Thermal History of Pallasitic Olivines.

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ABSTRACT

There has long been an amount of discrepancy between models for formation of pallasites, due to lack of geochemical data that comes with the depleted nature of olivines and the simple two-phase structure. There are three over arcing hypothesis that have been offered as a model for the formation, one hypothesis states that olivines form at silicate-metallic melt boundary, another hypothesis states that the olivines form at the bottom of a crust which is then fractured and intruded by liquid melt. A newer hypothesis states that an impact event fractures olivine crust and forces the olivine into the liquid melt and then a secondary impact fractures the body and causes quick cooling. The lack of geochemical data and limited phases means that it has been hard to provide conclusive data to show which hypothesis is the best model for formation. In this study the markers of each hypothesis have been investigated along with the hypothesis that oxygen data, taken from previous study by Greenwood et al. (2015), show no bimodal spread that suggests the samples are from different parent bodies. Although this study has concluded that Springwater is possibly from another body due to systematic differences in geochemical data from the remaining samples, but the mode of formation is a similar process. The data from this study supports the hypothesis of mantle olivine formation, due to differing Al levels and REE patterns, coupled with at least two violent mixing events that forced the mixing of liquid metallic melt and then broke the parent body apart creating a rapid cooling effect.

KEYWORDS

Olivine, pallasites, REE normalisation, impact event, element diffusion, Iron-Nickel alloy.

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INTRODUCTION

A pallasite is a sub-type of Stony Iron meteorites which are classified by consisting of only two major phases, an olivine silicate which is then surrounded by an Iron-Nickel alloy (Buseck, 1977; McKibbin, O'Neill, Mallmann, & Halfpenny, 2013; E. R. Scott, 1977), and has an average ratio of 1:1 olivine and Fe-Ni alloy. Out of all meteorite bodies found on earth only approximately 1% of them are pallasites, therefore a very little research has been able to be done on them comparatively with other types of meteorites. Due to the scarcity of samples and general depletion of elements present in the pallasitic olivines there has not been an agreement between researchers as to a model of pallasite formation.

Previous studies have concluded through oxygen isotope data that the pallasites found on earth are from at least five different planetary bodies (Boesenberg, Delaney, & Hewins, 2012; Greenwood et al., 2015; McKibbin et al., 2013) but there has been a large amount of debate around the formation of the pallasites and how they became fragmented meteorites. There have been several major models for the formation of these pallasites presented in the past, and the two earliest proposed models for pallasites that have remained, the first being that they have been formed at the metal-silicate melt boundary as the density of olivines bring them to the boundary between silicate and metallic melt (Anders, 1964; McKibbin et al., 2013), an indicator for this formation would be the Ni diffusion profiles, as olivines sitting at such a high temperature and depth would have very quickly equilibrated its Ni into the melt (Hsu 2003) and produce a homogenous profile across grains, but this hypothesis does not account for the fractured texture of some samples. A hypothesis that does account for the fractured natured is the still liquid metallic melt being injected into fractured olivine mantle due to overburdening (Buseck, 1977; Hsu, 2003; Mittlefehdt, 1980; Wasson & Choi, 2003). With a more recent hypothesis emerging stating that pallasites are formed through violent mixing of olivine and metallic melt, and propose that IIIAB iron meteorites are an example of unmixed metallic melt from this model due to similar geochemical markers between the two types of meteorites. J. Yang, J. I. Goldstein, and E. R. Scott (2010) has proposed that pallasites are formed when a differentiated asteroid or protoplanet is subjected to an impact force that drives the mixing of olivine and metallic core that has been ~80% differentiated (E. R. Scott, 1977; Wasson & Choi, 2003), which forms then pallasites distinctive texture. E. R. D. Scott (2007) proposes that in addition to the violent nature of mixing, the impact causes separation of the parent body into smaller bodies of differing silica-alloy ratios, which could explain some of the geochemical differences which have been attributed to entirely different planetary sources.

The main aim to be addressed in this study is to determine if all the samples that have been gathered the study have a common origin process such as the models addressed above. To address this aim geochemical data will be compared between samples and oxygen isotope data previously gathered to determine if systematic differences occur.

The hypothesis of a series of impacts that lead to the breakup of pallasitic bodies will be investigated by analysing the diffusion profiles of olivines and textural evidence. The geochemical diffusion profiles combined with the textural evidence could be used to suggest relative timing of any impact events that have led to the planetary breakup.

To address these hypotheses, several methods have been used to gather the relevant data. A scanning electron microscope (SEM) was used to locate and confirm specific minerals present in the samples, and once the spots were located and analysed ERDAS software was used to determine which oxides were most likely in the sample and the wt% in which the oxides occurred in the samples. The secondary testing includes ASI and NewWave Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) lasers housed at Adelaide Microscopy, the NewWave laser was used to analyse the iron-nickel alloy element levels, and the ASI laser was used to analyse the olivine element levels, and then produce the element maps of at least one olivine per sample. Iolite software was used to process the ICP-MS data and create output for both the qualitative and quantitative data that will be used throughout this study. In this study a comparison will be drawn between possible oxygen grouping, the formation temperatures of samples, and textural and diffusive evidence for impact events.

BACKGROUND

The olivines in pallasites have been reported to range in size from µm to cm (Boesenberg et al., 2012) and their texture ranges from sharply angular to rounded. Pallasites can be further classified into four different groups by their compositional variations; Main Group, Eagle Station, Pyroxene, ad Ungrouped. All the samples used in this study belong to the Main Group classification except for Springwater whose place in the Main Group is debated by some (Saito, Shimizu, & Masuda, 1998). There have been several hypotheses proposed for the formation of pallasites as mentioned above, but the limited amount of data available only serve to create differing arguments due to their inconclusively. This study aims to use the previous data combined with new geochemical data gathered for this study to look at the soundness of previous studies conclusions. A large contributor to the pallasite problem is the general low levels of geochemical data that is provided by the pallasite themselves, due to the low number of major phases and the fact that by nature olivines are low in incompatible elements (Saito et al., 1998). To try to combat this problem this study has aimed to use the newest and highest resolution equipment available at the University of Adelaide to obtain as much data as possible. It has been assumed by many previous researchers that the olivines in pallasites have been formed before being submerged in the liquid melt (Hsu, 2003) due to olivine being solid below the temperature of 1600-1700 ^{O}C which is above the metal solidification of 1500-1000 ^{O}C. This temperature window gives the base temperature constraints that many researchers have then worked from. In the studies by McKibbin et al. (2013) and Saito et al. (1998) there have been geochemical evidence based on levels of Al and REE patterns respectively that provide a more constrained window of formation for the pallasites. McKibbin et al. (2013) has based their findings on Ito and Ganguly (2006) hypothesis that the uptake of Al in olivines can be controlled by the temperature at the moment of uptake and proposed that the anomalously low levels of Al are more in line with the hydrothermal olivines of ophiolites than of the more common magmatic olivines. Saito et al. (1998) had used experimental data to predict that their REE patterns and offered an upper temperature limit of 1440 ^{O}C.

METHODS

The pallasite samples for this study are a group of 11 pallasite meteorites that were sourced commercially from accredited meteorite sellers, or from the Tate museum located in the Mawson building at the University of Adelaide. The Huckitta meteorite was the only sample sourced from the Tate museum by Martin Hand and will be promptly returned when the study has concluded to be put back on display.

Below is a complete list of all 11 meteorite samples that have been used in this study;

- Admire
- Huckitta
- Brenham
- Esquel
- Imilac
- Seymchan
- Springwater
- Glorieta Mountains
- Albin
- NWA 2957

- Brahin

To preserve the olivine crystals in the samples, they were set in an epoxy resin which would fill in any pre-existing gaps to hold the brittle olivines in place during any analysis performed on the samples. Once the resin had set the excess was sanded away using sand paper of grades ranging from 800 to 2400. After the sanding was completed and a flat surface free of any resin or coating was exposed, a cloth lap was used to polish the surfaces, first 0.3 then 0.03µm. After the SEM processing was done on the entire surface, the samples were then cut to fit into inch round mounts of epoxy resin, which were then polished on the cloth lap once more. The preparation of all samples for use in the electron microprobe and XL39 SEM was conducted by the staff at Adelaide Microscopy.

Major elements in the larger meteorite samples were measured using the Philips XL30 FEG SEM housed in the Adelaide Microscopy. After the samples were coated in carbon they were placed in the SEM and certain spots of interest were picked in each sample and then the major elements were analysed by ERDAS program. The spots picked were done to provide an even representation of the different minerals in the samples. The peaks in ERDAS had to be reviewed to then ensure that the program was picking up the most likely elements for the samples.

ICP-MS was chosen for the trace elements as it has a much higher detection than the SEM. The olivine's were processed using the LA-ICP-MS ASI with Agilent 7900 ICP-MS and the standards GSD and NIST612, which were detecting for Na, Mg, Al, P, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Zn, ^{69}Ga, ^{71}Ga, Y, Zr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, Ir, Th, and U. The samples were put in the stage of the SEM, then once lined up, 400 spots for sampling were taken from at least one olivine grain from each 1-inch mount. Once all spots were up, two spots of GSD and two spots of NIST612 were distributed within every 20 spots. The ICP-MS used a laser of 220nm, flurence was set at 4.5-4.6 j/m2, and spot size varied from 80µm to 110µm.

For the analysis of the Ni/Fe metals the NewWave 213 LA-ICP-MS also with Agilent 7900 was used. In this analysis the elements P, S, Ti, V, Cr, Mn, Co, Ni, Cu, Zn, Ga, As, Se, Mo, Ru, Rh, Os, Pd, Ag, Sn, Te, La, Ce, Nd, Sm, Eu, Gd, Dy, Er, Yb, W, Re, Ir, Pt, Au, and Pb were looked for. Standards used; MASS-1, GSD, and NIS-3 were used, also distributed every 20 spots. The laser was set to 4.5 j/m2 flurence with spots sizes of 80µm. The samples were put in the stage, then once lined up 400 spots for sampling were taken from at least one olivine grain from each 1-inch mount. Once all spots were lined up, two spots of GSD, two spots of NIS-3, and two spots of MASS-1 were distributed in every 20 spots.

Once the raw data from the machines were collected several different methods were used to prepare the data to be analysed. The electron probe data was processed using ImageJ software to identify changes in specific elements of interest. ERDAS software was used to identify specific elements detected by the SEM and then to convert the data into oxide data that could be used to identify specific minerals of interest. Photographs were also taken, and locations of detections spots were identified on these photographs along with the corresponding data label.

Iolite software was used to analyse the ICP-MS data, and to then perform different data reduction schemes that gave the output in the form of Excel spreadsheets. These spread sheets were then used in conjunction with GCDkit to produce spider plots of REE and trace elements normalised to chondrite values. For the REE chondrite plots Boynton (1984) values were used to normalise, and Sun et al. (1980) was used to normalise the trace elements to chondrite values. Iolite was also used to produce element maps of Al, Co, Cr, Ni, Fe, ^{69}Ga, ^{71}Ga, Mg, Mn, P, Sc, Si, Ti, and V which had their minimum and maximum values changed to reflect the levels of olivine only, not the metallic data as this was not accounted for in standards, so values obtained cannot be corrected, and were then overlaid on micrographs taken of the samples to give a visual connection to the specific locations in the olivine grain.

RESULTS

SEM data

The SEM provided both visual and numerical data which was used to provide a visual element to their geochemical signatures for easier analysis. Overall the data that the SEM provided conformed that the samples included the two major phases of olivine and iron-nickel phases. Along with this conformation of phases, the SEM data provided an insight into the inclusions in some of the phases (Table 1), and allowed for the identification of minor phases such as kamacite, taenite, and tetrataenite. Using this data, it was possible to find out what endmember of olivine the grains are. Overall much of the olivine grains looked at were forsterite with a very small number of fayalite. The exception to this pattern appears to be the Imilac sample, which had 50% fayalite. This tends to disagree with previous studies suggesting that pallasites are almost completely Forsterite, but this may be due to sample bias in this study due to the data being restricted to blocks no more than 3cm^2.

Element	Wt %	Mol %
TiO2	54.45	48.22
MgO	15.61	27.39
SiO2	15.13	17.82
Fe2O3	14.81	6.56
Total	100	100

Table 1: An example of olivine oxide data from the Springwater sample.

A small number of samples were contaminated due to lose olivine grains being removed and then being infilled with carbon during the preparation for the SEM analysis.

REE and trace element results of olivines

The observed values for almost all major and minor elements in the metal and olivines are above values previously reported, some values are up to an order larger than previously reported, but some overlap between previous studies and the values here do occur. This may be because the instruments that has been used have a higher resolution than instruments previously used due to the technology being relatively new and powerful coupled with the most recent software for analysis.

The trace element plots of the olivines form a 'V' pattern that has become a known feature of olivine, but many of the plots found in this study do lack numerical values for many of the trace elements which is largely due to low levels present in olivines in combination with detection limits set by the lasers not being met. The element levels do vary largely within samples when normalised to chondrite data, from 1^{-11} up to 1 sample/chondrite. Overall both the trace and REE plots display a depletion in REE in comparison to Chondrite values, which is expected of an olivine, and has an enrichment in HREE's in comparison to the LREE's. The exception to this observation being the Springwater and Glorieta Mountains samples which show a higher level of LREE enrichment which has a similar level as or above the values of their HREE's, so they form the 'V' pattern described in Saito et. al. (1998), as seen in Figure 1.

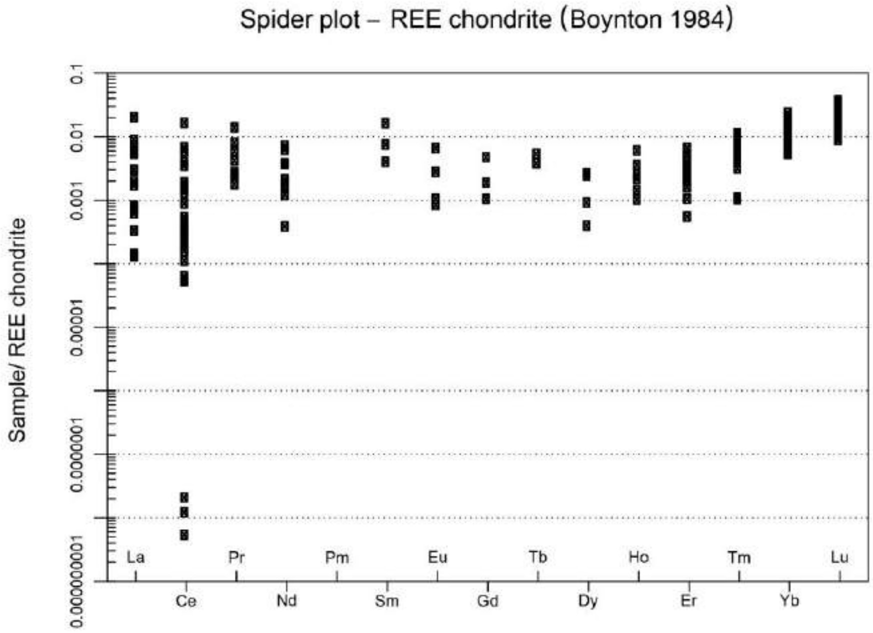

Figure 1: REE spider plot of the middle of a larger Glorieta Mountains olivine grain showing the "classic V' shape described in Saito et. al. (1998).

The trace plots present highly variable results for the different pallasite samples in terms of which trace elements have been detected and in what levels they are present. The constant throughout the samples is that there are detectable levels of both Zr and Ti throughout every single sample, and, with the exception of Springwater and Glorieta Mountains, every sample shows an enrichment in Sm, Zr, Ti, and Gd compared to other levels (Fig 2). The Springwater and Glorieta Mountains samples do have similar values for Zr and Ti when normalised to chondrite data, but what separates them from other samples is that trace elements, that appear to be depleted in other samples, such as Th, U, La, and Ce, are enriched to levels above Zr and Ti and in some cases, have values the same as chondrite data (Fig 3).

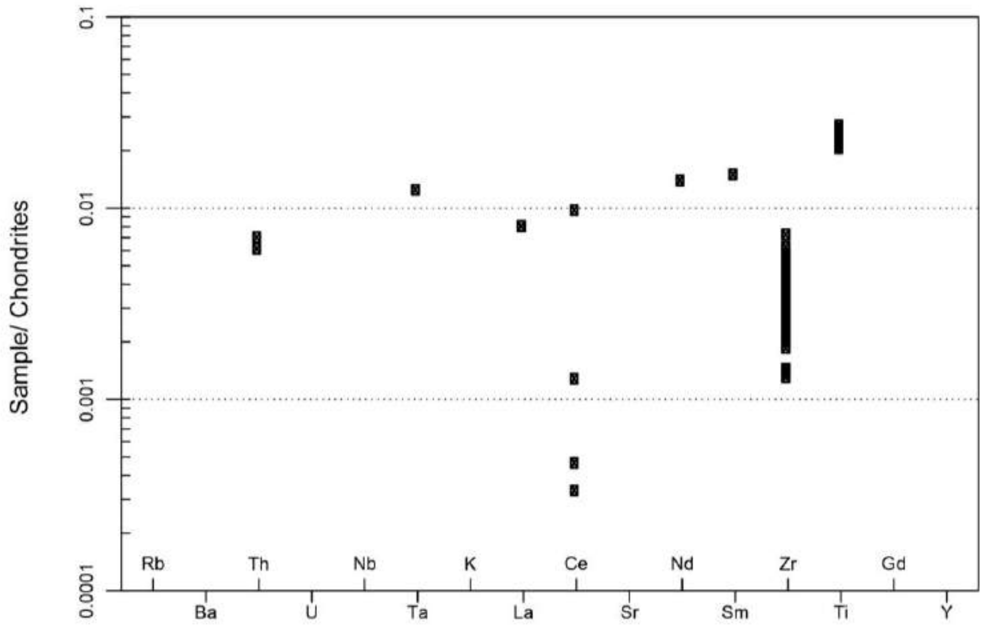

Figure 2: Trace element sider plot for a Brahin olivine edge.

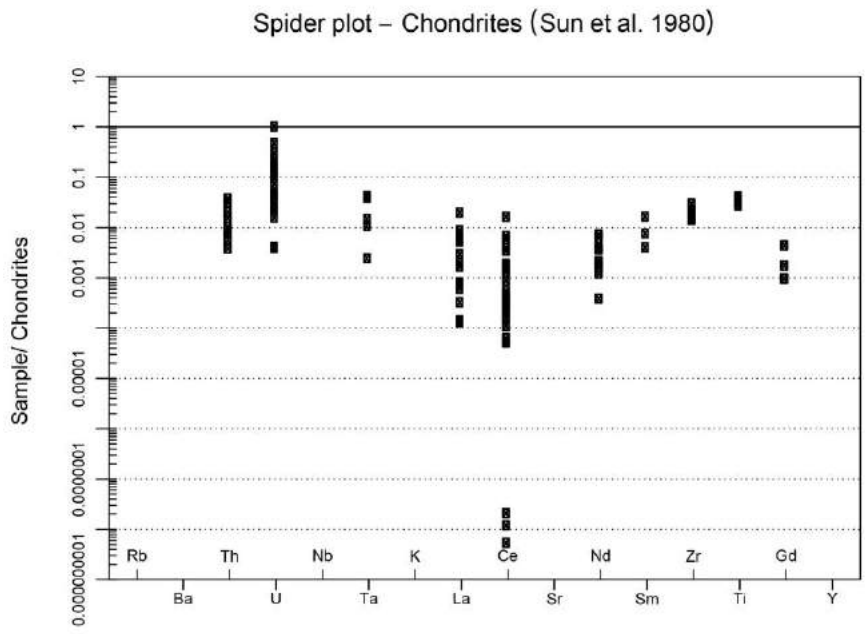

Figure 3: Trace spider plot of the middle of an olivine in the Glorieta Mountains showing an enrichment of U when normalised to chondrite data of Sun et. al. (1980).

Element mapping

The element maps have been affected by machine failure that affected the lasers ability to ablate and detect the standards needed to correct the values for samples Albin, Brahin, Glorieta Mountains, and Huckitta. The uncorrected values can still be used in a purely qualitative manner as the values are still the same relative to each other, but no quantitative data can be derived from these maps or their associated data.

When observing the fast diffusing elements Co, Mn, and Ni (McKibbin et al., 2013) it has been observed that almost all have a homogenous pattern, except for the Springwater and NWA samples. The Springwater sample (Figure 4) displays a diffusion pattern of Ni that shows a depletion at the grain/melt boundary, while the NWA samples (Figure 5 and 6) show not only a diffusion of Ni at the grain/melt boundary, but also diffusion at certain fractures in the olivine grain. These Ni diffusion patterns set both the Springwater and NWA samples apart from the other samples which have homogenous Ni diffusion.

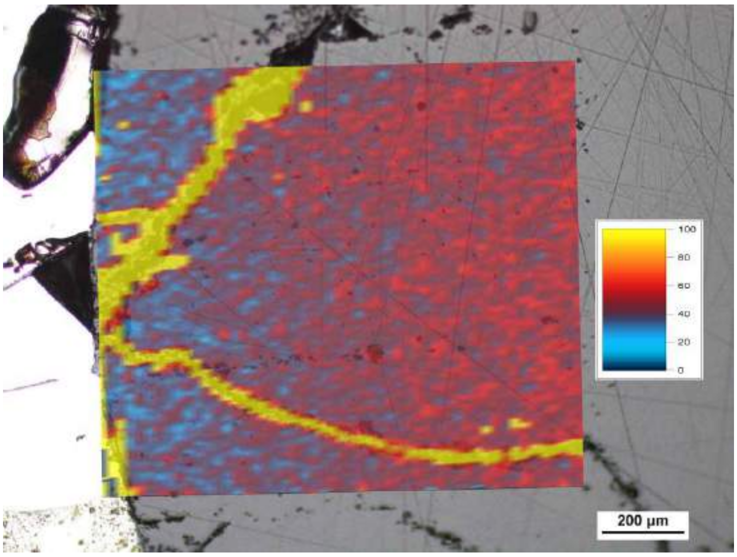

Figure 4: Ni in an angular Springwater sample that shows both diffusion at grain boundary and melt infiltration into the grain through fractures.

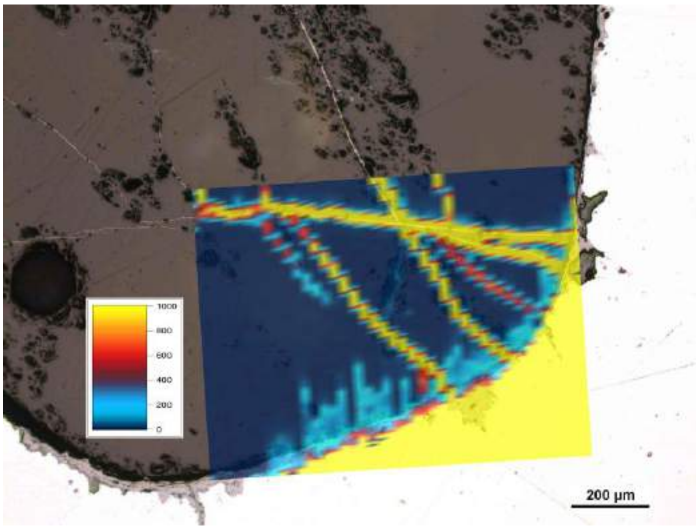

Figure 5: Ni in NWA sample that shows both possible diffusion at grain boundary and melt infiltration into the grain through fractures with minor Ni enrichment at fractures.

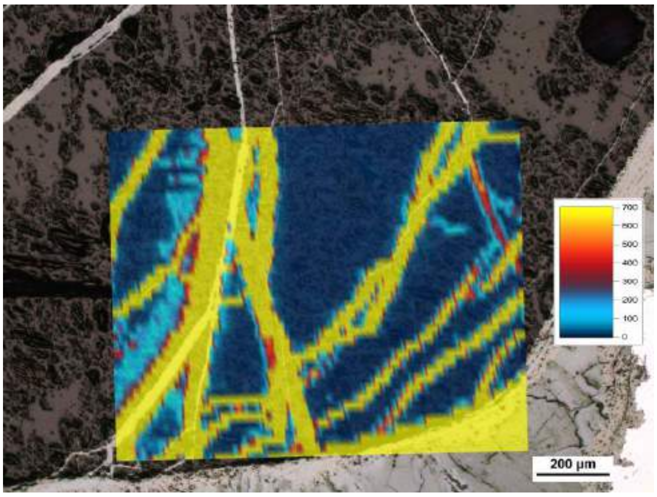

Figure 6: Ni in NWA sample that shows melt infiltration into the grain through fractures and possible diffusion at boundaries of melt intrusion.

The Al diffusion pattern is also homogenous throughout the grain samples of Springwater, Huckitta, Imilac, Glorieta, Brenham, Brahin, and Albin. The Al patterns of the samples with diffusion patterns do not have uniform diffusion patterns, as seen in Figure 7, but form patterns that do not seem to follow any fractures with melt inclusion.

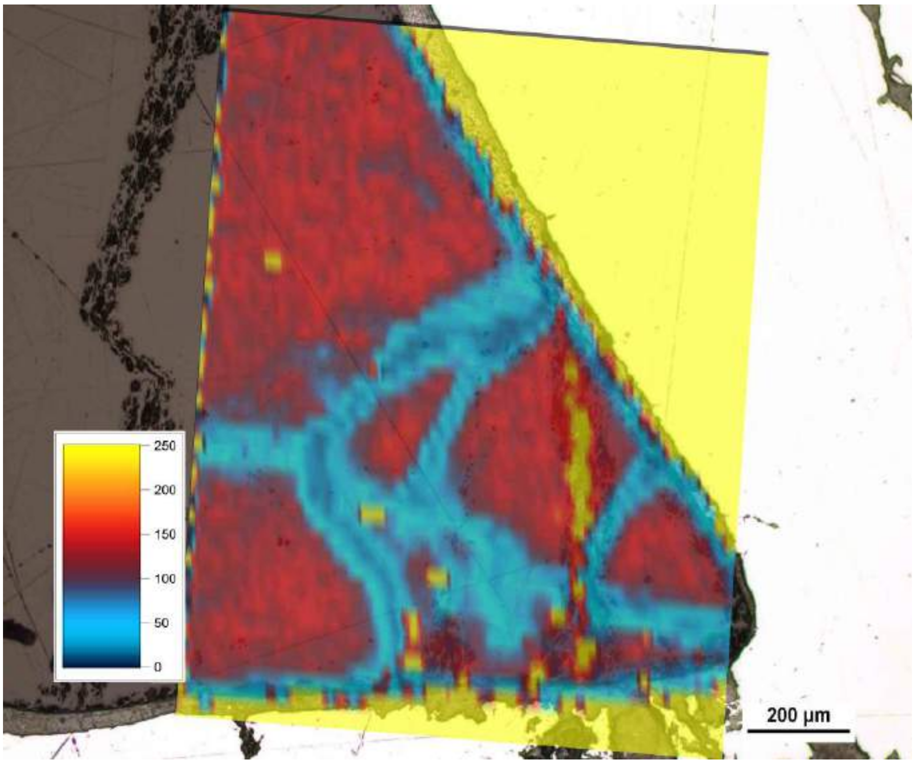

Figure 7: The 'skeletal' Al depletion pattern observable on the edge of an Admire sample grain of olivine.

Every sample, except for the Albin sample, also have minor to extensive Cr diffusion throughout the grains which in some cases, as with the Admire sample, follow a very similar Cr depletion as the Al depletion. The Cr pattern of Brenham, Esquel, Imilac, and Springwater all appear to follow the Al patterns of the same grains, suggesting that Al in the olivines controls the diffusion of Cr to some extent, as proposed in McKibbin et al. (2013). The other samples that show Cr diffusion have a trend more suggestive of Cr diffusing out from the core of the olivine grain. A similar pattern occurs in these samples with Sc, V, and Ti, although Sc has a less dramatic diffusion pattern. The elements Fe, Ga, Mg, and Mn show a homogenous diffusion across all grains in all samples analysed in this study, with Fe also being relatively high, compared to levels in olivines, in the infiltrating melt material.

DISCUSSION

Geochemical comparison between proposed oxygen groups

Figure 8 is a graph of the oxygen data available of seven of the samples available in this study, gathered from Greenwood et. al. (2015), and if the assumption that the groupings of different ^{17}O are due to the position in a solar system, and therefore can be used as an indicator of different bodies, is to be believed as true then comparisons could be drawn between groups in this study. Figure 8 presents with a possible three groups, Imilac, Esquel, and Brahin in one grouping with Glorieta Mountains, Admire, and possibly Brenham in another group.
Springwater's high Ꞓ^{17}O‰ and relatively low levels of Al would suggest that it has formed on a different planetary body which has a lower, and possibly hydrothermal origin of olivines (McKibbin et al., 2013). The Springwater sample has been suggested as geochemically distinct from all main group pallasites by several studies, and the oxygen data, coupled with lower Al levels, when compared with the samples may suggest that Springwater is in fact a sample from a parent body with a much lower temperature. The overlapping nature of Al levels in the two groups, not including Springwater, may offer some support to the melt boundary hypothesis as the lower Al levels may reflect a lower temperature due to a shallower depth further away from metallic melt.
When comparing REE plots between the perceived groupings there is no clear evidence for a common formation as most of the samples have different LREE and HREE enrichments. A comparison can be drawn between Glorieta Mountains and Springwater samples as they have a distinct 'V' shape, as discussed below, but this comparison is inconsistent with the groupings displayed in Figure 8.

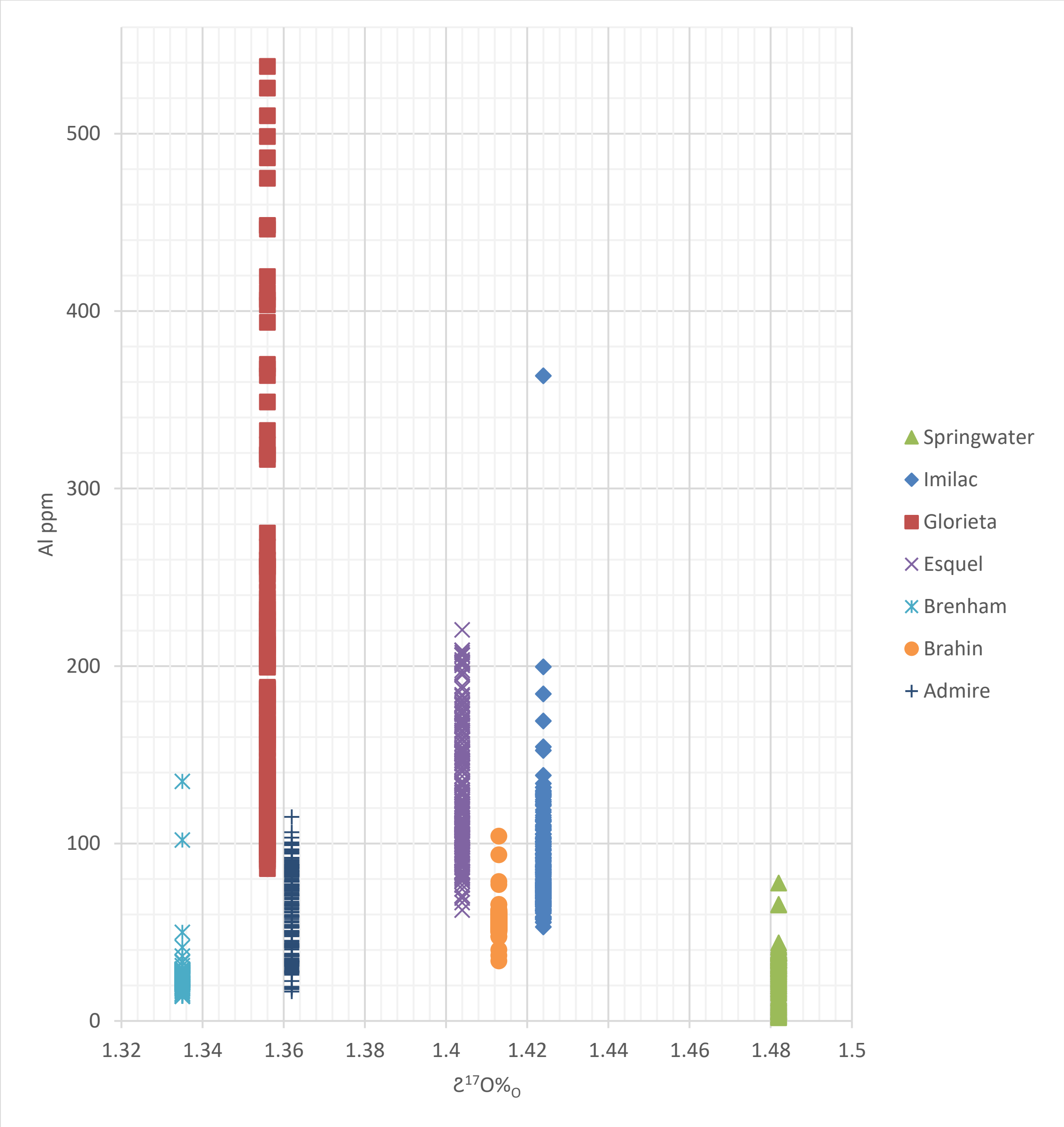

Figure 8: Ƹ^{17}O data was obtained from (Greenwood et al., 2015) which has been used in several studies to show that pallasites do not have a singular origin body, out of this data the applicable oxygen data was taken and a plot was created to show both Al levels and then compare them between apparent O groups, or inferred planetary bodies.

Low temperature formation

Saito et al. (1998) has shown through experimental conditions that the 'V' shaped REE patterns in the Springwater and Brenham olivines can be a product of melting chondrite material at a temperature of 1440 °C, and has suggested that Springwater and Brenham olivines have formed close to the olivine liquidus. The flat and low LREE patterns produced in this study when normalised to chondrite data, as seen in Figure 9, would be closer to the experiment results formed at a temperature of 1300 ^{o}C and may be the data indicating less affinity because of the lower temp, which would agree with the McKibbin et al. (2013) hypothesis of the ~1300 ^{O}C temperature formation of olivines close to the melting point of metal. The outliers of this pattern are the Glorieta Mountains and Springwater grains which have shown a “V” shape as described in Saito et al. (1998), although the LREE’s are not as high as the study has reported, the LREE levels are an order of magnitude higher than other samples in this study. These higher LREE’s could correspond to the formation temperature being higher than the formation temperature for the other samples, or could reflect a silicate melt with higher levels of LREE than the silicate melts that formed the other samples.

The overall levels of iron in both this study and in Saito et al. (1998) have some overlapping levels of FeO in their olivines, with the samples in this study being only ~2wt% more than the FeO levels observed in Saito et al. (1998), this would then constrain the formation temp of the olivines to a formation temperature of between 1300 ^{o}C and ~1470 ^{o}C. A problem with the correlation between Saito et al. (1998) data on Springwater and the data presented in this study may have occurred due to Saito et al. (1998) deriving their results from an experimental study that assumes a starting body of chondritic material at 0 atm pressure, which is contrary to previous studies, which have proposed that due to the slow cooling rates, 1.5 – 18 ^{O}C per million years (Boesenberg et al., 2012), pallasites formed beneath a mantle layer of ~200km (ref).

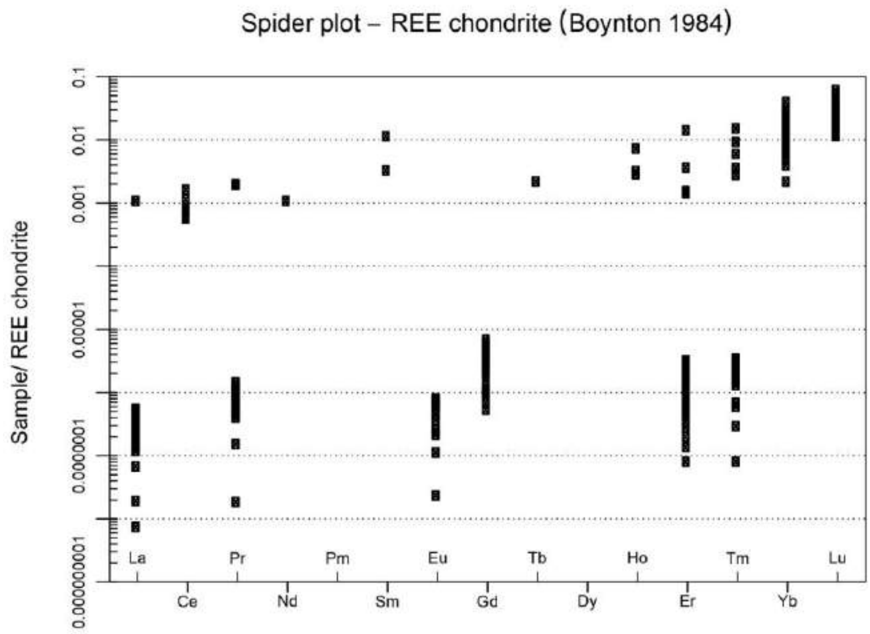

Figure 9: The REE spider plot of a small Brenham olivine, showing a depleted LREE pattern inconsistant with Saito et. al. (1998)

While the REE patterns of the olivines, when compared with Saito et al. (1998) data, appear to suggest a cooler temperature more in line which the McKibbin et al. (2013) findings of cooler formation temperature, the Al levels of this study, while overlapping, do not agree completely with the McKibbin study, which suggest a low temperature and hydrothermal origin of olivines due to the extremely low levels of Al. If the pallasites do have a restite nature, as suggested by McKibbin et al. (2013), then this overlap could be explained as a temperature profile along depth of the olivine formation.

Agee and Walker (1990) have shown that Al level in an olivine is related to the uptake of Al into the olivine lattice, therefore the higher Al levels of this study would suggest while a number of olivines were similar to the Brenham and Brahin samples of McKibbin et al. (2013) the samples also display a profile suggesting that different olivines experienced higher temperatures which could be explained as forming closer to the silicate-metal boundary than the McKibbin samples.

Impact history

The element maps presented in this study give an insight into the amount of time the olivines spent in the liquid melt before they were broken up due to their diffusion patterns across olivine grains. Overall the diffusion throughout the olivine grains appears to have occurred long enough for the homogenisation of the elements across grains, even the slower diffusing elements such as Al and P. While this does not provide information on the olivine origins, the secondary fracturing does provide evidence for the fracture origins proposed by both J. Yang, J. I. Goldstein, and E. Scott (2010) and by E. R. D. Scott (2007) and the temperature at time of impact by using the fractures throughout the olivine grains, the liquid melt within these fractures, and then the geochemical diffusive reaction to said metal. Figure 4, 5, and 6 show that after the olivine grains were submerged in the liquid melt there was an event that has fractured the olivine grains enough to let in the liquid melt in which it was sitting, which would have had to have occurred above the temperature of metal solidification of ~1500 ^{o}C to 1000 ^{o}C (Hsu, 2003) to facilitate the movement of the metal alloy into the fractured grains. It is also visible that after this fracturing event there was a very short amount of time before the pallasite body was then fractured again causing an incredibly fast cooling which ‘snap froze’ the liquid metal. The diffusion of Ni along the edges of the metal injection has not begun to diffuse into the metal as it would if given enough time to begin migrating. The lack of Ni equilibration from olivine to metal does fall in line with the findings of McKibbin et al. (2013) and Ito and Ganguly (2006) which found that the residence time of olivine in metal was in the order of 10^1 to 10^2 years, which is a short time scale for geological processes.

Textural differences of olivine grains

The data supports the evidence presented in Wasson and Choi (2003) lending to the hypothesis that pallasites are formed through an impact event, even without the larger grains (20mm or above) that have been previously reported, as six of the eleven samples in this study contain an angular or fractionated texture in a mix of rounded olivine grains. The fractured texture of the olivines observed are not characteristic of undisturbed crystal growth, and while not quantitative, the fractured texture of the olivine grains is consistent with the diffusion evidence that a fractionation event occurred at least once in the pallasite history while the metal alloy was still liquid and then rapid cooling occurred soon after. The metal would have had to have been liquid at the time of fractionation for the grains to have separated, therefore once again putting the temperature constraint above metal solidification at ~1500 ^{O}C, but below the olivine formation temperature

Textural evidence could also be lent to the hypothesis that the olivines were forced into the melt and solidified extremely quickly, again while looking at Seymchan as a best example of having fractured olivines forced into an almost solid melt and then solidified extremely quickly (Figure 4, 5, and 6). The numerous, 5 to 10mm, fractured olivines in Seymchan are unaligned and have uneven distribution across the sample, suggesting that the amount of time that the grains spent in the melt was short enough that the grains could not be aligned but may have been long enough that density could have taken effect and begun to separate the larger, more dense grains from the smaller grains.

In Wasson and Choi (2003) they offer overburdening as an explanation as to how the buoyant olivine grains became fractured an entered the melt, as the metallic core begins to contract it leaves the mantle unsupported and causes collapse. The data does not appear to dispute this hypothesis, first offered by Wai, Wetherill, and Wasson (1968), until the hypothesis that several of these collapses have occurred throughout the history of the Pallasitic body. It is possible that while the core retracted due to slow cooling, the overburdening of the olivine mantle was not enough to fracture and force the olivine into the melt by itself. It can be proposed that while the contraction occurred, an impact event occurred that fractured the mantle and pushed the olivine into the melt forming the fragmented texture best seen in Figure 10 and aloud the metal liquid infiltration seen in Figure 4 and 5. The impact would have had the most force closer to the surface of the body, which would have created the angular and small texture of a small amount of grains seen in samples such as Seymchan, then a second impact event occurred shortly after creating the rapid cooling consistent with the melt inclusion without incurring diffusion as discussed above.

Figure 10: A micrograph of the Seymchan pallasite sample analysis in this study, showing the fractured texture and density of olivine grains.

CONCLUSIONS

In conclusion it appears that while there are oxygen differences between samples, there does not seem to be enough systematic geochemical differences between them to say that they have come from different planetary bodies. It does appear that the Springwater sample could be considered to have a separate body due to the systematic geochemical differences that occur between Springwater and the other samples in this study. The REE chondrite patterns have been able to provide some constraining evidence for formation temperature which would put the window between ~1300 ^{o}C and ~1000 ^{O}C, using the experimental results from Saito et al. (1998) to give the upper limit while the presence of metallic melt movement assumes that the formation temp could be the lower limits for metal solidification.

The evidence provided here provides evidence of a formation model that borrows from two of the mentioned hypothesis. The olivines are formed at the base of a chondritic mantle which would have produced the variations in LREE's that suggest a cooler melting temperature, the Al levels also suggest that the different samples have differing formation temperatures but overlap each other. The olivines forming above the metal solidification temperature of ~1000 ^{O}C would spend a time at depth, consistent with slow cooling rates of 1.5 to 18 ^{O}C per million years, and erasing diffusion profiles of both fast and slow diffusers. At least two fracturing events would have occurred after the olivine formation, the first creating fracturing of the mantle and forcing the olivines and melt to mix. The final and possibly second impact event would have separated the parent body which would have created a high cooling rate which would have 'snap frozen' the metallic melt as it would have been exposed to lower temperatures quickly. This study has aimed to produce higher resolution data as to combat the geochemical depletion that comes with the samples, but unfortunately this is still a problem in this study as the REE plots are inconclusive. The recommendations of this study therefore are more geochemical analysis with instruments of higher resolution, as to produce a more complete geochemical profile of these simply yet complex meteorites.

ACKNOWLEDGMENTS

I would like to thank several people that were integral to my project, first and foremost of whom is my supervisor Professor Martin Hand for all his guidance and wisdom in helping me complete this research and the chance to participate in such an exciting project. I would also like to thank the staff at Adelaide Microscopy, specifically Dr, Benjamin Wade, Dr David Kelsey, and Dr Sarah Gilbert for all there help with machinery and analysis. And then finally I would like to thank the Honours class of 2017 for being there for discussions throughout the year.

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APPENDIX A: SEM DATA

H:\MDUGGAN\New Folder\Admire__0001.spc				
Acquisition Time:13:55:24	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	50.19	62.31	0.1806	
Al2O3	5.57	2.73	0.0133	
SiO2	40.59	33.81	0.1081	
Fe2O3	3.65	1.14	0.0222	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	935.2	45.4	0.88	20.6
AlK	67.87	39.27	4.6	1.73
SiK	515.8	30.87	1.2	16.71
FeK	30.2	3.2	5.17	9.44
H:\MDUGGAN\New Folder\Admire__0002.spc				
Acquisition Time:13:57:20	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	1.44	1.17	0.004	
SO2	62.11	80	0.2646	
Fe2O3	36.45	18.83	0.2263	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	14.93	34	15.75	0.44
S K	795.27	25.87	0.94	30.74
FeK	223.8	8.53	1.79	26.23

H:\MDUGGAN\New Folder\Admire__0003.spc				
Acquisition Time:13:58:08	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SiO2	4.57	11.28	0.0114	
Fe2O3	95.43	88.72	0.6305	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
SiK	9.2	23.53	21.05	0.39
FeK	144.53	5.67	2.23	25.51
H:\MDUGGAN\New Folder\Admire__0004.spc				
Acquisition Time:13:59:00	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	18.01	32.98	0.0611	
Al2O3	53.66	38.84	0.1625	
SiO2	19.69	24.19	0.0464	
Fe2O3	8.64	3.99	0.0531	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	127.87	32.93	2.81	3.88
AlK	336.47	30.27	1.53	11.12
SiK	89.4	23	3.36	3.89
FeK	29.2	2.27	5.14	12.88

H:\MDUGGAN\New Folder\Admire__0005.spc				
Acquisition Time:00:00:00	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	64.07	72.49	0.1957	
SnO2	35.93	27.51	0.2357	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	102.13	14.93	2.9	6.84
SnL	30.2	3.53	5.22	8.55

H:\MDUGGAN\New Folder\Admire__0006.spc				
Acquisition Time:14:02:04	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	5.77	8.75	0.012	
Fe2O3	94.23	91.25	0.6226	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	10.6	22.6	18.2	0.47
FeK	145.93	3.4	2.19	42.92

H:\MDUGGAN\New Folder\Admire__0007.spc				
Acquisition Time:14:02:52	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	7.01	9	0.0157	
P2O5	2.38	2.19	0.0068	
SO2	11.85	24.22	0.0457	
Fe2O3	78.76	64.58	0.512	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	14.73	22.4	13.52	0.66
P K	5.4	20.47	32.55	0.26
S K	34.67	19.53	6.4	1.77
FeK	127.8	4	2.35	31.95
H:\MDUGGAN\New Folder\Admire__0008.spc				
Acquisition Time:14:05:25	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	11.6	11.57	0.0294	
SO2	33.81	53.67	0.135	
Fe2O3	54.58	34.76	0.3462	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	39.13	18	5.72	2.17
S K	144.93	16.33	2.37	8.87
FeK	122.33	3.4	2.4	35.98

H:\MDUGGAN\New Folder\Admire__0009.spc				
Acquisition Time:14:07:16	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	87.85	77.18	0.5927	
NiO	12.15	22.82	0.0853	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	267.53	7.93	1.62	33.72
NiK	27.4	5.67	5.86	4.84
H:\MDUGGAN\New Folder\Admire__0010.spc				
Acquisition Time:14:08:32	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	52.1	63.55	0.1876	
Al2O3	2.68	1.29	0.0063	
SiO2	41.61	34.05	0.1116	
Fe2O3	3.61	1.11	0.022	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1160.47	40.67	0.78	28.54
AlK	38.47	35.07	6.99	1.1
SiK	635.73	30.33	1.07	20.96
FeK	35.67	4	4.78	8.92

H:\MDUGGAN\New Folder\Admire__0011.spc				
Acquisition Time:14:09:51	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	7.61	10.87	0.0162	
SO2	3.58	8.13	0.0137	
Fe2O3	88.81	81	0.5836	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	21.4	30.33	10.93	0.71
S K	14.53	33.87	16.11	0.43
FeK	204.13	6.8	1.87	30.02
H:\MDUGGAN\New Folder\Admire__0012.spc				
Acquisition Time:14:11:39	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	33.47	51.81	0.0601	
Fe2O3	66.53	48.19	0.4647	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	57.93	18.87	4.36	3.07
FeK	404.93	9.6	1.31	42.18

H:\MDUGGAN\New Folder\Admire__0013.spc				
Acquisition Time:14:12:52	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	93.3	86.7	0.6248	
NiO	6.7	13.3	0.0468	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	116.4	5	2.49	23.28
NiK	6.2	2.67	14.14	2.32

H:\MDUGGAN\New Folder\Admire__0014.spc				
Acquisition Time:14:12:52	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Nb2O5	1.7	0.96	0.0083	
Cl2O	1.04	1.81	0.0069	
CdO	0	0	0	
K2O	0.55	0.87	0.0042	
Sb2O3	0.98	0.51	0.0073	
TiO2	1.04	1.97	0.0062	
V2O5	1.48	1.23	0.0086	
Pr2O3	0	0	0	
Sm2O3	3.55	1.54	0.026	
Fe2O3	83.71	79.09	0.5594	
NiO	5.95	12.03	0.0419	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NbL	2.4	14.47	60.22	0.17
ClK	4.07	12.8	34.59	0.32
CdL	0	12.47	0	0
K K	2.11	10.67	59.13	0.2
SbL	1.33	10.67	92.2	0.13
TiK	2.27	8.4	49.74	0.27
V K	2.75	7.2	38.89	0.38
PrL	0	7.2	0	0
SmL	2.73	6	36.26	0.46
FeK	116.4	5	2.49	23.28
NiK	6.2	2.67	14.14	2.32

H:\MDUGGAN\New Folder\Admire__0015.spc				
Acquisition Time:14:14:52	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	4.88	7.44	0.0101	
Fe2O3	95.12	92.56	0.6289	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	10.8	27.27	19.32	0.4
FeK	178.2	5	1.99	35.64
H:\MDUGGAN\New Folder\Admire__0016.spc				
Acquisition Time:14:15:44	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	19.03	8.14	0.0405	
MgO	30.57	51.83	0.0831	
Al2O3	15.27	10.24	0.036	
SiO2	20.26	23.05	0.0509	
SnO2	14.87	6.74	0.0958	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	33.87	24.07	6.9	1.41
MgK	469.73	49.07	1.31	9.57
AlK	201.33	44.87	2.19	4.49
SiK	265.07	36.4	1.79	7.28
SnL	131.47	17	2.53	7.73

H:\MDUGGAN\New Folder\Admire__0017.spc				
Acquisition Time:14:16:42	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	48.7	61.18	0.1742	
Al2O3	6.64	3.3	0.016	
SiO2	40.64	34.25	0.1083	
Fe2O3	4.03	1.28	0.0245	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1014.27	42.2	0.84	24.03
AlK	91.8	36	3.6	2.55
SiK	580.6	29.2	1.12	19.88
FeK	37.47	3.2	4.56	11.71

Albin_001				
Acquisition Time:10:51:30	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :11		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	10.47	14.92	0.0224	
SO2	0.87	1.97	0.0033	
MnO	2.17	4.45	0.0155	
Fe2O3	86.49	78.67	0.569	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	40.53	31.62	7.36	1.28
S K	4.8	28.37	47.85	0.17
MnK	8.66	8.23	16.95	1.05
FeK	272.86	6.26	1.81	43.62

H:\MDUGGAN\New Folder\Albin__0002.spc				
Acquisition Time:10:53:41	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :14		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	86.28	74.63	0.5834	
NiO	13.72	25.37	0.0965	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	265.19	10.52	1.7	25.22
NiK	31.19	6.4	5.67	4.88

H:\MDUGGAN\New Folder\Albin__0004.spc				
Acquisition Time:10:56:03	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :7		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	20.88	7.29	0.0494	
MgO	45.93	63.49	0.1343	
SiO2	30.49	28.28	0.0791	
Fe2O3	2.7	0.94	0.0167	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	46.01	13.28	6.78	3.46
MgK	846.01	22	1.29	38.46
SiK	459.02	18.38	1.78	24.98
FeK	27.63	2.15	7.49	12.87
H:\MDUGGAN\New Folder\Albin__0005.spc				
Acquisition Time:10:57:41	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	20.85	7.27	0.0493	
MgO	46.07	63.64	0.1348	
SiO2	30.37	28.14	0.0787	
Fe2O3	2.71	0.94	0.0167	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	41.93	24.33	5.86	1.72
MgK	774.33	33.47	0.97	23.14
SiK	416.67	22.33	1.33	18.66
FeK	25.27	2.13	5.55	11.84

H:\MDUGGAN\New Folder\Albin__0006.spc				
Acquisition Time:11:04:50	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	66.82	50.31	0.1852	
MgO	0.67	2	0.0012	
SO2	20.66	38.77	0.0821	
Fe2O3	11.85	8.92	0.0768	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	277.4	15.29	2.8	18.14
MgK	12.55	34.7	31.95	0.36
S K	662.81	33.33	1.8	19.89
FeK	204.27	3.14	3.15	65.12

H:\MDUGGAN\New Folder\Albin__0007.spc				
Acquisition Time:11:08:04	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	79.25	77.02	0.2538	
SiO2	0.85	2.2	0.0021	
P2O5	1.02	1.12	0.0029	
SO2	0.91	2.2	0.0035	
Fe2O3	17.96	17.46	0.1189	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	259.87	15.33	1.69	16.95
SiK	13.53	33.47	17.11	0.4
P K	16.53	34.13	14.38	0.48
S K	19.27	31.87	12.21	0.6
FeK	216.13	6.67	1.81	32.42
H:\MDUGGAN\New Folder\Albin__0008.spc				
Acquisition Time:11:14:20	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6639	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	393.67	13.98	2.24	28.16

H:\MDUGGAN\New Folder\Albin__0008.spc				
Acquisition Time:11:14:20	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6639	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	393.67	13.98	2.24	28.16
H:\MDUGGAN\New Folder\Albin__0010.spc				
Acquisition Time:11:18:03	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :13		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	43.4	58.31	0.0196	
SO2	37.51	34.62	0.162	
Fe2O3	19.09	7.07	0.1164	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	41.32	8.26	4.96	5
S K	1021.82	45.45	0.88	22.48
FeK	241.63	9.21	1.8	26.24

H:\MDUGGAN\New Folder\Albin__0011.spc				
Acquisition Time:11:20:08	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
TiO2	48.55	47.42	0.2149	
NiO	33.64	35.14	0.0867	
Al2O3	1.55	1.18	0.0034	
SiO2	7.58	9.84	0.0199	
Mo2O3	0.87	0.28	0.0051	
TiO2	0.16	0.16	0.0009	
V2O5	0.3	0.13	0.0016	
Fe2O3	3.29	1.61	0.0221	
NiO	4.05	4.23	0.0295	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
TiL	107.36	8.19	4.63	13.11
NiL	286.06	20.97	2.83	13.64
AlK	38.55	29.17	11.41	1.32
SiK	208.55	34.76	3.57	6
MoL	20.58	29.56	19.39	0.7
TiK	4.79	11.19	48.59	0.43
V K	7.19	8.99	31.18	0.8
FeK	65.92	5.59	5.95	11.79
NiK	62.52	3.2	5.93	19.56

H:\MDUGGAN\New Folder\Albin__0011.spc				
Acquisition Time:11:20:08	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
TiO2	48.55	47.42	0.2149	
NiO	33.64	35.14	0.0867	
Al2O3	1.55	1.18	0.0034	
SiO2	7.58	9.84	0.0199	
Mo2O3	0.87	0.28	0.0051	
TiO2	0.16	0.16	0.0009	
V2O5	0.3	0.13	0.0016	
Fe2O3	3.29	1.61	0.0221	
NiO	4.05	4.23	0.0295	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
TiL	107.36	8.19	4.63	13.11
NiL	286.06	20.97	2.83	13.64
AlK	38.55	29.17	11.41	1.32
SiK	208.55	34.76	3.57	6
MoL	20.58	29.56	19.39	0.7
TiK	4.79	11.19	48.59	0.43
V K	7.19	8.99	31.18	0.8
FeK	65.92	5.59	5.95	11.79
NiK	62.52	3.2	5.93	19.56

H:\MDUGGAN\New Folder\Albin__0013.spc				
Acquisition Time:11:23:54	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	44.37	24.22	0.106	
Al2O3	0.27	0.23	0.0007	
SiO2	50.09	72.67	0.1502	
Fe2O3	5.28	2.88	0.0333	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	65	25.53	4.28	2.55
AlK	2.87	39.8	81.79	0.07
SiK	573.73	33.13	1.14	17.32
FeK	36.27	3.2	4.65	11.33

H:\MDUGGAN\New Folder\Albin__0014.spc				
Acquisition Time:11:34:24	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :9		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
N2O5	31.21	24.61	0.034	
Fe2O3	11.02	5.88	0.0189	
MgO	17.83	37.66	0.0436	
Al2O3	2.99	2.5	0.0072	
SiO2	9.99	14.16	0.0276	
SnO2	25.42	14.37	0.1692	
Fe2O3	1.55	0.83	0.0096	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
N K	101.51	20.08	3.73	5.06
FeL	24.74	38.13	12.93	0.65
MgK	385.42	64.79	1.87	5.95
AlK	63.17	58.81	6.78	1.07
SiK	224.7	54.35	2.59	4.13
SnL	363.31	34.88	1.82	10.42
FeK	22.21	9.73	9.26	2.28

H:\MDUGGAN\New Folder\Albin__0015.spc				
Acquisition Time:11:36:53	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	48.1	44.13	0.1861	
Cl2O	51.9	55.87	0.3536	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	21.67	16.8	8.86	1.29
ClK	31.07	8.87	5.81	3.5

H:\MDUGGAN\New Folder\Albin__0016.spc				
Acquisition Time:11:37:34	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	41.28	56.85	0.0186	
PtO	1.98	0.57	0.0153	
SO2	37.17	35.16	0.1574	
Fe2O3	19.56	7.42	0.1198	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	38.6	8	4.94	4.82
PtM	29.93	46.2	9.54	0.65
S K	976.8	39.87	0.86	24.5
FeK	244.67	10.67	1.72	22.94

H:\MDUGGAN\New Folder\Albin__0016.spc				
Acquisition Time:11:37:34	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	41.28	56.85	0.0186	
PtO	1.98	0.57	0.0153	
SO2	37.17	35.16	0.1574	
Fe2O3	19.56	7.42	0.1198	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	38.6	8	4.94	4.82
PtM	29.93	46.2	9.54	0.65
S K	976.8	39.87	0.86	24.5
FeK	244.67	10.67	1.72	22.94
H:\MDUGGAN\New Folder\Albin__0018.spc				
Acquisition Time:11:43:23	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	56.11	79.78	0.0471	
Al2O3	1.43	0.88	0.0036	
Fe2O3	36.39	14.26	0.2306	
NiO	6.07	5.08	0.0417	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	57.13	4.53	3.68	12.6
AlK	16.13	29.33	13.84	0.55
FeK	275.27	9.6	1.61	28.67
NiK	35.4	6.4	5.06	5.53

H:\MDUGGAN\New Folder\Albin__0019.spc				
Acquisition Time:11:44:46	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	52.15	78.88	0.0438	
Fe2O3	45.38	18.92	0.2862	
NiO	2.47	2.2	0.0169	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	53.73	5	3.84	10.75
FeK	345.47	8.2	1.42	42.13
NiK	14.53	5.33	8.92	2.73
H:\MDUGGAN\New Folder\Albin__0020.spc				
Acquisition Time:11:45:55	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	19.22	6.63	0.0451	
MgO	46.46	63.48	0.138	
SiO2	31.58	28.95	0.0822	
Fe2O3	2.74	0.94	0.0169	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	51.6	22	4.89	2.35
MgK	1067.27	29	0.81	36.8
SiK	585.93	21.53	1.11	27.21
FeK	34.33	2.6	4.73	13.21

H:\MDUGGAN\New Folder\Albin__0020.spc				
Acquisition Time:11:45:55	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	19.22	6.63	0.0451	
MgO	46.46	63.48	0.138	
SiO2	31.58	28.95	0.0822	
Fe2O3	2.74	0.94	0.0169	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	51.6	22	4.89	2.35
MgK	1067.27	29	0.81	36.8
SiK	585.93	21.53	1.11	27.21
FeK	34.33	2.6	4.73	13.21

H:\MDUGGAN\New Folder\Albin__0020.spc				
Acquisition Time:11:45:55	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	19.22	6.63	0.0451	
MgO	46.46	63.48	0.138	
SiO2	31.58	28.95	0.0822	
Fe2O3	2.74	0.94	0.0169	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	51.6	22	4.89	2.35
MgK	1067.27	29	0.81	36.8
SiK	585.93	21.53	1.11	27.21
FeK	34.33	2.6	4.73	13.21
H:\MDUGGAN\New Folder\Albin__0023.spc				
Acquisition Time:11:49:39	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :14		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	49.81	75.12	0.0367	
SO2	6.47	6.71	0.0266	
Fe2O3	43.72	18.17	0.273	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	55.44	7.68	3.94	7.22
S K	120.37	42.57	3.09	2.83
FeK	406.57	8.35	1.31	48.68

H:\MDUGGAN\New Folder\Albin__0024.spc				
Acquisition Time:11:50:31	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	82.1	82.1	0.2686	
Fe2O3	17.9	17.9	0.1189	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	310.53	18	1.55	17.25
FeK	243.87	9.6	1.72	25.4

H:\MDUGGAN\New Folder\Albin__0024.spc				
Acquisition Time:11:50:31	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	82.1	82.1	0.2686	
Fe2O3	17.9	17.9	0.1189	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	310.53	18	1.55	17.25
FeK	243.87	9.6	1.72	25.4

H:\MDUGGAN\New Folder\Albin__0024.spc				
Acquisition Time:11:50:31	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	82.1	82.1	0.2686	
Fe2O3	17.9	17.9	0.1189	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	310.53	18	1.55	17.25
FeK	243.87	9.6	1.72	25.4

H:\MDUGGAN\New Folder\Albin__0024.spc				
Acquisition Time:11:50:31	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	82.1	82.1	0.2686	
Fe2O3	17.9	17.9	0.1189	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	310.53	18	1.55	17.25
FeK	243.87	9.6	1.72	25.4

H:\MDUGGAN\New Folder\Albin__0028.spc				
Acquisition Time:11:57:10	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	77.99	72.1	0.2467	
SiO2	4.93	12.11	0.0124	
Fe2O3	17.08	15.79	0.1128	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	250.13	16.67	1.74	15.01
SiK	78.07	39	4.13	2
FeK	202.93	7.87	1.88	25.8

H:\MDUGGAN\New Folder\Albin__0029.spc				
Acquisition Time:11:58:15	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Cl2O	100	100	0.7909	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
ClK	42.07	15.2	5.22	2.77

H:\MDUGGAN\New Folder\Albin__0029.spc				
Acquisition Time:11:58:15	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Cl2O	100	100	0.7909	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
ClK	42.07	15.2	5.22	2.77

H:\MDUGGAN\New Folder\Brahin__0001.spc				
Acquisition Time:12:17:00	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	15.4	5.22	0.0355	
MgO	46.99	63.05	0.1443	
Al2O3	1.03	0.55	0.0023	
SiO2	33.47	30.13	0.0876	
Fe2O3	3.11	1.05	0.0192	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	15.67	9.4	9.68	1.67
MgK	430.13	16.47	1.29	26.12
AlK	6.8	18.4	25.07	0.37
SiK	240.47	15.67	1.77	15.35
FeK	15	2.27	7.61	6.62

H:\MDUGGAN\New Folder\Brahin__0002.spc				
Acquisition Time:12:22:26	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	49.41	77.05	0.0408	
Fe2O3	48.1	20.67	0.3041	
NiO	2.49	2.28	0.0171	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	44.13	5.67	4.36	7.79
FeK	324	9.53	1.48	33.99
NiK	12.93	5.93	9.94	2.18
H:\MDUGGAN\New Folder\Brahin__0003.spc				
Acquisition Time:12:23:20	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	50.18	77.54	0.0416	
Fe2O3	47.26	20.12	0.2986	
NiO	2.56	2.33	0.0176	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	45.33	4.8	4.22	9.44
FeK	320.27	9.6	1.49	33.36
NiK	13.4	5.33	9.45	2.51

H:\MDUGGAN\New Folder\Brahin__0003.spc				
Acquisition Time:12:23:20	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	50.18	77.54	0.0416	
Fe2O3	47.26	20.12	0.2986	
NiO	2.56	2.33	0.0176	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	45.33	4.8	4.22	9.44
FeK	320.27	9.6	1.49	33.36
NiK	13.4	5.33	9.45	2.51
H:\MDUGGAN\New Folder\Brahin__0005.spc				
Acquisition Time:12:29:19	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO2	66.44	83.15	0.2859	
Fe2O3	33.56	16.85	0.2077	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	1121.53	42.67	0.8	26.29
FeK	268.07	10.87	1.64	24.67

H:\MDUGGAN\New Folder\Brahin__0006.spc				
Acquisition Time:12:31:05	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	54	64.89	0.1939	
SiO2	42.08	33.93	0.1133	
Fe2O3	3.91	1.19	0.0238	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	891.73	31.4	0.89	28.4
SiK	479.87	23.13	1.23	20.74
FeK	28.73	2.13	5.16	13.47
H:\MDUGGAN\New Folder\Brahin__0007.spc				
Acquisition Time:12:31:58	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO2	36.34	58.73	0.1483	
Fe2O3	63.66	41.27	0.4063	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	186.53	30.07	2.17	6.2
FeK	168.2	6.8	2.07	24.74

H:\MDUGGAN\New Folder\Brahin__0008.spc				
Acquisition Time:12:33:12	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
P2O5	48.51	43.17	0.1489	
Fe2O3	33.59	26.57	0.2214	
NiO	17.9	30.26	0.1263	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
P K	440.53	39.27	1.34	11.22
FeK	206.07	8.53	1.87	24.15
NiK	83.6	5.33	3	15.67
H:\MDUGGAN\New Folder\Brahin__0009.spc				
Acquisition Time:12:37:00	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	48.33	61.03	0.1727	
Al2O3	7.45	3.72	0.0179	
SiO2	40.03	33.92	0.1063	
Fe2O3	4.18	1.33	0.0254	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	563.73	36.93	1.16	15.26
AlK	57.93	37.2	5.13	1.56
SiK	319.67	25.87	1.56	12.36
FeK	21.8	1.13	5.81	19.24

H:\MDUGGAN\New Folder\Brahin__0010.spc				
Acquisition Time:12:38:18	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
K2O	0.48	0.78	0.0038	
Fe2O3	95.9	91.81	0.6393	
NiO	3.62	7.41	0.0252	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
K K	2.93	14.6	49.9	0.2
FeK	206.67	5.67	1.84	36.47
NiK	5.8	7.2	20.01	0.81
H:\MDUGGAN\New Folder\Brahin__0011.spc				
Acquisition Time:12:39:03	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	53.99	64.78	0.1945	
SiO2	42.39	34.12	0.1143	
Fe2O3	3.62	1.1	0.022	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1123.53	43.67	0.8	25.73
SiK	608.07	33.6	1.1	18.1
FeK	33.4	3.2	4.88	10.44

