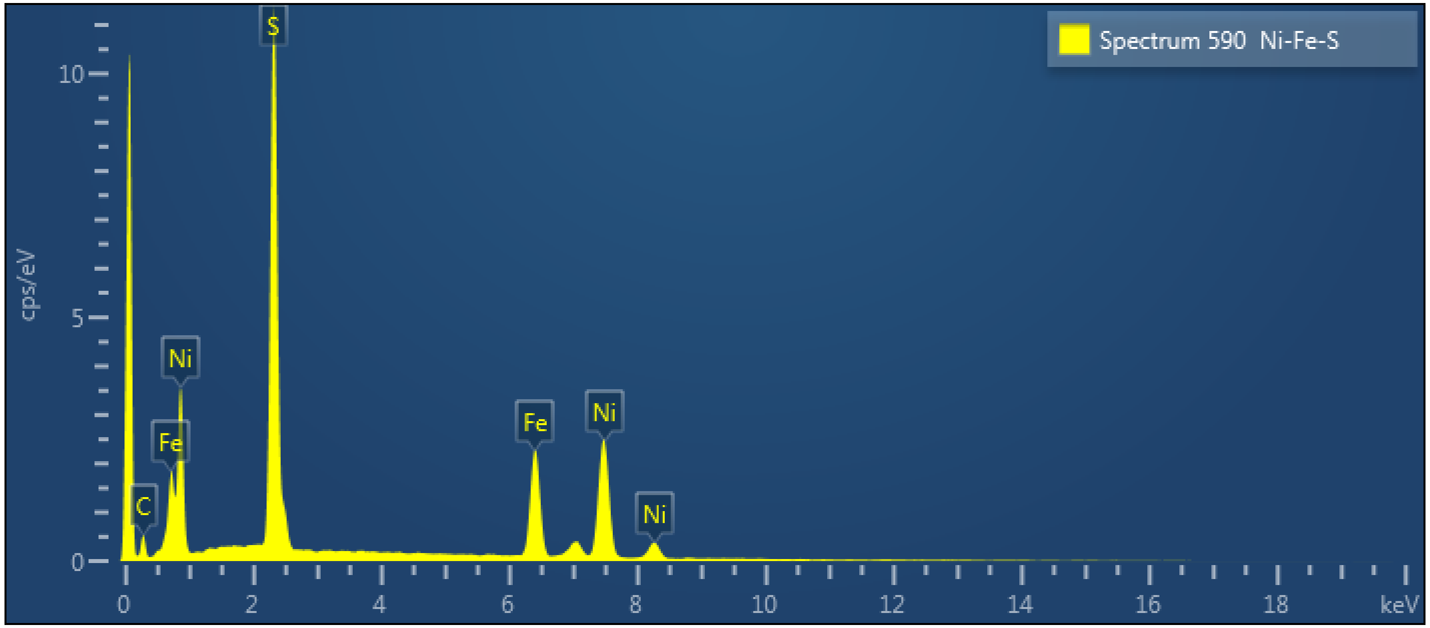
Spectrum 587 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	28.57	0.68	50.00			
Mg	K series	11.10	0.50	12.78	MgO	18.40	0.83
Ca	K series	35.30	0.66	24.66	CaO	49.39	0.93
Fe	K series	25.04	0.77	12.56	FeO	32.21	1.00
Total		100.00		100.00		100.00	



Spectrum 588 Fe-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	34.94	0.35	49.13
Fe	K series	23.11	0.36	18.66
Ni	K series	41.95	0.44	32.21
Total		100.00		100.00

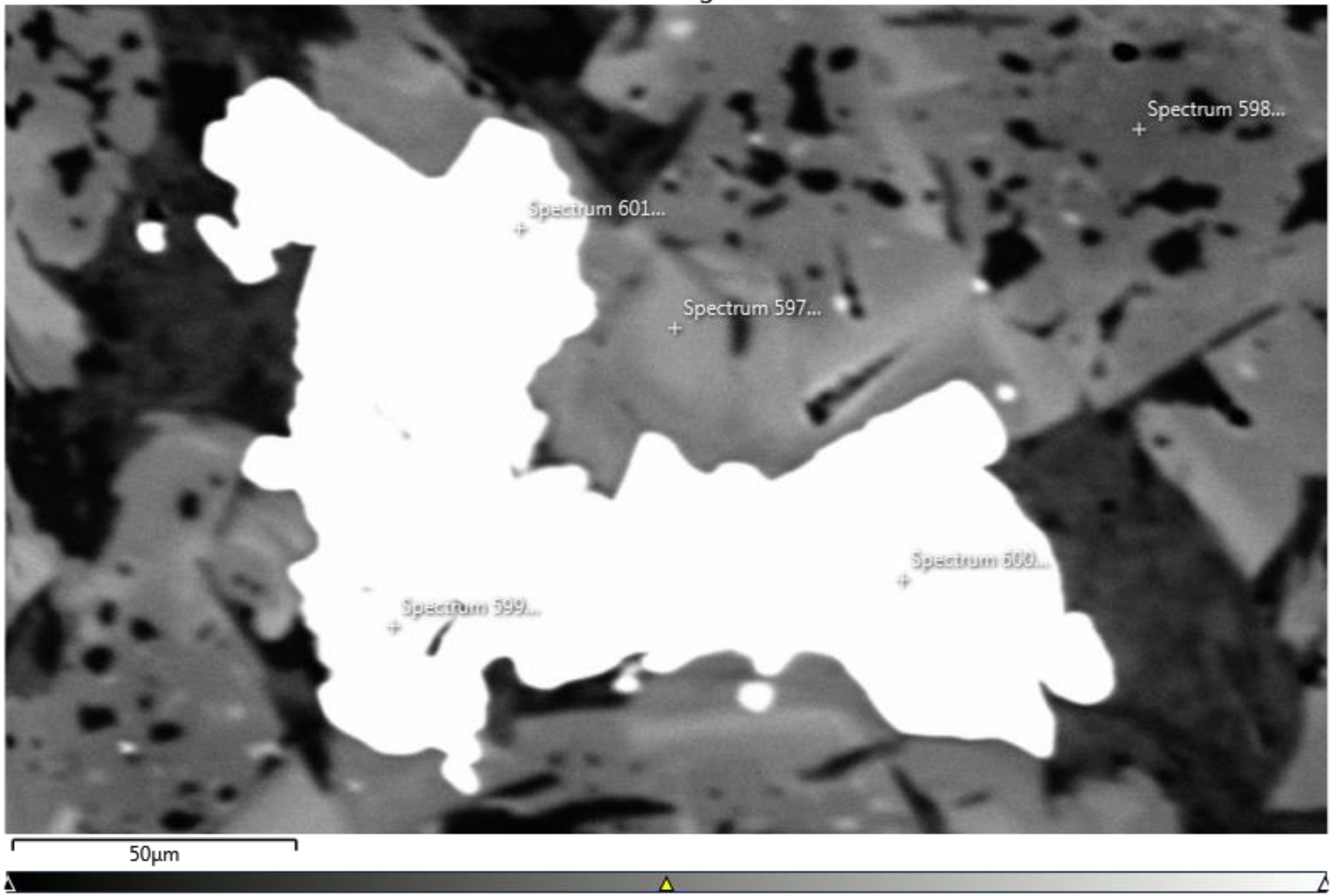


Spectrum 589 Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	37.72	0.31	52.58
Ni	K series	62.28	0.31	47.42
Total		100.00		100.00



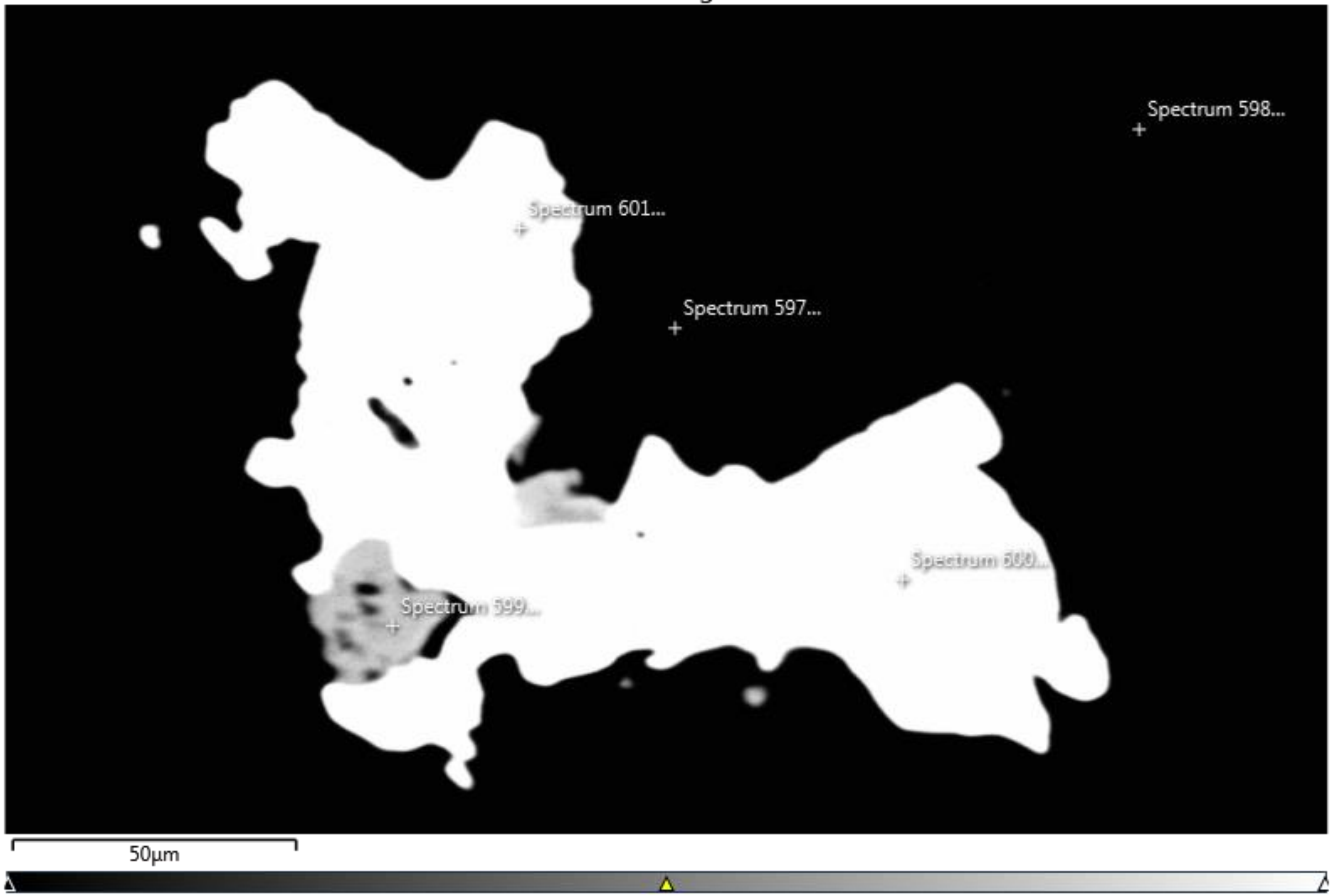
Spectrum 590 Ni-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	34.87	0.44	49.04
Fe	K series	23.63	0.45	19.08
Ni	K series	41.50	0.56	31.88
Total		100.00		100.00

Electron Image 143

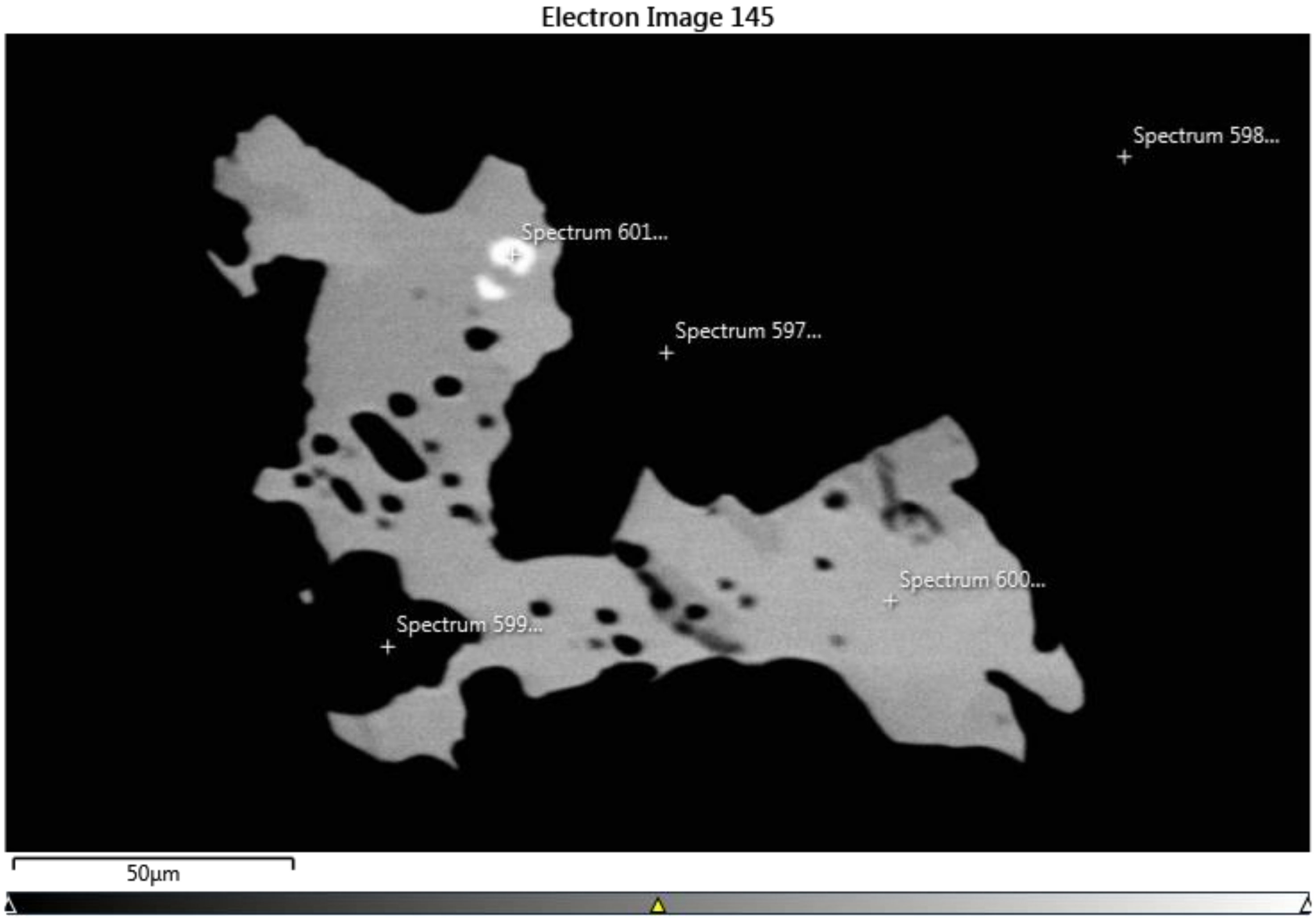


Backscatter image of dolomite-ankerite solid solution carbonate (spectra 597,598) hosting inclusions of Ni-S (spectrum 600) and Ni-Co-As-Fe-S (spectrum 601).

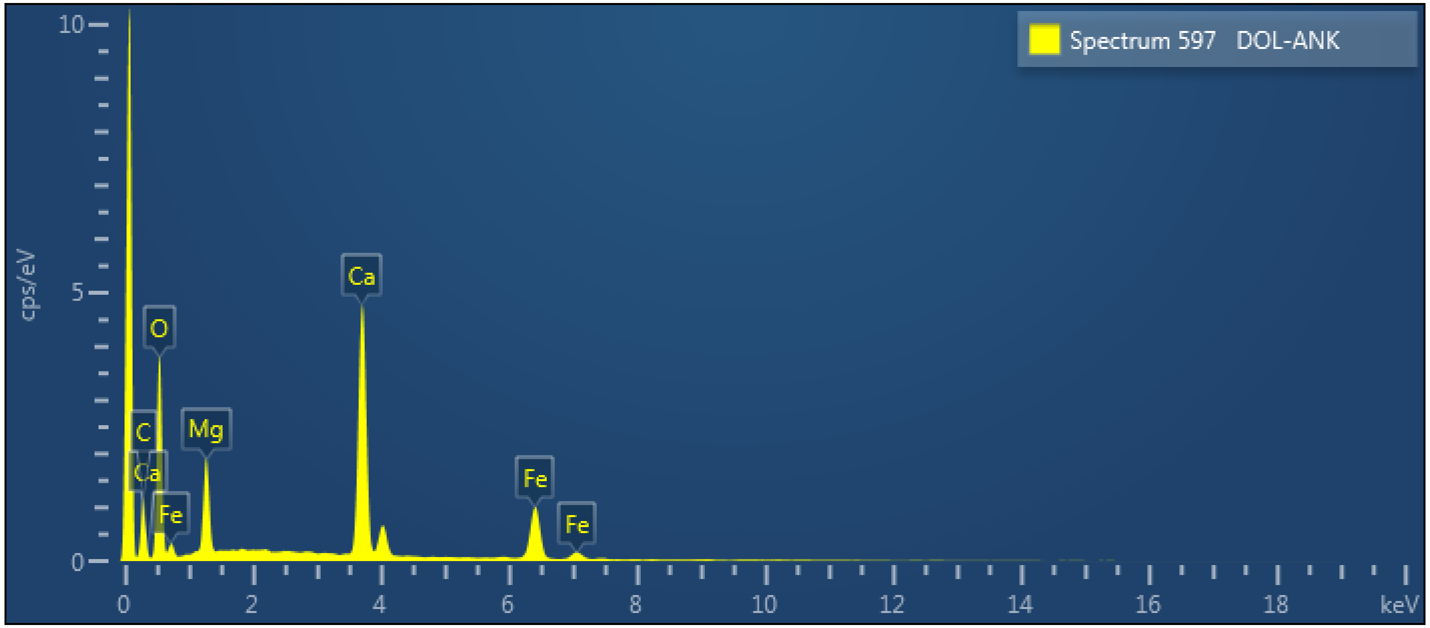
Electron Image 144



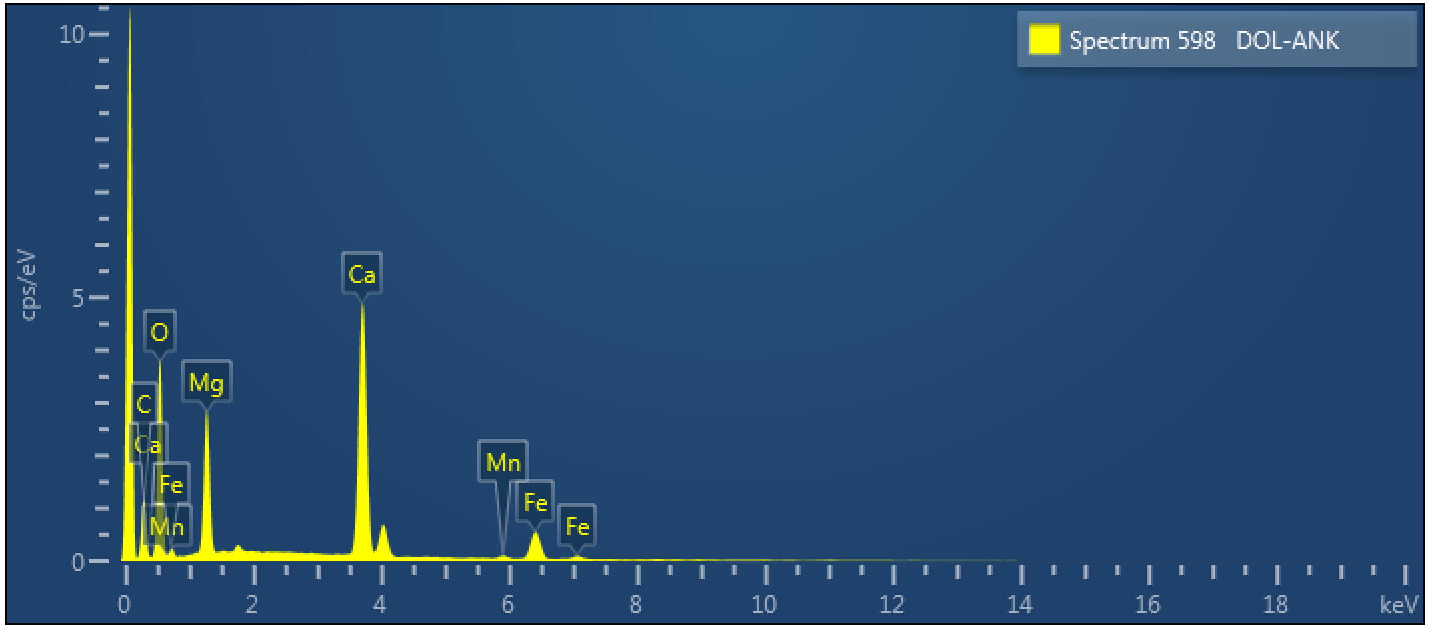
Brightness reduced to illustrate the grain of rutile (spectrum 599) associated with the Ni-S (spectrum 600) and Ni-Co-As-Fe-S (spectrum 601).



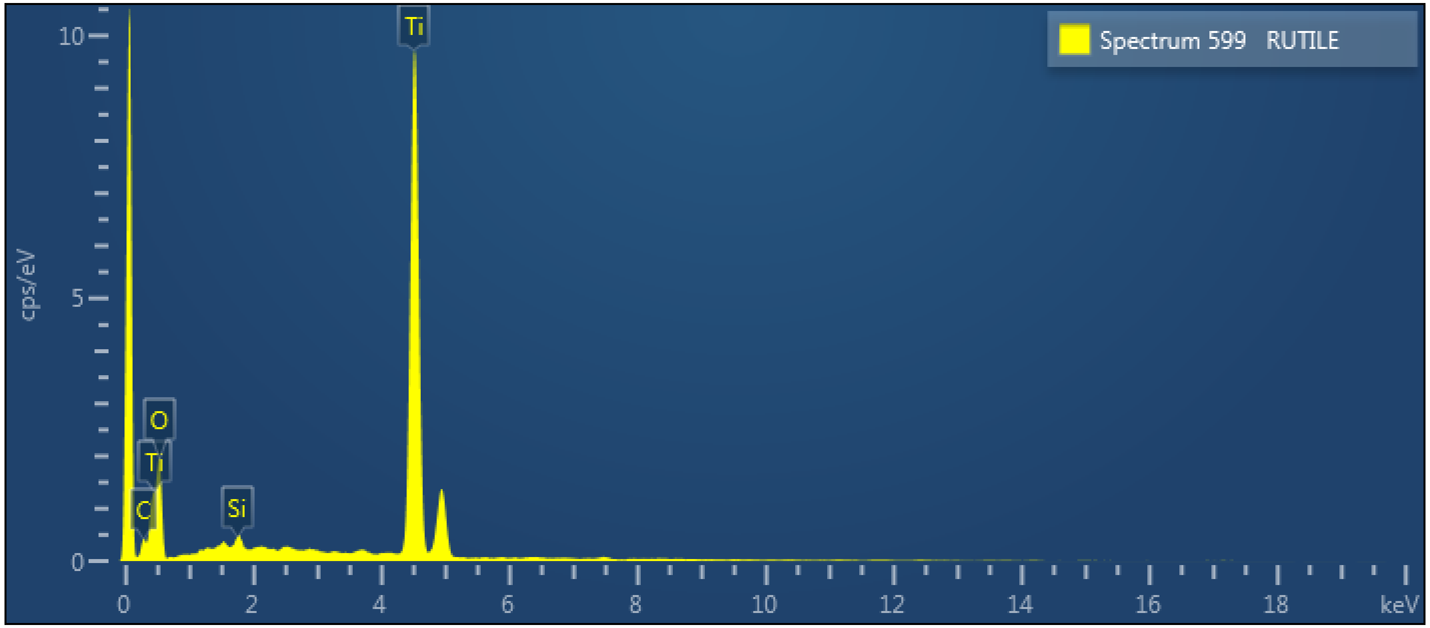
Brightness reduced to illustrate the inclusions of Ni-Co-As-Fe-S (spectrum 601) within Ni-S (spectrum 600).



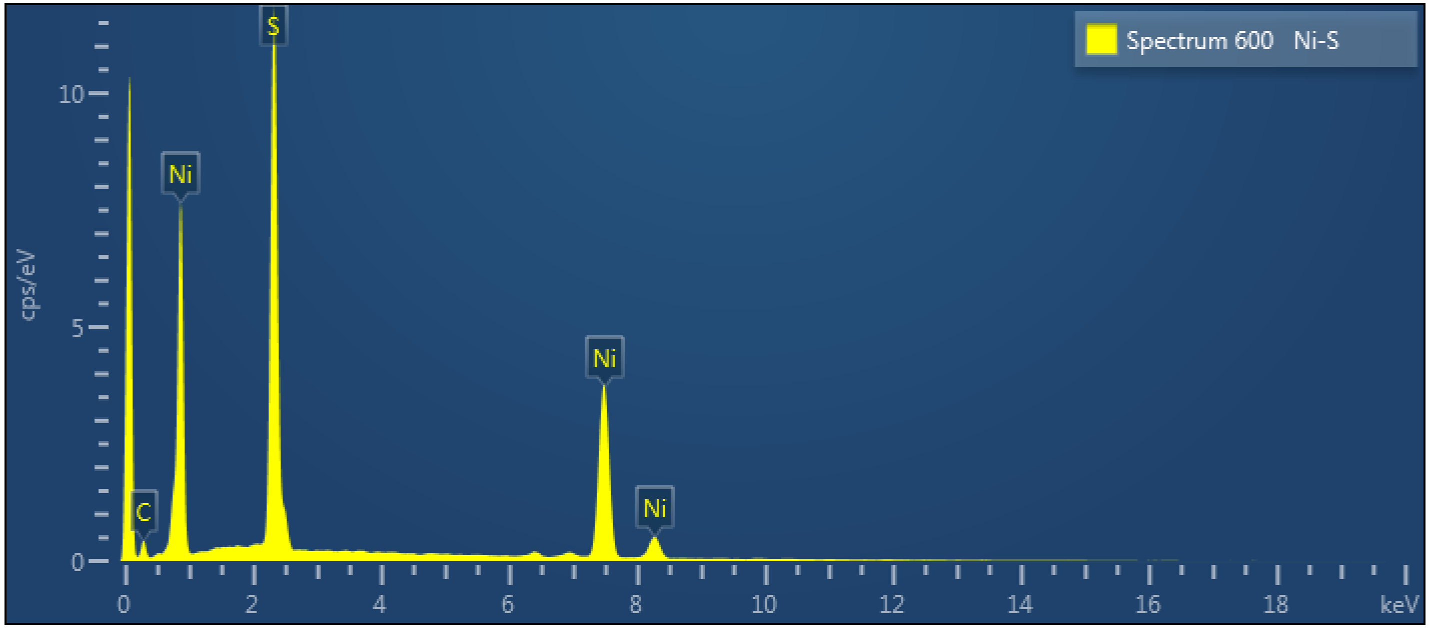
Spectrum 597 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.01	0.50	50.00			
Mg	K series	12.24	0.37	13.88	MgO	20.29	0.61
Ca	K series	36.58	0.49	25.17	CaO	51.19	0.68
Fe	K series	22.17	0.56	10.95	FeO	28.53	0.72
Total		100.00		100.00		100.00	



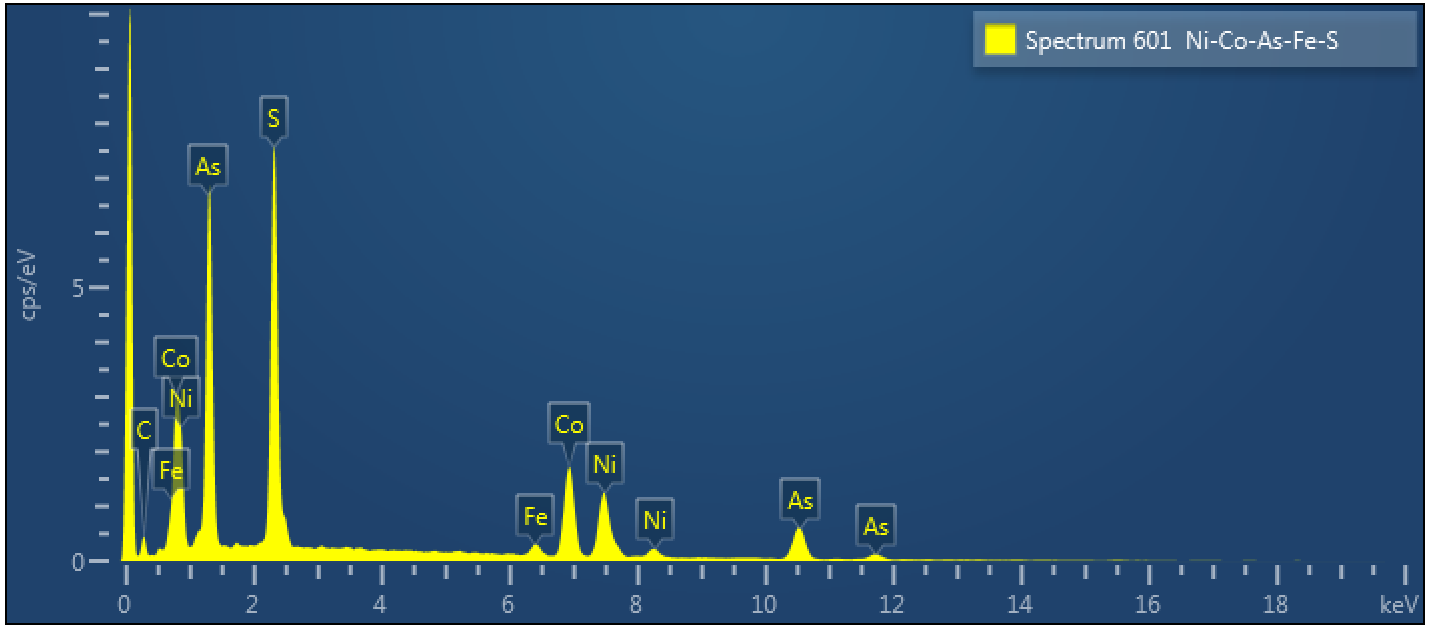
Spectrum 598 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.69	0.56	50.00			
Mg	K series	17.51	0.45	18.77	MgO	29.03	0.74
Ca	K series	38.35	0.56	24.94	CaO	53.65	0.78
Fe	K series	12.19	0.55	5.69	FeO	15.68	0.71
Mn	K series	1.27	0.30	0.60	MnO	1.64	0.38
Total		100.00		100.00		100.00	



Spectrum 599 RUTILE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	40.22	0.58	66.67			
Ti	K series	59.18	0.58	32.77	TiO2	98.71	0.97
Si	K series	0.60	0.15	0.57	SiO2	1.29	0.32
Total		100.00		100.00		100.00	