H:\MDUGGAN\New Folder\Brahin__0012.spc				
Acquisition Time:12:40:19	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
P2O5	6.54	6.99	0.0184	
Fe2O3	89.68	85.31	0.5947	
NiO	3.79	7.7	0.0264	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
P K	17.47	29.13	12.86	0.6
FeK	177.47	6.8	2.01	26.1
NiK	5.6	4.8	17.98	1.17
H:\MDUGGAN\New Folder\Brahin__0013.spc				
Acquisition Time:12:41:30	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
N2O5	90.81	85.02	0.1518	
MgO	2.52	6.32	0.0069	
Al2O3	3.72	3.69	0.0112	
SiO2	2.95	4.97	0.0096	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
N K	86.73	5.13	2.93	16.9
MgK	11.72	21	16.15	0.56
AlK	18.76	20.73	10.68	0.9
SiK	14.93	17.33	12.18	0.86

H:\MDUGGAN\New Folder\Brahin__0014.spc				
Acquisition Time:12:43:15	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	7.07	23.06	0.0125	
P2O5	4.46	4.13	0.0124	
Fe2O3	88.47	72.81	0.581	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	18	32.73	13.11	0.55
P K	14.93	31.8	15.32	0.47
FeK	219.2	7.47	1.8	29.36
H:\MDUGGAN\New Folder\Brahin__0015.spc				
Acquisition Time:12:44:25	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	86.5	80.36	0.2648	
Al2O3	13.5	19.64	0.0292	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	31	15.13	6.52	2.05
AlK	22.87	27.53	9.97	0.83

H:\MDUGGAN\New Folder\Brahin__0016.spc				
Acquisition Time:12:45:57	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	5.6	8.5	0.0116	
Fe2O3	94.4	91.5	0.6238	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	16.4	28.67	13.52	0.57
FeK	233.33	7.47	1.74	31.25
H:\MDUGGAN\New Folder\Brahin__0017.spc				
Acquisition Time:12:47:01	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	3.41	4.22	0.0084	
P2O5	46.65	41.44	0.142	
Fe2O3	33.32	26.31	0.2189	
NiO	16.61	28.03	0.1171	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	27	43.27	10.19	0.62
P K	384	42.6	1.46	9.01
FeK	186.27	8.93	1.98	20.85
NiK	70.87	5.33	3.29	13.29

H:\MDUGGAN\New Folder\Brahin__0018.spc				
Acquisition Time:12:49:01	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	17.44	38.17	0.048	
Al2O3	51.88	44.89	0.1368	
Fe2O3	30.68	16.95	0.1925	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	27.4	32.27	9.04	0.85
AlK	77.27	34.4	4.04	2.25
FeK	28.87	1.47	5.04	19.68
H:\MDUGGAN\New Folder\Brahin__0019.spc				
Acquisition Time:12:50:23	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	47.45	20.37	0.125	
MgO	35.13	59.75	0.0832	
SiO2	17.43	19.88	0.0436	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	123.87	20.2	2.67	6.13
MgK	557.73	30.8	1.15	18.11
SiK	269.07	19.6	1.68	13.73

H:\MDUGGAN\New Folder\Brahin__0020.spc				
Acquisition Time:12:51:43	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	20.8	7.21	0.0486	
MgO	45.81	62.9	0.1376	
Al2O3	2.29	1.25	0.0051	
SiO2	31.09	28.64	0.0806	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	38.93	22.2	6.05	1.75
MgK	746.13	35.87	0.99	20.8
AlK	27.4	37.33	9.52	0.73
SiK	402.2	29.27	1.38	13.74
H:\MDUGGAN\New Folder\Brahin__0021.spc				
Acquisition Time:12:52:48	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	54.59	65.12	0.1983	
SiO2	42.47	33.99	0.1145	
Fe2O3	2.93	0.88	0.0178	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	822.27	34.47	0.94	23.86
SiK	437.07	25.8	1.31	16.94
FeK	19.4	1.6	6.33	12.12

H:\MDUGGAN\New Folder\Brahin__0022.spc				
Acquisition Time:12:55:50	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	56.86	52.9	0.2202	
Cl2O	43.14	47.1	0.2862	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	17.8	16	10.24	1.11
ClK	17.47	8.67	8.72	2.02

F:\SEM DATA\Brenham__0001.spc				
Acquisition Time:16:58:46	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :17		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
CO2	13.42	35.99	0.0133	
Fe2O3	86.58	64.01	0.5525	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	50.8	6.02	3.72	8.44
FeK	440.82	10.16	1.16	43.39

F:\SEM DATA\Brenham__0002.spc				
Acquisition Time:17:01:49	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :46		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.72	61.66	0.216	
SiO2	39.38	34.14	0.143	
Fe2O3	12.9	4.21	0.0763	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	819.82	25.94	0.53	31.61
SiK	450.7	20.7	0.72	21.77
FeK	28.11	3.08	3.04	9.14

F:\SEM DATA\Brenham__0003.spc				
Acquisition Time:17:06:50	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :36		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.84	61.58	0.2178	
Al2O3	0.75	0.38	0.0026	
SiO2	39.63	34.22	0.1437	
Fe2O3	11.78	3.83	0.0696	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	882.29	28.02	0.57	31.49
AlK	10	24.93	12.74	0.4
SiK	483.77	22.9	0.78	21.13
FeK	27.4	3.47	3.52	7.9
F:\SEM DATA\Brenham__0004.spc				
Acquisition Time:17:09:08	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :62		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	50.07	66.67	0.186	
Fe2O3	49.93	33.33	0.3066	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	1066.27	39.85	0.4	26.76
FeK	261.76	9.65	0.81	27.12

F:\SEM DATA\Brenham__0005.spc				
Acquisition Time:17:13:09	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :23		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	31.6	48.69	0.0992	
P2O5	22.26	18.05	0.0811	
Fe2O3	46.13	33.25	0.3061	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	326.25	24.45	1.24	13.34
P K	467.47	42.72	1.05	10.94
FeK	239.13	12.21	1.41	19.59

F:\SEM DATA\Brenham__0006.spc				
Acquisition Time:17:15:21	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :81		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
P2O5	12.78	14.15	0.0473	
Fe2O3	87.22	85.85	0.5607	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
P K	113.32	36.63	1.34	3.09
FeK	181.97	8.14	0.86	22.37
F:\SEM DATA\Brenham__0007.spc				
Acquisition Time:17:18:10	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :30		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	31.23	48.3	0.0971	
P2O5	21.49	17.49	0.0783	
Fe2O3	47.28	34.21	0.3136	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	322.41	26.78	1.09	12.04
P K	455.35	57.64	0.95	7.9
FeK	247.31	10.87	1.2	22.75

F:\SEM DATA\Brenham__0008.spc				
Acquisition Time:17:19:00	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :18		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	20.58	35.42	0.0519	
Al2O3	0.88	1.12	0.003	
P2O5	2.26	2.05	0.0082	
Fe2O3	76.27	61.41	0.5064	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	93.36	18.65	2.87	5.01
AlK	12.27	33.56	17.03	0.37
P K	25.86	32.68	8.66	0.79
FeK	216.22	9.13	1.66	23.67

F:\SEM DATA\Brenham__0009.spc				
Acquisition Time:17:21:10	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :28		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	433.21	11.45	0.92	37.83

F:\SEM DATA\Brenham__0010.spc				
Acquisition Time:17:23:22	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :34		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	19.26	32.6	0.0541	
Al2O3	3.16	3.91	0.0111	
P2O5	20.78	18.51	0.076	
Fe2O3	56.81	44.98	0.3695	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	30.32	15.21	4.35	1.99
AlK	14.27	16.82	8.2	0.85
P K	74.64	19.42	2.41	3.84
FeK	49.19	5.35	2.66	9.2

F:\SEM DATA\Brenham__0011.spc				
Acquisition Time:17:26:08	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :50		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	38.04	56.66	0.1604	
Al2O3	2.7	1.59	0.0095	
SiO2	31.25	31.22	0.113	
Fe2O3	28.01	10.53	0.1683	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	400.89	34.42	0.76	11.65
AlK	22.28	29.3	5.7	0.76
SiK	234.75	28.6	1.03	8.21
FeK	40.88	3.51	2.39	11.65
F:\SEM DATA\Brenham__0012.spc				
Acquisition Time:17:28:47	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :27		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	2.11	3.27	0.0073	
Fe2O3	97.89	96.73	0.6368	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	24.09	38.05	7.99	0.63
FeK	218.29	6.02	1.34	36.25

F:\SEM DATA\Brenham__0013.spc				
Acquisition Time:17:30:04	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :28		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	4.72	6.55	0.0131	
Al2O3	0.53	0.54	0.002	
SO3	48.71	63.04	0.1804	
Fe2O3	46.04	29.87	0.2848	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	46.92	22.99	3.85	2.04
AlK	16.39	40.88	11.32	0.4
S K	1034.04	37.2	0.6	27.8
FeK	243.12	9.3	1.25	26.14

F:\SEM DATA\Brenham__0014.spc				
Acquisition Time:17:31:55	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :18		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.44	61.36	0.2147	
SiO2	39.68	34.43	0.1441	
Fe2O3	12.87	4.2	0.0761	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1113.3	38.55	0.73	28.88
SiK	620.83	31.14	0.99	19.94
FeK	38.33	3.68	4.13	10.42

F:\SEM DATA\Brenham__0015.spc				
Acquisition Time:17:35:55	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :19		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	238.45	5.27	1.48	45.22

F:\SEM DATA\Brenham__0016.spc				
Acquisition Time:17:37:03	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :17		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	296.05	6.73	1.42	43.98
F:\SEM DATA\Brenham__0017.spc				
Acquisition Time:17:40:04	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :22		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
TiO2	47.66	61.81	0.282	
Fe2O3	4.11	2.67	0.0084	
Al2O3	7.16	7.28	0.0283	
SnO2	41.07	28.25	0.2743	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
TiL	237.87	13.31	1.45	17.88
FeL	19.47	26.62	9.29	0.73
AlK	270.83	51.25	1.51	5.28
SnL	509.01	33.18	1	15.34

F:\SEM DATA\Brenham__0018.spc				
Acquisition Time:17:42:20	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :17		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.99	61.85	0.2175	
SiO2	39.37	34.04	0.1428	
Fe2O3	12.65	4.11	0.0748	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1118.5	35.91	0.73	31.15
SiK	610.25	33.35	1.01	18.3
FeK	37.35	2.89	4.15	12.92
F:\SEM DATA\Brenham__0019.spc				
Acquisition Time:17:43:38	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :14		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.33	61.24	0.2142	
SiO2	39.81	34.56	0.1447	
Fe2O3	12.86	4.2	0.0761	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1102.17	44.07	0.81	25.01
SiK	618.32	30.36	1.09	20.37
FeK	38.02	3.22	4.55	11.79

F:\SEM DATA\Brenham__0020.spc				
Acquisition Time:17:45:11	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :16		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Cl2O	100	100	0.7942	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
ClK	58.33	10.99	3.82	5.31
F:\SEM DATA\Brenham__0021.spc				
Acquisition Time:17:46:34	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :9		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.41	61.42	0.2143	
SiO2	39.43	34.27	0.1432	
Fe2O3	13.16	4.3	0.0779	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1085.53	41.88	1.02	25.92
SiK	602.6	27.22	1.38	22.14
FeK	38.32	1.68	5.45	22.87

F:\SEM DATA\Brenham__0022.spc				
Acquisition Time:17:48:46	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :33		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	0.8	1.25	0.0028	
Fe2O3	99.2	98.75	0.6462	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	9.15	30.15	15.62	0.3
FeK	222.17	6.12	1.18	36.31

F:\SEM DATA\Brenham__0023.spc				
Acquisition Time:17:50:25	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :16		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	0.77	0.86	0.0028	
P2O5	0.79	0.64	0.003	
SO3	39.55	56.4	0.1465	
Fe2O3	58.89	42.11	0.3655	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	17.78	39.64	13.58	0.45
P K	14.3	41.26	16.87	0.35
S K	637.22	35.68	1.02	17.86
FeK	236.71	7.69	1.64	30.79

F:\SEM DATA\Brenham__0024.spc				
Acquisition Time:17:51:30	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :22		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	46.78	60.98	0.2108	
SiO2	39.44	34.49	0.1433	
Fe2O3	13.78	4.53	0.0816	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1112.61	35.97	0.65	30.93
SiK	628.4	31	0.88	20.27
FeK	41.82	2.81	3.45	14.86
F:\SEM DATA\Brenham__0025.spc				
Acquisition Time:17:53:24	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :9		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	49.25	65.94	0.183	
Fe2O3	50.75	34.06	0.3119	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	1104.45	34.71	1	31.82
FeK	280.4	8.27	1.98	33.93

F:\SEM DATA\9th May\esquel__0001.spc				
Acquisition Time:13:52:48	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :45		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	17.87	6.09	0.0568	
MgO	45.48	61.42	0.2013	
Al2O3	1.94	1.03	0.0068	
SiO2	34.71	31.45	0.1252	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	3.02	0.67	10.29	4.53
MgK	47	1.33	2.23	35.32
AlK	1.49	1.33	20.41	1.12
SiK	24.29	1.18	3.16	20.66
F:\SEM DATA\9th May\esquel__0002.spc				
Acquisition Time:13:58:27	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :36		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	49.94	61.1	0.2355	
SiO2	45.79	37.59	0.1673	
Fe2O3	4.27	1.32	0.025	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	42.59	1.46	2.63	29.25
SiK	25.14	0.77	3.41	32.68
FeK	0.44	0.44	43.3	1

F:\SEM DATA\9th May\esquel__0003.spc				
Acquisition Time:00:00:00	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :40		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
P2O5	2	2.24	0.0074	
Fe2O3	98	97.76	0.6375	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
P K	0.89	1.36	33.56	0.65
FeK	10.45	0.4	5.04	26.44
F:\SEM DATA\9th May\esquel__0004.spc				
Acquisition Time:14:02:51	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :172		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	39.69	50.76	0.1503	
Fe2O3	60.31	49.24	0.3777	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	11.29	0.7	2.4	16.23
FeK	2.94	0.09	4.58	31.69

F:\SEM DATA\9th May\esquel__0006.spc				
Acquisition Time:14:10:45	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :47		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	3.16	10.76	0.0106	
Al2O3	12.37	16.65	0.0435	
Fe2O3	84.46	72.58	0.5416	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	0.74	1.69	39.9	0.44
AlK	2.85	1.69	12.72	1.69
FeK	3.68	0.34	8.25	10.87

F:\SEM DATA\9th May\esquel__0007.spc				
Acquisition Time:14:17:52	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :115		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	1.02	1.09	0.0038	
SiO2	0.89	1.61	0.0034	
SO3	45.39	61.5	0.1682	
Fe2O3	52.7	35.8	0.3247	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	0.71	1.54	25.52	0.46
SiK	0.56	1.91	34.64	0.29
S K	21.6	1.39	2.13	15.51
FeK	6.21	0.14	3.81	44.88
F:\SEM DATA\9th May\esquel__0008.spc				
Acquisition Time:14:20:21	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :93		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	60.98	75.71	0.2268	
Fe2O3	39.02	24.29	0.2367	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	35.88	1.34	1.79	26.71
FeK	5.58	0.17	4.5	32.69

F:\SEM DATA\9th May\esquel__0009.spc				
Acquisition Time:14:22:59	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :70		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	9.07	0.23	4.04	40.25

F:\SEM DATA\9th May\esquel__0010.spc				
Acquisition Time:14:25:25	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :116		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	17.43	5.88	0.0552	
MgO	45.81	61.18	0.2029	
SiO2	36.76	32.94	0.1332	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	2.8	0.65	6.71	4.33
MgK	45.24	1.12	1.41	40.41
SiK	24.68	1.11	1.95	22.21

F:\SEM DATA\9th May\esquel__0012.spc				
Acquisition Time:14:29:45	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :77		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	16.12	28.78	0.0387	
SiO2	0.84	1.86	0.003	
Fe2O3	83.04	69.35	0.5496	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	2.92	1.41	9.32	2.07
SiK	0.46	1.85	49.85	0.25
FeK	9.85	0.21	3.7	47.69

F:\SEM DATA\9th May\esquel__0014.spc				
Acquisition Time:14:36:52	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :116		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	18.48	7.91	0.0562	
NiO	2.17	1.99	0.0077	
MgO	28.99	49.17	0.1215	
Al2O3	17.82	11.95	0.0651	
SiO2	20.77	23.64	0.0741	
SnO2	11.77	5.34	0.0702	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	2.82	1.16	7.43	2.44
NiL	0.69	1.56	26.04	0.45
MgK	26.79	1.97	1.91	13.61
AlK	13.45	1.87	2.85	7.21
SiK	13.58	1.65	2.8	8.22
SnL	2.82	0.33	6.13	8.44

F:\SEM DATA\9th May\esquel__0015.spc				
Acquisition Time:14:39:33	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :107		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	19.82	34	0.0492	
SiO2	1.23	2.62	0.0044	
Fe2O3	78.95	63.37	0.5246	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	3.8	0.97	6.07	3.9
SiK	0.69	1.63	27.55	0.43
FeK	9.62	0.15	3.15	64.94
F:\SEM DATA\9th May\esquel__0016.spc				
Acquisition Time:14:41:57	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :128		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	51.8	68.19	0.1925	
Fe2O3	48.2	31.81	0.2954	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	26.96	1.77	1.81	15.2
FeK	6.16	0.2	3.67	30.46

F:\SEM DATA\9th May\esquel__0017.spc				
Acquisition Time:14:44:48	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :90		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	48.45	65.21	0.18	
Fe2O3	51.55	34.79	0.3172	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	21.63	1.25	2.39	17.27
FeK	5.68	0.18	4.56	32
F:\SEM DATA\9th May\esquel__0019.spc				
Acquisition Time:14:53:28	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :76		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	41.94	51.2	0.1506	
SO3	27.53	31.36	0.0999	
Fe2O3	30.54	17.44	0.205	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	16.11	1.62	3.12	9.95
S K	17.05	1.72	3.03	9.89
FeK	5.21	0.21	5.2	24.94

F:\SEM DATA\9th May\esquel__0020.spc				
Acquisition Time:14:55:17	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :67		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	62.53	76.9	0.2327	
Fe2O3	37.47	23.1	0.2269	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	38.45	1.07	2.02	35.86
FeK	5.58	0.24	5.38	23.44
F:\SEM DATA\9th May\esquel__0021.spc				
Acquisition Time:14:57:20	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :237		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	55.47	71.3	0.2062	
Fe2O3	44.53	28.7	0.2718	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	30.61	1.6	1.23	19.16
FeK	6.01	0.24	2.75	25.07

F:\SEM DATA\9th May\esquel__0023.spc				
Acquisition Time:15:13:02	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :182		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	50.65	62.5	0.2366	
SiO2	42.86	35.48	0.1558	
Fe2O3	6.48	2.02	0.0381	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	31.91	0.82	1.34	38.78
SiK	17.46	0.69	1.84	25.26
FeK	0.5	0.09	12.19	5.69
F:\SEM DATA\9th May\esquel__0025.spc				
Acquisition Time:15:22:33	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :42		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	100	100	0.4524	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	12.69	0.71	4.55	17.9

F:\SEM DATA\9th May\esquel__0026.spc				
Acquisition Time:15:23:46	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :164		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	11.48	23.62	0.0561	
Al2O3	80.75	65.66	0.3462	
SiO2	7.77	10.72	0.0254	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	3.81	1.04	4.96	3.65
AlK	22.04	1.02	1.73	21.61
SiK	1.43	0.93	9.88	1.53

H:\MDUGGAN\New Folder\Glorieta__0001.spØ ▯				
Acquisition Time:13:12:17	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	94.89	89.68	0.6341	
NiO	5.11	10.32	0.0356	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	383.53	11.67	1.36	32.87
NiK	15.33	6.73	9.04	2.28

H:\MDUGGAN\New Folder\Glorieta__0002.spØ ▯				
Acquisition Time:13:13:19	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	79.06	63.85	0.5405	
NiO	20.94	36.15	0.1482	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	312.8	10.93	1.51	28.61
NiK	61	6.4	3.64	9.53
H:\MDUGGAN\New Folder\Glorieta__0003.spØ ▯				
Acquisition Time:13:14:12	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	75.65	59.24	0.52	
NiO	24.35	40.76	0.1729	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	197.07	6.8	1.9	28.98
NiK	46.6	3.93	4.09	11.85

H:\MDUGGAN\New Folder\Glorieta__0004.spØ ▯				
Acquisition Time:13:17:29	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	54.7	65.37	0.1979	
SiO2	41.94	33.62	0.1127	
Fe2O3	3.36	1.01	0.0204	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1054.67	33.67	0.82	31.33
SiK	553.47	26.13	1.15	21.18
FeK	28.6	3.2	5.34	8.94
H:\MDUGGAN\New Folder\Glorieta__0005.spØ ▯				
Acquisition Time:13:19:04	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	9.93	27.96	0.0331	
P2O5	90.07	72.04	0.3201	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	57.47	30.93	4.91	1.86
P K	464.13	28.33	1.27	16.38

H:\MDUGGAN\New Folder\Glorieta__0006.spØ ▯				
Acquisition Time:13:20:16	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	30.44	53.31	0.0998	
P2O5	52.06	25.89	0.1662	
CaO	16	20.14	0.1022	
Fe2O3	1.5	0.66	0.0091	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	150.67	18.8	2.35	8.01
P K	209.47	12.6	1.89	16.62
CaK	88.4	3.93	2.87	22.47
FeK	3.6	1.27	17.76	2.84

H:\MDUGGAN\New Folder\Glorieta__0007.spØ ▯				
Acquisition Time:13:21:33	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	16.42	5.44	0.0376	
MgO	48.58	63.75	0.1525	
SiO2	34.99	30.81	0.0921	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	17.87	17.07	10.42	1.05
MgK	490	19.8	1.21	24.75
SiK	272.73	12.13	1.63	22.48

H:\MDUGGAN\New Folder\Glorieta__0008.spØ ▯				
Acquisition Time:13:22:39	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	8.33	6.76	0.0237	
P2O5	5.13	2.99	0.0167	
SO2	55.07	71.06	0.2251	
Fe2O3	26.53	13.73	0.166	
NiO	4.94	5.46	0.0343	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	63.13	30.07	4.54	2.1
P K	37.53	23.87	6.35	1.57
S K	484.53	20.47	1.22	23.67
FeK	117.6	4.53	2.47	25.94
NiK	17.27	2.4	7.02	7.19
H:\MDUGGAN\New Folder\Glorieta__0009.spØ ▯				
Acquisition Time:13:24:26	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	21.76	27.75	0.0509	
SiO2	6.32	13.69	0.0153	
Fe2O3	71.92	58.57	0.466	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	102.67	35.47	3.31	2.89
SiK	28.87	37.47	9.11	0.77
FeK	249.8	7.13	1.68	35.02

H:\MDUGGAN\New Folder\Glorieta__0010.spØ				
Acquisition Time:13:25:58	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO_2	67.02	81.03	0.2866	
Fe_2O_3	27.58	13.38	0.1724	
NiO	5.39	5.59	0.0374	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	940.87	36.07	0.87	26.09
FeK	186.33	9.87	1.99	18.89
NiK	28.73	6.13	5.75	4.68

H:\MDUGGAN\New Folder\Glorieta__0011.spØ				
Acquisition Time:13:27:26	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe_2O_3	100	100	0.6639	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	269	10.67	1.64	25.22

H:\MDUGGAN\New Folder\Glorieta__0012.spØ ‖				
Acquisition Time:13:29:14	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	49.95	62.54	0.177	
Al2O3	5.62	2.78	0.0133	
SiO2	39.39	33.08	0.1044	
Fe2O3	5.05	1.59	0.0307	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	741.4	29.13	0.98	25.45
AlK	55.07	27.4	4.91	2.01
SiK	402.8	22.67	1.36	17.77
FeK	33.8	2.13	4.71	15.84
H:\MDUGGAN\New Folder\Glorieta__0013.spØ ‖				
Acquisition Time:13:30:21	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO2	6.23	14.21	0.0242	
Fe2O3	93.77	85.79	0.6182	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	24.33	27.4	9.44	0.89
FeK	204.47	6.4	1.86	31.95

H:\MDUGGAN\New Folder\Glorieta__0014.spØ ₿				
Acquisition Time:13:31:38	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	48.24	61.16	0.1721	
Al2O3	8.2	4.11	0.0197	
SiO2	39.18	33.33	0.1035	
Fe2O3	4.38	1.4	0.0267	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	864.67	42.13	0.92	20.52
AlK	98.07	37.6	3.47	2.61
SiK	479.27	30.6	1.25	15.66
FeK	35.2	3.2	4.73	11
H:\MDUGGAN\New Folder\Glorieta__0016.spØ ₿				
Acquisition Time:13:35:21	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Cl2O	100	100	0.7909	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
ClK	26.53	9.8	6.61	2.71

H:\MDUGGAN\New Folder\Glorieta__0017.spØ ▯				
Acquisition Time:13:36:33	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	53.38	64.45	0.1906	
SiO2	42.25	34.22	0.1139	
Fe2O3	4.37	1.33	0.0266	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1094.13	36.27	0.81	30.17
SiK	602.4	31.2	1.11	19.31
FeK	40.07	3.27	4.4	12.27
H:\MDUGGAN\New Folder\Glorieta__0018.spØ ▯				
Acquisition Time:13:37:38	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	93.94	87.88	0.6285	
NiO	6.06	12.12	0.0423	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	372.93	8.73	1.37	42.7
NiK	17.87	5.33	7.72	3.35

H:\MDUGGAN\New Folder\Glorieta__0019.spØ ₿				
Acquisition Time:13:39:01	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	78.89	63.62	0.5394	
NiO	21.11	36.38	0.1494	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	279.53	8.93	1.59	31.29
NiK	55.07	5.33	3.8	10.32
H:\MDUGGAN\New Folder\Glorieta__0020.spØ ₿				
Acquisition Time:13:40:12	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	35.97	49.76	0.0741	
Al2O3	8.64	8.76	0.0172	
SiO2	5.26	9.05	0.0121	
Fe2O3	50.12	32.43	0.3498	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	43.87	18.33	5.28	2.39
AlK	34.67	28.67	7.14	1.21
SiK	22.8	30.47	10.36	0.75
FeK	187.33	6.47	1.95	28.97

H:\MDUGGAN\New Folder\Glorieta__0021.spØ ▯				
Acquisition Time:13:41:19	Date:15-May-2017			
kV:20.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	9.83	11.85	0.0232	
SiO2	14.17	28.99	0.0371	
P2O5	7	6.06	0.0189	
Fe2O3	68.99	53.1	0.4449	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	38.33	31.33	6.77	1.22
SiK	57.13	33.47	5.03	1.71
P K	26.4	33.6	9.46	0.79
FeK	195.13	7.47	1.92	26.13

F:\SEM DATA\Huckitta__0001.spc				
Acquisition Time:12:46:24	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :6		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	382.15	7.8	2.1	48.98

F:\SEM DATA\Huckitta__0002.spc				
Acquisition Time:12:50:50	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	0.95	3.67	0.003	
Fe2O3	99.05	96.33	0.645	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	13.91	34.13	28.06	0.41
FeK	288.26	2.97	2.56	97.12

F:\SEM DATA\Huckitta__0003.spc				
Acquisition Time:12:52:23	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :18		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	37.99	52.82	0.122	
MgO	1.25	3.21	0.0039	
Al2O3	12.06	12.29	0.0405	
Fe2O3	48.71	31.68	0.3289	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	147.6	14.59	2.11	10.12
MgK	11.46	22.32	15.3	0.51
AlK	112.28	23.97	2.64	4.68
FeK	94.5	5.7	2.55	16.57

F:\SEM DATA\Huckitta__0004.spc				
Acquisition Time:12:54:00	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :19		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	94.55	96.02	0.4679	
CaO	5.45	3.98	0.0357	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	862.75	18.37	0.79	46.97
CaK	24.75	7.73	5.84	3.2

F:\SEM DATA\Huckitta__0005.spc				
Acquisition Time:12:54:57	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :62		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	53.24	68.42	0.1887	
MgO	1.57	3.74	0.0046	
Al2O3	1.53	1.44	0.0049	
P2O5	1.92	1.3	0.0068	
Fe2O3	41.74	25.1	0.2909	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	257.58	18.4	0.84	14
MgK	15.46	30.39	7.15	0.51
AlK	15.44	28.64	6.99	0.54
P K	16.23	31.75	6.96	0.51
FeK	94.35	7.18	1.4	13.13

F:\SEM DATA\Huckitta__0006.spc				
Acquisition Time:12:57:00	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :3		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	23.52	35.15	0.0645	
Na2O	1.26	2.28	0.0034	
MgO	4.57	12.67	0.0144	
P2O5	5.84	4.59	0.021	
Fe2O3	64.8	45.31	0.4284	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	96.06	10.93	6.06	8.79
NaK	12.94	15.82	27.67	0.82
MgK	52.34	18.98	9.74	2.76
P K	54.93	27.32	10.22	2.01
FeK	151.57	4.6	4.49	32.94

F:\SEM DATA\Huckitta__0007.spc				not olivine
Acquisition Time:12:57:35	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	47.3	64.96	0.1531	
Al2O3	0.84	0.85	0.0027	
SiO2	0.82	1.4	0.0029	
Fe2O3	51.04	32.79	0.3524	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	355.8	23.77	2.33	14.97
AlK	14.6	25.97	23.02	0.56
SiK	13.58	28.86	25.62	0.47
FeK	194.53	5.26	3.03	36.97

F:\SEM DATA\Huckitta__0008.spc				
Acquisition Time:12:58:26	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :19		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	48.49	66.25	0.1579	
SO3	0.91	1.16	0.0033	
MnO	0.3	0.44	0.0022	
Fe2O3	50.3	32.15	0.3481	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	374.74	19.77	1.24	18.95
S K	12.48	34.4	16.54	0.36
MnK	1.68	12.48	70.43	0.13
FeK	196.23	10.33	1.72	18.99

F:\SEM DATA\Huckitta__0009.spc				
Acquisition Time:13:02:53	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :7		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	14.75	4.88	0.0462	
MgO	46.67	61.18	0.2093	
SiO2	38.58	33.94	0.1401	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	54.16	16.62	6.22	3.26
MgK	1078.83	26.75	1.12	40.33
SiK	599.61	19.22	1.52	31.2

F:\SEM DATA\Huckitta__0011.spc				
Acquisition Time:13:05:54	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :20		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	3.61	11.73	0.0118	
SiO2	4.42	9.64	0.0163	
SO3	3.82	6.25	0.014	
Fe2O3	88.16	72.38	0.5665	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	45.83	30.62	5.03	1.5
SiK	52.24	30.12	4.53	1.73
S K	35.34	25.95	5.89	1.36
FeK	212.84	6.36	1.57	33.45
F:\SEM DATA\Huckitta__0012.spc				
Acquisition Time:13:10:09	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	412.16	11.36	1.29	36.29

F:\SEM DATA\Huckitta__0013.spc				
Acquisition Time:13:17:37	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :20		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	234.63	6.2	1.5	37.85
F:\SEM DATA\Huckitta__0014.spc				
Acquisition Time:13:19:15	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :19		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	221.31	6.12	1.55	36.16

F:\SEM DATA\Huckitta__0015.spc				also probably not olivine
Acquisition Time:13:21:38	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :33		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	55.45	30.55	0.1599	
SiO2	4.21	6.16	0.0162	
CaO	40.35	63.3	0.2882	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	7.47	1.3	7.32	5.73
SiK	2.76	5.3	22.84	0.52
CaK	22.25	4.03	4.26	5.52

F:\SEM DATA\Huckitta__0016.spc				
Acquisition Time:13:23:49	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :14		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Cl2O	100	100	0.7942	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
ClK	68.76	15.39	3.84	4.47

F:\SEM DATA\Huckitta__0017.spc				
Acquisition Time:13:29:00	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :9		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	1.01	1.83	0.0038	
Cl2O	11.08	18.46	0.0842	
Fe2O3	87.91	79.71	0.5688	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	10.22	31.47	26.76	0.32
ClK	201.1	29.43	2.56	6.83
FeK	227.37	6.54	2.18	34.77

F:\SEM DATA\Huckitta__0018.spc				
Acquisition Time:13:30:52	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :7		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	32.84	48.61	0.1465	
Al2O3	6.38	3.73	0.0238	
SiO2	35.35	35.11	0.1315	
Cl2O	9.75	6.7	0.0678	
Fe2O3	15.67	5.86	0.0935	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	298.18	27.53	2.33	10.83
AlK	45.34	35.06	8.77	1.29
SiK	222.44	30.54	2.8	7.28
ClK	80.13	12.46	4.73	6.43
FeK	18.49	2.33	9.63	7.94

F:\SEM DATA\Huckitta__0019.spc				
Acquisition Time:13:32:26	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	38.31	42.17	0.156	
Cl2O	24.57	31.74	0.1806	
Fe2O3	37.12	26.09	0.2298	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	84.46	15.72	3.24	5.37
ClK	60.49	9.53	3.74	6.34
FeK	12.88	1.1	7.65	11.76
F:\SEM DATA\Huckitta__0020.spc				
Acquisition Time:13:35:04	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :11		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.15	61.41	0.2124	
SiO2	38.92	34.01	0.1413	
Fe2O3	13.93	4.58	0.0825	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	1077	34.97	0.93	30.8
SiK	595.11	28.52	1.28	20.86
FeK	40.62	2.83	4.98	14.38

F:\SEM DATA\Huckitta__0021.spc				
Acquisition Time:13:37:34	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :7		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	19.41	27.77	0.0524	
SiO2	16.5	29.34	0.0605	
Fe2O3	64.09	42.89	0.4187	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	89.76	18.29	4.66	4.91
SiK	210.42	27.43	2.88	7.67
FeK	170.38	4.43	2.92	38.44
F:\SEM DATA\Huckitta__0022.spc				
Acquisition Time:13:38:35	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :20		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	275.85	9.36	1.37	29.48

F:\SEM DATA\Huckitta__0023.spc				
Acquisition Time:13:40:13	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :6		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	14.75	17.87	0.0547	
SiO2	12.21	25.1	0.045	
SnO2	11.76	9.64	0.0739	
Fe2O3	61.27	47.39	0.3918	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	156.39	28.46	3.71	5.49
SiK	114.01	28.46	4.56	4.01
SnL	40.96	14.39	8.11	2.85
FeK	116.07	2.69	3.78	43.18

F:\SEM DATA\Imilac__0001.spc				
Acquisition Time:13:53:07	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :19		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	8.06	9.61	0.0218	
MgO	16.36	36.15	0.0571	
Al2O3	2.55	2.23	0.0087	
SiO2	11.6	17.2	0.0417	
TiO2	0.96	1.07	0.0054	
Fe2O3	60.48	33.74	0.384	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	20.25	7.93	6.71	2.55
MgK	129.69	11.25	2.15	11.53
AlK	18.61	13.35	8.18	1.39
SiK	78.7	12.58	2.93	6.26
TiK	3.22	3.84	23.17	0.84
FeK	84.68	1.74	2.51	48.71

F:\SEM DATA\Imilac__0002.spc				
Acquisition Time:13:56:07	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :17		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	35.49	53.53	0.1516	
Al2O3	7.34	4.38	0.0263	
SiO2	32.2	32.59	0.1163	
Fe2O3	24.96	9.5	0.1496	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	233.23	13.63	1.63	17.11
AlK	37.93	16.85	5.26	2.25
SiK	148.63	13.07	2.1	11.37
FeK	22.36	2.11	5.44	10.58

F:\SEM DATA\Imilac__0003.spc				
Acquisition Time:13:58:43	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :62		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	6.42	12.03	0.0238	
Fe2O3	93.58	87.97	0.6052	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	6.92	3.33	6.73	2.08
FeK	26.22	0.61	2.53	43.16

F:\SEM DATA\Imilac__0004.spc				
Acquisition Time:14:01:08	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :31		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Tm2O3	69.81	47.45	0.4963	
SnO2	30.19	52.55	0.21	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
TmM	67.48	3.52	2.27	19.18
SnL	23.12	2.14	4.01	10.82

F:\SEM DATA\Imilac__0005.spc				
Acquisition Time:14:05:47	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :15		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
TiO2	70.99	70.59	0.4008	
Fe2O3	9.05	4.5	0.0181	
MgO	7.15	14.08	0.0279	
Al2O3	1.32	1.03	0.0051	
SiO2	4.69	6.21	0.0185	
SnO2	6.8	3.58	0.0447	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
TiL	114.16	2.67	2.45	42.69
FeL	14.22	4.96	8.82	2.87
MgK	96.14	13.76	2.95	6.99
AlK	16.49	15.46	10.66	1.07
SiK	53.1	9.85	4.1	5.39
SnL	27.98	2.22	5.2	12.62

F:\SEM DATA\Imilac__0006.spc				
Acquisition Time:14:09:04	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :42		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	6.43	18.39	0.0224	
Al2O3	12.01	13.57	0.0428	
SiO2	5.54	10.62	0.02	
SO3	3.56	5.12	0.0128	
Fe2O3	72.46	52.29	0.4581	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	18.01	10.15	5.27	1.77
AlK	32.23	10.79	3.49	2.99
SiK	13.33	8.03	6.24	1.66
S K	6.71	6.17	9.98	1.09
FeK	35.73	0.52	2.6	68.95

F:\SEM DATA\Imilac__0007.spc				
Acquisition Time:14:11:44	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :22		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	99.46	2.51	2.16	39.65

F:\SEM DATA\Imilac__0008.spc				
Acquisition Time:14:13:49	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :71		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	55.54	1.73	1.63	32.19
F:\SEM DATA\Imilac__0009.spc				
Acquisition Time:14:17:25	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :18		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	64.55	1.04	2.96	62

F:\SEM DATA\Imilac__0011.spc				
Acquisition Time:14:19:58	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :21		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Br2O	100	100	0.869	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
BrL	169.5	5.38	1.72	31.48
F:\SEM DATA\Imilac__0012.spc				
Acquisition Time:14:21:52	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :69		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	18.84	6.43	0.0599	
MgO	44.86	60.65	0.1974	
SiO2	36.3	32.92	0.1316	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	13.91	10.58	5.11	1.31
MgK	201.55	12.27	0.9	16.43
SiK	111.65	8.03	1.22	13.9

F:\SEM DATA\Imilac__0013.spc				
Acquisition Time:14:24:56	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :31		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	49.12	65.82	0.1825	
Fe2O3	50.88	34.18	0.3128	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	125.34	7.72	1.68	16.23
FeK	31.99	0.6	3.19	53.63
F:\SEM DATA\Imilac__0014.spc				
Acquisition Time:14:26:18	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :97		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SiO2	3.07	6.54	0.0115	
SO3	19.66	31.46	0.0726	
Fe2O3	77.27	62	0.4899	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
SiK	0.4	0.15	21.3	2.6
S K	1.98	0.16	7.77	12.06
FeK	1.99	0.19	7.85	10.21

F:\SEM DATA\Imilac__0015.spc				
Acquisition Time:14:28:46	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :54		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	13.91	4.54	0.0436	
MgO	48.8	63.1	0.2201	
SiO2	37.29	32.36	0.1348	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	0.85	0.53	22.17	1.59
MgK	18.78	1.25	3.33	15
SiK	9.55	0.85	4.76	11.28
F:\SEM DATA\Imilac__0016.spc				
Acquisition Time:14:32:02	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :25		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	48.43	65.2	0.1799	
Fe2O3	51.57	34.8	0.3173	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	134.69	5.4	1.79	24.96
FeK	35.37	0.76	3.43	46.58

F:\SEM DATA\Imilac__0017.spc				
Acquisition Time:14:33:31	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :35		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	1.42	3.58	0.0053	
Al2O3	2.9	2.89	0.011	
SiO2	2.84	4.81	0.0109	
SO3	46.52	59.18	0.1713	
Fe2O3	46.33	29.54	0.2835	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	3.28	9.24	24.02	0.35
AlK	6.4	8.16	12.57	0.78
SiK	5.65	6.85	13.15	0.83
S K	69.43	5.62	2.18	12.36
FeK	17.12	0.54	4.21	31.58

F:\SEM DATA\Imilac__0018.spc				
Acquisition Time:14:35:19	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :38		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	1.97	2.09	0.0074	
SO3	47.14	63.53	0.1747	
Fe2O3	50.89	34.38	0.313	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	4.67	7.54	15.37	0.62
S K	76.31	3.94	1.94	19.36
FeK	20.36	0.5	3.67	41.05
F:\SEM DATA\Imilac__0019.spc				
Acquisition Time:14:36:24	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :35		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	23.21	37.61	0.0861	
Fe2O3	76.79	62.39	0.4866	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	39.87	5.71	3.03	6.98
FeK	33.56	0.54	2.96	62.16

F:\SEM DATA\Imilac__0020.spc				
Acquisition Time:14:38:08	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :41		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	47.33	64.19	0.1758	
Fe2O3	52.67	35.81	0.3244	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	23.24	1.27	3.39	18.26
FeK	6.39	0.46	6.55	14

F:\SEM DATA\9th May\NWA__0001.spc				
Acquisition Time:15:46:42	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :63		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	22.84	38.75	0.0578	
Fe2O3	77.16	61.25	0.5152	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	2.96	0.84	9.15	3.53
FeK	6.27	0.25	5.22	24.75

F:\SEM DATA\9th May\NWA__0003.spc				
Acquisition Time:15:50:21	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :102		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	30.03	45.51	0.1453	
Al2O3	39.89	23.9	0.1569	
SiO2	30.08	30.59	0.1045	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	0.8	0.19	13.47	4.1
AlK	0.81	0.19	13.36	4.15
SiK	0.48	0.21	19.68	2.23
F:\SEM DATA\9th May\NWA__0004.spc				
Acquisition Time:15:59:40	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :119		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	23.49	39.62	0.0598	
Fe2O3	76.51	60.38	0.5112	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	2.37	0.99	8.04	2.39
FeK	4.82	0.13	4.28	36.06

F:\SEM DATA\9th May\NWA__0005.spc				
Acquisition Time:16:01:07	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :73		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	35.28	44.1	0.1159	
MgO	4.64	10.75	0.0148	
Al2O3	8.06	7.38	0.0272	
SiO2	7.59	11.79	0.0266	
Fe2O3	44.43	25.98	0.297	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	3.28	1	8.19	3.29
MgK	1.03	1.09	20.44	0.94
AlK	1.77	0.94	12.67	1.87
SiK	1.53	1	14.34	1.53
FeK	2	0.22	9.14	9.12

F:\SEM DATA\9th May\NWA__0006.spc				
Acquisition Time:16:06:49	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :68		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SiO2	1.68	4.2	0.0062	
MnO	2.72	5.76	0.0193	
Fe2O3	95.61	90.04	0.6225	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
SiK	0.66	1.33	33.48	0.49
MnK	0.32	0.22	32.78	1.47
FeK	7.76	0.23	4.46	33.25
F:\SEM DATA\9th May\NWA__0007.spc				
Acquisition Time:16:08:35	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :129		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	57.65	73.12	0.2475	
P2O5	23.74	15.85	0.085	
Fe2O3	18.6	11.04	0.1307	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	23.02	1.16	1.92	19.83
P K	13.86	1.22	2.56	11.34
FeK	2.89	0.12	5.4	23.31

F:\SEM DATA\9th May\NWA__0008.spc				
Acquisition Time:16:11:20	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :94		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	31.14	49.15	0.0849	
Fe2O3	68.86	50.85	0.4646	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	7.35	1.13	4.34	6.5
FeK	9.55	0.17	3.39	56.44

F:\SEM DATA\9th May\NWA__0009.spc				
Acquisition Time:16:15:39	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :265		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	2.26	3.5	0.0078	
Fe2O3	97.74	96.5	0.6357	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	0.53	1.15	19.56	0.46
FeK	4.45	0.22	3.05	20
F:\SEM DATA\9th May\NWA__0010.spc				
Acquisition Time:16:21:23	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :215		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	21.92	7.64	0.0706	
MgO	44.05	60.84	0.1911	
SiO2	34.02	31.52	0.1231	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	2.07	0.72	6.16	2.88
MgK	24.65	0.89	1.42	27.56
SiK	13.19	0.57	1.95	22.95

F:\SEM DATA\9th May\NWA__0011.spc				
Acquisition Time:16:25:47	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :102		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.4249	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	2.55	0.1	6.41	26.2

F:\SEM DATA\9th May\NWA__0012.spc				
Acquisition Time:16:30:34	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :207		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	8.04	0.38	2.56	20.9

F:\SEM DATA\9th May\NWA__0013.spc				
Acquisition Time:16:43:16	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :82		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.4249	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	1.61	0.37	10.5	4.4
F:\SEM DATA\9th May\NWA__0016.spc				
Acquisition Time:16:48:51	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :89		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	9.87	0.18	3.42	55.5

F:\SEM DATA\9th May\NWA__0017.spc				
Acquisition Time:16:51:35	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :75		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	16.51	29.65	0.04	
P2O5	2.17	2.05	0.0079	
Fe2O3	81.32	68.3	0.5379	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	1.85	1.05	12.4	1.76
P K	0.64	1.21	31.6	0.53
FeK	5.92	0.21	4.91	27.75

F:\SEM DATA\9th May\NWA__0018.spc				
Acquisition Time:16:54:08	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :84		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	16.7	7.85	0.0523	
Na2O	0.98	1.19	0.0043	
MgO	18.18	33.84	0.0806	
Al2O3	44.82	32.99	0.1763	
SiO2	19.32	24.14	0.0666	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	0.38	0.12	22.53	3.2
NaK	0.14	0.24	60.09	0.6
MgK	2.58	0.36	7.67	7.23
AlK	5.29	0.36	5.05	14.83
SiK	1.77	0.26	9.32	6.77

F:\SEM DATA\9th May\NWA__0019.spc				
Acquisition Time:16:56:36	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :68		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	52.14	63.75	0.2444	
SiO2	41.97	34.43	0.1521	
Fe2O3	5.89	1.82	0.0346	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	52.4	1.47	1.72	35.65
SiK	27.09	1.29	2.44	20.94
FeK	0.72	0.24	18.37	3.06
F:\SEM DATA\9th May\NWA__0020.spc				
Acquisition Time:17:03:06	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :188		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	17.58	23.97	0.0705	
SnO2	82.42	76.03	0.5644	
TiO2	0	0	0	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	11.27	2.26	2.57	4.99
SnL	17.49	1.38	1.87	12.69
TiK	0	1.14	0	0

F:\SEM DATA\9th May\NWA__0022.spc				
Acquisition Time:17:09:56	Date: 9-May-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:17.0	
Detector Type :SUTW-Sapphire	Resolution :142.22	Lsec :40		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	5.74	0.39	6.97	14.62

F:\SEM DATA\Seymchan__0001.spc				
Acquisition Time:15:34:39	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :51		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	52.59	1.86	1.99	28.33

F:\SEM DATA\Seymchan__0002.spc				
Acquisition Time:15:39:50	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :20		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	48.22	62.02	0.2188	
SiO2	39.34	33.95	0.1427	
Fe2O3	12.43	4.04	0.0735	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	972.59	28.85	0.72	33.71
SiK	526.93	22.71	0.99	23.21
FeK	31.73	2.3	4.16	13.77

F:\SEM DATA\Seymchan__0003.spc				
Acquisition Time:15:41:40	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :21		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	48.03	62.07	0.2172	
SiO2	38.79	33.63	0.1406	
Fe2O3	13.19	4.3	0.078	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	857.29	31.34	0.76	27.35
SiK	461.09	25.66	1.05	17.97
FeK	29.91	2.63	4.26	11.37

F:\SEM DATA\Seymchan__0005.spc				
Acquisition Time:15:45:38	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :29		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	13.25	31.37	0.0473	
SiO2	8.78	13.96	0.0324	
SO3	13.55	16.15	0.0489	
Fe2O3	64.42	38.52	0.4027	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	51.9	15.84	3.27	3.28
SiK	29.58	12.43	4.63	2.38
S K	34.99	8.27	3.81	4.23
FeK	42.94	1.31	2.92	32.82

F:\SEM DATA\Seymchan__0006.spc				
Acquisition Time:15:48:21	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :43		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	5.72	8.43	0.02	
SO3	3.12	5.85	0.0115	
Fe2O3	91.16	85.72	0.5885	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	17.9	17.13	6.09	1.05
S K	7.15	11.43	11.56	0.63
FeK	54.53	3.03	2.15	18
F:\SEM DATA\Seymchan__0007.spc				
Acquisition Time:15:50:37	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :100		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	48.44	61.98	0.2206	
SiO2	39.91	34.26	0.1448	
Fe2O3	11.66	3.76	0.0688	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	259.48	18.4	0.66	14.1
SiK	141.54	11.62	0.91	12.18
FeK	7.87	0.87	3.94	9.05

F:\SEM DATA\Seymchan__0008.spc				
Acquisition Time:15:57:52	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :13		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	216.23	6.41	1.92	33.75
F:\SEM DATA\Seymchan__0009.spc				
Acquisition Time:15:58:42	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :28		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	31.49	50.76	0.1314	
Al2O3	10.24	6.53	0.0368	
SiO2	28.15	30.45	0.1012	
Fe2O3	30.12	12.26	0.1816	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	237.61	22.99	1.33	10.34
AlK	62.35	23.69	3.15	2.63
SiK	152.02	17.74	1.69	8.57
FeK	31.9	1.8	3.5	17.76

F:\SEM DATA\Seymchan__0010.spc				
Acquisition Time:16:02:06	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :13		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	16.18	32.58	0.0618	
Al2O3	7.64	6.08	0.0277	
SiO2	26.86	36.28	0.0985	
Fe2O3	49.32	25.06	0.3034	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	145.6	24.32	2.65	5.99
AlK	61.25	31.43	5.03	1.95
SiK	192.86	30.89	2.29	6.24
FeK	69.43	1.3	3.38	53.41

F:\SEM DATA\Seymchan__0011.spc				
Acquisition Time:16:03:00	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :24		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Al2O3	35.17	45.46	0.135	
SnO2	20.72	18.13	0.1302	
Fe2O3	44.11	36.41	0.2827	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AlK	390.77	40.14	1.12	9.74
SnL	73.07	24.14	3.04	3.03
FeK	84.75	7.16	2.37	11.83
F:\SEM DATA\Seymchan__0012.spc				
Acquisition Time:16:08:34	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :32		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	49.7	62.42	0.2292	
SiO2	41.18	34.7	0.1495	
Fe2O3	9.11	2.89	0.0537	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	61.14	2.66	2.34	23
SiK	33.14	1.55	3.19	21.44
FeK	1.39	0.49	19.5	2.81

F:\SEM DATA\Seymchan__0013.spc				
Acquisition Time:16:10:20	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :45		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	136.75	5.12	1.31	26.69
F:\SEM DATA\Seymchan__0014.spc				
Acquisition Time:16:14:52	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :63		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	0	0	0	
Br2O	25.95	23.32	0.1699	
SnO2	57.84	60.65	0.3971	
Fe2O3	16.21	16.04	0.1164	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	0	4.77	0	0
BrL	54.08	5.87	1.89	9.21
SnL	43.75	7.07	2.19	6.19
FeK	6.85	1.8	5.93	3.81

F:\SEM DATA\Seymchan__0015.spc				
Acquisition Time:16:20:32	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :42		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	5.41	14.96	0.0214	
Al2O3	23.22	25.38	0.0917	
SiO2	6.37	11.81	0.0242	
SnO2	59.15	43.76	0.3849	
Fe2O3	5.85	4.08	0.0389	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	42.64	32.52	3.75	1.31
AlK	171.44	31.57	1.38	5.43
SiK	40.03	25.7	3.68	1.56
SnL	139.65	17.73	1.46	7.88
FeK	7.54	4.52	8.33	1.67

F:\SEM DATA\Seymchan__0016.spc				
Acquisition Time:16:23:31	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :18		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	47.97	61.91	0.2172	
SiO2	39.13	33.88	0.1419	
Fe2O3	12.9	4.2	0.0763	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	402.97	19.42	1.21	20.75
SiK	218.77	13.86	1.67	15.78
FeK	13.75	1.02	6.71	13.42
F:\SEM DATA\Seymchan__0017.spc				
Acquisition Time:16:25:03	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :20		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SiO2	0.94	2.3	0.0035	
SO3	7.12	13.08	0.0264	
Fe2O3	91.94	84.63	0.5934	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
SiK	4.11	15.77	31.94	0.26
S K	24.57	16.74	6.82	1.47
FeK	82.33	1.89	2.48	43.64

F:\SEM DATA\Seymchan__0019.spc				
Acquisition Time:16:31:10	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :53		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	7.65	15.05	0.0171	
Fe2O3	92.35	84.95	0.6064	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	44.14	18.88	2.8	2.34
FeK	372.9	10.55	0.73	35.35
F:\SEM DATA\Seymchan__0020.spc				
Acquisition Time:16:32:58	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :21		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	455.83	11.79	1.04	38.67

F:\SEM DATA\Seymchan__0021.spc				
Acquisition Time:16:33:59	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :118		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	13.73	4.5	0.0429	
MgO	47.62	61.83	0.2148	
SiO2	38.65	33.67	0.1402	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	0.65	0.7	20.24	0.93
MgK	14.29	0.99	2.59	14.36
SiK	7.75	0.53	3.52	14.59

F:\SEM DATA\Seymchan__0022.spc				
Acquisition Time:16:37:00	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :20		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	9.63	25.91	0.0341	
Al2O3	13.72	14.6	0.0488	
SiO2	5.38	9.72	0.0193	
SO3	1.99	2.7	0.0071	
Fe2O3	69.27	47.06	0.4365	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	35.16	20.97	5.53	1.68
AlK	47.18	22.58	4.51	2.09
SiK	16.51	17.63	9.65	0.94
S K	4.8	11.9	24.66	0.4
FeK	43.74	1.86	3.49	23.5

F:\SEM DATA\Seymchan__0023.spc				
Acquisition Time:16:39:00	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :30		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	1.47	5.2	0.0048	
SiO2	1.9	4.49	0.007	
SO3	4.71	8.37	0.0174	
Fe2O3	91.92	81.94	0.5933	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	6.17	9.63	14.85	0.64
SiK	7.48	9.89	12.67	0.76
S K	14.64	10.02	7.31	1.46
FeK	74.42	2.51	2.17	29.7

F:\SEM DATA\Seymchan__0024.spc				
Acquisition Time:16:40:35	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :17		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	0.71	1.86	0.0026	
Al2O3	2.91	3	0.011	
SO3	48.35	63.51	0.1789	
Fe2O3	48.04	31.64	0.2945	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	8.47	18.26	18.94	0.46
AlK	33.2	19.92	6.16	1.67
S K	375.43	16.32	1.29	23.01
FeK	92.05	1.95	2.55	47.29

F:\SEM DATA\Springwater__0001.spc				
Acquisition Time:10:46:25	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :100		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	10.19	19.49	0.0232	
SO3	0.16	0.29	0.0006	
Fe2O3	89.65	80.22	0.5901	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	59.95	20.56	1.68	2.92
S K	2.48	34.95	34.32	0.07
FeK	362.52	11.35	0.54	31.94
F:\SEM DATA\Springwater__0002.spc				
Acquisition Time:11:04:50	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :257		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	3.02	4.71	0.0076	
SO3	33.74	49.12	0.125	
Fe2O3	63.25	46.17	0.3972	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	23.71	24.48	2.24	0.97
S K	625.68	37.73	0.26	16.58
FeK	296.07	11.49	0.38	25.77

F:\SEM DATA\Springwater__0018.spc				
Acquisition Time:12:44:29	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :14		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	411.9	11.11	1.33	37.07
F:\SEM DATA\Springwater__0003.spc				
Acquisition Time:11:12:48	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :495		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	4.37	7.58	0.0103	
SO3	18.38	29.74	0.068	
Fe2O3	77.26	62.68	0.4946	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	30.87	24.61	1.3	1.25
S K	325.75	40.02	0.28	8.14
FeK	352.88	12.61	0.25	27.97

F:\SEM DATA\Springwater__0004.spc				
Acquisition Time:11:21:17	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :666		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	16.71	28.58	0.062	
Fe2O3	83.29	71.42	0.5319	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	246.74	36.43	0.28	6.77
FeK	315.41	11.78	0.23	26.77

F:\SEM DATA\Springwater__0005.spc				
Acquisition Time:11:30:35	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:100.0	
Detector Type :SUTW-Sapphire	Resolution :177.90	Lsec :749		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SO3	17.17	29.25	0.0637	
Fe2O3	82.83	70.75	0.5287	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
S K	247.51	45.36	0.27	5.46
FeK	306.05	12.56	0.22	24.37

F:\SEM DATA\Springwater__0006.spc				
Acquisition Time:11:36:47	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :936		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Cr2O3	54.91	52.21	0.1605	
Al2O3	1.35	1.92	0.0049	
SO3	6.97	12.58	0.0263	
Fe2O3	36.77	33.28	0.2322	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
CrL	153.7	12.09	0.28	12.71
AlK	49.06	39.02	0.75	1.26
S K	181.31	35.48	0.29	5.11
FeK	238.53	9.95	0.22	23.96

F:\SEM DATA\Springwater__0008.spc				
Acquisition Time:11:47:49	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :6		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
SiO2	0.19	0.34	0.0007	
SO3	49.16	65.72	0.1826	
Fe2O3	50.65	33.94	0.3113	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
SiK	5.46	48.72	71.35	0.11
S K	1064.23	33.81	1.21	31.48
FeK	270.19	7.09	2.4	38.12

F:\SEM DATA\Springwater__0009.spc				
Acquisition Time:11:49:23	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :10		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
NiO	39.18	57.93	0.1154	
Fe2O3	60.82	42.07	0.415	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
NiL	337.65	19.38	1.77	17.42
FeK	288.39	6.52	1.85	44.2

F:\SEM DATA\Springwater__0010.spc				
Acquisition Time:11:52:04	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :7		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	0.59	2.2	0.0019	
Al2O3	0.56	0.83	0.0019	
P2O5	0.96	1.03	0.0035	
SO3	2.12	4.01	0.0079	
TiO2	1.26	2.38	0.0075	
Fe2O3	94.51	89.56	0.6127	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	6.42	26.18	42.37	0.25
AlK	6.17	26.94	44.57	0.23
P K	8.69	30.34	34.02	0.29
S K	17.5	26.18	16.95	0.67
TiK	6.67	10.07	27.54	0.66
FeK	203.3	8.06	2.59	25.23

F:\SEM DATA\Springwater__0011.spc				
Acquisition Time:11:58:33	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :56		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	40.78	39.52	0.1715	
SiO2	1.93	4.97	0.0071	
Fe2O3	57.29	55.51	0.3726	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	286.71	15.96	0.83	17.96
SiK	43.2	37.31	3.34	1.16
FeK	265.95	7.98	0.84	33.32
F:\SEM DATA\Springwater__0012.spc				
Acquisition Time:12:02:23	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :5		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	100	100	0.6519	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeK	214.71	6.29	3.11	34.13

F:\SEM DATA\Springwater__0013.spc				
Acquisition Time:12:04:54	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :33		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	42.89	58.33	0.1888	
SiO2	38.78	35.38	0.1414	
Fe2O3	18.33	6.29	0.109	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	835.75	36.11	0.62	23.15
SiK	520	28.13	0.79	18.49
FeK	46.86	5.6	2.79	8.37
F:\SEM DATA\Springwater__0014.spc				
Acquisition Time:12:07:25	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :17		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Fe2O3	19.29	6.65	0.0612	
MgO	43.21	58.99	0.1895	
SiO2	37.51	34.36	0.1365	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
FeL	61.33	25.39	4.12	2.42
MgK	834.67	43.24	0.87	19.3
SiK	499.46	33.6	1.14	14.86

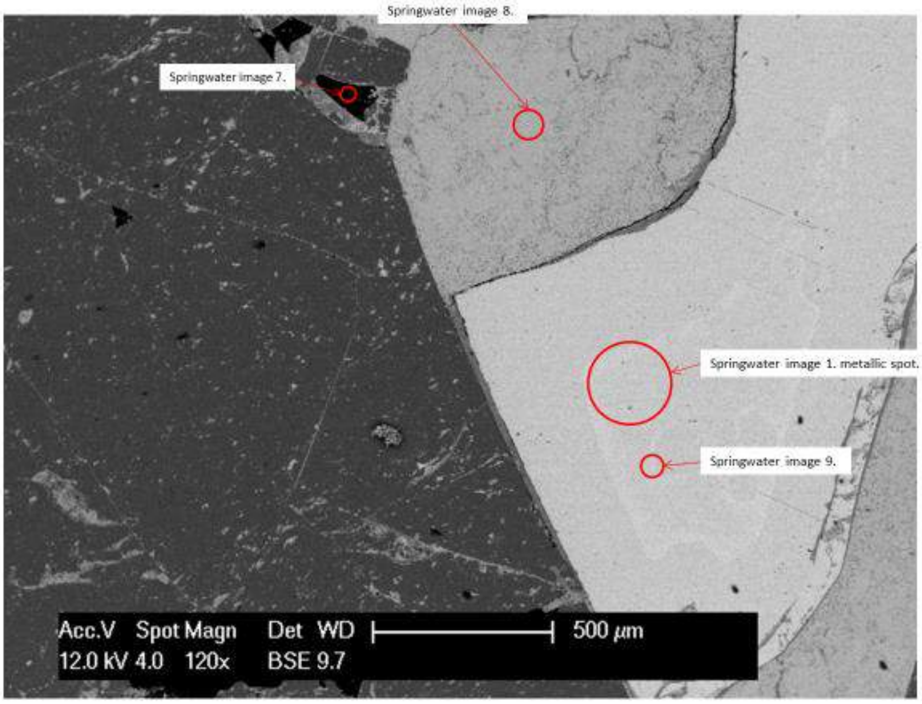
F:\SEM DATA\Springwater__0015.spc				
Acquisition Time:12:09:46	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :53		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
MgO	21.91	41.6	0.0918	
Al2O3	21.09	15.83	0.0797	
SiO2	18.15	23.13	0.0661	
SnO2	28.28	14.37	0.1726	
Fe2O3	10.57	5.07	0.066	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
MgK	342.36	57.04	0.85	6
AlK	278.83	63	0.99	4.43
SiK	204.88	60.89	1.21	3.36
SnL	117.08	21.13	1.47	5.54
FeK	23.92	6.71	3.49	3.57

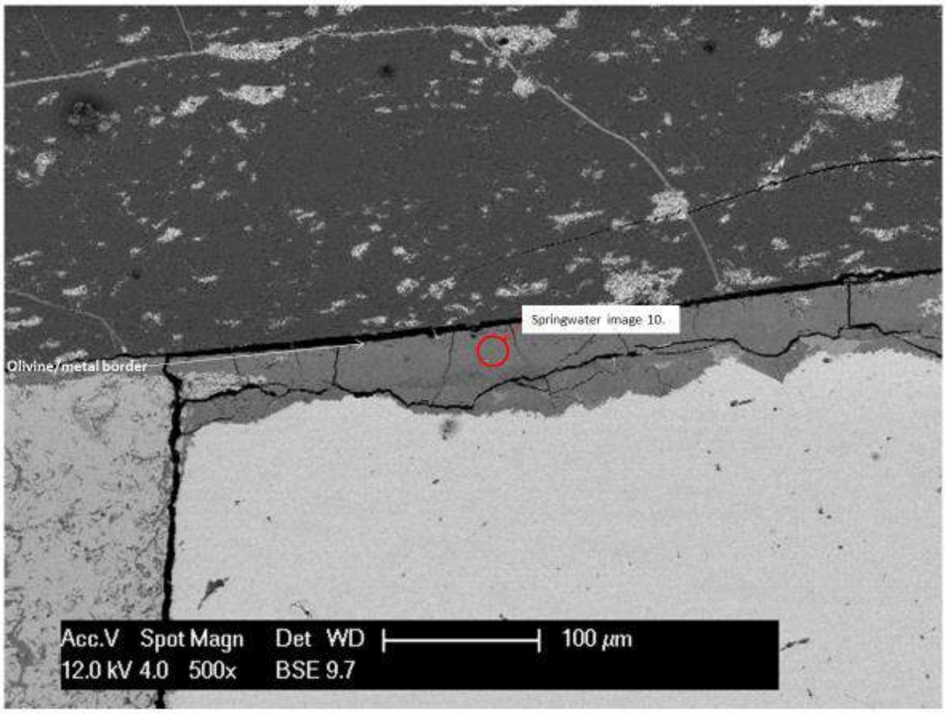
F:\SEM DATA\Springwater__0016.spc				
Acquisition Time:12:13:22	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:35.0	
Detector Type :SUTW-Sapphire	Resolution :145.30	Lsec :37		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
Cr2O3	78.33	60.35	0.2201	
MgO	10.51	30.54	0.0392	
P2O5	10.19	8.41	0.0386	
Fe2O3	0.96	0.7	0.0059	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
CrL	408.38	19.02	0.84	21.48
MgK	804.26	38.3	0.6	21
P K	566.36	26.79	0.71	21.14
FeK	11.8	3.94	6.12	2.99

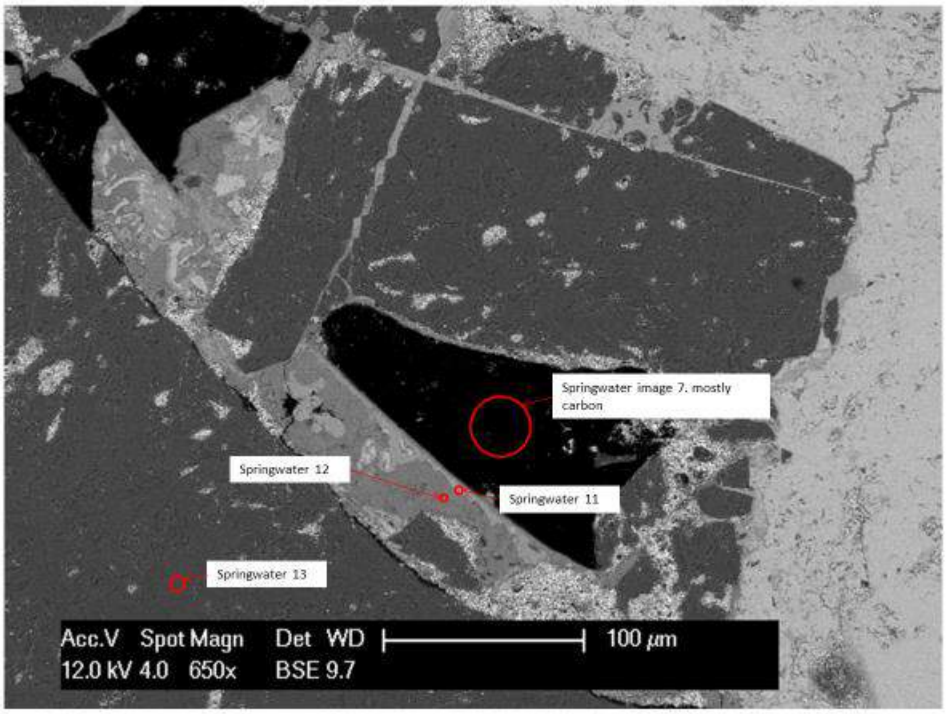
F:\SEM DATA\Springwater__0017.spc				
Acquisition Time:12:14:59	Date:28-Apr-2017			
kV:12.00	Tilt: 0.30	Take-off:36.44	AmpT:50.0	
Detector Type :SUTW-Sapphire	Resolution :149.80	Lsec :39		
EDAX ZAF Quantification	Standardless			
Oxides				
SEC Table : Default				
Element	Wt %	Mol %	K-Ratio	
TiO2	54.45	48.22	0.273	
MgO	15.61	27.39	0.0625	
SiO2	15.13	17.82	0.0586	
Fe2O3	14.81	6.56	0.0907	
Total	100	100		
Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
TiL	105.01	3.84	1.62	27.34
MgK	290.65	18.05	1	16.1
SiK	226.63	21.05	1.16	10.77
FeK	40.99	4.53	2.76	9.05