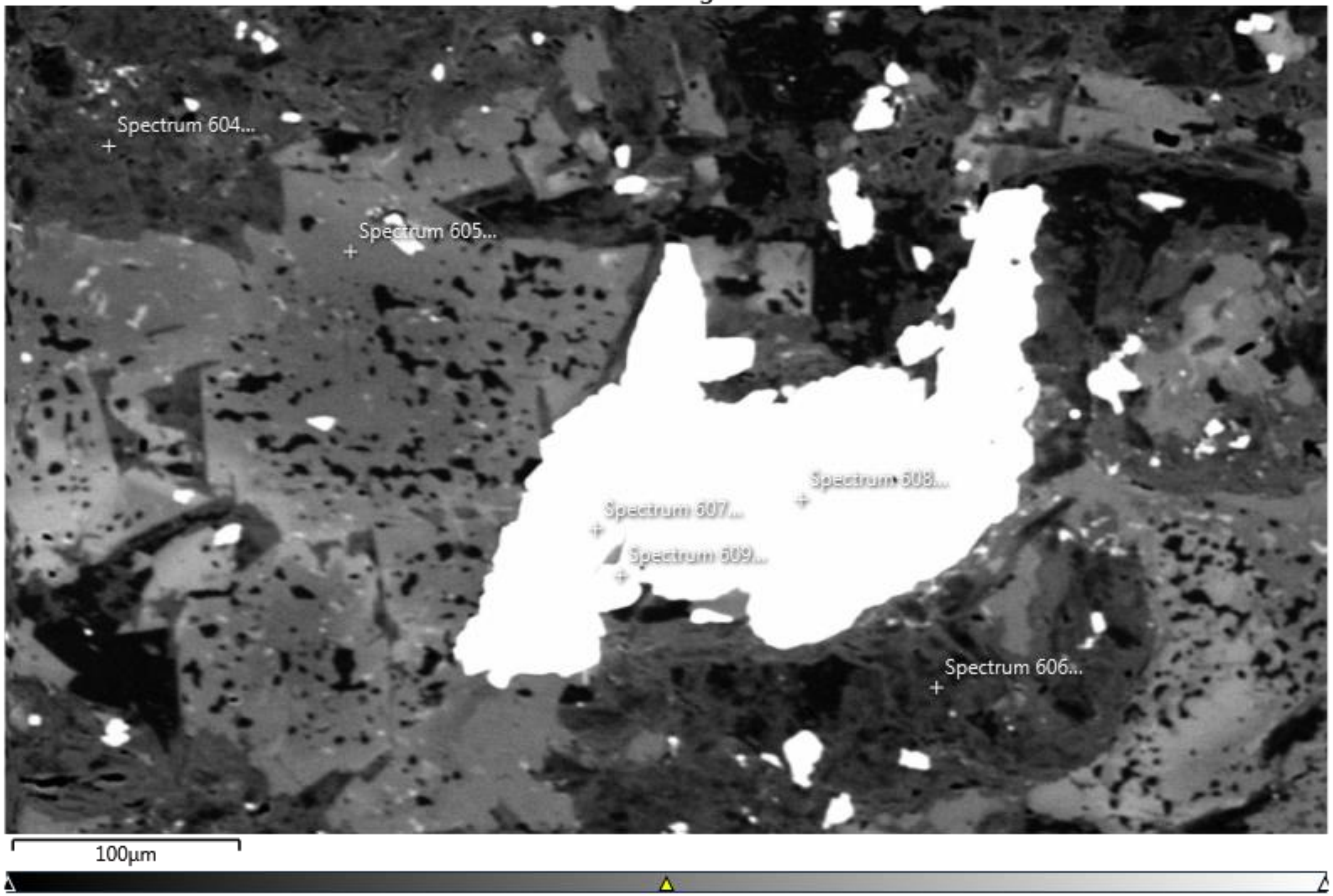


Spectrum 600 Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	37.45	0.42	52.30
Ni	K series	62.55	0.42	47.70
Total		100.00		100.00



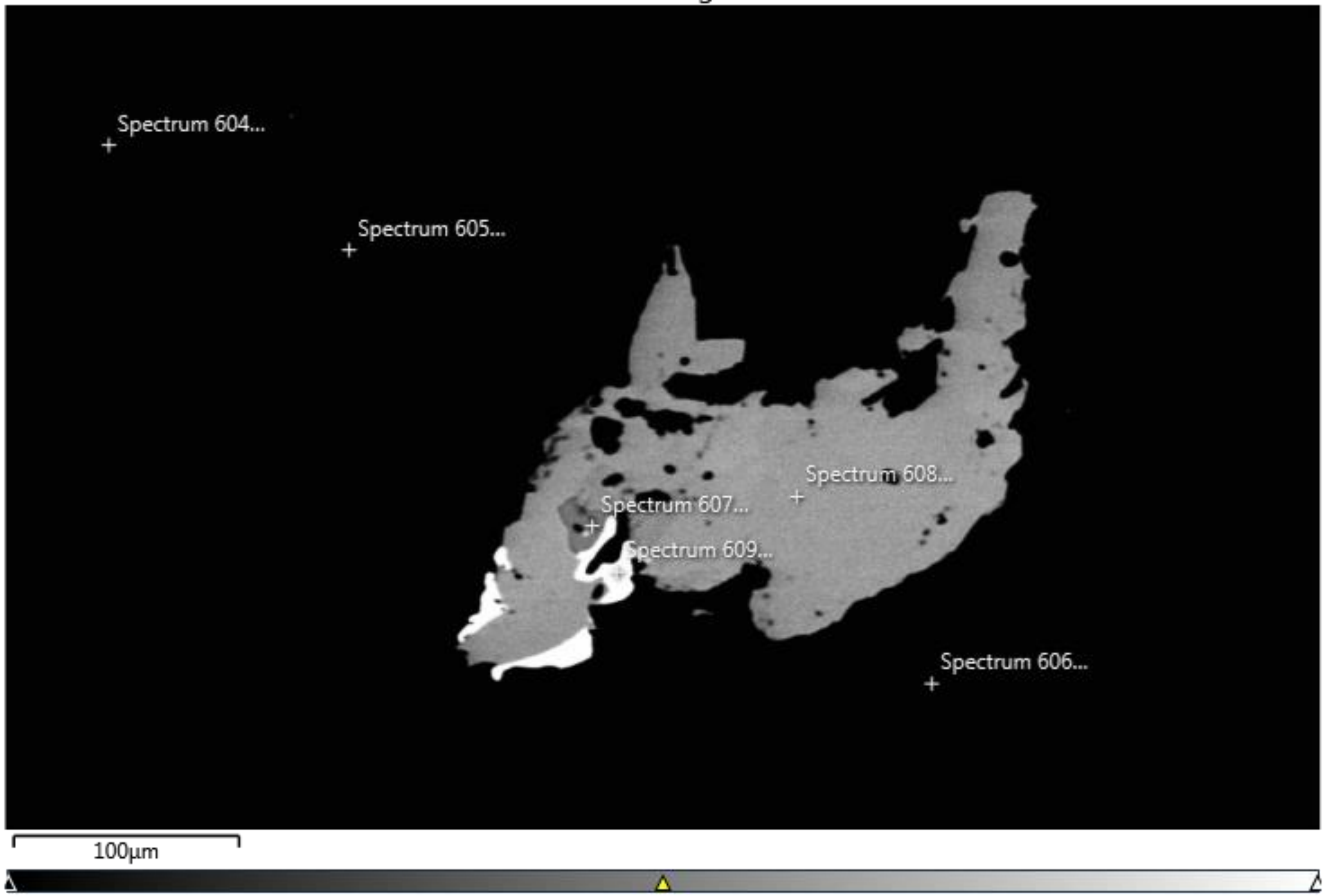
Spectrum 601 Ni-Co-As-Fe-S				
Element	Line Type	Weight %	Weight % Sigma	Atomic %
S	K series	23.88	0.50	39.06
Co	K series	20.73	0.63	18.45
Ni	K series	16.71	0.64	14.93
As	L series	36.65	0.73	25.65
Fe	K series	2.03	0.29	1.90
Total		100.00		100.00

Electron Image 146



Backscatter image of dolomite-ankerite solid solution carbonate (spectrum 605) and Cr-mica (spectra 604,606) hosting chalcopyrite (spectrum 607), Ni-Fe-S (spectrum 608), and Sb-Ni-S (spectrum 609).

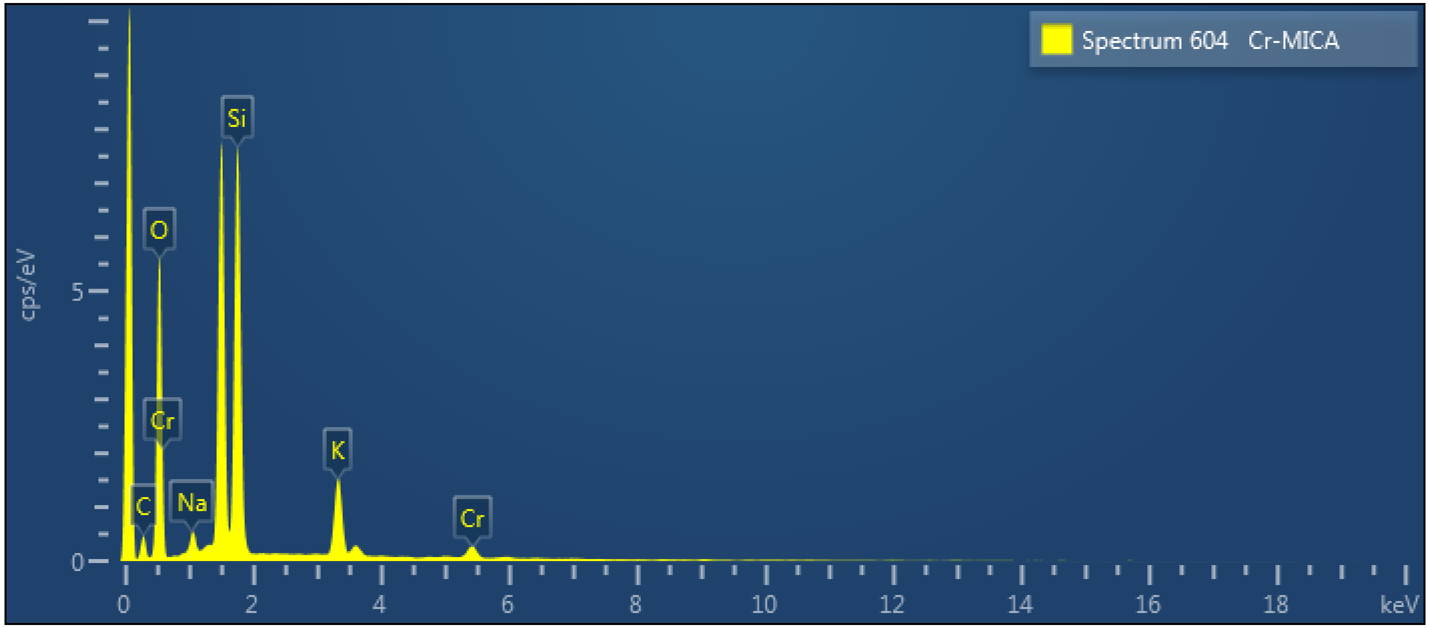
Electron Image 147



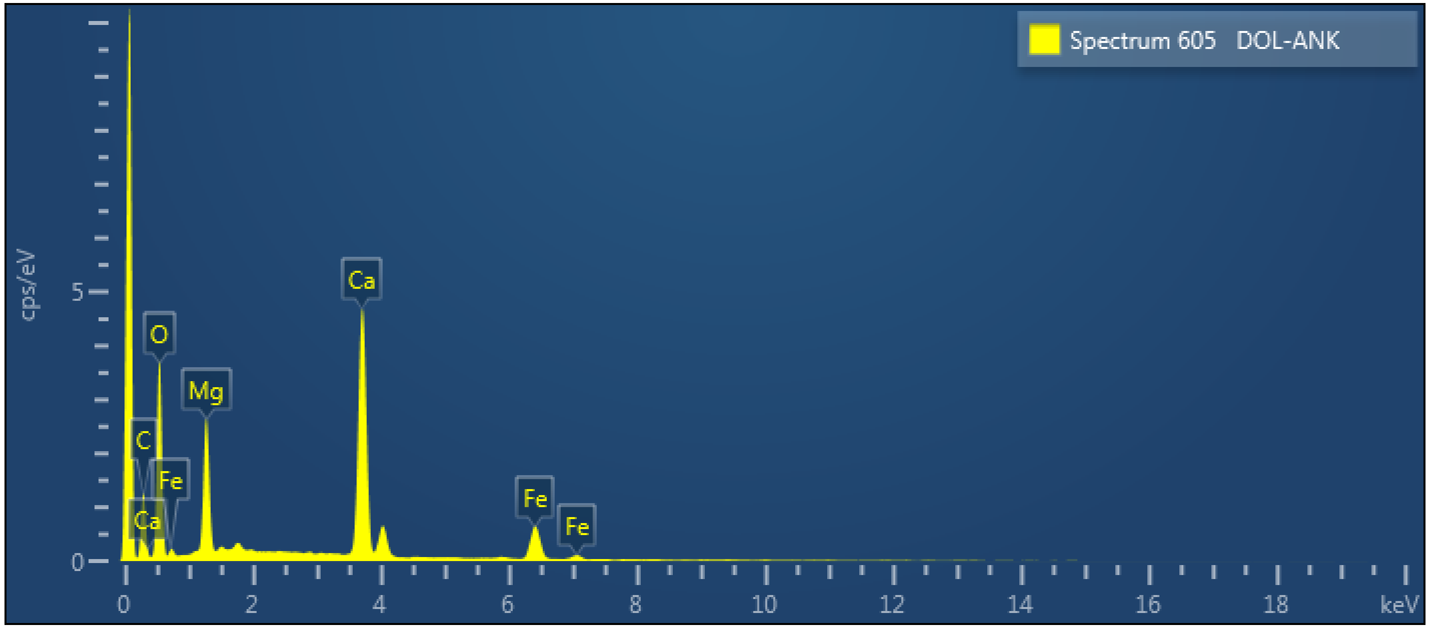
Brightness reduced to illustrate chalcopyrite (spectrum 607), Ni-Fe-S (spectrum 608), and Sb-Ni-S (spectrum 609).

Electron Image 148

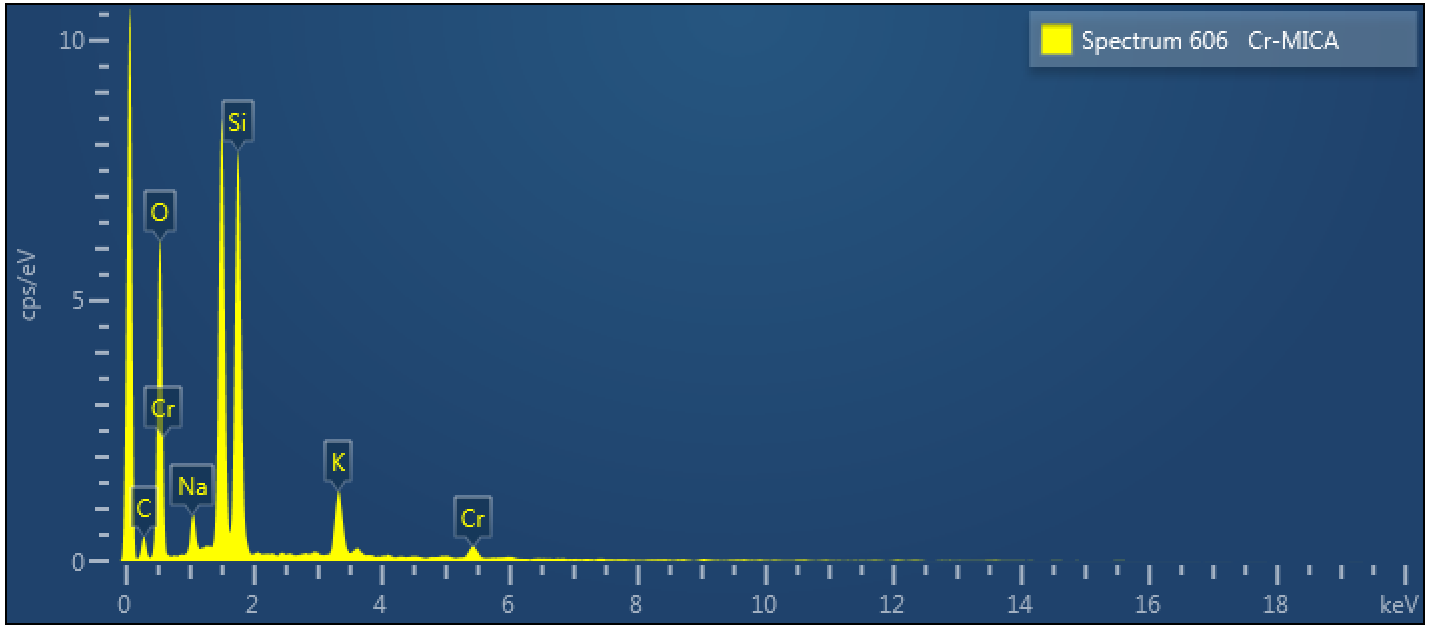
Brightness reduced further to illustrate Sb-Ni-S (spectrum 609).



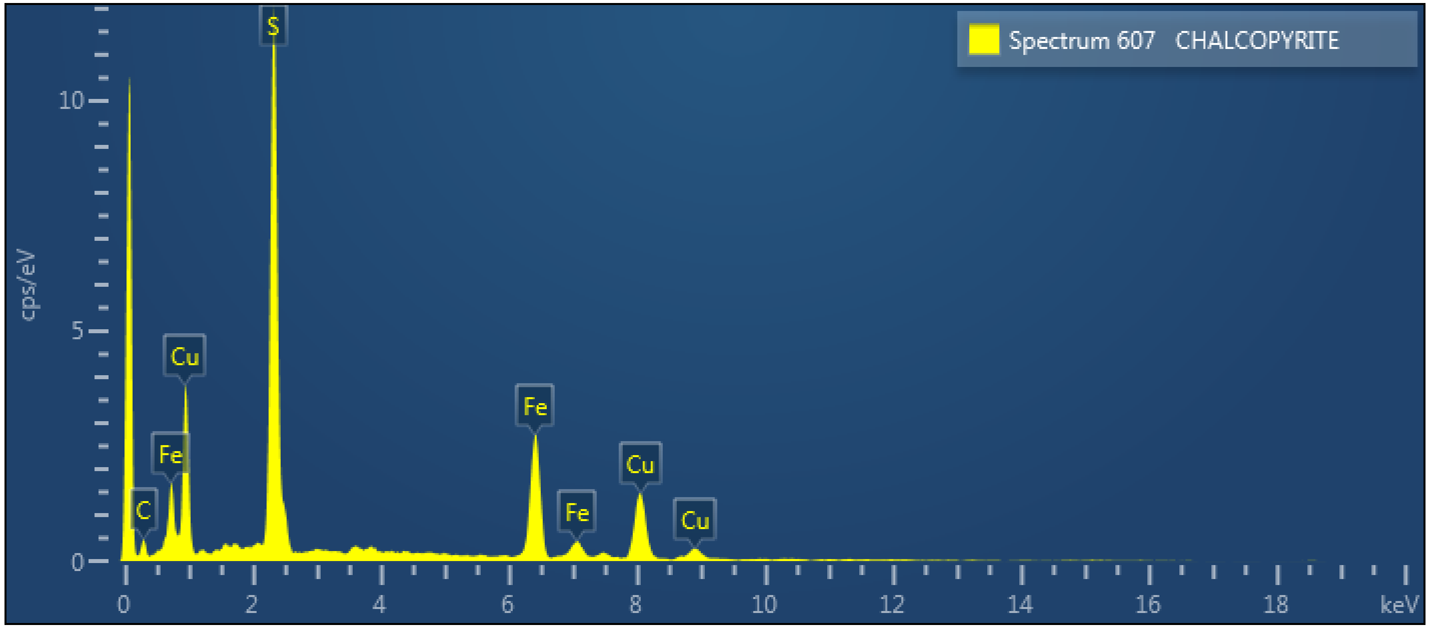
Spectrum 604 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	46.79	0.41	61.44			
Na	K series	1.60	0.17	1.46	Na2O	2.16	0.23
Al	K series	19.79	0.30	15.41	Al2O3	37.40	0.58
Si	K series	23.10	0.34	17.28	SiO2	49.42	0.72
K	K series	6.66	0.22	3.58	K2O	8.03	0.26
Cr	K series	2.05	0.21	0.83	Cr2O3	3.00	0.30
Total		100.00		100.00		100.00	



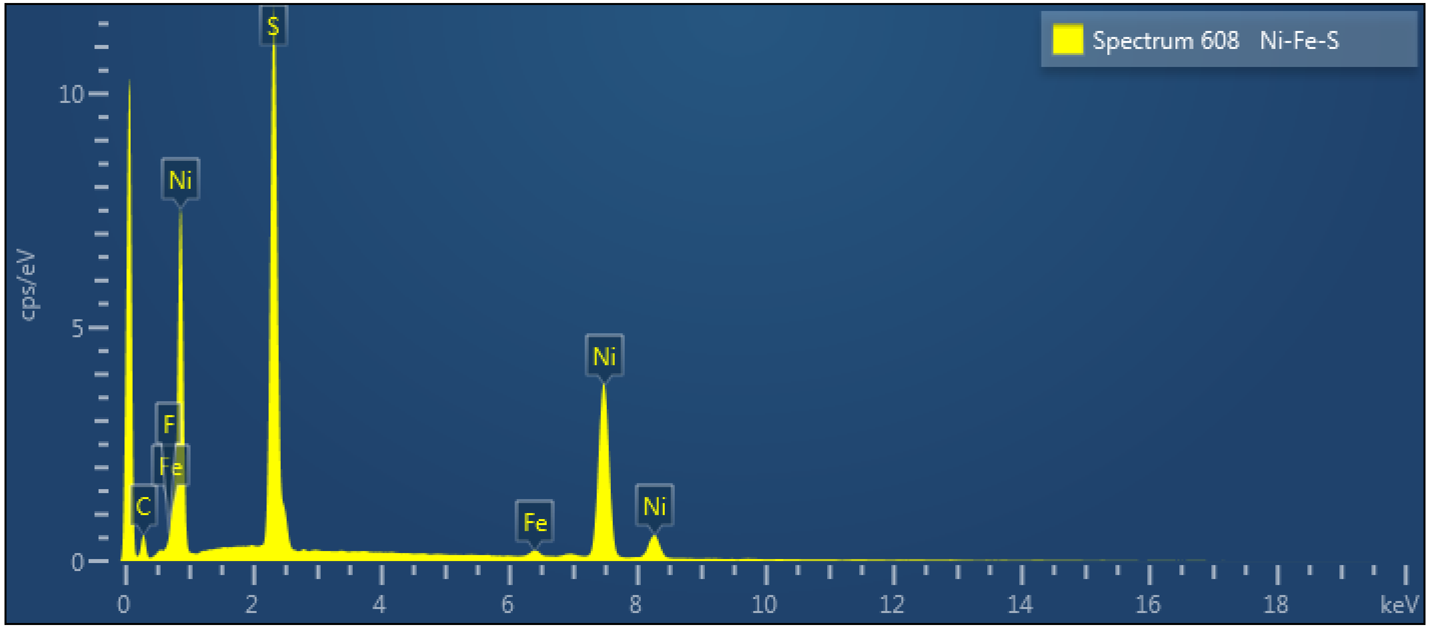
Spectrum 605 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.45	0.56	50.00			
Mg	K series	16.87	0.46	18.23	MgO	27.98	0.76
Ca	K series	37.73	0.56	24.73	CaO	52.79	0.78
Fe	K series	14.95	0.59	7.03	FeO	19.23	0.76
Total		100.00		100.00		100.00	



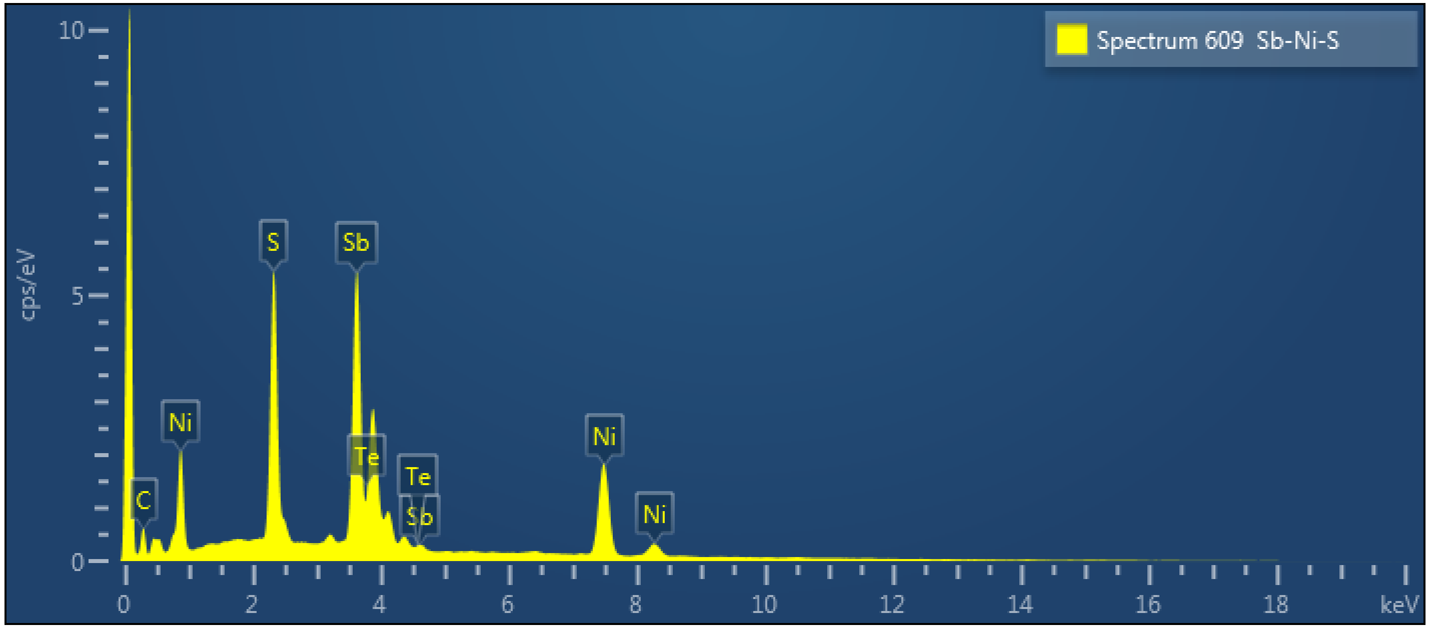
Spectrum 606 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	46.83	0.73	61.18			
Na	K series	2.93	0.34	2.67	Na2O	3.96	0.45
Al	K series	20.29	0.55	15.72	Al2O3	38.34	1.04
Si	K series	22.52	0.60	16.76	SiO2	48.17	1.27
K	K series	5.16	0.35	2.76	K2O	6.22	0.43
Cr	K series	2.27	0.35	0.91	Cr2O3	3.31	0.51
Total		100.00		100.00		100.00	



Spectrum 607 CHALCOPYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	37.56	1.24	52.74
Fe	K series	30.74	1.31	24.78
Cu	K series	31.71	1.62	22.47
Total		100.00		100.00



Spectrum 608 Ni-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	35.71	0.39	48.51
Ni	K series	60.69	0.45	45.02
Fe	K series	1.18	0.16	0.92
F	K series	2.42	0.34	5.55
Total		100.00		100.00

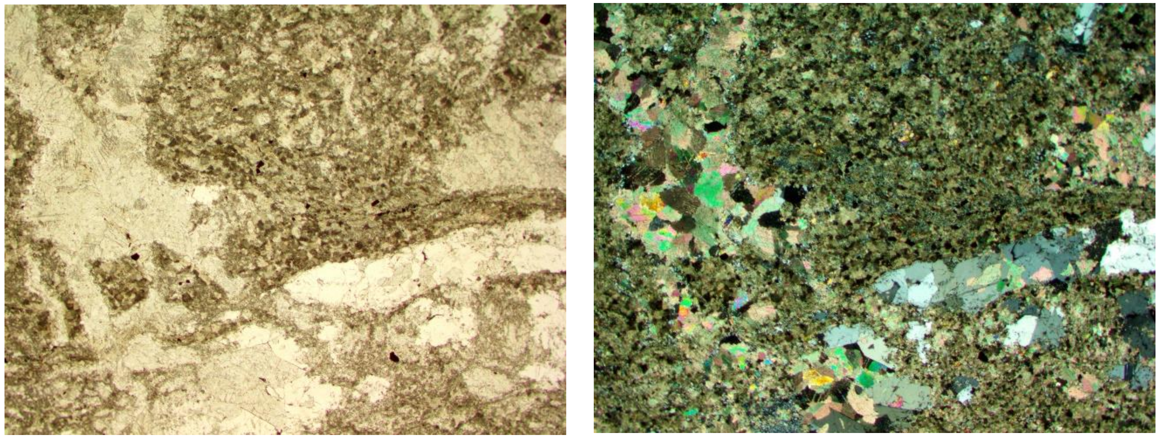


Spectrum 609 Sb-Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	14.67	0.25	33.02
Ni	K series	25.95	0.45	31.89
Sb	L series	55.76	0.55	33.05
Te	L series	3.62	0.56	2.05
Total		100.00		100.00

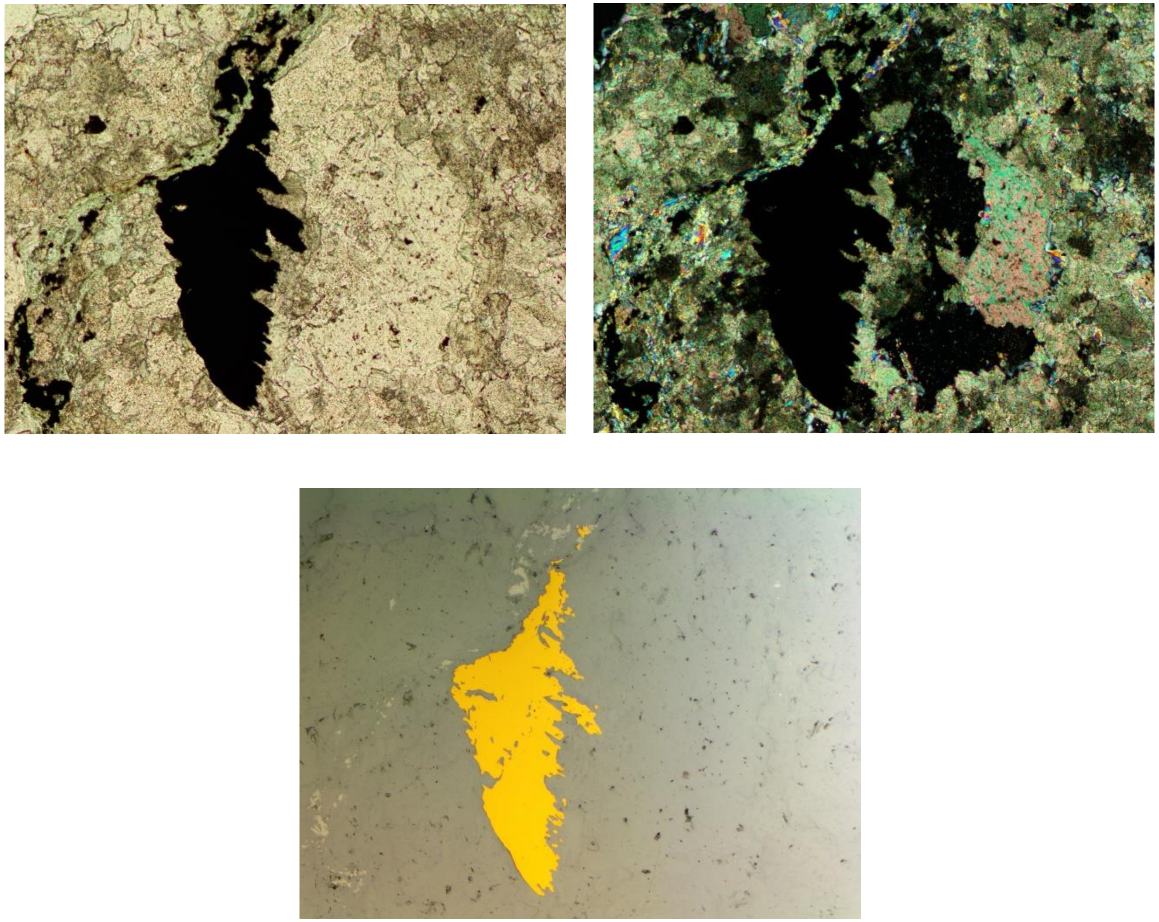
Specimen Notes for 'MID-23'

The rock was collected from the Laroma Prospect. It is an altered ultramafic with intense quartz, Cr-mica (fuchsite), and compositionally zoned dolomite-ankerite solid solution carbonate alteration. EDS determinations have also identified the presence of zoned chromite grains with zincian margins. There are also randomly disseminated grains of altered rutile/sphene.

In terms of metal inventory, the rock contains chromite, Zn-chromite, Cr-Ti-magnetite, altered rutile/sphene, Ni-S, Ni-Co-Fe-S, and Ni-As-S.

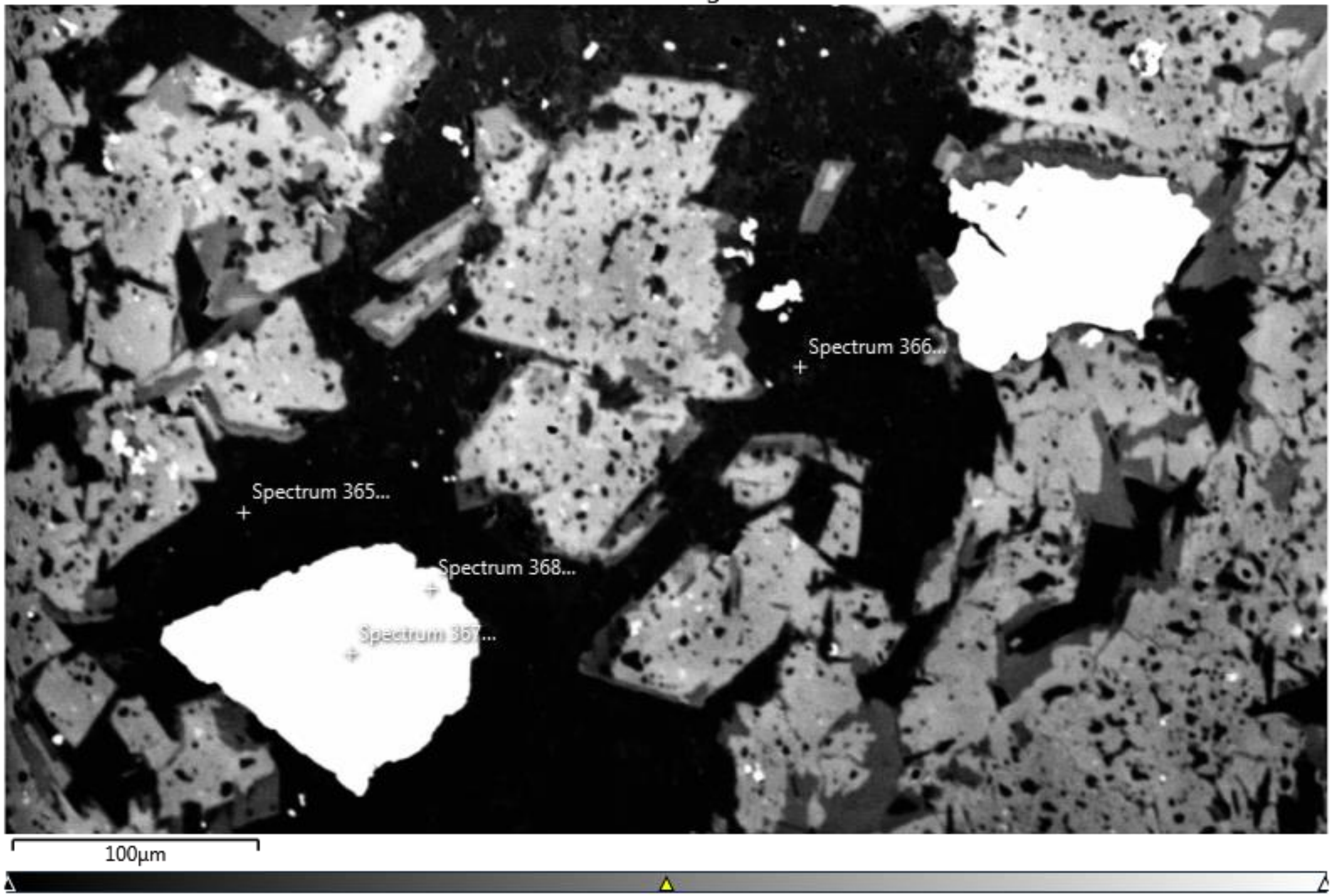


Plane light image (left) and crossed polarized light image (right) illustrating a strongly carbonate altered rock crosscut by anastomosing veinlets of coarser-grained birefringent carbonate and quartz. Field of View = 17mm



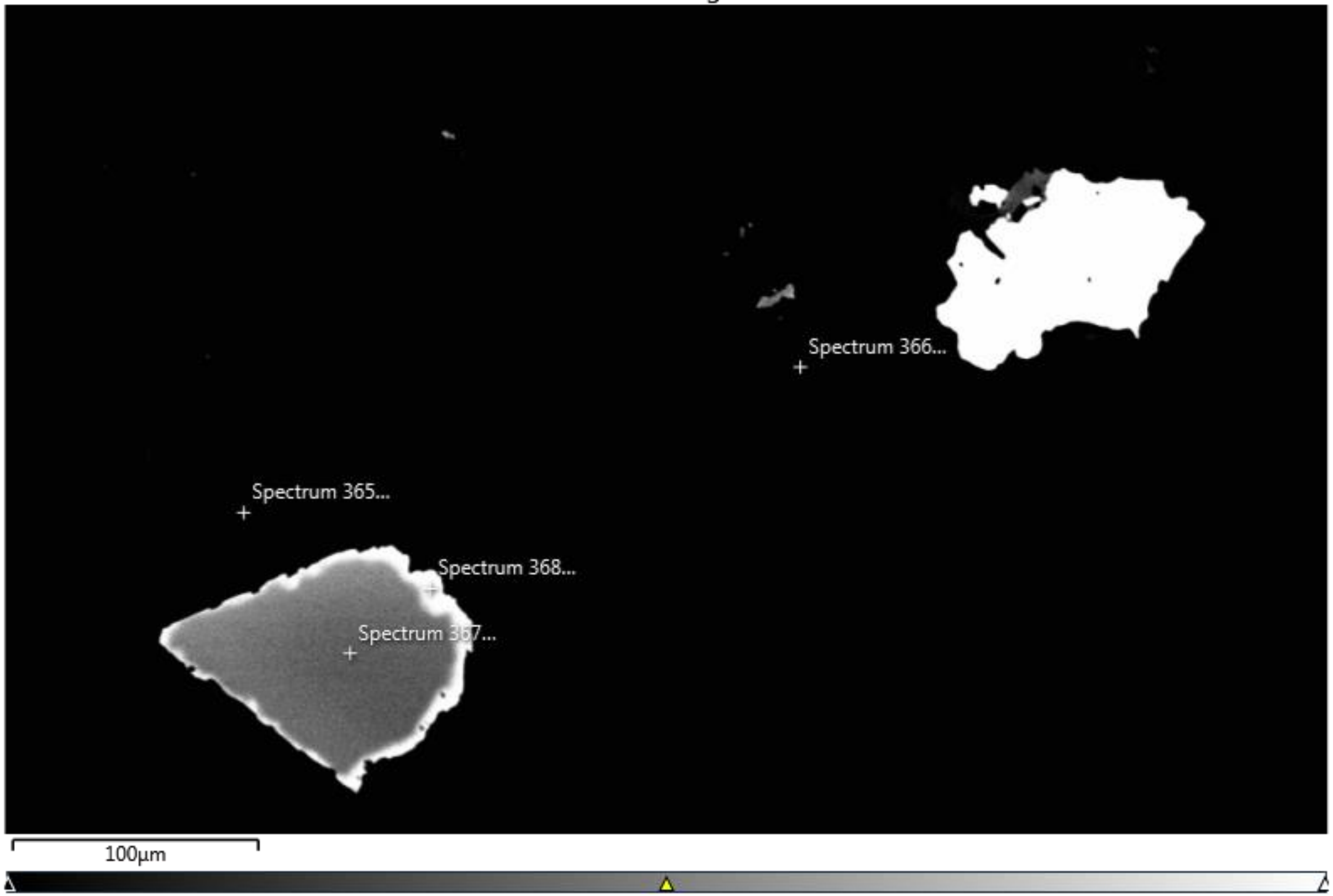
Plane light image (top left), crossed polarized light image (right) and reflected light image (bottom) of a Ni-S grain hosted within dolomite-ankerite solid solution carbonate and green Cr-mica (fuchsite). Field of view = 2.2mm

Electron Image 81



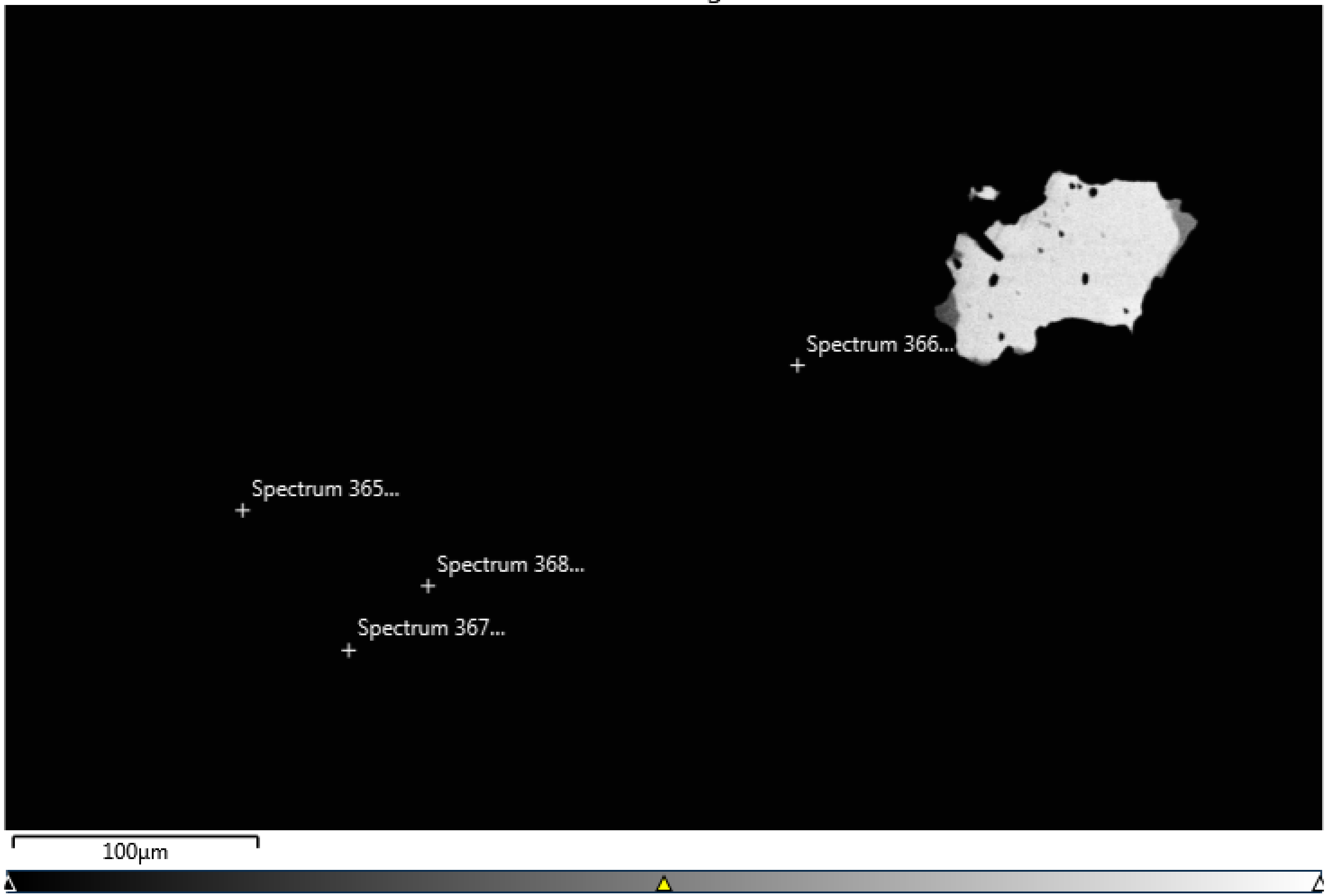
Backscatter image of compositionally zoned dolomite-ankerite solid solution carbonate, quartz (spectrum 365), and Cr-mica (fuchsite – spectrum 366) hosting coarse-grained zoned chromite grains (spectra 367,368).

Electron Image 83

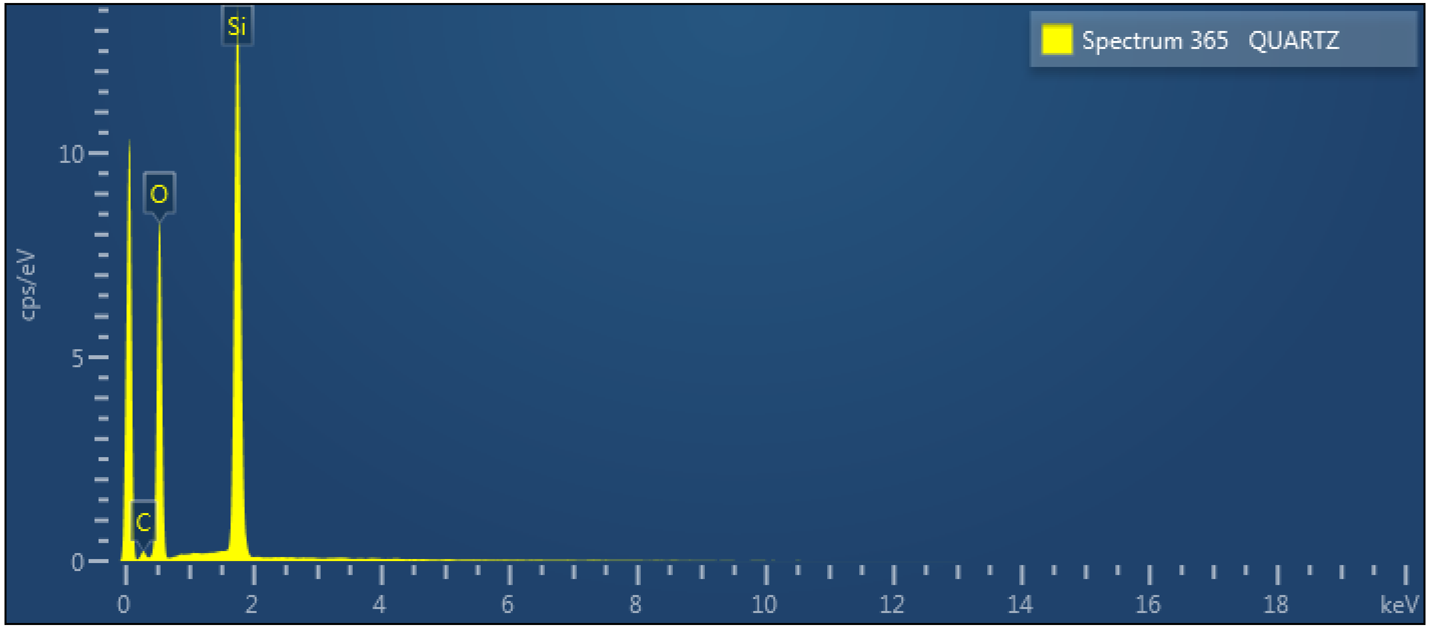


Brightness reduced to illustrate the zoning in the chromite (spectrum 367) with bright Zn-chromite margins (spectrum 368).

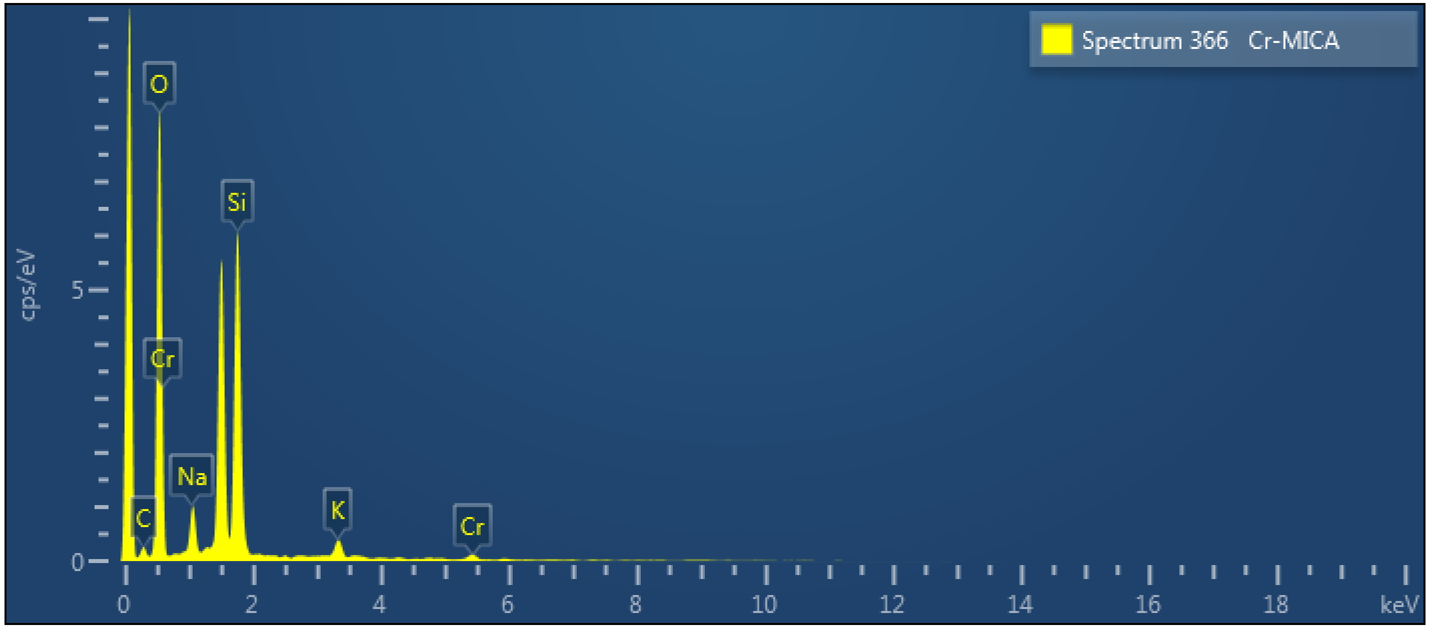
Electron Image 84



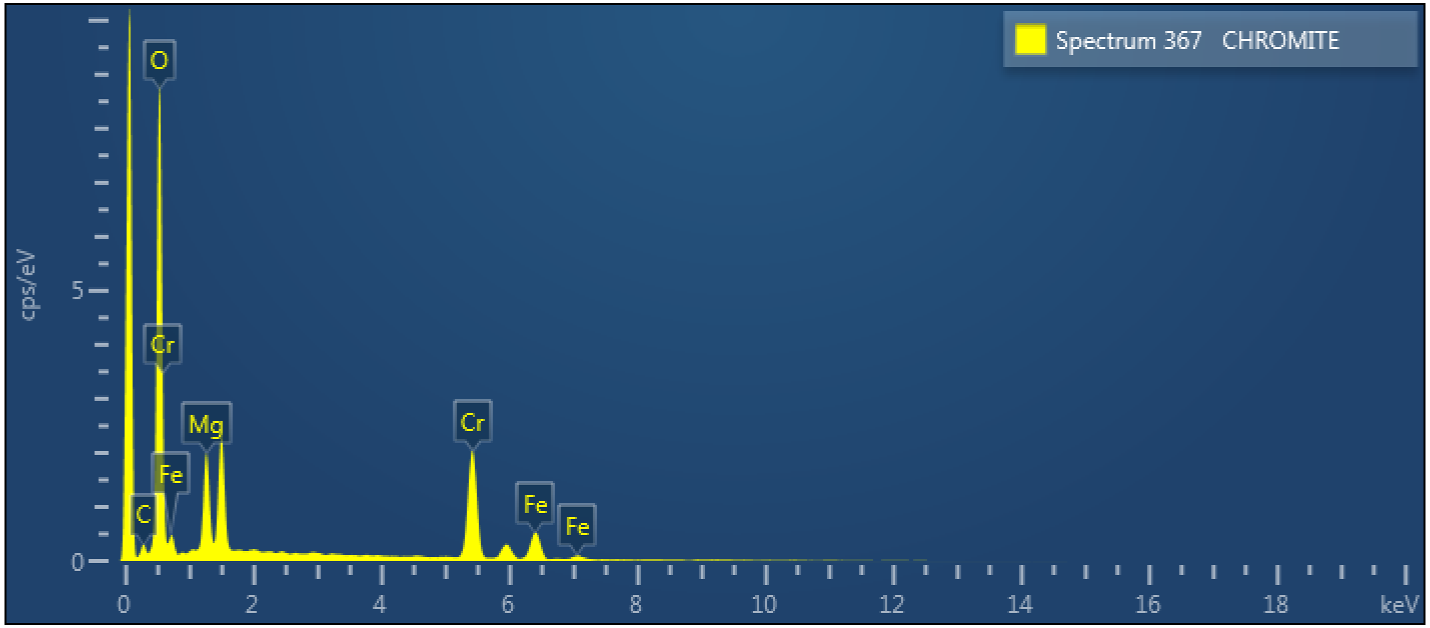
Brightness reduced further to illustrate a bright grain of Ni-S.



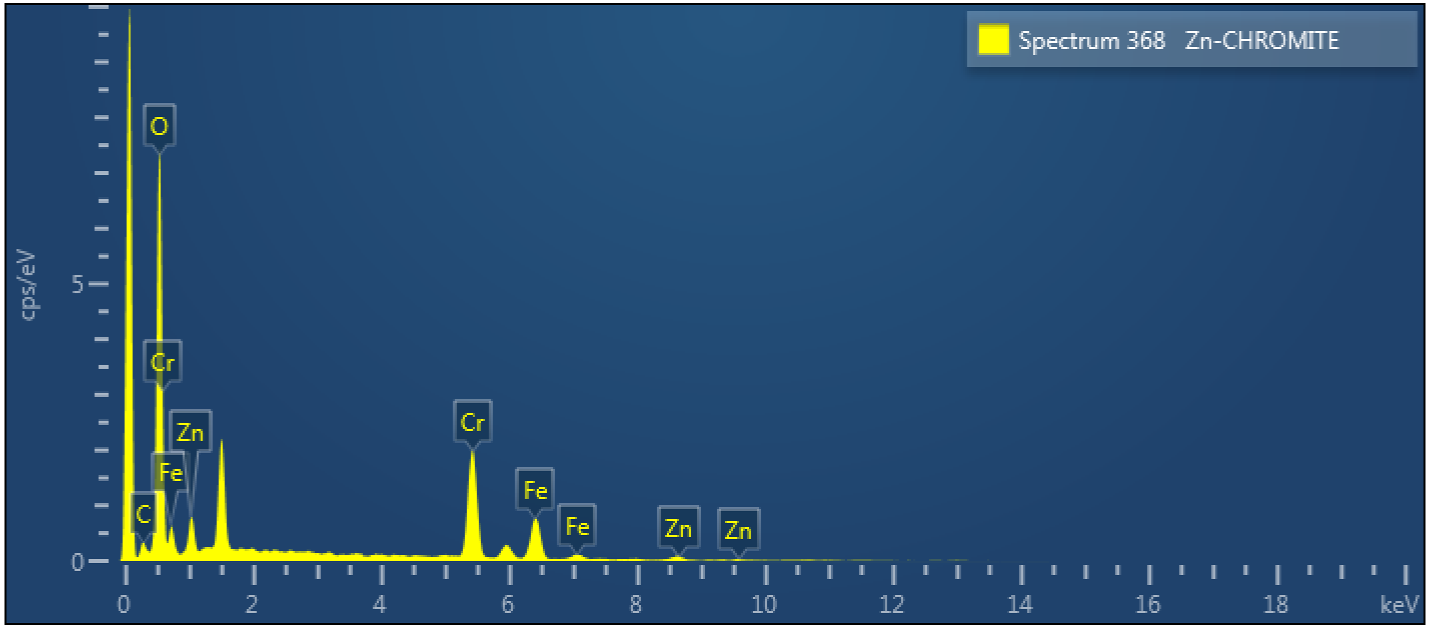
Spectrum 365 QUARTZ							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	53.26	0.37	66.67			
Si	K series	46.74	0.37	33.33	SiO2	100.00	0.79
Total		100.00		100.00		100.00	



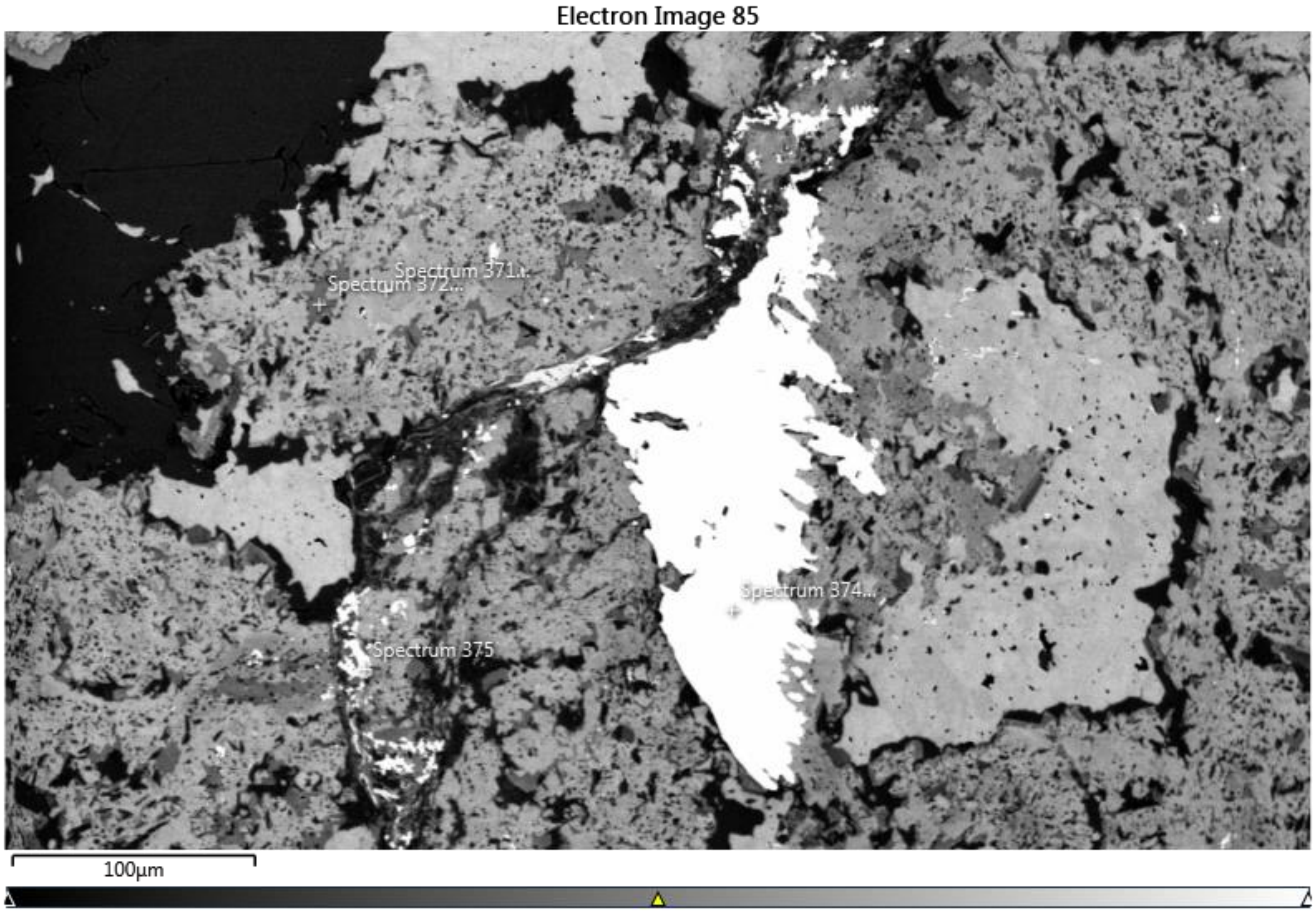
Spectrum 366 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	47.90	0.70	61.45			
Na	K series	4.77	0.39	4.26	Na2O	6.43	0.52
Al	K series	19.23	0.52	14.63	Al2O3	36.33	0.98
Si	K series	24.66	0.59	18.02	SiO2	52.76	1.26
K	K series	2.13	0.24	1.12	K2O	2.56	0.29
Cr	K series	1.31	0.27	0.52	Cr2O3	1.91	0.40
Total		100.00		100.00		100.00	



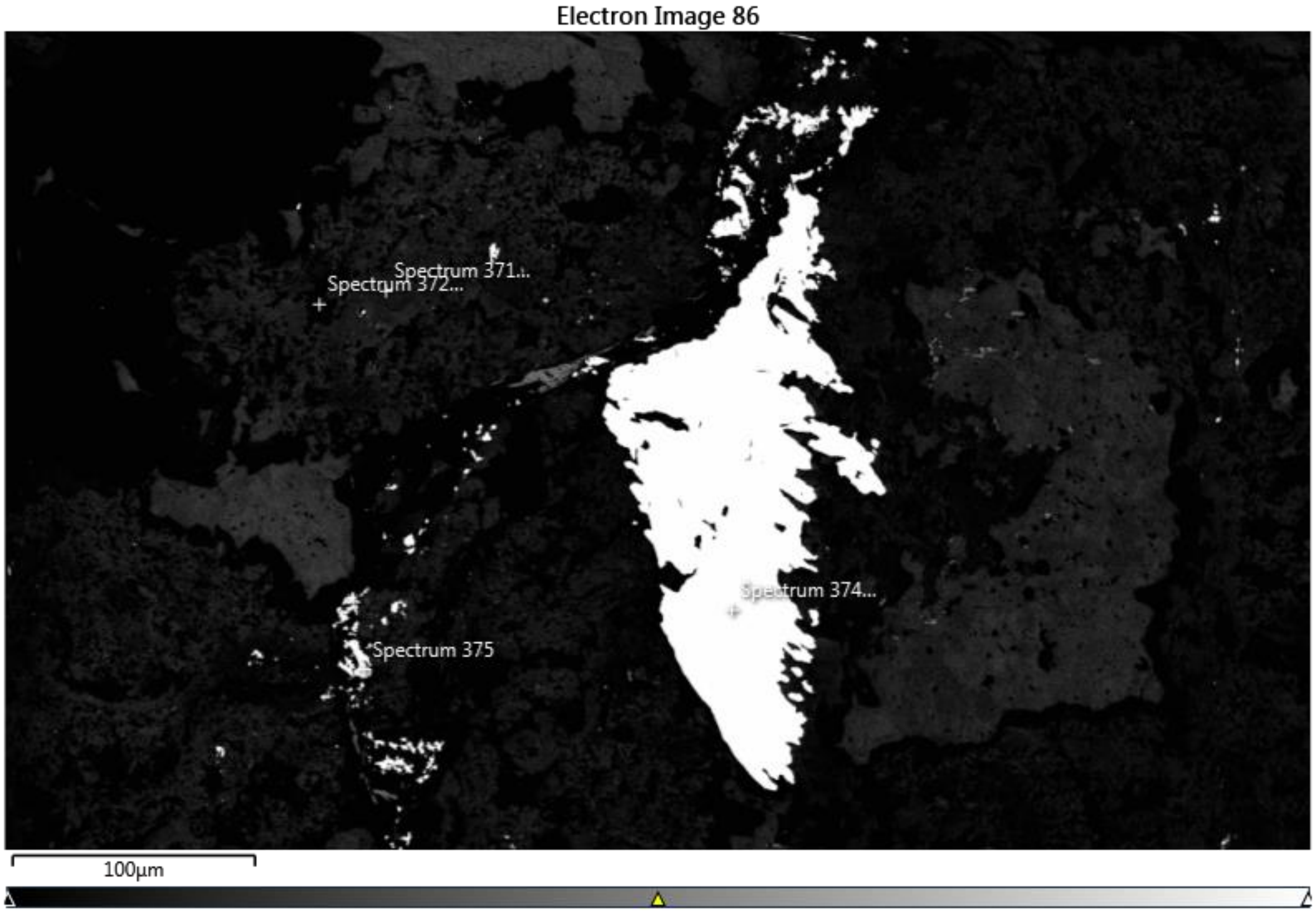
Spectrum 367 CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	35.50	0.66	56.56			
Mg	K series	11.54	0.45	12.10	MgO	19.13	0.74
Al	K series	12.65	0.43	11.95	Al2O3	23.90	0.82
Cr	K series	29.16	0.61	14.30	Cr2O3	42.62	0.90
Fe	K series	11.15	0.53	5.09	FeO	14.34	0.69
Total		100.00		100.00		100.00	