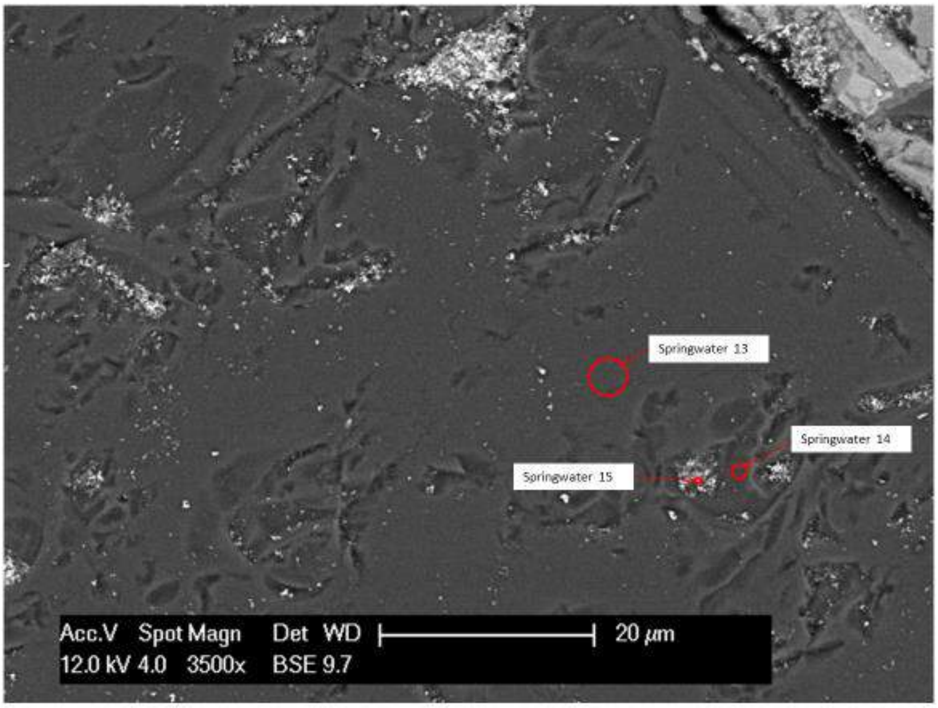
Visual locations of SEM data points in Backscatter images

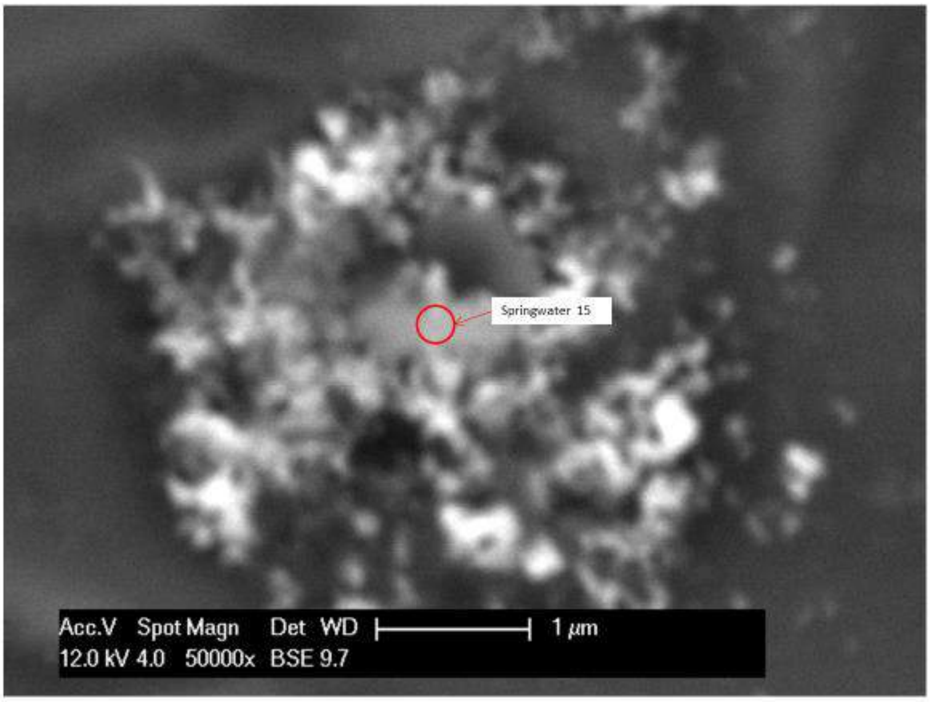
SPRINGWATER

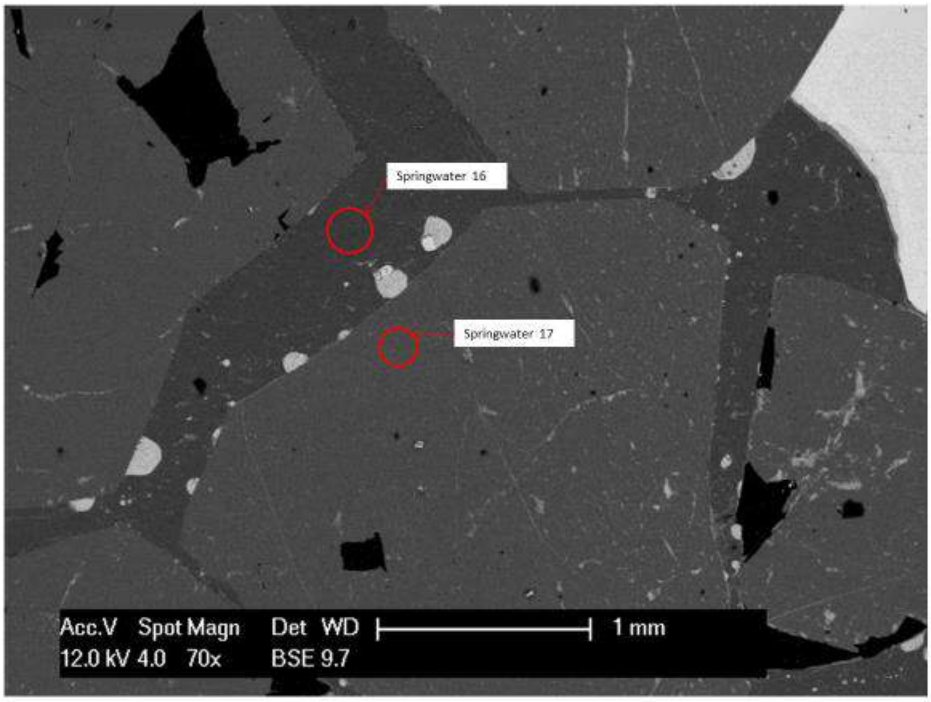

Springwater image 8.
Springwater image 7.
Springwater image 1. metallic spot.
Springwater image 9.
Acc.V Spot Magn Det WD 500 µm
12.0 kV 4.0 120x BSE 9.7


Springwater image 10.
Olivine/metal border
Acc.V Spot Magn Det WD 100 µm
12.0 kV 4.0 500x BSE 9.7

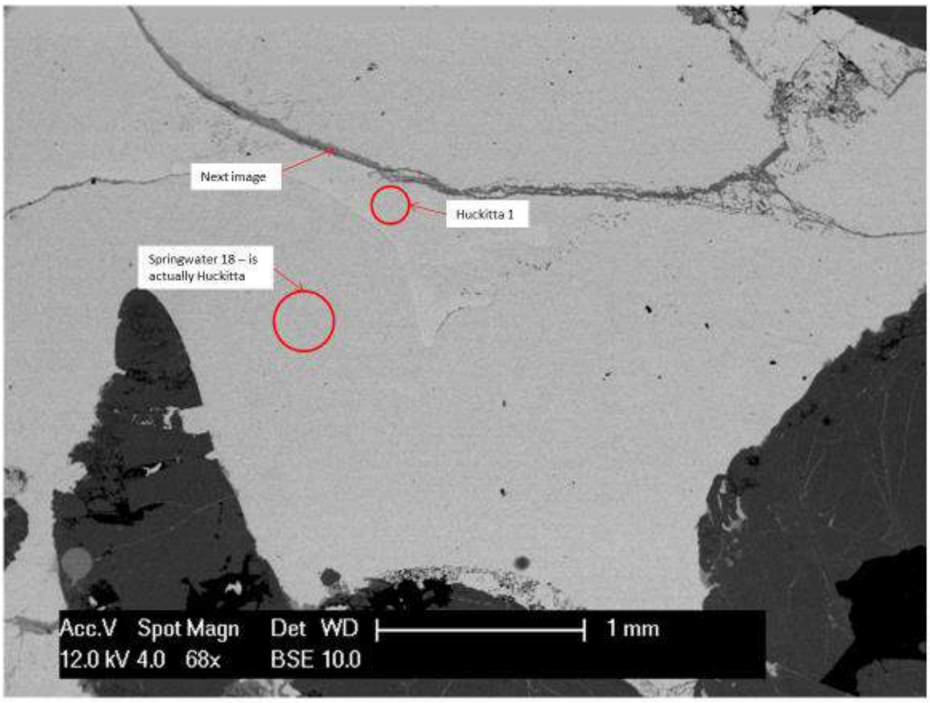

Springwater image 7. mostly carbon
Springwater 12
Springwater 11
Springwater 13
Acc.V Spot Magn Det WD 100 µm
12.0 kV 4.0 650x BSE 9.7

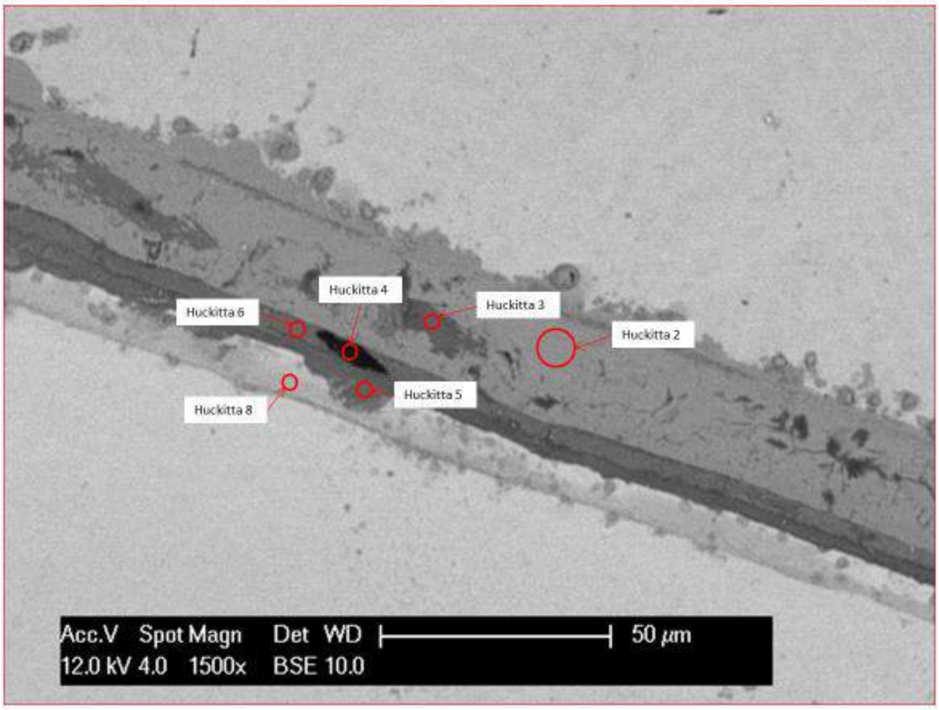

Springwater 13
Springwater 14
Springwater 15
Acc.V Spot Magn Det WD 20 µm
12.0 kV 4.0 3500x BSE 9.7

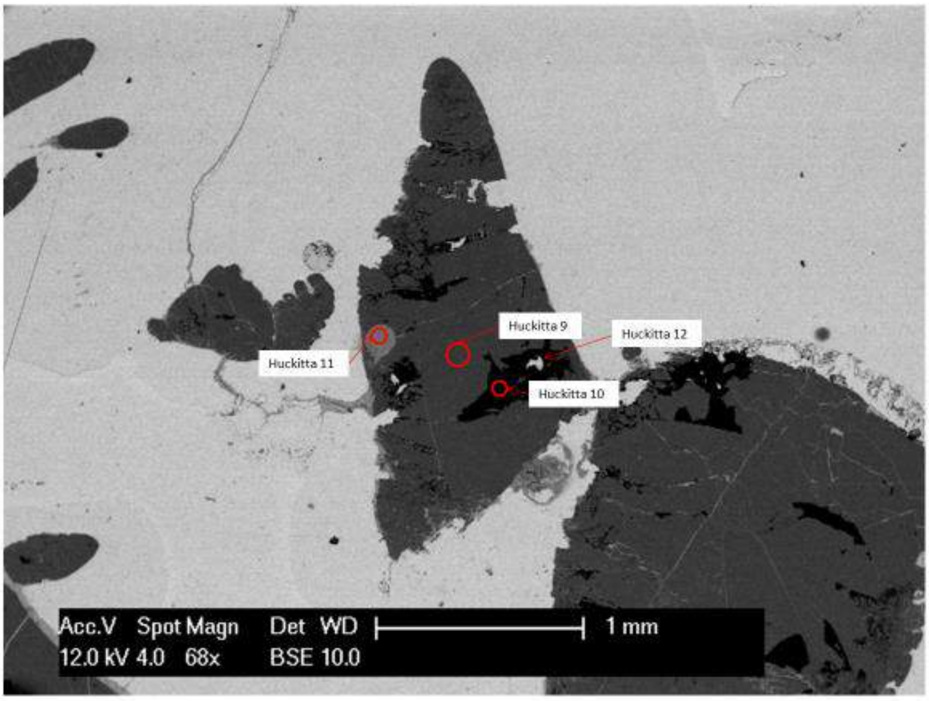

Springwater 15
Acc.V Spot Magn Det WD 1 μm
12.0 kV 4.0 50000x BSE 9.7

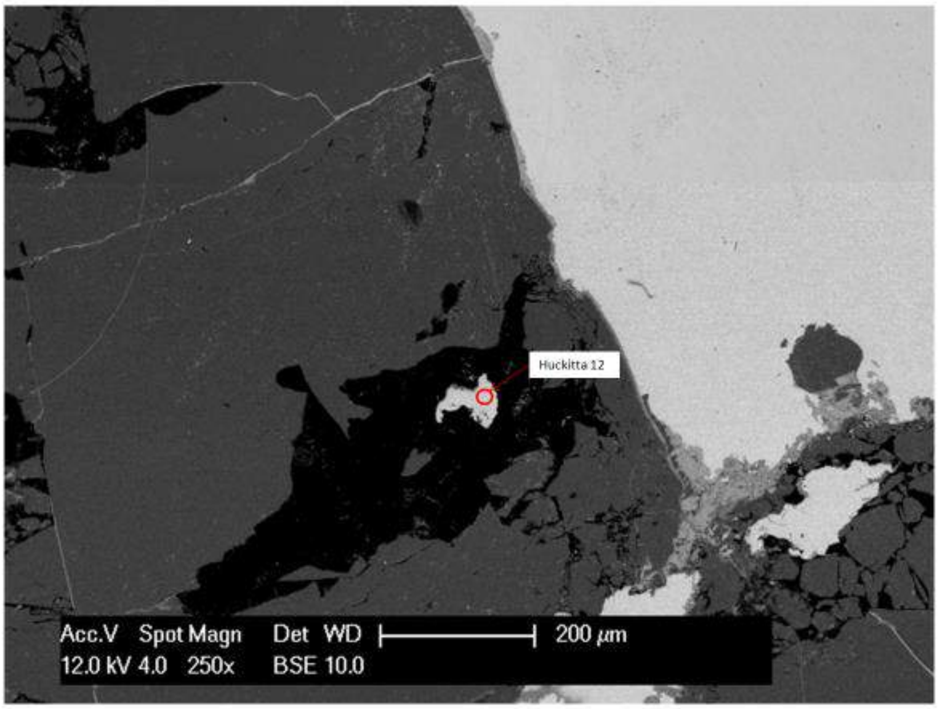

Springwater 16
Springwater 17
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 70x BSE 9.7

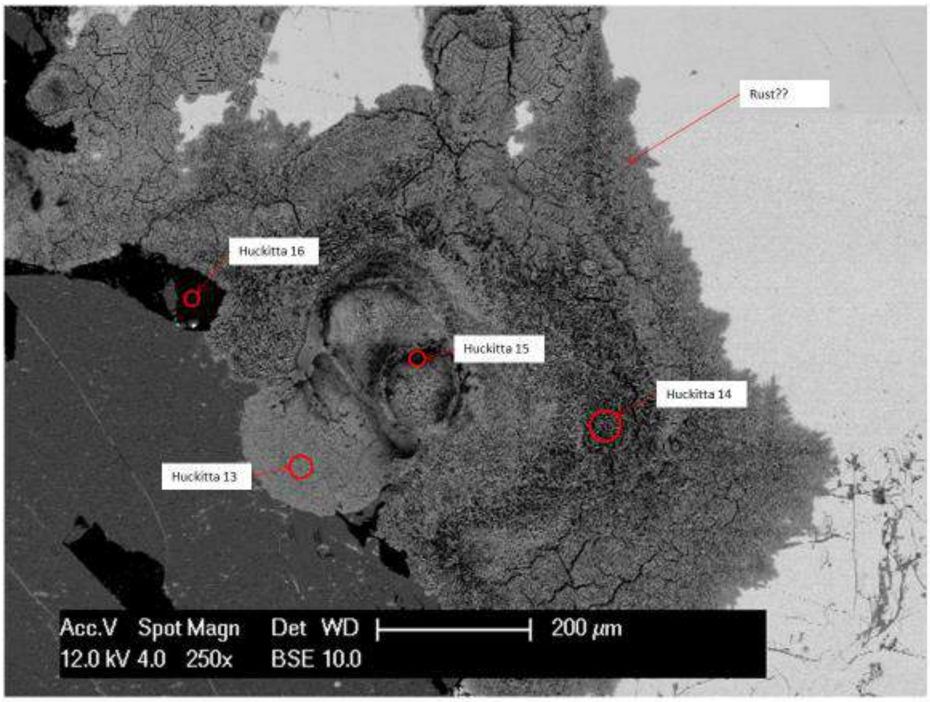
HUKKITA

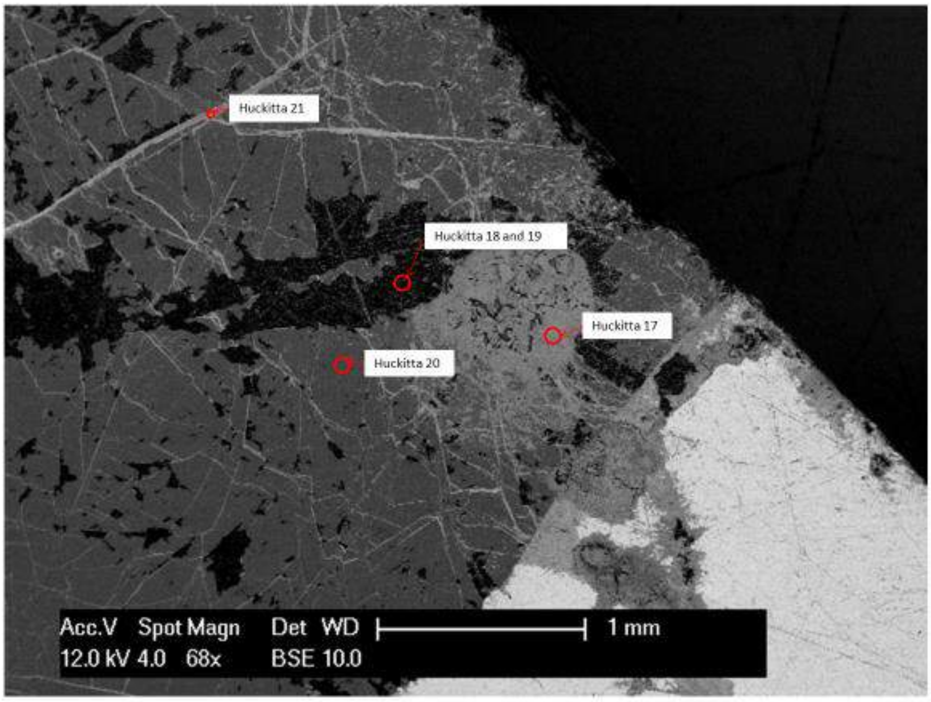

Next image
Huckitta 1
Springwater 18 – is actually Huckitta
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 68x BSE 10.0

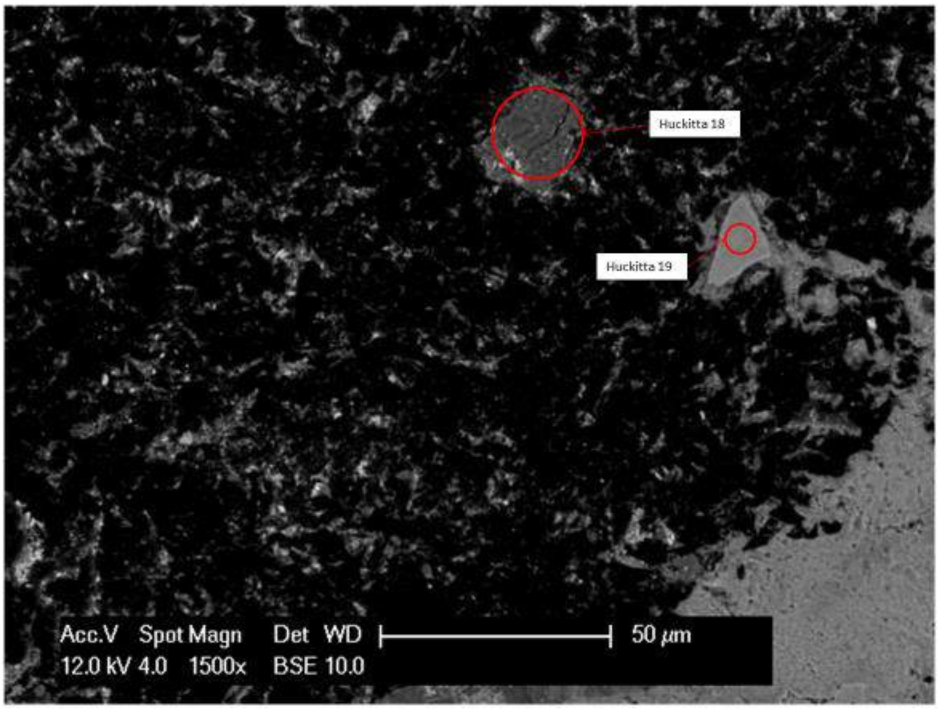

Huckitta 4
Huckitta 6
Huckitta 3
Huckitta 2
Huckitta 8
Huckitta 5
Acc.V Spot Magn Det WD 50 µm
12.0 kV 4.0 1500x BSE 10.0

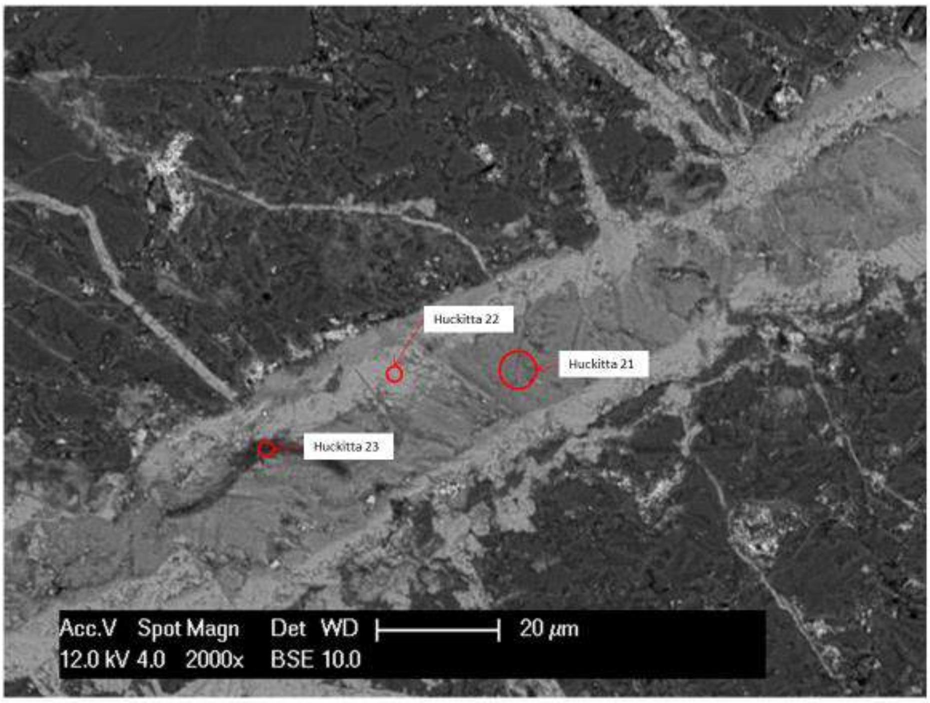

Huckitta 9
Huckitta 12
Huckitta 11
Huckitta 10
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 68x BSE 10.0


Huckitta 12
Acc.V Spot Magn Det WD
12.0 kV 4.0 250x BSE 10.0
200 µm

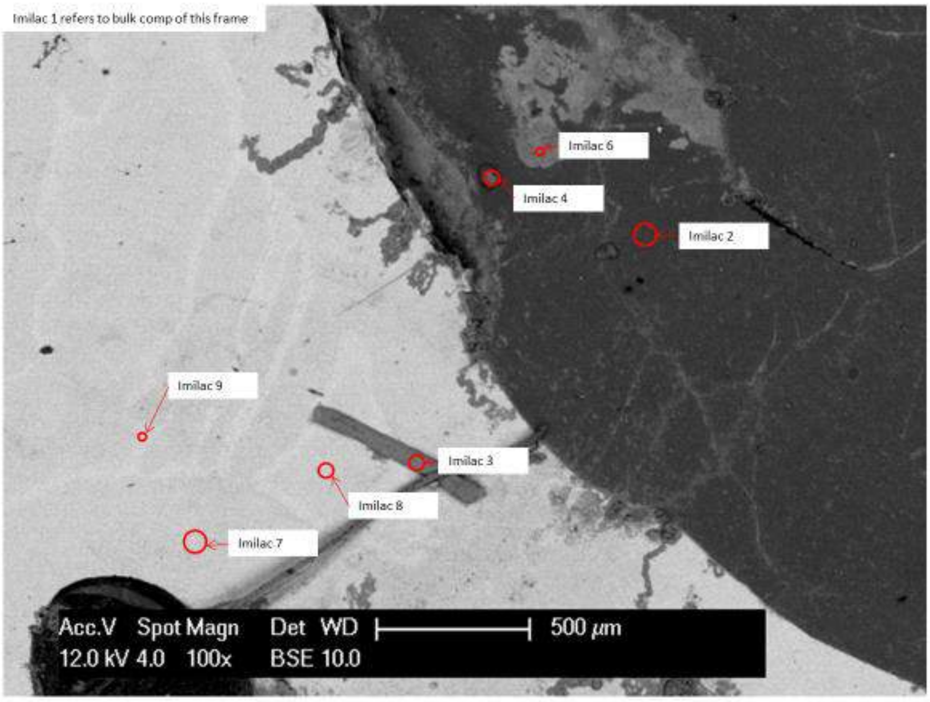

Rust??
Huckitta 16
Huckitta 15
Huckitta 14
Huckitta 13
Acc.V Spot Magn Det WD
12.0 kV 4.0 250x BSE 10.0
200 µm

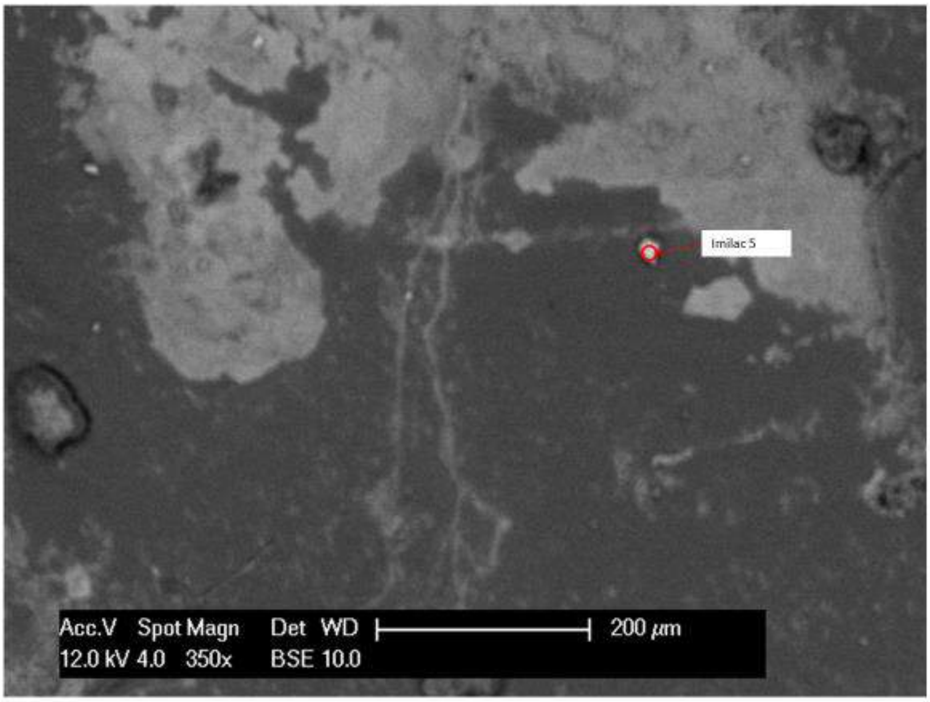

Huckitta 21
Huckitta 18 and 19
Huckitta 17
Huckitta 20
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 68x BSE 10.0

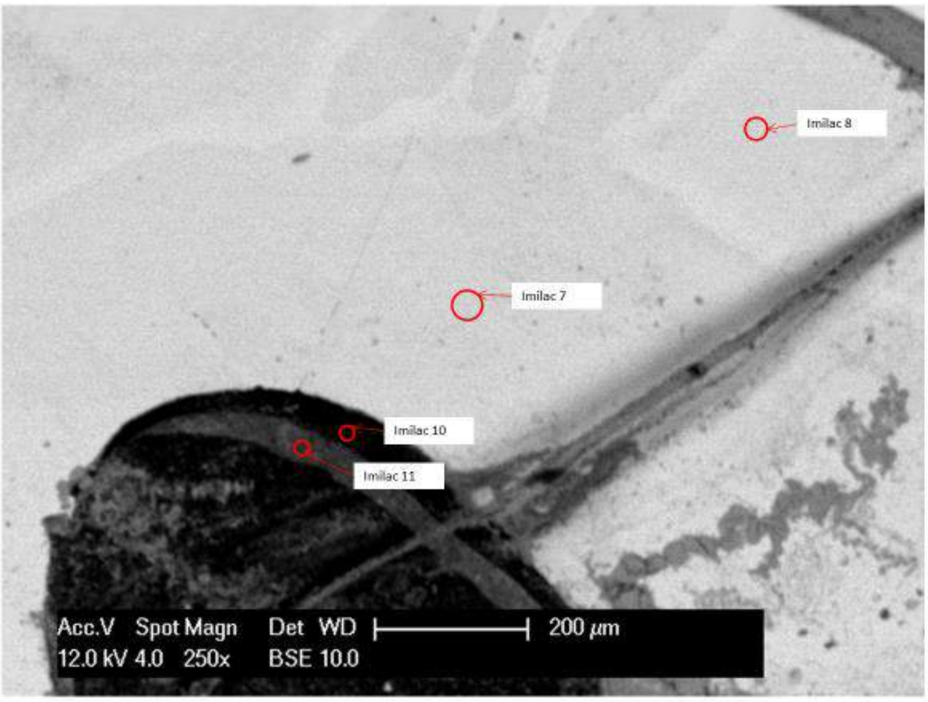

Huckitta 18
Huckitta 19
Acc.V Spot Magn Det WD 50 µm
12.0 kV 4.0 1500x BSE 10.0

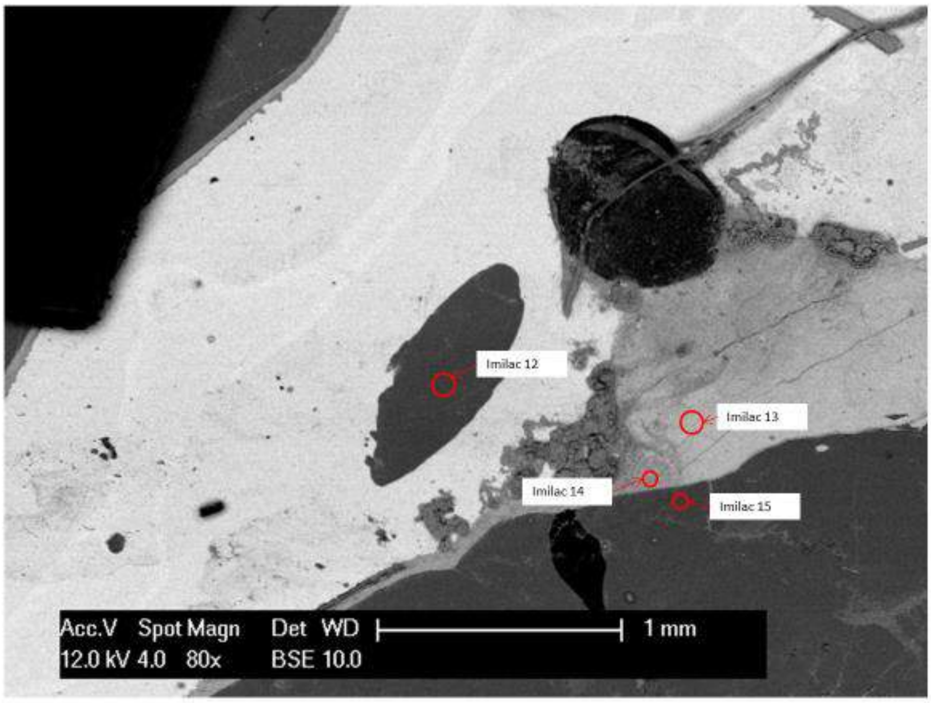

Huckitta 22
Huckitta 21
Huckitta 23
Acc.V Spot Magn Det WD 20 μm
12.0 kV 4.0 2000x BSE 10.0

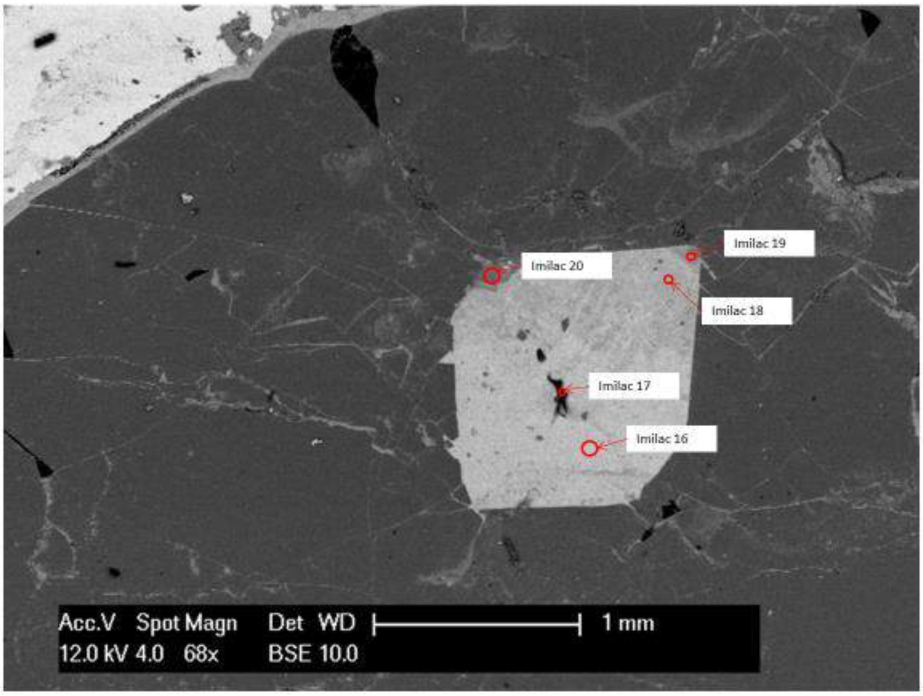
Imilac


Imilac 1 refers to bulk comp of this frame
Imilac 6
Imilac 4
Imilac 2
Imilac 9
Imilac 3
Imilac 8
Imilac 7
Acc.V Spot Magn Det WD 500 µm
12.0 kV 4.0 100x BSE 10.0

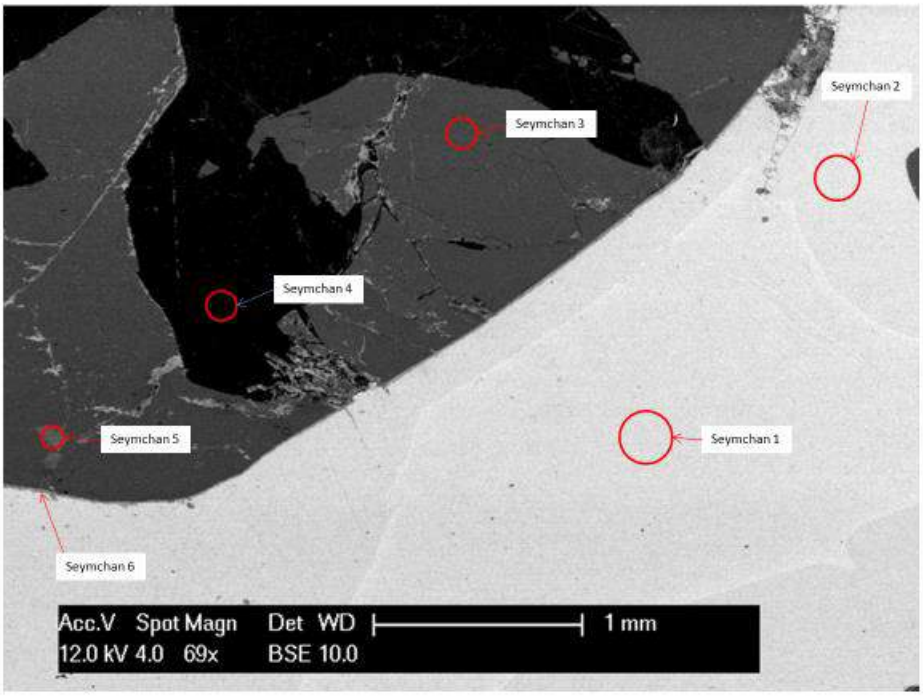

Imilac 5
Acc.V Spot Magn Det WD 200 µm
12.0 kV 4.0 350x BSE 10.0

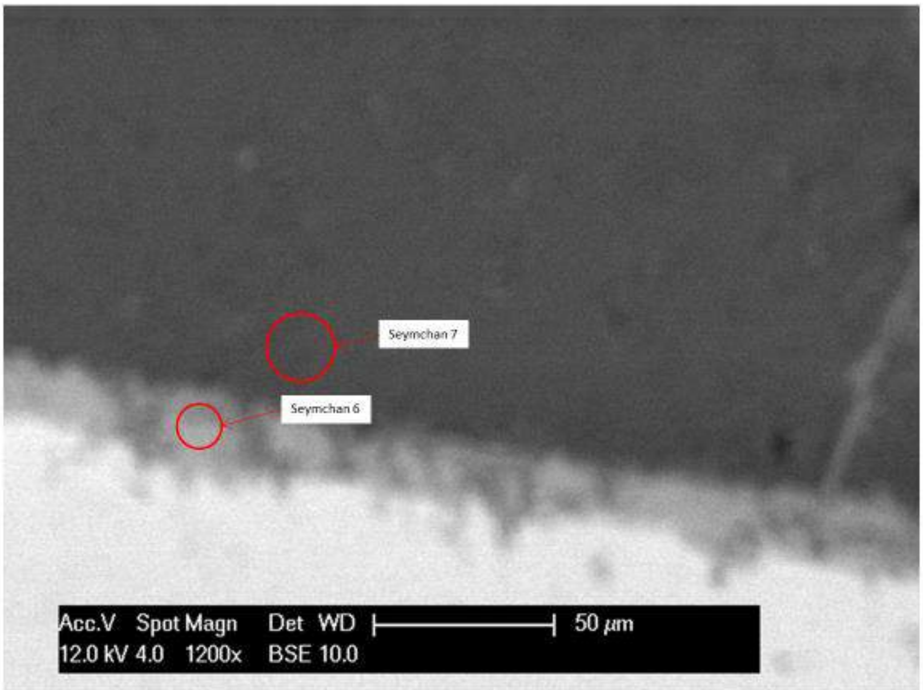

Imilac 8
Imilac 7
Imilac 10
Imilac 11
Acc.V Spot Magn Det WD 200 µm
12.0 kV 4.0 250x BSE 10.0

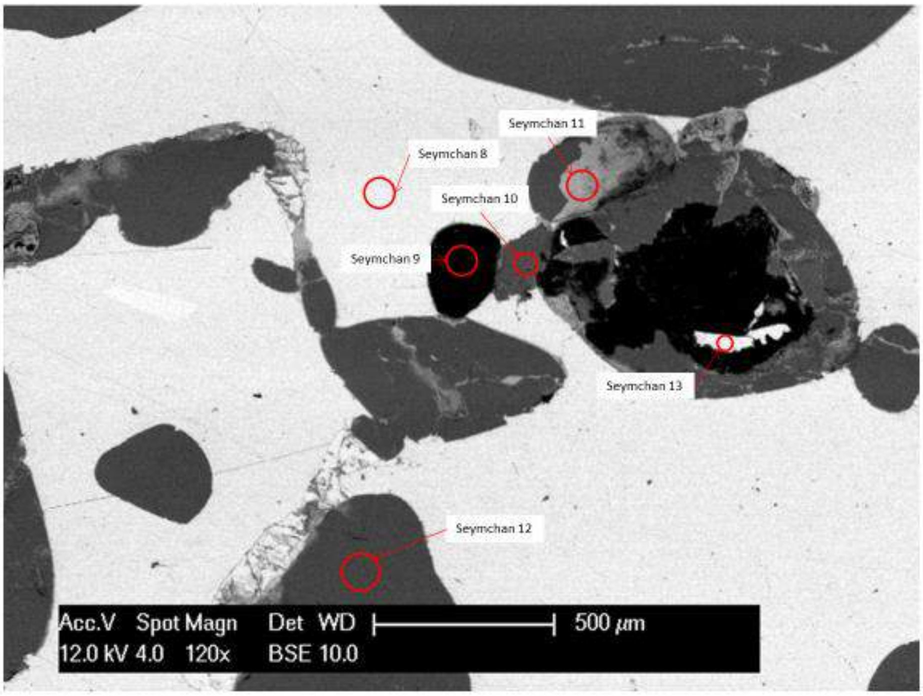

Imilac 12
Imilac 13
Imilac 14
Imilac 15
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 80x BSE 10.0

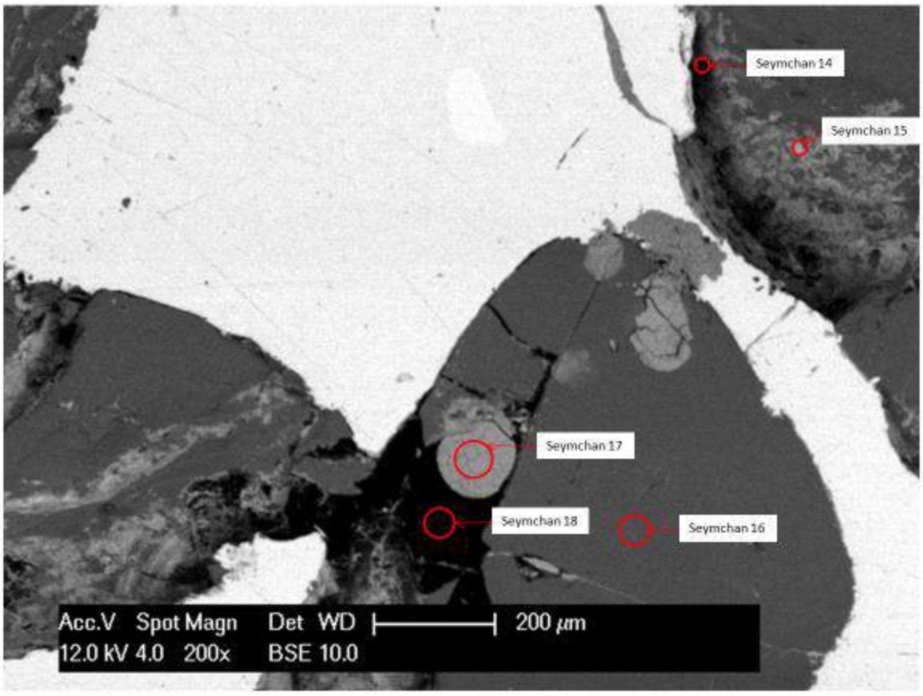

Imilac 19
Imilac 20
Imilac 18
Imilac 17
Imilac 16
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 68x BSE 10.0

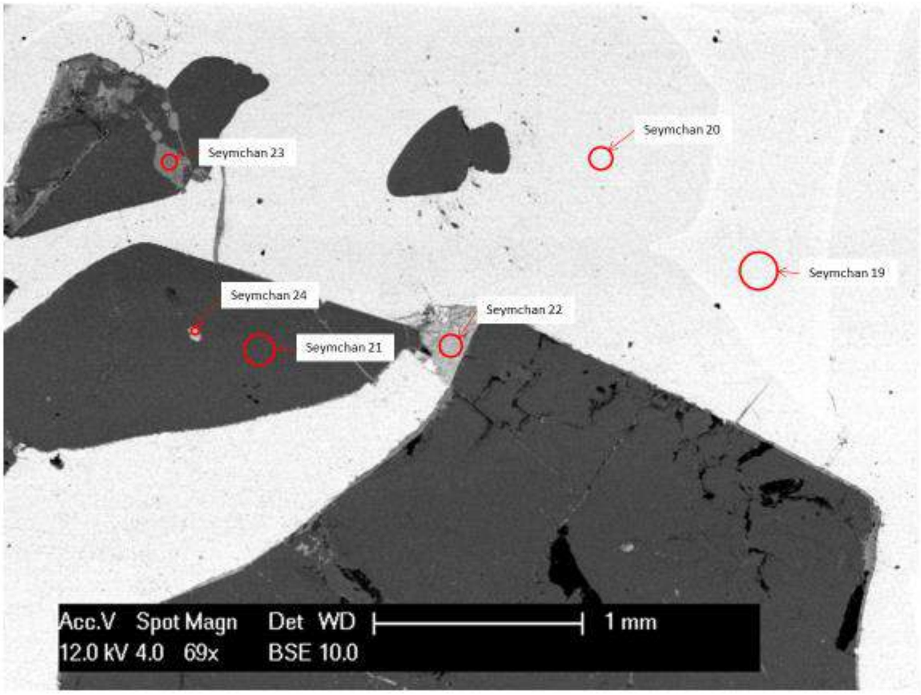
SEYMCHAN


Seymchan 2
Seymchan 3
Seymchan 4
Seymchan 5
Seymchan 1
Seymchan 6
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 69x BSE 10.0

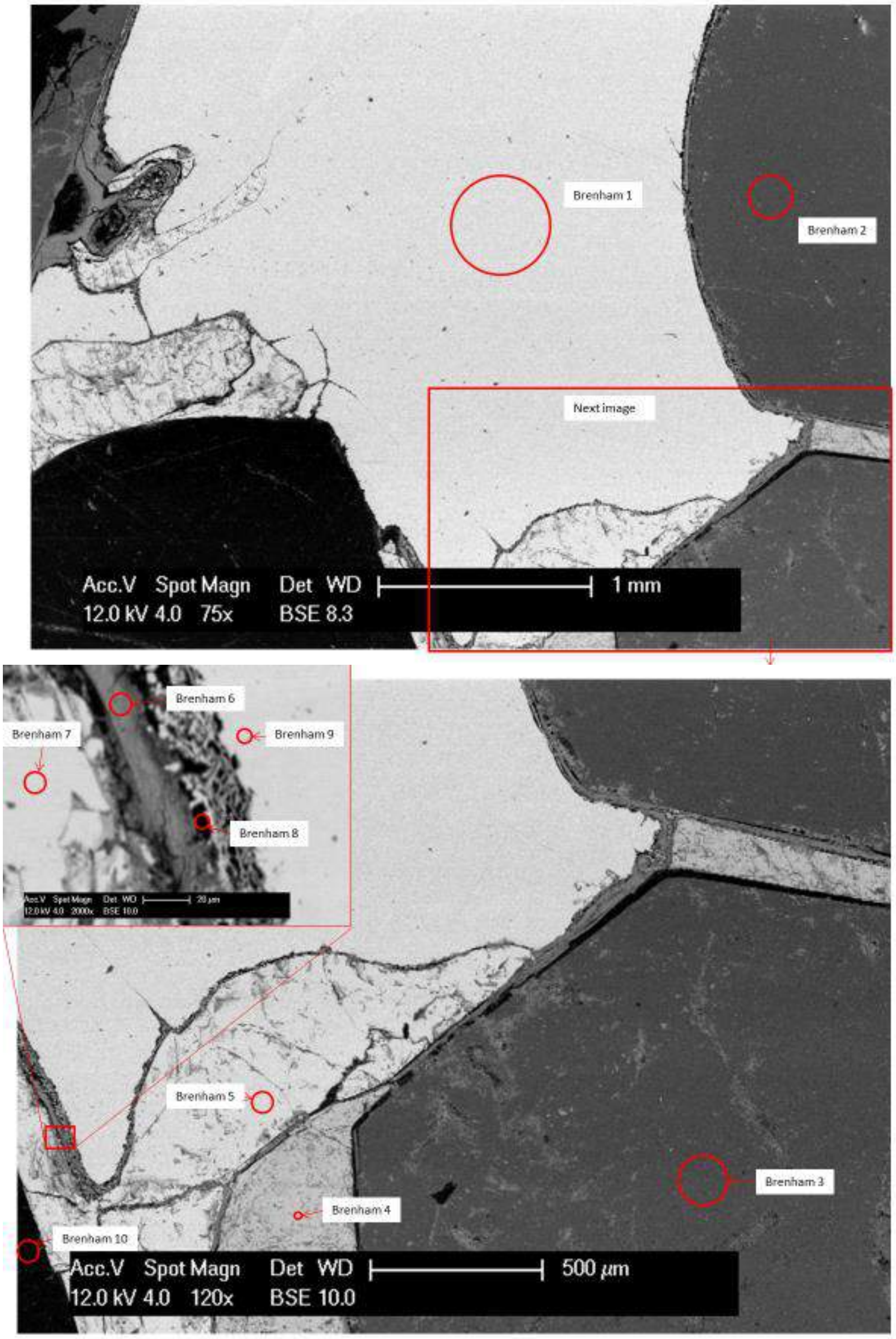

Seymchan 7
Seymchan 6
Acc.V Spot Magn Det WD 50 μm
12.0 kV 4.0 1200x BSE 10.0

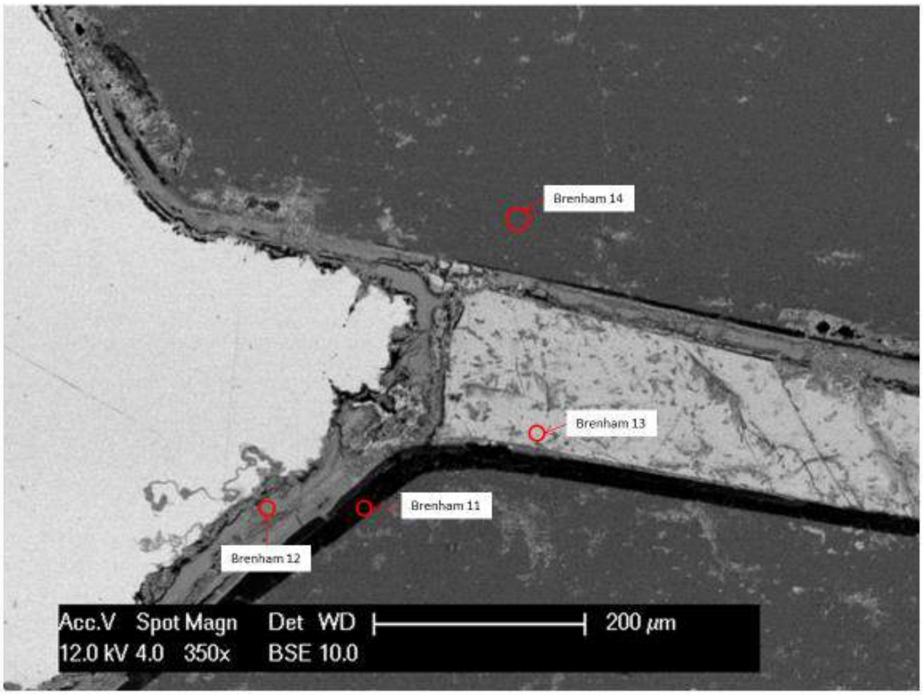

Seymchan 11
Seymchan 8
Seymchan 10
Seymchan 9
Seymchan 13
Seymchan 12
Acc.V Spot Magn Det WD 500 µm
12.0 kV 4.0 120x BSE 10.0

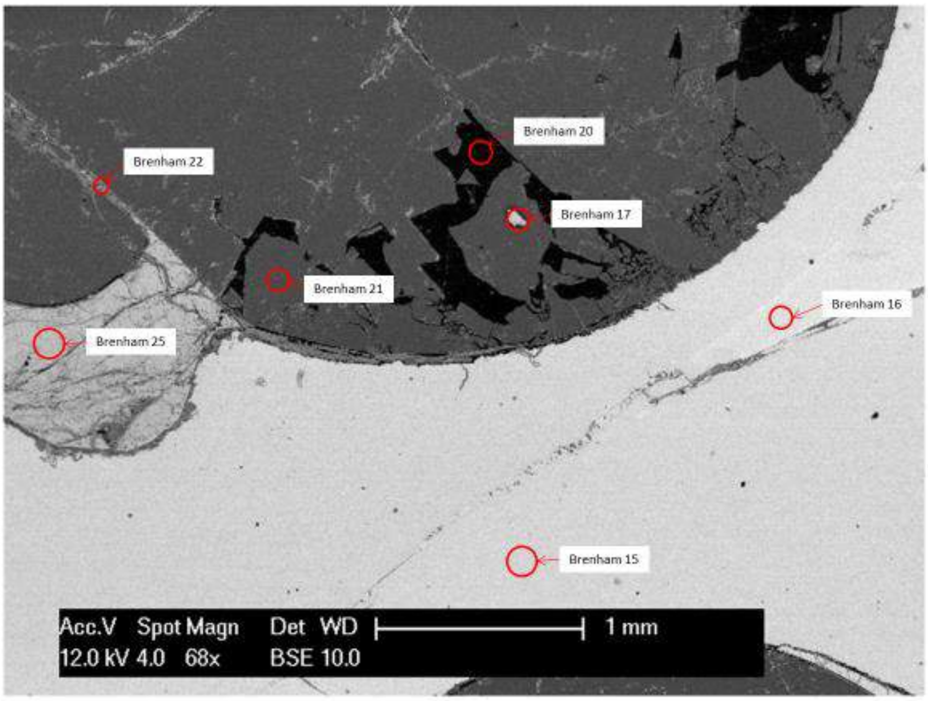

Seymchan 14
Seymchan 15
Seymchan 17
Seymchan 18
Seymchan 16
Acc.V Spot Magn Det WD 200 µm
12.0 kV 4.0 200x BSE 10.0

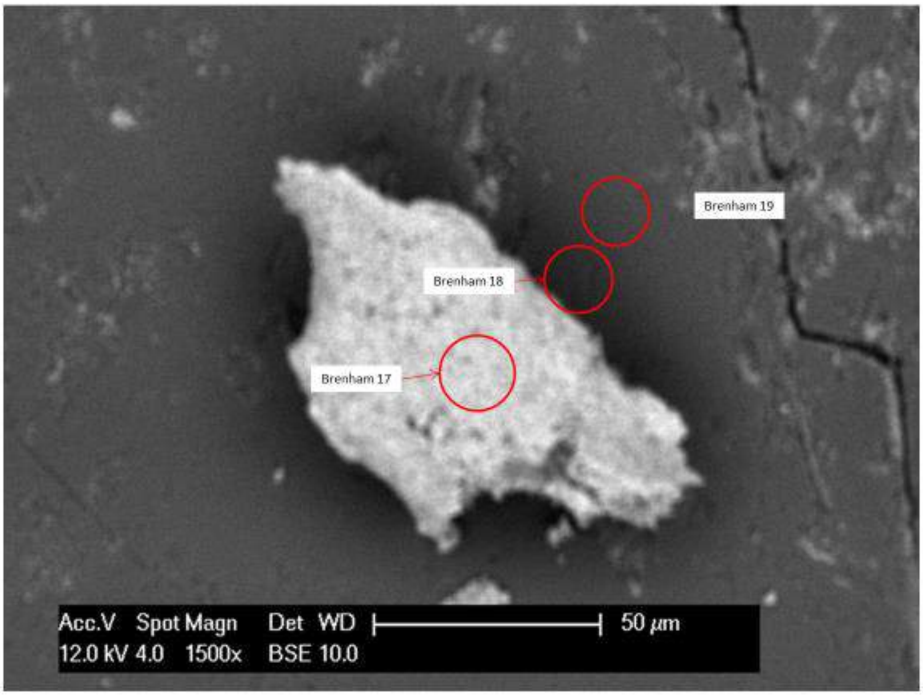

Seymchan 23
Seymchan 20
Seymchan 19
Seymchan 24
Seymchan 22
Seymchan 21
Acc.V Spot Magn Det WD
12.0 kV 4.0 69x BSE 10.0
1 mm

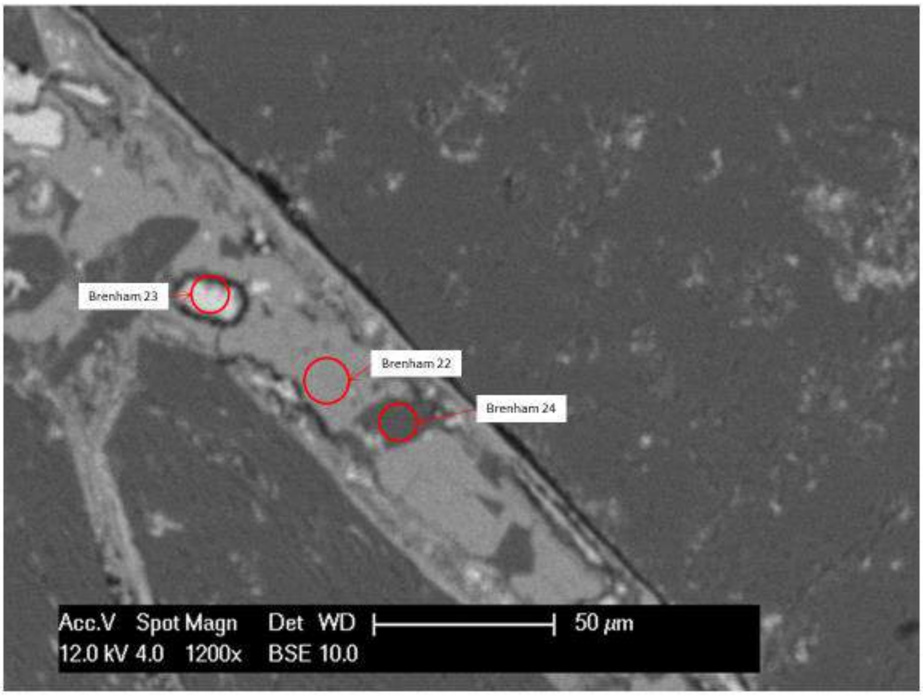
BRENHAM


Brenham 1
Brenham 2
Next image
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 75x BSE 8.3
Brenham 6
Brenham 7
Brenham 9
Brenham 8
Brenham 5
Brenham 3
Brenham 4
Brenham 10
Acc.V Spot Magn Det WD 500 µm
12.0 kV 4.0 120x BSE 10.0

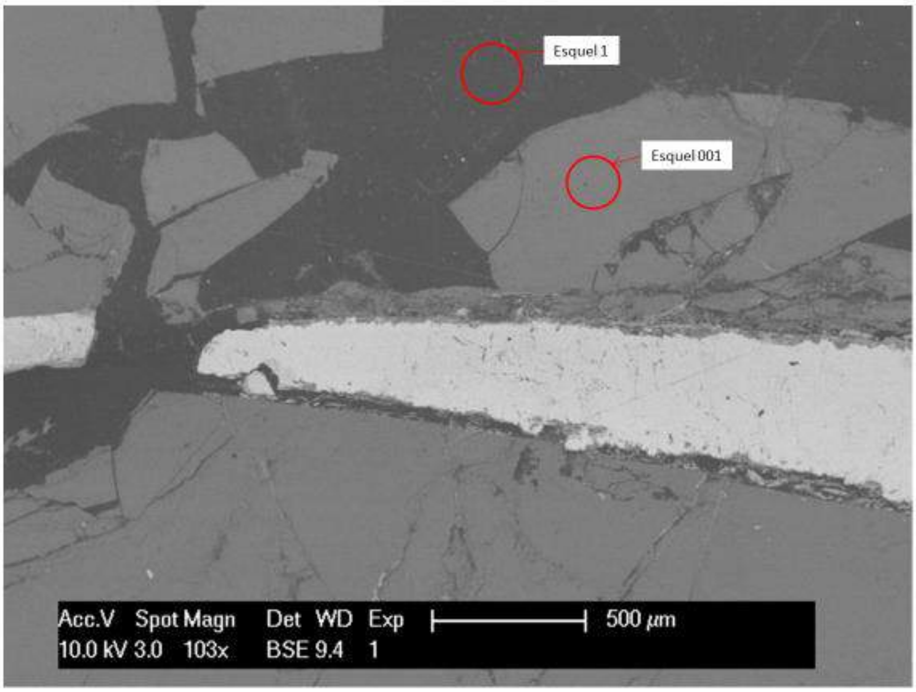

Brenham 14
Brenham 13
Brenham 11
Brenham 12
Acc.V Spot Magn Det WD 200 μm
12.0 kV 4.0 350x BSE 10.0

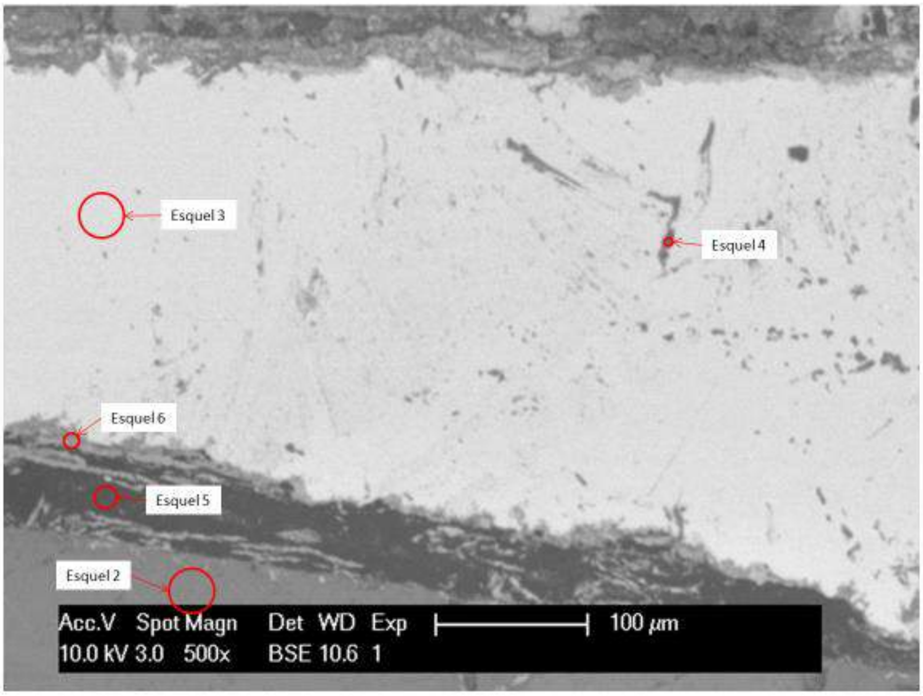

Brenham 20
Brenham 22
Brenham 17
Brenham 21
Brenham 16
Brenham 25
Brenham 15
Acc.V Spot Magn Det WD 1 mm
12.0 kV 4.0 68x BSE 10.0

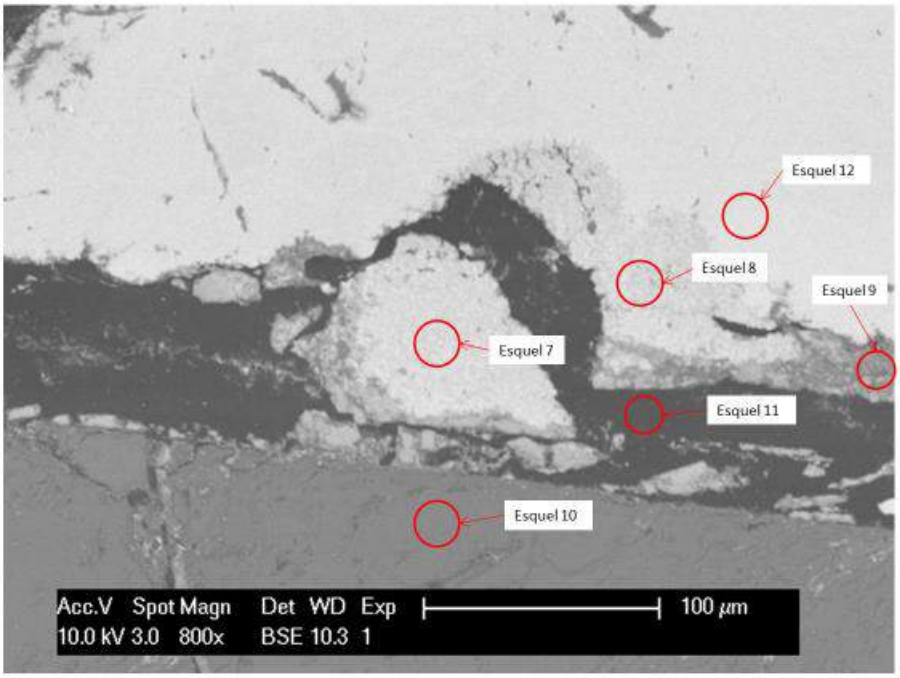

Brenham 19
Brenham 18
Brenham 17
Acc.V Spot Magn Det WD 50 µm
12.0 kV 4.0 1500x BSE 10.0