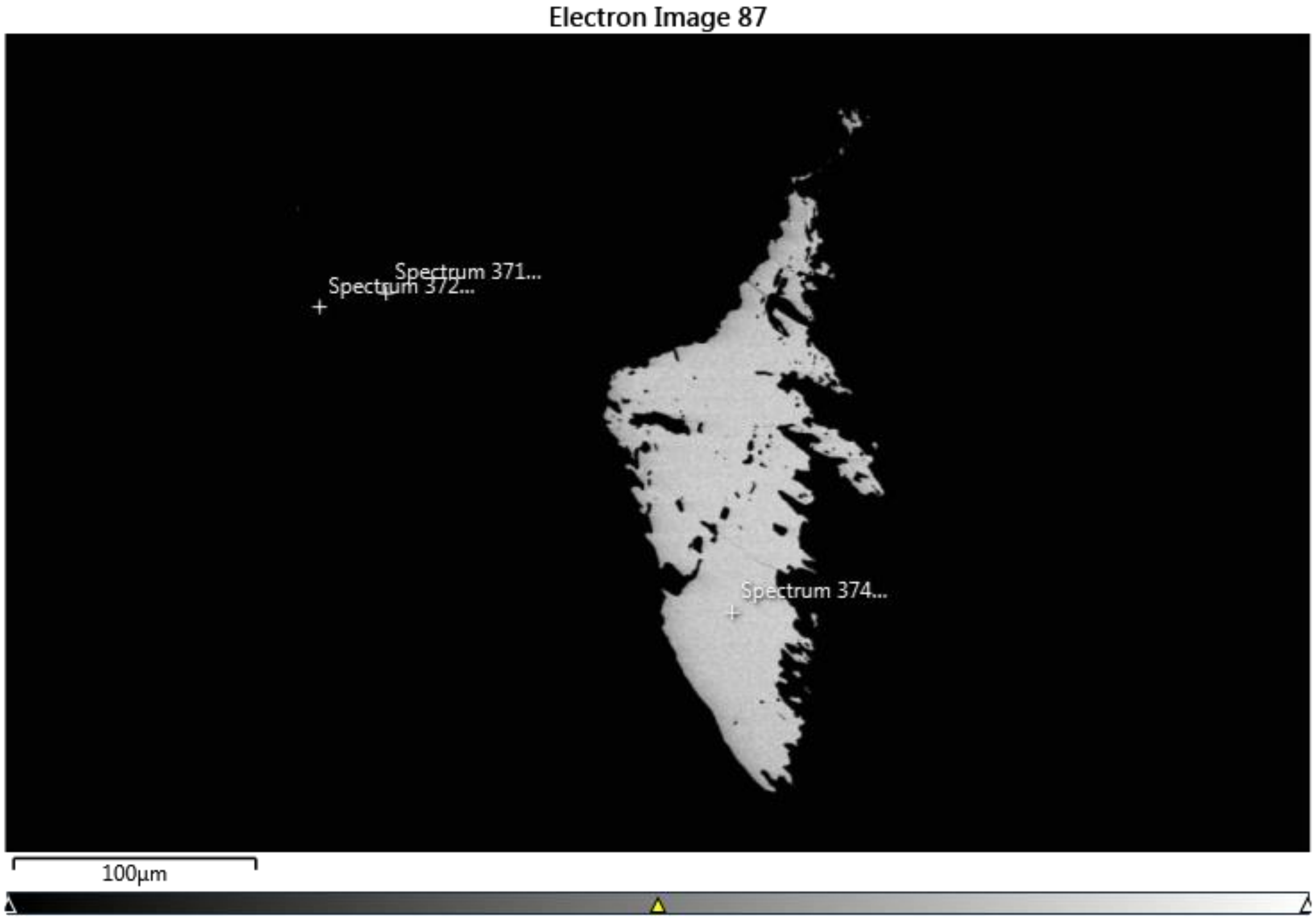
Spectrum 368 Zn-CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	32.72	1.06	57.80			
Al	K series	13.36	0.68	14.00	Al2O3	25.25	1.28
Cr	K series	31.66	1.01	17.21	Cr2O3	46.28	1.47
Fe	K series	18.53	0.96	9.38	FeO	23.84	1.24
Zn	K series	3.72	0.93	1.61	ZnO	4.63	1.16
Total		100.00		100.00		100.00	



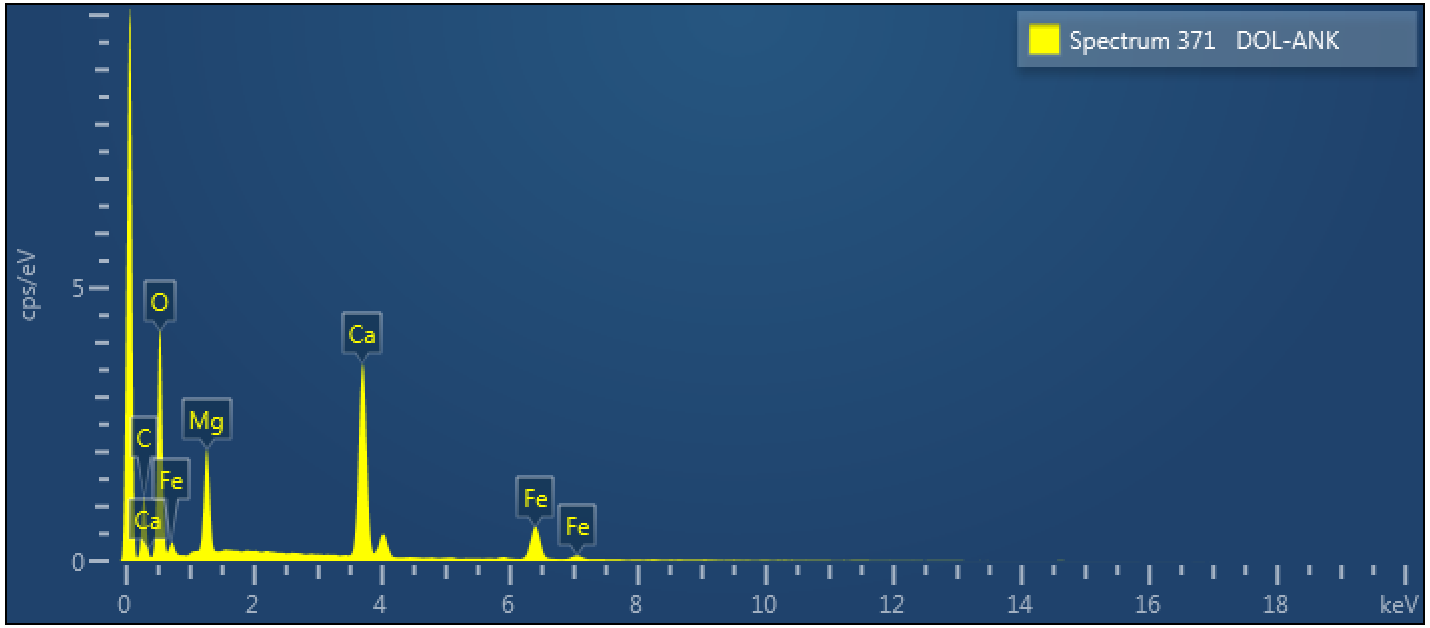
Backscatter image of dolomite-ankerite solid solution carbonate (spectra 371,372) hosting coarse-grained Ni-S (spectrum 374).



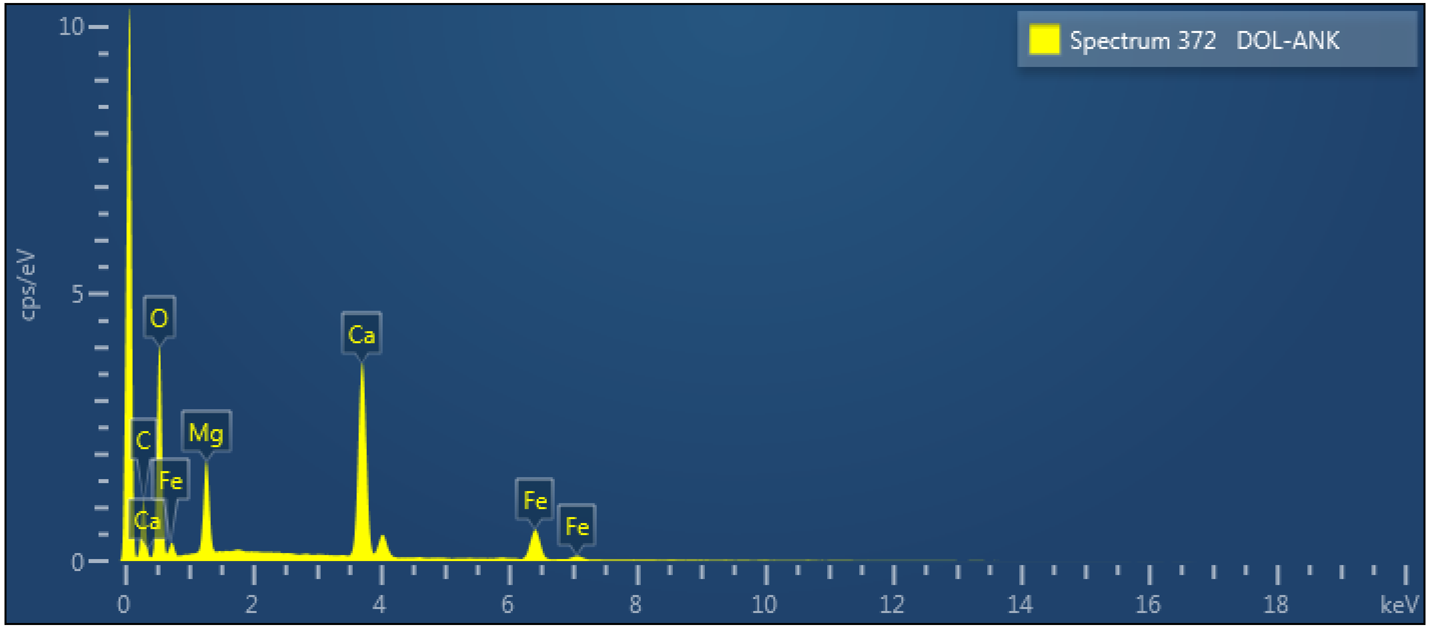
Brightness reduced to illustrate the Cr-Ti-magnetite (spectrum 375) and the coarse grain of Ni-S (spectrum 374).



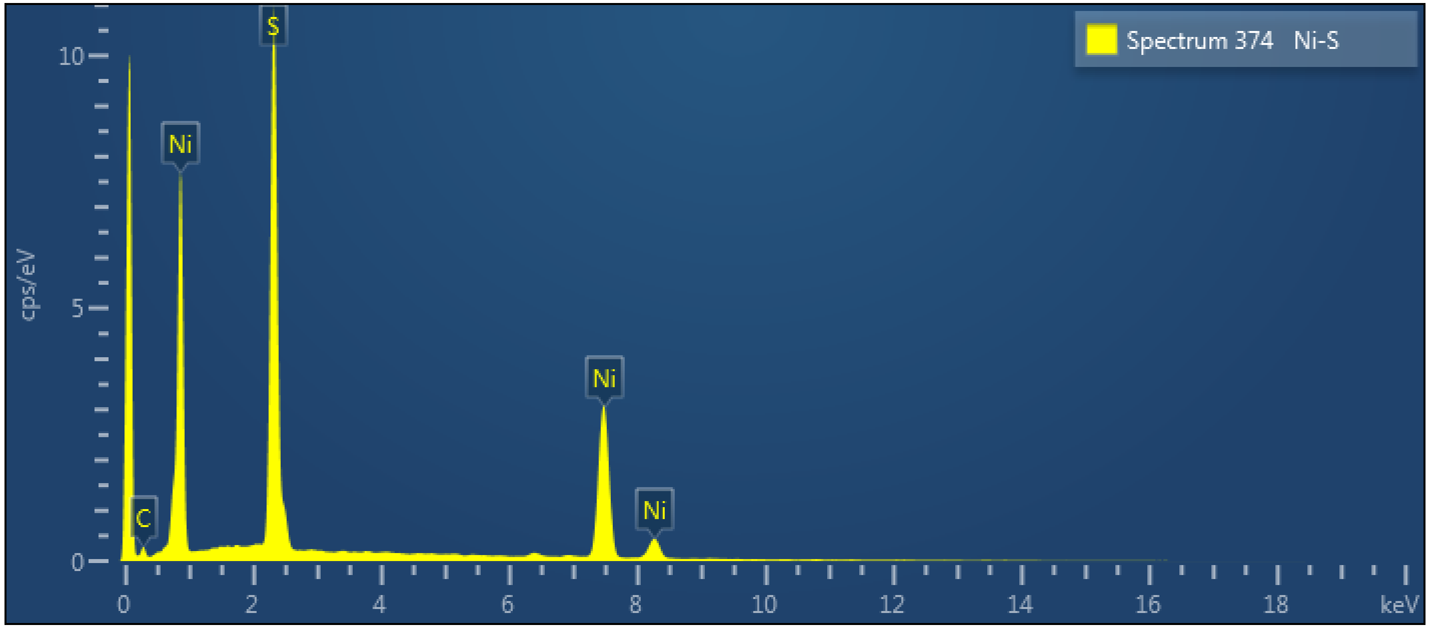
Backscatter image illustrating the coarse-grained Ni-S (spectrum 374).



Spectrum 371 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.09	0.57	50.00			
Mg	K series	16.13	0.46	17.64	MgO	26.75	0.77
Ca	K series	36.05	0.55	23.92	CaO	50.45	0.77
Fe	K series	17.73	0.61	8.44	FeO	22.81	0.79
Total		100.00		100.00		100.00	

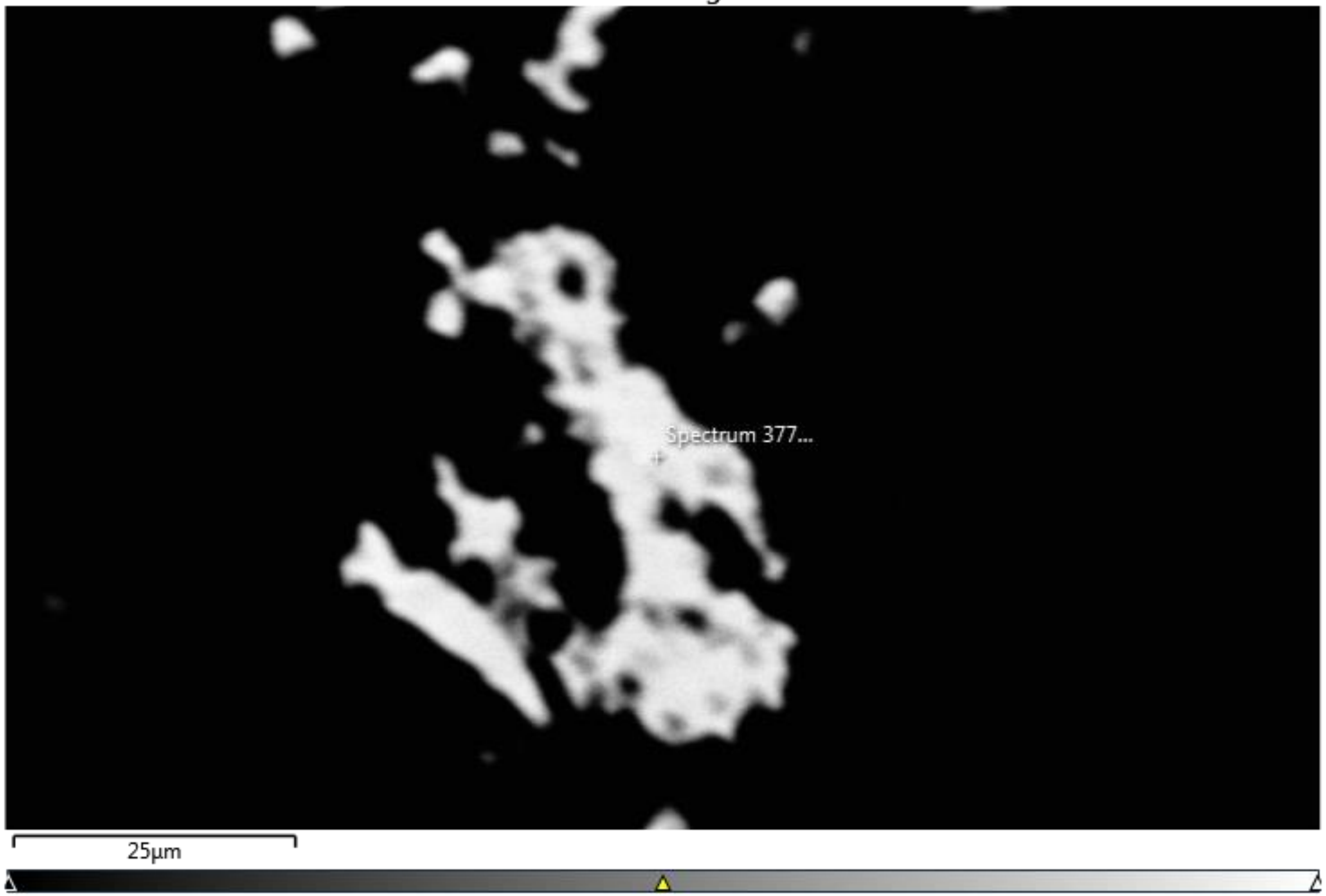


Spectrum 372 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.93	0.60	50.00			
Mg	K series	15.10	0.48	16.60	MgO	25.04	0.79
Ca	K series	37.68	0.59	25.12	CaO	52.71	0.83
Fe	K series	17.29	0.64	8.27	FeO	22.24	0.82
Total		100.00		100.00		100.00	

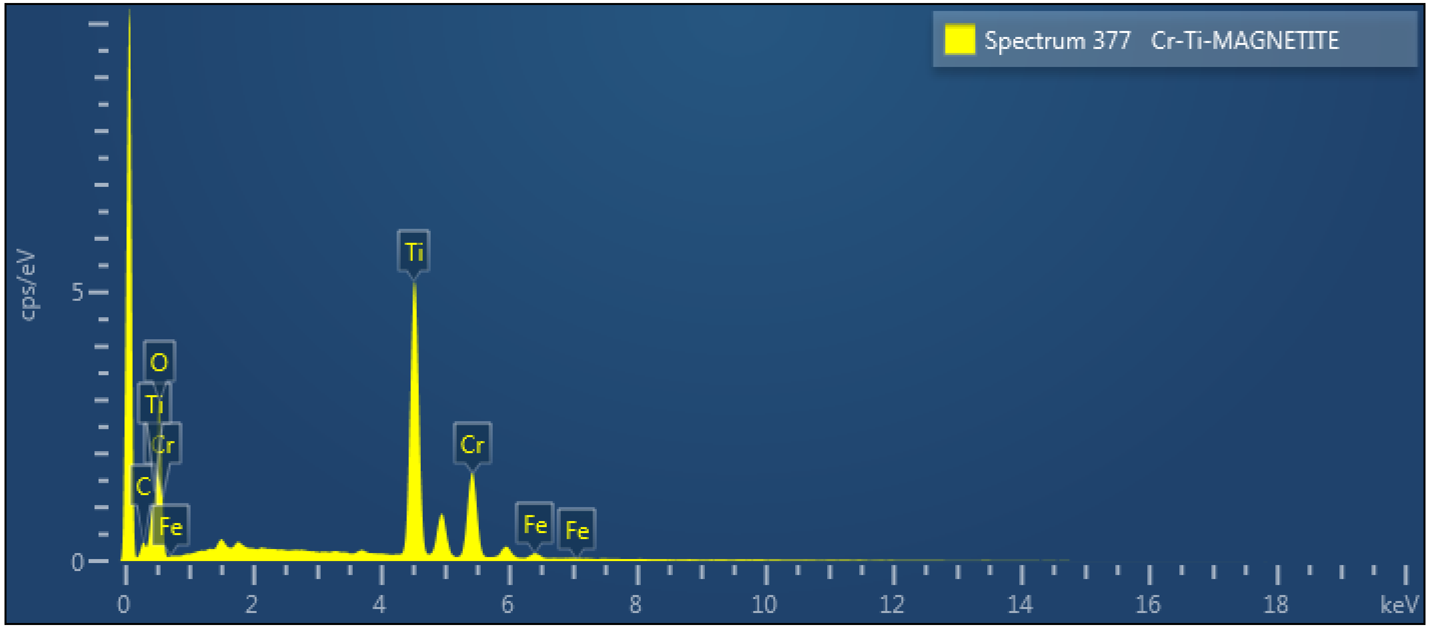


Spectrum 374 Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	40.16	0.48	55.14
Ni	K series	59.84	0.48	44.86
Total		100.00		100.00

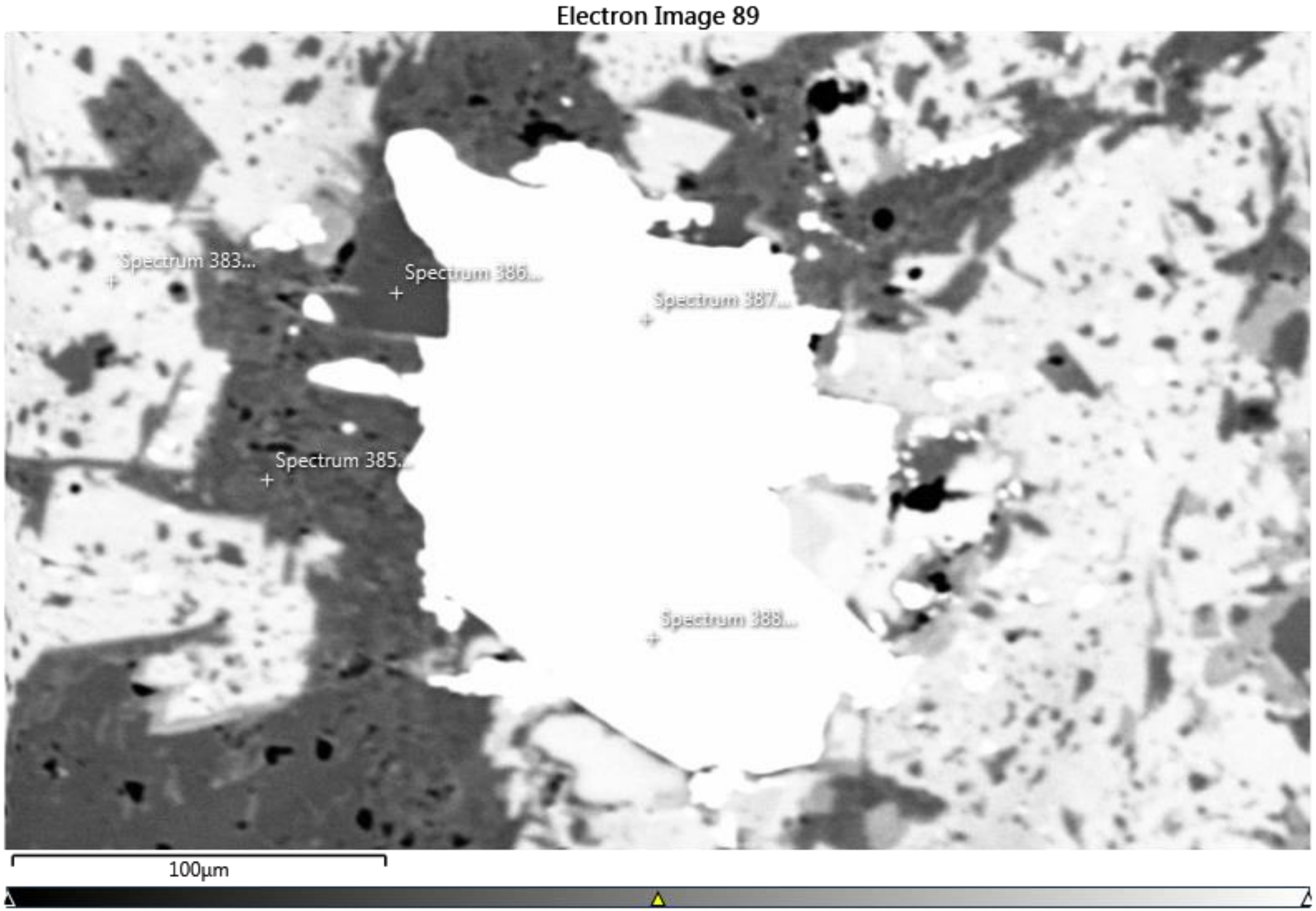
Electron Image 88



Higher magnification image of the Cr-Ti-magnetite (spectrum 377).

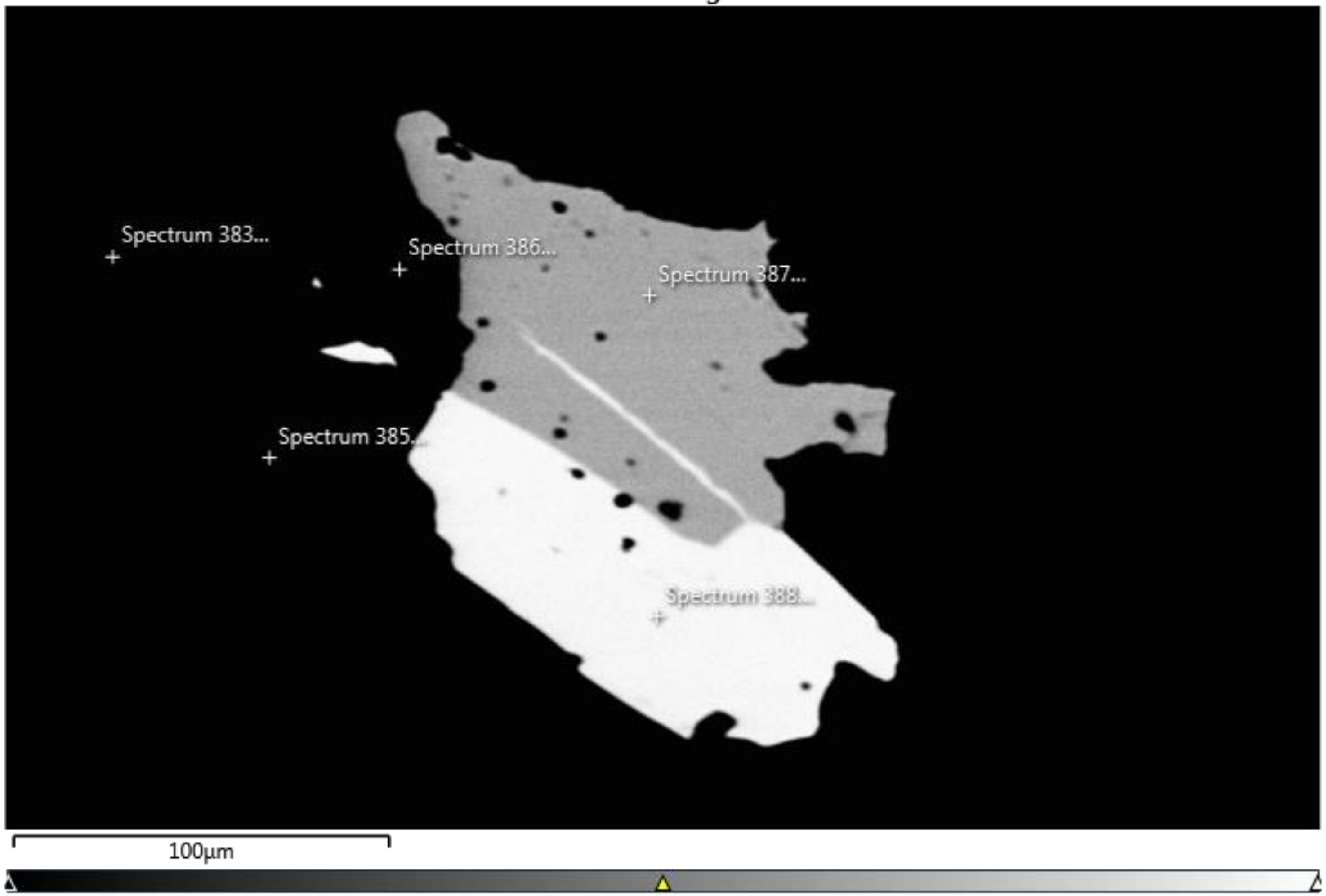


Spectrum 377 Cr-Ti-MAGNETITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	37.41	0.36	64.59			
Ti	K series	41.16	0.36	23.74	TiO2	68.66	0.60
Cr	K series	19.14	0.32	10.17	Cr2O3	27.98	0.47
Al	K series	0.70	0.11	0.72	Al2O3	1.33	0.21
Fe	K series	1.58	0.19	0.78	FeO	2.03	0.24
Total		100.00		100.00		100.00	

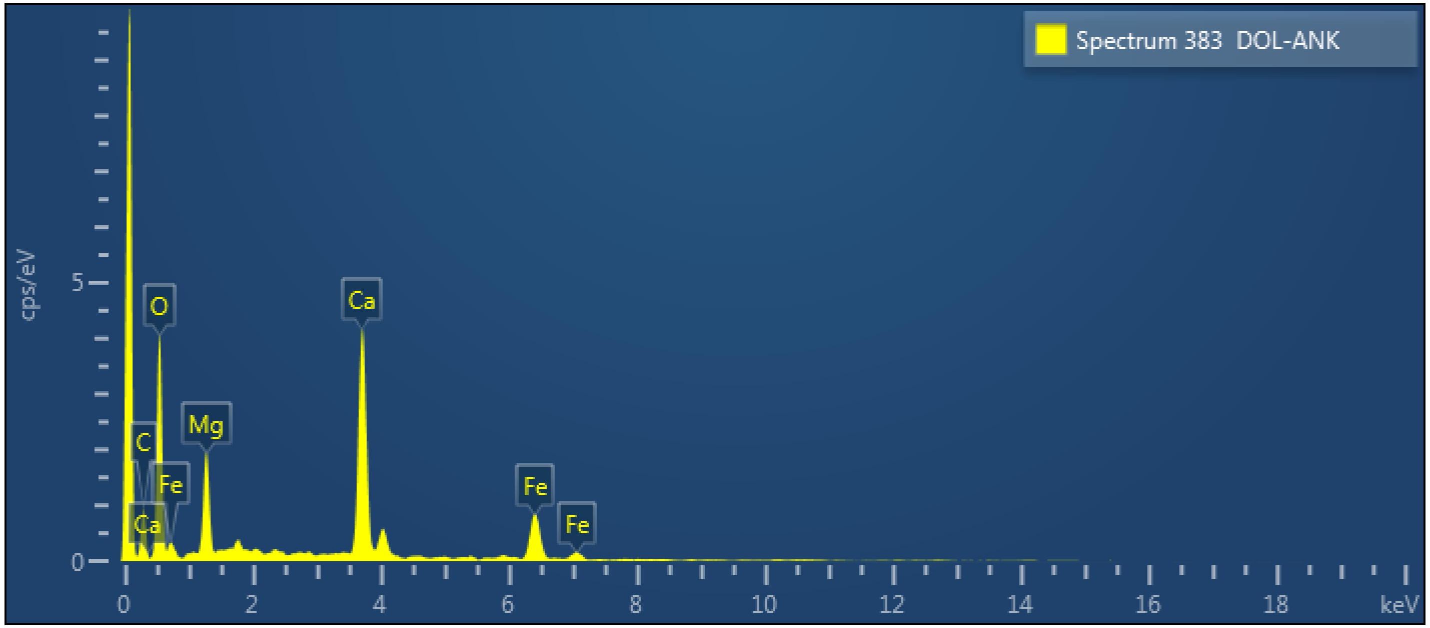


Backscatter image of dolomite-ankerite solid solution carbonate (spectrum 383), quartz (spectrum 386), and Cr-mica (fuchsite – spectrum 385) hosting Ni-Co-Fe-S (spectrum 387) and Ni-S (spectrum 388).

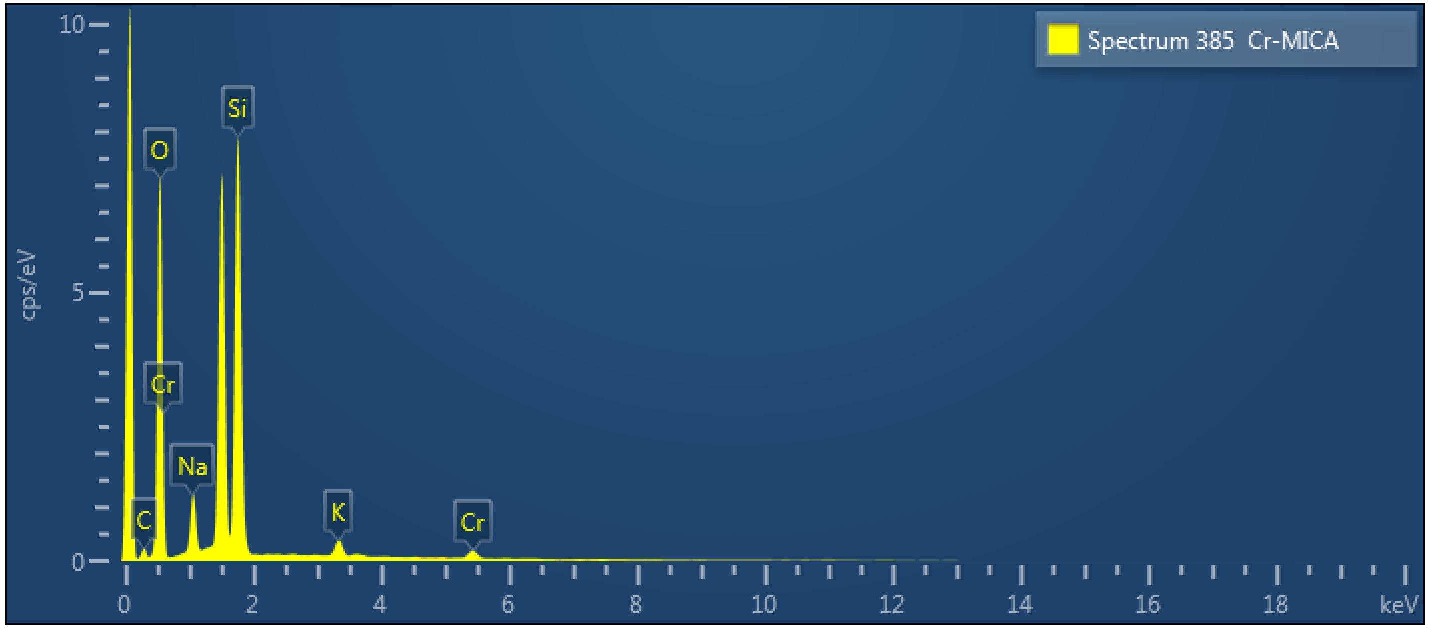
Electron Image 90



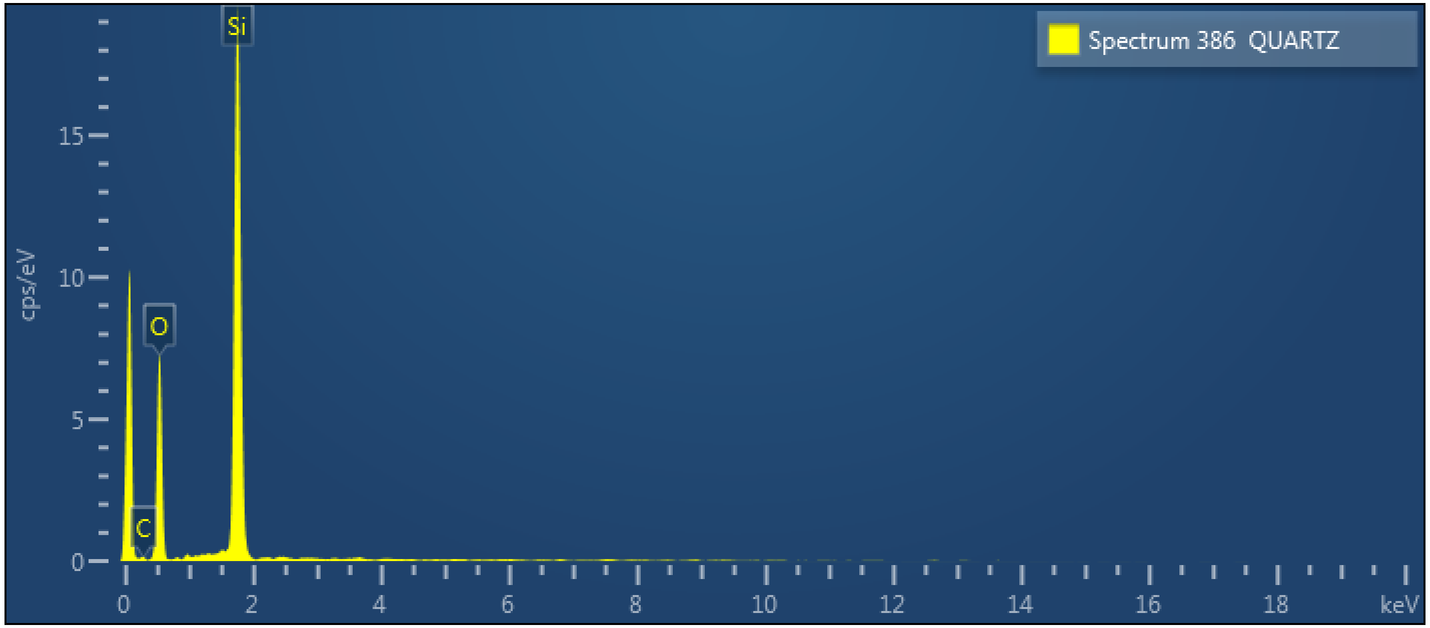
Brightness reduced to illustrate the two intergrowths of Ni-Co-Fe-S (spectrum 387) and Ni-S (spectrum 388).



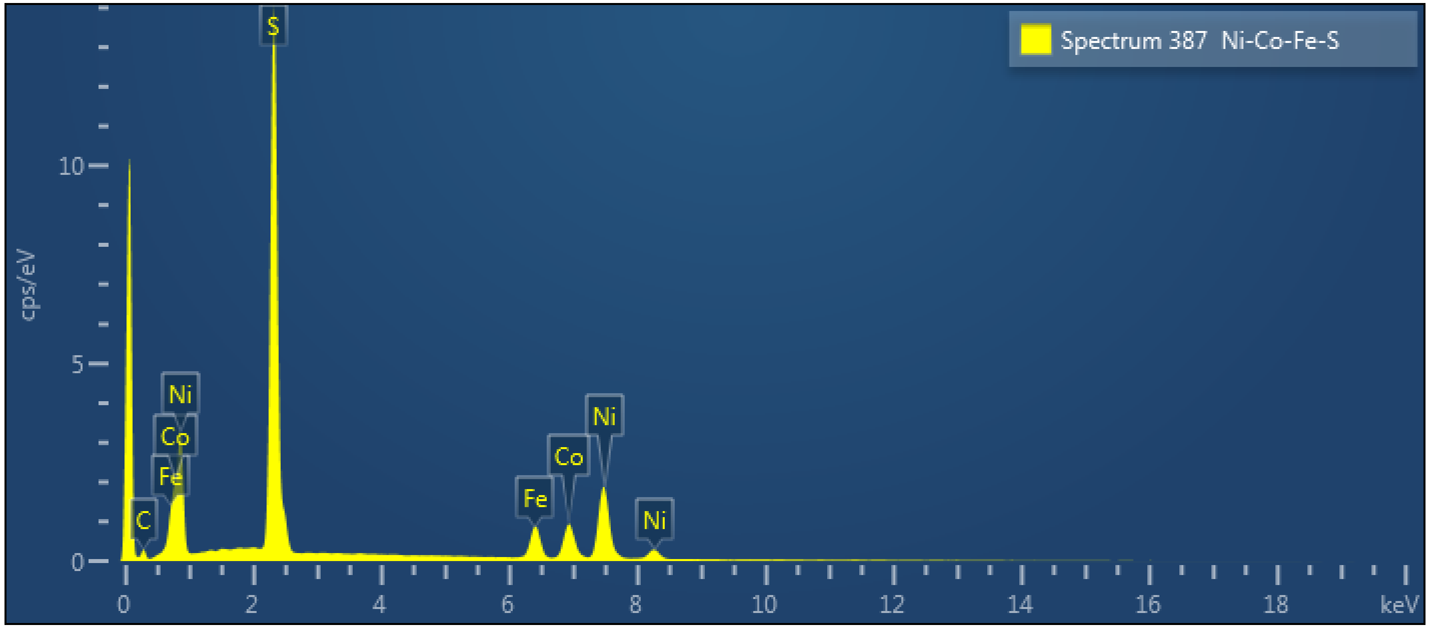
Spectrum 383 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.45	1.35	50.00			
Mg	K series	14.09	1.03	15.75	MgO	23.37	1.70
Ca	K series	35.50	1.30	24.06	CaO	49.67	1.82
Fe	K series	20.96	1.50	10.19	FeO	26.96	1.93
Total		100.00		100.00		100.00	



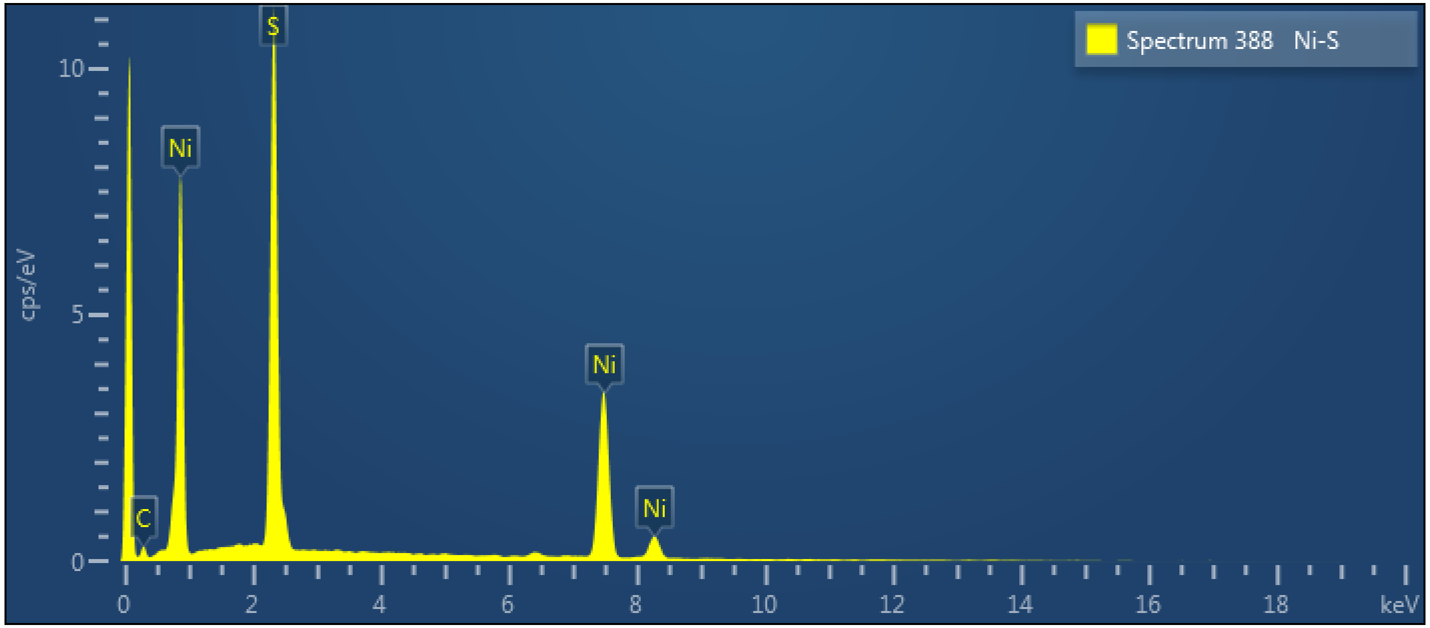
Spectrum 385 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	48.23	0.29	61.73			
Na	K series	4.52	0.15	4.02	Na2O	6.09	0.21
Al	K series	19.37	0.21	14.70	Al2O3	36.61	0.40
Si	K series	24.98	0.24	18.21	SiO2	53.44	0.52
Cr	K series	1.47	0.13	0.58	Cr2O3	2.14	0.18
K	K series	1.43	0.09	0.75	K2O	1.72	0.11
Total		100.00		100.00		100.00	



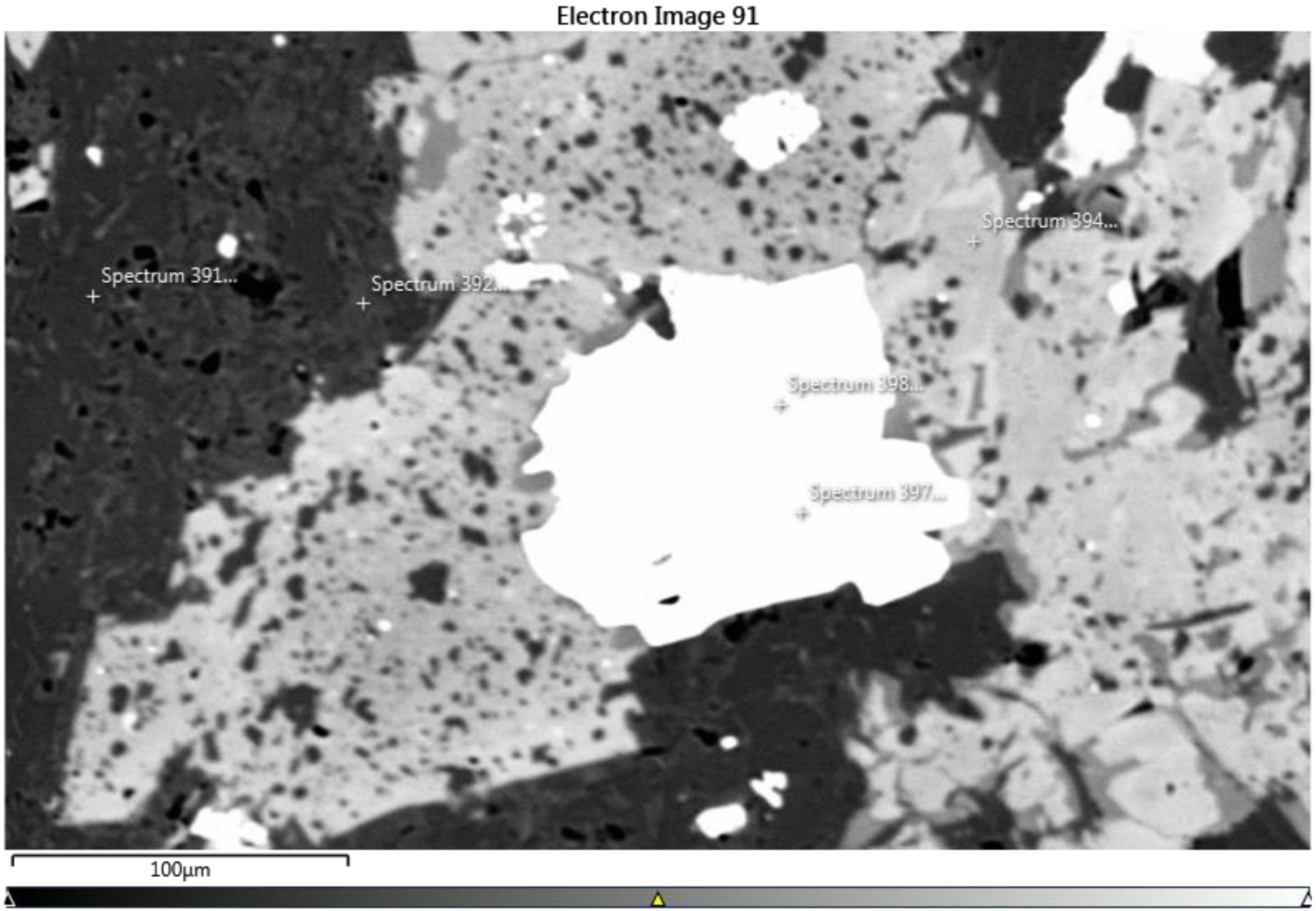
Spectrum 386 QUARTZ							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	53.26	0.89	66.67			
Si	K series	46.74	0.89	33.33	SiO2	100.00	1.89
Total		100.00		100.00		100.00	



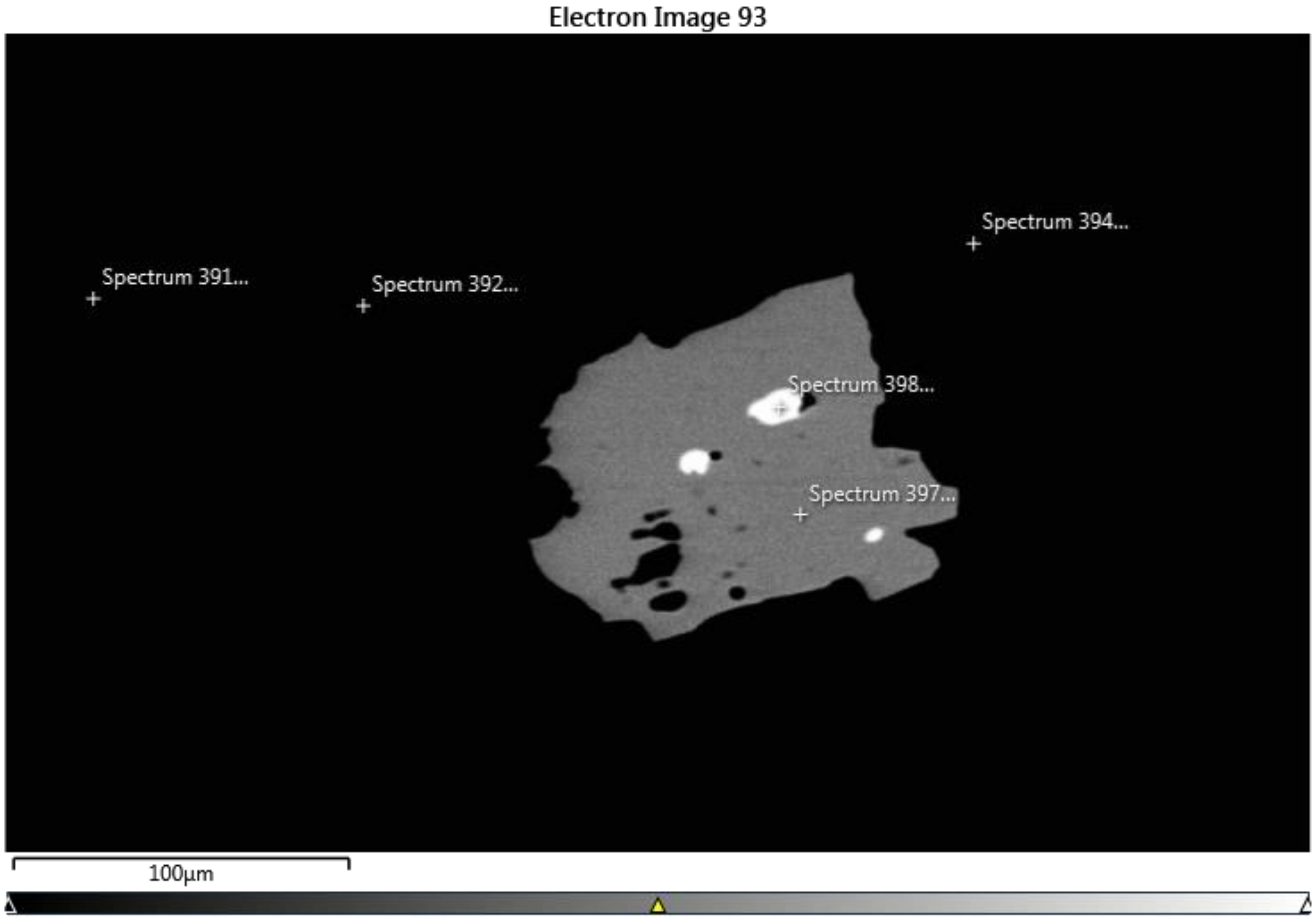
Spectrum 387 Ni-Co-Fe-S							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
S	K series	23.95	0.20	18.35	SO3	59.80	0.49
Fe	K series	5.26	0.16	2.31	FeO	6.77	0.20
Co	K series	7.55	0.21	3.15	CoO	9.59	0.26
Ni	K series	18.73	0.28	7.84	NiO	23.84	0.35
O	K series	44.51	0.27	68.35			
Total		100.00		100.00		100.00	



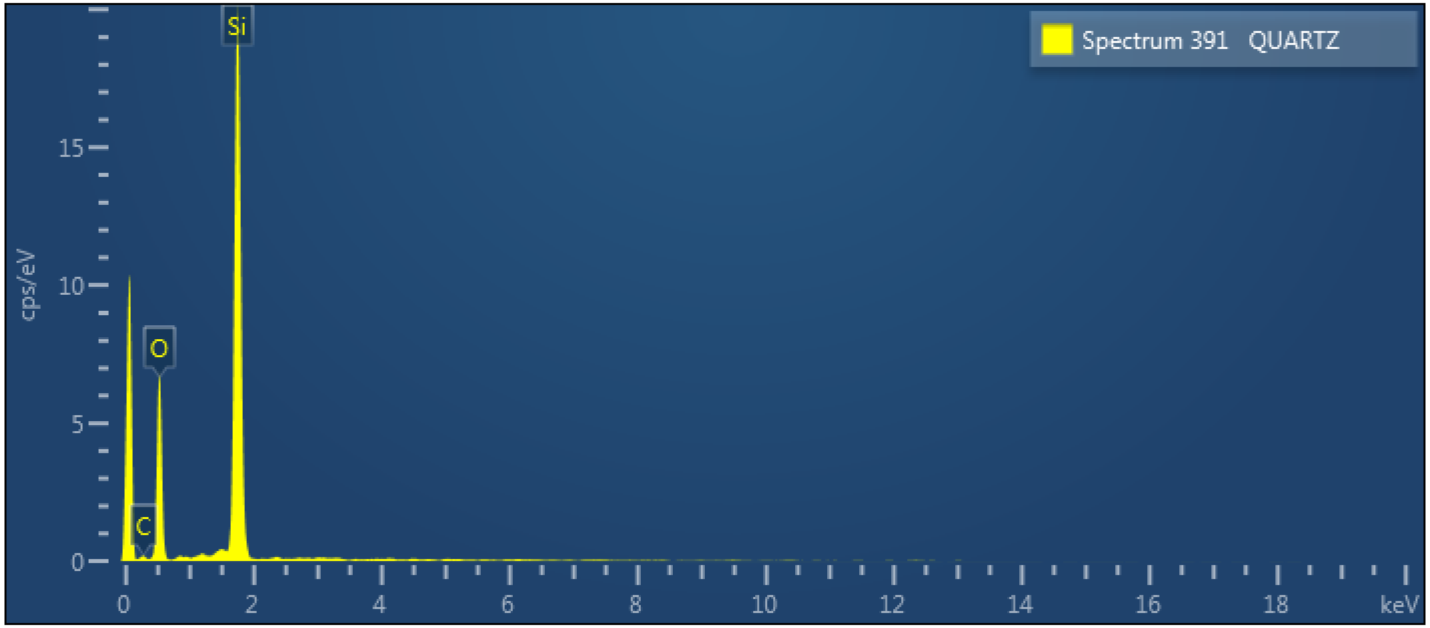
Spectrum 388 Ni-S							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
S	K series	21.07	0.29	16.86	SO3	52.61	0.73
Ni	K series	37.24	0.47	16.28	NiO	47.39	0.60
O	K series	41.69	0.42	66.86			
Total		100.00		100.00		100.00	



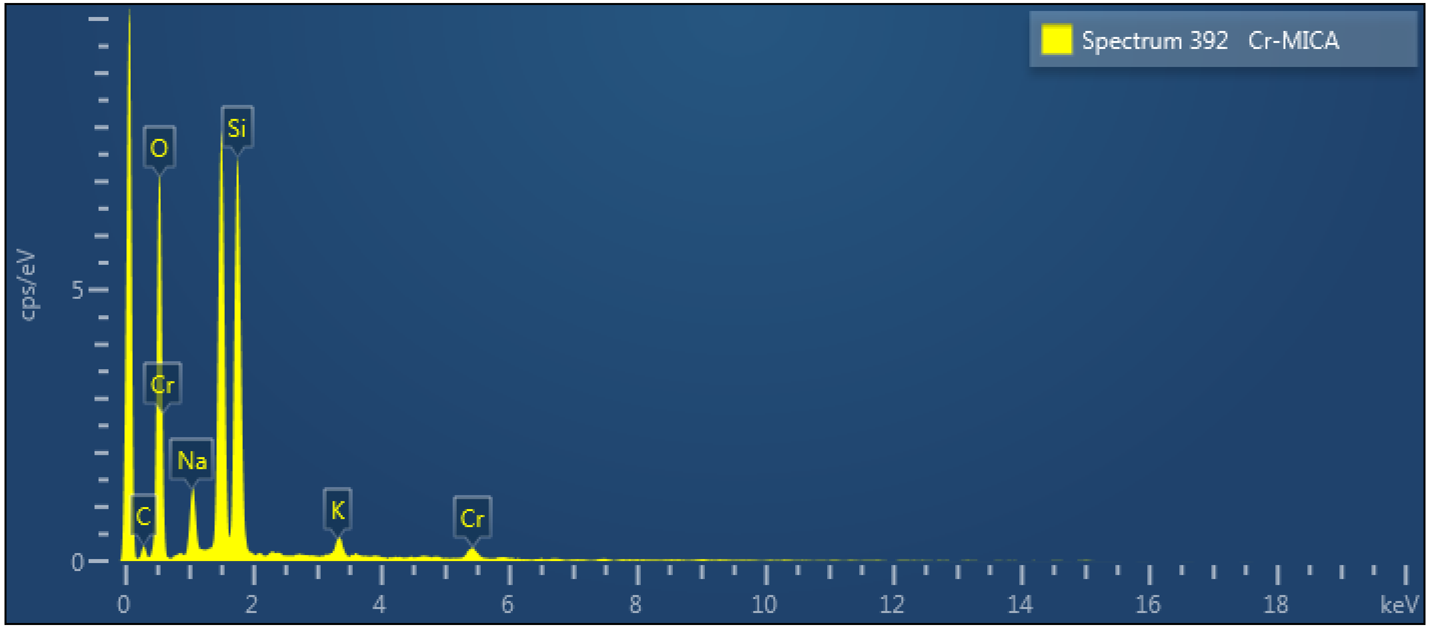
Another example of Ni-S (spectrum 397) and Ni-As-S (spectrum 398) hosted by dolomite-ankerite solid solution carbonate (spectrum 393), quartz (spectrum 391), and Cr-mica (fuchsite - spectrum 392).



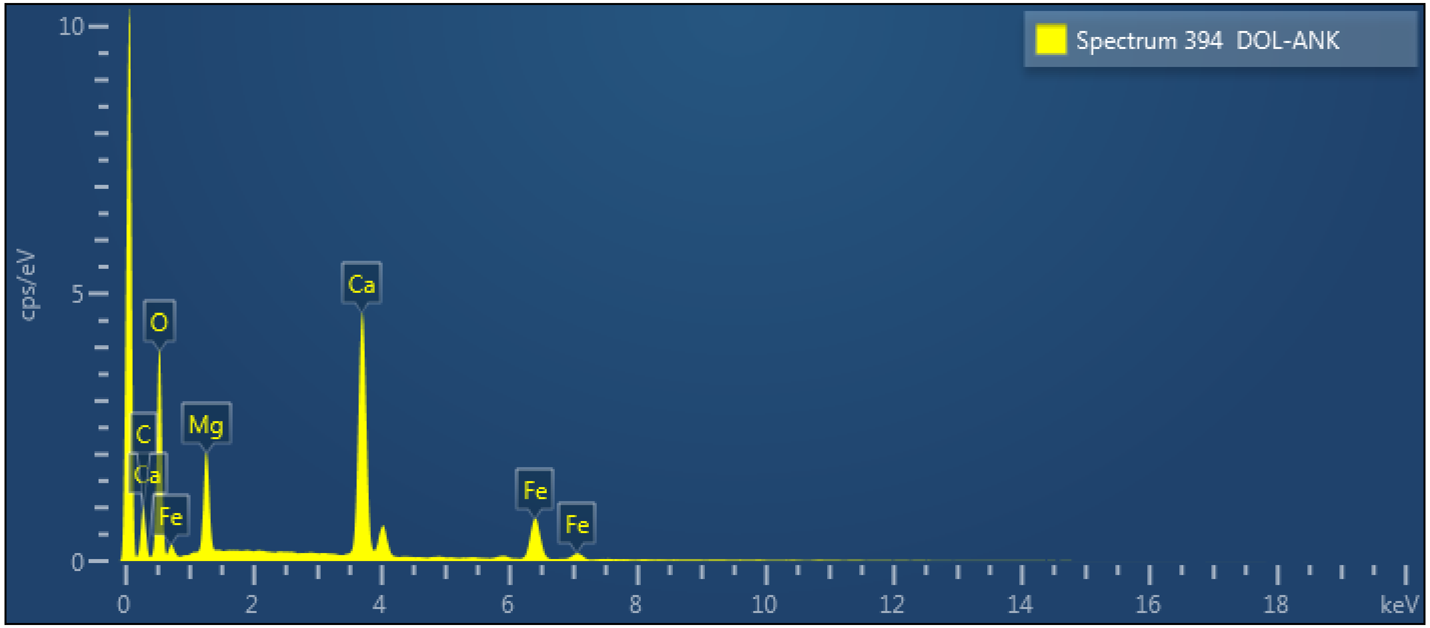
Brightness reduced to illustrate the inclusions of Ni-As-S (spectrum 398) within Ni-S (spectrum 397).