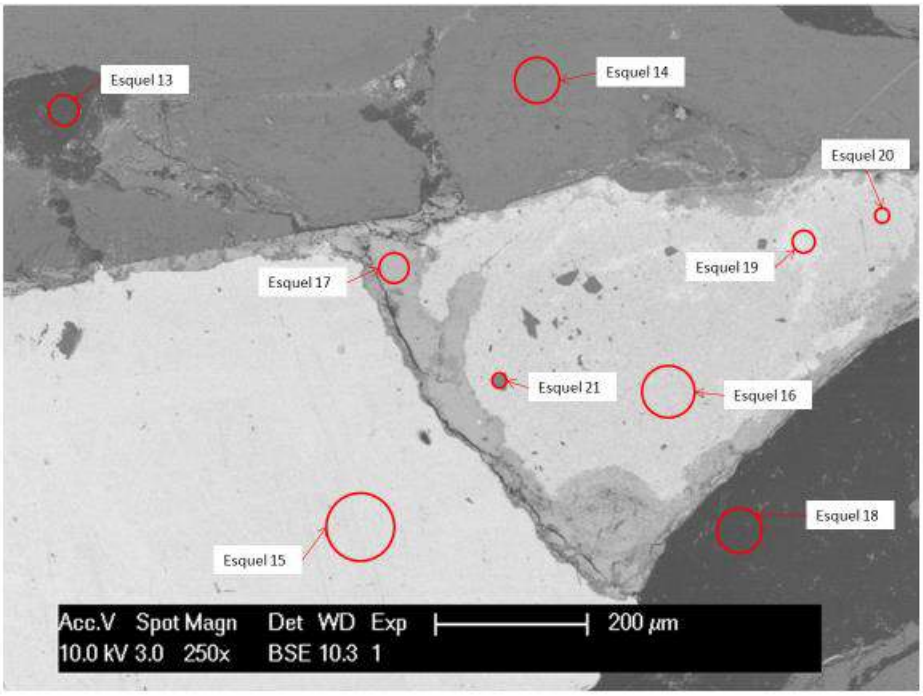

Brenham 23
Brenham 22
Brenham 24
Acc.V Spot Magn Det WD 50 µm
12.0 kV 4.0 1200x BSE 10.0

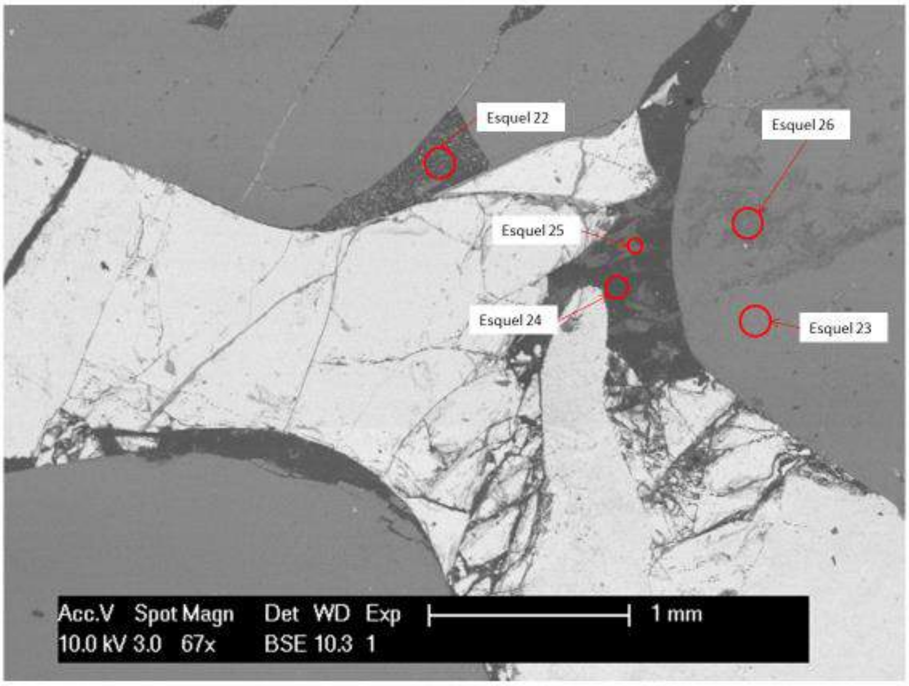
ESQUEL

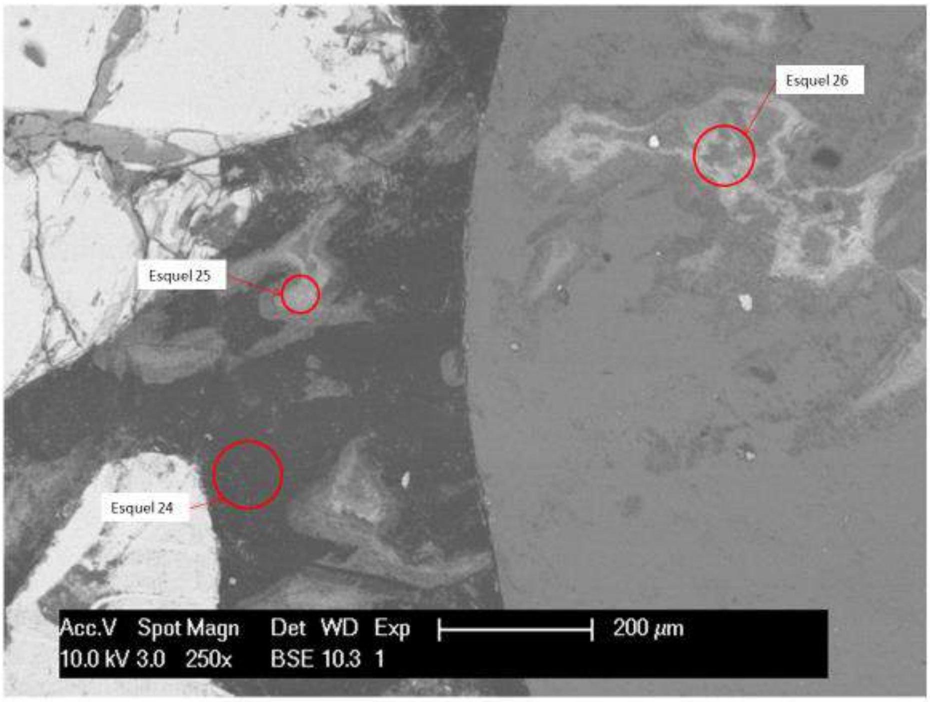

Esquel 1
Esquel 001
Acc.V Spot Magn Det WD Exp 500 μm
10.0 kV 3.0 103x BSE 9.4 1


Esquel 3
Esquel 4
Esquel 6
Esquel 5
Esquel 2
Acc.V Spot Magn Det WD Exp 100 µm
10.0 kV 3.0 500x BSE 10.6 1

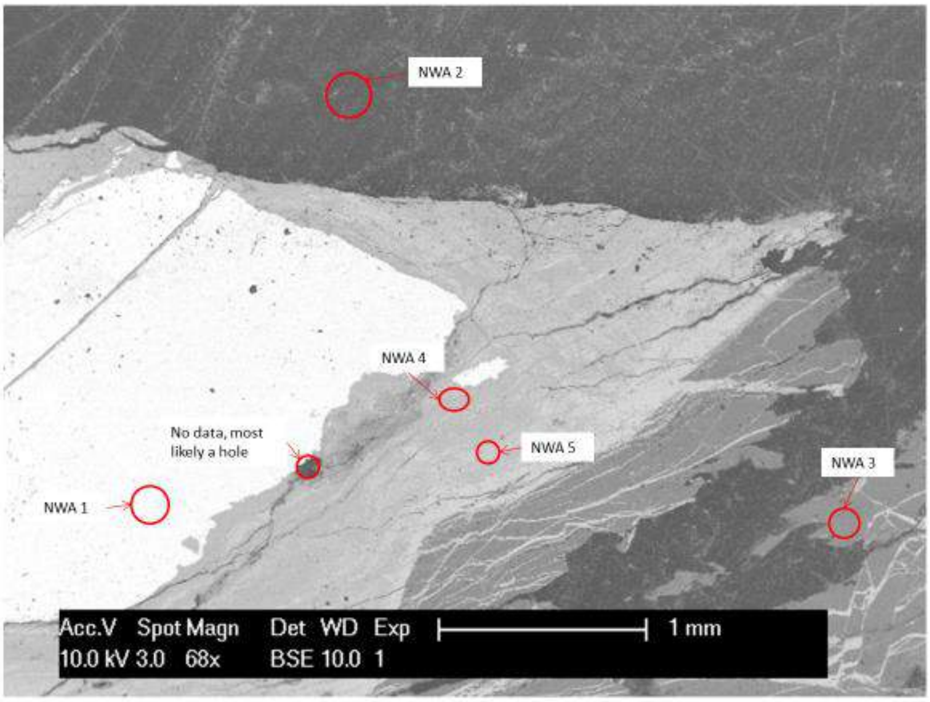

Esquel 12
Esquel 8
Esquel 9
Esquel 7
Esquel 11
Esquel 10
Acc.V Spot Magn Det WD Exp 100 µm
10.0 kV 3.0 800x BSE 10.3 1

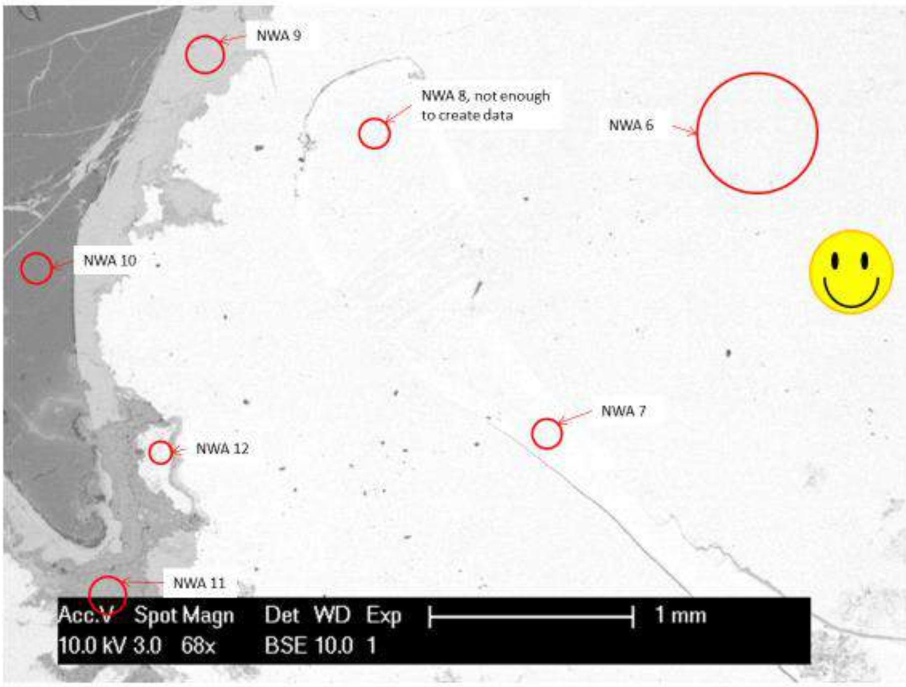

Esquel 13
Esquel 14
Esquel 20
Esquel 19
Esquel 17
Esquel 21
Esquel 16
Esquel 18
Esquel 15
Acc.V Spot Magn Det WD Exp 200 µm
10.0 kV 3.0 250x BSE 10.3 1

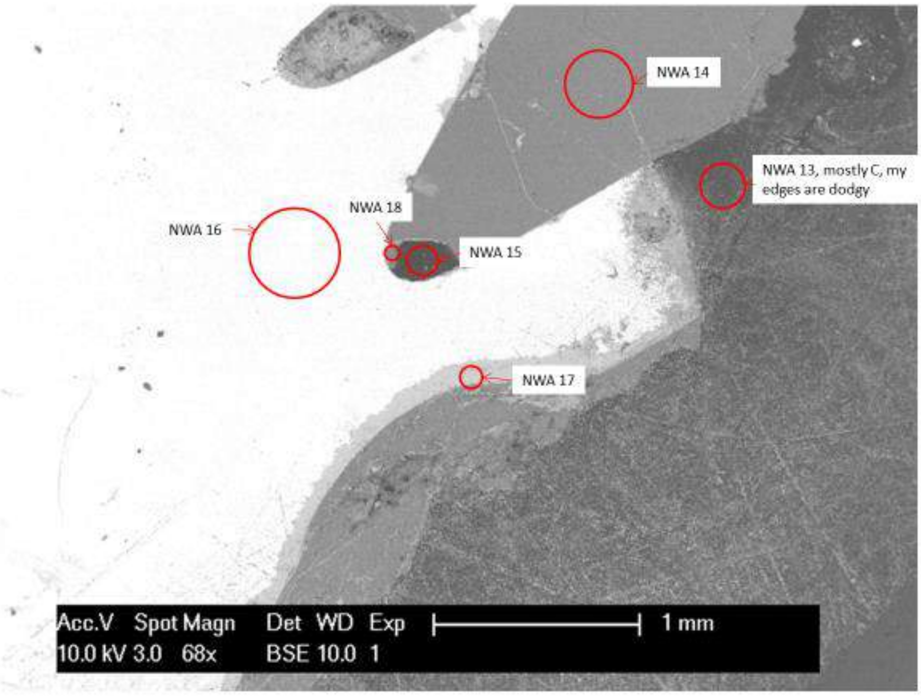

Esquel 22
Esquel 26
Esquel 25
Esquel 24
Esquel 23
Acc.V Spot Magn Det WD Exp 1 mm
10.0 kV 3.0 67x BSE 10.3 1

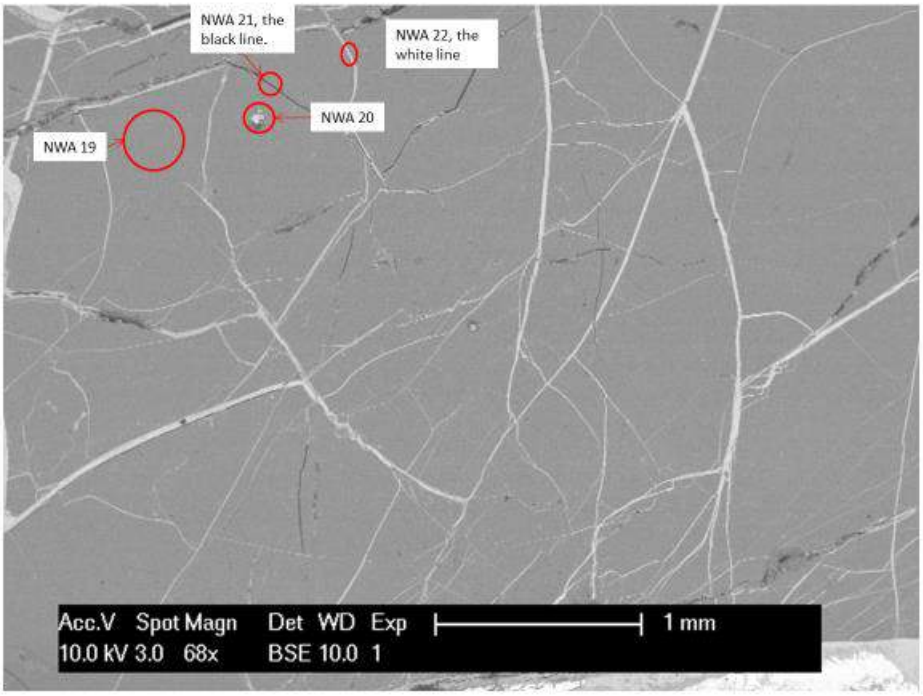

Esquel 26
Esquel 25
Esquel 24
Acc.V Spot Magn Det WD Exp 200 µm
10.0 kV 3.0 250x BSE 10.3 1

NWA 2957

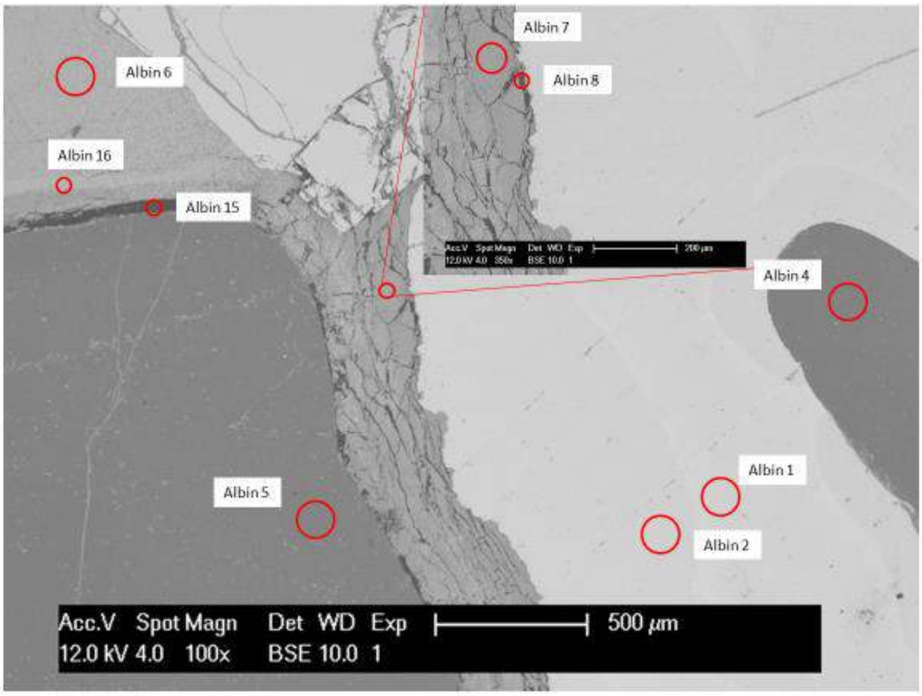

NWA 2
NWA 4
No data, most likely a hole
NWA 5
NWA 3
NWA 1
Acc.V Spot Magn Det WD Exp 1 mm
10.0 kV 3.0 68x BSE 10.0 1

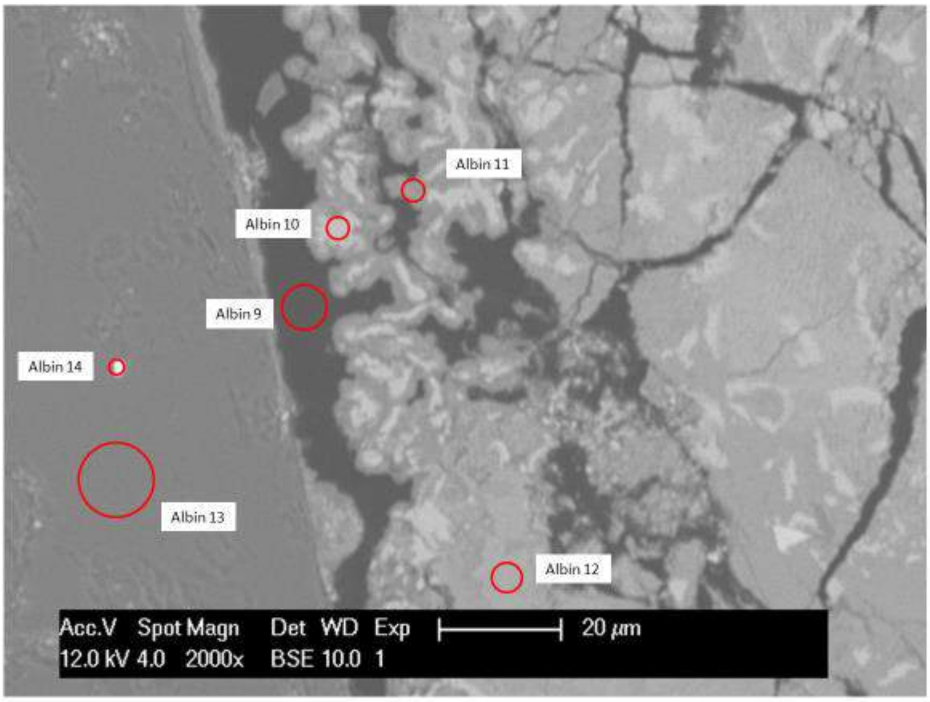

NWA 9
NWA 8, not enough to create data
NWA 6
NWA 10
NWA 7
NWA 12
NWA 11
Acc.V Spot Magn Det WD Exp 1 mm
10.0 kV 3.0 68x BSE 10.0 1

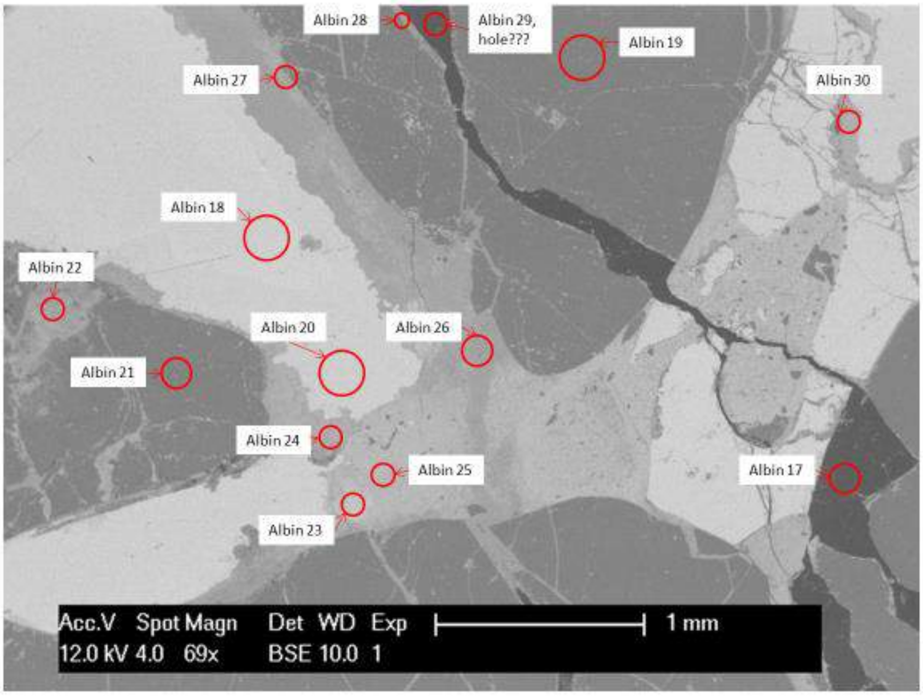

NWA 14
NWA 13, mostly C, my edges are dodgy
NWA 18
NWA 16
NWA 15
NWA 17
Acc.V Spot Magn Det WD Exp 1 mm
10.0 kV 3.0 68x BSE 10.0 1

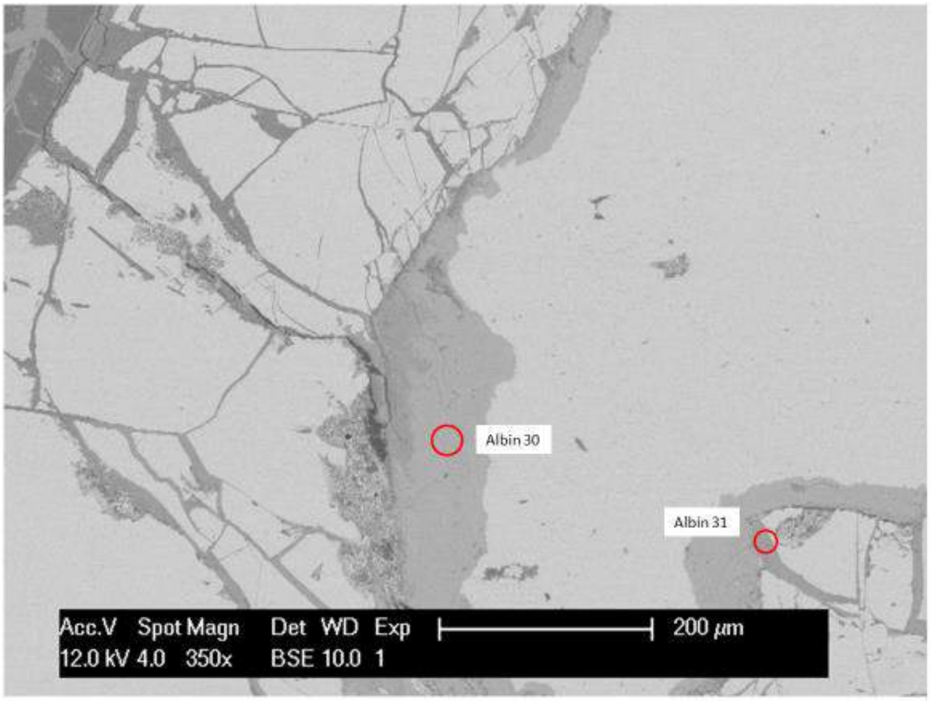

NWA 21, the black line.
NWA 22, the white line
NWA 20
NWA 19
Acc.V Spot Magn Det WD Exp 1 mm
10.0 kV 3.0 68x BSE 10.0 1

ALBIN

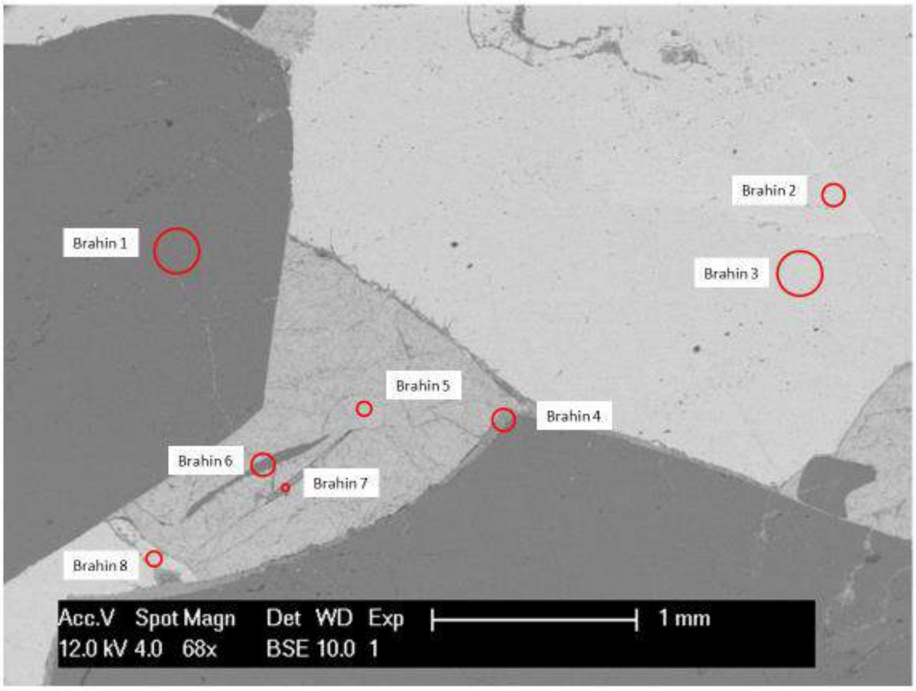

Albin 7
Albin 6
Albin 8
Albin 16
Albin 15
Albin 4
Albin 1
Albin 5
Albin 2
Acc.V Spot Magn Det WD Exp 500 µm
12.0 kV 4.0 100x BSE 10.0 1

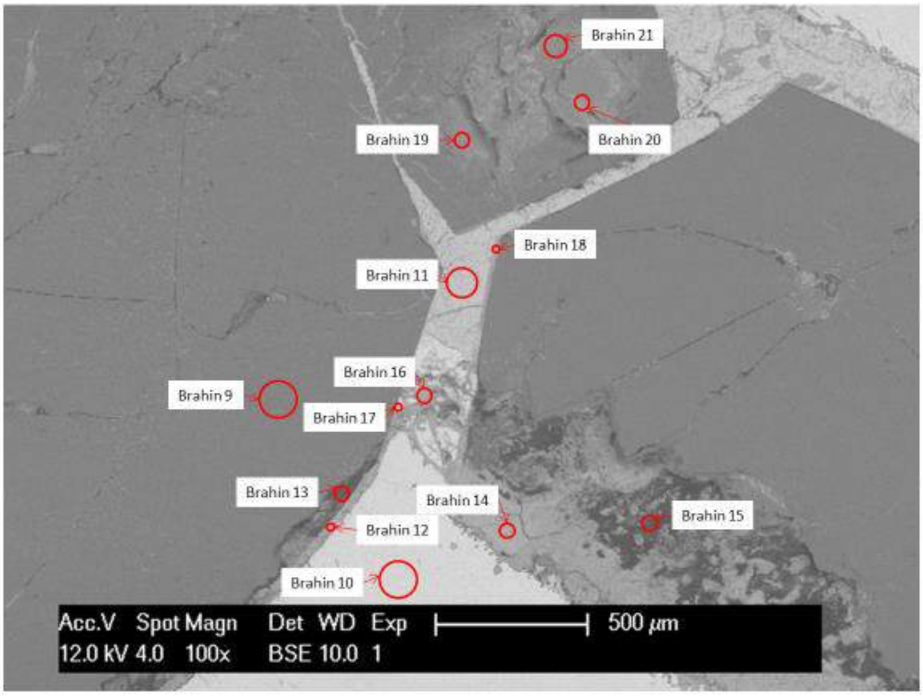

Albin 11
Albin 10
Albin 9
Albin 14
Albin 13
Albin 12
Acc.V Spot Magn Det WD Exp 20 μm
12.0 kV 4.0 2000x BSE 10.0 1

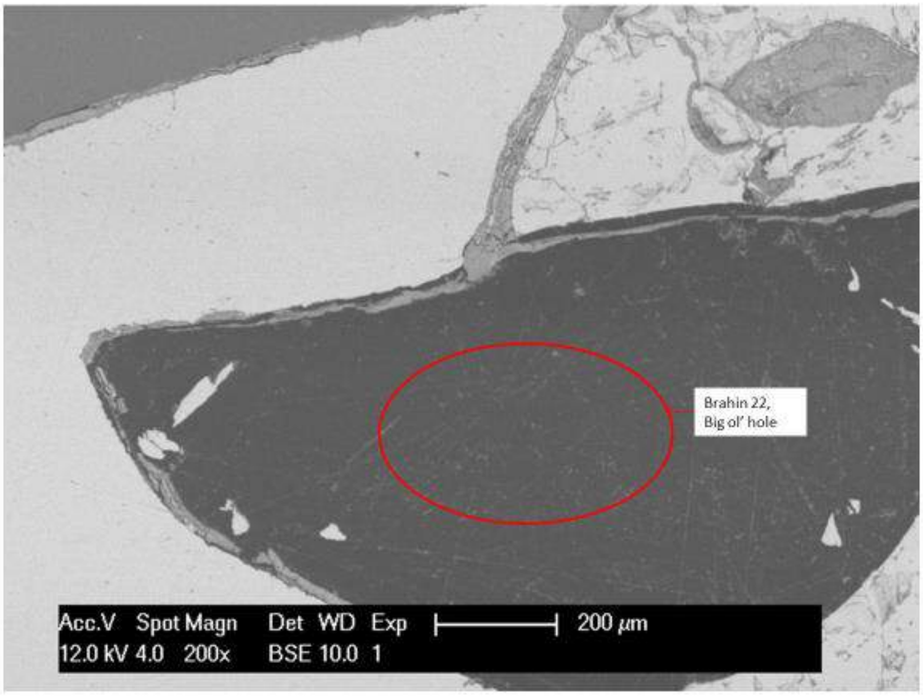

Albin 28
Albin 29, hole???
Albin 19
Albin 27
Albin 30
Albin 18
Albin 22
Albin 20
Albin 26
Albin 21
Albin 24
Albin 25
Albin 17
Albin 23
Acc.V Spot Magn Det WD Exp 1 mm
12.0 kV 4.0 69x BSE 10.0 1


Albin 30
Albin 31
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 350x BSE 10.0 1
200 µm

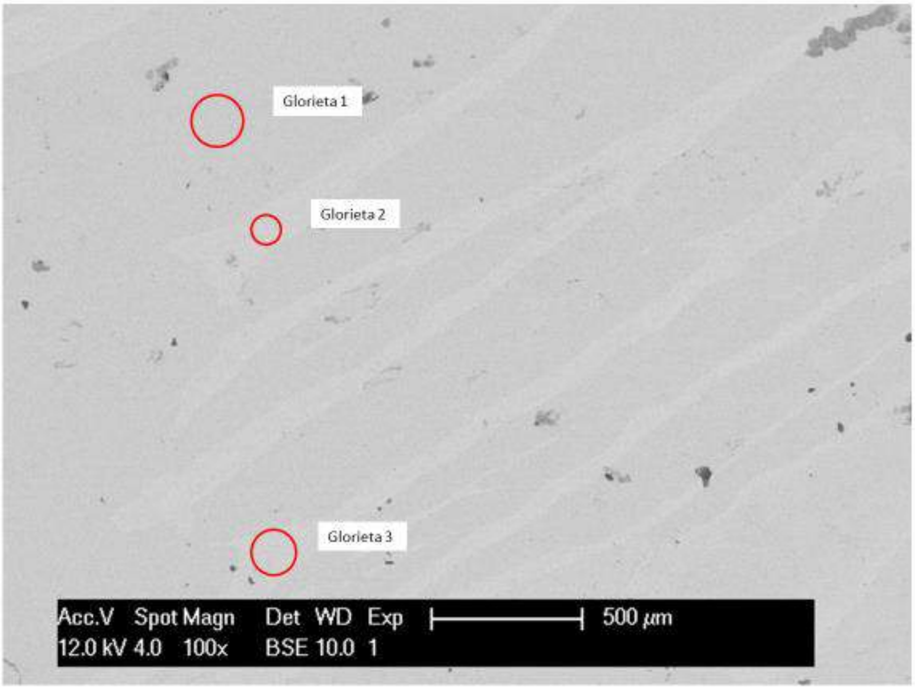
BRAHIN


Brahin 1
Brahin 2
Brahin 3
Brahin 4
Brahin 5
Brahin 6
Brahin 7
Brahin 8
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 68x BSE 10.0 1
1 mm


Brahin 21
Brahin 19
Brahin 20
Brahin 18
Brahin 11
Brahin 16
Brahin 9
Brahin 17
Brahin 13
Brahin 14
Brahin 15
Brahin 12
Brahin 10
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 100x BSE 10.0 1
500 µm



GLORIETA MNTS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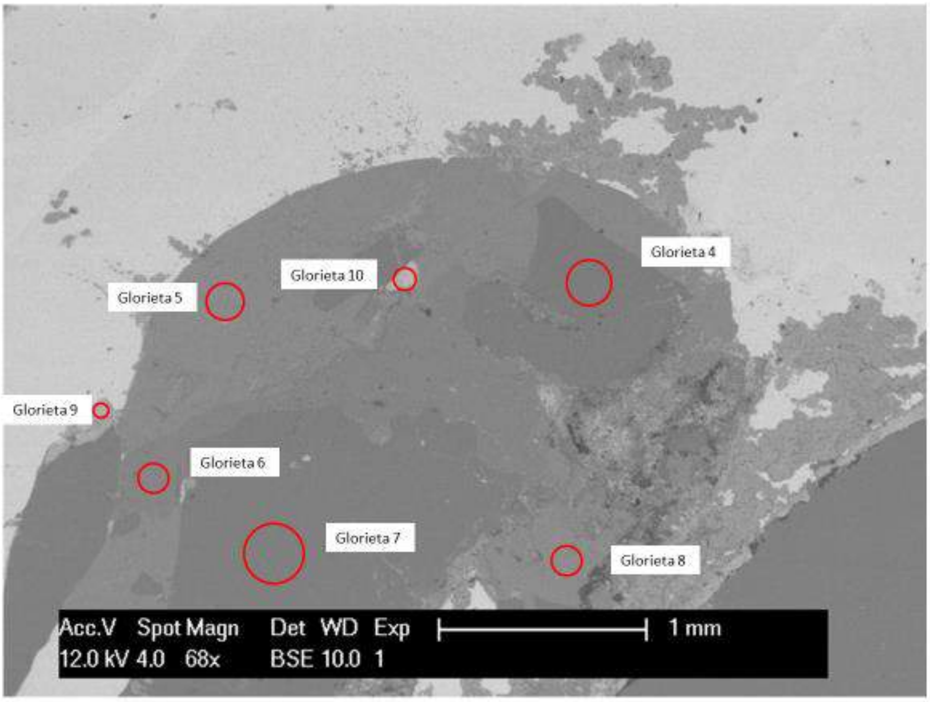
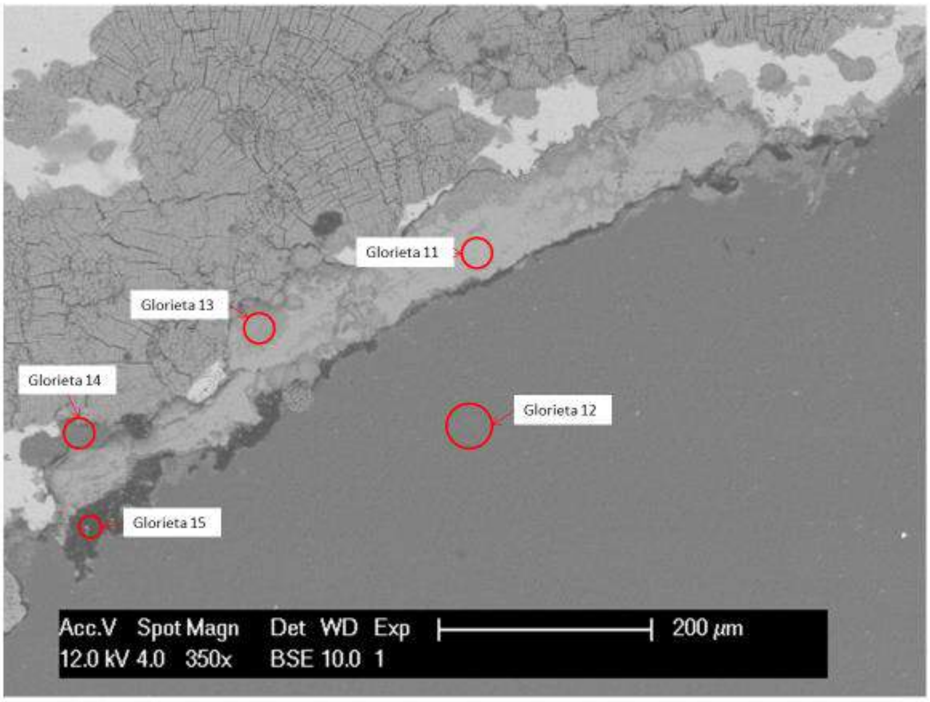
Glorieta 2
Glorieta 3
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 100x BSE 10.0 1
500 μm


Glorieta 4
Glorieta 10
Glorieta 5
Glorieta 9
Glorieta 6
Glorieta 7
Glorieta 8
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 68x BSE 10.0 1
1 mm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Glorieta 13
Glorieta 14
Glorieta 12
Glorieta 15
Acc.V Spot Magn Det WD Exp
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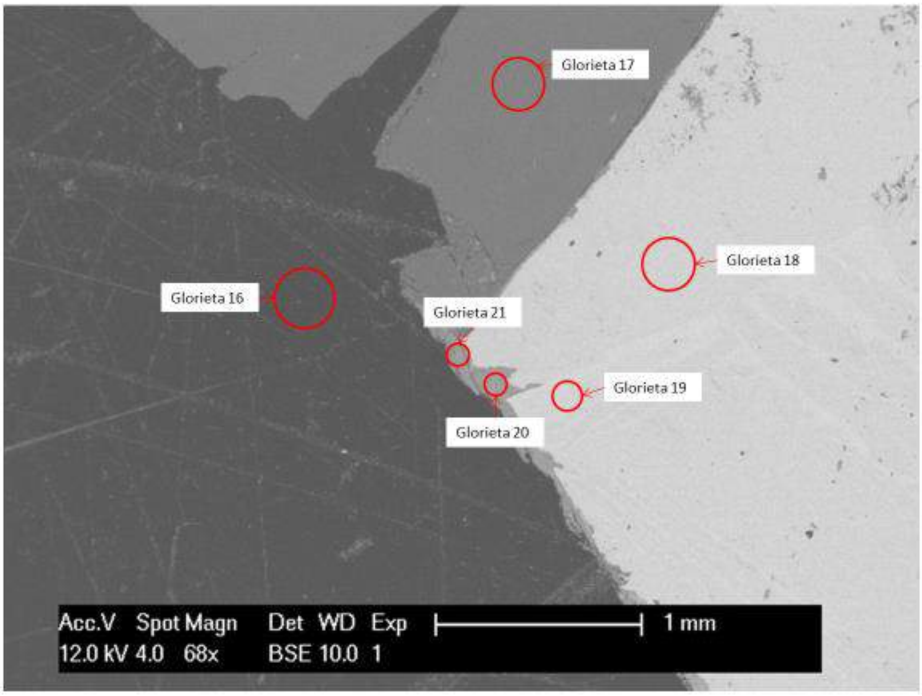
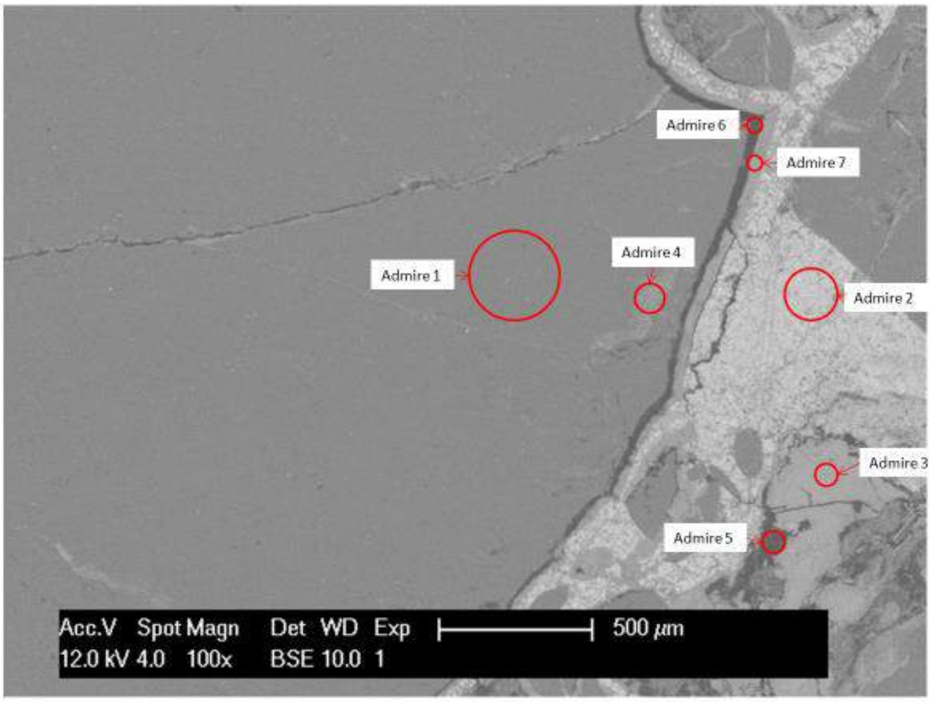
200 μm


Glorieta 17
Glorieta 18
Glorieta 16
Glorieta 21
Glorieta 19
Glorieta 20
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 68x BSE 10.0 1
1 mm

ADMIRE


Admire 6
Admire 7
Admire 1
Admire 4
Admire 2
Admire 3
Admire 5
Acc.V Spot Magn Det WD Exp
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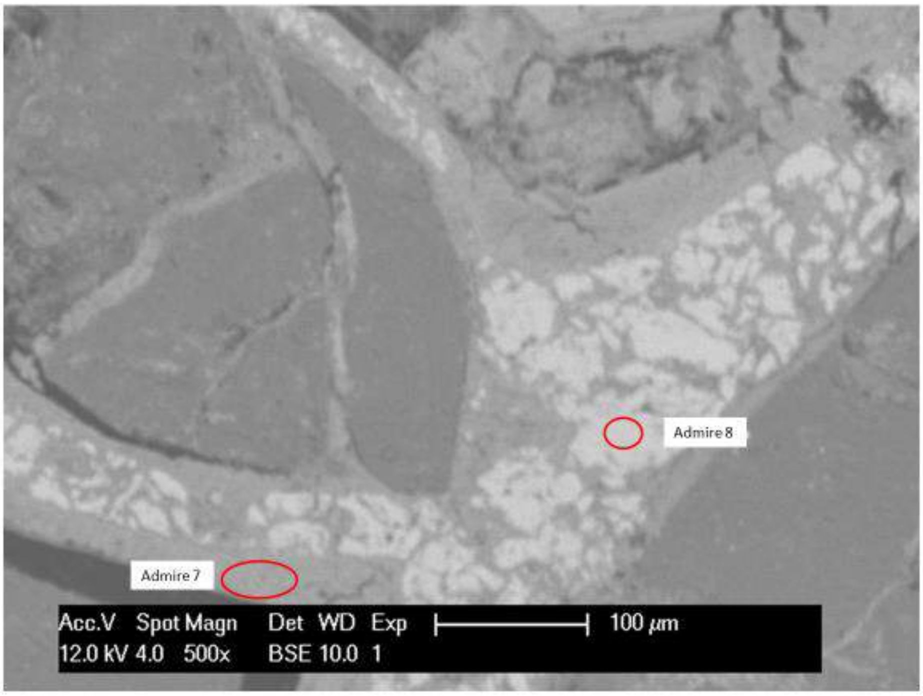
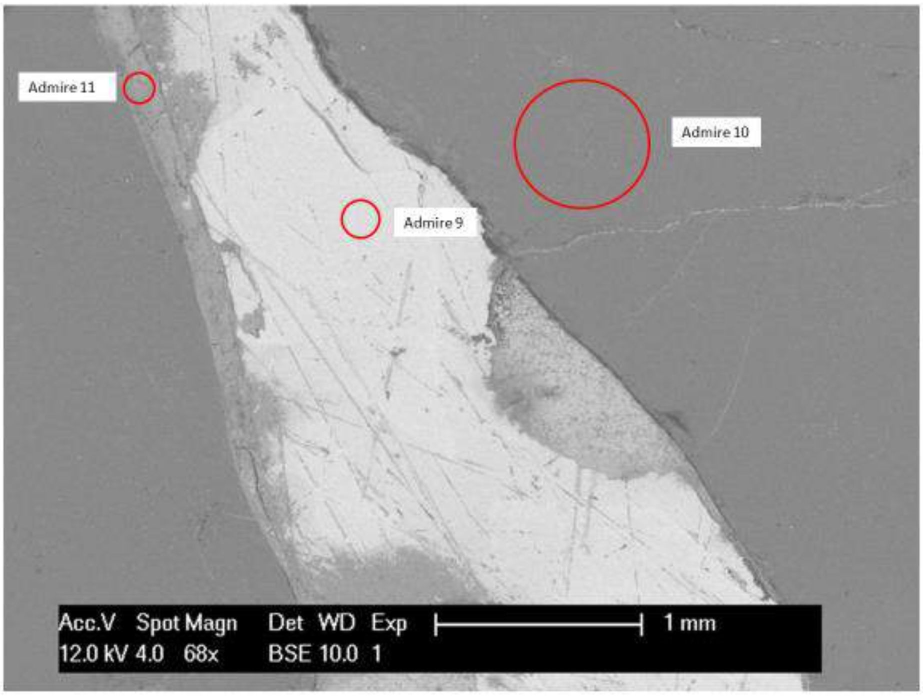
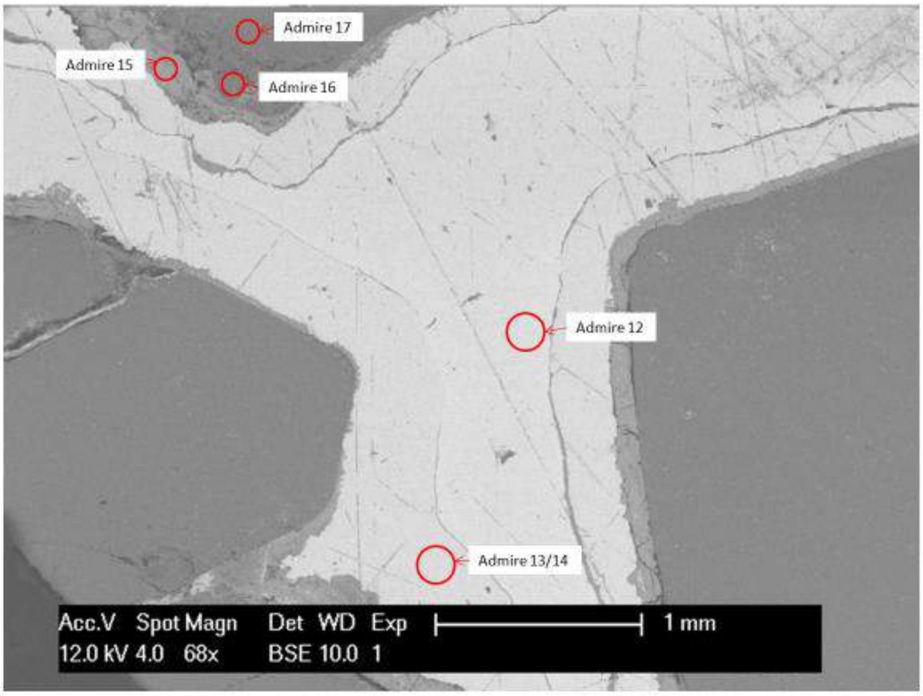
500 µm


Admire 8
Admire 7
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 500x BSE 10.0 1
100 µm


Admire 11
Admire 10
Admire 9
Acc.V Spot Magn Det WD Exp
12.0 kV 4.0 68x BSE 10.0 1
1 mm



APPENDIX B: LASER DATA FOR METALLIC ALLOY

APPENDIX C: TRACE AND REE SPIDER PLOTS OF OLIVINES

Corrected concentrations

Fe ppm Fe57_CPS Fe57_CPS_ Fe57_CPS_

Si_ppm_m2Si_ppm_m2Si_ppm_m2P_ppm_m3

64-Albin.d	202800.1	228.7585	15.41281	36.12924	31.47457
69-Admire.	191474.3	202.9628	16.84974	32.40933	20.71752
8-Glorieta.d	930556.7	55.27507	8.37501	15.25052	454.1117
17-Glorieta	922119.7	50.90101	10.14332	17.67058	647.328
38-Brenham	926076.5	83.34688	29.63445	27.61931	1042.762
39-Brenham	924374.2	50.65571	10.16812	19.07908	1175.804
40-Brenham	927126.2	40.97898	7.78786	24.18687	1082.883
50-Albin.d	938809.8	57.83069	6.947193	20.82844	1081.509
59-Albin.d	940653.2	47.40892	9.594663	26.47939	918.0775
60-Albin.d	938477.1	59.12406	9.760162	27.72074	897.1841
62-Albin.d	945221.3	56.90232	10.58648	26.6231	652.2027
65-Albin.d	932775.7	51.86233	13.43197	23.94435	649.2119
85-Admire.	920488	50.99504	11.04586	21.01658	679.3201
87-NWA.d	941060.9	70.01493	14.68055	33.71633	841.3084
102-NWA.d	945218.8	41.21154	11.15358	28.68172	903.6292
33-Brenham	633175.8	48.75454	6.964934	14.72514	9.877543

34-Brenham	633262.3	45.34158	6.712581	12.54594	10.51215
36-Brenham	633191.1	47.23606	6.331911	15.23838	5.69872
37-Brenham	633143.1	59.51545	37.98859	80.94608	3.67223
46-Brenham	633144.2	119.0311	102.5694	196.49	0
68-Albin.d	603822.8	15.69939	24.15291	43.27719	1183.493
78-Admire.	569094.9	88.77881	40.97484	13.52739	771.6927
79-Admire.	586944	48.48158	8.921549	15.79584	575.2051
81-Admire.	585323.9	135.7951	28.09555	47.22393	4027.029
88-NWA.d	580491.2	965.9373	59.2101	9.530736	9520.055
103-NWA.d	603759.5	35.01805	6.762106	13.75847	787.3023
67-Albin.d					
7-Glorieta.d	471685.7	70.75285	11.32046	30.98975	144901.8
13-Glorieta	402849.5	64.45591	169.1968	315.0202	136968.8
22-Glorieta	283850.8	-170.31	567.7017	688.6221	153279.4
44-Brenham	519467.6	69.60866	13.50616	28.26319	140360.2
45-Brenham	507849.2	76.17738	12.18838	28.13078	144940.2
48-Brenham	412168.1	8.243361	107.1637	248.8423	141785.8
49-Albin.d	588518.5	65.91407	14.12444	28.17356	146776.5
51-Albin.d	601801.6	73.41979	12.03603	33.44933	142627
58-Albin.d	597136.9	62.10223	17.91411	28.42491	148925.9
61-Albin.d	607102.3	61.92444	12.14205	26.05926	146190.2
63-Albin.d	599341.4	61.13283	14.38419	32.31649	145400.2
66-Albin.d	532624.5	71.37168	14.91349	35.23311	146045.6
71-Admire.	472032.1	58.53199	23.60161	43.55535	142364.9
89-NWA.d	926302.7	1259.772	240.8387	540.7199	15006.1
90-NWA.d	863220	2000.944	160.5589	208.5367	30385.34
91-NWA.d	556531.4	-33.3919	122.4369	288.0384	149150.4
98-NWA.d	626725.9	46.37772	16.29487	38.05104	148659.4
101-NWA.d	627292.5	55.20174	18.81878	34.12722	148793.8
104-NWA.d	380206.2	152.0825	91.24948	252.8599	126228.5
108-NWA.d	360807.5	20.20522	71.43989	152.7948	148508.4
9-Glorieta.d	920735.5	59.29537	9.023208	15.1496	627.9416
10-Glorieta	923576.9	48.39543	8.681623	23.01738	456.247
11-Glorieta	725168.7	47.86113	18.85439	33.45783	149.8199
14-Glorieta	924195.6	52.67915	8.502599	20.22879	547.1238
15-Glorieta	693239.6	56.84565	15.25127	33.18538	198.2665
16-Glorieta	921718.7	55.85615	8.295468	22.9084	416.6168
18-Glorieta	848060.7	42.57265	9.667892	16.16879	228.9764
19-Glorieta	922577.3	59.59849	9.225773	20.78751	673.4814
20-Glorieta	826266.4	52.88105	18.17786	33.00604	136.1687
23-Glorieta	919668.7	42.85656	9.380621	16.91988	928.8654
24-Glorieta	748945.5	41.94095	10.18566	15.99748	205.0613
25-Glorieta	930075.9	-44.6436	79.98653	227.8872	230.6588

26-Glorieta	929035.8	46.8234	14.67877	29.25905	293.5753
41-Brenham	924827.7	40.69242	8.69338	22.95052	963.6704
42-Brenham	925625.1	42.949	7.03475	21.28753	884.8976
43-Brenham	930695.5	34.99415	10.60993	18.67906	681.2691
47-Brenham	921251.6	46.79958	9.028266	22.83414	670.6712
70-Admire.	920161.8	48.58454	13.80243	18.10989	901.7586
82-Admire.	924411.1	49.73332	12.20223	24.42849	515.8214
83-Admire.	760728.3	52.94669	10.49805	27.13974	171.4682
86-Admire.	706366.4	52.27111	19.77826	33.8519	87.44816
100-NWA.d	939481.4	35.88819	13.34064	26.40882	1012.761
105-NWA.d	892286.8	70.3122	12.84893	26.6419	7655.821
107-NWA.d	927185.4	47.10102	17.80196	47.9837	394.981
109-NWA.d	746093.8	47.45156	11.63906	27.02799	285.0078

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S34_CPS_InS34_CPS_LOTi_ppm_m4Ti_ppm_m4Ti_ppm_m4V_ppm_m5

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#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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0.003885	0.008404	0.157847	0.145705	0.220196	0.048568	0.042497	0.075065	1953.655
0.002997	0.007756	0.311658	0.155829	0.238766	0.431526	0.155829	0.075505	1879.535
0.068176	0.009126	22.05065	9.054616	0.31917	0.337684	0.100133	0.088149	1386.954
5.097947	0.010692	3851.782	726.9295	0.448846	42.29408	5.475573	0.111428	1072.457
0.070399	0.087489	0	1.852605	3.763753	4.001628	1.148615	1.104616	5446.66
0.025897	0.054063	1.13945	0.897749	1.938447	4.920354	0.310759	0.531001	4661.388

0.02894	0.0708	0.645576	0.845928	1.634755	0.289396	0.289396	0.572359	1415.816
0.004763	0.008337	0.63926	0.162949	0.309415	0.060166	0.045124	0.09307	1791.183
0.006273	0.009278	0.489288	0.175642	0.290462	0.09033	0.040147	0.083429	1634.724
0.034979	0.068429	-0.60073	0.745204	2.036764	-0.19771	0.380206	0.709609	536.0907
0.019484	0.044639	0.9381	0.793777	1.141956	0.057729	0.194836	0.335811	477.7092
0.002394	0.006075	0.147318	0.088391	0.136554	0.053403	0.020256	0.044074	6364.124

0.002401	0.006173	0.197645	0.099746	0.13327	0.049873	0.020319	0.043343	6243.38
0.004496	0.01248	0.565632	0.203047	0.364281	0.073967	0.04351	0.08843	2844.112
0.002403	0.006043	0.373375	0.09242	0.139905	0.047319	0.018299	0.049834	5868.642
0.004714	0.011512	0.457538	0.180242	0.289123	0.042981	0.042981	0.101011	2614.9
0.001788	0.008413	0.409243	0.119823	0.133065	0.071894	0.023965	0.059541	6074.126
0.002714	0.007688	0.50714	0.11364	0.190746	0.066149	0.032226	0.088453	5631.123
0.002399	0.006928	0.370876	0.099638	0.186416	0.062735	0.027677	0.065667	6181.268
0.004297	0.008637	0.396608	0.198304	0.237981	0.059491	0.042966	0.096597	4610.567
0.002943	0.006818	0.200488	0.097485	0.141813	0.031269	0.02759	0.064483	6470.789
0.002397	0.006288	0.509283	0.164768	0.193333	0.059916	0.023966	0.08085	3157.554
0.029762	0.07222	0.539444	1.450918	1.666529	0.037203	0.186015	0.690972	6026.892
0.003716	0.005222	0.338169	0.167226	0.270888	0.063174	0.044594	0.091638	5945.829
0.002035	0.006256	0.048091	0.081385	0.245819	0.070287	0.024046	0.068358	6625.465
0.002036	0.007985	0.007405	0.062943	0.14469	0.031471	0.020364	0.071205	6588.599
0.001806	0.006577	0.059565	0.107961	0.174548	0.046535	0.031644	0.049984	6570.71
0.002395	0.004997	0.108708	0.082913	0.238954	0.055275	0.025795	0.069451	5958.656
3.680647	0.005114	2318.808	441.6777	0.271116	25.94856	4.232744	0.065446	6387.763
0.002219	0.004172	0.131266	0.097988	0.176394	0.06286	0.029581	0.072518	5853.371
0.003043	0.0063	0.217568	0.118674	0.220718	0.05173	0.024343	0.056411	3188.973
0.003532	0.008377	0.084764	0.183655	0.278789	0.026842	0.059335	0.138873	2487.822
0.00357	0.007265	0.041337	0.112738	0.300653	0.026305	0.033821	0.066087	6256.946
0.003748	0.008246	0.376545	0.146335	0.264527	0.067814	0.04283	0.08879	4854.04
0.004821	0.00963	0.146495	0.159476	0.292842	0.020398	0.048214	0.105771	4496.849
0.003283	0.007061	0.073117	0.122359	0.235945	-0.01343	0.029844	0.088	2770.992

Co_ppm_mCo_ppm_mNi_ppm_m Ni_ppm_m Ni_ppm_m
Cu_ppm_mCu_ppm_mCu_ppm_mZn_ppm_m
0.210912 0.014884 2.758081 0.64896 0.093763 0.082742 0.03407 0.071333 249.4441
0.214451 0.012711 0.440391 0.095737 0.089748 -0.04212 0.025275 0.066951 298.7
147.028 0.009619 62198.41 1433.057 0.056003 68.30286 1.861113 0.03849 -1.32139
132.7852 0.010241 70874.12 1622.931 0.039009 80.59326 2.397511 0.035242 -0.35041
127.7986 0.01285 66251.51 1444.679 0.05281 60.3061 1.315029 0.045091 -0.426 122.0174
0.011818 67534.78 1663.874 0.057208 68.95832 2.033623 0.041118 0.184875 153.9029
0.01026 65251.14 1576.115 0.055735 71.94499 2.225103 0.046558 0.37085 172.741
0.014001 53061.53 1633.529 0.066434 73.41493 2.065382 0.058873 -0.43185
148.6232 0.011715 51284.41 1448.606 0.047157 70.17273 1.467419 0.054784 -0.73371
187.6954 0.010483 53436.89 1501.563 0.069941 75.07817 2.06465 0.061645 -1.33264
172.0303 0.016301 46561.6 1190.979 0.06736 61.59062 1.474545 0.053275 -0.11343
110.0675 0.012832 59977.48 1399.164 0.090729 77.02862 1.790929 0.049624 -0.35445
145.4371 0.013268 72626.5 1656.878 0.066763 86.52587 2.945562 0.050761 -0.79162
154.334 0.016003 51607.78 1543.34 0.078789 75.28487 2.446758 0.065951 -0.2635
151.235 0.013347 47336.56 1777.011 0.078674 64.14255 1.663585 0.083145 -1.22878
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0.392623 0.009097 5.952666 2.153092 0.041218 108.6678 1.899787 0.034411 -0.69659
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100.2241 0.00642 25792.6 555.4587 0.037312 28.30424 0.97809 0.029302 -0.44678

27.35777 0.016056 382065.4 11320.46 0.063936 159.1468 5.377217 0.060809 -1.20752
96.68387 0.196164 459248.4 112797.8 0.733645 375.4557 64.45591 0.548246 3.464505
141.9254 0.348279 562024.6 238434.7 1.84679 266.8198 90.83227 1.20858 -8.51552
45.71315 0.016363 338692.9 12467.22 0.064465 112.3089 4.363528 0.06167 -0.57141
28.43956 0.014752 345743.8 9547.566 0.075338 106.4452 2.539246 0.052666 -0.03047
140.1371 0.133427 445141.5 82433.61 0.514633 202.7867 26.37876 0.446353 4.616282
51.78963 0.016276 262832.4 5885.185 0.0662 96.28163 3.178 0.066189 -1.36536
43.32971 0.022448 253719.5 5777.295 0.08162 96.76969 2.768287 0.063415 1.444324
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26.63122 0.015059 319787.7 6817.593 0.091164 132.8365 3.302272 0.084231 -0.57523
41.53883 0.027 380457.9 15105.03 0.117149 178.5226 7.080482 0.118527 10.19589
222.3126 0.258494 53169.77 4260.992 1.330763 70.76953 10.37459 1.451201 -7.0399
207.1728 0.130357 101687.3 10013.35 0.365764 39.88076 2.58966 0.44316 -1.5538
101.2887 0.113421 292735.5 23374.32 0.703589 165.8464 15.58288 0.547983 10.6854
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52.69257 0.014774 222187 6774.76 0.078192 91.3338 2.634629 0.094672 -0.79039
53.22886 0.125057 492747.2 55510.1 0.661323 282.8734 32.69773 0.546759 -5.39893
19.48361 0.063625 489976.6 24534.91 0.464554 228.752 8.659381 0.318896 -2.52565

149.1592	0.01023	72185.66	2025.618	0.047085	86.54914	2.025618	0.033454	-1.10488
221.6585	0.010526	69637.7	2770.731	0.033871	85.52322	2.955446	0.039971	-1.31148
105.8746	0.018627	271068.1	11747.73	0.08558	768.6788	34.8081	0.072723	-0.91371
138.6293	0.010876	69314.67	2033.23	0.056537	73.56597	2.218069	0.037406	-0.60997
85.96171	0.023441	303084.4	10953.19	0.12239	862.3901	36.04846	0.053382	-0.513
151.1619	0.010789	71709.71	2212.125	0.049517	80.37387	2.765156	0.043284	-0.66364
186.5734	0.013225	145696.8	5597.201	0.054201	381.7969	12.21207	0.050085	-0.64453
202.967	0.011674	70484.9	2029.67	0.039234	82.66292	2.02967	0.044751	-0.07381
214.8293	0.015731	168558.4	6775.385	0.07406	428.006	19.83039	0.059389	-0.49576
150.8257	0.009694	72837.76	2207.205	0.048224	93.62228	2.575072	0.037524	-0.36787
109.346	0.010484	247002.2	10784.82	0.058979	689.0299	25.46415	0.044429	-0.35949
744.0608	0.098982	63617.19	6324.516	0.41872	48.73598	6.696547	0.359493	1.543926
204.3879	0.018141	64660.89	2787.107	0.07057	63.54605	2.415493	0.060649	1.728007
144.2731	0.014837	67512.42	1849.655	0.060007	70.65683	2.034621	0.04095	-0.73986
162.91	0.011332	66830.13	2036.375	0.057352	71.27313	1.85125	0.045552	-0.37025
260.5947	0.013618	61984.32	2978.226	0.055237	68.12691	3.536643	0.040804	-0.05584
116.0777	0.011422	72041.88	2211.004	0.050663	76.99821	1.824078	0.046639	-0.5896
161.9485	0.015882	70116.33	2392.421	0.077398	87.5994	2.208388	0.05343	1.085791
177.4869	0.013129	69145.95	2588.351	0.06743	73.58312	2.588351	0.068425	-0.64709
82.15866	0.011156	235369.3	8824.448	0.056227	541.6386	15.21457	0.051203	-0.53251
86.1767	0.022516	290316.6	10030.4	0.102995	741.6847	31.08012	0.113534	-1.04542
206.6859	0.011651	53174.65	1878.963	0.09374	74.21903	2.442652	0.070115	-0.78916
135.6276	0.015889	95117.77	5532.178	0.074422	85.12416	4.104519	0.064409	-0.28553
131.6603	0.021806	67869.97	2410.682	0.115983	52.66413	2.410682	0.103915	-1.98418
86.54688	0.014895	250239.9	10445.31	0.106199	610.3047	26.85938	0.070895	0.999766