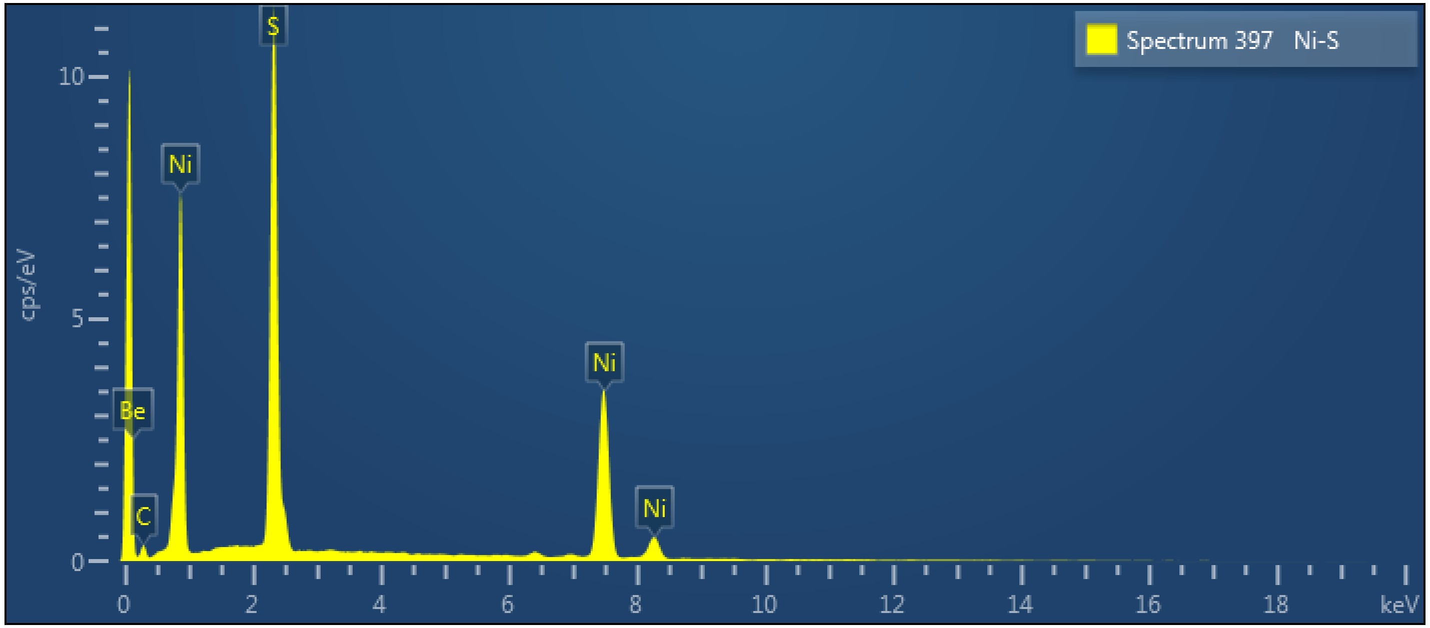
Spectrum 391 QUARTZ							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	53.26	0.79	66.67			
Si	K series	46.74	0.79	33.33	SiO2	100.00	1.69
Total		100.00		100.00		100.00	



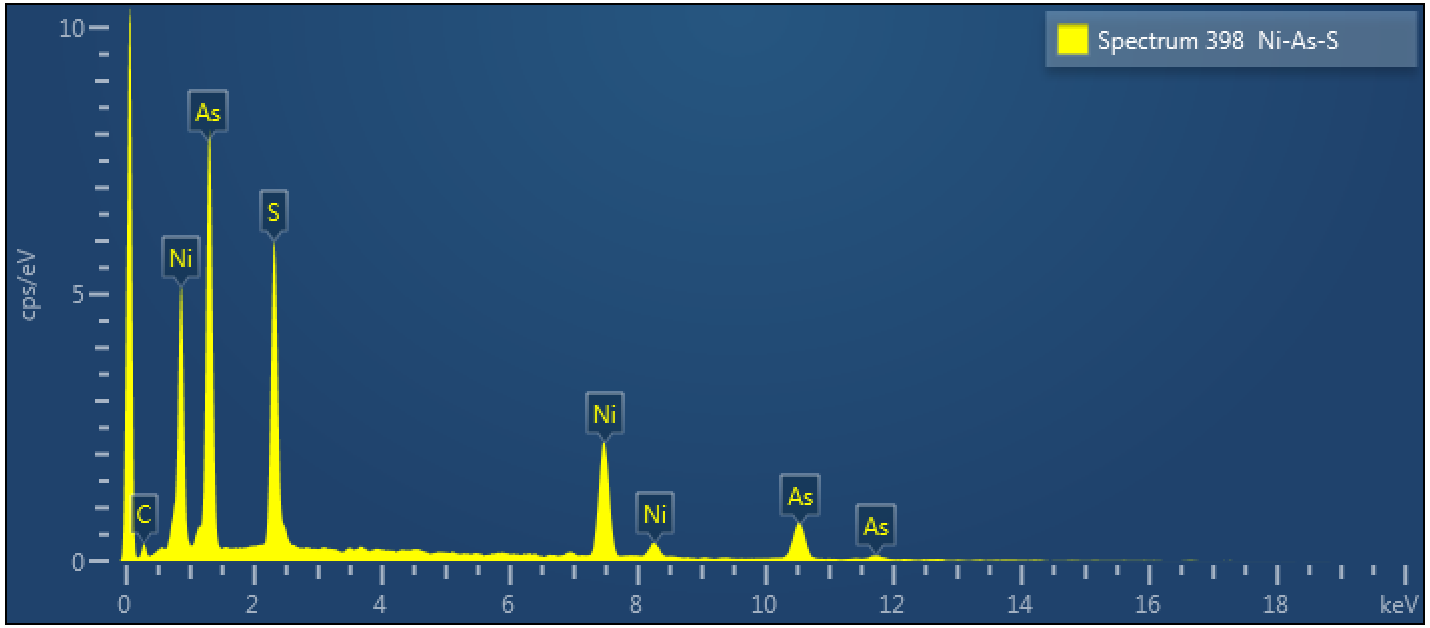
Spectrum 392 Cr-MICA							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	47.81	0.81	61.38			
Na	K series	4.71	0.44	4.21	Na2O	6.35	0.59
Al	K series	20.77	0.61	15.81	Al2O3	39.25	1.15
Si	K series	23.31	0.67	17.05	SiO2	49.87	1.43
K	K series	1.66	0.26	0.87	K2O	2.00	0.31
Cr	K series	1.74	0.38	0.69	Cr2O3	2.54	0.56
Total		100.00		100.00		100.00	



Spectrum 394 DOL-ANK							
Element	Line Type	Weight %	Weight % Sigma	Atomic %	Oxide	Oxide %	Oxide % Sigma
O	K series	29.52	0.51	50.00			
Mg	K series	13.66	0.39	15.22	MgO	22.65	0.65
Ca	K series	37.79	0.51	25.54	CaO	52.87	0.71
Fe	K series	19.03	0.56	9.23	FeO	24.48	0.72
Total		100.00		100.00		100.00	



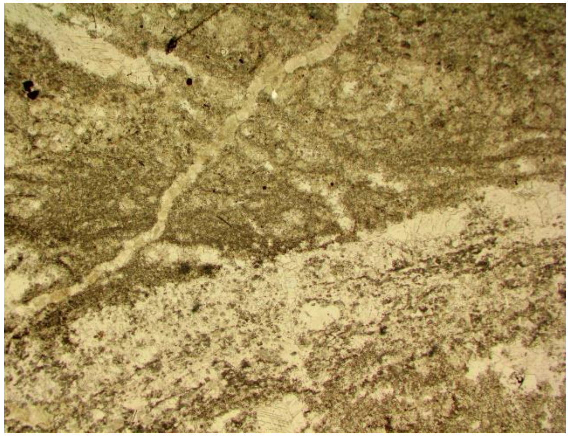
Spectrum 397 Ni-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	6.16	1.22	2.06
Ni	K series	13.49	2.67	2.46
Be	K series	80.35	3.88	95.48
Total		100.00		100.00

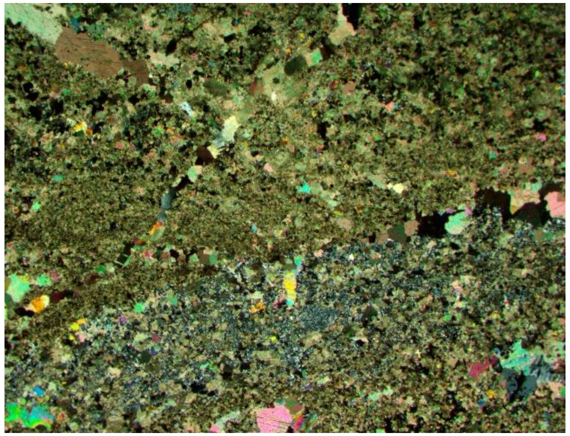


Spectrum 398 Ni-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	20.73	0.70	35.35
Ni	K series	33.72	1.05	31.41
As	L series	45.55	1.07	33.24
Total		100.00		100.00

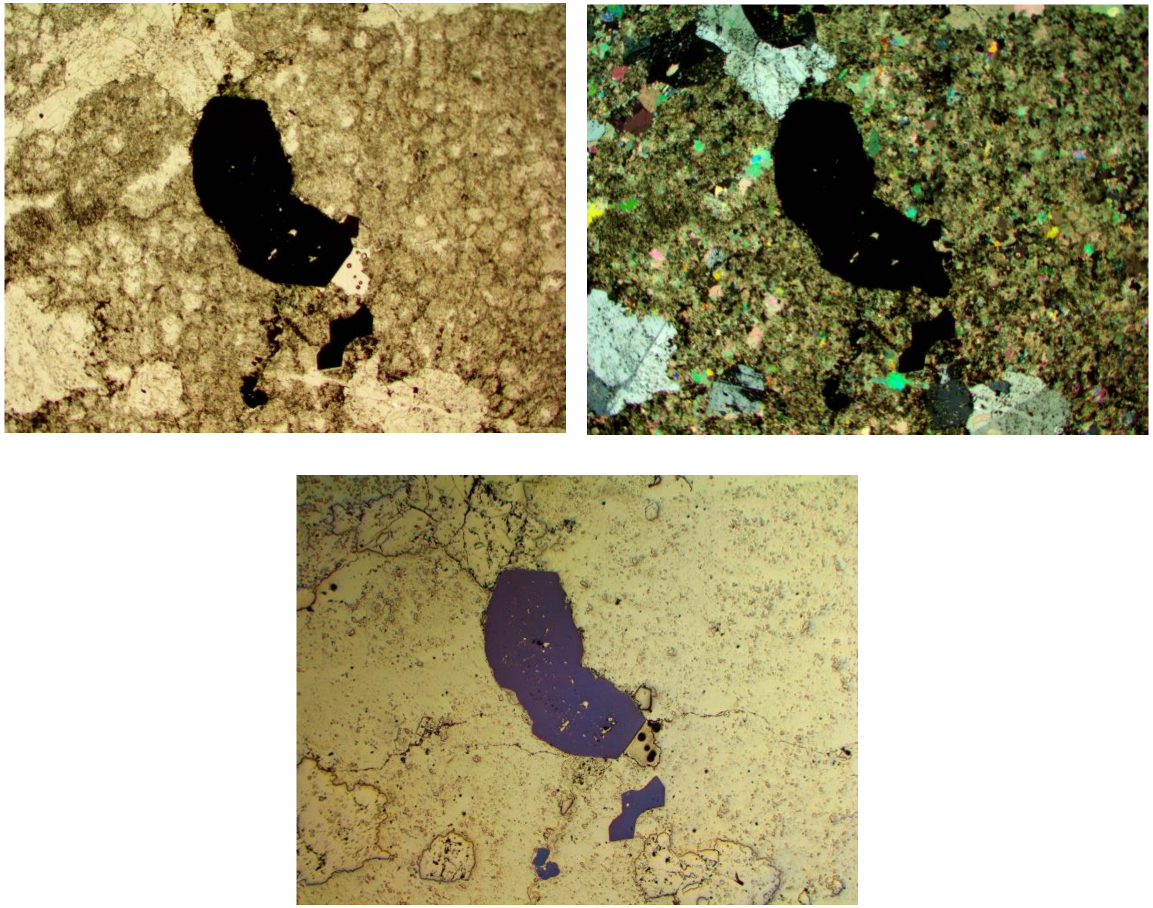
Specimen Notes for 'MID-27 (ML-46)'

This sample was collected from the big pit in the Laroma Prospect. The rock is an altered ultramafic with strong green coloured Cr-mica (fuchsite), Mn-bearing dolomite-ankerite solid solution carbonate, crosscut by anastomosing quartz-carbonate stringers. The host rock mineralogy contains 5% disseminated pyrite and numerous other Ni-bearing sulphides.
In terms of metal inventory, the rock hosts chromite, Zn-chromite, Ni-S, Ni-Co-Fe-S, Ni-Fe-Sb-as-S, and Cu-Sb-Fe-Zn-Te-S.

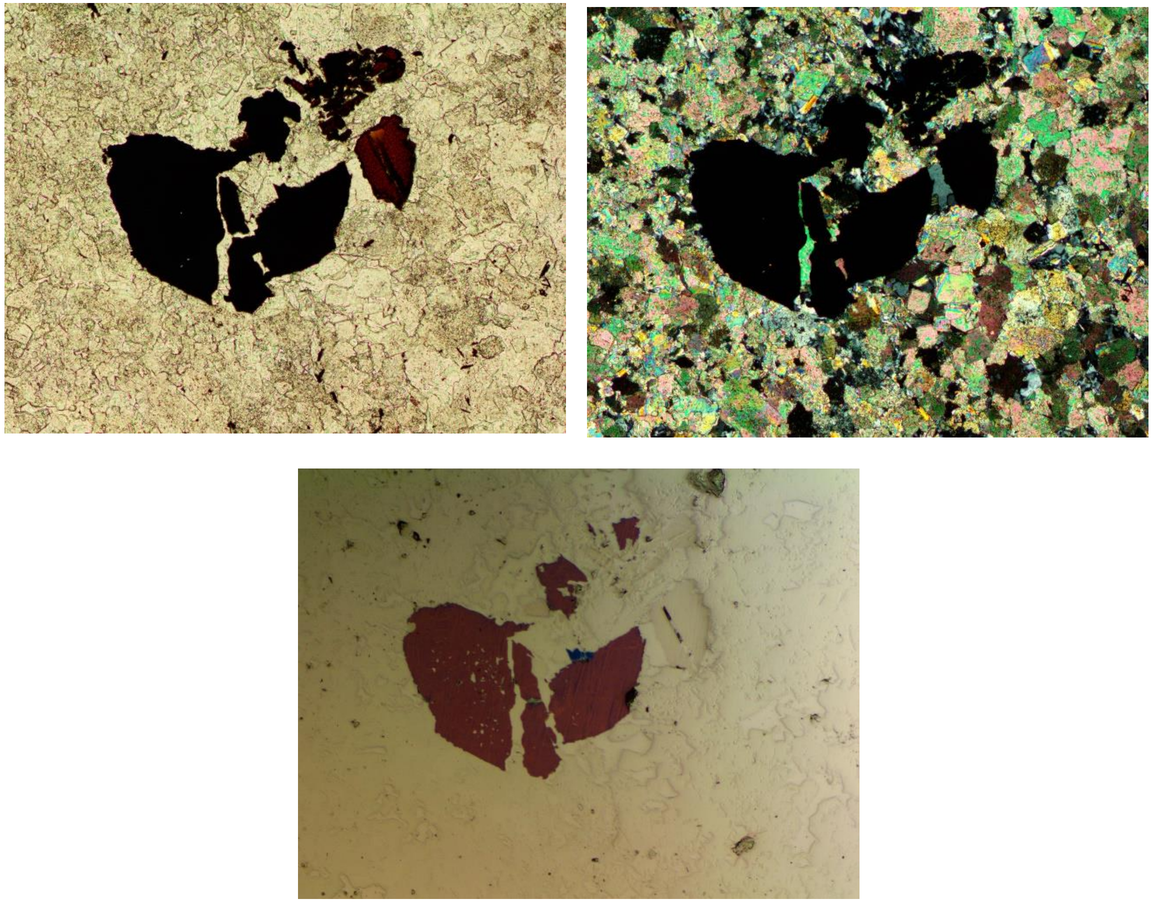




Plane light image (left) and crossed polarized light image (right) illustrating an intensely carbonate altered ultramafic crosscut by numerous generations of anastomosing quartz-carbonate veinlets. Field of view = 17mm

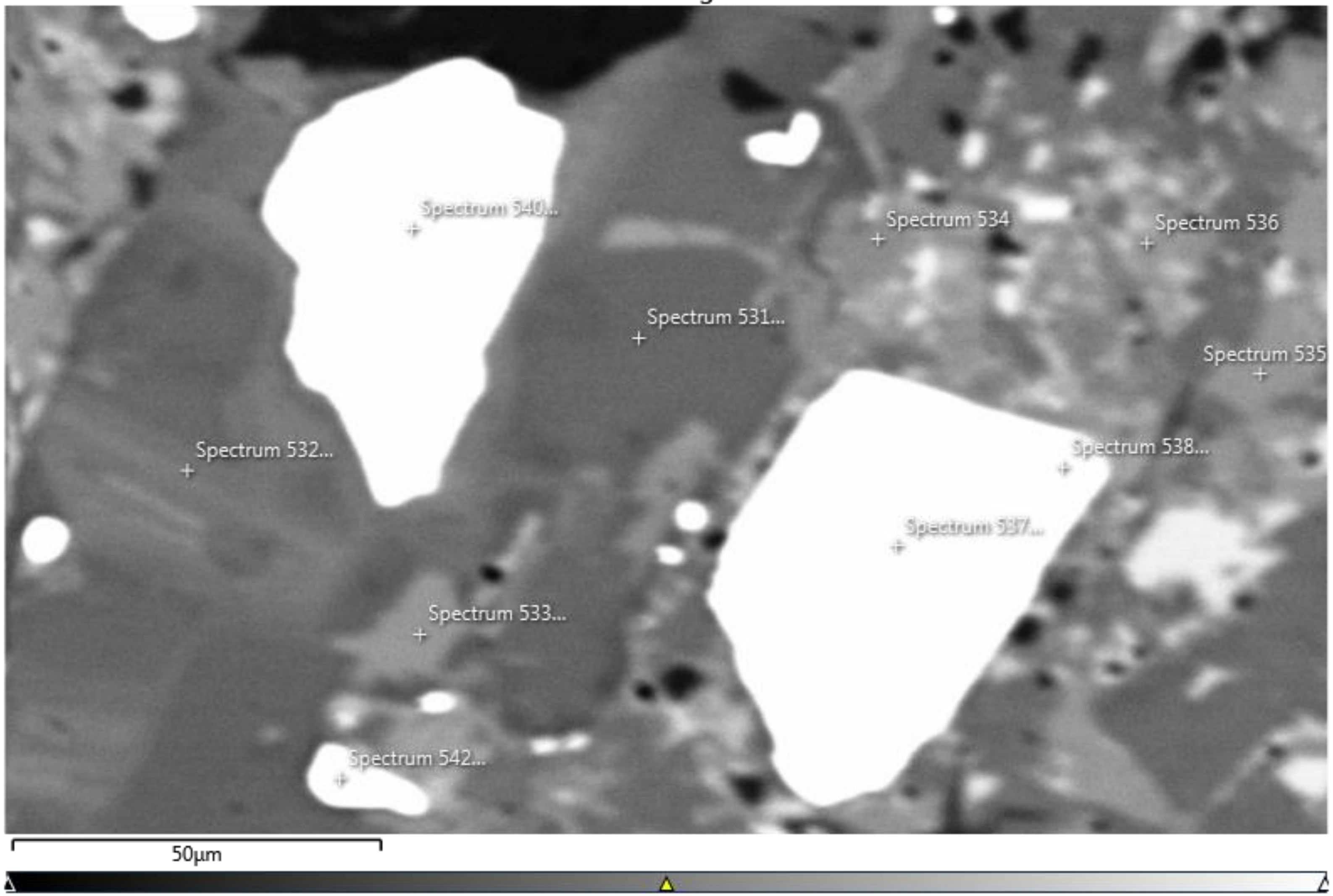


Plane light image (top left), crossed polarized light image (top right), and reflected light image (bottom) illustrating a grain of arsenian pyrite hosted within Mn-bearing dolomite-ankerite solid solution carbonate and first-order grey quartz. Field of view = 17mm

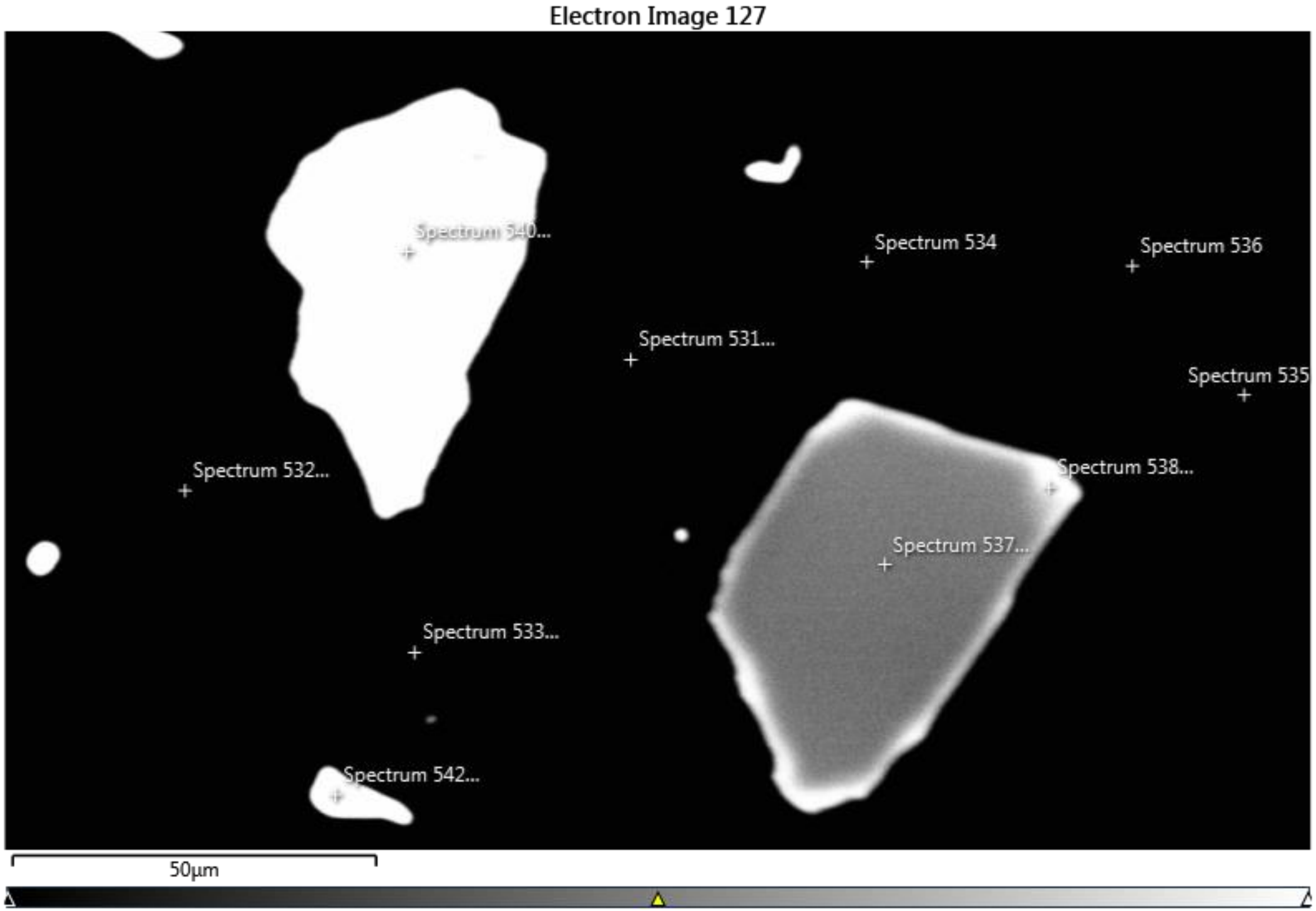


Plane light image (top left), crossed polarized light image (top right), and reflected light image (bottom) illustrating a grain of chromite (blood red – top left image) intergrown with an assemblage of Ni-Co-Sb-sulphides within birefringent Mn-bearing dolomite-ankerite solid solution carbonate and first-order grey quartz. Field of view = 2.2mm

Electron Image 126



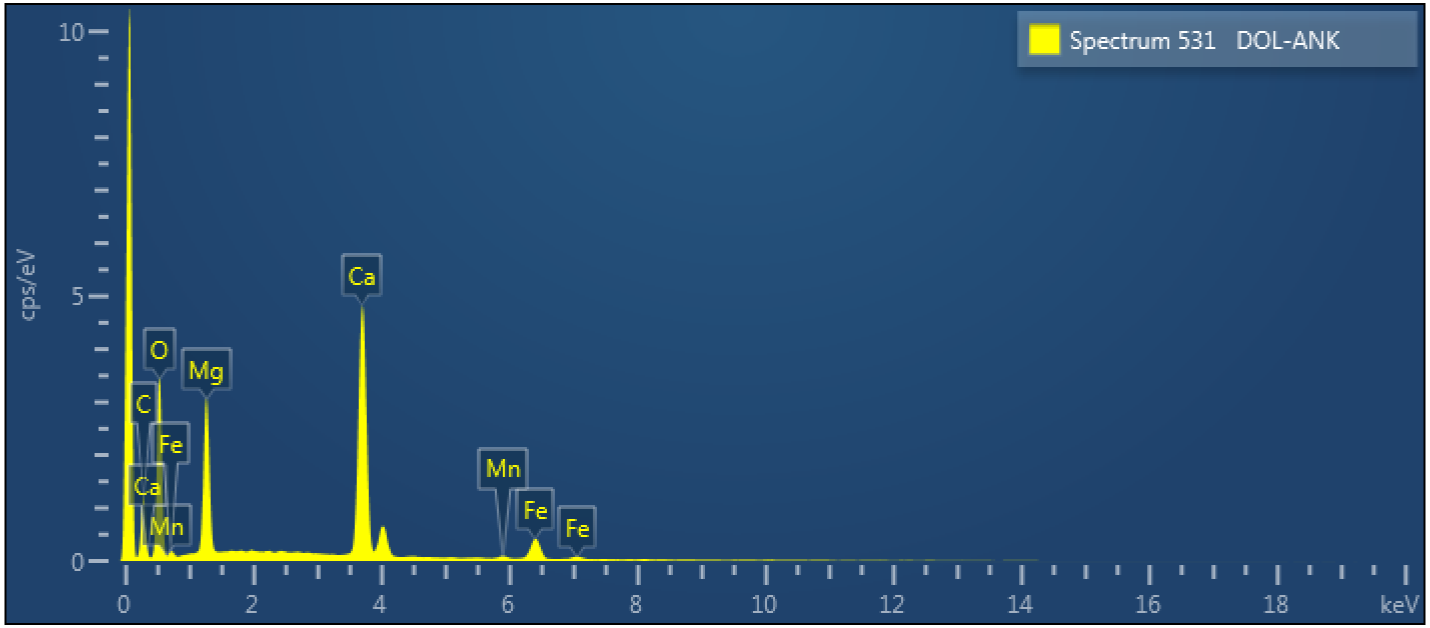
Backscatter electron image of dolomite-ankerite solid solution carbonate (spectra 531-536), quartz, and Cr-mica (fuchsite) hosting grains of compositionally zoned chromite, and grains of Ni-Co-Fe-S (spectrum 540) and Ni-Fe-Sb-S-S (spectrum 542).



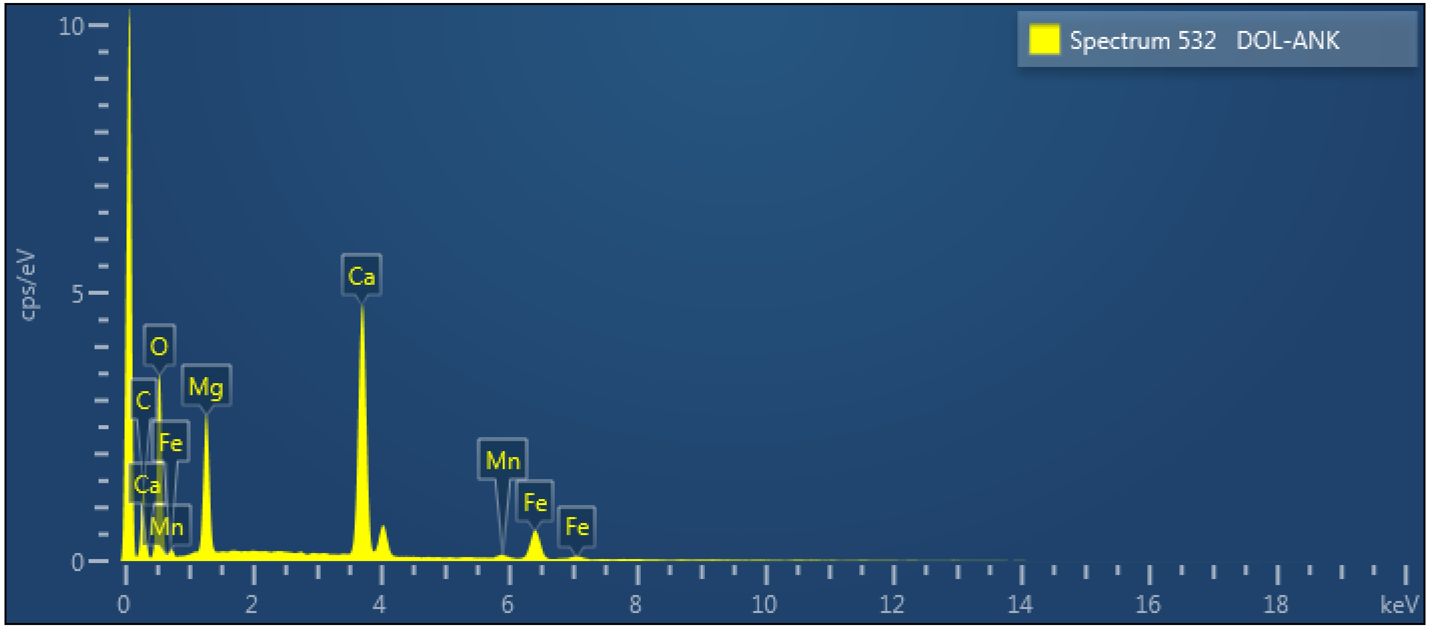
Brightness reduced to show the zoning in the chromite (spectrum 537) with a bright Zn-chromite rind (spectrum 538).

Electron Image 128

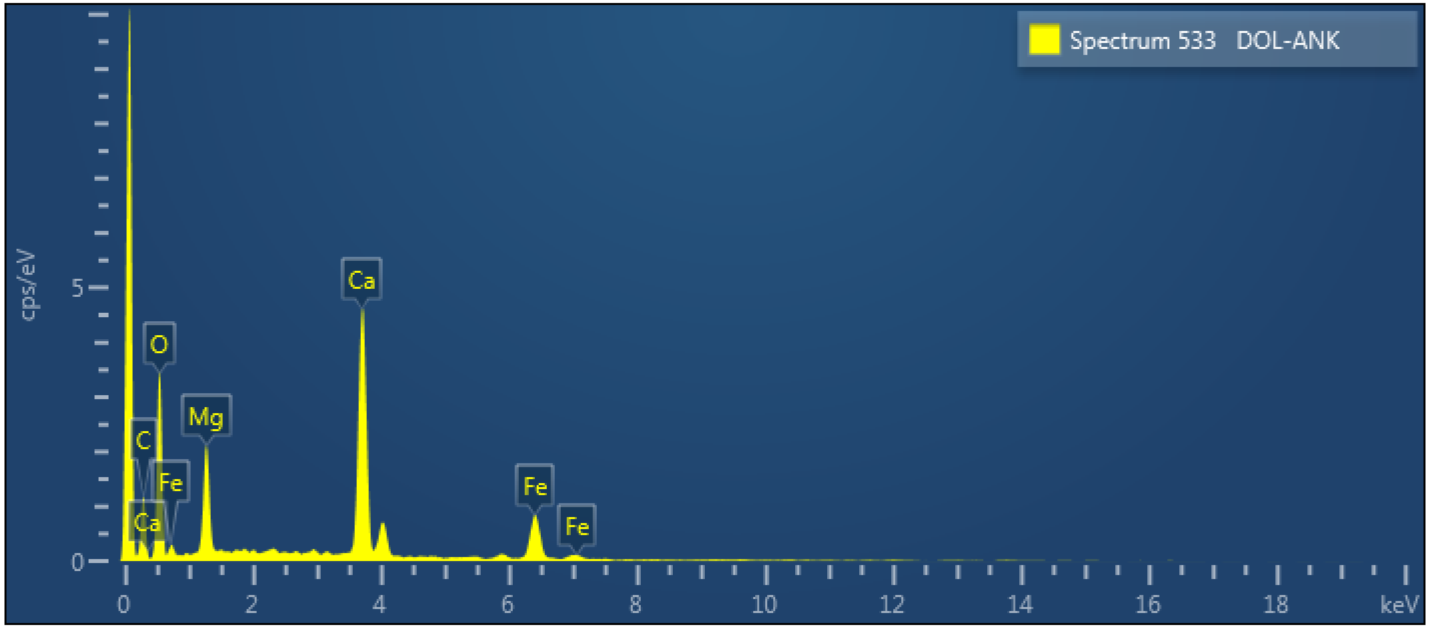
Brightness reduced further to show Ni-Co-Fe-S (spectrum 540) and Ni-Fe-Sb-S-S (spectrum 542).



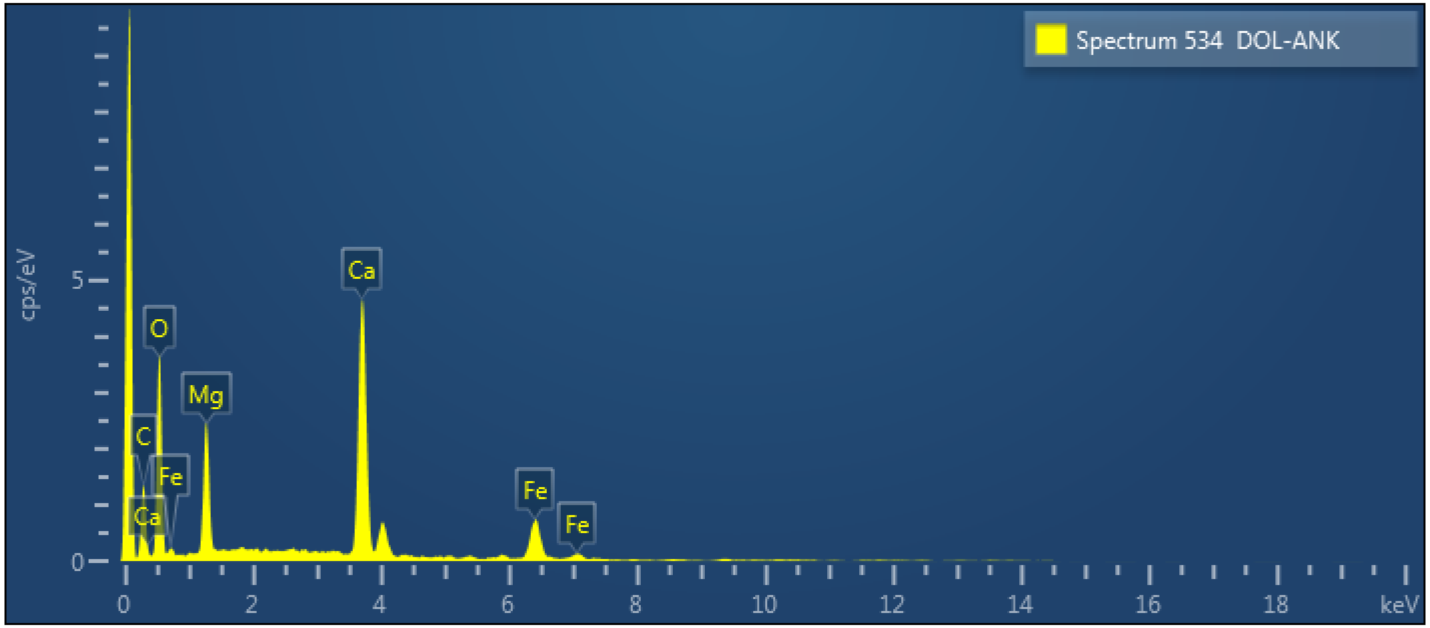
Spectrum 531 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.19	0.46	50.00			
Mg	K series	18.94	0.38	19.98	MgO	31.40	0.63
Ca	K series	39.34	0.46	25.18	CaO	55.05	0.65
Fe	K series	9.47	0.43	4.35	FeO	12.18	0.55
Mn	K series	1.07	0.25	0.50	MnO	1.38	0.32
Total		100.00		100.00		100.00	



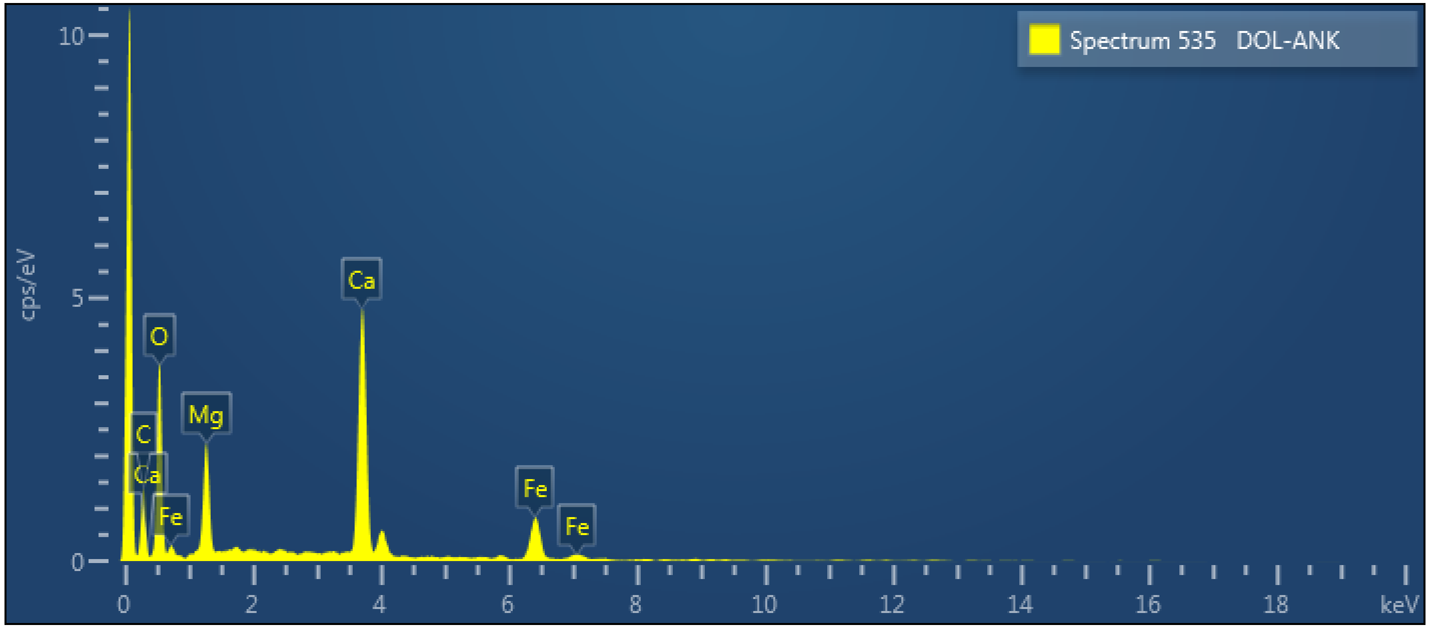
Spectrum 532 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.57	0.54	50.00			
Mg	K series	17.03	0.43	18.34	MgO	28.24	0.71
Ca	K series	38.50	0.54	25.14	CaO	53.87	0.75
Fe	K series	12.80	0.53	6.00	FeO	16.46	0.69
Mn	K series	1.10	0.31	0.52	MnO	1.42	0.40
Total		100.00		100.00		100.00	



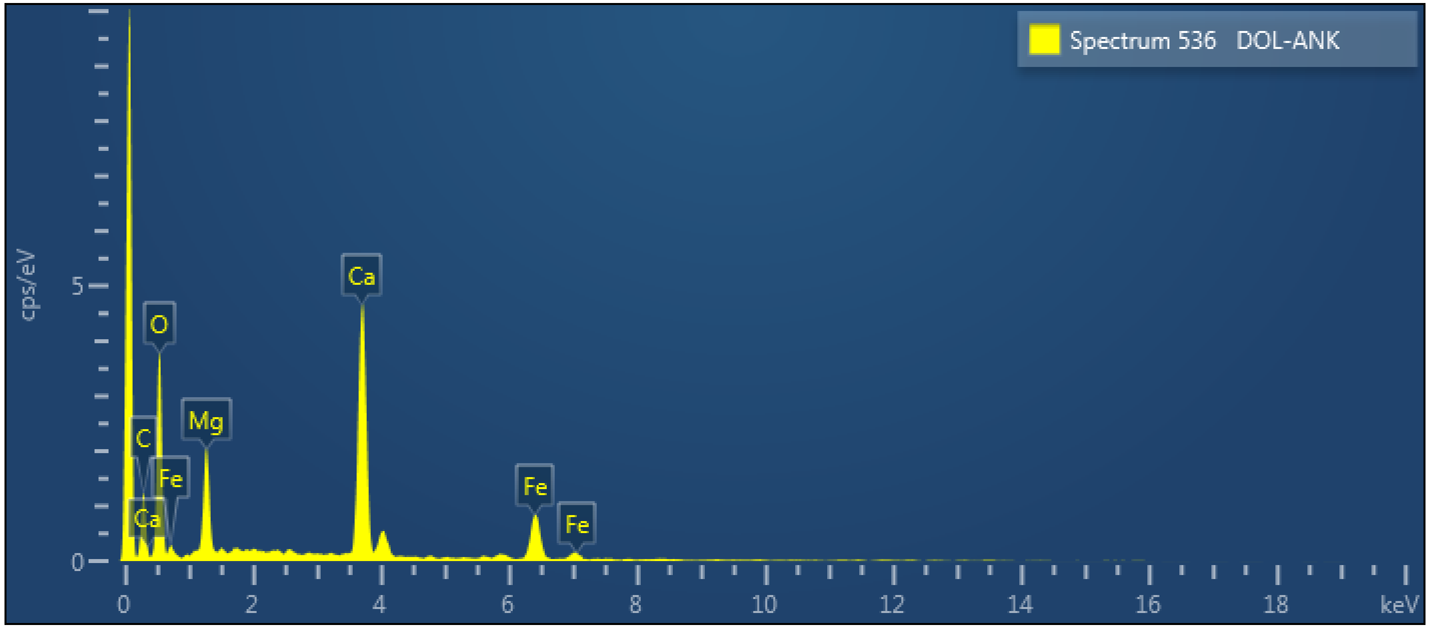
Spectrum 533 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.52	1.05	50.00			
Mg	K series	13.75	0.81	15.33	MgO	22.80	1.35
Ca	K series	37.41	1.04	25.30	CaO	52.34	1.46
Fe	K series	19.32	1.16	9.38	FeO	24.86	1.49
Total		100.00		100.00		100.00	



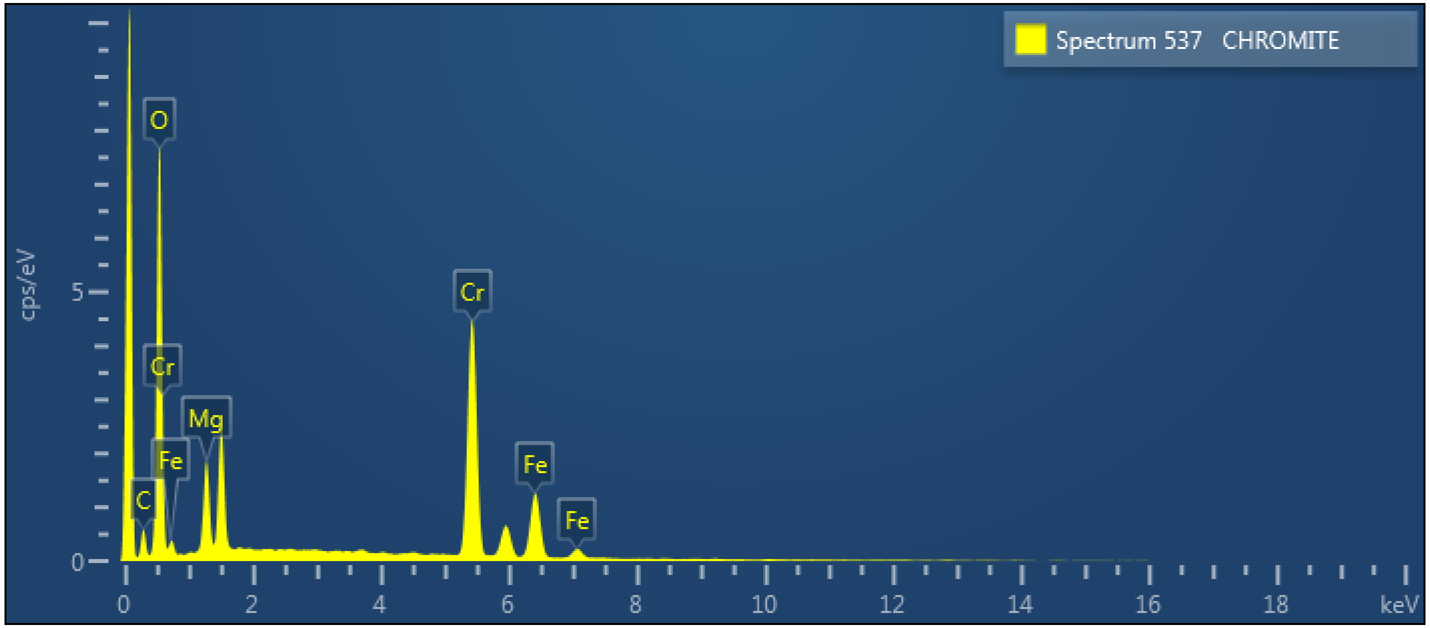
Spectrum 534 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.20	1.41	50.00			
Mg	K series	16.07	1.10	17.50	MgO	26.64	1.83
Ca	K series	37.59	1.40	24.84	CaO	52.60	1.95
Fe	K series	16.14	1.55	7.65	FeO	20.76	2.00
Total		100.00		100.00		100.00	



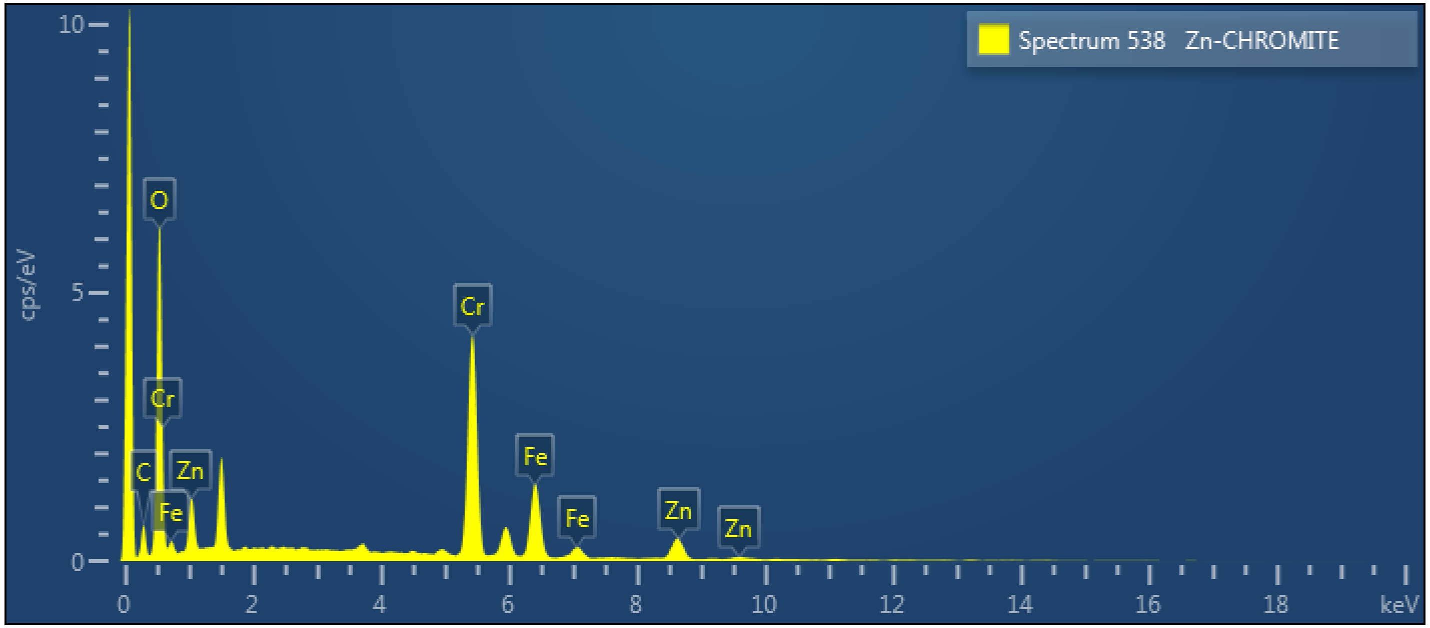
Spectrum 535 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.55	1.32	50.00			
Mg	K series	13.74	1.03	15.29	MgO	22.78	1.72
Ca	K series	37.87	1.31	25.58	CaO	52.99	1.83
Fe	K series	18.83	1.44	9.13	FeO	24.23	1.85
Total		100.00		100.00		100.00	



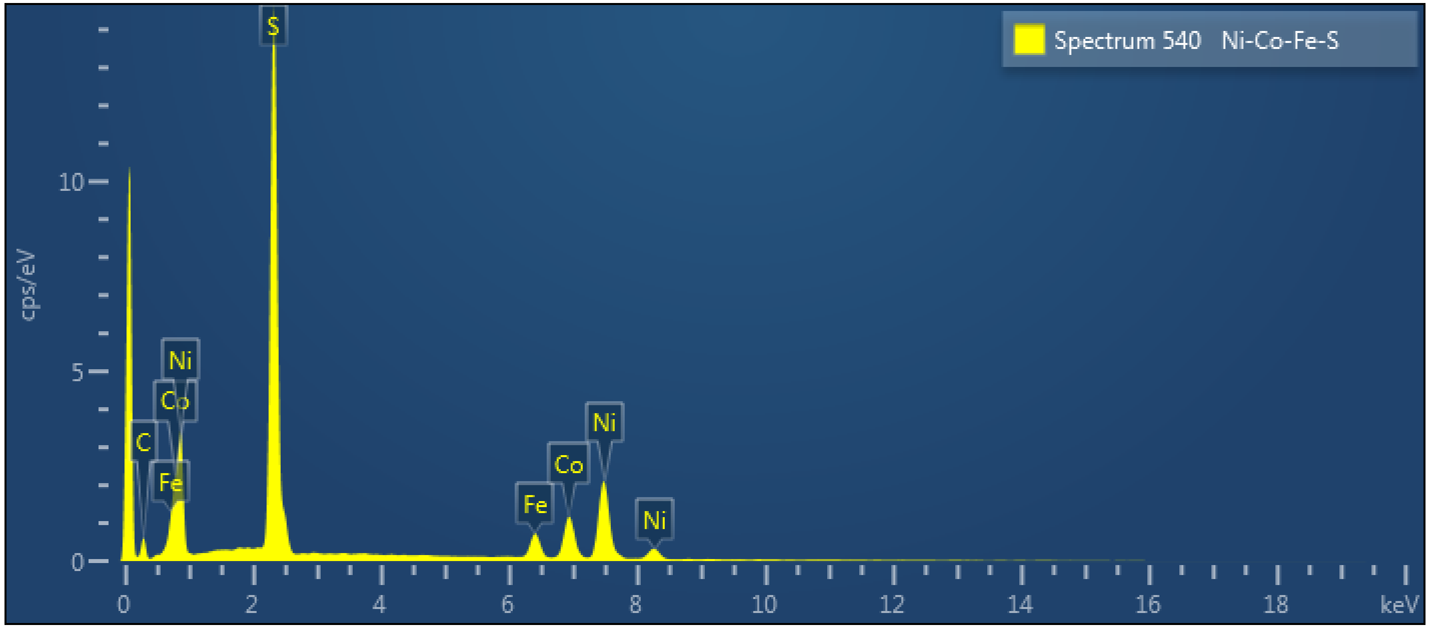
Spectrum 536 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.40	1.20	50.00			
Mg	K series	13.57	0.92	15.18	MgO	22.49	1.53
Ca	K series	36.63	1.18	24.87	CaO	51.26	1.65
Fe	K series	20.40	1.30	9.94	FeO	26.25	1.68
Total		100.00		100.00		100.00	



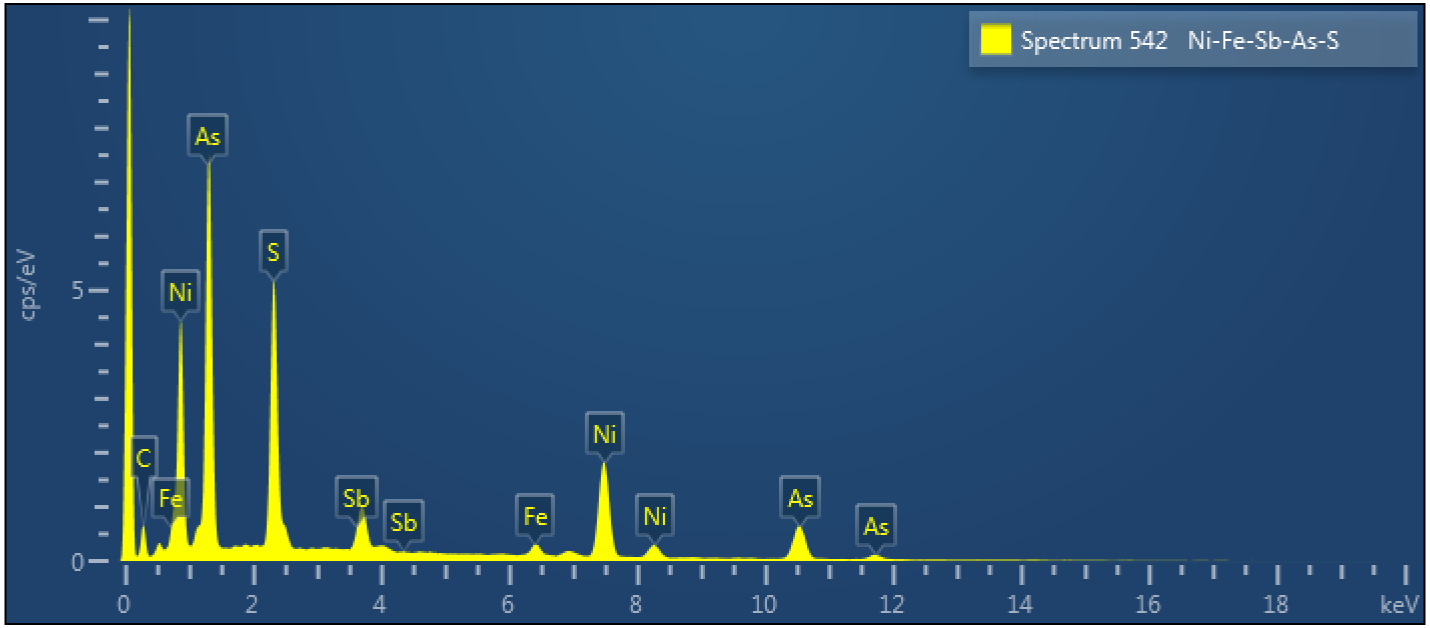
Spectrum 537 CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	33.08	0.48	56.96			
Mg	K series	6.82	0.28	7.72	MgO	11.30	0.46
Al	K series	8.23	0.26	8.40	Al2O3	15.55	0.49
Cr	K series	36.67	0.49	19.42	Cr2O3	53.59	0.71
Fe	K series	15.20	0.44	7.50	FeO	19.56	0.56
Total		100.00		100.00		100.00	



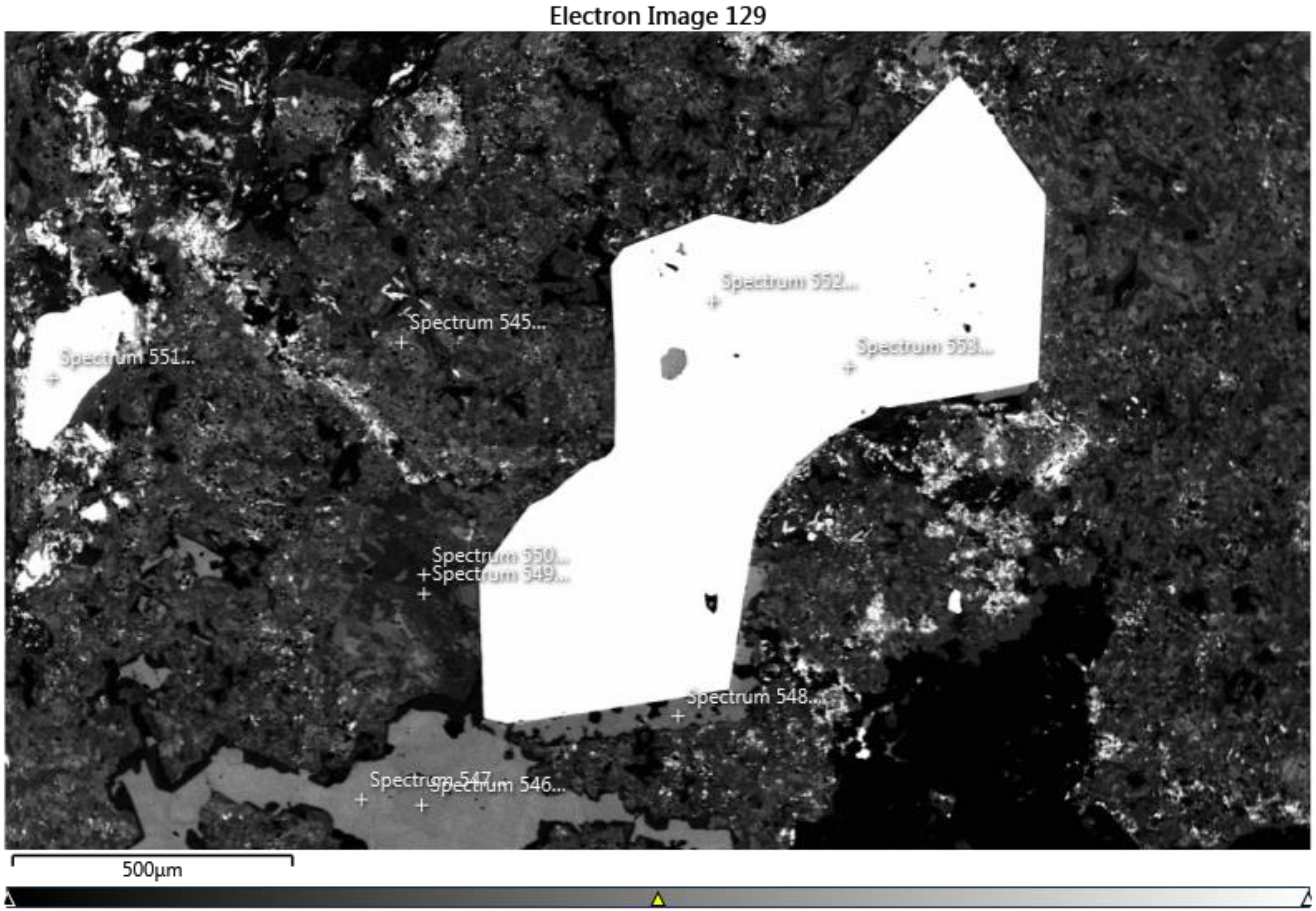
Spectrum 538 Zn-CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.87	0.84	57.09			
Al	K series	6.72	0.39	7.62	Al2O3	12.70	0.73
Cr	K series	35.24	0.82	20.73	Cr2O3	51.50	1.20
Fe	K series	17.49	0.73	9.57	FeO	22.49	0.93
Zn	K series	10.69	0.95	5.00	ZnO	13.30	1.18
Total		100.00		100.00		100.00	



Spectrum 540 Ni-Co-Fe-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	43.29	0.44	58.18
Fe	K series	6.73	0.28	5.19
Co	K series	15.60	0.41	11.41
Ni	K series	34.37	0.50	25.23
Total		100.00		100.00

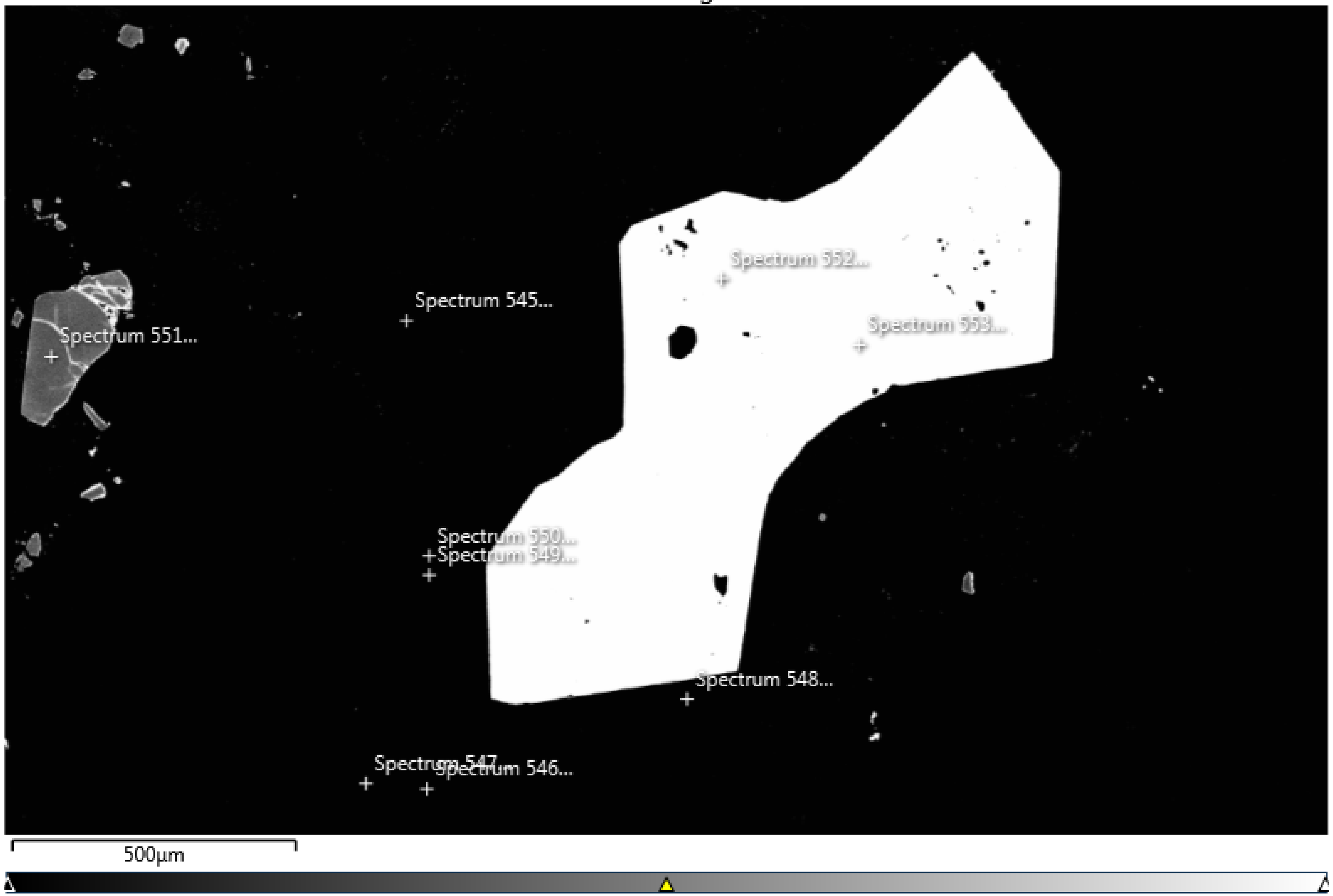


Spectrum 542 Ni-Fe-Sb-As-S				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	20.29	0.42	34.75
Ni	K series	30.91	0.64	28.91
As	L series	46.51	0.66	34.09
Fe	K series	2.29	0.27	2.25
Sb	L series	0.00	0.51	0.00
Total		100.00		100.00

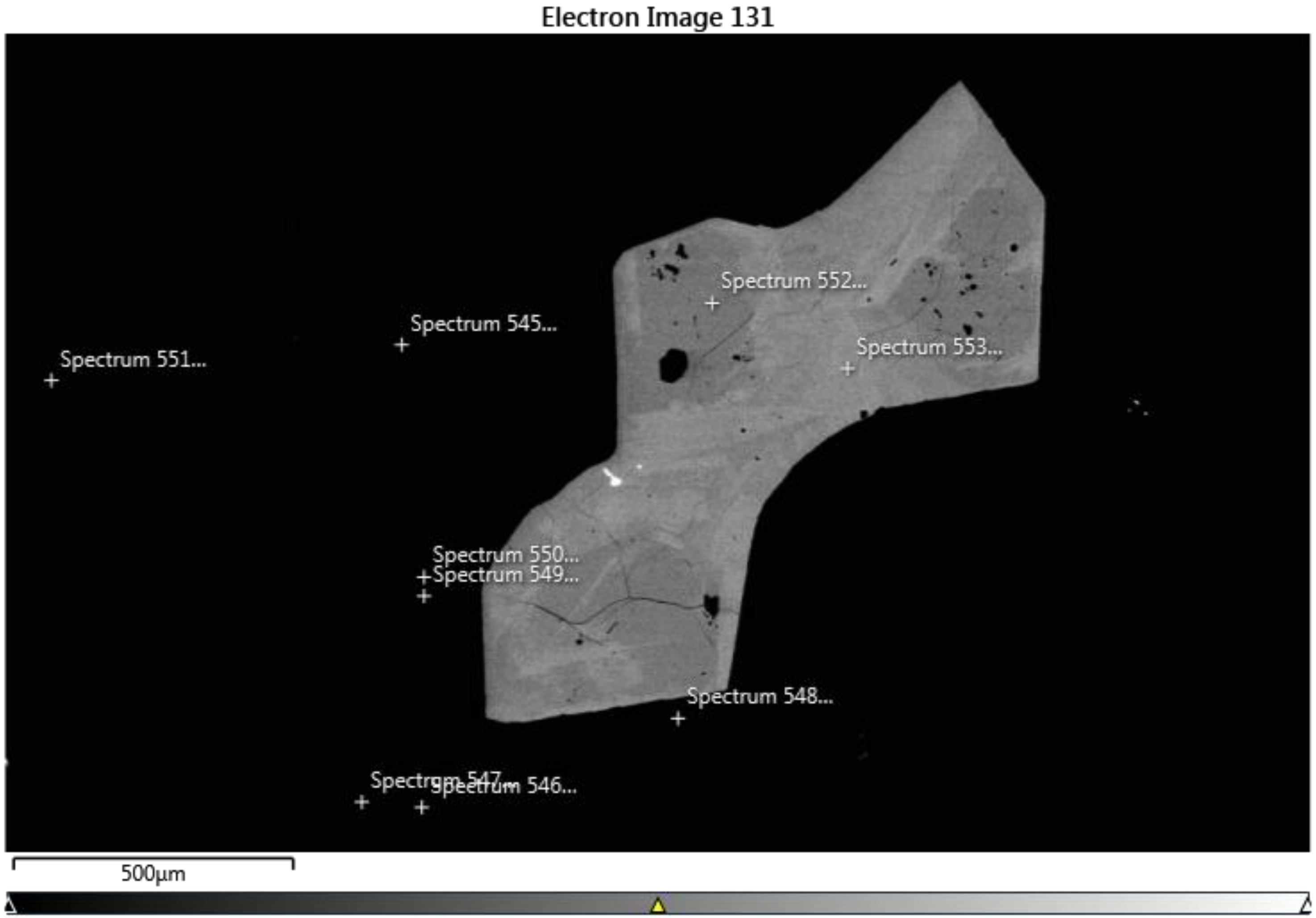


Backscatter image of dolomite ankerite solid solution carbonate (spectra 545,550), Mn-bearing dolomite-ankerite solid solution (spectrum 549), calcite (spectra 546,548), and Fe-calcite (spectrum 547) hosting grains of chromite (spectrum 551), pyrite (spectrum 552), and arsenian pyrite (spectrum 553).