Zn_ppm_m	Zn_ppm_m	Ga_ppm_m	Ga_ppm_m	Ga_ppm_m	As_ppm_m	As_ppm_m	As_ppm_m	Se_ppm_m
4.867202	0.531417	56.94626	0.8112	0.007781	5.925818	0.320424	0.485706	-0.00065
5.74423	0.529159	44.07739	0.689308	0.008108	4.771541	0.29487	0.380954	-0.00065
0.539723	0.725574	10.51529	0.279167	0.005534	28.4192	0.930557	0.370771	0.006142
0.368848	0.461595	8.16998	0.184424	0.006255	27.77424	0.885235	0.362854	0.00627
0.425995	0.571963	25.70788	0.648254	0.007346	30.93095	0.944598	0.416253	0.016669
0.480675	0.480712	26.30769	0.739499	0.00645	29.76485	0.961349	0.292121	0.049916
0.352308	0.640496	24.29071	0.648988	0.007564	29.87201	0.890041	0.323085	0.007232
0.356748	0.330874	15.02096	0.3943	0.004206	25.89238	0.901257	0.3314	-0.00053
0.451514	0.797467	15.03164	0.395074	0.005725	25.41645	0.846588	0.289288	0.090303
0.488008	0.601545	15.84149	0.544317	0.008131	26.07089	0.80709	0.277695	0.076955
0.378089	0.807313	14.89669	0.529324	0.010148	26.54181	0.888508	0.270258	0.037809
0.429077	0.533212	16.11836	0.391766	0.004703	23.80444	0.578321	0.321901	0.020521
0.441834	0.563652	17.19472	0.515473	0.008007	26.2155	0.920488	0.331597	-0.00052
0.319961	0.803892	20.72216	0.526994	0.010791	21.45619	0.639921	0.344974	-0.00056
0.453705	0.805402	19.32027	0.623844	0.008884	20.37892	0.60494	0.363134	0.00794
0.379906	0.484076	0.017856	0.004179	0.002692	2.747983	0.151962	0.20449	31.16492
0.26597	0.400146	0.009879	0.00304	0.003905	2.887676	0.202644	0.217361	31.63779
0.291268	0.376533	0.018996	0.004052	0.004007	2.646739	0.227949	0.177787	31.4696
2.279315	2.289825	0.014689	0.01089	0.019312	3.67223	0.70912	1.261778	29.37784
4.811896	3.321981	0.056983	0.040521	0.054694	-0.25326	2.279319	2.505985	30.26429
0.712511	1.018806	18.35621	2.052998	0.012895	29.46655	3.381408	0.737871	13.04257
0.23902	0.339875	2.249063	0.103575	0.002382	2.094269	0.125201	0.138688	53.49492
0.31695	0.545658	11.33976	0.31695	0.004406	17.45572	0.504772	0.269924	0.287603
0.936518	1.403138	14.2702	0.725802	0.011522	23.99828	1.755972	0.594057	0.063215
0.087074	0.223837	2.565771	0.220587	0.002387	3.169482	0.174147	0.129972	0.285602
0.241504	0.320898	14.0676	0.531308	0.003377	15.42002	0.519233	0.175646	0.027773
0.773565	0.898599	0.117921	0.017924	0.00784	11.00914	0.556589	0.362745	0.045282
5.639892	8.297893	0.273938	0.153083	0.095346	12.40776	3.786785	3.995864	-0.00741
10.21863	12.64328	0.244112	0.175988	0.119825	7.380122	8.515525	7.266014	-0.00852
0.405185	0.641854	0.592193	0.124672	0.007247	9.79716	0.685697	0.518626	0.028051
0.467221	0.747432	0.121884	0.019298	0.007841	9.953845	0.477378	0.466531	0.078209
4.616282	5.561054	0.766633	0.230814	0.059449	9.232565	1.648672	2.970413	-0.00379
0.376652	0.573617	0.111819	0.014124	0.009987	7.921459	0.435504	0.399757	-0.00067
0.445333	0.544089	0.184151	0.028886	0.006803	8.413186	0.493477	0.442432	0.018054
0.489652	0.873611	0.112262	0.015526	0.006105	7.882207	0.477709	0.486093	0.068074
0.643528	0.650789	0.131134	0.016999	0.008788	8.18374	0.497824	0.472471	0.021856
0.371592	0.609326	0.190591	0.028768	0.009907	8.103096	0.431526	0.424825	0.04555
0.575234	0.669424	0.220507	0.023435	0.006795	7.904147	0.394142	0.384267	-0.00068
2.171348	1.037338	1.925891	0.396507	0.009597	11.04555	0.708048	0.558423	0.198253
7.410422	12.18144	26.86278	8.521985	0.177089	41.68362	10.55985	8.105334	1.685871
3.625524	4.728374	0.302127	0.081143	0.060424	5.282906	1.035864	2.949795	0.759634
3.561801	5.451671	0.150263	0.086819	0.065299	5.899233	1.669594	3.153196	0.389572
0.727002	0.915972	0.100276	0.015041	0.013323	5.602929	0.401105	0.461358	-0.00055
0.802934	1.130281	0.161841	0.041401	0.012328	5.783637	0.401467	0.45426	-0.00056
5.474969	6.220629	0.12927	0.091249	0.056936	7.832247	2.129155	2.727447	1.064577
2.597814	3.91036	0.207825	0.055564	0.030943	8.515058	1.44323	1.925485	-0.00289

0.368294	0.556787	10.79102	0.331465	0.005166	28.89268	0.847077	0.304064	0.020256
0.387902	0.661281	10.17782	0.350959	0.00402	28.37228	1.034406	0.351994	0.020319
0.652652	0.896004	24.0901	0.913713	0.009635	19.85512	1.000733	0.566299	0.076868
0.406646	0.467828	8.225341	0.277259	0.005873	27.35619	0.720873	0.306704	0.027726
0.63778	0.881634	27.92369	0.928941	0.013131	20.38124	0.998265	0.496692	0.02357
0.313384	0.446075	8.737893	0.313384	0.006408	27.1907	0.903284	0.387693	0.006083
0.390108	0.423522	7.836081	0.339224	0.008119	13.1619	0.644526	0.358628	0.062756
0.313676	0.396764	9.004354	0.23987	0.005683	27.36364	0.904126	0.324507	-0.00053
0.429659	0.637118	10.06393	0.462709	0.00867	14.85627	0.842792	0.449307	-0.0008
0.275901	0.392846	9.822062	0.349474	0.006562	26.13699	1.030029	0.220537	0.005702
0.239663	0.393571	19.12807	0.95865	0.008141	16.86625	0.808861	0.333955	0.032954
1.636934	3.354598	6.045494	0.85567	0.036878	22.13581	2.790228	3.027955	-0.0035
0.390195	0.495455	8.119773	0.278711	0.005759	27.98256	1.244908	0.425183	0.011148
0.314441	0.571026	24.84087	0.59189	0.010739	29.89043	0.943324	0.299626	0.020346
0.351738	0.529735	24.8808	0.555375	0.008237	29.19421	1.073725	0.312843	0.020364
0.353664	0.469778	25.72442	1.005151	0.005196	29.80087	1.414657	0.309624	0.008749
0.313226	0.536905	26.29252	0.755426	0.007445	29.20368	1.013377	0.352397	0.007002
0.515291	0.428206	18.56887	0.607307	0.006822	27.73368	0.938565	0.35049	-0.00056
0.443717	0.820637	16.10324	0.554647	0.008442	26.91885	0.905923	0.320234	-0.00054
0.36515	0.632028	29.50104	1.201951	0.00658	15.15371	0.684655	0.411174	-0.00053
0.649857	0.944864	45.48999	2.401646	0.014239	17.77218	0.932404	0.572792	0.032493
0.544899	0.888167	20.4619	0.789164	0.006055	20.49948	0.845533	0.361869	0.041337
0.535372	0.732032	18.2205	0.695984	0.006887	19.54108	0.642446	0.501554	0.010707
0.667573	1.271672	14.0005	0.482136	0.015951	21.62196	0.871554	0.551453	-0.00074
0.462578	0.809228	39.84141	1.939844	0.00917	11.75844	0.537188	0.472113	0.025367

Se_ppm_m	Se_ppm_m	Mo_ppm_m	Mo_ppm_m	Mo_ppm_m	Ru_ppm_m	Ru_ppm_m	Ru_ppm_m	Rh_ppm_m
1.14E-05	0.134639	0.071386	0.017846	0.010655	0	0.4056	0.003216	0.00288
1.49E-05	0.095963	0.06625	0.017616	0	0.005361	0.004212	0.002248	0.00046
0.0134	0.034228	4.103755	0.156334	0.005946	0.12637	0.015633	0	0.298336
0.013647	0.087913	4.396667	0.18258	0.01382	0.14717	0.013094	0.003579	0.269812
0.024078	0.063097	4.615565	0.144468	0.010335	0.976085	0.057417	0.006506	0.711227
0.038824	0.070356	4.769771	0.203362	0.006958	0.941013	0.05916	0	0.691432
0.01539	0.103515	4.431663	0.203968	0.010705	0.945669	0.055628	0.006133	0.684219
3.94E-05	0.083092	3.537435	0.144577	0.007071	0.612104	0.04694	0.005157	0.403688
0.054558	0.114483	3.521806	0.186249	0.01146	0.538054	0.04327	0	0.377202
0.050678	0.09229	3.530551	0.133264	0.007649	0.578102	0.035662	0.00446	0.353055
0.04348	0.094278	3.484086	0.124769	0	0.510419	0.039699	0	0.351055
0.029849	0.095445	3.63596	0.126857	0.011781	0.794725	0.042908	0.001966	0.46303
3.13E-05	0.085261	3.994918	0.202507	0.011364	0.382923	0.034979	0.004136	0.484177
3.2E-05	0.056887	4.441807	0.188212	0.012078	0.739674	0.050817	0.006382	0.600397
0.016636	0.15601	4.244032	0.166359	0.015356	0.752394	0.047261	0.004636	0.642749
1.076399	0.051722	9.371003	3.799055	0.003268	0	1.266352	0.002482	0.000886
1.127207	0.075192	4.787463	0.899233	0	0	1.266525	0.002438	0.000887
0.709174	0.054376	3.026653	0.227949	0.005217	0	1.266382	0	0.000633
2.532572	0.216484	2.69719	0.240594	0.032395	0	1.266286	0.012964	0.01203
3.798865	0.941219	2.140027	0.316572	0.060681	0	1.266288	0	0.005065
1.569939	0.19751	6.34014	0.74874	0.010475	0.891242	0.101442	0.003616	0.43596
1.252009	0.021875	0.813806	0.034146	0.003304	0.038129	0.005577	0	0.011382
0.085694	0.087844	2.683508	0.111519	0.005956	0.223039	0.02113	0	0.327515

0.088969	0.276858	2.727609	0.23413	0.010271	0.52328	0.087799	0	0.669611
0.065015	0.032215	7.105212	0.162538	0.001786	0.192723	0.015093	0.001344	0.091834
0.025358	0.05013	3.501805	0.181128	0.003752	0.607382	0.048301	0	0.493875
0.044338	0.04718	42.73472	1.226383	0.01578	0.366971	0.036791	0	0.212259
0.001934	1.214108	29.00516	5.881602	0.099995	0.370622	0.16114	0	0.171614
0.002555	2.432942	25.54657	9.083227	0	0.386037	0.391714	0	0.107863
0.03948	0.141742	40.1029	1.662296	0.009175	1.840993	0.098699	0.006487	0.638945
0.054848	0.081574	43.66488	0.9446	0.006906	1.899356	0.111727	0.009626	0.699816
0.000907	0.90644	36.76539	7.501459	0	1.368398	0.486358	0	0.41629
3.77E-05	0.115764	39.32481	0.988711	0.010832	1.166444	0.078861	0.006606	0.375475
0.026479	0.094218	38.63566	1.323963	0.014422	1.252951	0.079438	0	0.392375
0.058519	0.111328	38.84972	0.979304	0.014712	1.171583	0.063297	0	0.364253
0.031569	0.146907	38.551	1.104926	0.012499	1.036931	0.065567	0.002901	0.316907
0.044351	0.105912	38.70547	1.066828	0.006254	0.978125	0.059934	0	0.305664
3.41E-05	0.080157	39.63791	1.001334	0.010822	1.344344	0.073502	0.00221	0.40586
0.113288	0.166127	38.51782	1.982535	0.016154	0.593816	0.067973	0.003769	0.358744
1.278298	1.945977	13.33876	1.797027	0.180864	1.704397	0.537256	0	1.185667
0.466139	1.075434	8.718522	0.638783	0.071122	0.169191	0.060425	0	0.096681
0.545401	0.645766	50.19914	4.452252	0.067959	2.036905	0.233743	0.036042	0.532044
2.51E-05	0.092337	44.74823	1.629487	0.014401	1.411387	0.073954	0	0.601657
3.26E-05	0.146398	51.93982	1.505502	0.018259	1.64727	0.107894	0.006001	0.607219
0.988536	0.682751	37.71645	4.182268	0.084337	1.703324	0.266144	0	0.463852
0.000462	0	39.76099	2.237007	0.048055	1.81847	0.18762	0	0.542655

0.023939	0.032992	4.209603	0.139952	0	0.134427	0.016205	0.003292	0.26867 1
0.024013	0.062951	3.952909	0.203187	0.004101	0.105657	0.017179	0.007403	0.268391
0.062365	0.162786	6.192941	0.304571	0.017571	0.4293	0.04496	0.00918	0.503267
0.025877	0.032996	4.334477	0.182991	0.004091	0.131605	0.017375	0.003439	0.31552
0.036048	0.152776	6.377804	0.291161	0.015621	0.425649	0.040208	0.006263	0.507451
0.013273	0.066345	4.420563	0.145632	0.007222	0.135493	0.01401	0	0.28094
0.047491	0.072647	5.241015	0.254418	0.004695	0.208623	0.027138	0	0.368058
2.95E-05	0.083054	4.210643	0.166064	0.005972	0.124363	0.014577	0.003539	0.27216
7.44E-05	0.120428	5.436833	0.347032	0.014828	0.25449	0.036356	0	0.380083
0.012324	0.104737	4.35923	0.202327	0.0084	0.130961	0.01545	0.003463	0.257691
0.037447	0	5.946628	0.254641	0.008026	0.301076	0.02846	0.003712	0.479325
0.000521	0.878103	3.348273	0.651053	0.093973	0.104169	0.094868	0.034381	0.282743
0.024155	0.109256	4.050596	0.222969	0.012133	0.15422	0.026013	0.004817	0.311784
0.024046	0.088147	4.444722	0.179417	0.006606	0.995115	0.046241	0.009724	0.704719
0.024066	0.111079	4.400422	0.164761	0.009897	0.957096	0.053686	0.006217	0.699773
0.018242	0.102397	4.020604	0.297823	0	0.93628	0.072594	0	0.649625
0.014924	0.097726	4.200907	0.18425	0.012183	1.203155	0.0737	0.005182	0.849394
3.86E-05	0.069562	4.173854	0.178511	0.009294	0.329418	0.029445	0.003933	0.474803
3.14E-05	0.165747	3.803027	0.136813	0	0.343881	0.033279	0.004146	0.519519
3.35E-05	0	5.903252	0.243433	0.007383	0.882445	0.057815	0.008063	0.821587
0.04662	0	6.046496	0.324929	0.01312	1.083566	0.081938	0.010003	0.929578
0.041337	0.110199	4.342283	0.174744	0.013157	0.871839	0.048853	0	0.631331
0.023199	0.119088	6.138933	0.392606	0.008876	1.324154	0.083875	0.005454	0.810196
7.05E-05	0.173975	4.654471	0.222524	0.020483	1.144147	0.064903	0	0.867846
0.035813	0.126132	7.028203	0.328281	0.009327	2.311399	0.146234	0.005667	1.169875

Rh_ppm_m	Rh_ppm_m	Pd_ppm_m	Pd_ppm_m	Pd_ppm_m	Ag_ppm_m	Ag_ppm_m	Ag_ppm_m	Sn_ppm_m
0.003853	0.004635	-2.7E-06	4.46E-08	0.002696	-0.00081	0.01379	0.033945	0.559728
0.003561	0.004652	-2E-06	3.83E-08	0.002739	0	0.01302	0.025111	0.727603
0.015447	0.005388	2.562753	0.091195	0	0.00335	0.007072	0.021602	0.496917
0.015307	0.004158	2.699966	0.112499	0.003043	-0.00387	0.005902	0.017764	0.510854
0.029634	0.00737	3.94879	0.14632	0.004886	0.007594	0.014817	0.021811	2.500407
0.024034	0.009387	3.789934	0.1479	0.00883	-0.00111	0.012756	0.026112	1.072274
0.022251	0.009323	3.754861	0.165028	0.006403	0.016132	0.01094	0.020962	1.594657
0.020654	0.01094	2.837083	0.108902	0.009002	0.017837	0.018588	0.024967	0.598961
0.016179	0.005483	2.522832	0.12981	0	-0.00376	0.010159	0.029958	0.464683
0.013889	0.005495	2.627736	0.127633	0.004108	-0.00244	0.012013	0.034185	0.405422
0.014556	0.005271	2.228832	0.081289	0.002607	0.005104	0.012477	0.026816	0.436692
0.014365	0.003263	2.609906	0.102605	0	-0.00093	0.009701	0.036216	0.542875
0.020251	0.008077	3.135182	0.141755	0	-0.00184	0.012703	0.034183	0.666433
0.024468	0.012122	2.702727	0.107281	0	-0.00885	0.012234	0.038228	2.710255
0.028357	0.00955	2.595571	0.107755	0.011949	-0.0051	0.015313	0.03617	0.349731
0.002026	0.004194	0.002279	0.002153	0.003625	0.011904	0.011777	0.015719	0.112705
0.00152	0.003985	0.000861	0.001203	0	0.025077	0.008612	0.016398	0.125386
0.00152	0.00461	0.002279	0.0019	0.002666	0.024315	0.006838	0.014567	0.620527
0.009244	0.0184	0.002406	0.004939	0	0.059515	0.041787	0.077203	1.823452
0.043054	0.095959	0.01013	0.013929	0	0.050652	0.17728	0.202315	0.172215
0.031399	0.009318	4.299218	0.845352	0.008377	-0.01691	0.021738	0.049812	0.577255
0.001935	0.003659	0.017073	0.004325	0.003622	0.046324	0.008195	0.013851	0.557713
0.014087	0.006379	2.03787	0.070433	0.004206	0.004109	0.009274	0.017395	0.739549
0.063215	0.017453	3.312933	0.292662	0.016256	0.039802	0.028096	0.07206	4.413342
0.007198	0.003135	0.931108	0.039473	0.002358	0.001741	0.003831	0.014018	16.83424
0.026565	0.004998	1.72796	0.082111	0.004176	-0.00555	0.008211	0.014525	0.434707
0.013207	0.00612	5.962107	0.235843	0.009907	0.006604	0.012264	0.027016	0.726396
0.077347	0.088506	7.73471	1.772538	0.049978	-0.02417	0.136969	0.340448	0.314223
0.147602	0.153819	5.620246	1.192173	0.096066	-0.06812	0.181665	0.662962	0.283851
0.017662	0.013356	9.163409	0.405185	0.006743	0.063375	0.031168	0.048013	1.080493
0.033518	0.015815	9.374897	0.284396	0.013702	0.027424	0.022345	0.046148	0.076177
0.077488	0.099646	7.831193	1.648672	0	-0.00824	0.140137	0.272847	1.731106
0.022364	0.012776	5.296666	0.223637	0.009551	-0.01177	0.014124	0.038612	0.061206
0.022868	0.010986	5.163457	0.216649	0.006804	0.008425	0.020461	0.034351	0.589766
0.01672	0.007165	5.039835	0.13137	0.006044	-0.00119	0.014331	0.034024	0.176753
0.018213	0.005168	4.419705	0.169989	0.005483	0.004857	0.013356	0.037564	0.485682
0.01798	0.003449	4.507048	0.179802	0	0.011987	0.013186	0.036283	0.251723
0.017044	0.005008	5.752344	0.181092	0.002639	0	0.011718	0.046498	3.195747
0.02549	0.008635	8.062309	0.424829	0.010952	0.58532	0.217135	0.038945	0.981827
0.351995	0.191652	4.612987	1.055985	0	0.166734	0.259365	0.716773	1241.246
0.036255	0.056705	2.071728	0.397081	0.040499	0.060425	0.098407	0.320427	215.805

0.103515	0.071112	6.778553	0.71236	0.046679	-0.11131	0.133568	0.222568	200.3513
0.031336	0.01399	4.537495	0.200552	0.005758	-0.01003	0.017548	0.04077	81.47436
0.033874	0.012882	5.38217	0.276009	0.008941	0.01631	0.020073	0.04201	0.069002
0.083645	0.092223	9.200989	1.292701	0.065129	0.068437	0.144478	0.279246	0.121666
0.063502	0.043765	7.576958	0.591724	0.026772	0.014432	0.115458	0.176146	0.064945
0.015284	0.004053	2.806402	0.117854	0.003893	0.001657	0.005709	0.017098	0.484307

0.014777	0.005001	2.737482	0.116371	0.002816	-0.00591	0.005726	0.020062	0.445164
0.033358	0.008685	11.05157	0.580135	0	0.009137	0.013488	0.030248	0.99058
0.012015	0.00432	2.60808	0.072087	0.004002	0.004251	0.008318	0.020074	0.340104
0.02357	0.008555	12.42285	0.471403	0.005252	0.018024	0.015251	0.027906	1.346271
0.014379	0.004292	2.684045	0.11245	0.005823	-0.00277	0.006452	0.023511	0.457172
0.016961	0.007137	6.580951	0.288341	0	0.016792	0.013569	0.021939	0.240849
0.014023	0.005774	2.6847	0.101483	0.009656	-0.00055	0.008303	0.018704	1.180899
0.028093	0.007698	7.419873	0.49576	0.008138	0.009254	0.014377	0.029136	0.432964
0.013795	0.005267	3.012835	0.099324	0.009767	0.001471	0.008829	0.02221	0.49846
0.017975	0.007737	11.05444	0.479325	0.005892	0.00719	0.010186	0.022032	0.736962
0.091147	0.048662	1.543926	0.446436	0.055416	-0.06511	0.12835	0.249911	0.264142
0.016723	0.005427	2.513971	0.15422	0	0.005388	0.012449	0.033377	0.354892
0.025895	0.007536	3.7548	0.151672	0.004589	0.008693	0.011283	0.026814	0.706568
0.022215	0.007895	3.582169	0.109224	0.007811	0.015551	0.015551	0.026786	0.716434
0.035366	0.009089	3.616683	0.184278	0.00806	-0.0121	0.011354	0.030205	0.742695
0.027638	0.011604	3.878469	0.158455	0	0.00608	0.011239	0.023925	0.679884
0.025765	0.004577	3.305221	0.158268	0.004222	0.001472	0.011042	0.041599	0.85207
0.022186	0.008407	3.078289	0.144208	0.005491	0.00037	0.010723	0.026823	0.998364
0.034994	0.008273	10.25462	0.395579	0.007956	0.024343	0.015215	0.03117	1.153264
0.052271	0.015371	13.03952	0.508584	0.009211	0.008476	0.028255	0.049491	2.104972
0.031942	0.010758	2.876692	0.140922	0.007239	-0.02217	0.014844	0.036271	0.460346
0.037476	0.011494	3.747605	0.178457	0	0.008923	0.017846	0.038392	0.314085
0.050068	0.014813	2.659168	0.135369	0	0.007417	0.024107	0.053367	0.311534
0.043273	0.010539	12.50453	0.537188	0.006227	0.01343	0.016414	0.032388	0.937094

Sn_ppm_mSn_ppm_mTe_ppm_mTe_ppm_mTe_ppm_mLa_ppm_mLa_ppm_mLa_ppm_mCe_ppm_m

0.32448	0.028041	-4.5E-05	7.3E-07	0.057478	0	0.4056	0	-5.4E-07
0.842487	0.031432	-4.2E-05	9.19E-07	0	0	0.382949	0	-4.8E-07
0.111667	0.019733	-5.9E-05	3.72E-06	0.02232	0	1.861113	0	-7.9E-07
0.106966	0.01777	-5.6E-05	3.32E-06	0.04959	0	1.844239	0.000708	-7.4E-07
1.185378	0.02428	0.629732	0.296344	0.029092	0	1.852153	0	0.000111
0.2958	0.020693	0.010168	0.01442	0.037476	0.00024	0.000333	0	-6.9E-07
1.390689	0.02524	-5E-05	3.15E-06	0.043931	0	1.854252	0.000574	-6.7E-07
0.095759	0.021829	-4.6E-05	2.82E-06	0	0	1.87762	0.000601	-5.8E-07
0.050795	0.020228	-4.4E-05	2.63E-06	0	0	1.881306	0.000645	-5.4E-07
0.033785	0.023406	-4.3E-05	2.44E-06	0.080099	0	1.876954	0.000649	-5.2E-07
0.030247	0.023534	0.004915	0.00983	0.030258	0	1.890443	0.000659	-5E-07
0.093278	0.027657	-4E-05	2.05E-06	0.030177	0	1.865551	0.001263	-4.7E-07
0.046024	0.025869	-2.5E-05	1.49E-06	0.028086	0	1.840976	0	-2.6E-07
0.809312	0.030983	0.030114	0.02635	0	0	1.882122	0.000705	-2.7E-07
0.028357	0.022869	0.022685	0.020795	0.048025	0	1.890438	0	-9.5E-08
0.049388	0.015855	0.230476	0.060785	0.044245	0	1.266352	0.000651	0.000557
0.030397	0.014497	0.307765	0.054461	0.01665	0	1.266525	0	0.000342
0.468561	0.019614	0.316596	0.070917	0.058853	0	1.266382	0	-4.5E-07
1.101669	0.078703	0.278583	0.164617	0.115295	0	1.266286	0.00307	0.000418
0.115232	0.206114	-0.00067	0.000177	0.23748	0	1.266288	0	0.00076
0.090573	0.056287	0.016907	0.024153	0.055919	0	1.207646	0.001234	0.000217
0.170728	0.010725	0.391537	0.05008	0	0.002937	0.000615	0.000278	0.007854
0.176083	0.01331	-1.9E-05	1.29E-06	0.018539	0	1.173888	0	-2.1E-07
1.100409	0.047997	0.210717	0.152184	0.053581	0.0048	0.002927	0.001203	0.017443
7.314189	0.008978	0.029025	0.015093	0	0.000255	0.000197	0.00029	0.000395
0.241504	0.011884	0.010868	0.013283	0.02359	0	1.207519	0.000315	0.000145
0.311313	0.028668	-8E-05	3.96E-06	0.078277	0	0.943371	0.000979	-1.1E-06

0.225596 0.30735 -0.00077 0.000201 0.376366 0.001934 0.003948 0.008548 -1E-05
0.624472 0.684875 -0.00085 0.00025 0.695605 0 0.567702 0.031374 -1.1E-05 0.841538
0.02694 0.008311 0.015584 0.068348 0 1.038935 0.001087 -7.6E-07 0.020314 0.038062 -6.7E-05 3.45E-06 0.052378 0 1.015698 0 -8.9E-07

3.627079	0.156327	-0.00035	9.07E-05	0.581033	0	0.824336	0.008344	-4.5E-06
0.023541	0.034169	-6E-05	3.41E-06	0.049178	0	1.177037	0.001282	0.000129
0.373117	0.027068	-6.1E-05	4.57E-06	0	0	1.203603	0.000772	-7.8E-07
0.089571	0.031565	-5.4E-05	2.39E-06	0.061192	0	1.194274	0.001322	-6.6E-07

0.388545 0.036044 -5E-05 2.31E-06 0.049555 0 1.214205 0.000773 -6E-07 0.143842
0.027214 -4.7E-05 2.16E-06 0.033826 0 1.198683 0.001551 -5.5E-07
3.302272 0.032457 -4.4E-05 1.6E-06 0.058074 0 1.065249 0 -5.2E-07 0.273779 0.048848
1.32169 0.349304 0.050929 0.000453 0.00067 0 0.002549 592.8337 0.535848 -0.00041
1.78E-05 0.556541 0 1.852605 0.017502 -4E-06 170.9176 0.218343 -0.00017 1E-05
0.21874 0 1.72644 0.008299 -1.6E-06 122.4369 0.18104 -0.00016 2.23E-05 0.251964 0
1.113063 0 -1.5E-06
86.48817 0.03394 -2.1E-05 9.15E-07 0 0 1.253452 0.000801 -1.6E-07 0.025092 0.033592
0.0138 0.018819 0.037311 0 1.254585 0 -1.3E-07

0.144478	0.212915	-0.0001	1.37E-05	0.261985	0	0.760412	0.008186	-5.2E-07

0.072162	0.123129	0.039689	0.055564	0.209261	0	0.721615	0.005643	0.000332
0.053403	0.019967	-5.7E-05	3.5E-06	0.045175	0	1.841471	0.00049	-7.6E-07
0.049873	0.020716	-5.5E-05	3.88E-06	0.041022	0	1.847154	0	-7.2E-07
0.075418	0.047992	-0.00012	1.35E-05	0.058076	0	1.450337	0.000947	0.000203
0.036968	0.019201	-5.4E-05	2.96E-06	0.029911	0	1.848391	0.001023	-7.2E-07
0.105372	0.028384	0.011092	0.016638	0.054408	0	1.386479	0.000885	-1.4E-06
0.134571	0.02468	-5.6E-05	3.32E-06	0.031453	0	1.843437	0.000976	-7.5E-07
0.037315	0.025109	-5.4E-05	3.05E-06	0.024684	0	1.696121	0	0.000254
0.867223	0.019383	-5.4E-05	2.95E-06	0	0	1.845155	0.00071	-7.2E-07
0.11733	0.037793	0.014873	0.021483	0.049193	0	1.652533	0.00134	-1.1E-06
0.068055	0.019177	-5.3E-05	2.94E-06	0.032288	0	1.839337	0.000877	-7.2E-07
0.062911	0.022578	-5.6E-05	3.89E-06	0.025181	0.00024	0.000345	0.000953	0.000449
0.165554	0.190666	-0.00034	4.09E-05	0.235979	0	1.860152	0.007397	-4.5E-06
0.040878	0.030445	-7.4E-05	6.69E-06	0.056348	0	1.858072	0.00105	-9.9E-07
0.042542	0.021271	-4.8E-05	3.33E-06	0.035709	0	1.849655	0.000782	-6.5E-07
0.042579	0.022428	-4.8E-05	3.15E-06	0.042871	0	1.85125	0	-6.4E-07
0.042812	0.018285	-4E-05	2.23E-06	0.02586	0	1.861391	0.000565	-5.4E-07
0.060803	0.026998	-5E-05	4.05E-06	0.038608	0	1.842503	0.000601	0.000332
0.069932	0.017748	0.049689	0.034966	0	0	1.840324	0	-3.9E-07
0.388253	0.023863	0.011463	0.0159	0.039916	0	1.848822	0.000644	-2.9E-07
0.085202	0.025684	0.019779	0.019779	0.04633	0	1.521457	0	-2.8E-07
0.169528	0.043047	0.087589	0.060748	0.068034	0	1.412733	0.001533	-4.7E-07
0.033821	0.021644	0.01165	0.016159	0.043062	0	1.878963	0.000969	-1.2E-07
0.030338	0.027256	-1.5E-05	9.64E-07	0.03332	0	1.784574	0.000746	-7.4E-08
0.053777	0.043962	-2.1E-05	1.85E-06	0.116145	0	1.854371	0.001516	0.000408
0.126836	0.029166	-1.3E-05	8.65E-07	0.067216	0	1.492188	0	0.000134

Ce_ppm_mCe_ppm_mNd_ppm_mNd_ppm_mNd_ppm_mSm_ppm_mSm_ppm_mSm_ppm_
mEu_ppm_m

8.52E-09	0	-1.6E-06	2.68E-08	0.00368	-8.5E-06	1.14E-07	0.004308	-1.1E-06
1.03E-08	0.001033	-1.3E-06	2.72E-08	0.006165	-8.5E-06	1.84E-07	0.004304	-1E-06
4.65E-08	0.001076	-4E-06	2.42E-07	0.006423	-5.2E-06	3.35E-07	0.002966	-1.7E-06
4.43E-08	0.000709	-3.6E-06	2.21E-07	0	-5.3E-06	3.32E-07	0.004961	-1.6E-06
0.000204	0.000641	-3.2E-06	2.22E-07	0.006326	-7.9E-06	5.56E-07	0.007406	-1.6E-06
3.51E-08	0.000592	-2.8E-06	1.44E-07	0.002919	-6.8E-06	3.51E-07	0.005741	-1.4E-06
4.26E-08	0.001268	-2.6E-06	1.11E-07	0.003946	0.00063	0.001279	0.004617	-1.3E-06
2.82E-08	0.00115	0.000545	0.001089	0.002968	-7.1E-06	4.88E-07	0.003465	0.000169
3.2E-08	0.001538	-1.8E-06	1.07E-07	0.007589	-7.5E-06	4.52E-07	0.003714	-1.1E-06
2.82E-08	0	-1.7E-06	9.57E-08	0.003195	-7.6E-06	4.32E-07	0	-1.1E-06
2.08E-08	0.000657	-1.6E-06	6.62E-08	0	-7.6E-06	3.4E-07	0.005287	-1.1E-06
2.24E-08	0.000917	-1.4E-06	6.72E-08	0.005465	-7.6E-06	3.54E-07	0.006401	-1E-06
1.51E-08	0.001048	-3.5E-08	1.34E-09	0.006221	-8.2E-06	4.79E-07	0.006131	-5.5E-07
1.41E-08	0.000695	9.39E-08	6.4E-09	0	-9.1E-06	4.89E-07	0.007775	-5.7E-07
5.86E-09	0.001511	1.07E-06	6.81E-08	0	-7.6E-06	3.97E-07	0.003705	-1.9E-07
0.000418	0.000539	-2E-06	7.34E-08	0	-4.3E-06	1.39E-07	0.00312	-9.6E-07
0.000329	0.000369	-1.9E-06	7.98E-08	0.001823	-4.3E-06	1.77E-07	0.002137	-9.5E-07
2.28E-08	0.000512	-1.9E-06	8.99E-08	0.001814	-4.3E-06	2.15E-07	0.005077	-9.1E-07
0.000836	0	-9.5E-06	1.24E-06	0	-2.3E-05	3.04E-06	0	0.000431
0.001393	0	-3.3E-05	9.12E-06	0.035489	0.008611	0.012283	0.041454	-1.7E-05
0.000435	0.001707	0.000725	0.001328	0.00606	-1.8E-05	3.02E-06	0.009901	-2.2E-06
0.001593	0	0.003756	0.001707	0.002292	0.00387	0.002504	0.002693	0.001002
1.29E-08	0.000689	-2.6E-07	1.64E-08	0.002038	-5.1E-06	2.93E-07	0.00609	-4.4E-07
0.004683	0.001187	0.013814	0.010302	0.008228	0.01276	0.009248	0.00966	-1.1E-06
0.000232	0.000411	5.07E-08	6.27E-10	0	-2.6E-06	2.67E-08	0.002299	-1.6E-07
0.000169	0	6.04E-07	6.52E-08	0.00156	-4.1E-06	4.11E-07	0.004017	-8.7E-08
5.38E-08	0.000708	0.001415	0.001887	0.003489	-7.1E-06	3.49E-07	0.006885	-2.3E-06
2.66E-06	0.018023	-5.2E-05	1.37E-05	0.071145	-7E-05	1.77E-05	0	-2.1E-05
3.35E-06	0.015679	-5.4E-05	1.59E-05	0	-8.7E-05	2.55E-05	0.217469	-2.4E-05
6.13E-08	0	-3E-06	2.08E-07	0.003851	-8.2E-06	7.27E-07	0.006271	-1.6E-06
4.57E-08	0.001141	-3.5E-06	1.63E-07	0.005627	-9.6E-06	4.77E-07	0.006574	-1.8E-06
1.07E-06	0.006002	-1.7E-05	4.12E-06	0	-5.3E-05	1.32E-05	0	0.028852
0.000259	0.00169	-3E-06	1.65E-07	0.008331	-9E-06	5.06E-07	0.008406	-1.6E-06
5.78E-08	0.000774	-2.8E-06	1.93E-07	0.005317	-9.4E-06	7.1E-07	0.006206	-1.6E-06
2.87E-08	0.000787	-2.3E-06	9.08E-08	0.005407	-9.2E-06	3.82E-07	0.006317	-1.4E-06
2.91E-08	0.000771	-2E-06	8.86E-08	0.003806	-8.9E-06	4.13E-07	0.004452	-1.3E-06
2.52E-08	0.001236	-1.7E-06	7.91E-08	0.00506	-8.5E-06	3.96E-07	0.007143	-1.2E-06
1.81E-08	0.001804	-1.5E-06	5.22E-08	0.005199	0.00245	0.00277	0.004373	-1.1E-06
0.001699	0	0.001511	0.002077	0.009324	0.003304	0.00321	0	-1.7E-06
1.54E-07	0.031487	4E-06	2.04E-07	0.08628	-0.00015	5.56E-06	0.184532	-8.6E-06
9.67E-08	0.004866	0.003971	0.007942	0	-6.5E-05	3.8E-06	0	0.001381

2.11E-07	0	2.44E-06	3.56E-07	0.053618	-6E-05	8.57E-06	0.045796	-3.1E-06
7.14E-09	0.000788	1.08E-06	5.01E-08	0	-9.7E-06	4.51E-07	0.004623	-3.1E-07
7.65E-09	0	1.33E-06	8.28E-08	0	-1E-05	6.02E-07	0.006747	-2.7E-07
4.94E-08	0.008067	7.98E-06	7.6E-07	0.029093	-5.8E-05	8.36E-06	0.064727	-1.1E-06
0.000671	0.005564	1.06E-05	1.73E-06	0.023179	-5.8E-05	9.38E-06	0.032508	-5.1E-07
4.42E-08	0.000686	-3.9E-06	2.39E-07	0.002429	-5.1E-06	2.95E-07	0.003976	-1.6E-06

4.8E-08	0.000825	-3.8E-06	2.77E-07	0	-4.9E-06	3.51E-07	0.003965	-1.6E-06
0.000406	0.000952	-7.9E-06	9.14E-07	0.008964	-1.1E-05	1.23E-06	0.007684	0.000203
3.88E-08	0.000488	-3.6E-06	1.85E-07	0.002411	-5E-06	2.59E-07	0.00541	-1.6E-06
1.66E-07	0.001491	-6.8E-06	7.76E-07	0.00438	-9.8E-06	1.11E-06	0.007172	-2.8E-06
4.61E-08	0	-3.7E-06	2.21E-07	0.00253	-5.3E-06	3.13E-07	0.004995	-1.6E-06
0.000356	0.000939	-3.6E-06	2.04E-07	0	-5.3E-06	3.05E-07	0.003244	-1.6E-06
4.24E-08	0.00071	-3.5E-06	2.03E-07	0.002518	-5.3E-06	3.14E-07	0.004973	-1.5E-06
9.42E-08	0.000797	-5.1E-06	4.63E-07	0.008706	-7.9E-06	6.94E-07	0.00778	0.000281
4.23E-08	0.000727	-3.4E-06	2.02E-07	0	-5.6E-06	3.13E-07	0.007706	-1.5E-06
0.000524	0.001775	-3.5E-06	2.55E-07	0	-6.1E-06	4.34E-07	0.003288	-1.6E-06
5.58E-07	0.012666	-2.2E-05	3.72E-06	0.050044	-3.6E-05	4.46E-06	0.030784	-9.7E-06
9.66E-08	0.000753	-4.6E-06	4.09E-07	0.005182	-8.2E-06	7.25E-07	0.004369	-2.1E-06
4.07E-08	0.000783	-2.6E-06	1.7E-07	0.002772	-6.7E-06	4.44E-07	0.003242	-1.3E-06
4.07E-08	0.000559	-2.6E-06	1.7E-07	0.002755	-6.5E-06	3.7E-07	0.004489	-1.3E-06
2.79E-08	0.001187	0.000856	0.001712	0.002787	-5.7E-06	2.98E-07	0.006223	-1.1E-06
0.000369	0.000602	-2.5E-06	2.03E-07	0.007089	-7.1E-06	5.53E-07	0	-1.3E-06
2.58E-08	0.000646	0.000699	0.001399	0.003195	-7.1E-06	4.23E-07	0.005224	-8.4E-07
1.66E-08	0.000885	-2.2E-07	1.15E-08	0.006323	-8.4E-06	4.44E-07	0.005171	-6.2E-07
1.67E-08	0.000611	-1.6E-07	8.52E-09	0	-8.1E-06	5.48E-07	0.006007	-5.8E-07
4.38E-08	0.002071	0.00113	0.002119	0.007544	-1.6E-05	1.55E-06	0.008847	-9.9E-07
9.21E-09	0	9.96E-07	6.76E-08	0.005784	0.000752	0.001522	0.005596	-2.5E-07
4.28E-09	0.000736	1.42E-06	9.64E-08	0.006211	-9E-06	5.89E-07	0.005997	-1.5E-07
0.000593	0.001494	2.37E-06	2.04E-07	0.005388	-1.4E-05	1.19E-06	0.006268	-1.6E-07
0.000269	0.001304	1.89E-06	1.28E-07	0.00543	-1E-05	7.01E-07	0	-6.6E-08

Eu_ppm_mEu_ppm_mGd_ppm_mGd_ppm_mGd_ppm_mDy_ppm_mDy_ppm_mDy_ppm_ mEr_ppm_m

1.87E-08	0.001596	-8.5E-07	1.1E-08	0	-2.1E-06	2.76E-08	0.002538	-9.5E-07
2.22E-08	0.001593	-5.9E-07	1.19E-08	0.004261	-1.9E-06	4.21E-08	0.003519	-8.6E-07
1.01E-07	0.001107	-2.7E-06	1.64E-07	0.002949	-2.6E-06	1.49E-07	0.003558	-1.5E-06
8.85E-08	0.001327	-2.3E-06	1.35E-07	0.007037	-2.4E-06	1.46E-07	0	-1.4E-06
1.09E-07	0.002356	-2.3E-06	1.54E-07	0	-2.6E-06	1.82E-07	0.002202	0.001148
7.58E-08	0.00091	-2E-06	1.04E-07	0.004765	-2.2E-06	1.13E-07	0.002831	-1.2E-06
5.56E-08	0.000882	-1.9E-06	1.22E-07	0.00462	-2.2E-06	1.34E-07	0	-1.1E-06
0.000338	0.001936	-1.5E-06	1.01E-07	0.004809	-2.1E-06	1.41E-07	0.002864	-1E-06
6.4E-08	0.000987	-9.9E-07	5.83E-08	0.006187	-2E-06	1.15E-07	0.003057	-9.6E-07
6.01E-08	0.001669	-9.3E-07	4.69E-08	0	-1.9E-06	1.09E-07	0.002206	-9.3E-07
4.54E-08	0	-8.5E-07	3.78E-08	0	-1.9E-06	8.13E-08	0	-8.9E-07
4.85E-08	0.001411	-7.2E-07	3.36E-08	0	-1.8E-06	8.95E-08	0.003124	-8.2E-07
3.31E-08	0.000965	3.35E-07	2.03E-08	0	-1.3E-06	7.18E-08	0.002114	0.000552
3.2E-08	0.001498	4.8E-07	2.63E-08	0.008937	-1.3E-06	6.96E-08	0.004712	-4.7E-07
1.25E-08	0	1.08E-06	7.18E-08	0	-8.9E-07	5.86E-08	0.002983	-1.8E-07
3.42E-08	0	-1.4E-06	4.81E-08	0.003127	-1.5E-06	5.19E-08	0.003571	-8.1E-07
3.93E-08	0.000794	-1.4E-06	5.7E-08	0.002142	-1.5E-06	6.21E-08	0.001272	-7.9E-07
4.05E-08	0	-1.3E-06	6.33E-08	0.002967	-1.4E-06	7.09E-08	0.002794	-7.8E-07
0.000861	0.002812	-6.9E-06	9.75E-07	0.017766	-7.5E-06	1.03E-06	0.006279	0.00076
5.07E-06	0.007918	-2.3E-05	6.08E-06	0.029705	-3E-05	7.98E-06	0.053708	-1.5E-05
3.74E-07	0	0.002174	0.003019	0.009802	-3.7E-06	5.43E-07	0	-1.8E-06
0.000524	0.000714	-1.4E-08	7.4E-10	0	0.000967	0.000831	0.000933	-2.5E-07
2.7E-08	0.000634	2.08E-08	2E-09	0.004538	-9.1E-07	5.4E-08	0.001393	-3.6E-07
1.17E-07	0.001835	0.002224	0.004331	0.009591	0.002458	0.003395	0.004027	0.002458
1.63E-09	0.000443	0.000546	0.000766	0.002009	-3.8E-07	3.72E-09	0	-1.3E-07
8.09E-09	0.00048	6.18E-07	6.52E-08	0.004081	-4.7E-07	4.83E-08	0.004303	-9E-08
1.13E-07	0.001098	-3.7E-06	1.7E-07	0.004072	-3.5E-06	1.6E-07	0.004132	0.000349
5.96E-06	0.013317	-3.4E-05	8.86E-06	0.069031	-3.4E-05	8.86E-06	0.041517	-2E-05
7.38E-06	0.024323	-3.5E-05	1.08E-05	0.126802	-3.7E-05	1.08E-05	0.075743	-2E-05
1.25E-07	0.001669	-2E-06	1.45E-07	0.004497	-2.5E-06	1.97E-07	0.007452	-1.3E-06
8.63E-08	0.00175	-2.4E-06	1.12E-07	0	-3E-06	1.52E-07	0	-1.5E-06
0.029676	0.012805	-1.2E-05	2.89E-06	0	-1.5E-05	3.96E-06	0.034464	-7.7E-06
8.95E-08	0.001968	-1.9E-06	1.07E-07	0	0.000471	0.000953	0.00364	-1.4E-06
1.06E-07	0.003014	-1.8E-06	1.44E-07	0.008871	-2.7E-06	2.17E-07	0.002642	-1.3E-06
6.09E-08	0.002302	-1.3E-06	5.49E-08	0	-2.4E-06	1.04E-07	0.004504	-1.2E-06
5.71E-08	0	-1.1E-06	4.86E-08	0.009748	0.000437	0.000862	0.00366	-1.1E-06
5.51E-08	0.002158	-9.2E-07	3.96E-08	0.004211	-2.1E-06	1.03E-07	0	-9.9E-07
5.65E-08	0.001162	-7.7E-07	3.83E-08	0.008268	-2E-06	7.24E-08	0.002572	-9.4E-07
2.17E-07	0.00241	0.000755	0.001511	0.008986	0.00085	0.001227	0.006413	-1.5E-06
3.15E-07	0.036572	9.93E-06	4.45E-07	0.121081	-2.1E-05	9.45E-07	0.05842	-7.1E-06
0.002762	0.010489	4.63E-06	2.76E-07	0.056662	-9E-06	5.35E-07	0	-3E-06

4.45E-07	0.008673	5E-06	8.57E-07	0	-8.7E-06	1.45E-06	0	-2.7E-06
1.38E-08	0.001699	1.19E-06	5.14E-08	0.004584	-1.2E-06	5.89E-08	0.004484	-2.9E-07
1.38E-08	0.00244	1.36E-06	8.41E-08	0	0.000539	0.001079	0	-2.6E-07
1.6E-07	0.012465	7.98E-06	7.6E-07	0.033635	-5.8E-06	5.55E-07	0	-1E-06
7.94E-08	0.007124	9.45E-06	1.66E-06	0.032307	-5.4E-06	8.66E-07	0.011213	-5.7E-07
9.58E-08	0.001826	-2.5E-06	1.51E-07	0.00477	-2.5E-06	1.38E-07	0.002384	-1.4E-06

1.09E-07	0.000762	-2.5E-06	1.79E-07	0.002832	-2.4E-06	1.74E-07	0.0043	-1.4E-06
0.000421	0.002481	-5.1E-06	5.51E-07	0	-5E-06	5.22E-07	0	-2.9E-06
8.13E-08	0.001056	-2.4E-06	1.28E-07	0.003934	-2.4E-06	1.24E-07	0.003563	-1.4E-06
2.5E-07	0.001377	-4.5E-06	5.13E-07	0.00715	-4.7E-06	5.68E-07	0.004292	-2.6E-06
9.77E-08	0.000795	-2.4E-06	1.2E-07	0.004131	0.000277	0.000553	0.002478	0.000793
8.82E-08	0.001208	-2.3E-06	1.26E-07	0	-2.4E-06	1.36E-07	0.00194	-1.3E-06
9.41E-08	0.000791	-2.3E-06	1.37E-07	0.004965	-2.3E-06	1.13E-07	0.001769	-1.3E-06
0.000562	0	-3.3E-06	2.97E-07	0.006444	-3.5E-06	3.14E-07	0.003855	0.000446
8.83E-08	0.001545	0.000478	0.000956	0.00303	-2.4E-06	1.29E-07	0.001808	-1.3E-06
1.12E-07	0.001475	-2.3E-06	1.5E-07	0.006909	-2.5E-06	1.8E-07	0.001962	-1.4E-06
1.19E-06	0.018162	-1.4E-05	2.23E-06	0	-1.5E-05	1.84E-06	0	-8.9E-06
2.04E-07	0.001166	-3.1E-06	2.79E-07	0	-3.1E-06	2.6E-07	0.002606	-1.8E-06
6.29E-08	0	0.00061	0.001221	0.004519	-2.1E-06	1.28E-07	0.002686	-1.1E-06
7.78E-08	0.001195	-1.7E-06	9.81E-08	0	-2.1E-06	1.37E-07	0.001915	-1.1E-06
6.51E-08	0	-1.5E-06	8.75E-08	0.004538	-1.8E-06	1.15E-07	0.001937	-9.4E-07
8.29E-08	0	-1.7E-06	1.35E-07	0.006605	-2.2E-06	1.84E-07	0.002058	-1.1E-06
5.71E-08	0.000996	-4.4E-07	2.76E-08	0.005172	-1.6E-06	1.14E-07	0.003694	-7.2E-07
3.51E-08	0.000982	1.82E-07	1.13E-08	0.003685	-1.3E-06	6.66E-08	0	-5.2E-07
3.5E-08	0	2.27E-07	1.52E-08	0.005966	-1.3E-06	8.67E-08	0.003485	-4.9E-07
9.04E-08	0	7.15E-07	7.06E-08	0.006308	-2.3E-06	2.12E-07	0.008781	0.000452
1.84E-08	0.001476	1.05E-06	6.58E-08	0	-1E-06	7.52E-08	0	-2.3E-07
8.57E-09	0	1.39E-06	9.28E-08	0	-9.3E-07	6.42E-08	0.002491	-1.5E-07
1.37E-08	0.001656	2.3E-06	2.04E-07	0	-1.3E-06	1.13E-07	0.006101	-1.7E-07
4.33E-09	0.001198	1.82E-06	1.22E-07	0.010759	-9E-07	6.12E-08	0.002627	-7.9E-08

Er_ppm_m Er_ppm_m

1.54E-08	0	-1.4E-06	2.31E-08	0.002733	-2.9E-06	4.87E-08	0.007322	
Yb_ppm_m	Yb_ppm_m	Yb_ppm_m	W_ppm_m	W_ppm_m	W_ppm_m	Re185_CPS		
								0
1.88E-08	0.004597	-1.4E-06	3.03E-08	0.002712	-2.6E-06	5.74E-08	0.007253	0
9.68E-08	0.002288	0.001135	0.001284	0.003268	0.036664	0.007258	0.003143	0
9.04E-08	0.001876	-1.4E-06	8.48E-08	0.003226	0.033012	0.007193	0	0
0.001315	0.002829	-1.6E-06	1.11E-07	0.002388	0.242632	0.022226	0.005393	0
6.29E-08	0	-1.4E-06	7.39E-08	0	0.220001	0.022185	0.005224	0
4.64E-08	0.0021	-1.4E-06	8.34E-08	0.002976	0.237344	0.018543	0.00336	0
6.57E-08	0.001578	-1.4E-06	9.76E-08	0.003106	0.138944	0.017274	0.006001	0
5.83E-08	0	-1.3E-06	8.09E-08	0.004981	0.144861	0.020694	0	0
5.44E-08	0.003225	-1.3E-06	7.32E-08	0.005004	0.136079	0.016893	0.002675	0
3.97E-08	0	-1.3E-06	4.54E-08	0.002414	0.147455	0.020795	0.006471	0
3.17E-08	0	0.00041	0.000821	0.002413	0.134133	0.016603	0.002706	0
0.000773	0.001618	-1E-06	6.08E-08	0.002281	0.111011	0.013807	0.003532	0
2.45E-08	0.002516	-1.1E-06	5.83E-08	0.003546	0.173155	0.018821	0.00475	0
8.7E-09	0.001646	-8.5E-07	5.1E-08	0.003218	0.184507	0.017014	0.003575	0
2.79E-08	0.001709	-9.2E-07	3.17E-08	0.001445	-2.6E-06	8.99E-08	0.001635	0
3.29E-08	0.001352	-9.2E-07	3.8E-08	0.001921	-2.6E-06	1E-07	0.002172	0
3.8E-08	0.001623	-8.9E-07	4.05E-08	0.001371	-2.5E-06	1.25E-07	0.001549	0
0.00152	0.004798	-4.8E-06	6.58E-07	0.011438	-1.3E-05	1.77E-06	0.012922	0
4.18E-06	0.013553	-1.8E-05	4.94E-06	0.032208	0.006458	0.009371	0.030115	0
3.14E-07	0.004433	0.000507	0.001014	0.004483	0.207715	0.039852	0.005022	0
6.37E-09	0	0.002163	0.001252	0.001684	0.019008	0.004553	0.001117	0
2E-08	0.00148	-7E-07	4.34E-08	0	0.058929	0.007278	0.001668	0
0.00281	0	-1.8E-06	1.87E-07	0.006041	0.133454	0.029266	0.012274	0
1.39E-09	0.000744	-3.1E-07	3.13E-09	0.000752	0.039357	0.005341	0.001164	0
9.18E-09	0	-4.5E-07	4.83E-08	0.001134	0.149853	0.011834	0.001259	0
0.000708	0.003767	-2.1E-06	1.04E-07	0.002692	0.018962	0.006509	0	0
5.16E-06	0.022759	-2E-05	5.16E-06	0.032463	-6.4E-05	1.61E-05	0.0716	0
7.38E-06	0.041418	-2.2E-05	7.95E-06	0.112717	-6.8E-05	2.04E-05	0.113285	0
1.03E-07	0.004528	-1.6E-06	1.25E-07	0	0.109088	0.017662	0.007815	0
7.82E-08	0	-1.9E-06	9.85E-08	0.00304	0.139151	0.01422	0.003429	0
1.9E-06	0.015737	-9.8E-06	2.39E-06	0.030993	0.067596	0.078312	0.059898	0
7.53E-08	0	0.001648	0.001883	0.003948	0.070622	0.012947	0.003194	0
9.75E-08	0.002029	-1.7E-06	1.32E-07	0.004815	0.093881	0.014443	0.00771	0
5.25E-08	0.002055	-1.6E-06	7.17E-08	0.0058	0.078822	0.01672	0	0
4.86E-08	0	-1.6E-06	7.16E-08	0.002836	0.09228	0.016999	0.003183	0
4.55E-08	0.001915	-1.5E-06	7.19E-08	0.004538	0.095895	0.013186	0.00303	0
3.73E-08	0	-1.5E-06	7.24E-08	0	0.082024	0.012783	0.0031	0
1.89E-07	0.007784	0.001699	0.001983	0.008187	0.088742	0.021713	0.00458	0

3.15E-07	0.044853	-1.8E-05	6.48E-07	0.086576	0.463151	0.185261	0.096148	0
1.67E-07	0.01266	-7.5E-06	4.66E-07	0.029949	-7.8E-06	4.66E-07	0.039586	0
4.45E-07	0.020329	0.008905	0.016696	0	0.066784	0.047862	0.038318	0
1.25E-08	0.004538	-1.1E-06	4.76E-08	0.006876	0.116571	0.017548	0.004462	0
1.51E-08	0.002998	-1.1E-06	6.65E-08	0.003017	0.095348	0.012546	0.005636	0
9.89E-08	0	-6.2E-06	8.36E-07	0	0.112541	0.07452	0.032695	0
9.38E-08	0.011975	-5.6E-06	9.38E-07	0.016884	0.016597	0.012267	0.029587	0
8.29E-08	0.001823	-1.5E-06	9.21E-08	0.003139	0.040512	0.006998	0	0

9.97E-08	0.002191	-1.4E-06	1.07E-07	0.002593	0.030293	0.006834	0.002154	0
3.34E-07	0.003518	-3.1E-06	3.77E-07	0.003602	0.04235	0.011603	0.004164	0
7.02E-08	0.001804	0.000314	0.000628	0.002573	0.028465	0.007948	0.003578	0
3.05E-07	0.005615	-2.8E-06	3.19E-07	0	0.024541	0.008319	0.006486	0
0.000903	0.002714	-1.5E-06	8.85E-08	0.001934	0.022859	0.005899	0.003739	0
7.46E-08	0.001479	-1.4E-06	7.97E-08	0	0.028156	0.007463	0.00337	0
7.57E-08	0.00305	-1.4E-06	7.38E-08	0	0.026939	0.006643	0.003701	0
0.000892	0	0.000826	0.001818	0.006639	0.03272	0.010411	0.004793	0
7.17E-08	0	-1.4E-06	8.09E-08	0.004689	0.034947	0.007725	0.002239	0
9.44E-08	0.002511	-1.5E-06	1.03E-07	0.004067	0.023667	0.007489	0.005362	0
1.41E-06	0.019491	-8.9E-06	1.1E-06	0.027766	-2.9E-05	4.65E-06	0.068958	0
1.58E-07	0.002765	0.000595	0.001208	0.002827	0.02527	0.007618	0.003215	0
7.58E-08	0.001475	-1.3E-06	6.29E-08	0	0.236201	0.017202	0.002359	0
7.41E-08	0.001466	-1.3E-06	8.7E-08	0.005282	0.216041	0.016846	0.003265	0
5.4E-08	0.002067	-1.2E-06	6.33E-08	0.00464	0.212199	0.026059	0	0
9.4E-08	0.001579	-1.3E-06	8.84E-08	0.005332	0.226628	0.025795	0.006012	0
4.78E-08	0.001674	-1.2E-06	7.91E-08	0.003286	0.113364	0.015091	0	0
2.77E-08	0.001646	-1.1E-06	6.1E-08	0.003233	0.122392	0.013681	0.003597	0
3.04E-08	0.003503	-1E-06	6.39E-08	0.003114	0.121564	0.011411	0	0
0.000904	0.003924	0.000494	0.001003	0	0.097479	0.016953	0	0
1.69E-08	0.002486	-9.6E-07	7.33E-08	0.003485	0.178501	0.020669	0	0
8.74E-09	0.001913	-9.3E-07	6.07E-08	0.004517	0.163645	0.017132	0.00894	0
1.48E-08	0.00468	-1.4E-06	1.34E-07	0.003922	0.133515	0.020398	0	0
5.22E-09	0.002013	-9.7E-07	6.57E-08	0.002841	0.134297	0.014922	0.003135	0

Re185_CPS	Re185_CPS	Os_ppm_m	Os_ppm_m	Os_ppm_m	Ir_ppm_m1	Ir_ppm_m1	Ir_ppm_m1	Pt_ppm_m
0	0	-4.8E-06	7.71E-08	0.006557	-2.1E-06	3.45E-08	0.001454	-0.01014
0	0	-5.2E-06	1.07E-07	0.002558	-1.8E-06	3.83E-08	0.000767	0.006893
0	0	-2.9E-06	1.75E-07	0.006492	0.006514	0.002047	0.00148	0.046528
0	0	0.002951	0.002398	0.004567	0.006178	0.00166	0	0.049794
0	0	0.031672	0.010372	0.008471	0.024448	0.00426	0	2.129976
0	0	0.029025	0.011092	0	0.024403	0.003697	0.001519	1.93564
0	0	0.039681	0.01094	0.006643	0.026701	0.004079	0.001825	2.008155
0	0	0.021405	0.0092	0.005399	0.010702	0.002629	0.002163	1.674837
0	0	0.01505	0.005456	0.007795	0.007337	0.002258	0.000996	1.753378
0	0	0.00976	0.004129	0.00481	0.008071	0.002065	0.000662	1.751198
0	0	0.006995	0.003592	0.004223	0.010208	0.003025	0.000793	1.725974
0	0	0.013805	0.005597	0	0.011193	0.002239	0.000817	2.182695
0	0	0.009941	0.004971	0.007444	0.008284	0.002209	0.002137	0.416061
0	0	0.116692	0.017127	0.00545	0.145488	0.011293	0.002039	1.362656
0	0	0.164468	0.026466	0.004631	0.163901	0.014934	0	1.453747
0	0	-2.7E-06	9.24E-08	0	-2.1E-06	7.22E-08	0	-0.00633
0	0	-2.9E-06	1.25E-07	0.0043	-2.1E-06	8.74E-08	0.001323	0.002533
0	0	-3.3E-06	1.77E-07	0.002718	-2.1E-06	9.88E-08	0.001674	0.022542
0	0	0.004685	0.006585	0	0.001393	0.001899	0.003189	0.021527
0	0	0.01013	0.020261	0.079047	0.002406	0.004939	0.010958	-0.24059
0	0	0.013163	0.007367	0.00786	0.019322	0.004831	0.001491	3.055343
0	0	-2.4E-06	6.26E-08	0.003824	-4.7E-07	1.37E-08	0	0.005122
0	0	0.003874	0.002583	0.004828	0.005165	0.001526	0.001185	0.264125
0	0	0.015921	0.009365	0.014969	0.008546	0.00398	0.003023	0.539669
0	0	0.015789	0.003483	0.00115	0.024845	0.002554	0.000313	0.23684
0	0	0.140072	0.016905	0.002289	0.119061	0.008332	0.00053	1.115747
0	0	-3.7E-06	1.79E-07	0.004634	-5.6E-06	2.64E-07	0.002242	-0.04151
0	0	-4.2E-05	1.05E-05	0.057148	-5.4E-05	1.37E-05	0.026084	0.475362
0	0	-5.2E-05	1.31E-05	0.095425	-5.5E-05	1.65E-05	0.050385	0.624472
0	0	-1.1E-05	8.42E-07	0.009719	-3.5E-06	2.7E-07	0.001608	-0.01766
0	0	-1.3E-05	6.6E-07	0	-4.1E-06	2.03E-07	0.002388	-0.00406
0	0	-7.6E-05	1.73E-05	0.076384	-2.1E-05	5.19E-06	0	0.032973
0	0	-1.3E-05	7.18E-07	0.017681	0.000459	0.000659	0.002295	0.002354
0	0	0.001324	0.002768	0	-3.6E-06	2.65E-07	0.005317	-0.02407
0	0	-6E-06	2.51E-07	0.005903	-2.9E-06	1.15E-07	0.001682	-0.03344
0	0	-5.1E-06	2.43E-07	0.003157	-2.5E-06	1.09E-07	0	0.015785
0	0	-4.8E-06	2.28E-07	0	-2.2E-06	1.11E-07	0.000596	-0.03596
0	0	0.002024	0.002237	0	0.000383	0.000543	0	-0.00533
0	0	0.00085	0.001699	0	0.000736	0.00084	0.000917	0.018881
0	0	0.329764	0.148208	0	0.329764	0.122272	0	1.908184

0	0	-4.4E-05	2.42E-06	0	0.007078	0.006043	0.012259	0.207173
0	0	-4.5E-05	8.01E-06	0.031322	-4.6E-06	8.01E-07	0.014044	0.066784
0	0	-1.1E-05	5.01E-07	0.005403	0.001291	0.001116	0.00128	0.001253
0	0	-1.3E-05	8.03E-07	0.00832	0.000326	0.000665	0.001388	0.005018
0	0	-7.8E-05	1.06E-05	0.059675	2.12E-07	2.43E-08	0	-0.28135
0	0	-7.3E-05	1.15E-05	0.064102	0.000649	0.001227	0.00789	0.072162
0	0	0.003131	0.002762	0.007438	0.006703	0.00162	0.002201	0.040512

0	0	0.002586	0.002586	0.003284	0.008312	0.002401	0.00122	0.024013
0	0	0.007252	0.005656	0.010678	0.008702	0.003336	0.004591	0.053662
0	0	0.007763	0.003882	0	0.005656	0.001756	0.001234	0.022366
0	0	0.008319	0.005823	0.005818	0.008735	0.003189	0.004084	0.041594
0	0	0.006083	0.003687	0.007958	0.006341	0.001788	0.000923	0.025808
0	0	0.005936	0.00441	0.007867	0.007463	0.001866	0.00138	0.037315
0	0	0.002952	0.002583	0.005393	0.006643	0.001845	0.001501	0.044284
0	0	0.007436	0.005619	0.004961	0.00661	0.002479	0.002318	0.031398
0	0	0.004782	0.003311	0.005274	0.007173	0.002391	0.001202	0.064377
0	0	0.007789	0.003895	0.004705	0.00719	0.002397	0.001761	0.035949
0	0	-2E-05	2.42E-06	0	0.003534	0.006883	0.008523	0.037203
0	0	0.002787	0.003159	0.008472	0.008733	0.002973	0.001191	0.044594
0	0	0.034034	0.013502	0.004765	0.026635	0.004254	0.001514	1.929191
0	0	0.035544	0.010182	0.006722	0.02277	0.003703	0	1.977135
0	0	0.032574	0.015822	0.008356	0.020289	0.00484	0.001917	2.021471
0	0	0.036666	0.013266	0.010507	0.023584	0.003869	0.001289	2.142831
0	0	0.017851	0.005705	0.004457	0.006625	0.002392	0.0007	0.460081
0	0	0.019782	0.006841	0.003634	0.006841	0.002219	0.001359	0.47145
0	0	0.008064	0.003804	0	0.010954	0.002739	0.001319	0.49143
0	0	0.014975	0.007487	0.014653	0.011443	0.003532	0	0.559442
0	0	0.137164	0.022548	0.004856	0.150317	0.012965	0	1.384796
0	0	0.14812	0.021415	0	0.138483	0.011421	0.002126	1.447289
0	0	0.113117	0.025961	0.017294	0.145754	0.012795	0.003093	1.689332
0	0	0.128328	0.023875	0	0.144145	0.00955	0.002521	1.792117

Pt_ppm_m Pt_ppm_m
Au_ppm_mAu_ppm_mAu_ppm_mPb_ppm_mPb_ppm_mPb_ppm_m208_LOD

0.02393	0.031523	-0.00142	0.002393	0.006777	0.01014	0.006895	0.004168
0.02987	0.029011	0.000766	0.003293	0.011807	0.004595	0.001991	0.002802
0.020472	0.049027	1.392113	0.046528	0.007895	0.002587	0.001452	0.003986
0.022131	0.05669	1.082568	0.044262	0.007434	-0.00045	2.95E-05	0.003209
0.081495	0.070491	1.753989	0.064825	0.009992	0.046119	0.017966	0.004733
0.068404	0.074508	1.682361	0.05916	0.00621	0.002403	0.00183	0.003749
0.103838	0.067643	1.635451	0.057482	0.006924	0.001762	0.001298	0.003175
0.101391	0.067363	1.526505	0.073227	0.007197	0.002554	0.001596	0.003116
0.088421	0.041108	1.442962	0.067727	0.007408	0.004515	0.001881	0.003416
0.084463	0.033438	1.465901	0.078832	0.00895	0.003153	0.001802	0.004009
0.081289	0.033383	1.380023	0.064275	0.009853	0.001153	0.001153	0.003829
0.08395	0.024952	1.947636	0.069025	0.007962	0.002425	0.001548	0.002972
0.03866	0.064913	1.443325	0.071798	0.005973	0.001657	0.001233	0.003167
0.079049	0.072394	1.42853	0.054582	0.009874	0.004894	0.002259	0.004228
0.062384	0.05945	1.291169	0.079398	0.00517	0.003289	0.001569	0.003208
0.016463	0.045268	0.00114	0.002279	0.004624	0.003419	0.0019	0.003065
0.015198	0.036795	0.001646	0.00228	0.006212	0.006713	0.00228	0.002504
0.012031	0.037661	0.003166	0.002153	0.005496	0.002014	0.001038	0.002259
0.092439	0.218042	0.008864	0.013929	0.023187	0.007218	0.004939	0.015601
0.329235	0.694635	-0.02153	0.037989	0.061792	0.046853	0.027858	0.046002
0.422676	0.047935	2.028845	0.156994	0.019142	0.000604	0.001449	0.00464
0.008195	0.02051	0.009106	0.002504	0.002987	0.00272	0.001059	0.001639
0.023478	0.03381	0.975501	0.035217	0.006382	0.002477	0.001092	0.003469
0.084287	0.108177	1.498429	0.140478	0.017087	0.032544	0.007258	0.005528
0.020898	0.017624	0.069659	0.012771	0.002523	0.012771	0.008591	0.001764
0.050716	0.032911	0.904432	0.044678	0.002765	0.009539	0.00314	0.001841

0.028301	0.082122	0.00566	0.005	0.012247	0.007358	0.003679	0.00602
0.346451	0.887639	0.062039	0.079764	0.127623	0.020142	0.034645	0.05403
1.930186	1.901119	-0.03974	0.124894	0.174943	0.05677	0.085155	0.107466
0.036363	0.106792	0.02909	0.010389	0.009557	0.012259	0.00613	0.003641
0.02844	0.119253	0.005789	0.004063	0.012834	0.00193	0.001727	0.006661
0.230814	0.7803	-0.04946	0.025554	0.07294	0.053582	0.046163	0.038679
0.029426	0.104703	0.001177	0.004002	0.009591	0.000589	0.001036	0.004926
0.027683	0.107537	0.012036	0.005296	0.007256	0.004213	0.002287	0.004748
0.029857	0.05856	0.00215	0.00418	0.011528	0.003105	0.002269	0.00268
0.030355	0.040286	0.004735	0.004128	0.008188	0.005464	0.002186	0.003914
0.020378	0.038037	0.011507	0.005154	0.009189	0.003596	0.001918	0.004109
0.030892	0.03107	0.014381	0.00522	0.009593	0.002344	0.001598	0.00492
0.050979	0.055737	0.037763	0.012273	0.012553	0.019825	0.006136	0.009006
0.778094	1.104097	1.259772	0.407573	0.16729	0.555782	0.222313	0.09452
0.189908	0.494884	0.022444	0.022444	0.055812	0.115671	0.082869	0.03187

0.244874	0.60426	0.015583	0.034505	0.064039	0.116872	0.080141	0.027323
0.025069	0.083461	0.005264	0.003259	0.008341	0.027075	0.01078	0.004133
0.03011	0.073726	0.002635	0.004266	0.009794	0.006398	0.002635	0.00517
0.25854	0.545672	-0.00989	0.025094	0.062794	0.016729	0.015969	0.038579
0.209268	0.341151	0.007216	0.020205	0.032572	0	0.002237	0.019125
0.020256	0.042197	1.312969	0.040512	0.005318	0.001492	0.001271	0.003883

0.02586	0.054478	1.241287	0.060956	0.008449	0.003861	0.001829	0.003832
0.034808	0.098738	3.451803	0.246557	0.018051	0.000725	0.001595	0.008051
0.017375	0.060856	1.064673	0.049907	0.007996	0.004806	0.002033	0.003994
0.034662	0.136441	3.812818	0.221837	0.01408	0.004021	0.002773	0.010396
0.020278	0.066209	1.131871	0.057147	0.006163	0.003318	0.002028	0.006556
0.023746	0.062885	1.62658	0.096679	0.009218	0.005258	0.003731	0.004181
0.023987	0.05818	1.175363	0.049819	0.008489	0.002306	0.001495	0.004468
0.034703	0.095759	1.969819	0.118982	0.010077	0.001653	0.001983	0.004922
0.022072	0.043953	1.283858	0.069895	0.007784	0.002226	0.001527	0.001852
0.02846	0.058476	2.995782	0.149789	0.008292	0.002397	0.001797	0.002866
0.279023	0.649993	0.837068	0.186015	0.082888	0.014137	0.017671	0.030254
0.040878	0.081612	1.057243	0.065033	0.008387	0.003902	0.002415	0.002655
0.081385	0.058268	1.627697	0.059189	0.007011	0.001887	0.001387	0.005094
0.083306	0.069585	1.666125	0.053686	0.005963	0.000889	0.001	0.004734
0.154495	0.079459	1.692004	0.09307	0.007327	0.002345	0.001619	0.003485
0.10318	0.058433	1.698788	0.077385	0.006169	0.002082	0.0014	0.003592
0.051529	0.037743	1.582678	0.090176	0.006735	0.003313	0.002024	0.006384
0.038825	0.05926	1.394012	0.053616	0.006916	0.002089	0.001424	0.003443
0.039558	0.054865	3.061171	0.126281	0.006664	0.003347	0.001521	0.005156
0.066398	0.121265	4.393599	0.240165	0.009557	0.003249	0.002684	0.005871
0.080795	0.05828	1.401706	0.080795	0.008304	0.000282	0.000676	0.004393
0.073168	0.068201	1.179603	0.071383	0.007631	0.000571	0.001071	0.003977
0.090864	0.126444	0.955001	0.048214	0.012889	0.002225	0.00204	0.005222
0.105945	0.080336	3.297735	0.164141	0.01007	0.00388	0.002089	0.005914

GSD	Fe ppm	Fe57_CPS					Fe57_CPS_
		Si_ppm_m2Si_ppm_m2P_ppm_m3P_ppm_m3					
13-Imilac.d	50000000	4.29E+07	9.60E+05	1.28	0.16	3.61	0.15
14-Imilac.d	50000000	6.90E+07	2.60E+06	0.383	0.082	7.32	0.38
15-Imilac.d	50000000	6.90E+07	2.50E+06	0.389	0.074	7.46	0.47
16-Imilac.d	50000000	7.00E+07	2.50E+06	0.405	0.073	6.63	0.36
17-Imilac.d	50000000	6.14E+07	2.60E+06	0.63	0.13	2.17	0.14
18-Imilac.d	50000000	6.11E+07	2.50E+06	0.468	0.096	1.81	0.17
19-Imilac.d	50000000	7.04E+07	2.80E+06	0.364	0.062	6.64	0.34
20-Imilac.d	50000000	7.19E+07	2.50E+06	0.382	0.064	6.35	0.32
21-Imilac.d	50000000	7.65E+07	2.10E+06	1.43	0.12	0.041	0.014
22-Imilac.d	50000000	8.47E+07	2.20E+06	1.33	0.13	0.034	0.0084
23-Imilac.d	50000000	3.38E+07	1.20E+06	0.74	0.16	1286	56
24-Imilac.d	50000000	3.42E+07	9.70E+05	0.7	0.17	1244	47
25-Imilac.d	50000000	1.38E+07	8.40E+05	1.01	0.44	1600	130
26-Imilac.d	50000000	5.03E+06	2.10E+05	Below LOD	Below LOD	133	29

27-Imilac.d	50000000	6.18E+07	2.80E+06	0.38	0.081	6.25	0.32
28-Imilac.d	50000000	8.73E+07	1.20E+06	1.059	0.088	0.0548	0.0088
29-Imilac.d	50000000	1.06E+08	1.70E+06	7.9	2	0.0533	0.0069
30-Imilac.d	50000000	1.08E+08	1.50E+06	0.382	0.05	0.0919	0.0097
31-Imilac.d	50000000	2.78E+07	1.10E+06	Below LOD	Below LOD	1.77	0.33
32-Imilac.d	50000000	6.25E+07	1.90E+06	0.291	0.07	4.1	0.22
39-Brahin.d	50000000	5.76E+07	2.30E+06	Below LOD	Below LOD	3.16	0.18
40-Brahin.d	50000000	6.21E+07	1.90E+06	0.307	0.074	2.66	0.14
41-Brahin.d	50000000	6.23E+07	2.10E+06	0.347	0.075	2.52	0.14
42-Brahin.d	50000000	6.50E+06	7.00E+05	Below LOD	Below LOD	1190	290
43-Brahin.d	50000000	6.52E+06	5.60E+05	Below LOD	Below LOD	1590	230
44-Brahin.d	50000000	6.42E+07	2.30E+06	0.331	0.076	2.9	0.23
45-Brahin.d	50000000	2.40E+07	7.90E+05	0.91	0.2	1435	50
46-Brahin.d	50000000	2.68E+07	8.30E+05	0.75	0.15	1430	53
47-Brahin.d	50000000	1.52E+07	2.00E+06	Below LOD	Below LOD	91	25
48-Brahin.d	50000000	6.42E+07	2.30E+06	0.297	0.064	4.26	0.3
49-Brahin.d	50000000	5.60E+06	1.00E+06	Below LOD	Below LOD	1550	260
50-Brahin.d	50000000	5.71E+07	2.90E+06	Below LOD	Below LOD	1.27	0.14
51-Brahin.d	50000000	5.55E+07	1.90E+06	0.227	0.07	0.624	0.064
52-Brahin.d	50000000	5.44E+07	2.00E+06	0.354	0.088	1.79	0.39
53-Brahin.d	50000000	5.88E+07	3.00E+06	0.299	0.076	0.649	0.06
54-Brahin.d	50000000	5.71E+07	2.20E+06	0.358	0.08	0.646	0.067
55-Brahin.d	50000000	3.04E+07	2.10E+06	Below LOD	Below LOD	3.27	0.78
56-Brahin.d	50000000	3.37E+06	6.00E+05	Below LOD	Below LOD	1970	300
57-Brahin.d	50000000	5.65E+07	2.70E+06	0.396	0.096	0.577	0.047
58-Brahin.d	50000000	5.63E+07	2.50E+06	0.257	0.076	0.56	0.045
67-Esquel.d	50000000	5.52E+07	2.60E+06	0.33	0.086	7.52	0.58
68-Esquel.d	50000000	5.72E+07	2.10E+06	0.353	0.085	6.27	0.38
69-Esquel.d	50000000	5.59E+07	2.50E+06	0.33	0.092	4.19	0.3
70-Esquel.d	50000000	5.47E+07	2.00E+06	0.326	0.08	5.19	0.29
71-Esquel.d	50000000	5.34E+07	2.10E+06	0.37	0.1	5.2	0.34
72-Esquel.d	50000000	5.64E+07	2.20E+06	0.259	0.07	5.04	0.28
73-Esquel.d	50000000	5.65E+07	2.10E+06	0.292	0.08	5.13	0.31
74-Esquel.d	50000000	5.55E+07	1.70E+06	0.428	0.072	4.75	0.25
75-Esquel.d	50000000	5.84E+07	2.10E+06	0.288	0.062	6.38	0.51
76-Esquel.d	50000000	5.79E+07	2.40E+06	0.271	0.07	3.59	0.2
77-Esquel.d	50000000	5.68E+07	2.00E+06	0.389	0.095	4.06	0.17
78-Esquel.d	50000000	5.62E+07	2.00E+06	0.331	0.084	4.77	0.22
79-Esquel.d	50000000	3.30E+06	6.60E+05	Below LOD	Below LOD	680	240
80-Esquel.d	50000000	5.11E+07	1.80E+06	0.463	0.082	1.14	0.11
81-Esquel.d	50000000	5.13E+07	2.10E+06	0.337	0.089	1.175	0.079

82-Esquel.d	50000000	1.85E+07	1.50E+06	Below LOD	Below LOD	1.08	0.11
83-Esquel.d	50000000	5.40E+07	2.10E+06	0.347	0.08	3.54	0.24
84-Esquel.d	50000000	5.95E+07	1.80E+06	0.47	0.1	2.18	0.13
85-Esquel.d	50000000	1.00E+07	7.10E+05	23.6	5.4	1.94	0.22
86-Esquel.d	50000000	5.22E+06	4.60E+05	Below LOD	Below LOD	1790	160
94-Springwater.d	50000000	5.25E+07	1.70E+06	0.25	0.1	2.71	0.13
95-Springwater.d	50000000	4.88E+07	2.10E+06	0.35	0.1	0.522	0.049
96-Springwater.d	50000000	4.95E+07	2.00E+06	0.366	0.088	0.423	0.032
97-Springwater.d	50000000	5.66E+07	2.20E+06	0.251	0.076	2.62	0.14
98-Springwater.d	50000000	5.73E+07	2.10E+06	0.244	0.08	2.22	0.12
99-Springwater.d	50000000	2.68E+07	9.10E+05	0.66	0.16	1398	63
100-Springwater.d	50000000	2.74E+07	8.80E+05	0.56	0.19	1383	46
101-Springwater.d	50000000	2.69E+07	7.60E+05	Below LOD	Below LOD	1452	60
102-Springwater.d	50000000	6.54E+07	2.20E+06	0.79	0.1	6.37	0.48
103-Springwater.d	50000000	5.33E+07	1.20E+06	0.36	0.11	0.59	0.16
104-Springwater.d	50000000	2.64E+07	1.00E+06	0.65	0.19	1487	68
105-Springwater.d	50000000	2.74E+07	9.50E+05	0.6	0.14	1352	51
106-Springwater.d	50000000	5.68E+07	2.90E+06	0.32	0.075	5.4	0.54
107-Springwater.d	50000000	5.10E+07	1.90E+06	0.304	0.098	1.32	0.23
108-Springwater.d	50000000	2.31E+07	1.80E+06	Below LOD	Below LOD	3.02	0.28
109-Springwater.d	50000000	5.16E+06	7.90E+05	Below LOD	Below LOD	1.02	0.4
110-Springwater.d	50000000	5.78E+07	1.60E+06	0.329	0.079	0.579	0.031
111-Springwater.d	50000000	2.36E+07	6.60E+05	Below LOD	Below LOD	1448	60
112-Springwater.d	50000000	4.64E+07	2.00E+06	0.204	0.084	2.85	0.32
113-Springwater.d	50000000	5.36E+07	2.10E+06	0.218	0.085	4.18	0.22
120-Springwater.d	50000000	1.52E+07	1.50E+06	Below LOD	Below LOD	2.82	0.35
121-Springwater.d	50000000	2.43E+07	7.60E+05	0.68	0.16	1399	57
122-Springwater.d	50000000	2.89E+07	1.10E+06	0.93	0.14	1194	54
123-Springwater.d	50000000	5.04E+07	1.80E+06	0.31	0.078	3.67	0.21
124-Springwater.d	50000000	5.16E+07	1.20E+06	0.323	0.089	0.117	0.02
125-Springwater.d	50000000	2.54E+07	7.70E+05	0.53	0.18	1351	62
126-Springwater.d	50000000	4.91E+07	2.00E+06	0.38	0.084	2.39	0.23
127-Springwater.d	50000000	1.93E+07	1.80E+06	Below LOD	Below LOD	9	2.6
128-Springwater.d	50000000	5.25E+07	2.00E+06	0.206	0.086	4.77	0.28
129-Huckitta.d	50000000	5.18E+07	2.20E+06	0.257	0.088	3.36	0.21
130-Huckitta.d	50000000	4.35E+07	1.80E+06	0.33	0.1	0.687	0.049
131-Huckitta.d	50000000	9.10E+06	4.10E+05	Below LOD	Below LOD	1940	140
132-Huckitta.d	50000000	5.12E+07	2.00E+06	0.262	0.076	2.48	0.23
133-Huckitta.d	50000000	3.33E+07	1.90E+06	0.3	0.13	2.87	0.26
134-Huckitta.d	50000000	5.14E+07	1.30E+06	0.303	0.068	4.61	0.32
135-Huckitta.d	50000000	1.90E+07	6.00E+05	0.7	0.22	1643	64
136-Huckitta.d	50000000	5.24E+07	1.40E+06	0.39	0.11	3.83	0.26

137-Huckitta.d	50000000	6.89E+06	6.00E+05	Below LOD	Below LOD	1880	130
138-Huckitta.d	50000000	5.01E+07	2.10E+06	0.29	0.11	3.4	0.3
139-Huckitta.d	50000000	1.17E+07	4.90E+05	1.03	0.44	4.29	0.44
147-Huckitta.d	50000000	1.00E+07	3.00E+05	5.51	0.47	7.28	0.54
148-Huckitta.d	50000000	4.63E+06	6.40E+05	Below LOD	Below LOD	2010	310
149-Huckitta.d	50000000	9.77E+07	3.50E+06	1.458	0.089	13.34	0.38
150-Huckitta.d	50000000	9.15E+06	4.40E+05	Below LOD	Below LOD	1796	95
151-Huckitta.d	50000000	4.85E+07	2.20E+06	0.251	0.097	4.09	0.24
152-Huckitta.d	50000000	5.70E+07	1.10E+06	0.861	0.094	3.64	0.18
153-Huckitta.d	50000000	5.70E+06	1.10E+06	Below LOD	Below LOD	4.11	0.91
155-Huckitta.d	50000000	4.09E+06	4.60E+05	Below LOD	Below LOD	1230	140
156-Springwater.d	50000000	4.92E+07	1.40E+06	0.47	0.11	0.105	0.017
157-Springwater.d	50000000	2.14E+07	5.80E+05	0.69	0.19	1474	65
158-Springwater.d	50000000	4.88E+07	1.60E+06	0.362	0.071	2.74	0.16
159-Springwater.d	50000000	5.35E+06	5.50E+05	Below LOD	Below LOD	1700	240
160-Springwater.d	50000000	4.97E+07	1.90E+06	0.214	0.089	3.13	0.41
161-Springwater.d	50000000	4.21E+07	1.60E+06	0.47	0.1	1.7	0.22
163-Springwater.d	50000000	4.89E+07	1.50E+06	0.386	0.085	4.16	0.2

MASS

MASS

S_ppm_m3	S_ppm_m3	Ti_ppm_m4	Ti_ppm_m4	V_ppm_m5	V_ppm_m5	Cr_ppm_m	Cr_ppm_m	Mn_ppm_m
21.49	0.89	0.0027	0.0011	0.000103	0.000086	Below LOD	Below LOD	0.1117
2.34	0.18	0.00137	0.00039	Below LOD	Below LOD	Below LOD	Below LOD	0.00105
2.23	0.2	0.00095	0.00029	Below LOD	Below LOD	Below LOD	Below LOD	0.00055
2.02	0.26	0.00106	0.00028	Below LOD	Below LOD	0.00185	0.00084	Below LOD
2.03	0.25	0.00044	0.00023	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.45	0.27	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.13	0.28	0.00094	0.00028	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.32	0.19	0.0006	0.00024	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
1526	41	0.00164	0.00032	0.2434	0.0059	8.31	0.16	1.77
1437	54	0.00201	0.00041	0.2218	0.0071	7.9	0.23	1.37
9.13	0.63	0.0148	0.0015	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
10.28	0.47	0.0153	0.0016	Below LOD	Below LOD	Below LOD	Below LOD	0.00286
10.4	1.2	0.0292	0.007	Below LOD	Below LOD	Below LOD	Below LOD	0.057
86	22	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.0095
2.42	0.27	0.00101	0.00031	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
912	18	0.00188	0.00038	0.1645	0.0029	5.558	0.09	3.11
985	16	0.00253	0.00042	0.1535	0.0028	5.225	0.093	1.661
569	14	0.00105	0.00022	0.0755	0.0016	2.686	0.058	0.581
594	29	0.00161	0.00072	0.0957	0.0051	3.41	0.2	0.306
5.38	0.55	0.00059	0.00025	0.00061	0.00011	0.0203	0.0045	0.0076
2.61	0.35	0.00052	0.0003	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.4	0.27	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.43	0.27	0.00057	0.00027	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD

5.4 2 0.0153 0.0049 Below LOD Below LOD Below LOD Below LOD Below LOD
5.6 1.8 0.0185 0.0042 Below LOD Below LOD Below LOD Below LOD Below LOD
2.51 0.28 0.00068 0.00027 Below LOD Below LOD Below LOD Below LOD 0.00062
9.99 0.77 0.013 0.0017 Below LOD Below LOD Below LOD Below LOD Below LOD
7.96 0.73 0.0138 0.0019 0.000164 0.000056 0.0054 0.0024 0.00302
Below LOD Below LOD 0.0046 0.0017 0.00073 0.00019 0.0238 0.0048 0.0303
2.28 0.25 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD0.00049
Below LOD Below LOD0.0133 0.0059 Below LOD Below LOD Below LOD Below LOD Below LOD
2.22 0.32 Below LOD Below LOD Below LOD Below LOD0.00255 0.00093 Below LOD
2.21 0.3 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD0.00051
2.66 0.25 Below LOD Below LOD Below LOD Below LOD0.0025 0.001 Below LOD
2.51 0.3 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
2.89 0.31 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
1.76 0.48 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
Below LOD Below LOD 0.024 0.014 Below LOD Below LOD Below LOD Below LOD Below LOD
2.85 0.32 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
1.71 0.26 Below LOD Below LOD Below LOD Below LOD0.0026 0.0012 Below LOD
2.99 0.4 0.00103 0.00036 Below LOD Below LOD Below LOD Below LOD Below LOD
2.79 0.34 0.00066 0.00026 Below LOD Below LOD Below LOD Below LOD0.00063
3.01 0.32 0.00069 0.00032 Below LOD Below LOD Below LOD
Below LOD Below LOD 2.94 0.27 0.00058 0.00025 Below LOD Below
LOD Below LOD Below LOD Below LOD 2.83 0.36 0.0008 0.00028
Below LOD Below LOD Below LOD Below LOD Below LOD 2.69 0.26
0.00077 0.0003 Below LOD Below LOD Below LOD Below LOD Below
LOD 2.36 0.24 Below LOD Below LOD Below LOD Below LOD 0.0017
0.0009 Below LOD
2.62 0.35 0.00033 0.00021 Below LOD Below LOD Below LOD Below LOD Below LOD

2.28	0.29	0.00045	0.00021	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.1	0.28	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.25	0.32	0.00043	0.00023	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.47	0.29	0.00067	0.00028	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.0082	0.0052	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.89	0.38	Below LOD	Below LOD	Below LOD	Below LOD	0.0021	0.001	0.00079
2.36	0.3	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.0007
2.21	0.79	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
2.43	0.31	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.00053
410	14	0.00365	0.00053	0.0845	0.0024	1.562	0.043	0.471
230	23	Below LOD	Below LOD	0.0597	0.0064	1.14	0.13	0.384
Below LOD	Below LOD	0.0229	0.007	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
4.58	0.31	0.00071	0.00028	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
4.74	0.41	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
4.01	0.35	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
3.7	0.36	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
3.46	0.25	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
11.6	0.63	0.0102	0.0016	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
13.12	0.76	0.0094	0.0016	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
12.3	0.76	0.0088	0.0013	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
1695	63	0.00238	0.00051	0.1667	0.0045	5.06	0.16	0.615
1753	57	0.00342	0.00056	0.1722	0.0038	4.93	0.12	1.017
32.3	3.7	0.0087	0.0015	0.00198	0.00026	0.059	0.012	0.0121
41.8	5.1	0.0096	0.0014	0.00327	0.00063	0.08	0.013	0.0139

5.12 0.76 0.00057 0.00026 0.000199 0.000054 0.0059 0.0015 0.00201
4.43 0.53 0.00029 0.00019 0.00021 0.000059 0.005 0.0015 Below LOD
2.92 0.66 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
1728 66 0.00362 0.00067 0.1625 0.0038 4.83 0.14 0.978 13.92 0.99 0.0121 0.0017 0.000181 0.000088 0.0049 0.0024 0.00108
3.93 0.59 0.00059 0.00029 0.000078 0.000035 0.0023 0.0014 0.00127
3.52 0.42 Below LOD Below LOD0.000137 0.000043 0.0028 0.0012 Below LOD
Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD

16.25	0.9	0.0107	0.0016	0.000217	0.000083	0.0045	0.0022	Below LOD
22.5	1.5	0.0082	0.0013	0.000138	0.000058	Below LOD	Below LOD	0.157
3.59	0.35	Below LOD	Below LOD	0.000044	0.000024	Below LOD	Below LOD	Below LOD
1863	70	0.00301	0.00061	0.1594	0.0039	4.55	0.12	1.61
17.06	0.94	0.008	0.0015	0.000178	0.00008	Below LOD	Below LOD	0.133
4.92	0.53	Below LOD	Below LOD	0.000122	0.000042	Below LOD	Below LOD	0.0065
6.4	1.1	0.00138	0.00068	0.00025	0.00012	0.0062	0.0031	0.0414
3.82	0.44	0.00062	0.0003	0.000144	0.000036	0.0053	0.0012	0.00162

3.26 0.37 0.00084 0.00032 Below LOD Below LOD Below LOD Below LOD Below LOD
3.07 0.33 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
15.8 1.9 0.0152 0.0036 Below LOD Below LOD Below LOD Below LOD0.0033
3.17 0.34 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD0.00064
2.48 0.51 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
2.86 0.31 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD0.00088
12.7 1.2 0.0113 0.002 Below LOD Below LOD Below LOD Below LOD0.00398
2.93 0.34 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD0.00062
9.3 2.6 0.0158 0.0042 Below LOD Below LOD Below LOD Below LOD0.0046
3.01 0.36 0.00042 0.00024 Below LOD Below LOD Below LOD Below LOD Below LOD

Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD 0.0286
14 1.7 Below LOD Below LOD 0.00116 0.00023 0.0125 0.0048 0.0884
Below LOD Below LOD0.0158 0.0069 Below LOD Below LOD Below LOD Below LOD Below LOD
10.52 0.32 Below LOD Below LOD0.000104 0.000026 0.00133 0.00051 0.02247
11.7 1.5 0.0108 0.0028 Below LOD Below LOD Below LOD Below LOD0.0168
4.21 0.41 0.00088 0.00037 Below LOD Below LOD Below LOD Below LOD Below LOD
21 1 0.00058 0.00029 Below LOD Below LOD 0.00207 0.00074 0.0967 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD
16.2 4.3 0.0138 0.0048 Below LOD Below LOD Below LOD Below LOD0.0279
1755 70 0.00334 0.00064 0.1616 0.0054 4.77 0.12 0.86 18.7 3.5 0.0086 0.0015 0.00015 0.00011 0.0055 0.004 0.00168
3.7 0.47 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD0.00061
9.3 4.6 0.0179 0.0053 Below LOD Below LOD Below LOD Below LOD Below LOD
3.96 0.4 0.00063 0.00029 0.000075 0.000039 0.0022 0.0011 0.00081
4.94 0.44 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD0.00128
3.87 0.52 0.00078 0.00026 0.000070.000035 Below LOD Below LOD 0.00097

Mn_ppm_m	Co_ppm_m	Co_ppm_m	Ni_ppm_m	Ni_ppm_m	Cu_ppm_m	Cu_ppm_m	Zn_ppm_m	Zn_ppm_m
0.0076	26.24	0.42	326	10	0.352	0.039	Below LOD	Below LOD
0.00023	31.28	0.75	398	12	0.415	0.012	Below LOD	Below LOD
0.00022	30.84	0.84	395	12	0.42	0.013	Below LOD	Below LOD
Below LOD	30.64	0.76	390	12	0.408	0.013	Below LOD	Below LOD
Below LOD	19.64	0.65	1407	46	2.89	0.12	Below LOD	Below LOD
Below LOD	21.4	0.83	1165	44	2.12	0.1	Below LOD	Below LOD
Below LOD	30.32	0.74	398	12	0.417	0.014	Below LOD	Below LOD
Below LOD	31.47	0.87	382	10	0.402	0.013	Below LOD	Below LOD
0.24	0.1235	0.0038	0.661	0.031	1.138	0.039	Below LOD	Below LOD
0.1	0.0712	0.0021	0.724	0.044	1.076	0.032	0.0021	0.0011
Below LOD	13.31	0.39	2619	77	0.858	0.03	Below LOD	Below LOD
0.00067	14.19	0.32	2584	80	0.86	0.029	Below LOD	Below LOD
0.015	15.19	0.83	2410	170	0.822	0.06	Below LOD	Below LOD
0.0024	35.45	0.86	404	47	0.367	0.021	Below LOD	Below LOD
Below LOD	33.39	0.66	359	12	0.408	0.015	Below LOD	Below LOD
0.12	0.51	0.062	2.72	0.44	2.96	0.45	Below LOD	Below LOD
0.032	0.335	0.014	1.365	0.023	1.027	0.017	Below LOD	Below LOD
0.062	34.3	1.3	215.1	7.4	9.43	0.93	Below LOD	Below LOD
0.012	47.3	3.7	340	37	3.24	0.21	Below LOD	Below LOD
0.0012	34.23	0.8	333	10	0.392	0.015	0.0026	0.0011
Below LOD	33.4	0.99	366	11	0.454	0.014	Below LOD	Below LOD

Below LOD	30.9	1	372	11	0.469	0.018	Below LOD	Below LOD
Below LOD	30.57	0.93	383	14	0.477	0.014	Below LOD	Below LOD
Below LOD	12.6	2.3	4590	720	5.49	0.61	Below LOD	Below LOD
Below LOD	13	1.7	5180	780	4.71	0.51	Below LOD	Below LOD
0.00019	31.86	0.83	333	10	0.414	0.016	Below LOD	Below LOD
Below LOD	12.08	0.24	3670	100	1.556	0.039	Below LOD	Below LOD
0.00043	13.24	0.31	3185	96	1.334	0.04	Below LOD	Below LOD
0.002	21.3	1.4	326	68	0.292	0.03	0.129	0.013
0.00024	33	1.1	342	12	0.426	0.016	Below LOD	Below LOD
Below LOD	12.7	2.4	4950	720	3.44	0.43	Below LOD	Below LOD
Below LOD	25.53	0.78	782	28	1.543	0.06	Below LOD	Below LOD
0.00023	26.08	0.76	837	27	1.639	0.067	Below LOD	Below LOD
Below LOD	26.33	0.74	764	25	1.448	0.055	Below LOD	Below LOD
Below LOD	26.6	1	782	37	1.487	0.058	Below LOD	Below LOD
Below LOD	27	0.94	749	30	1.418	0.058	Below LOD	Below LOD
Below LOD	25.5	1.4	403	39	0.631	0.08	Below LOD	Below LOD
Below LOD	11.2	2.9	6.70E+03	1.20E+03	3.68	0.44	Below LOD	Below LOD
Below LOD	26.52	0.81	766	28	1.379	0.055	Below LOD	Below LOD
Below LOD	25.58	0.82	743	33	1.568	0.091	0.00459	0.00094
Below LOD	31.1	1	366	15	0.376	0.013	Below LOD	Below LOD
0.00024	30.92	0.87	364	12	0.365	0.011	0.005	0.015
Below LOD	30.6	1	374	15	0.359	0.016	Below LOD	Below LOD

Below LOD	30.5	1	391	13	0.398	0.013	Below LOD	Below LOD	
Below LOD	31.37	0.78	398	13	0.417	0.017	Below LOD	Below LOD	
Below LOD	30.93	0.86	397	17	0.409	0.014	Below LOD	Below LOD	
Below LOD	31.29	0.97	388	15	0.396	0.014	Below LOD	Below LOD	
Below LOD	30.83	0.79	385	11	0.395	0.011	Below LOD	Below LOD	
Below LOD	30.74	0.86	399	16	0.405	0.019	Below LOD	Below LOD	
Below LOD	30.33	0.9	385	12	0.403	0.014	Below LOD	Below LOD	
Below LOD	30.41	0.75	397	13	0.406	0.012	Below LOD	Below LOD	
Below LOD	30.02	0.73	390	15	0.385	0.013	Below LOD	Below LOD	
Below LOD	14.6	2.2	2950	620	4.83	0.95	Below LOD	Below LOD	
0.00025	20.37	0.69	1476	65	2.78	0.12	Below LOD	Below LOD	
0.00025	20.47	0.77	1122	51	1.851	0.076	Below LOD	Below LOD	
Below LOD	15.62	0.97	2140	160	5.03	0.32	Below LOD	Below LOD	
0.00025	29.25	0.69	393	11	0.362	0.012	Below LOD	Below LOD	
0.049	30.33	0.58	123.5	3.2	0.312	0.01	Below LOD	Below LOD	
0.049	50.5	5.4	394	34	0.424	0.035	Below LOD	Below LOD	
Below LOD	8.28	0.73	5820	570	2.41	0.22	0.06	0.016	
Below LOD	34.23	0.82	373.6	9.6	0.2823	0.0095	Below LOD	Below LOD	
Below LOD	29.5	1.1	966	40	1.397	0.055	Below LOD	Below LOD	
Below LOD	29.23	0.85	951	29	1.404	0.043	Below LOD	Below LOD	
Below LOD	35.1	1.2	384	10	0.295	0.01	Below LOD	Below LOD	
Below LOD	35.97	0.95	341	11	0.2857	0.0089	Below LOD	Below LOD	
Below LOD	13.98	0.44	3131	98	0.83	0.026	Below LOD	Below LOD	

Below LOD	13.61	0.28	3065	55	0.8	0.025	Below LOD	Below LOD
Below LOD	14.55	0.28	3196	72	0.827	0.025	Below LOD	Below LOD
0.024	0.714	0.032	19.4	1.9	2.23	0.11	Below LOD	Below LOD
0.063	0.123	0.011	2.12	0.4	2.03	0.15	Below LOD	Below LOD
0.0025	14.3	0.43	3038	99	0.834	0.026	Below LOD	Below LOD
0.0027	13.65	0.31	2978	91	0.813	0.02	Below LOD	Below LOD
0.00034	34.7	1	375	11	0.311	0.011	Below LOD	Below LOD
Below LOD	29.15	0.83	868	29	1.374	0.044	Below LOD	Below LOD
Below LOD	32.7	1.9	322	20	0.179	0.014	Below LOD	Below LOD
Below LOD	23.5	3.2	1950	520	4.45	0.78	Below LOD	Below LOD
0.047	5.32	0.27	15	1	4.05	0.11	Below LOD	Below LOD
0.00048	14.15	0.44	3430	120	0.914	0.036	Below LOD	Below LOD
0.00033	38.6	1.3	301.4	8.3	0.2161	0.0082	Below LOD	Below LOD
Below LOD	35.47	0.92	386	17	0.336	0.015	0.005	0.0014
Below LOD	38.9	2.5	274	23	0.207	0.018	Below LOD	Below LOD
Below LOD	15.21	0.29	3239	71	0.817	0.017	Below LOD	Below LOD
0.023	13.85	0.29	2593	94	0.644	0.024	0.0106	0.0028
Below LOD	37.53	0.9	349.9	9.1	0.2802	0.0092	Below LOD	Below LOD
0.16	0.76	0.087	5.58	0.68	1.499	0.081	Below LOD	Below LOD
0.026	14.26	0.38	3330	100	0.846	0.035	Below LOD	Below LOD
0.001	40.3	1.1	290.7	8.9	0.209	0.0088	Below LOD	Below LOD
0.0064	36.7	2.4	281	25	0.19	0.014	Below LOD	Below LOD
0.00032	38.22	0.95	369	11	0.319	0.011	Below LOD	Below LOD
Below LOD	28.16	0.57	385	10	0.3163	0.0082	Below LOD	Below LOD

Below LOD	20.05	0.58	959	36	1.275	0.055	Below LOD	Below LOD
0.0016	7.99	0.33	5610	240	2.6	0.14	Below LOD	Below LOD
0.0003	28.47	0.79	388	16	0.358	0.014	Below LOD	Below LOD
Below LOD	29.9	1.3	353	18	0.319	0.015	Below LOD	Below LOD
0.00031	29.33	0.74	366	10	0.337	0.0091	Below LOD	Below LOD
0.00083	11.03	0.32	4680	130	2.121	0.068	0.0405	0.0072
0.00024	29.9	0.54	386	11	0.362	0.0095	Below LOD	Below LOD
0.0023	9.32	0.57	4670	330	2.44	0.17	Below LOD	Below LOD
Below LOD	30.8	1	361	11	0.341	0.013	Below LOD	Below LOD
0.0026	30.5	1.6	289	14	0.197	0.013	0.418	0.061
0.0044	23.4	1.2	183	11	0.344	0.015	0.124	0.048
Below LOD	9.78	0.82	5670	790	3.6	0.5	Below LOD	Below LOD
0.00076	31.12	0.44	566	11	0.687	0.036	0.387	0.014
0.0043	10.06	0.49	5240	220	2.7	0.12	0.035	0.011
Below LOD	29.85	0.84	397	13	0.378	0.012	Below LOD	Below LOD
0.0023	30.92	0.49	544	11	0.407	0.014	Below LOD	Below LOD
Below LOD	27.8	6.1	381	63	0.333	0.08	Below LOD	Below LOD
0.0042	12.59	0.85	3580	270	1.65	0.15	Below LOD	Below LOD
0.064	0.0841	0.0054	1.13	0.1	2.16	0.13	Below LOD	Below LOD
0.00092	14.33	0.39	3500	120	0.872	0.028	Below LOD	Below LOD
0.0003	38.31	0.92	332.8	9	0.2495	0.0073	Below LOD	Below LOD
Below LOD	12.9	1.1	3430	390	1	0.14	Below LOD	Below LOD
0.00033	33.27	0.85	358	9.8	0.2488	0.0075	Below LOD	Below LOD
0.00031	29.72	0.84	1244	48	2.009	0.064	Below LOD	Below LOD
0.00044	38.68	0.85	329	10	0.2513	0.007	Below LOD	Below LOD

NiS

Ga_ppm_m	Ga_ppm_m	As_ppm_m	As_ppm_m	Se_ppm_m	Se_ppm_m	Mo_ppm_m	Mo_ppm_m	Ru_ppm_m
0.1032	0.005	0.13	0.0091	Below LOD	Below LOD	0.0332	0.0022	0.00687
0.1132	0.0048	0.1336	0.0038	Below LOD	Below LOD	0.0288	0.0014	0.00553
0.1105	0.0035	0.1316	0.0056	0.0007	0.00034	0.0281	0.0012	0.00565
0.1058	0.0035	0.1304	0.005	Below LOD	Below LOD	0.0278	0.0012	0.00584
0.2147	0.007	0.0825	0.0034	Below LOD	Below LOD	0.0458	0.0015	0.01529
0.1584	0.0072	0.0724	0.0043	Below LOD	Below LOD	0.0386	0.0015	0.01087
0.1101	0.0038	0.1325	0.0046	Below LOD	Below LOD	0.0299	0.0011	0.00615
0.1103	0.0044	0.1312	0.0045	Below LOD	Below LOD	0.0292	0.0011	0.0064
0.000178	0.000049	0.00468	0.0009	0.357	0.011	0.02948	0.00098	Below LOD
0.000159	0.000039	0.0041	0.00064	0.341	0.013	0.0762	0.0037	Below LOD
0.00101	0.00014	0.0466	0.0037	Below LOD	Below LOD	0.401	0.012	0.01079
0.00115	0.00017	0.0456	0.0026	Below LOD	Below LOD	0.392	0.012	0.01031
0.00122	0.00025	0.042	0.0048	Below LOD	Below LOD	0.306	0.014	0.00795
0.1708	0.0097	0.284	0.019	Below LOD	Below LOD	0.0769	0.0056	0.0064
0.1145	0.0052	0.1375	0.0044	Below LOD	Below LOD	0.0252	0.0012	0.00374
0.000345	0.000059	0.00477	0.00078	0.2455	0.0075	0.01107	0.00052	Below LOD
0.0009	0.00014	0.00394	0.00059	0.2236	0.0074	0.01646	0.00083	Below LOD
0.0021	0.00011	0.00535	0.00056	0.1198	0.0053	0.00754	0.00066	0.000132
0.082	0.015	0.108	0.028	0.148	0.012	0.0313	0.0046	0.0036
0.1108	0.0044	0.1339	0.005	0.00078	0.0004	0.0247	0.0012	0.00349
0.1269	0.0043	0.1514	0.0054	Below LOD	Below LOD	0.02326	0.00098	0.0045
0.1244	0.0047	0.1564	0.005	Below LOD	Below LOD	0.0232	0.0012	0.00458
0.1309	0.0047	0.1573	0.0061	Below LOD	Below LOD	0.02315	0.00097	0.00489
0.33	0.11	0.131	0.017	Below LOD	Below LOD	0.264	0.056	0.0144
0.088	0.023	0.149	0.014	Below LOD	Below LOD	0.311	0.049	0.0139

0.1229	0.0041	0.1508	0.0052	Below LOD	Below LOD	0.02329	0.00091	0.0041
0.00563	0.00064	0.0658	0.0043	Below LOD	Below LOD	0.474	0.017	0.01477
0.00623	0.00056	0.0629	0.0043	Below LOD	Below LOD	0.422	0.013	0.01263
0.024	0.002	0.183	0.015	Below LOD	Below LOD	0.0313	0.0053	0.00399
0.1224	0.0055	0.1531	0.007	Below LOD	Below LOD	0.02257	0.00092	0.00452
0.0308	0.0099	0.136	0.029	Below LOD	Below LOD	0.277	0.049	0.0118
0.1434	0.0071	0.0848	0.0038	Below LOD	Below LOD	0.03	0.0013	0.00658
0.1524	0.0058	0.0868	0.0036	Below LOD	Below LOD	0.0317	0.0014	0.00628
0.1352	0.0058	0.088	0.0029	Below LOD	Below LOD	0.0336	0.002	0.00696
0.1362	0.0051	0.0863	0.0041	Below LOD	Below LOD	0.0323	0.0016	0.00639
0.1342	0.0055	0.0948	0.0042	Below LOD	Below LOD	0.0301	0.0013	0.00649
0.0874	0.0083	0.1138	0.006	Below LOD	Below LOD	0.0227	0.0016	0.00495
0.0113	0.005	0.197	0.055	Below LOD	Below LOD	0.396	0.055	0.0138
0.1362	0.0043	0.0816	0.0032	Below LOD	Below LOD	0.0294	0.0015	0.00673
0.1332	0.0074	0.0896	0.0046	Below LOD	Below LOD	0.0308	0.0016	0.00727
0.1143	0.0049	0.0989	0.0042	Below LOD	Below LOD	0.0313	0.0012	0.0038
0.1168	0.0055	0.1012	0.0044	Below LOD	Below LOD	0.03	0.0011	0.00434
0.1188	0.0052	0.1007	0.0044	Below LOD	Below LOD	0.0301	0.0015	0.00474
0.1181	0.0058	0.1018	0.0044	Below LOD	Below LOD	0.0302	0.0015	0.0056
0.1213	0.0038	0.105	0.0045	Below LOD	Below LOD	0.0312	0.0014	0.00631
0.1197	0.0049	0.1034	0.004	Below LOD	Below LOD	0.0319	0.0014	0.00696
0.1218	0.005	0.1034	0.0033	Below LOD	Below LOD	0.0309	0.0016	0.00671
0.1173	0.0046	0.1014	0.0045	Below LOD	Below LOD	0.0312	0.0013	0.00754
0.121	0.0053	0.1009	0.0039	Below LOD	Below LOD	0.0308	0.0013	0.00789
0.1199	0.0052	0.0985	0.0039	Below LOD	Below LOD	0.0296	0.0014	0.00896
0.1179	0.0041	0.1008	0.0042	Below LOD	Below LOD	0.0302	0.0015	0.01161
0.1129	0.0041	0.1004	0.0037	Below LOD	Below LOD	0.0308	0.001	0.01151
0.39	0.12	0.131	0.035	Below LOD	Below LOD	0.133	0.04	0.056
0.244	0.012	0.0611	0.0033	Below LOD	Below LOD	0.0466	0.0023	0.0388
0.1514	0.006	0.0518	0.003	Below LOD	Below LOD	0.0415	0.0016	0.0313
0.491	0.039	0.0873	0.0068	Below LOD	Below LOD	0.0537	0.0036	0.0519
0.1119	0.0038	0.1047	0.0035	Below LOD	Below LOD	0.0316	0.0014	0.015
0.1304	0.0049	0.0735	0.0031	0.0798	0.005	0.1212	0.004	0.00958

0.0709	0.0072	0.0705	0.0095	0.0485	0.009	0.0739	0.0066	0.008
0.005	0.0018	0.096	0.013	Below LOD	Below LOD	0.51	0.046	0.0415
0.0824	0.0028	0.179	0.0065	Below LOD	Below LOD	0.02152	0.00086	0.00319
0.0907	0.0042	0.0715	0.0039	Below LOD	Below LOD	0.029	0.0014	0.00385
0.0873	0.0032	0.0716	0.0031	Below LOD	Below LOD	0.0296	0.0014	0.00385
0.0766	0.0028	0.1697	0.0063	Below LOD	Below LOD	0.01981	0.00096	0.0025
0.0809	0.0025	0.17	0.0055	Below LOD	Below LOD	0.02044	0.00079	0.0019
0.00224	0.0004	0.0659	0.0045	Below LOD	Below LOD	0.3633	0.0086	0.00681
0.00191	0.00029	0.062	0.0034	Below LOD	Below LOD	0.354	0.013	0.00612
0.00179	0.00026	0.0671	0.0036	Below LOD	Below LOD	0.376	0.011	0.00688
0.000442	0.000082	0.00489	0.00084	0.25	0.011	0.0184	0.001	0.000028
0.000102	0.000033	0.00478	0.0008	0.269	0.013	0.0102	0.00054	Below LOD
0.00148	0.00024	0.0603	0.0036	0.0038	0.002	0.36	0.012	0.00567
0.00138	0.00018	0.0661	0.0041	0.0028	0.0014	0.363	0.011	0.00607
0.0808	0.0031	0.1678	0.006	Below LOD	Below LOD	0.02057	0.00094	0.00178
0.0851	0.0027	0.085	0.0032	Below LOD	Below LOD	0.0274	0.0014	0.00293
0.0577	0.0034	0.179	0.012	Below LOD	Below LOD	0.0214	0.0016	0.00234
0.281	0.051	0.115	0.035	Below LOD	Below LOD	0.0347	0.0067	0.005
0.000056	0.000026	0.0034	0.00089	0.267	0.014	0.00802	0.0005	Below LOD
0.00107	0.0002	0.0728	0.0039	0.00135	0.00088	0.389	0.014	0.00579
0.0789	0.0032	0.161	0.0059	Below LOD	Below LOD	0.01871	0.00086	0.00155
0.0864	0.0033	0.1686	0.0063	Below LOD	Below LOD	0.0196	0.001	0.00197
0.0806	0.0082	0.161	0.015	Below LOD	Below LOD	0.0167	0.0021	0.00248
0.00385	0.00052	0.0682	0.0029	Below LOD	Below LOD	0.363	0.01	0.01112
0.00182	0.00023	0.0529	0.0035	Below LOD	Below LOD	0.305	0.014	0.0096
0.078	0.0028	0.163	0.0062	Below LOD	Below LOD	0.01943	0.00097	0.00376
0.000145	0.00005	0.00405	0.00093	0.267	0.011	0.01183	0.0007	Below LOD
0.00115	0.0002	0.0595	0.003	Below LOD	Below LOD	0.359	0.013	0.0134
0.0773	0.0027	0.1752	0.0066	Below LOD	Below LOD	0.0186	0.001	0.00404
0.0676	0.0051	0.166	0.011	Below LOD	Below LOD	0.0188	0.0019	0.00335
0.0841	0.0028	0.1741	0.0058	0.00006	0.00011	0.02066	0.00079	0.00412
0.1313	0.0038	0.0851	0.0031	Below LOD	Below LOD	0.0284	0.0011	0.021
0.1531	0.0063	0.0405	0.0027	Below LOD	Below LOD	0.0374	0.0017	0.0388
0.00546	0.00097	0.0618	0.0069	Below LOD	Below LOD	0.579	0.027	0.0689
0.1499	0.0054	0.086	0.0029	Below LOD	Below LOD	0.02712	0.00099	0.02021
0.1483	0.0086	0.0858	0.0059	Below LOD	Below LOD	0.027	0.0017	0.019
0.1444	0.0055	0.0864	0.003	Below LOD	Below LOD	0.0291	0.0013	0.01727
0.0233	0.0034	0.0592	0.0057	Below LOD	Below LOD	0.559	0.016	0.0555
0.1419	0.0043	0.0875	0.0037	Below LOD	Below LOD	0.0289	0.0012	0.01686

0.0089	0.0015	0.0661	0.0095	Below LOD	Below LOD	0.472	0.032	0.0435
0.1352	0.0061	0.0846	0.0039	Below LOD	Below LOD	0.0274	0.0013	0.01378
0.19	0.01	0.1014	0.0098	Below LOD	Below LOD	0.0431	0.0028	0.0207
0.268	0.012	0.188	0.011	Below LOD	Below LOD	0.0547	0.0035	0.0341
0.0094	0.0024	0.046	0.019	Below LOD	Below LOD	0.553	0.075	0.0454
0.4238	0.0082	0.3194	0.0058	Below LOD	Below LOD	0.1042	0.0024	0.0697
0.0108	0.0014	0.0683	0.0071	Below LOD	Below LOD	0.586	0.03	0.0602
0.1355	0.0055	0.091	0.0043	Below LOD	Below LOD	0.0299	0.0013	0.01951
0.329	0.013	0.1865	0.0063	Below LOD	Below LOD	0.0562	0.0019	0.051
0.126	0.03	0.068	0.018	Below LOD	Below LOD	0.0224	0.0059	0.0164
0.0321	0.0036	0.068	0.016	Below LOD	Below LOD	0.329	0.03	0.0525
Below LOD	Below LOD	0.00317	0.00088	0.274	0.017	0.019	0.0052	Below LOD
0.00114	0.00021	0.0731	0.0047	Below LOD	Below LOD	0.386	0.011	0.0161
0.0809	0.0032	0.1583	0.0063	Below LOD	Below LOD	0.0197	0.001	0.00537
0.00163	0.00064	0.067	0.012	Below LOD	Below LOD	0.298	0.031	0.0146
0.0766	0.0022	0.1846	0.0061	Below LOD	Below LOD	0.0209	0.00081	0.00578
0.127	0.0048	0.0932	0.0036	Below LOD	Below LOD	0.0333	0.0019	0.01127
0.0769	0.0029	0.1747	0.0079	Below LOD	Below LOD	0.01953	0.00073	0.00423

Ru_ppm_m	NiS Rh_ppm_m	Rh_ppm_m	NiS Pd_ppm_m	Pd_ppm_m	Ag_ppm_m	Ag_ppm_m	Sn_ppm_m	Sn_ppm_m
0.00064	0.00505	0.00027	0.0204	0.0021	Below LOD	Below LOD	0.0033	0.0011
0.00034	0.00408	0.00021	0.02067	0.00077	Below LOD	Below LOD	0.0054	0.0015
0.00031	0.00385	0.00016	0.0202	0.001	Below LOD	Below LOD	0.0038	0.00041
0.00033	0.00366	0.00015	0.02029	0.00092	Below LOD	Below LOD	0.00348	0.00048
0.00062	0.00635	0.00029	0.0717	0.003	0.000108	0.000055	0.00573	0.00041
0.00069	0.00539	0.00025	0.059	0.0025	Below LOD	Below LOD	0.00504	0.00087
0.00038	0.00314	0.00011	0.02072	0.00099	Below LOD	Below LOD	0.0054	0.0012
0.00038	0.00283	0.00014	0.0213	0.00096	Below LOD	Below LOD	0.00383	0.00052
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000827	0.000096	0.0148	0.0092
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.00097	0.0001	1.12	0.45
0.00068	0.0028	0.00015	0.0509	0.0016	Below LOD	Below LOD	0.0076	0.0029
0.0006	0.00249	0.00011	0.051	0.002	Below LOD	Below LOD	0.0043	0.0019
0.00077	0.00186	0.00018	0.042	0.0029	Below LOD	Below LOD	0.043	0.029
0.0013	0.00355	0.00036	0.0249	0.0029	Below LOD	Below LOD	0.027	0.013
0.0003	0.001519	0.000062	0.0198	0.00085	Below LOD	Below LOD	0.043	0.028
Below LOD	1.53E-05	4.8E-06	0.000052	0.000029	0.00062	0.000086	0.0016	0.0014
Below LOD	Below LOD	Below LOD	0.000028	0.000017	0.000636	0.000061	0.0019	0.0017
0.00003	3.77E-05	6.9E-06	0.0163	0.0015	0.00071	0.000089	0.00059	0.00012
0.001	0.00162	0.00041	0.0097	0.0014	0.00066	0.00017	0.00131	0.0003
0.00025	0.001567	0.000069	0.01833	0.00081	Below LOD	Below LOD	0.00308	0.00033
0.00031	0.00445	0.00022	0.0193	0.00072	Below LOD	Below LOD	0.026	0.019
0.00033	0.00674	0.00031	0.01989	0.00096	Below LOD	Below LOD	0.0068	0.0011
0.0003	0.00897	0.00038	0.0212	0.001	Below LOD	Below LOD	0.0101	0.0048
0.0019	0.0189	0.0024	0.124	0.012	Below LOD	Below LOD	0.0291	0.0095
0.0021	0.0191	0.002	0.116	0.017	0.00098	0.00054	0.037	0.022
0.00029	0.0135	0.00059	0.01946	0.00076	Below LOD	Below LOD	0.0147	0.0098
0.00086	0.0225	0.0011	0.0939	0.0026	Below LOD	Below LOD	0.0147	0.0067
0.00067	0.02036	0.00079	0.0826	0.003	Below LOD	Below LOD	0.0118	0.0049
0.00046	0.0193	0.0018	0.0338	0.0029	0.00125	0.00033	0.0152	0.007
0.00018	0.01053	0.00048	0.01864	0.00079	Below LOD	Below LOD	0.0065	0.0014
0.0021	0.0106	0.0028	0.097	0.017	Below LOD	Below LOD	0.0057	0.0022
0.00039	0.01031	0.00052	0.0402	0.0014	Below LOD	Below LOD	0.018	0.0055
0.00039	0.00906	0.00044	0.0415	0.0018	Below LOD	Below LOD	0.0106	0.0043
0.00039	0.00776	0.00034	0.0384	0.0016	Below LOD	Below LOD	0.0112	0.0038
0.00047	0.0067	0.00032	0.0402	0.0018	Below LOD	Below LOD	0.013	0.0041
0.00037	0.00582	0.00024	0.0373	0.0014	Below LOD	Below LOD	0.0151	0.009
0.0005	0.0042	0.00031	0.0152	0.0018	Below LOD	Below LOD	0.00194	0.00036
0.0037	0.005	0.0012	0.095	0.014	Below LOD	Below LOD	0.0116	0.006

0.00044	0.0045	0.00026	0.0379	0.0017	Below LOD	Below LOD	0.0125	0.0061
0.00046	0.00444	0.00016	0.0384	0.0018	Below LOD	Below LOD	0.0056	0.0013
0.00033	0.00445	0.00023	0.01855	0.00093	Below LOD	Below LOD	0.0082	0.0083
0.00044	0.00616	0.00023	0.01867	0.00084	Below LOD	Below LOD	0.00323	0.00038
0.00048	0.00792	0.00035	0.0198	0.0011	Below LOD	Below LOD	0.0035	0.0018
0.00046	0.01283	0.0006	0.01932	0.00081	Below LOD	Below LOD	0.00246	0.00019
0.00042	0.02519	0.00095	0.02017	0.00095	Below LOD	Below LOD	0.00245	0.00025
0.00054	0.08	0.2	0.01951	0.00083	Below LOD	Below LOD	0.00247	0.00027
0.00062	Below LOD	Below LOD	0.0196	0.0011	Below LOD	Below LOD	0.00269	0.00027
0.0006	Below LOD	Below LOD	0.01956	0.00085	Below LOD	Below LOD	0.00262	0.0002
0.00058	Below LOD	Below LOD	0.02	0.001	Below LOD	Below LOD	0.00252	0.00023
0.00076	Below LOD	Below LOD	0.01964	0.00076	Below LOD	Below LOD	0.00365	0.00053
0.00069	Below LOD	Below LOD	0.02006	0.00095	Below LOD	Below LOD	0.00224	0.00022
0.00092	Below LOD	Below LOD	0.01924	0.00071	Below LOD	Below LOD	0.00267	0.00021
0.013	Below LOD	Below LOD	0.091	0.018	Below LOD	Below LOD	0.0112	0.0038
0.0024	Below LOD	Below LOD	0.0742	0.0028	Below LOD	Below LOD	0.00508	0.00035
0.0017	Below LOD	Below LOD	0.0565	0.0023	Below LOD	Below LOD	0.00239	0.00027
0.0042	Below LOD	Below LOD	0.1061	0.0075	Below LOD	Below LOD	0.011	0.0013
0.001	Below LOD	Below LOD	0.02	0.001	Below LOD	Below LOD	0.00227	0.00018
0.00072	Below LOD	Below LOD	0.0086	0.00043	Below LOD	Below LOD	0.00206	0.00021
0.0019	Below LOD	Below LOD	0.0197	0.0022	Below LOD	Below LOD	0.00274	0.00062
0.0063	Below LOD	Below LOD	0.112	0.012	Below LOD	Below LOD	0.0025	0.0011
0.00024	0.001802	0.000072	0.01987	0.00092	Below LOD	Below LOD	0.00371	0.00036
0.00027	0.001648	0.00009	0.0468	0.0021	Below LOD	Below LOD	0.00316	0.00055
0.00021	0.001518	0.000071	0.0462	0.0022	Below LOD	Below LOD	0.00358	0.00085
0.0002	0.001077	0.000062	0.01963	0.00077	Below LOD	Below LOD	0.0057	0.0015
0.00016	0.000939	0.000036	0.01881	0.00057	Below LOD	Below LOD	0.005	0.001
0.00042	0.001274	0.000073	0.0683	0.0021	Below LOD	Below LOD	0.0063	0.0075
0.00035	0.001276	0.000066	0.0628	0.0021	Below LOD	Below LOD	0.0028	0.002
0.0004	0.001231	0.000051	0.066	0.0026	Below LOD	Below LOD	0.00189	0.00058
0.000016	1.71E-05	5.4E-06	0.000445	0.000097	0.000317	0.000074	0.0071	0.005
Below LOD	Below LOD	Below LOD	0.000097	0.000042	0.000395	0.000088	0.0087	0.0031
0.00037	0.00108	0.00007	0.0633	0.0024	Below LOD	Below LOD	0.04	0.033
0.0004	0.001139	0.000058	0.0629	0.0028	Below LOD	Below LOD	0.017	0.013
0.00016	0.000794	0.000043	0.0188	0.0009	Below LOD	Below LOD	0.0044	0.00066
0.00024	0.000963	0.000041	0.0451	0.0016	Below LOD	Below LOD	0.01	0.0058
0.00032	0.00073	0.00006	0.0133	0.0012	Below LOD	Below LOD	0.00304	0.00055
0.0014	0.00103	0.00025	0.095	0.017	Below LOD	Below LOD	0.0162	0.0045

Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000199	0.000062	0.0038	0.0025
0.0004	0.001306	0.000081	0.0785	0.0027	Below LOD	Below LOD	0.00093	0.00034
0.00014	0.000826	0.00006	0.01593	0.00081	Below LOD	Below LOD	0.031	0.018
0.00018	0.000944	0.000055	0.0201	0.001	Below LOD	Below LOD	0.0071	0.001
0.00054	0.00212	0.00024	0.0126	0.0012	Below LOD	Below LOD	0.08	0.046
0.00084	0.00611	0.00033	0.0602	0.0022	Below LOD	Below LOD	0.042	0.034
0.0009	0.00635	0.00054	0.0482	0.0022	0.0003	0.00013	0.0089	0.0043
0.0003	0.00756	0.00033	0.01789	0.00093	Below LOD	Below LOD	0.0042	0.0011
Below LOD	0.000039	0.000047	Below LOD	Below LOD	0.000221	0.000074	0.00148	0.00039
0.00098	0.0315	0.002	0.0648	0.0023	Below LOD	Below LOD	0.0123	0.0059
0.00031	0.0469	0.003	0.01456	0.0007	Below LOD	Below LOD	0.0194	0.007
0.00061	0.223	0.027	0.0123	0.0012	Below LOD	Below LOD	0.203	0.097
0.00033	Below LOD	Below LOD	0.01894	0.00077	Below LOD	Below LOD	0.0109	0.0024
0.00097	Below LOD	Below LOD	0.02093	0.00076	Below LOD	Below LOD	0.0102	0.0048
0.0015	Below LOD	Below LOD	0.0508	0.002	Below LOD	Below LOD	0.035	0.015
0.0049	Below LOD	Below LOD	0.1307	0.0061	Below LOD	Below LOD	0.091	0.062
0.00079	0.189	0.0096	0.02144	0.00082	Below LOD	Below LOD	0.059	0.038
0.0012	0.0794	0.0049	0.0208	0.0011	Below LOD	Below LOD	0.039	0.026
0.0009	0.0458	0.0019	0.02056	0.00077	Below LOD	Below LOD	0.256	0.085
0.0023	0.049	0.0026	0.1149	0.0045	Below LOD	Below LOD	0.78	0.39
0.00068	0.0237	0.001	0.02221	0.00083	Below LOD	Below LOD	0.101	0.046
0.0043	0.0229	0.0021	0.1125	0.0084	Below LOD	Below LOD	0.043	0.013

0.00088	0.01289	0.00056	0.0204	0.001	Below LOD	Below LOD	0.077	0.044
0.0022	0.0206	0.0015	0.0211	0.0017	Below LOD	Below LOD	0.228	0.099
0.0022	0.01242	0.00088	0.0373	0.003	Below LOD	Below LOD	0.147	0.091
0.0073	0.0081	0.0016	0.133	0.019	0.0027	0.0013	0.09	0.1
0.0017	0.02008	0.00059	0.0755	0.0022	0.000073	0.000031	0.168	0.05
0.0039	0.00791	0.00053	0.1308	0.0062	Below LOD	Below LOD	0.67	0.18
0.00094	0.00491	0.00021	0.0221	0.001	Below LOD	Below LOD	0.0031	0.0005
0.0013	0.01297	0.00031	0.0476	0.0018	Below LOD	Below LOD	0.0129	0.0077
0.0038	0.00413	0.00087	0.0194	0.0051	Below LOD	Below LOD	0.0034	0.0021
0.0063	0.0057	0.00062	0.0766	0.008	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.00163	0.00049
0.0011	0.00454	0.00025	0.0802	0.003	Below LOD	Below LOD	0.0052	0.0034
0.00042	0.00286	0.00017	0.0195	0.001	Below LOD	Below LOD	0.00436	0.00064
0.0038	0.00352	0.00076	0.082	0.011	Below LOD	Below LOD	0.005	0.0022
0.00047	0.00308	0.00015	0.0193	0.001	0.000113	0.000059	0.0095	0.0045
0.00063	0.00512	0.0003	0.0673	0.003	Below LOD	Below LOD	0.0069	0.0027
0.00039	0.00254	0.00017	0.0182	0.001	Below LOD	Below LOD	0.00428	0.00077

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0.000037 Below LOD Below LOD0.0001240.000044 0.000047 0.000019 0.000031 0.000016

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Below LOD Below LOD Below LOD Below LOD Below LOD 0.000022 0.000024 Below LOD Below LOD
Below LOD Below LOD Below LOD Below LOD Below LOD 0 1 Below LOD Below LOD
0.000022 Below LOD Below LOD Below LOD Below LOD 0.000006 0.000011 Below LOD Below LOD
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Below LOD Below LOD Below LOD2.08E-08 7.70E-10 Below LOD Below LOD
Below LOD Below LOD

				NiS		MASS
Yb_ppm_m	Yb_ppm_m	W_ppm_m	W_ppm_m182_Int2SE	Os_ppm_m	Os_ppm_m	Ir_ppm_m1
Below LOD	Below LOD	0.00099	0.0003	0.00061	0.00024	0.000252
Below LOD	Below LOD	0.00091	0.00011	0.00066	0.00014	0.000262
Below LOD	Below LOD	0.000818	0.000094	0.000485	0.000095	0.000264
Below LOD	Below LOD	0.000806	0.000099	0.00057	0.00013	0.000283
Below LOD	Below LOD	0.000933	0.000083	0.00065	0.0001	0.000308
Below LOD	Below LOD	0.00087	0.00012	0.00061	0.00013	0.000293
Below LOD	Below LOD	0.00074	0.0001	0.000505	0.000097	0.000244
Below LOD	Below LOD	0.00083	0.0001	0.00058	0.00011	0.000249
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.0011	0.00018	Below LOD	Below LOD	1.2E-06
Below LOD	Below LOD	0.00098	0.00015	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.0011	0.00028	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00111	0.00037	Below LOD	Below LOD	0.000174
Below LOD	Below LOD	0.00096	0.00014	0.00052	0.0001	0.00026
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.000038	0.000015	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00101	0.00028	0.00057	0.00018	0.000308
Below LOD	Below LOD	0.00101	0.00012	0.00046	0.000094	0.000289
Below LOD	Below LOD	0.00105	0.00012	0.000232	0.000057	0.00031
Below LOD	Below LOD	0.00097	0.00014	0.000219	0.000053	0.000283
Below LOD	Below LOD	0.00102	0.00009	0.000197	0.000063	0.000279
Below LOD	Below LOD	0.00072	0.00031	Below LOD	Below LOD	0.000122
Below LOD	Below LOD	0.00083	0.00032	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.001	0.00011	0.000211	0.000048	0.000336
Below LOD	Below LOD	0.00136	0.00022	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00098	0.0002	Below LOD	Below LOD	0.000022
Below LOD	Below LOD	0.00047	0.00017	0.000101	0.000072	0.000165
Below LOD	Below LOD	0.00097	0.00011	0.000235	0.000054	0.000323
Below LOD	Below LOD	0.00089	0.00066	0.00041	0.00035	0.000083
Below LOD	Below LOD	0.00094	0.00014	0.000188	0.000061	0.00028
Below LOD	Below LOD	0.00112	0.00012	0.000236	0.000064	0.000312
Below LOD	Below LOD	0.0009	0.00014	0.000169	0.000056	0.000297
Below LOD	Below LOD	0.00106	0.00011	0.000202	0.000058	0.000264
Below LOD	Below LOD	0.00087	0.00013	0.000181	0.000047	0.000331
Below LOD	Below LOD	0.00095	0.00018	0.000145	0.00006	0.000219
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000033
Below LOD	Below LOD	0.0009	0.00013	0.000254	0.000065	0.000296