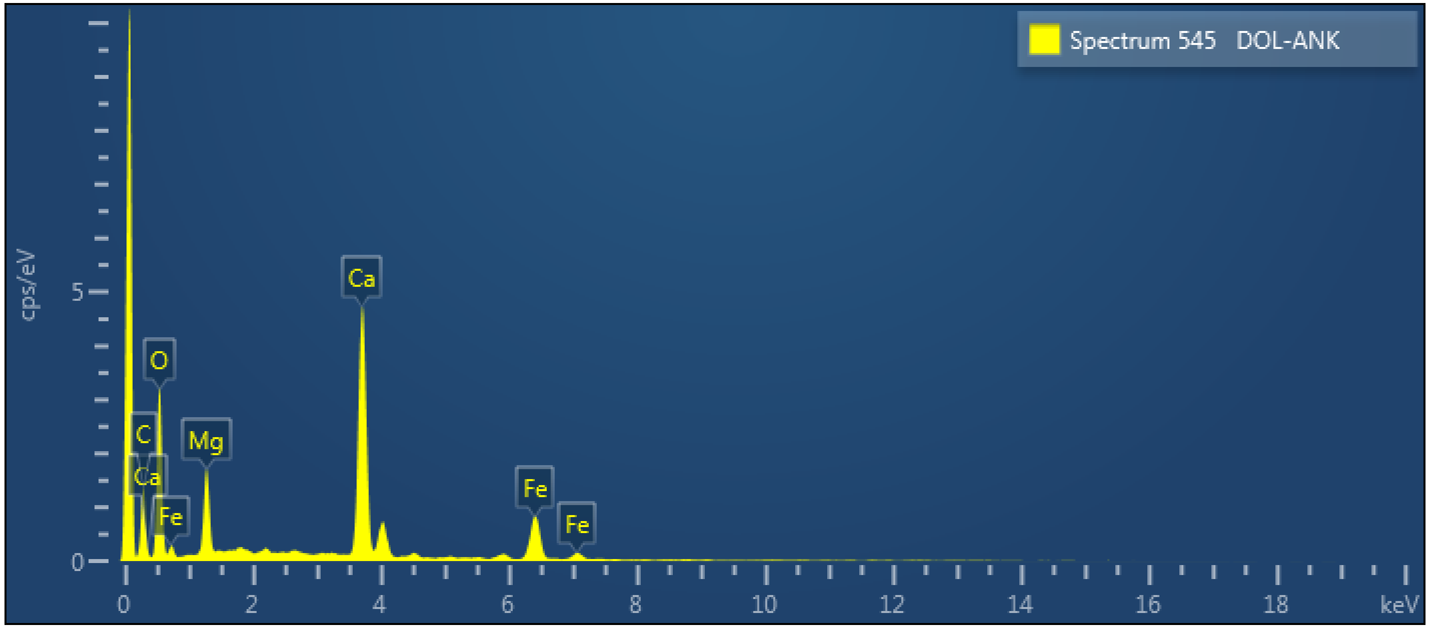
Electron Image 130



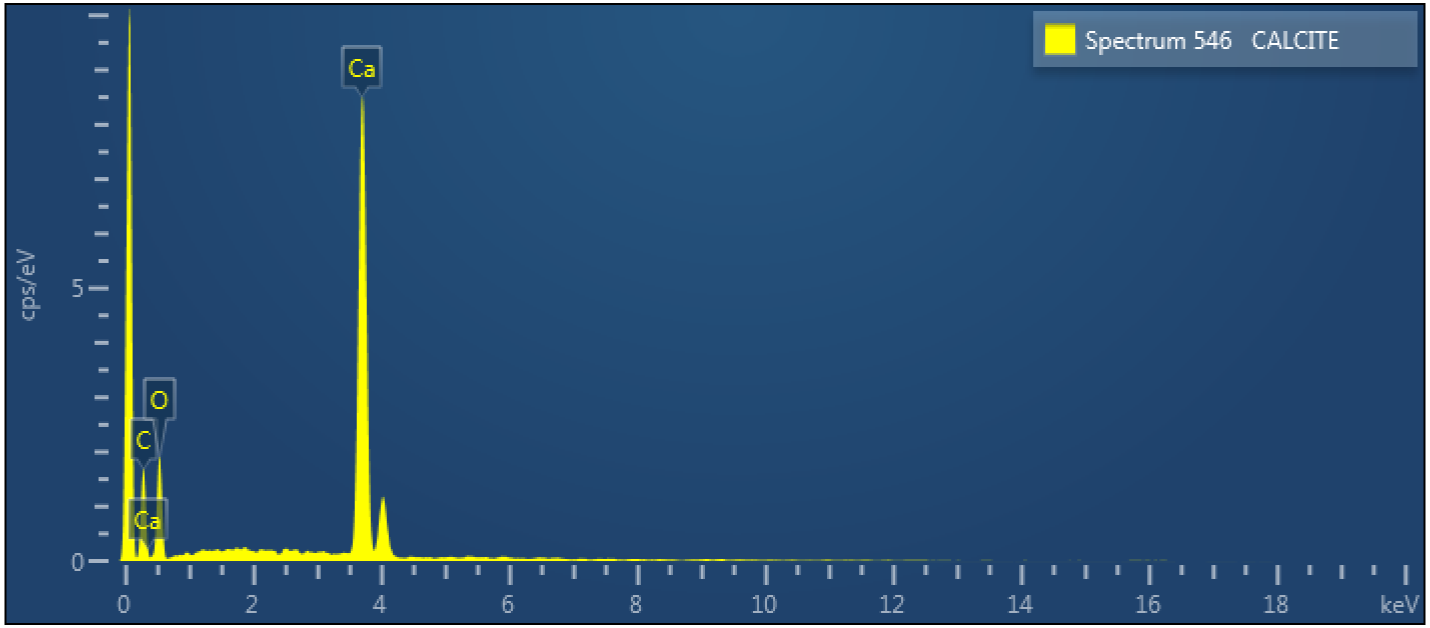
Brightness reduced to illustrate the zoning in the chromite (spectrum 551). Note the bright zones in the chromite grain reflecting the increased Zn-content in the bright areas.



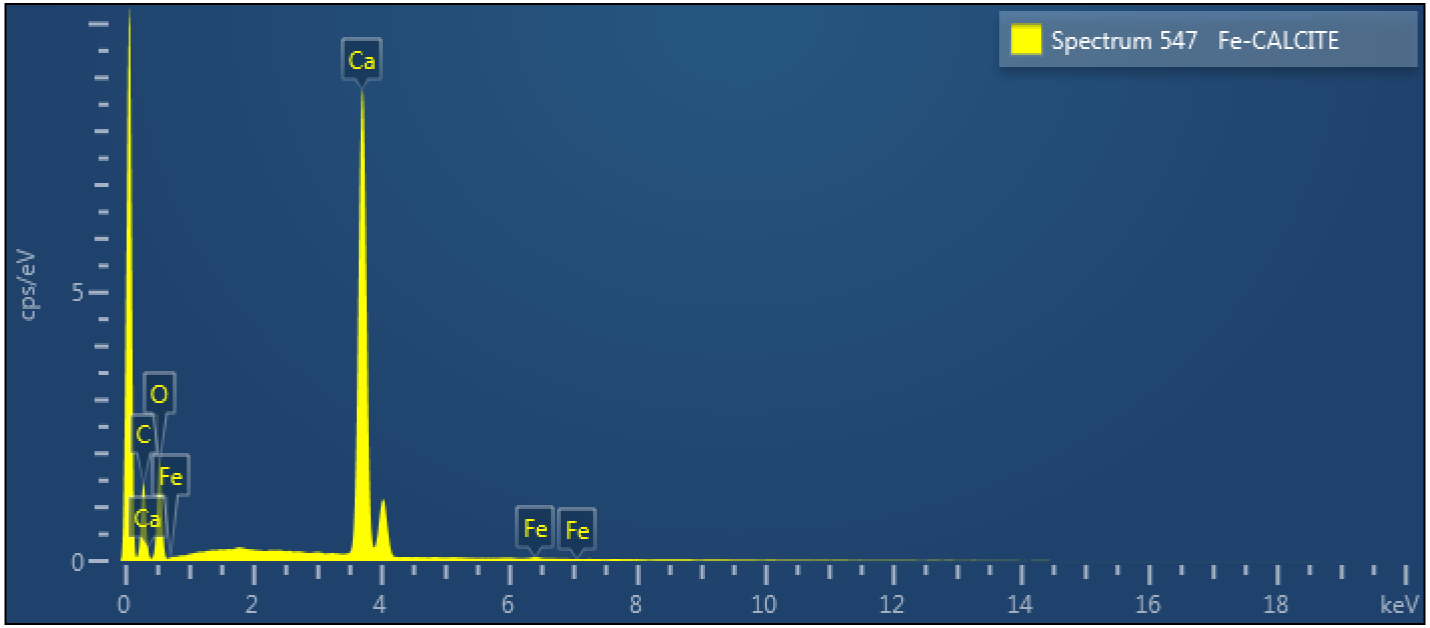
Brightness reduced to illustrate the complicated arsenian pyrite zoning with brighter areas reflecting more As-content in the pyrite.



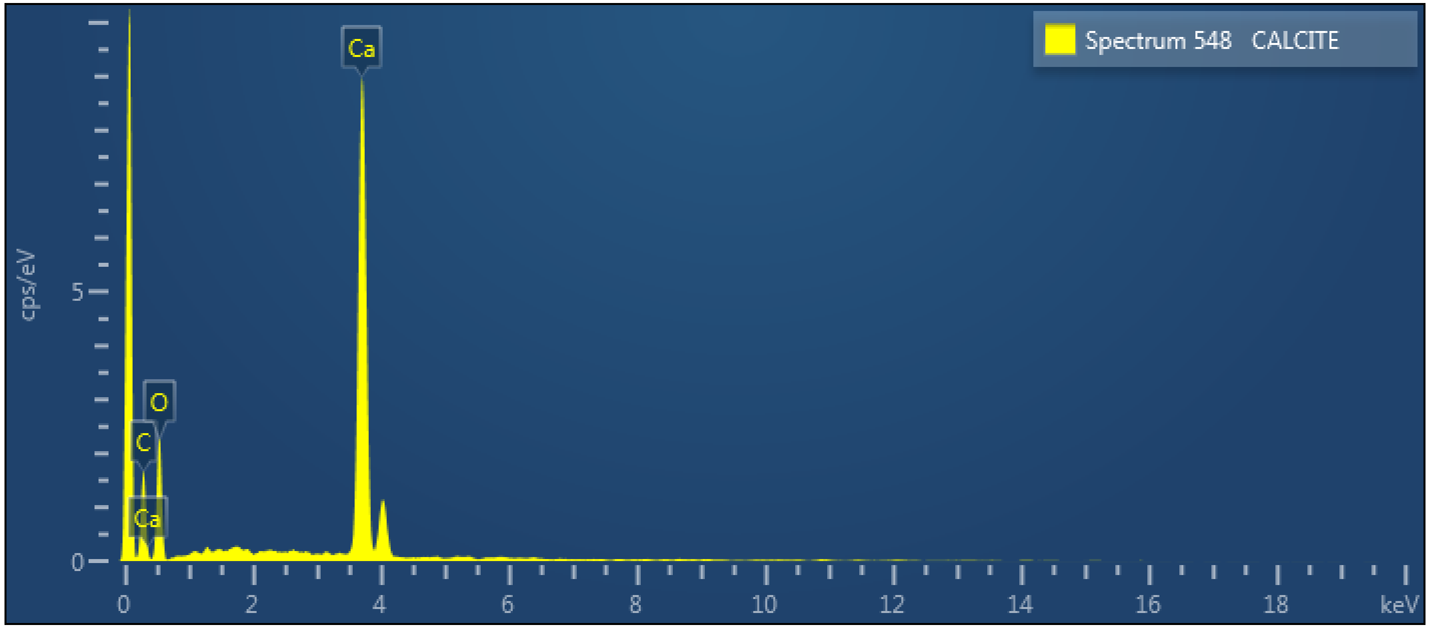
Spectrum 545 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	29.08	0.89	50.00			
Mg	K series	11.83	0.65	13.38	MgO	19.62	1.07
Ca	K series	38.79	0.90	26.62	CaO	54.28	1.26
Fe	K series	20.29	0.99	9.99	FeO	26.10	1.28
Total		100.00		100.00		100.00	



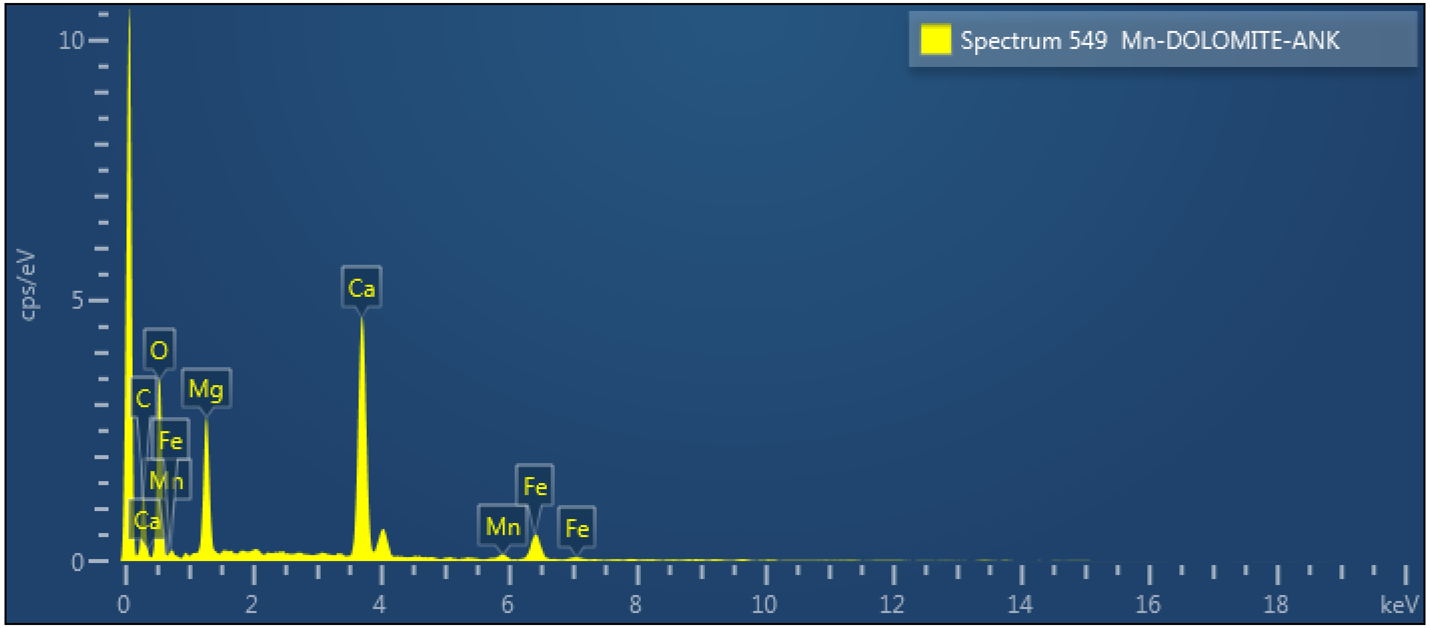
Spectrum 546 CALCITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	28.53	0.85	50.00			
Ca	K series	71.47	0.85	50.00	CaO	100.00	1.20
Total		100.00		100.00		100.00	



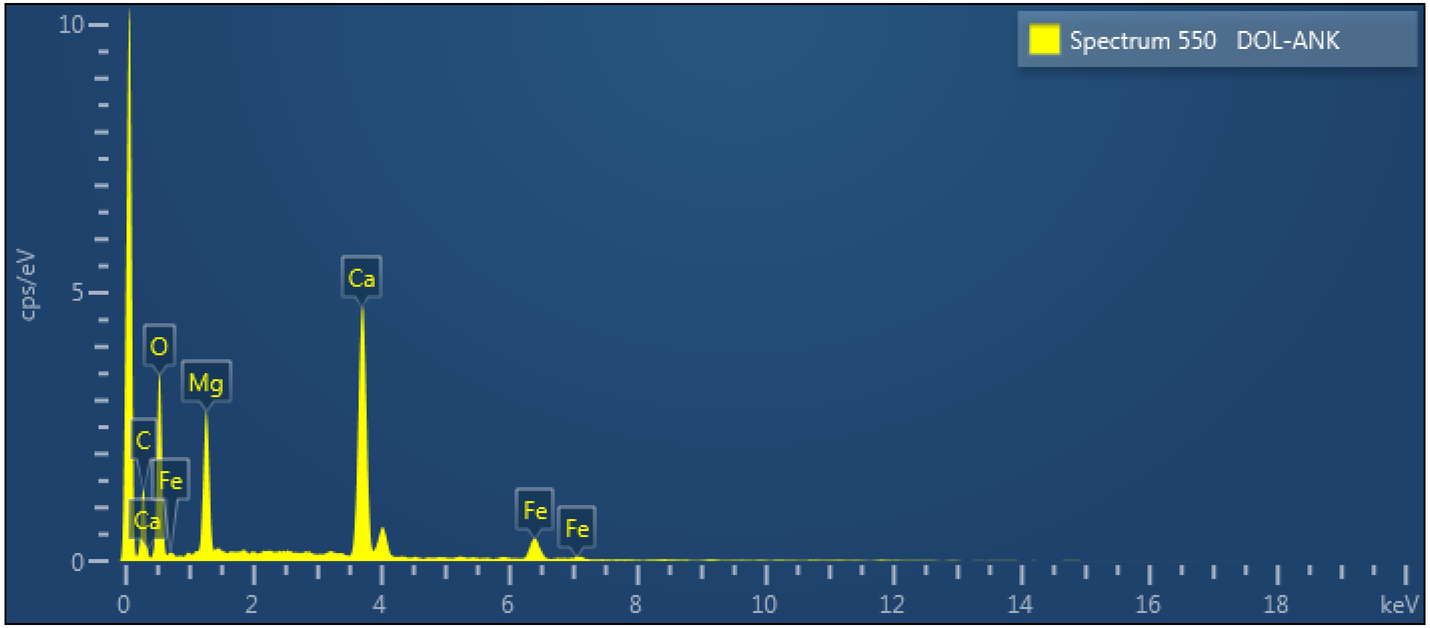
Spectrum 547 Fe-CALCITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	28.47	0.31	50.00			
Ca	K series	70.82	0.34	49.64	CaO	99.08	0.48
Fe	K series	0.71	0.21	0.36	FeO	0.92	0.28
Total		100.00		100.00		100.00	



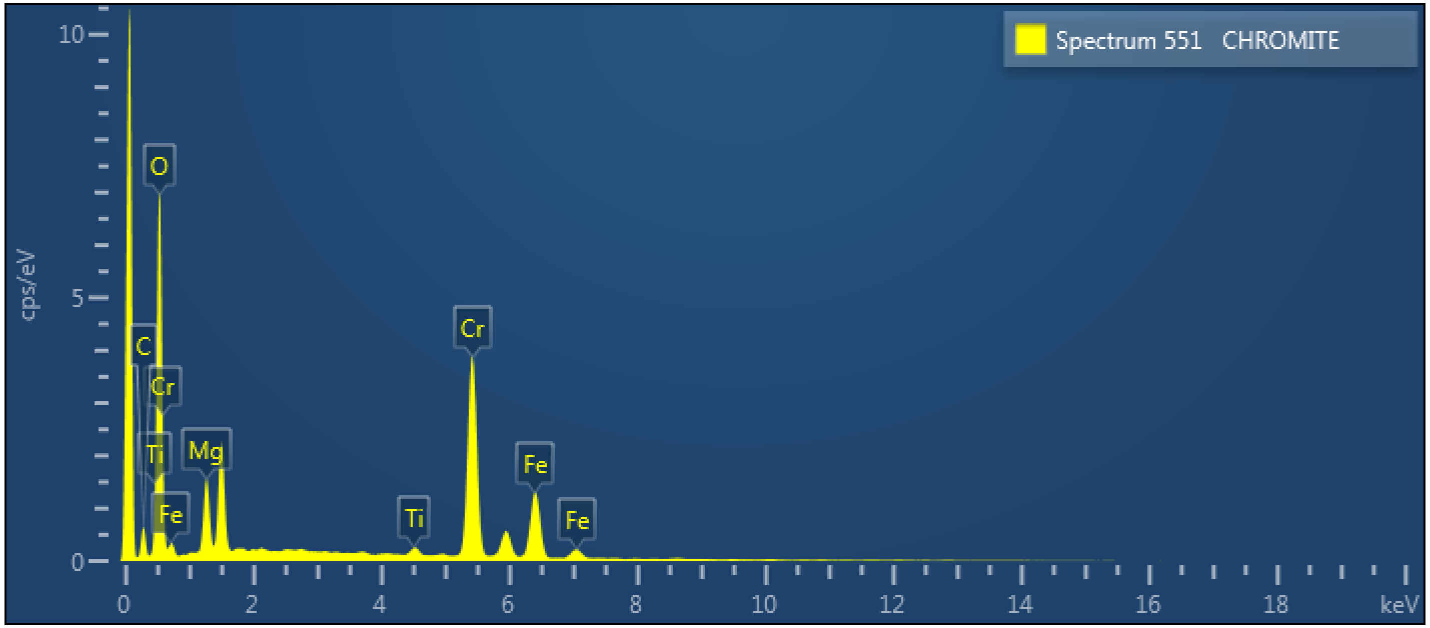
Spectrum 548 CALCITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	28.53	0.89	50.00			
Ca	K series	71.47	0.89	50.00	CaO	100.00	1.25
Total		100.00		100.00		100.00	



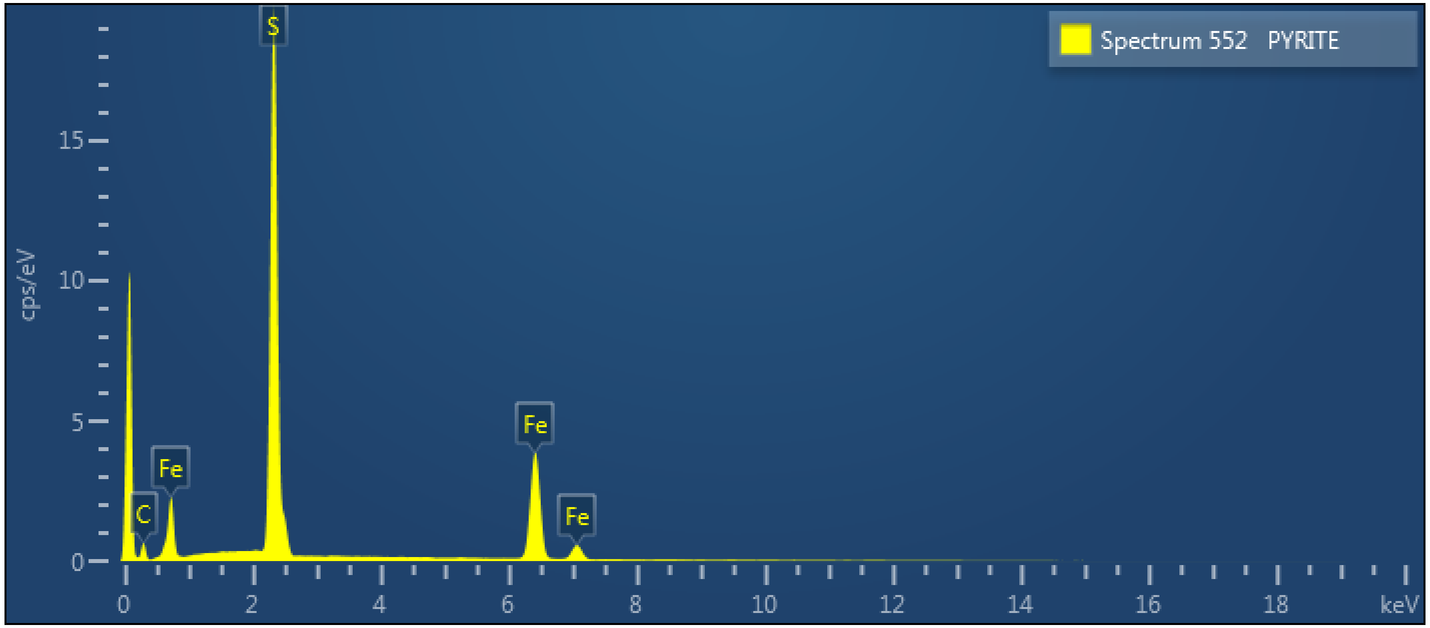
Spectrum 549 Mn-DOLOMITE-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	30.64	1.10	50.00			
Mg	K series	17.44	0.89	18.73	MgO	28.92	1.48
Ca	K series	38.01	1.09	24.76	CaO	53.18	1.53
Fe	K series	11.85	1.06	5.54	FeO	15.25	1.36
Mn	K series	2.06	0.60	0.98	MnO	2.66	0.77
Total		100.00		100.00		100.00	



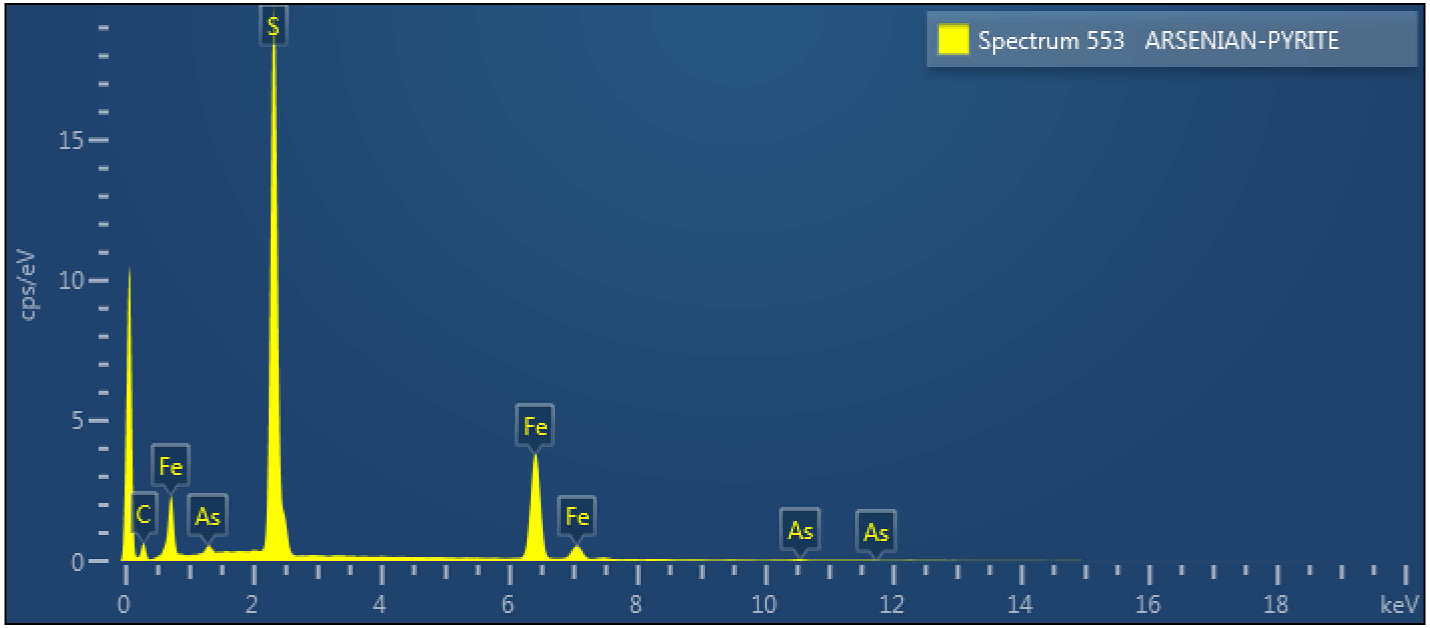
Spectrum 550 DOL-ANK							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	31.13	1.11	50.00			
Mg	K series	18.27	0.92	19.31	MgO	30.29	1.52
Ca	K series	40.90	1.13	26.22	CaO	57.22	1.59
Fe	K series	9.71	1.08	4.47	FeO	12.49	1.39
Total		100.00		100.00		100.00	



Spectrum 551 CHROMITE							
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**	**Oxide**	**Oxide %**	**Oxide % Sigma**
O	K series	32.91	0.50	56.97			
Mg	K series	6.34	0.28	7.22	MgO	10.51	0.46
Al	K series	8.19	0.27	8.40	Al2O3	15.47	0.50
Cr	K series	34.39	0.49	18.32	Cr2O3	50.27	0.72
Fe	K series	17.18	0.46	8.52	FeO	22.10	0.60
Ti	K series	0.99	0.14	0.57	TiO2	1.66	0.24
Total		100.00		100.00		100.00	



Spectrum 552 PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.88	0.30	67.93
Fe	K series	45.12	0.30	32.07
Total		100.00		100.00



Spectrum 553 ARSENIAN-PYRITE				
Element	**Line Type**	**Weight %**	**Weight % Sigma**	**Atomic %**
S	K series	54.27	0.38	67.61
Fe	K series	44.02	0.38	31.48
As	L series	1.70	0.23	0.91
Total		100.00		100.00