Below LOD	Below LOD	0.00081	0.00013	0.000243	0.00007	0.000274
Below LOD	Below LOD	0.00083	0.00012	0.00005	0.000035	0.000044
Below LOD	Below LOD	0.00073	0.00012	Below LOD	Below LOD	0.00007
Below LOD	Below LOD	0.00078	0.00012	Below LOD	Below LOD	0.000049
Below LOD	Below LOD	0.00075	0.00011	Below LOD	Below LOD	0.000068
Below LOD	Below LOD	0.00075	0.00012	0.000079	0.000056	0.00006
Below LOD	Below LOD	0.00072	0.00013	0.000153	0.000081	0.000049
Below LOD	Below LOD	0.00067	0.00011	Below LOD	Below LOD	0.000054
Below LOD	Below LOD	0.00084	0.0001	0.000168	0.00009	0.000071
Below LOD	Below LOD	0.00085	0.00011	Below LOD	Below LOD	0.000038
Below LOD	Below LOD	0.00075	0.00012	Below LOD	Below LOD	0.000044
Below LOD	Below LOD	0.0007	0.0001	0.00022	0.00012	0.000052
Below LOD	Below LOD	0.00074	0.00012	0.00015	0.00011	0.000063
Below LOD	Below LOD	0.00078	0.00045	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00086	0.00011	Below LOD	Below LOD	0.000071
Below LOD	Below LOD	0.00074	0.00011	Below LOD	Below LOD	0.00007
Below LOD	Below LOD	0.0011	0.00025	Below LOD	Below LOD	0.000105
Below LOD	Below LOD	0.00079	0.00011	0.00015	0.00012	0.000048
Below LOD	Below LOD	0.000581	0.000077	0.000091	0.000088	0.000033
Below LOD	Below LOD	0.00058	0.00024	Below LOD	Below LOD	0.000079
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00072	0.00012	0.000289	0.000078	0.000219
Below LOD	Below LOD	0.00059	0.00011	0.000268	0.000076	0.000238
Below LOD	Below LOD	0.000579	0.000086	0.000251	0.00007	0.000231
Below LOD	Below LOD	0.000552	0.000088	0.00037	0.000074	0.000264
Below LOD	Below LOD	0.00071	0.0001	0.000269	0.000061	0.000233
Below LOD	Below LOD	0.00083	0.00018	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00082	0.00014	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00087	0.00019	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.000084	0.000029	Below LOD	Below LOD	Below LOD

Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00088	0.00018	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00087	0.0002	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00068	0.0001	0.000224	0.000053	0.000268
Below LOD	Below LOD	0.00065	0.00011	0.0003	0.000057	0.000232
Below LOD	Below LOD	0.00051	0.00014	0.000142	0.00006	0.0002
Below LOD	Below LOD	0.00036	0.00031	Below LOD	Below LOD	0.00028
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00069	0.00015	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.000577	0.000097	0.000346	0.000077	0.000265
Below LOD	Below LOD	0.00079	0.00011	0.000362	0.000075	0.000304
Below LOD	Below LOD	0.00055	0.0002	0.00051	0.00024	0.000219
Below LOD	Below LOD	0.00067	0.00014	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00102	0.0002	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00069	0.0001	0.00061	0.00012	0.000288
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.0007	0.00013	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00079	0.00012	0.00053	0.00013	0.000266
Below LOD	Below LOD	0.00079	0.00017	0.00079	0.00028	0.000205
Below LOD	Below LOD	0.00074	0.0001	0.00047	0.00011	0.000214
Below LOD	Below LOD	0.00227	0.00017	0.00502	0.00041	0.00304
Below LOD	Below LOD	0.00226	0.00021	0.00522	0.00054	0.00322
Below LOD	Below LOD	0.00197	0.0004	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00237	0.00024	0.00481	0.00035	0.00339
Below LOD	Below LOD	0.00227	0.00026	0.00503	0.00058	0.00339
Below LOD	Below LOD	0.00231	0.00025	0.00494	0.00044	0.00329
Below LOD	Below LOD	0.00257	0.00029	0.00104	0.00033	0.0006
Below LOD	Below LOD	0.00239	0.00023	0.00462	0.00041	0.00359
Below LOD	Below LOD	0.00259	0.00061	0.00023	0.0002	0.000094
Below LOD	Below LOD	0.00231	0.00026	0.00411	0.00028	0.00316
Below LOD	Below LOD	0.00457	0.00065	0.0085	0.00091	0.0057

Below LOD	Below LOD	0.0058	0.001	0.0133	0.0014	0.00718
Below LOD	Below LOD	0.0022	0.001	Below LOD	Below LOD	0.000073
Below LOD	Below LOD	0.00791	0.00036	0.0206	0.00072	0.01274
Below LOD	Below LOD	0.0025	0.0005	0.00048	0.00028	0.000279
Below LOD	Below LOD	0.0023	0.00021	0.00459	0.00034	0.00287
Below LOD	Below LOD	0.00372	0.00028	0.01391	0.00074	0.00757
Below LOD	Below LOD	0.00125	0.00066	0.0026	0.0014	0.00223
Below LOD	Below LOD	0.00262	0.00067	Below LOD	Below LOD	0.00058
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00082	0.0002	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00074	0.00011	0.00064	0.00012	0.000289
Below LOD	Below LOD	0.00062	0.00035	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	0.00069	0.0001	0.00052	0.00014	0.000211
Below LOD	Below LOD	0.00082	0.00013	0.00046	0.00012	0.000225
Below LOD	Below LOD	0.00066	0.00011	0.00039	0.00013	0.000191

Ir_ppm_m1	Pt_ppm_m	Pt_ppm_m	Au_ppm_m	Au_ppm_m	Pb_ppm_m	Pb_ppm_m208_Int2SE
0.000047	0.0084	0.0012	0.00991	0.00074	Below LOD	Below LOD
0.000033	0.00852	0.00051	0.01039	0.00047	Below LOD	Below LOD
0.000031	0.00746	0.00051	0.01013	0.00044	Below LOD	Below LOD
0.000036	0.00786	0.00044	0.00998	0.0004	Below LOD	Below LOD
0.000032	0.01077	0.00072	0.02493	0.00099	0.000042	0.000024
0.000031	0.0096	0.00074	0.01988	0.0008	Below LOD	Below LOD
0.000027	0.00783	0.00043	0.01025	0.00046	Below LOD	Below LOD
0.000029	0.00786	0.00047	0.01048	0.00048	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000067	0.000027
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.00044	0.00017
2.4E-06	Below LOD	Below LOD	Below LOD	Below LOD	0.000093	0.000048
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
0.000083	0.014	0.004	0.0135	0.0016	Below LOD	Below LOD
0.000025	0.00677	0.00046	0.00973	0.00053	0.000154	0.000055
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	0.000805	0.00008	Below LOD	Below LOD
0.000096	0.007	0.0022	0.0065	0.0017	Below LOD	Below LOD
0.000027	0.00777	0.0005	0.01044	0.00047	Below LOD	Below LOD
0.000036	0.01134	0.00057	0.01051	0.0004	Below LOD	Below LOD
0.000031	0.01056	0.00061	0.01069	0.00041	Below LOD	Below LOD
0.000032	0.01133	0.00068	0.011	0.00047	Below LOD	Below LOD
0.00006	0.0046	0.003	0.021	0.0066	Below LOD	Below LOD

Below LOD	Below LOD	Below LOD	0.006	0.0016	Below LOD	Below LOD
0.000035	0.01111	0.00067	0.01023	0.00046	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	0.0005	0.00013	0.000171	0.000067
0.000013	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
0.000048	0.0124	0.0017	0.0154	0.0014	0.0007	0.00015
0.000037	0.01131	0.00054	0.00991	0.00042	Below LOD	Below LOD
0.000072	Below LOD	Below LOD	0.0028	0.0012	Below LOD	Below LOD
0.000034	0.01148	0.00061	0.01501	0.00072	Below LOD	Below LOD
0.000036	0.01201	0.00066	0.01541	0.00079	Below LOD	Below LOD
0.000026	0.012	0.00062	0.01449	0.00054	Below LOD	Below LOD
0.000032	0.01174	0.00076	0.01471	0.00071	Below LOD	Below LOD
0.00004	0.01133	0.00065	0.01417	0.00069	0.000044	0.000021
0.00005	0.0097	0.00095	0.00795	0.00085	Below LOD	Below LOD
0.000066	Below LOD	Below LOD	0.0021	0.0014	Below LOD	Below LOD
0.00003	0.01108	0.00072	0.01339	0.0007	Below LOD	Below LOD
0.000036	0.01109	0.00067	0.0144	0.00091	Below LOD	Below LOD
0.000013	0.00555	0.00052	0.00785	0.00037	Below LOD	Below LOD
0.000014	0.00524	0.00039	0.00784	0.00038	Below LOD	Below LOD
0.000013	0.0058	0.00045	0.00825	0.00035	Below LOD	Below LOD
0.000015	0.00585	0.00038	0.00862	0.00041	Below LOD	Below LOD
0.00002	0.00591	0.0004	0.00856	0.0004	Below LOD	Below LOD
0.000012	0.0059	0.00042	0.00852	0.00035	Below LOD	Below LOD

0.000012	0.00609	0.00042	0.00818	0.00042	Below LOD	Below LOD
0.000017	0.00615	0.00055	0.00855	0.00033	Below LOD	Below LOD
0.000011	0.00575	0.0005	0.00791	0.00043	Below LOD	Below LOD
0.000012	0.00586	0.00045	0.00876	0.00039	Below LOD	Below LOD
0.000014	0.00617	0.0004	0.00838	0.00039	Below LOD	Below LOD
0.000015	0.00584	0.00034	0.00787	0.00036	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	0.0256	0.0091	Below LOD	Below LOD
0.000018	0.01041	0.00062	0.0208	0.00079	Below LOD	Below LOD
0.000015	0.00858	0.00062	0.01419	0.00067	Below LOD	Below LOD
0.000035	0.0095	0.0013	0.0349	0.0027	Below LOD	Below LOD
0.000015	0.00639	0.00047	0.0084	0.00038	Below LOD	Below LOD
0.000011	0.00351	0.00028	0.00963	0.00038	Below LOD	Below LOD
0.00004	0.0053	0.0014	0.00482	0.00084	Below LOD	Below LOD

Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD

0.000025	0.00771	0.00056	0.01087	0.00055	Below LOD	Below LOD
0.000037	0.00799	0.00046	0.01554	0.00072	Below LOD	Below LOD
0.000035	0.00866	0.00049	0.01521	0.00058	Below LOD	Below LOD
0.000033	0.00758	0.00053	0.0108	0.00046	Below LOD	Below LOD
0.000028	0.00727	0.00047	0.01151	0.00046	Below LOD	Below LOD

Below LOD Below LOD Below LOD 0.000088 0.000056 Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD Below LOD 0.000094 0.000045

Below LOD Below LOD Below LOD 0.000168 0.000068 Below LOD Below LOD

Below LOD	Below LOD	Below LOD	0.000065	0.000034	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000091	0.000033
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000138	0.000086
Below LOD	Below LOD	Below LOD	0.000133	0.00006	Below LOD	Below LOD
0.000035	0.00759	0.00066	0.01108	0.00059	Below LOD	Below LOD
0.000036	0.00795	0.0006	0.01545	0.0007	Below LOD	Below LOD
0.000043	0.00612	0.00092	0.00761	0.00061	Below LOD	Below LOD
0.00018	0.0102	0.004	0.043	0.012	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000044	0.000021
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
0.000043	0.00688	0.00054	0.01086	0.00055	Below LOD	Below LOD
0.000029	0.00731	0.00047	0.01097	0.00059	Below LOD	Below LOD
0.000061	0.00525	0.00092	0.0101	0.00099	0.000186	0.000076
Below LOD	Below LOD	Below LOD	0.00036	0.0001	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	0.000256	0.000076	0.0142	0.0015
0.000035	0.00789	0.00042	0.0106	0.00044	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
0.000029	0.00833	0.00051	0.01079	0.00048	0.000059	0.00003
0.000054	0.0059	0.00085	0.00954	0.0009	0.000202	0.000087
0.000025	0.00702	0.00051	0.01124	0.00054	0.000056	0.000021
0.00018	0.02857	0.00086	0.00725	0.00035	Below LOD	Below LOD
0.00018	0.0398	0.0016	0.01139	0.00063	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
0.00016	0.0328	0.0013	0.00794	0.00038	Below LOD	Below LOD
0.00025	0.0309	0.0019	0.00789	0.0004	0.00006	0.000035
0.00016	0.0289	0.0012	0.00725	0.00036	0.000087	0.000027
0.00012	0.0061	0.0011	0.00116	0.00019	0.000203	0.000081
0.00014	0.0293	0.001	0.00773	0.0004	0.00005	0.000027
0.000052	Below LOD	Below LOD	0.00061	0.00027	0.00027	0.00017
0.00014	0.0265	0.0012	0.00722	0.00041	0.000065	0.000028
0.00044	0.0324	0.0025	0.00759	0.00086	0.0007	0.00015

0.00045	0.0582	0.003	0.01271	0.00088	0.00056	0.00019
0.00008	Below LOD	Below LOD	0.00128	0.00061	Below LOD	Below LOD
0.0004	0.0877	0.0018	0.02373	0.0006	0.000683	0.000089
0.000086	0.0036	0.0015	0.00143	0.00032	0.00059	0.00018
0.00012	0.0273	0.0011	0.00715	0.00034	Below LOD	Below LOD
0.00018	0.0646	0.0017	0.01387	0.00065	0.000073	0.000026
0.00058	0.0249	0.007	0.008	0.0024	Below LOD	Below LOD
0.00021	Below LOD	Below LOD	0.00064	0.00034	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	0.000045	0.000015
Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD	Below LOD
0.000038	0.00812	0.00055	0.01136	0.00048	Below LOD	Below LOD
Below LOD	Below LOD	Below LOD	0.00082	0.00036	0.00035	0.00022
0.000027	0.00647	0.00047	0.00933	0.00054	0.000036	0.000016
0.000032	0.00889	0.00063	0.0207	0.0011	Below LOD	Below LOD
0.000023	0.00605	0.00041	0.00974	0.00038	0.000051	0.000024

CORRECTED VALUES

GSD Fe ppm Fe57_CPS Fe57_CPS_

Si_ppm_m2Si_ppm_m2P_ppm_m3P_ppm_m3

100-Gloriet	MOSTLY Fe	995873	1.44E+08	69711111294.635	199.1746	284.8197	55.76889
101-Gloriet	FeNi SULPH	999510.5	1.36E+09	51974547 66.7673	3.598238	9.45537	0.519745
102-Gloriet	MIXTURE	994787.7	4.26E+08	37801934127332.8	19895.75	972.9024	49.73939
103-Gloriet	MOSTLY Fe	994413	1.75E+09	417653451246.994	61.6536	81.93963	2.187709
105-Admire	MIXTURE	996472.3	24114629	7174600 109612	19929.45	896.8251	199.2945
106-Admire	MOSTLY Fe	977938.3	2.35E+08	3911753324057.28	7041.156	1261.54	88.01445
107-Admire	FeNi SULPH	998567.3	1.37E+09	67902576 177.745	61.91117	96.4616	3.994269
10-NWA	MIXTURE	997846.8	3.03E+08	8581482997788.99	19956.94	50.09191	4.989234
114-Admire	MOSTLY Fe	982736.5	1.96E+08	5110229694146.15	18868.54	1269.696	68.79155
115-Admire	MIXTURE	963120.9	1.27E+08	2889362857787.26	19262.42	583.6513	59.7135
116-Admire	MOSTLY Fe	991478.2	1.05E+09	436250416.285972	1.82432	130.8751	6.345461
117-Admire	MOSTLY Fe	996087.6	7.03E+08	2789045378.89014	4.980438	810.8153	39.8435
118-Admire	MOSTLY Fe	997604.3	1.44E+08	758179379.01026	9.976043	700.3182	47.88501
119-Admire	MOSTLY Fe	998883.3	1.46E+09	6193076527.04976	1.53828	250.5199	9.189726
11-NWA	MOSTLY Fe	997202.6	44275798	1296363469205.86	17351.33	45.87132	19.94405

120-AdmireFeNi SULPH 1.2E+09 39954765 7.052016 1.338485 14.18394 2.59706
998869.1
121-AdmireNi PHOSPH 911947.93.26E+08 16232673 0 0 22215.05 1659.745
122-AdmireMOSTLY Fe 979794.51.71E+09 1.35E+0814.34419 1.234541 2743.425 391.9178
123-AdmireFeNi SULPH 1.44E+09 47828143 20.14761 1.355131 79.11572 3.985679
996419.6
124-AdmireMOSTLY Fe 984747.21.75E+09 43328879 37.36131 1.693765 430.9254 18.11935
125-AdmireMOSTLY Fe 991419.31.02E+09 35691096 4.560529 1.269017 62.06285 2.379406
127-Albin MOSTLY Fe 995131.6 2.31E+08 19504579 792.1247 185.0945 100.3093 4.577605
12-NWA MOSTLY Fe 989663.4 1.19E+09 16626345 354.2995 63.33846 197.3389 6.531778
130-Albin MOSTLY Fe 9918649.46E+08 39674560 9.402871 1.626657 164.0543 7.934912
131-Albin MOSTLY Fe 991737.8 1.05E+09 31735611 6.466131 1.507442 155.7028 7.735555
133-Albin FeNi SULPH 997441.4 1.11E+09 27928359 14.96162 3.191812 45.78256 1.69565
134-Albin FeNi SULPH 9924101.16E+09 85347264 10.30122 1.468767 154.6175 11.51196
135-Albin MOSTLY Fe 992204.9 1.1E+09 43657017 4.703051 1.389087 86.71871 3.175056
136-Albin CHROMITE 573901.11.32E+08 229560436.72967 3.443407 8.034616 1.262582
137-Albin FeNi SULPH 994526.4 1.39E+09 1.03E+0818.49819 6.563874 75.58401 7.359495
13-NWA MOSTLY Fe 9854021.86E+09 29562061 216.0001 10.64234 244.9709 10.44526
144-Albin Ni PHOSPH 905483.5 4.06E+08 16117606 8.330448 2.71645 21731.6 2897.547
145-Albin MOSTLY Fe 990052.2 9.96E+08 35641880 4.039413 1.148461 75.838 7.920418
146-Albin FeNi SULPH 992965.1 1.36E+09 1.19E+08 8.5395 1.072402 139.6109 8.5395
147-Albin MOSTLY Fe 993927.3 1.07E+09 33793528 143.1255 21.8664 1073.441 357.8138
148-Albin Ni PHOSPH 930144.4 4.59E+08 27904331 8.743357 2.604404 23253.61 390.6606
149-Albin MOSTLY Fe 993691.9 9.96E+08 37760292 2.941328 1.271926 114.2746 11.32809
14-NWA MOSTLY Fe 990737.8 1.29E+08 25759183 0 0 168.4254 23.77771
150-Albin MOSTLY Fe 997047.5 1.16E+09 25923234 161.5217 25.92323 143.3754 9.172837
151-Albin Ni PHOSPH 934126.3 4.43E+08 26155535 7.846661 2.428728 23409.2 541.7932
152-Albin Ni PHOSPH 935439.1 5E+08 22450539 5.612635 2.245054 22899.55 636.0986
153-Albin Ni PHOSPH 937087.7 4.67E+08 24364281 8.621207 2.623846 23089.84 712.1867
154-Albin MOSTLY Fe 993267.9 9.71E+08 31784572 4.509436 1.390575 216.3337 19.07074
15-NWA MOSTLY Fe 991856.1 2.94E+08 12497387 934.3285 65.46251 74.98432 10.71205
16-NWA MOSTLY Fe 991782.9 24199503 4165488 2102.58 376.8775 1467.839 456.2201
17-NWA MOSTLY Fe 990716.1 2.07E+09 45572942951.0875 45.57294 157.3257 2.377719
18-NWA MOSTLY Fe 991390.4 1.04E+09 41638396 13.7605 1.863814 97.55281 4.362118
19-NWA MOSTLY Fe 990900.4 2.6E+08 990900489.97376 6.738123 49.94138 3.170881

20-NWA MOSTLY Fe 994092.36.91E+08 16899569 132.0155 6.958646 72.36992 2.187003
21-NWA MOSTLY Fe 990775.81.22E+09 19815516 101.4554 4.557569 73.23815 1.961736
22-NWA MOSTLY Fe 9931963.18E+08 11918352 431.0471 27.80949 39.33056 2.780949
23-NWA MOSTLY Fe 989782.22.56E+08 10689648 653.2563 45.52998 68.29497 4.552998
24-NWA Ni PHOSPH 938626.2 5.5E+08 28158786 7.039696 1.839707 22339.3 581.9482
25-NWA MOSTLY Fe 992453.41.85E+09 57562298 56.37135 11.71095 297.736 29.7736

26-NWA MOSTLY Fe 989655.21.79E+09 1.52E+0818.58573 1.563655 674.9449 35.62759
33-NWA MOSTLY Fe 9931221.19E+09 55614834 4.171113 1.052709 107.2572 3.972488
34-Seymch NiFe metal 973129.27.73E+08 33086393 4.320694 1.557007 15.74523 0.797966
35-Seymch MOSTLY Fe 1.11E+09 35718385 4.524329 1.369205 42.26676 2.18279
992177.4
36-Seymch Ni PHOSPH 3.31E+08 13615924 0 0 19687.89 2759.985
919994.9
37-Seymch Ni PHOSPH 2.77E+08 22951312 12.0053 3.70752 29660.16 865.0879
882742.8
38-Seymch NiFe metal 9745657.82E+08 40931729 6.237216 2.144043 11.94817 0.877108
39-Seymch MOSTLY Fe 1.15E+09 47599377 4.601273 1.090819 75.76234 3.371623
991653.7
40-Seymch Ni PHOSPH 4.52E+08 16754531 8.467344 1.981719 26302.81 792.6875
900781.2
41-Seymch Ni PHOSPH 3.81E+08 26933676 7.900545 2.693368 27077.32 825.9661
897789.2
42-Seymch FeNi SULPH 1.24E+09 41966563 8.193472 1.338933 1.498806 0.459634
999203.9
43-Seymch FeNi SULPH 1.2E+09 29982423 9.314539 1.059379 2.498535 0.319813
999414.1
44-Seymch MOSTLY Fe 7.56E+08 25783693 8.13178 1.983361 58.50915 2.380033
991680.5
45-Seymch Ni PHOSPH 4.48E+08 17846552 98.15603 37.47776 25645.49 1534.803
892327.6
46-Seymch MOSTLY Fe 1.11E+09 45619278 4.720604 1.309075 87.66835 7.338753
991723.4
47-Seymch MOSTLY Fe 3.06E+08 29812390 89.43717 35.77487 35.37737 4.571233
993746.3
48-Seymch Ni PHOSPH 2.09E+08 9371578 15.5057 6.304516 33959.19 1073.472
851961.6
49-Seymch MOSTLY Fe 1.06E+09 37683132 0 0 87.06787 8.528288
991661.4
50-Seymch MIXTURE
51-Seymch MOSTLY Fe 992133.4 51590939 0 0 128.9773 27.77974
13096161
52-Seymch Ni PHOSPH 907116.1 4.28E+08 217707858.164044 2.902771 26941.35 653.1236
61-Seymch MOSTLY Fe 991352.5 1.07E+09 495676254.659357 1.487029 168.5299 12.49104
62-Seymch Ni PHOSPH 888014.7 3.75E+08 213123538.880147 3.01925 28949.28 639.3706
63-Seymch MOSTLY Fe 992376.8 1.05E+09 476340843.532861 1.171005 74.42826 15.48108
64-Seymch MOSTLY Fe 991611.5 1.05E+09 515638003.708627 1.289095 55.92689 2.57819
65-Seymch MOSTLY Fe 991580.5 1.15E+09 495790253.311879 1.249391 50.57061 2.578109
66-Seymch Ni PHOSPH 863293.1 2.32E+08 124314209.150907 6.388369 32010.91 1208.61

67-Seymch MOSTLY Fe	982092.2	8.43E+08	373195035.165805		1.296362	34.96248	3.339113
68-Seymch MOSTLY Fe	991337.6	1.01E+09	436188543.311068		1.348219	122.3311	4.361885
69-Seymch FeNi SULPH	999601.4	1.27E+09	45981663839.6651		399.8405	1.999203	0.419833
70-Seymch FeNi SULPH	999611.8	1.12E+09	899650585477.872		1899.262	5.397903	1.239519
71-Seymch FeNi SULPH	995428.6	9.78E+08	9755200410750.63		2787.2	24.46764	1.473234
72-GlorietaNiFe metal979798.4		7.96E+08	333131476.094346		1.489294	30.56971	3.527274
73-GlorietaMOSTLY Fe	992153.3	9.41E+08	377018264.365475		1.289799	41.69028	1.885091
74-GlorietaMOSTLY Fe	991599	1E+09	456135564.462196		1.447735	50.76987	2.181518
75-GlorietaNiFe metal	979675	9.46E+08	391870004.388944		1.312764	29.97805	1.95935
76-GlorietaNiFe metal973516.2		9.52E+08	350465825.685334		1.304512	20.98901	0.895635
77-GlorietaNiFe metal976083.9		9.59E+08	370911884.411899		1.210344	24.81205	1.171301
78-GlorietaMOSTLY Fe	991571.9	9.92E+08	515617414.779377		1.229549	52.355	2.181458
79-GlorietaNi PHOSPH	864002.4	1.2E+08	14342440	0	0	31743.45	1347.844
7-NWA MOSTLY Fe	991990.7	1.48E+09	2380777835.71167		5.555148	122.8085	8.927917
80-GlorietaNiFe metal	953281.4	49189322	14680534	0	0	70.54283	32.41157
87-GlorietaMOSTLY Fe	992028.9	1.01E+09	456333303.908594		1.071391	53.76797	3.174492
88-GlorietaNi PHOSPH	896872.6	3.91E+08	197311978.251228		2.690618	27659.55	573.9984
89-GlorietaMOSTLY Fe	991770.51.05E+09		39670820	4.125765	1.249631	72.79595	2.578603
8-NWA MOSTLY Fe	987963.51.16E+09		1.03E+08	27.0702	6.718152	302.3168	29.6389
90-GlorietaNiFe metal	975277.37.78E+08		44862756	3.647537	1.677477	29.47288	1.833521
91-GlorietaFeNi SULPH	998229.4	1.02E+08	21961048	2475.609	1237.805	33.34086	8.185481
92-GlorietaFeNi SULPH	999741.4	1.21E+09	29992243	6.678273	1.019736	1.19969	0.299922
93-GlorietaFeNi SULPH	999692.5	1.23E+09	47985238	7.437712	1.059674	1.03968	0.239926
94-GlorietaFeNi SULPH	999591.9	1.39E+09	39983675	6.157486	1.159527	0.939616	0.239902
95-GlorietaMOSTLY Fe	991499.51.05E+09		43625978	4.005658	1.169969	51.75627	1.982999
96-GlorietaFeNi SULPH	998328.6	1.38E+09	29949859	26.15621	2.196323	84.85793	8.585626
97-GlorietaMOSTLY Fe	9920611.04E+09		39682441	2.996024	1.230156	30.93246	1.587298
98-GlorietaMOSTLY Fe	9914525.15E+08		16656394	608.7515	25.77775	234.3793	12.294
99-GlorietaMOSTLY Fe	992195.32.04E+09		31750249	961.8341	18.85171	128.3901	4.960976
9-NWA MOSTLY Fe	982744.11.33E+08		14544613	182.7904	39.30976	338.064	35.37879

S_ppm_m3S_ppm_m3Ti_ppm_m4Ti_ppm_m4V_ppm_m5V_ppm_m5Cr_ppm_mCr_ppm_mMn_ppm_m

332.6216 49.79365 0.185232 0.077678 0.169298 0.039835 2.051498 0.617441 13.64346
41359.75 699.6574 0.145729 0.015392 6.686725 0.099951 152.7252 2.198923
49.97553 1153.954 198.9575 529.2271 71.62472 20.69159 1.094267 13.38984
0.915205 68.4414 378.6725 11.13743 1.014301 0.377877 0.056085 0.013723
0.131263 0.043754 0.877072
737.3895 378.6595 3.108994 1.016402 5.321162 0.637742 41.45325 6.776012 1219.682
15451.43 1818.965 0.997497 0.234705 4.322487 0.625881 79.01742 8.997033 299.2491
42219.43 938.6533 0.066105 0.010585 4.829071 0.08388 165.7622 3.794556 32.17384
417.1 65.85789 6.845229 1.536684 7.16454 1.476813 95.39416 19.35823
1097.632 10220.46 2948.209 12.97212 2.751662 6.682608 0.884463 121.0731
11.00665 1100.665
31975.62 4045.108 2.8701 1.367632 5.913563 0.770497 141.3862 13.67632 654.9222
70.39495 6.940347 0 0 0 0 0 0 0.012889
156.585 14.7421 0.125507 0.023906 0.030879 0.002988 0.876557 0.071718 6.853083
243.4155 61.85147 0.093775 0.039904 0.034318 0.00838 1.496406 0.239425 2.094969
767.1424 101.8861 0.021576 0.006792 0.06293 0.009789 1.678124 0.33962 4.714729
418.8251 259.2727 3.250881 1.057035 4.666908 1.156755 59.0344 12.96363 710.0083
42032.41 719.1858 0.049344 0.00919 5.178138 0.07991 176.2005 3.196381 39.35544
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0.00725 0.803431 0.391918 29.78575 14.50096
5.29089 34436.26 677.5654 0.061579 0.010363 4.268662
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10044.42 1969.494 0.140031 0.018907 1.299866 0.256034 42.73803 8.665776 12.99866
394.5849 79.31355 0.008724 0.004759 0.037277 0.007733 1.308674 0.277597 0.283546
833.9203 97.52289 0.041796 0.021893 0.029854 0.009155 0.210968 0.087572
6.746992 376.0721 23.75192 0.031471 0.011678 0.003682 0.000891 0 0 1.561689
72.40607 6.744675 0.012894 0.007141 0.001071 0.000536 0 0 0.029558
67.43817 6.347122 0.012099 0.006149 0.000734 0.000357 0.023802 0.01686
0.014876 20068.52 518.6695 0.041893 0.00798 2.411813 0.053862 70.73854
1.835292 19.6097 24591.92 1587.856 0.216345 0.05756 5.478103 0.853473
391.0096 103.2106 24.01632

392.9132	49.61025	0.022821	0.006945	0.111325	0.014883	9.009221	1.468463	0.488165
585.3791	87.23297	170.6782	2.295604	1213.227	14.92143	121437.5	1606.923	1256.843
33117.73	517.1537	0.116757	0.017504	4.246628	0.145201	144.4052	13.32665	13.52556
723.8763	17.34308	0.007095	0.003153	0.002759	0.000552	0.167518	0.02562	0.129088
659.192	114.0909	0.429199	0.072439	2.100722	0.217316	191.9625	27.1645	2.336147
423.7424	51.48272	0.156428	0.029702	0.898967	0.158408	71.87779	12.47466	1.108859
30166.28	714.9348	0.256185	0.037733	4.686795	0.218452	225.4031	18.07196	11.10135
18228.63	377.6924	0.042938	0.011728	2.262179	0.067587	71.08568	1.848705	15.90284
346.0137	33.4852	0.12836	0.020463	0.015998	0.005581	0.492977	0.117198	0.139522
90.6247	10.3344	0	0	0.005286	0.001113	0.172902	0.075521	0.043126
634.0722	190.2217	0	0	0	0	0	0	0
19821.3	478.5828	0.039284	0.011965	2.464701	0.057829	77.01195	1.974154	17.14922
239.8836	12.70412	0.100886	0.020551	0.000878	0.000617	0	0	0.015133
232.5502	13.65741	0.089802	0.02058	0.001216	0.000842	0	0	0.014593
220.7779	15.74307	0.106828	0.02249	0.001349	0.000618	0.052477	0.026238	0.021178
56.81492	5.959607	0	0	0.000636	0.000318	0.022845	0.0147	0.008145
569.3254	29.75568	1.30925	0.396742	0.097202	0.023805	0.267801	0.055544	0.448319
3391.898	892.6046	10.90961	4.363845	1.05129	0.257864	2.5588	1.229811	8.13262
636.0398	31.70292	0.005548	0.002576	0.020587	0.001724	0.509228	0.053499	0.141078
73.75944	5.948342	0.008526	0.004164	0	0	0.018638	0.011302	0.008129
850.1925	69.36303	0	0	0	0	0	0	0.118512
1031.47	16.89957	0	0	0.001551	0.000696	0	0	0.050301
687.2021	12.08746	0.008323	0.004359	0.01718	0.001665	0.176358	0.027742	0.26097
536.3259	31.78227	0	0	0.005761	0.001986	0	0	2.38367
332.5668	43.55042	0.190038	0.13461	0.031079	0.007126	0.239527	0.075223	8.729879

225.458 14.64257 0.107003 0.018773 0 0 0 0
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Ga_ppm_mGa_ppm_mAs_ppm_mAs_ppm_mSe_ppm_mSe_ppm_mMo_ppm_mMo_ppm_mRu_ppm_m

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0.016277 0.003368 0.652937 0.039288 0.002993 0.006174 6.626651 0.175863
0.254439
0.019491 0.003561 0.684074 0.054351 0 0 6.934449 0.149934 0.193415 1.648825
0.041717 2.751352 0.063569 0 0 0.431476 0.017283 0.070323 1.906348 0.174567
1.924201 0.218208 0 0 0.70025 0.087283 0.092044 1.844716 0.476056 2.638143
1.150468 0 0 1.527346 0.257864 0.103145
4.808936 0.079257 4.874323 0.12483 0.026155 0.00852 1.66044 0.047554 0.259766
2.379337 0.053535 2.333733 0.073363 0 0 0.63449 0.023793 0.109648
1.585441 0.110981 1.62904 0.114944 0 0 0.467705 0.053509
0.081452
3.157237 0.145137 3.479323 0.133208 0.057657 0.02187 0.982163 0.037776
0.16482
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0.104031
0.09932 0.025823 0.184734 0.051646 0.266177 0.065551 0.208571 0.025823
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3.77305 0.170243 4.750955 0.296935 0 0 1.128352 0.096999
0.213793
0.011827 0.00244 0.53314 0.039422 0 0 8.158539 0.172707
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4.188153 0.258038 5.061512 0.357283 0.010123 0.004764 1.296144 0.099245
0.250098
5.898345 0.376069 4.690966 0.296897 0.000752 0.001682 1.017366 0.033648
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2.1948 0.051642 2.141171 0.073491 0 0 0.556148 0.021849 0.109641 8.758163
0.291939 1.981291 0.072012 0.001168 0.004087 0.840784 0.035033 0.506027
2.502271 0.057546 1.958558 0.067468 0 0 0.56951 0.023812
0.212524
0.805915 0.167439 1.392872 0.137999 0 0 7.525558 1.011994
0.491277

0.123231 0.01536 1.015154 0.068854 0 0 11.05194 0.335442
0.628513
6.024761 0.181269 1.399475 0.070169 0 0 0.886854 0.038983
0.512621
2.736964 0.063466 2.00314 0.067432 0 0 0.587059 0.0238
0.198529
0.304464 0.055848 1.062922 0.070261 0 0 10.44906 0.234203
0.607127
0.183149 0.028729 0.90138 0.055663 0 0 10.59391 0.233425
0.614088
0.018385 0.009592 0.041967 0.021982 6.085152 0.18785 0.139889 0.010192
0.002058
0.008875 0.001779 0 0 6.070441 0.193886 0.141317 0.010994 0
2.560519 0.065451 2.12418 0.075368 0.075368 0.027767 0.595008 0.027767
0.190998
0.560382 0.119572 1.490187 0.089233 0.013563 0.013742 9.940529 0.588936
0.57109
2.760958 0.065454 2.048901 0.075371 0 0 0.610902 0.021818
0.19894
1.907993 0.258374 1.49062 0.218624 2.842115 0.516748 0.335886 0.051675
0.196762
0.185728 0.105643 1.388697 0.114163 0 0 12.52384 0.494138
0.591261
2.681452 0.051566 2.056706 0.073383 0 0 0.606897 0.0238
0.190597

3.135142 0.277797 2.30175 0.634965 0 0 0.557579 0.130962
0.184537
0.023404 0.004173 0.691222 0.050798 0 0 10.21413 0.217708
0.520685
2.66079 0.061464 2.14727 0.07336 0 0 0.632483 0.031723
0.192521
0.020602 0.004085 0.868478 0.060385 0 0 11.20675 0.213124 0.658907 2.421399
0.045649 2.042311 0.067482 0 0 0.579548 0.023817 0.250277 2.675368 0.071396
2.102216 0.073379 0 0 0.606866 0.021815 0.229459 2.718914 0.061478 2.086285
0.07536 0 0 0.598915 0.021815 0.235005
0.155393 0.041438 1.288033 0.082876 0 0 11.36094 0.431647 0.661283 2.726288
0.072675 0.885847 0.039284 0 0 0.78371 0.029463 0.378695
2.664715 0.061463 2.099653 0.073359 0 0 0.626525 0.021809 0.191328 0.004138
0.001339 0 0 6.0176 0.19992 1.37945 0.919633 0
0.007197 0.001559 0 0 5.957686 0.199922 0.217516 0.014794 0
0.033645 0.003783 0.021899 0.009954 3.64526 0.195104 0.16982 0.012542 0
1.393273 0.037232 1.497132 0.066626 0 0 0.68194 0.023515 0.031941 1.061604
0.023812 3.039958 0.095247 0 0 0.513935 0.021827 0.018057 1.031263 0.031731
3.03231 0.077345 0 0 0.466052 0.019832 0.013486 1.493025 0.045065 1.481269
0.06074 0 0 0.681854 0.023512 0.031154
1.952873 0.040888 1.670554 0.046729 0 0 0.778813 0.023364
0.044587

1.76476 0.0449 1.592969 0.052709 0 0 0.745728 0.031235 0.031625 1.066931
0.023798 2.899356 0.067427 0 0 0.46941 0.019435 0.014279 0.078797 0.014861
2.073606 0.190081 0 0 8.640024 0.397441 0.076032
2.468073 0.170622 2.797414 0.218238 0 0 0.759865 0.053568
0.115666
6.253526 0.705428 2.897976 0.629166 0 0 0.768345 0.162058 0.01449 1.154722
0.031745 2.753872 0.06349 0 0 0.456333 0.021825 0.012698
0.02583 0.004843 1.126472 0.060987 0 0 8.735539 0.197312
0.065113
0.9521 0.023802 2.564719 0.073391 0 0 0.485968 0.021819
0.017852
5.018854 0.750852 4.564391 0.592778 0 0 1.402908 0.197593
0.207472
1.780856 0.048764 1.388795 0.050714 0 0 0.770469 0.031209
0.034525
0.006189 0.005191 0 0 5.210758 0.778619 3.194334 2.595397 0 0 0 0 0 5.558562
0.199948 0.145962 0.009797 0
0 0 0 0 5.710243 0.169948 0.173946 0.008797 0
0 0 0 0 5.43778 0.21991 0.134745 0.009396 0
1.100564 0.027762 2.470817 0.085269 0.051558 0.021813 0.475127 0.018442
0.012295
0.02995 0.002795 0.119999 0.015574 5.390975 0.185689 0.100232 0.009384
0.000859
1.418647 0.039682 3.299595 0.087301 0.015079 0.008532 0.448015 0.014286
0.019444
2.756237 0.257778 6.940164 0.6147 0.196307 0.04759 0.927999 0.089231
0.035692
3.651279 0.109141 12.66041 0.674693 0.146845 0.021828 1.133087 0.039688
0.047427
6.014394 0.628956 6.60404 0.530682 0 0 2.417551 0.373443
0.245686

Ru_ppm_mRh_ppm_mRh_ppm_mPd_ppm_mPd_ppm_mAg_ppm_mAg_ppm_mSn_ppm_mSn_ppm_m

0.003585	0.015137	0.004581	0.033063	0.013942	0	0	0.023702	0.01454
0.0003	0	0	0.002559	0.001	0.01979	0.003198	0.259873	0.259873
0.001114	0	0	0.052326	0.009152	0.07063	0.012335	0.620748	0.133302
0.002585	0.067421	0.00358	0.600625	0.019292	0	0	4.892512	1.531396
0	0	0	0	0	0	0	0.277019	0.175379
0.004694	0.01154	0.002738	0	0	0	0	0.880144	0.449852
0.000599	0.000859	0.000399	0.002237	0.001039	0.014379	0.002996	0.213693	0.08388
0	0	0	0	0	0	0	0.319311	0.173625
0.004324	0.008845	0.004521	0.035575	0.013758	0	0	0.184754	0.086481
0.005201	0	0	0	0	0.082828	0.088607	0.117501	0.044304
0.005354	0.062265	0.002974	0.453502	0.015467	0	0	0.076939	0.005949
0.004781	0.045422	0.004383	0.272928	0.041836	0	0	0.249022	0.023906
0.00399	0.012769	0.004589	0.022346	0.011971	0	0	0.203511	0.029928
0.002198	0.003476	0.000599	0.002577	0.000959	0	0	0.519419	0.239732
0	0	0	0	0	0	0	0.051855	0.063821
0.00042	0	0	0	0	0.005594	0.002797	0.165812	0.073916
0.014956	0.082258	0.006566	1.730877	0.142264	0.042497	0.01222	0.084446	0.012585
0.008426	0.196939	0.012541	1.150279	0.080343	0	0	0.224961	0.018224
0.000897	0.000638	0.000299	0	0	0	0	0.05022	0.01116
0.006499	0.031118	0.009847	0.153621	0.055146	0.003722	0.00195	0.137077	0.018119
0.004759	0.06702	0.002776	0.444949	0.017251	0	0	0.099142	0.023794
0.019903	0.053936	0.008757	0.22689	0.031844	0	0	23.68413	9.354237
0.011282	0.200506	0.006334	0.983725	0.027711	0	0	0.124698	0.006334
0.009125	0.055148	0.00238	0.45229	0.019837	0	0	9.720267	2.777219
0.010116	0.056727	0.002777	0.447869	0.018645	0	0	6.743817	2.380171
0.006184	0.032517	0.001935	0.10912	0.007381	0.017355	0.00399	5.685416	1.635804
0.031757	0.161763	0.008535	0.379101	0.023818	0.031757	0.004565	2.064213	0.754232
0.007938	0.065089	0.00258	0.431609	0.01786	0	0	1.706592	0.952517
0.004247	0.004247	0.001263	0.021005	0.004591	0	0	2.525165	1.0445
0.019891	0.12531	0.009547	0.405767	0.029836	0.03262	0.003182	0.676278	0.437592
0.015175	0.248518	0.00946	0.713431	0.061095	0	0	0.512409	0.315329
0.041652	0.093265	0.005433	1.919625	0.199206	0	0	3.621934	1.792857
0.010891	0.078808	0.002772	0.586111	0.039602	0	0	1.940502	0.851445
0.031775	0.177344	0.008937	0.625568	0.049648	0.0282	0.004369	2.323538	0.774513
0.01471	0.190834	0.005367	1.127114	0.069575	0	0	1.351741	0.496964
0.015998	0.076086	0.004465	1.183144	0.042787	0	0	2.790433	2.046318
0.005962	0.054653	0.002981	0.336862	0.014707	0	0	0.228549	0.111293
0.035667	0.101848	0.017635	0.441869	0.079259	0	0	0.089166	0.045574
0.007578	0.066603	0.002393	0.135798	0.01017	0	0	4.805769	1.176516
0.015693	0.07118	0.004671	0.97336	0.039233	0	0	1.606697	0.635206

0.017212	0.07839	0.004116	0.98034	0.031805	0	0	0.860604	0.61739
0.01593	0.064659	0.003374	0.955829	0.035609	0	0	7.496702	3.186098
0.00735	0.045492	0.002185	0.308906	0.014899	0	0	3.873745	1.787882
0.015275	0.060702	0.007736	0.174567	0.023805	0	0	0.04503	0.008332
0.053556	0.049589	0.021819	0.315387	0.103145	0	0	3.590254	1.209975
0.014068	0.17932	0.011294	0.438689	0.014663	0	0	0.114725	0.007133
0.007733	0.074354	0.003371	0.432246	0.019828	0	0	0.051156	0.004164
0.012684	0.049149	0.005747	0.251689	0.023782	0	0	0.03706	0.008522
0.012724	0.118695	0.005965	0.510963	0.025846	0	0	0.065212	0.006163
0.006143	0.071336	0.002774	0.379071	0.014465	0	0	0.065193	0.018428
0.004767	0.007906	0.001827	0.035358	0.007747	0	0	0.027809	0.035755
0.021775	0.137184	0.013263	0.752234	0.057407	0	0	0.170243	0.120753
0.016332	0.09574	0.004318	0.974294	0.039422	0	0	0.031913	0.026282
0.019849	0.179436	0.012703	0.690748	0.043668	0	0	0.43668	0.456529
0.02771	0.210994	0.018408	1.001531	0.091048	0	0	0.148448	0.037607
0.008342	0.076073	0.003377	0.373613	0.016684	0	0	0.046677	0.00437
0.021409	0.16913	0.006812	1.710761	0.070065	0	0	0.476833	0.19268
0.013097	0.100408	0.003572	0.379607	0.018256	0	0	0.212326	0.119061
0.04784	0.128983	0.007176	1.365272	0.167439	0	0	0.292558	0.154559
0.03531	0.14477	0.006709	1.887304	0.081212	0	0	0.847433	0.459026
0.019491	0.189066	0.006042	1.512525	0.058474	0	0	0.682195	0.350843
0.009123	0.100355	0.004363	0.426014	0.016461	0	0	0.420461	0.192381
0.032428	0.143585	0.005225	1.70608	0.046841	0	0	0.756656	0.306266
0.028729	0.139157	0.006285	1.734529	0.06105	0	0	0.628452	0.269337
0.001639	0.001719	0.000959	0.001539	0.001179	0.01199	0.003197	17.98567	8.992835
0	0	0	0	0	0.011793	0.002399	4.99707	2.398594
0.01309	0.096391	0.004363	0.430984	0.018247	0	0	4.56173	2.776705
0.033908	0.139382	0.006425	1.820348	0.107079	0.017847	0.019631	0.169542	0.064248
0.010512	0.102148	0.004165	0.40621	0.017256	0	0	0.158676	0.039669
0.0318	0.10494	0.015304	0.325949	0.05565	0.023452	0.012124	0.129187	0.045712
0.037486	0.153864	0.007497	2.62745	0.092012	0	0	8.178832	3.748631
0.0119	0.098968	0.003768	0.415903	0.017057	0	0	0.376831	0.218165
0.057544	0.073418	0.021827	0.384948	0.10715	0	0	0.912763	0.337325
0.030842	0.134435	0.005806	1.4659	0.048984	0	0	1.596524	0.961543
0.010112	0.102704	0.004362	0.419342	0.017646	0	0	0.87239	0.376714
0.02664	0.162862	0.007282	1.738733	0.062161	0	0	0.085249	0.053281
0.015084	0.115314	0.004366	0.366584	0.018458	0	0	0.134963	0.093283
0.012693	0.108879	0.00476	0.425005	0.018047	0	0	0.436309	0.337148
0.011899	0.110462	0.004165	0.417654	0.016659	0	0	0.872591	0.475959
0.036258	0.147278	0.007424	2.377509	0.096689	0	0	1.277674	0.915091

0.016892	0.162634	0.005696	0.887811	0.03732	0	0	0.080532	0.033391
0.015267	0.099332	0.00456	0.42231	0.021809	0	0	0.097151	0.05155
0	0	0	0	0	0.007797	0.002799	0.185926	0.047981
0	0	0	0	0	0.008997	0.003998	0.279891	0.083967
0	0	0	0	0	0	0	0.264784	0.11547
0.004899	0.056632	0.003135	1.003314	0.037232	0	0	0.045071	0.006663
0.003373	0.037702	0.002381	0.344674	0.018057	0	0	0.036114	0.002778
0.002776	0.036987	0.001884	0.363917	0.013089	0	0	0.044225	0.003768
0.003723	0.056037	0.002939	1.009065	0.02939	0	0	0.039775	0.003919
0.005257	0.066589	0.003115	1.353187	0.035047	0	0	0.062694	0.004089
0.003904	0.060712	0.003123	1.18887	0.033187	0	0	0.053099	0.004295
0.003173	0.03768	0.002578	0.361725	0.017848	0	0	0.058106	0.01884
0.020736	0.057888	0.006048	2.059782	0.105408	0	0	0.046656	0.022464
0.007936	0.088089	0.005754	0.501947	0.043648	0	0	0.089279	0.057535
0.011058	0.093422	0.028598	2.764516	0.438509	0	0	0.499519	0.141086
0.002579	0.035515	0.002381	0.371614	0.01746	0	0	0.535696	0.35713
0.008251	0.046279	0.003408	1.601814	0.044844	0	0	0.12915	0.075337
0.002777	0.034315	0.002182	0.337599	0.014281	0	0	0.077358	0.073391
0.031615	0.148195	0.021735	0.486078	0.023711	0	0	0.158074	0.047422
0.004486	0.061638	0.003316	1.262009	0.054616	0	0	0.091676	0.025357
0	0	0	0	0	0	0	#VALUE!	#VALUE!
0	0	0	0	0	0	0	0.03719	0.013996
0	0	0	0	0	0.005198	0.001999	0.047985	0.027991
0	0	0	0	0	0.005598	0.002399	0.009796	0.002799
0.002578	0.032323	0.001983	0.398385	0.018244	0	0	0.051161	0.011105
0.000519	0.000739	0.000299	0.031947	0.005191	0.00599	0.002596	0.103826	0.049916
0.003373	0.03873	0.001944	0.432737	0.017857	0	0	0.357142	0.357142
0.007138	0.091412	0.00932	0.906187	0.107077	0	0	0.174496	0.099145
0.003969	0.112912	0.004564	1.041805	0.073422	0	0	0.145059	0.00635
0.041275	0.196549	0.02162	0.650577	0.090412	0	0	0.137584	0.027517

Te_ppm_mTe_ppm_mLa_ppm_mLa_ppm_mCe_ppm_mCe_ppm_mNd_ppm_mNd_ppm_mSm_ppm_m

0 0 0.008365 0.002988 0.01195 0.004581 0.012946 0.005577 0
0.023788 0.007996 0.00072 0.0002 0.00098 0.00024 0.0008 0.00042 0
0.000398 0.004377 5.153001 0.65656 10.98246 1.293224 5.471333 0.676456
1.153954
0 0 0.01074 0.00358 0.029435 0.009745
0.011734 0.003381 0.00171
0.35873 0.478307 0.004584 0.004185 0 0 0 0 0
0.160382 0.062588 0.002719 0.001037 0.00667 0.001643 0.005085 0.003129
0.000958
0.060713 0.013381 0.000296 0.00013 0.000395 0.000126 0.000699 0.000479
0.00022
0 0 0 0 0 0 0 0 0
0.149376 0.062895 0.001867 0.000943 0.005503 0.001965 0.003341 0.002162
9.83E-05
0.007705 0.025041 0 0 0.001541 0.000848 0 0 0
0 0 0.000139 3.17E-05 0 0 0 0 0
0.725152 0.093632 0.000657 0.000219 0.001474 0.000398 0.000996 0.000657 0
0.217478 0.087789 0.001776 0.000938 0.002354 0.001097 0 0 0 0 0.000707
0.00019 0.001378 0.00034 0.001079 0.000539 0
0 0 0 0 0 0 0 0 0
0.101485 0.018179 4.4E-05 4.99E-05 0.000144 0.000116 0.00026 0.00026 0
0 0 0.000328 0.000237 0.001076 0.000474
0.000912 0.000912 0.000182
0.025671 0.012345 0.000901 0.000196 0.00241 0.000274 0.001293 0.000509
0.001274
0.034675 0.009765 0.00013 8.37E-05 0.000705 0.000197 0 0
0.000797
0.431319 0.082719 0.00076 0.000187 0.002521 0.000453 0.001379 0.000492
0.001418
0.009319 0.004957 0 0 0 0 0 0 0 0.543342
0.095533 0 0 0 0 0 0 0
0.186057 0.053442 0.000396 0.000257 0.001188 0.000574 0.000614 0.000515 0
0 0 0 0 0.000165 0.000113 0 0 0
0 0 0 0 0 0 0 0 0
0.029724 0.01157 0 0 0.000104 7.58E-05 0 0 0
0.434676 0.05756 0 0 0 0 0 0 0
0.005953 0.004366 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0.028642 0.008354 8.75E-06 1.87E-05 2.78E-05 3.38E-05 0
0 0.000117
0 0 0.000197 2.96E-05 7.88E-05 5.12E-05 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0.056003 0.013504 3.97E-05 5.56E-05 8.54E-05 7.55E-05 0 0 0
0.052877 0.014511 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.020739	0.008176	0	0	0.00013	9.57E-05	0	0	0

0.003923 0.005978 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0	0	0	0	8.06E-05	9.56E-05	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0.012696	0.004364	0.025193	0.007935	0.00972	0.003769	

0.000238

0	0	0.1448	0.099178	0.196373	0.08926	0.119014	0.081326	0
0.003963	0.002378	9.91E-05	5.35E-05	0.000153	7.13E-05	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.009543	0.006561	0	0	0	0	0	0	0

0 0 8.92E-05 7.13E-05 0.000495 0.000218
0.000238 0.000277 0

0.028803	0.015891	8.54E-05	0.000139	0	0	0	0	0
0.483014	0.152426	0.004355	0.002771	0.005939	0.003365	0.002573	0.002375	0
0	0	0	0	0	0	0	0	0
0.007344	0.003573	7.94E-05	2.18E-05	9.92E-05	6.55E-05	0	0	0
0.004354	0.002771	0.000313	0.000129	0.000869	0.000176	0	0	

0.00017

0 0 0 0 0 0 0 0 0 0 0 0.000195 4.87E-05 0 0 0 0 0

0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.001802	0.004504	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.009992	0.005396	2.8E-05	4.2E-05	9.19E-05	6.59E-05	0	0	0
0.015391	0.005996	0	0	0	0	0	0	0

0 0 0 0 0.000214 0.000147 0 0 0

0.020702 0.010351 0.000102 0.000123 0.000286 0.000214 0 0 0 0 0 2.58E-05 4.17E-05 0 0 0 0 0

0.226574	0.065587	7.35E-05	0.000121	0	0	0	0	0
0	0	0	0	0.000204	0.000239	0	0	0
0.004562	0.003768	0	0	0	0	0	0	0

0.009921	0.039685	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.050071	0.031079	0.000173	0.00019	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

0.012595	0.007197	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.073407	0.025792	0.001647	0.000873	0.003016	0.001528	0.000992	0.000655	
	0.000198							
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.013996	0.006598	0	0	0	0	0	0	0
0.012395	0.004998	0	0	0	0	0	0	0

0 0 0 0 0 0 0 0 0.135773 0.021963 6.99E-05 6.19E-05 8.19E-05 8.59E-05 0 0 0

0	0	0	0	0	0	0	0	0

0.031132 0.014673 0.000238 0.000198 #VALUE! #VALUE! 0.000833 0.000734 0 0

0 0.00506 0.00121 0.00893 0.001984 0.007878 0.001806 0.001984

0	0	0	0	0	0	0	0	0

Sm_ppm_m	Eu_ppm_m	Eu_ppm_m	Gd_ppm_m	Gd_ppm_m	Dy_ppm_m	Dy_ppm_m	Er_ppm_m	Er_ppm_m
0	0	0	0.000598	0.001295	0.003585	0.002191	0	0
0	0	0	0.000132	0.000192	0.000252	0.000198	6.2E-05	9E-05
0.13927	0.260634	0.029844	0.954996	0.103458	0.734153	0.04775	0.389957	0.025864
0.000835	0.000617	0.000298	0.002247	0.001034	0.001233	0.000477	0.001114	0.000398
0	0	0	0	0	0	0	0	0
0.001017	0.000548	0.000352	0.000567	0.000861	0	0	0.00043	0.00043
0.00028	3.4E-05	4.79E-05	0.000134	0.000196	0	0	0	0
0	0	0	0	0	3.39E-05	0.000122	0	0
0.000472	0	0	0.001199	0.001258	0.00057	0.000668	0.000943	0.000865
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0.000219	0.000259	0	0
0	0	0	0	0	0.000599	0.000898	0	0
0	0.000154	0.000102	0	0	3.6E-05	7.99E-05	9.39E-05	0.00011
0	0	0	0	0	0	0	0.002393	0.005385
0	0	0	0	0	0	0	0	0
0.000419	0	0	0	0	0	0	0	0
0.000627	0.000292	0.000135	0	0	7.45E-05	9.01E-05	0.000157	0.000114
0.000418	0	0	0	0	0	0	2.59E-05	5.58E-05
0.000611	0.000136	8.27E-05	0.000374	0.000276	0.000195	0.000154	0.000203	0.000124
0	2.38E-05	5.16E-05	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0		0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.000177	6.76E-05	6.76E-05	0	0	0.000298	0.000219	0.000318	0.000199
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0.000109	8.74E-05	0	0	0	0	6.16E-05	7.15E-05
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.000595	0.000694	0.000496	0	0	0.001845	0.001766	0.001329	0.000873
0	0.00238	0.003769	0.005752	0.008529	0	0	0.009521	0.009521
0	4.16E-05	4.95E-05	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.000174	0	0	4.35E-05	9.3E-05	0.0002	0.000146	0.000433	0.000192
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0.000714	0.001369	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	4.71E-05	0.0001
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	8.53E-05	0.000182	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.000238	0	0	0	0	0.000224	0.000175	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	5.93E-05	0.000126	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.000635	0.000536	0.000198	0.00252	0.000714	0.002858	0.000853	0.001091	0.000377
0	0	0	0	0	0	0	0	0

Yb_ppm_mYb_ppm_mW_ppm_mW_ppm_m182_Int2SE
Os_ppm_mOs_ppm_mIr_ppm_m1
0 0 0.007768 0.003187 0 0 0 0
0.000299
0.000172 0.00017 9E-05 0.000134 0 0 0 0 0
0.354144 0.031833 0.324301 0.023875 0 0 0 0 0
0.000656 0.000318 0.009367 0.001432 0 0 0.002446 0.000736
0.002168
0 0 0.001594 0.003189 0 0 0 0 0
0.002132 0.001467 0.022493 0.006846 0 0 0.000685 0.000861 5.09E-05 0 0
0.001278 0.000479 0 0 0 0 0
0.000239 0.000379 0 0 0 0 0 0
9.98E-05
0.001199 0.001042 0.007862 0.003341 0 0 0 0 0
0 0 0.001791 0.00156 0 0 0 0 0
0 0 0.014872 0.002181 0 0 0.001408 0.000734
0.000793
0 0 0.032472 0.004582 0 0 0 0
0.001096
0.000379 0.000838 0.016161 0.005786 0 0 0.001117 0.001676
0.00012
0.0003 0.00022 0.006932 0.001219 0 0 0 0
0.00012
0 0 0 0 0 0 0 0 0
0 0 0.00026 0.00022 0 0 0 0 0
0 0 0.012038 0.003101 0 0 0.002426 0.001514
0.000912
0.000529 0.000255 0.02038 0.002547 0 0 0.007995 0.001626 0.005095 0 0 0.004623
0.000897 0 0 0 0 0
0.000303 0.000185 0.018119 0.002757 0 0 0.001477 0.000512
0.000532
0 0 0.013087 0.001983 0 0 0.001606 0.000694
0.00111
0.000199 0.000438 0.044781 0.009354 0 0 0 0 0.000756 0 0 0.053244 0.004948 0 0
0.039191 0.004157 0.043347
0 0 0.016068 0.002182 0 0 0.000793 0.000555
0.001607
0 0 0.018645 0.002579 0 0 0.001765 0.000774
0.001468
0 0 0.008518 0.001576 0 0 0.000798 0.000499
0.000579
0 0 0.037315 0.004168 0 0 0.00528 0.00137
0.003573
0 0 0.016411 0.001865 0 0 0.001151 0.000556
0.001707
0 0 0.00287 0.001951 0 0 0 0 0 0.000358 0.000239 0.023272 0.002387 0 0
0.003361 0.001193 0.002248 0 0 0.078044 0.004533 0 0 0.045328 0.003153
0.051635

0 0 0.015574 0.003079 0 0 0.001485 0.000978
0.001014
0 0 0.015168 0.001782 0 0 0.001881 0.000812
0.001861
#VALUE! #VALUE! 0.041705 0.003972 0 0 0.005978 0.001767 0.004369 0 0
0.049895 0.004572 0 0 0.007236 0.001431 0.004572
0 0 0.016371 0.003721 0 0 0 0 0
0 0 0.017092 0.002186 0 0 0.00161 0.000696
0.001272
0 0 0.019815 0.007728 0 0 0.011096 0.005152
0.017239
0 0 0.021536 0.002991 0 0 0.002194 0.000698
0.001416
0 0 0.018309 0.002802 0 0 0 0
0.000129 0 0 0.01478 0.002619 0 0 0
0 0
0 0 0.019679 0.003186 0 0 0.000131 0.000319 0
0 0 0.016687 0.002384 0 0 0.001391 0.000636
0.001192
0.000674 0.000793 0.015076 0.004364 0 0 0.008927 0.002777 0.012696 0 0
0.097195 0.057523 0 0 0.013885 0.013092 0.008133
0 0 0.05013 0.004359 0 0 0.031505 0.002576
0.035864
5.35E-05 0.000115 0.021612 0.002379 0 0 0.011897 0.002181 0.015545 0 0 0.01526
0.004162 0 0 0.008522 0.003171 0.011494

0	0	0.032805	0.003579	0	0	0.017894	0.003579	0.023878
0	0	0.021401	0.002378	0	0	0.013871	0.002378	0.015
0	0	0.004628	0.001867	0	0	0.00153	0.001351	0.001907
0	0	0.045332	0.007522	0	0	0.030485	0.006335	0.031673
0	0	0.017458	0.003004	0	0	0	0	0
0.000181	0.000141	0.049027	0.004565	0	0	0.037515	0.002977	0.045057
0.001287	0.000435	0.047108	0.004157	0	0	0.041566	0.00574	0.050077
0	0	0.022445	0.002383	0	0	0.014678	0.001887	0.016744
0	0	0.038925	0.003114			0.089917	0.007396	0.077461
0	0	0.030559	0.002778			0.067468	0.005358	0.05834
0	0	0.030176	0.0046			0.02944	0.009568	0.023184
0	0	0.03019	0.004767			0.002542	0.001607	0.001059
0	0	0.033915	0.003508			0.086346	0.008771	0.078745
0	0	0.032725	0.002975			0.069019	0.004562	0.061681
0	0	0.033149	0.003423			0.008107	0.002522	0.006089

0	0	0.030884	0.004669			0.002981	0.001652	0.003878
0	0	0.001779	0.000859			0.000899	0.000759	0.000939
0	0	0.001039	0.00084			0	0	4E-05
0	0	0.033519	0.00357			0.073186	0.007933	0.060889
0	0	0.029447	0.004819			0.022844	0.005889	0.016597
0	0	0.035702	0.00357			0.092825	0.006942	0.078148
0	0	0.028819	0.008149			0.0795	0.019875	0.069562
0	0	0.040213	0.007327			0.00886	0.005282	0.004771
0	0	0.034906	0.002975			0.08568	0.005553	0.069218
0	0	0.025597	0.014485			0.071434	0.02778	0.04544
0	0	0.032293	0.00508			0.000581	0.000907	0.000236
0	0	0.032318	0.002974			0.085058	0.007534	0.064438
0	0	0.033212	0.004973			0.000977	0.000977	0
0	0	0.032351	0.003573			0.080184	0.007741	0.070062
0	0	0.034508	0.003371			0.090038	0.007338	0.073776
0	0	0.033119	0.002776			0.093605	0.006544	0.078137
0	0	0.034186	0.004662			0.004662	0.002245	0.002003
0	0	0.029463	0.003143			0.085638	0.007464	0.072282
0	0	0.035886	0.003172			0.077523	0.006939	0.063644
0	0	0	0			0	0	0
0	0	3.6E-05	8.8E-05			0	0	0
0	0	0.007764	0.001613			7.96E-05	0.000199	0.000358
0	0	0.003488	0.00098			0	0	0.001274
0	0	0.004445	0.00125			0.000317	0.000377	0.000972
0	0	0.004542	0.000972			0.000516	0.000436	0.001031
0	0	0.005212	0.001019			0.000568	0.00049	0.001254
0	0	0.003115	0.000974			0.001032	0.000662	0.001577
0	0	0.003651	0.000781			0.00162	0.0008	0.001152

0	0	0.003708	0.001269	0	0	0.001011
0	0	0.003283	0.002074	0	0	0
0	0	0.028966	0.002976	0.018451	0.002381	0.019741
0.000267	0.001087	0	0	0	0	0
0	0	0.00371	0.000933	0.000774	0.000516	0.001171
0	0	0.003462	0.001309	0	0	0
0	0	0.004403	0.001031	0.000595	0.000476	0.000714
0	0	0.039123	0.00573	0.023118	0.003754	0.030034
0	0	0.004408	0.001092	0.001365	0.0008	0.001014
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0.005156	0.00115	0.000754	0.000496	0.001249
0	0	0	0	0	0	0.00014
0	0	0.004306	0.000952	0.000833	0.000536	0.00129
0	0	0.008526	0.002379	0	0	0.002796
0.000913	0.000377	0.01143	0.001548	0.002361	0.000675	0.003254
0	0	0.061323	0.011203	0.04501	0.012186	0.042848

Ir_ppm_m1Pt_ppm_m Pt_ppm_m
Au_ppm_mAu_ppm_mPb_ppm_mPb_ppm_m208_Int2SE

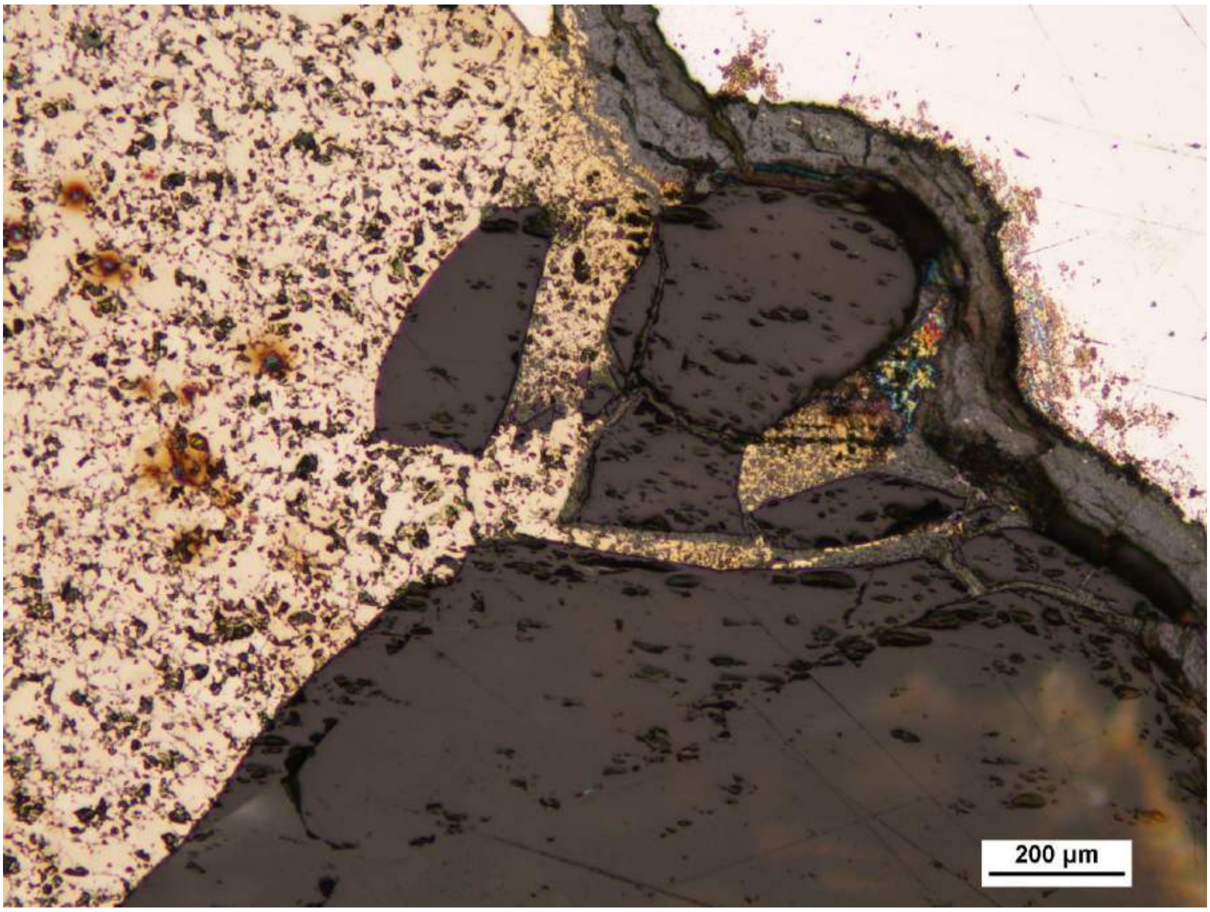
0.000438	0	0	0.007967	0.003187	0.004979	0.002589
0	0	0	0.001699	0.00048	0.00102	0.00046
0	0	0	0.104453	0.006964	3.589194	0.183041
0.000338	0.009367	0.00181	0.202065	0.009745	0.019292	0.00537
0	0	0	0	0	0	0
0.000137	0	0	0	0	0.015843	0.003912
0	0	0	0.000879	0.000379	0.002037	0.000499
4.99E-05	0	0	0	0	0.00459	0.003792
0	0	0	0.014741	0.004521	0.103974	0.015724
0	0	0	0	0	0.743529	0.184919
0.000258	0.065239	0.006147	0.155662	0.006742	0	0
0.000418	0.046816	0.007172	0.070523	0.009562	0.105187	0.008566
0.000279	0	0	0.026137	0.005587	0	0
8.59E-05	0	0	0.001538	0.000519	0.001918	0.000699
0	0	0	0	0	0	0
0	0	0	0.001378	0.00042	0	0
0.000529	0.034289	0.008025	0.055994	0.009302	0	0
0.000607	0.243381	0.016852	0.331171	0.023515	0.000803	0.000333
0	0	0	0.002371	0.000538	0	0
0.000197	0.027376	0.009847	0.047662	0.011029	0.008449	0.001517
0.000337	0.080107	0.006543	0.158032	0.004957	0	0
0.000478	0.244802	0.039805	0.084586	0.013733	0.032839	0.006966
0.002177	0.426347	0.014845	0.552232	0.025731	0.001722	0.000574
0.000516	0.292005	0.013886	0.185479	0.008133	0.01706	0.004364
0.000337	0.29772	0.013884	0.180893	0.007339	0.007141	0.001983
0.000219	0.151412	0.00778	0.10932	0.004588	0.012169	0.002793
0.000496	0.821716	0.05756	0.423958	0.018062	0.006987	0.001588
0.000377	0.330206	0.013692	0.19606	0.006549	0.005755	0.002183
0	0.034778	0.008609	0.017332	0.002984	0.004706	0.001607
0.000438	0.519143	0.039781	0.282445	0.016509	0.002307	0.000796
0.002759	0.404015	0.02365	0.210876	0.033504	#VALUE!	#VALUE!
0.000525	0.123146	0.027165	0.058856	0.013582	0.004709	0.001811
0.000416	0.363151	0.015049	0.269294	0.019801	0.001802	0.000812
0.000655	0.987007	0.069508	0.391228	0.021845	0.005163	0.001231
0.000795	0.944231	0.047709	0.695749	0.023854	0.006003	0.001849
0	0	0	0.004316	0.001804	0.003274	0.001563
0.000338	0.322751	0.0157	0.176877	0.007552	0.001391	0.000616
0.005548	0.271462	0.085203	0.182296	0.033685	0.015456	0.014465
0.000319	0.414772	0.021935	0.216758	0.008774	0.007717	0.001555
0.000157	0	0	0	0	0.003288	0.00114

0	0	0	0.000898	0.000524	0.003555	0.002058
0	0	0	0	0	0.006204	0.001649
0.000318	0.274937	0.013111	0.155744	0.006357	0.002384	0.000934
0.002182	0.110096	0.013489	0.024995	0.005356	0.009125	0.002976
0.004959	0	0	0.136866	0.047606	0.263814	0.103145
0.002576	0.240348	0.009115	0.089759	0.003765	0.000555	0.000277
0.001507	0.20839	0.010707	0.157829	0.006147	0	0
0.00218	0.138726	0.0218	0.087397	0.012089	0	0
0.001909	0.195637	0.014713	0.138974	0.013321	0	0
0.001209	0.186662	0.010106	0.126027	0.004954	0	0
0.000735	0.023439	0.009535	0.00735	0.002185	0	0
0.003761	0.376117	0.033653	0.188059	0.023755	0	0
0	0	0	0	0	0	0
0.00397	0.494242	0.031759	0.299721	0.023819	0.000655	0.000258
0.005344	0.467117	0.041566	0.31669	0.021772	0.001207	0.000673
0.001112	0.217692	0.01013	0.159297	0.006952	0	0
0.003503	0.613071	0.021409	0.50992	0.019463	0	0
0.003175	0.435764	0.018058	0.1395	0.006151	0	0
0.005888	0.149039	0.03496	0.038456	0.010304	0	0
0.000583	0	0	0.004061	0.00143	0	0
0.004288	0.645162	0.025339	0.418478	0.018127	0	0
0.003372	0.422841	0.017651	0.154698	0.005355	0	0
0.001639	0.063415	0.014953	0.016755	0.003603	0.003729	0.001387
0.000826	0.034296	0.008978	0.008619	0.002334	0.002029	0.001041
0.000699	0.007394	0.004796	0.001219	0.000939	0.04996	0.03797
5.8E-05	0	0	0.00052	0.00028	0.012393	0.010194
0.003173	0.423844	0.01904	0.158867	0.00714	0.025387	0.011305
0.003926	0.096371	0.021416	0.031767	0.007674	0.021237	0.009102
0.003372	0.450639	0.017653	0.158874	0.006942	0.000893	0.000575
0.009937	0.445198	0.057637	0.116865	0.018682	0.003259	0.001809
0.003408	0.035782	0.020447	0.010735	0.005623	0.005964	0.002897
0.002777	0.428398	0.019833	0.148353	0.006148	0	0
0.013096	0.442492	0.164694	0.182553	0.037701	0.063497	0.029764
0.000236	0	0	0.000871	0.00078	0	0
0.002379	0.41617	0.016655	0.151677	0.006345	0	0
0	0	0	0	0	0	0
0.00397	0.458081	0.019252	0.13794	0.005954	0	0
0.003371	0.448208	0.019832	0.15727	0.00833	0	0
0.00357	0.471992	0.019832	0.158653	0.006941	0	0
0.00095	0	0	0.005007	0.001899	0.003626	0.002763

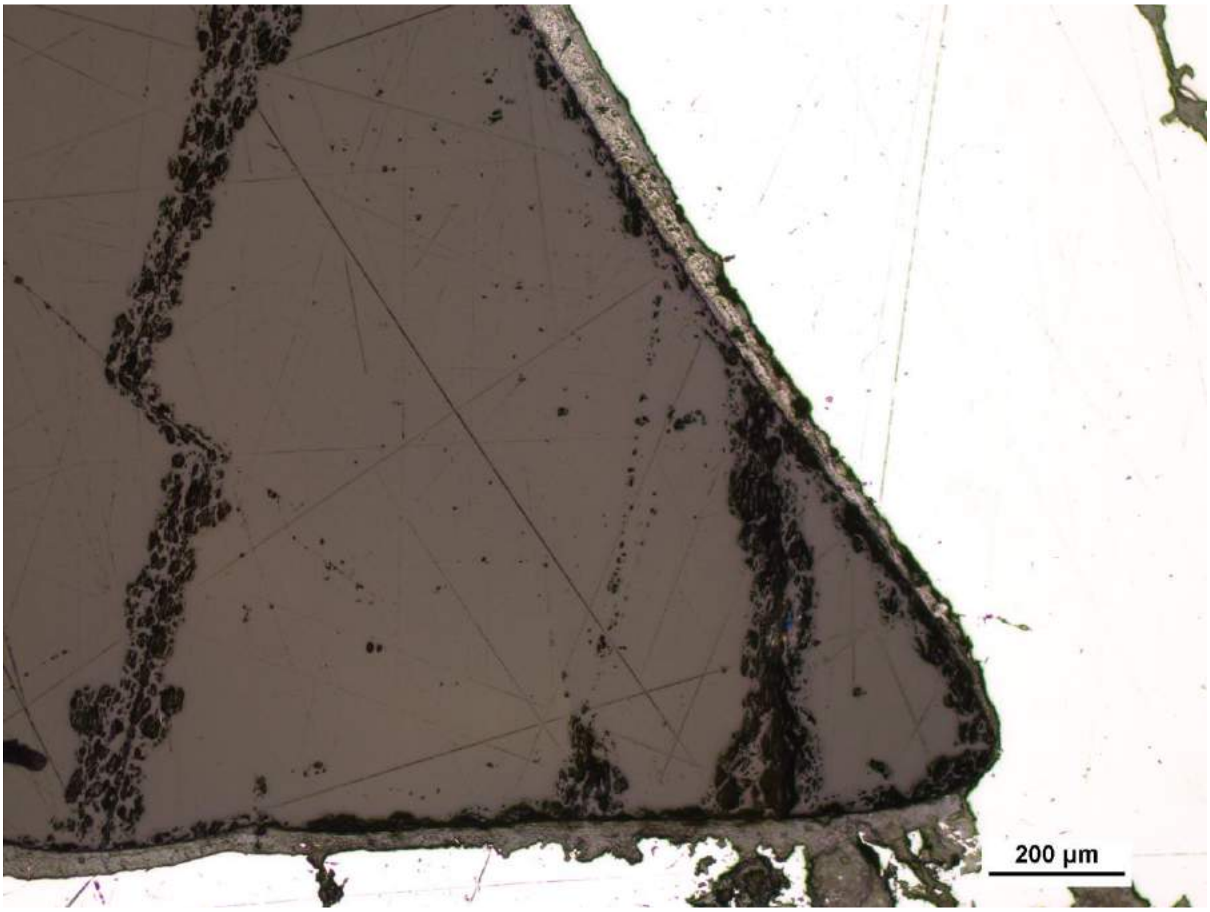
0.003732	0.504795	0.025534	0.211935	0.010017	0	0
0.003172	0.38801	0.016654	0.148304	0.005948	0	0
0	0	0	0	0	0.00102	0.00042
0	0	0	0	0	0.00078	0.00056
0.000181	0	0	0	0	0.001015	0.000617
0.000431	0.01019	0.002939	0.257491	0.010582	0	0
0.000357	0.01012	0.002976	0.137909	0.005159	0	0
0.000297	0.006148	0.002578	0.135849	0.005553	0	0
0.000392	0.010189	0.002939	0.260594	0.011168	0	0
0.000409	0.009346	0.002531	0.344819	0.011877	0	0
0.000371	0.009956	0.002538	0.300439	0.011518	0.000566	0.000449
0.000337	0.007338	0.002578	0.144175	0.006148	0	0
0	0	0	0.008813	0.003456	0	0
0.001567	0.268234	0.016864	0.185701	0.01488	0.002659	0.000635
0	0	0	0.856047	0.120113	0	0
0.000278	0.00873	0.002778	0.161304	0.009127	0.001805	0.000913
0	0	0	0.001435	0.000771	0	0
0.000258	#VALUE!	#VALUE!	0.12893	0.005752	0	0
0.004742	0.308245	0.035567	0.233159	0.023711	0	0
0.00041	0.008777	0.003706	0.307212	0.014434	0	0
0	0	0	0.010382	0.008385	0	0
0	0	0	0	0	0	0
0	0	0	0.0004	0.00026	0	0
0	0	0	0.00068	0.00032	0	0
0.000357	0.008329	0.003173	0.145156	0.006147	0	0
0.000116	0	0	0.004692	0.000679	0.001318	0.000439
0.000337	0.00873	0.002976	0.193055	0.008333	0	0
0.000773	0.017648	0.005354	0.162598	0.018243	0.004085	0.001448
0.000397	0.024606	0.002778	0.547692	0.051594	0.00029	0.000191
0.007469	0.40096	0.049137	0.269272	0.045206	0	0

APPENDIX D: ELEMENT MAPPING OF OLIVINE GRAINS

Micrographs with no overlay



ADMIRE



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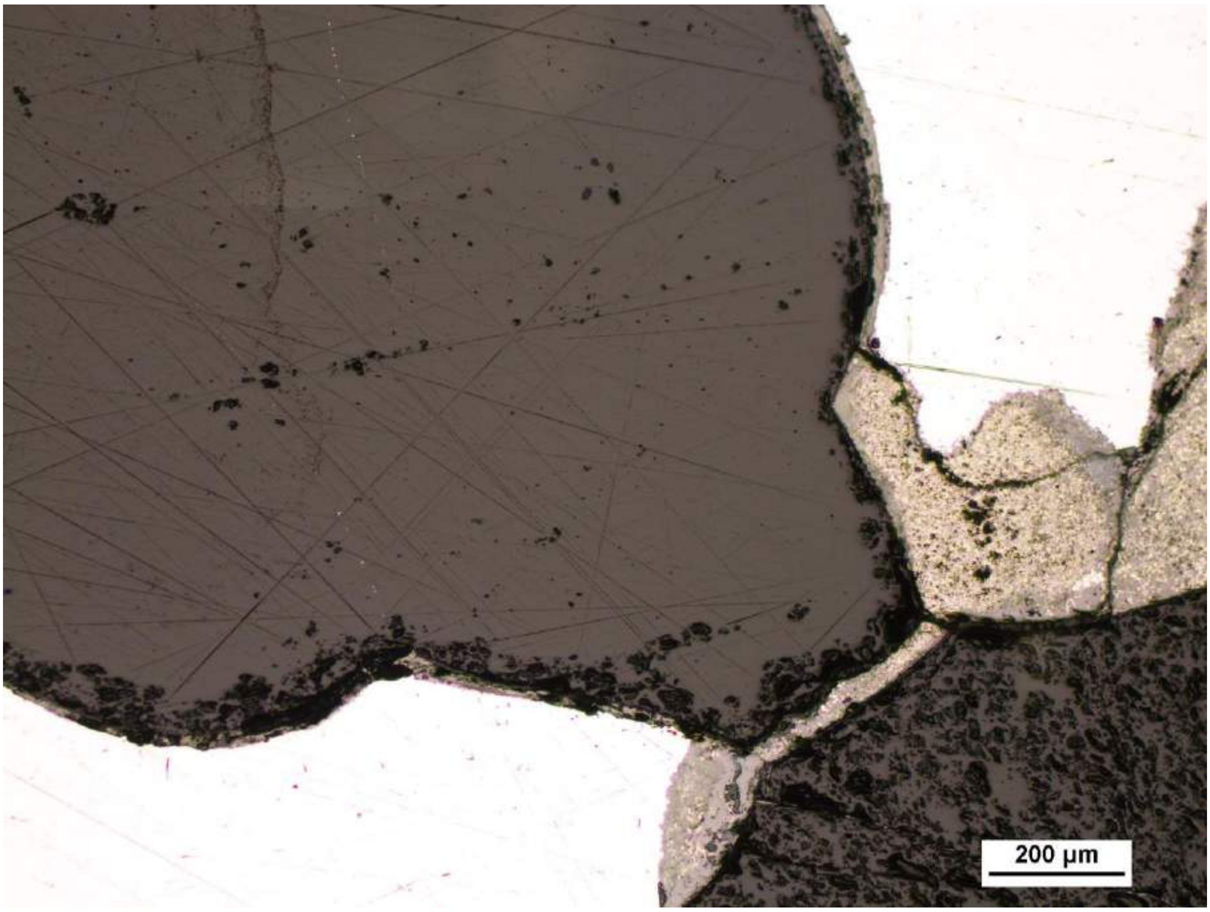
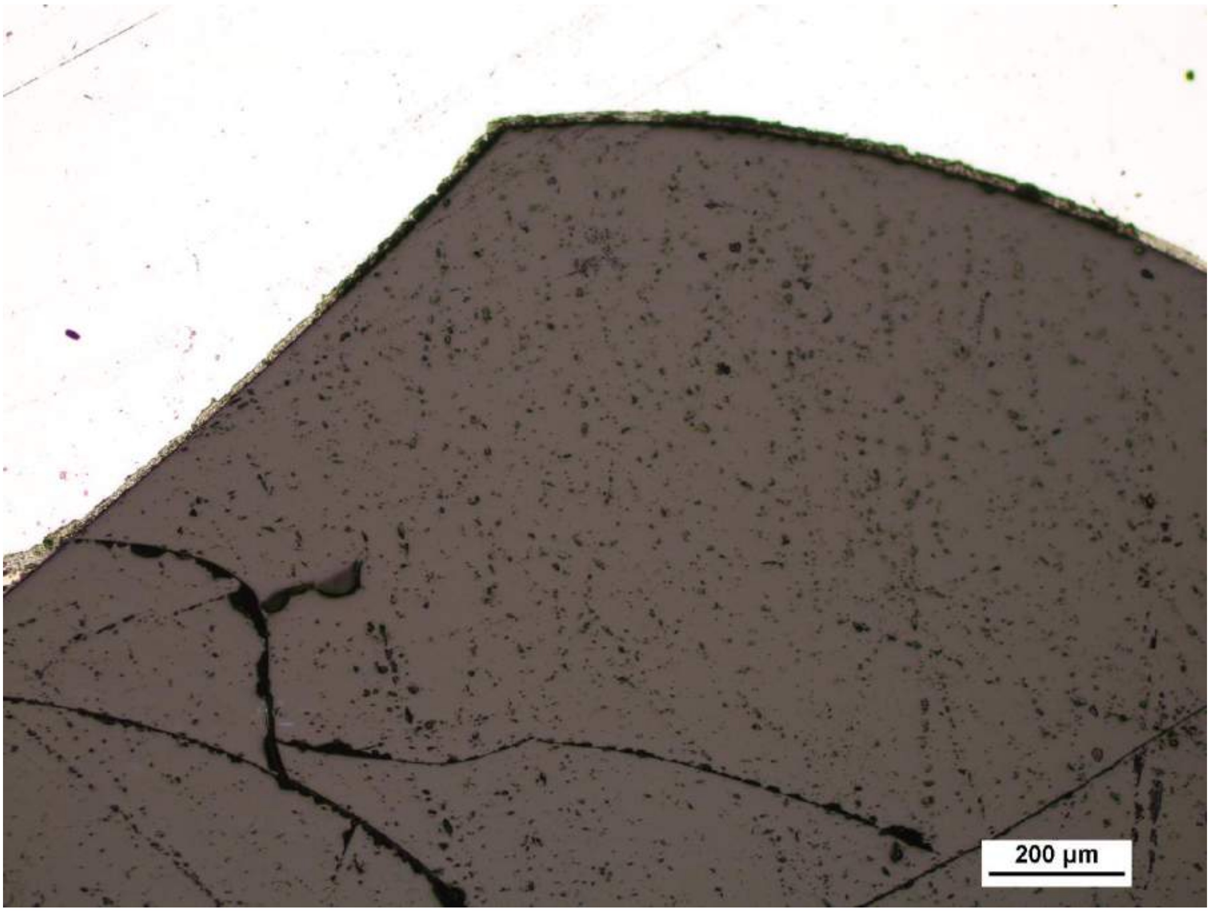
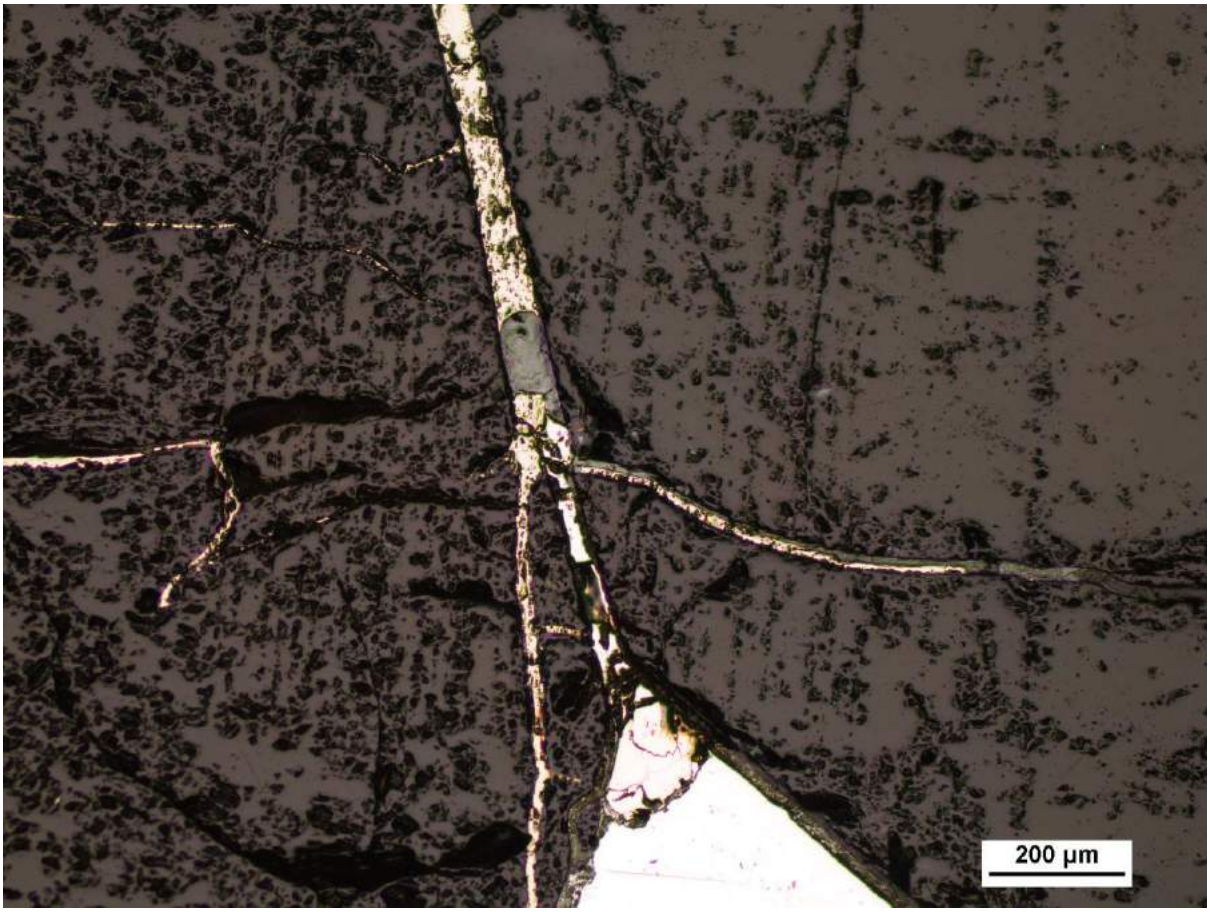


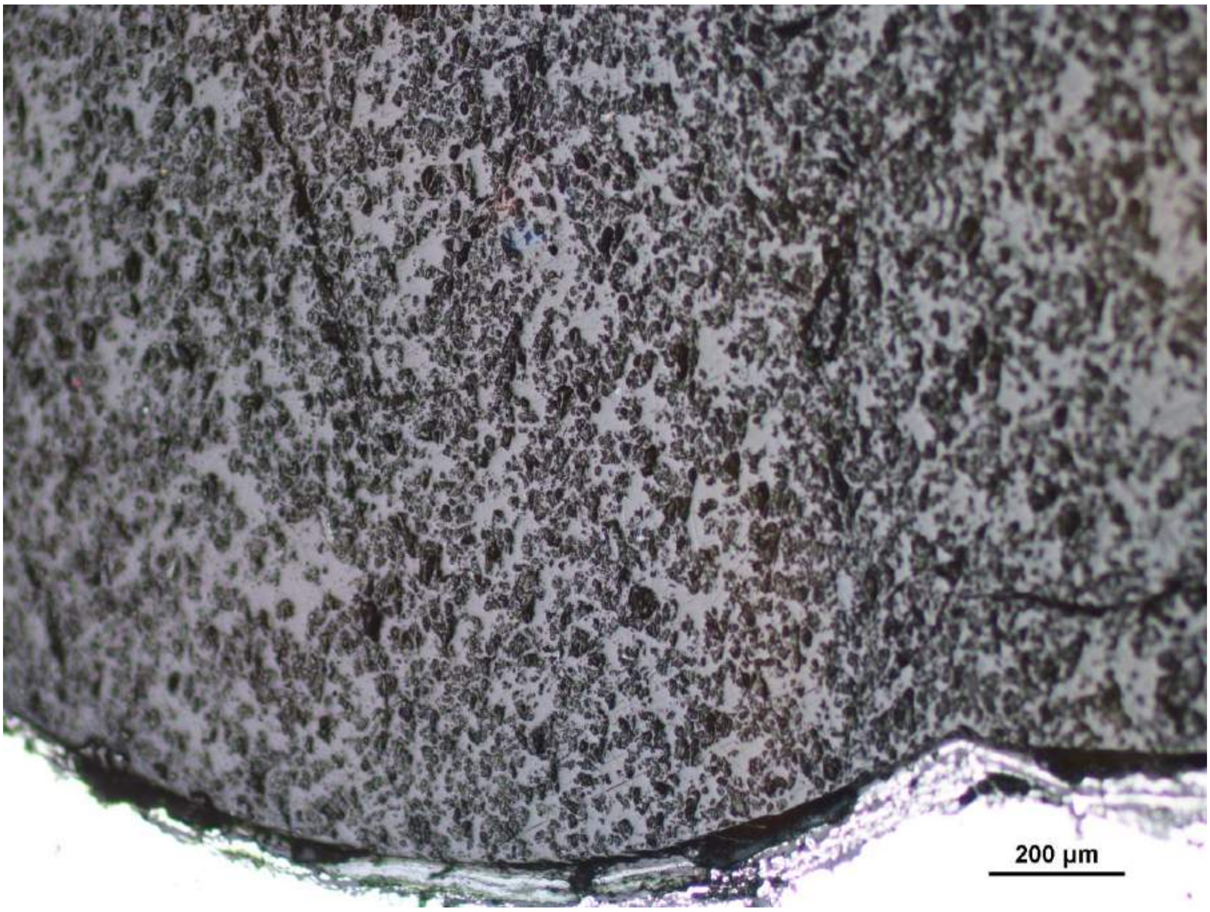
ALBIN



BRAHIN



BRAHIN



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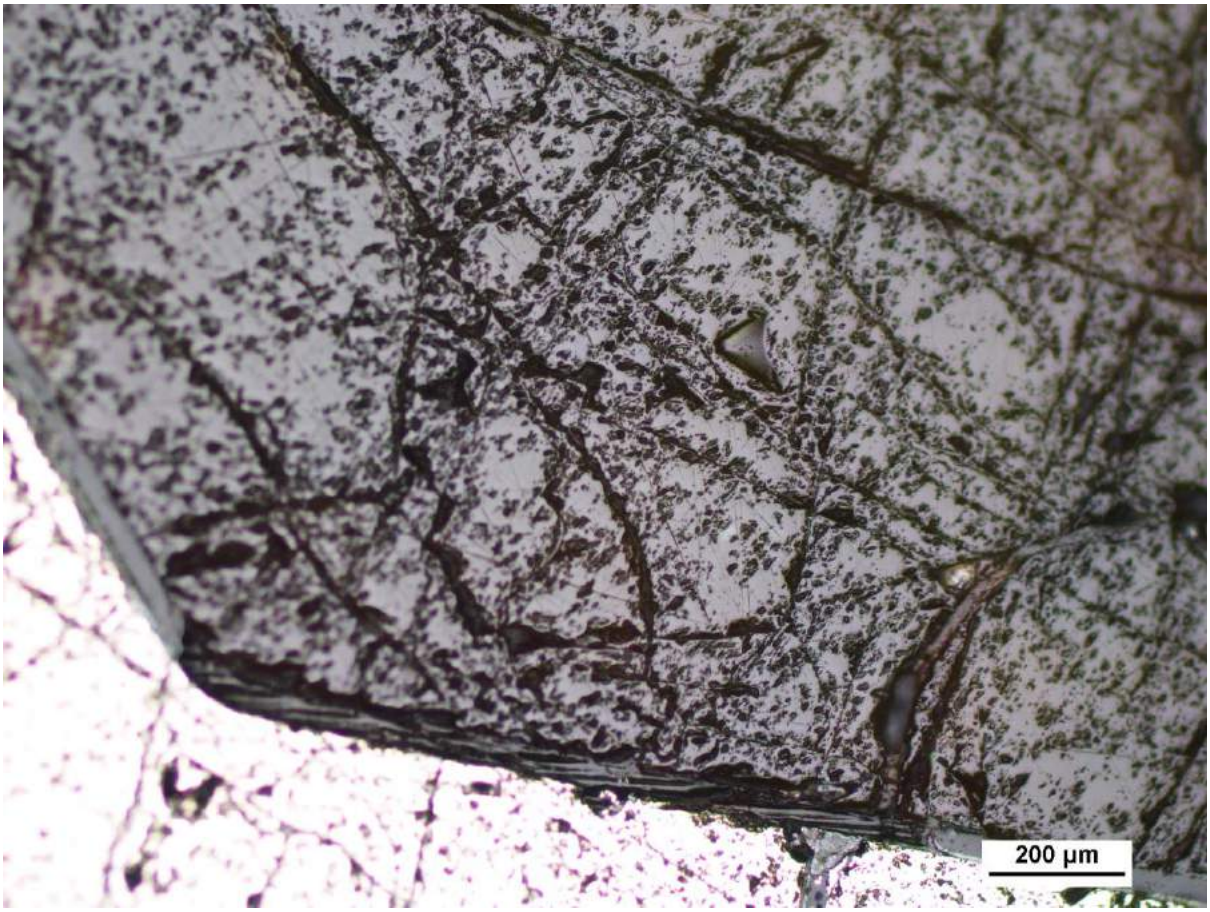
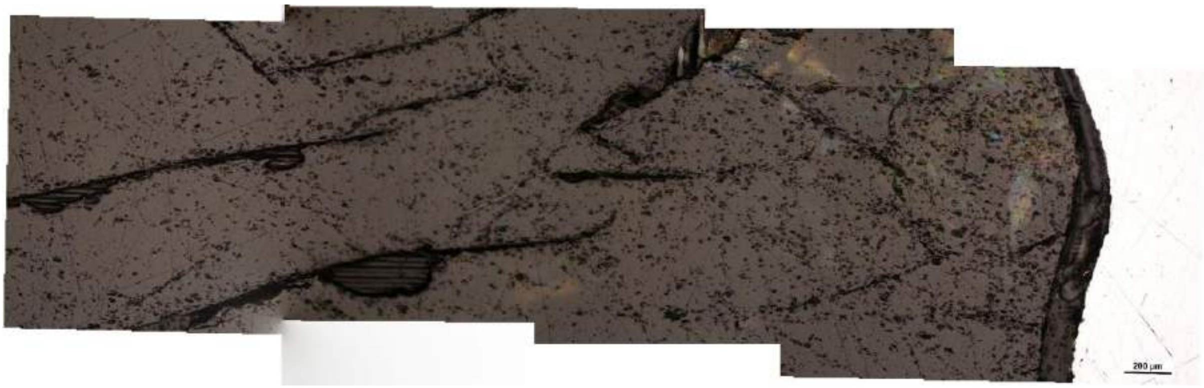
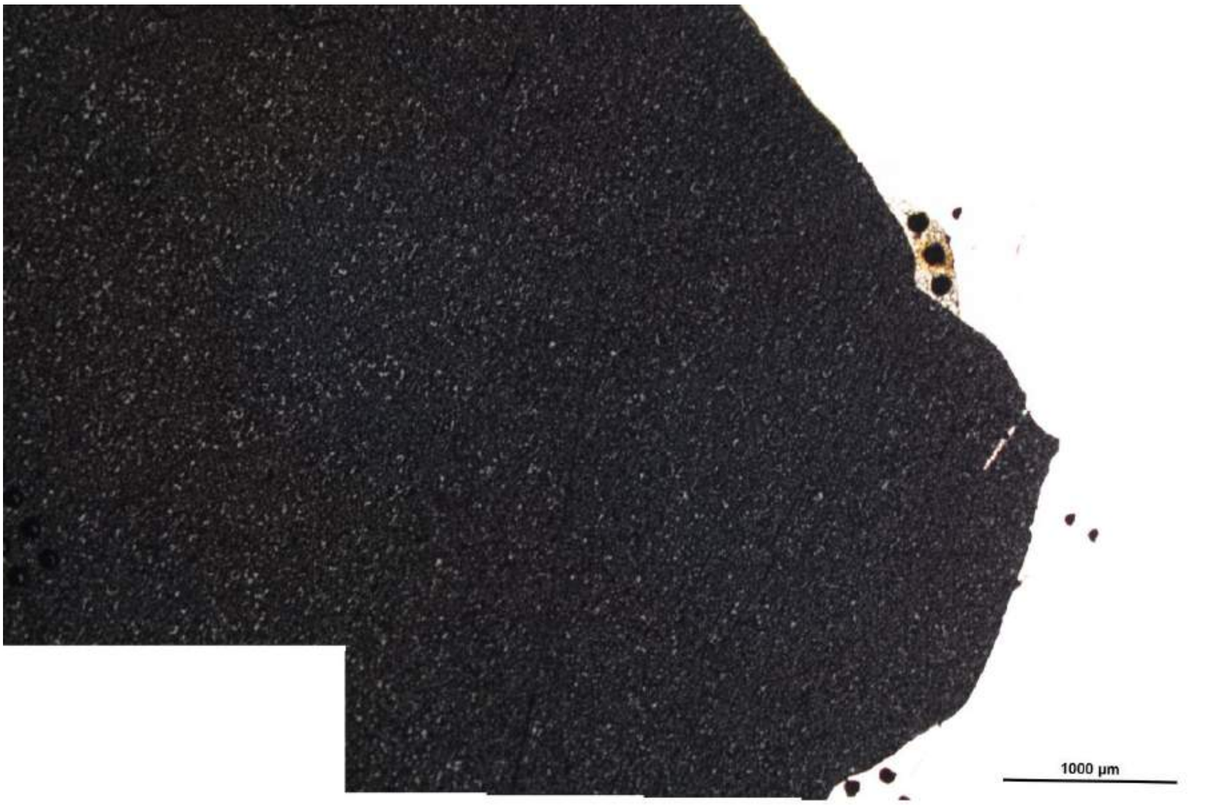


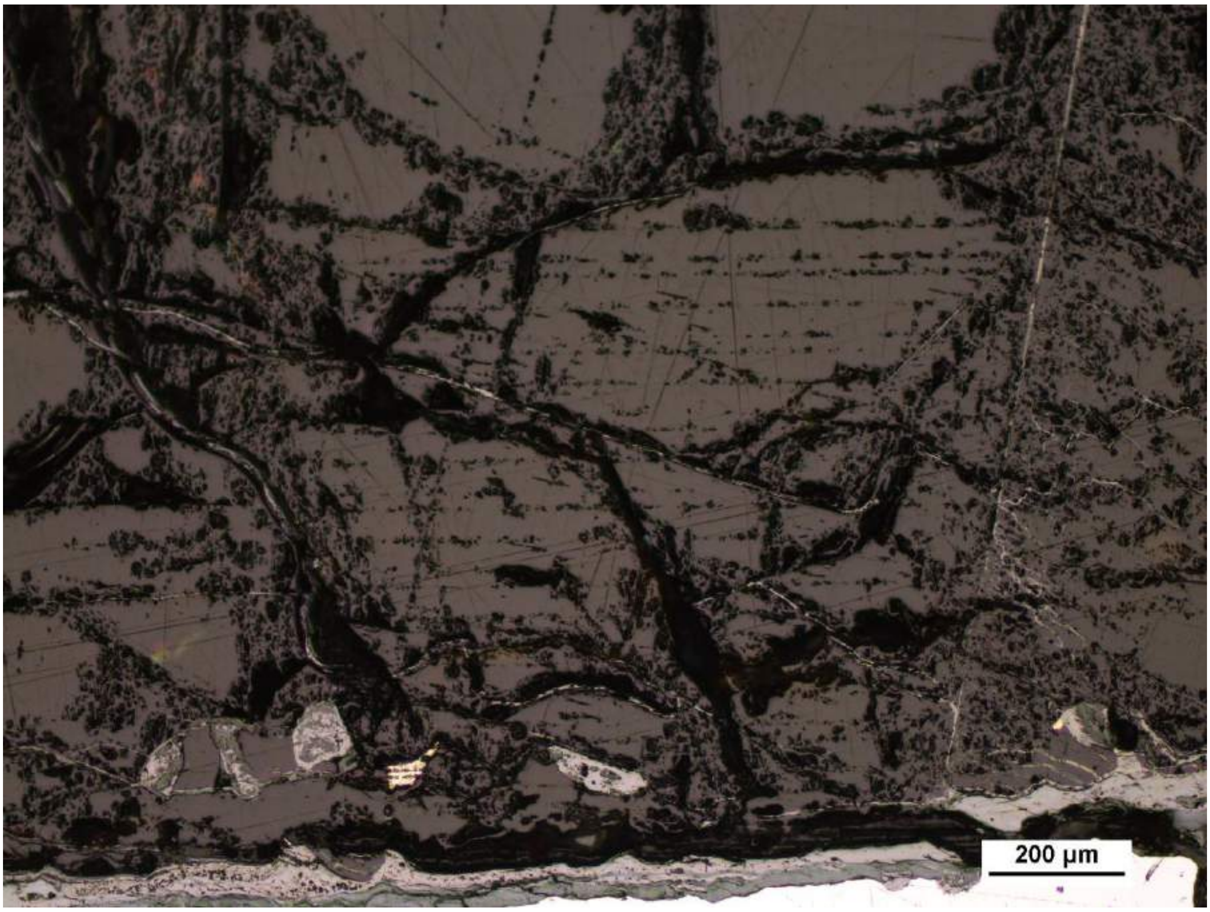
BRENHAM



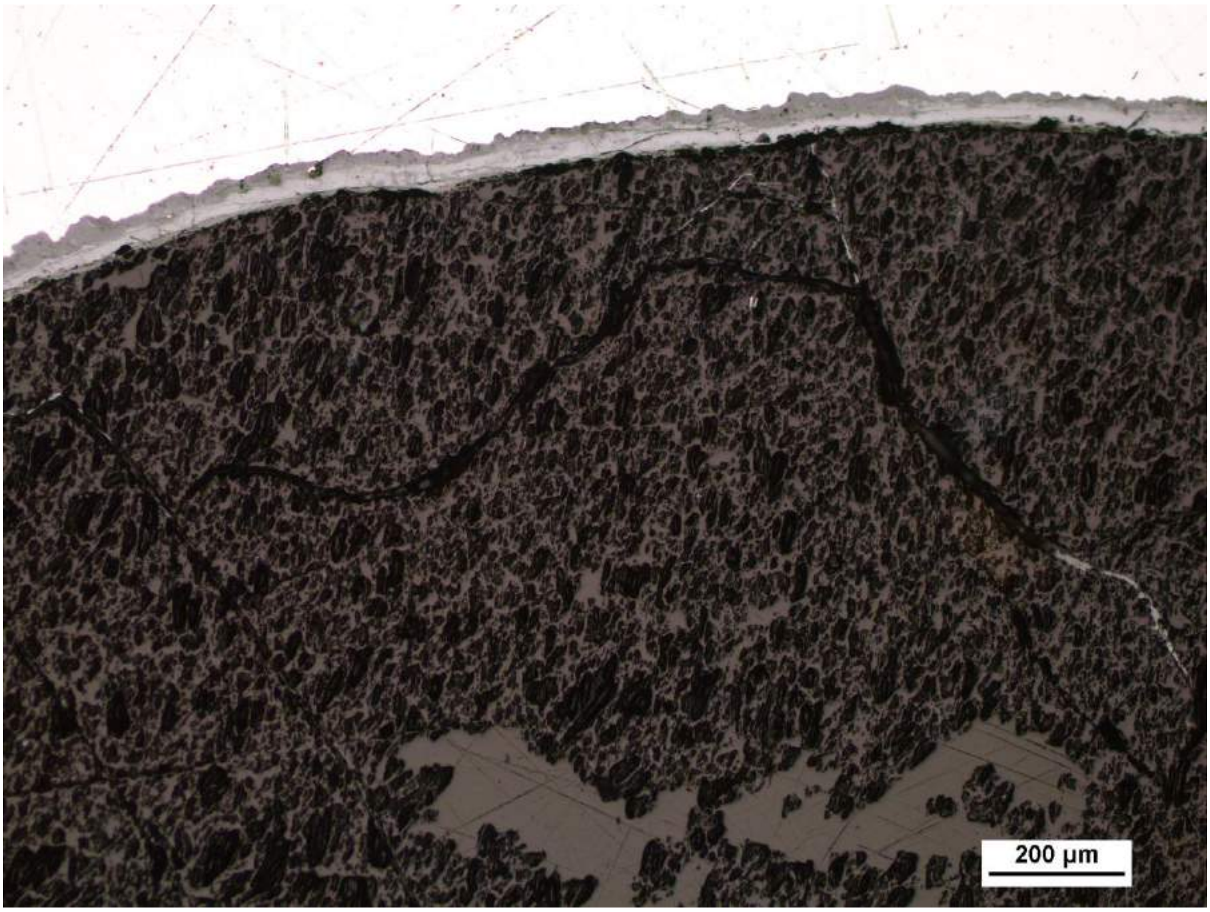
ESQUEL



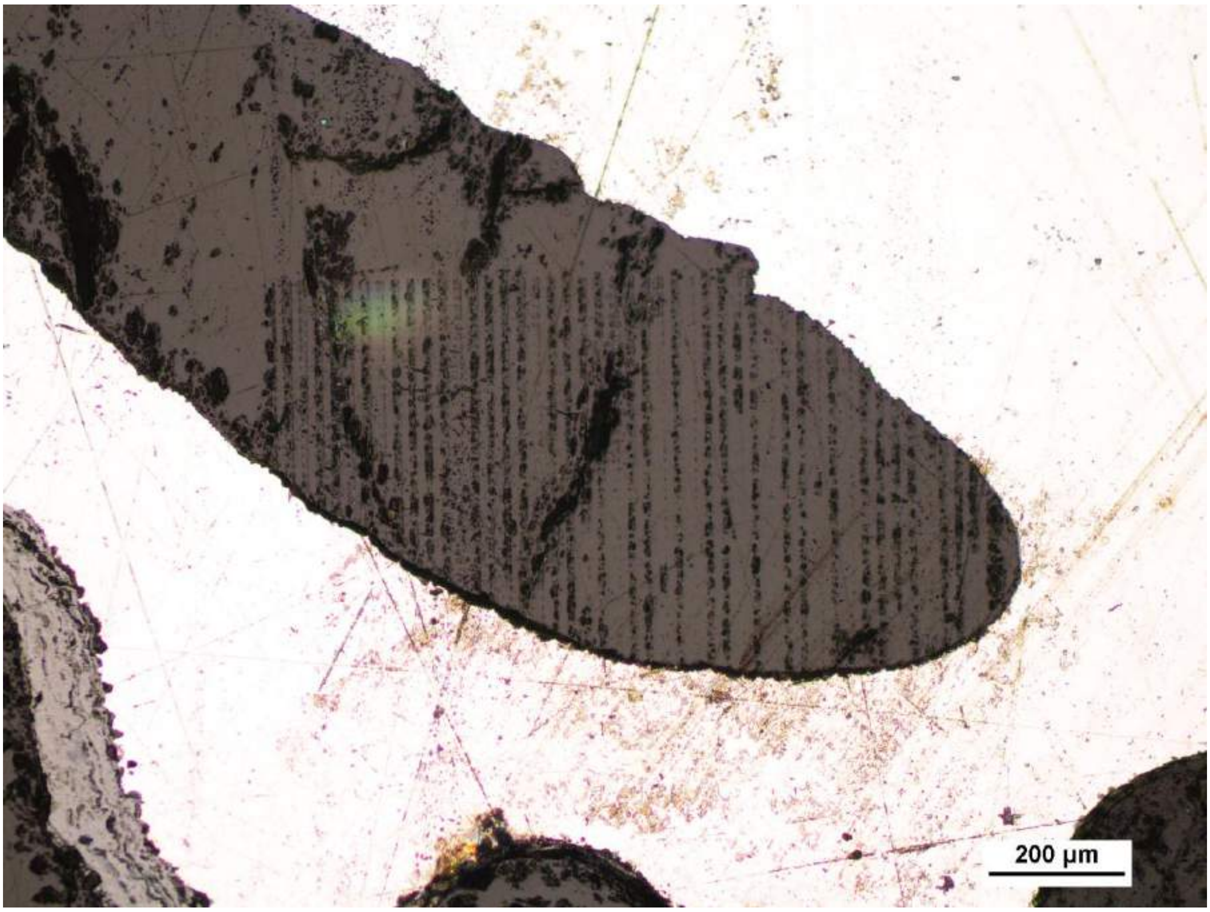
GLORIETA MOUNTAINS



HUCKITTA



IMILAC



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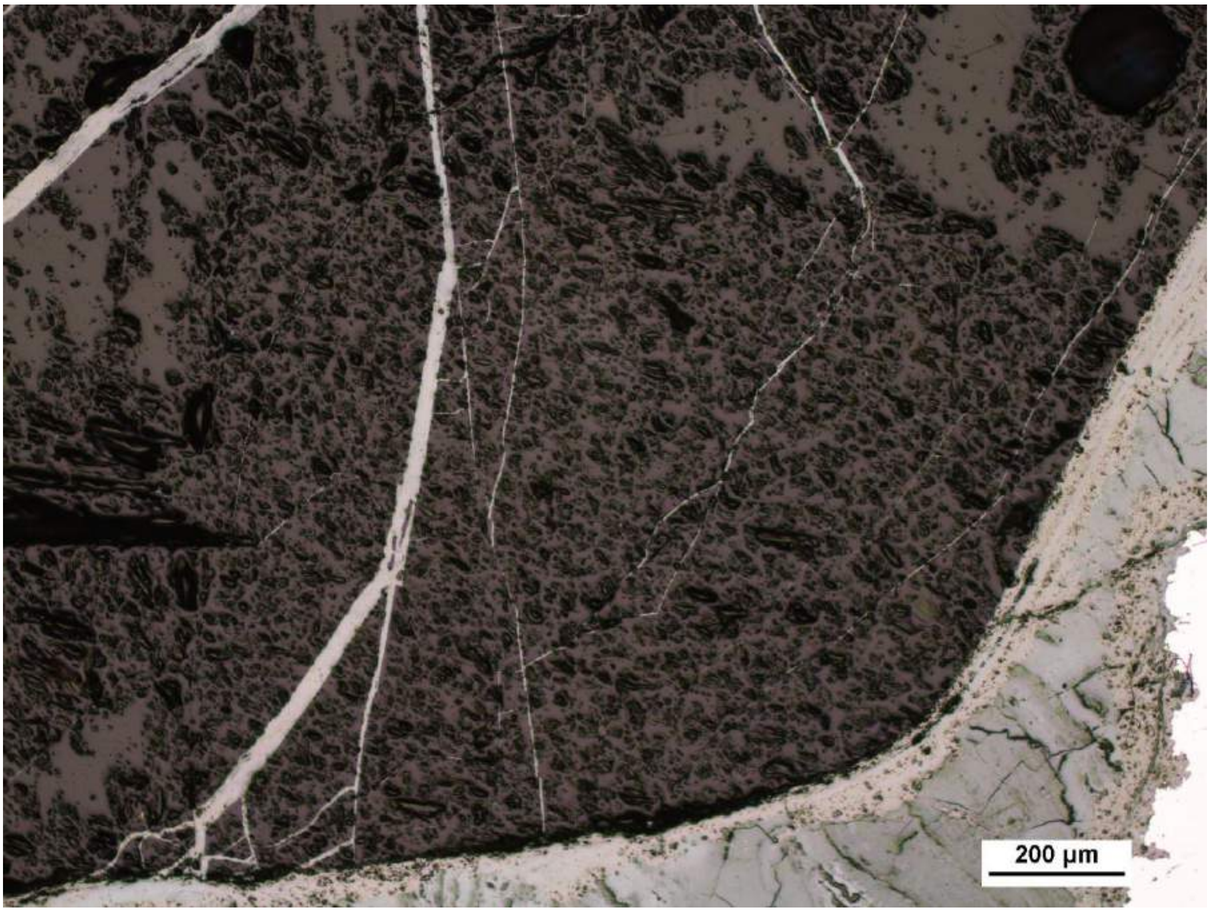
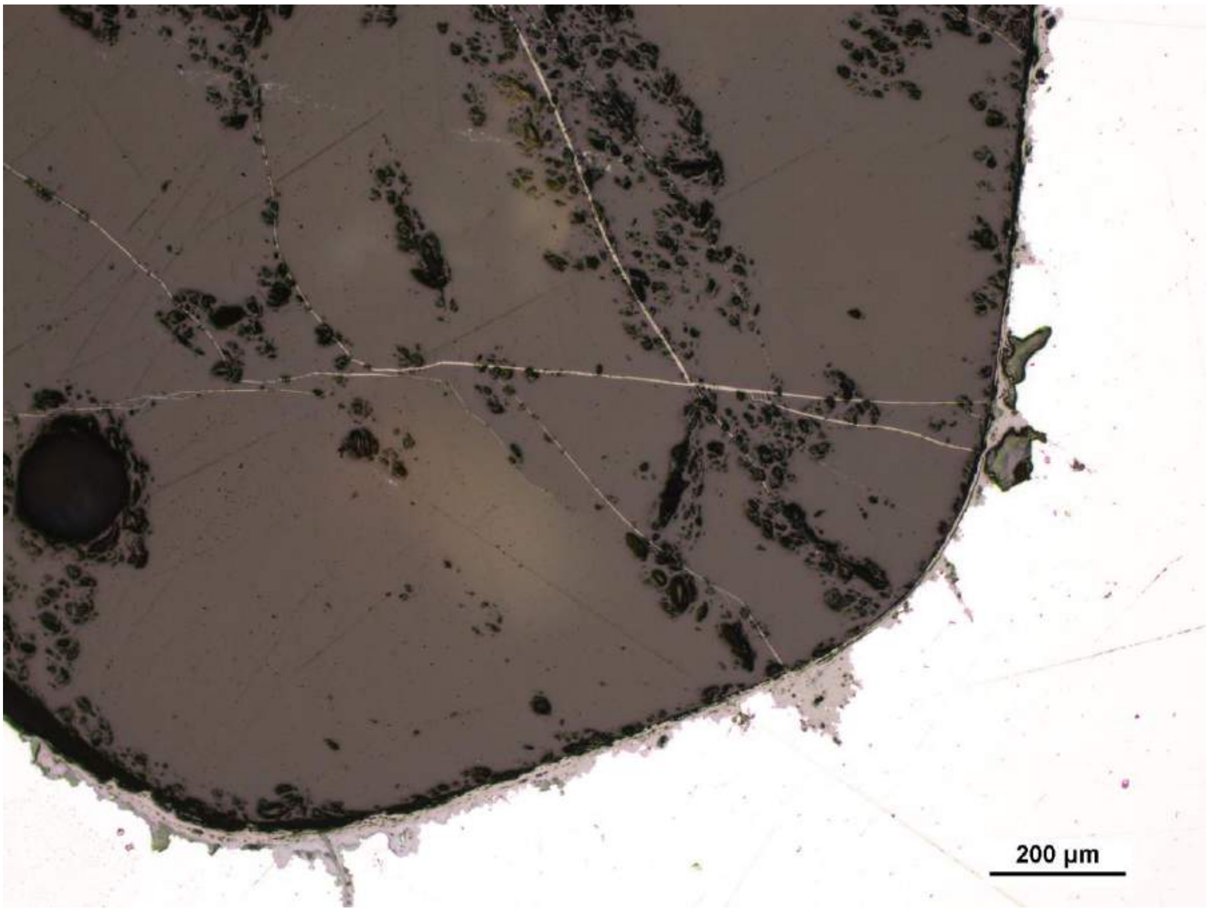


NWA 2951



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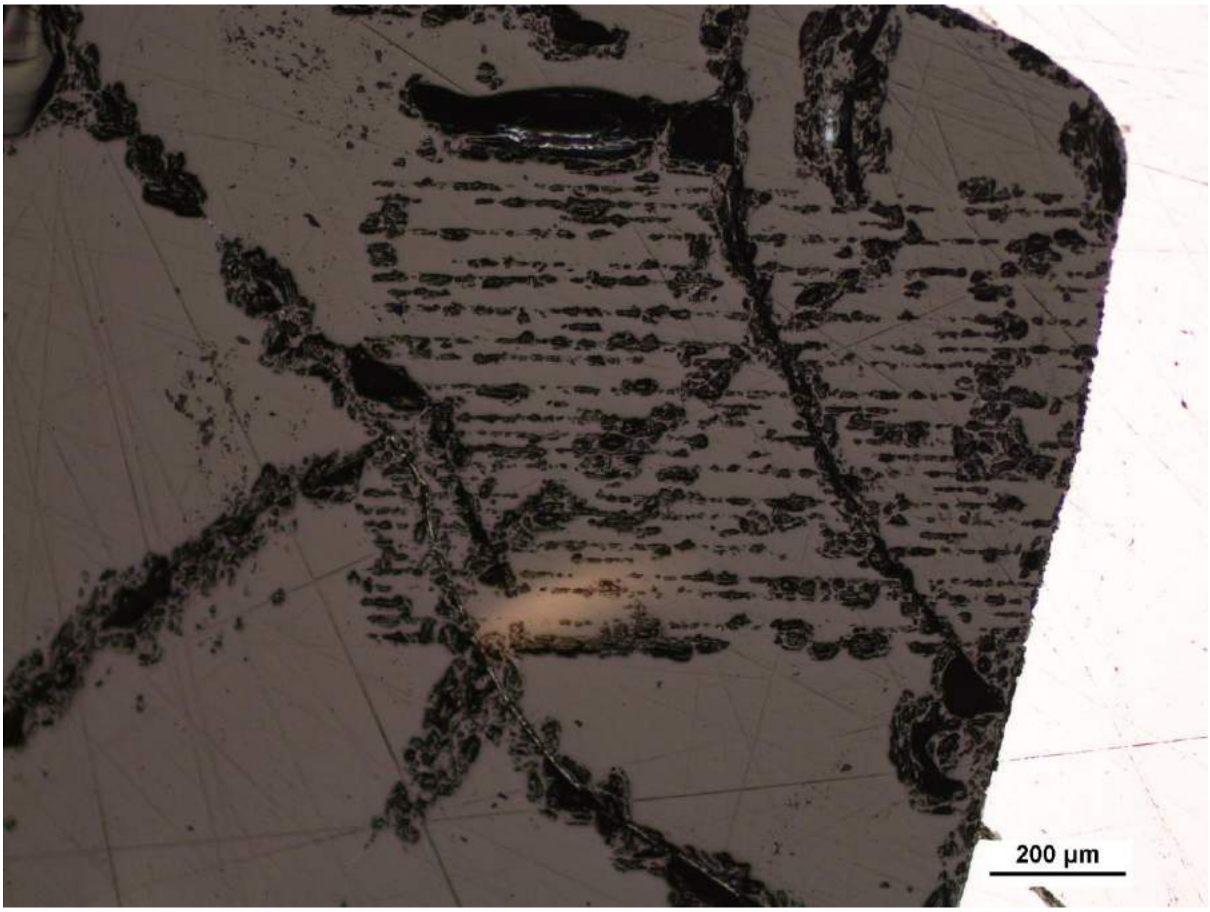
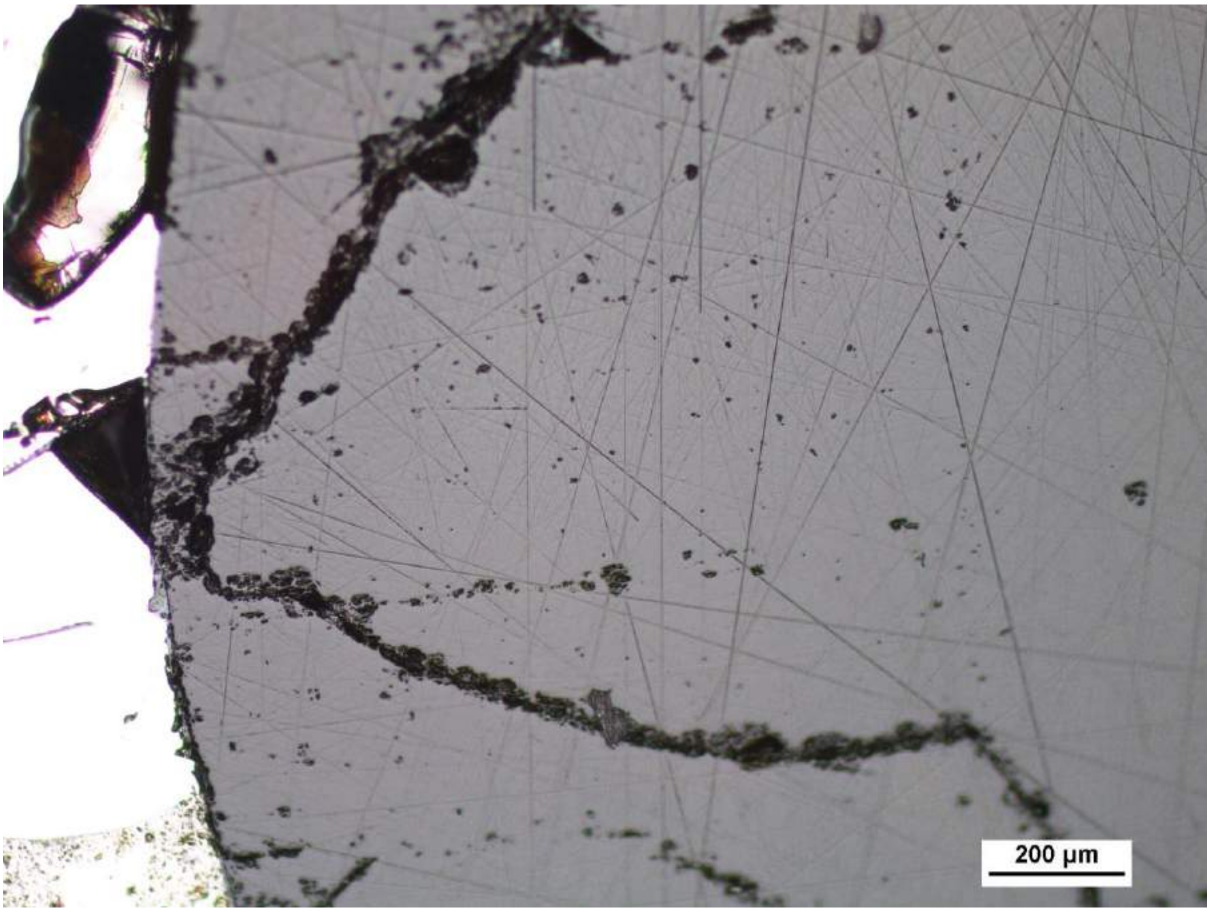
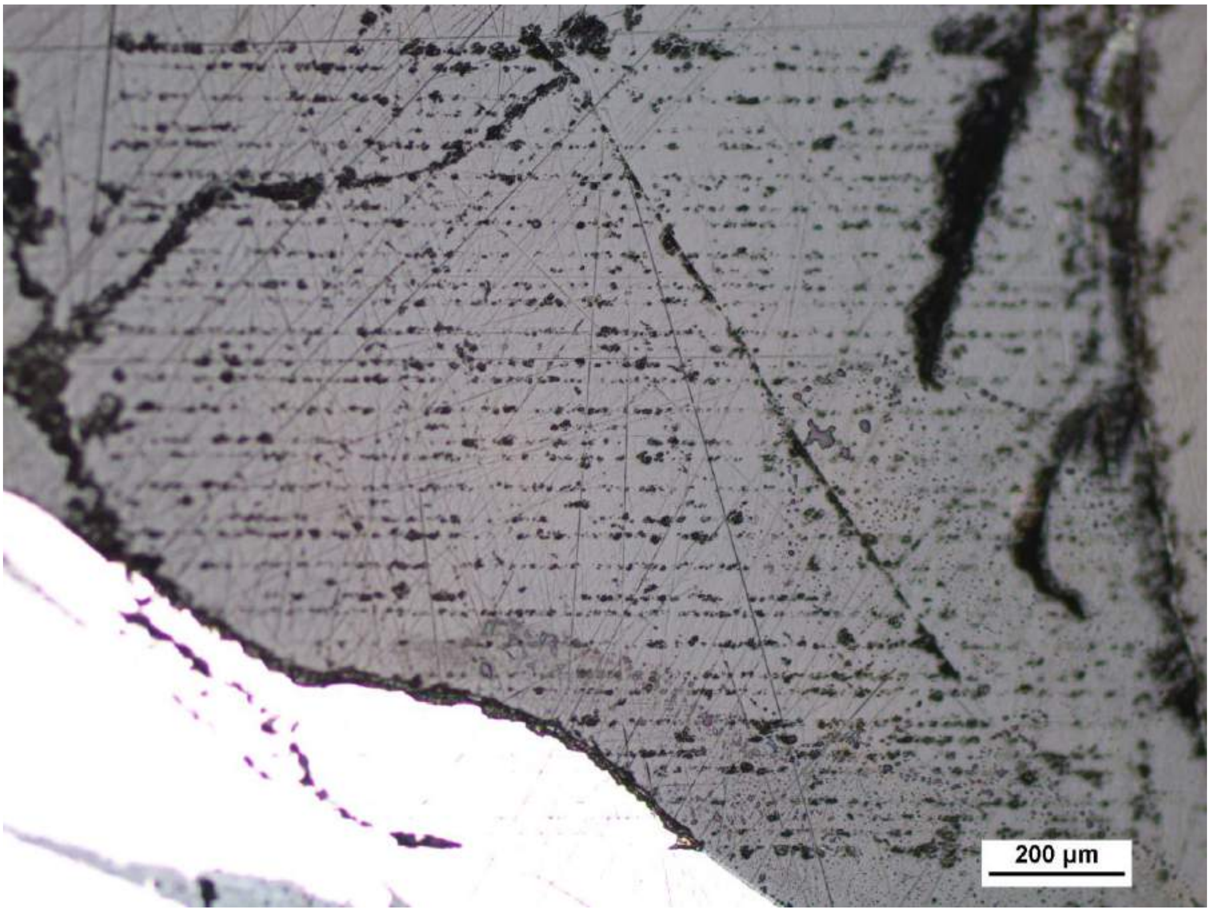


SEYMCHAN

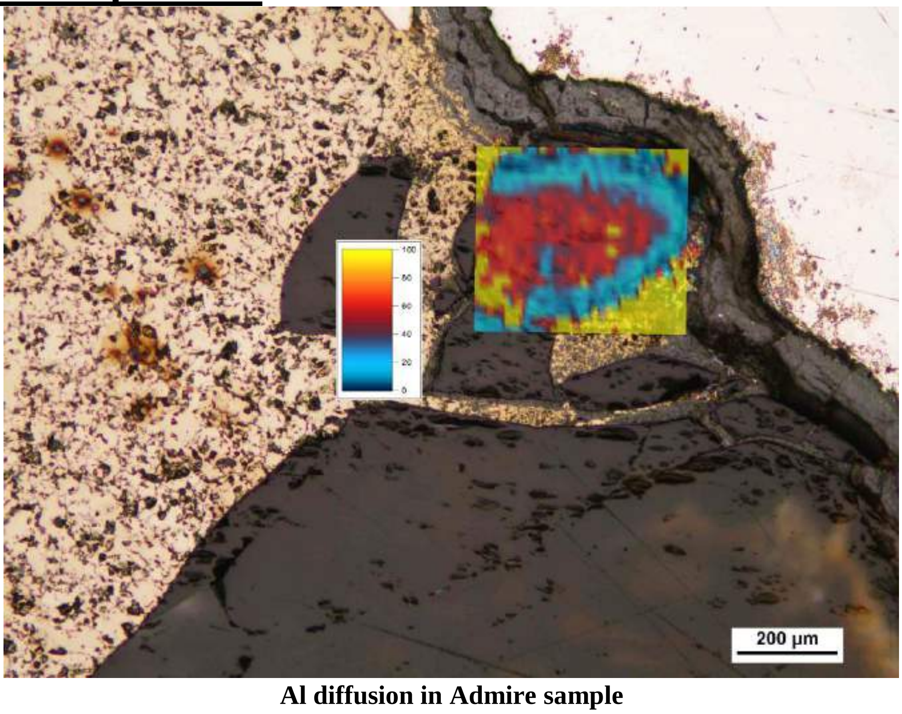


SPRINGWATER

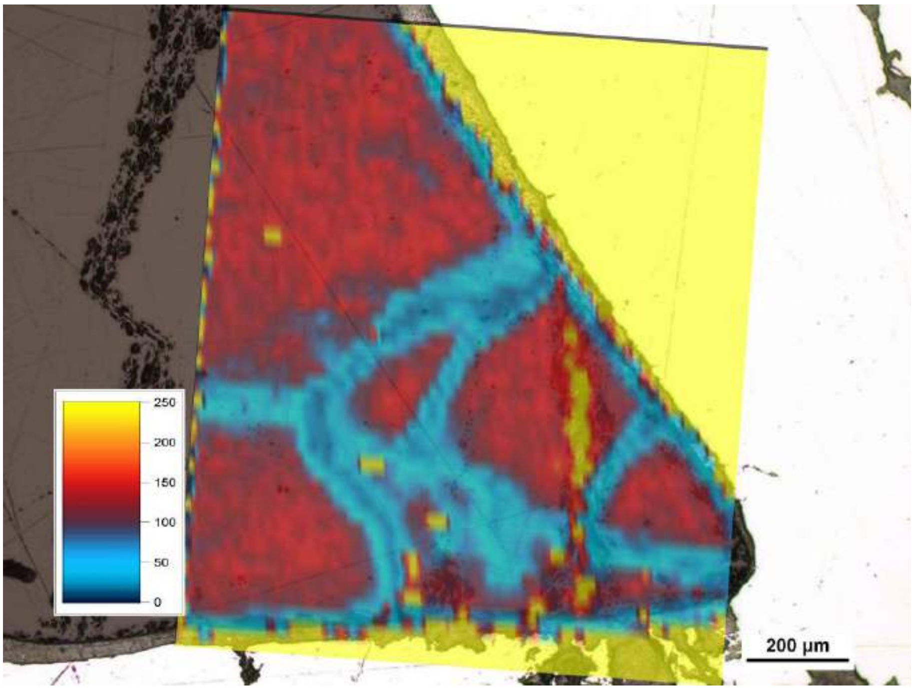


SPRINGWATER

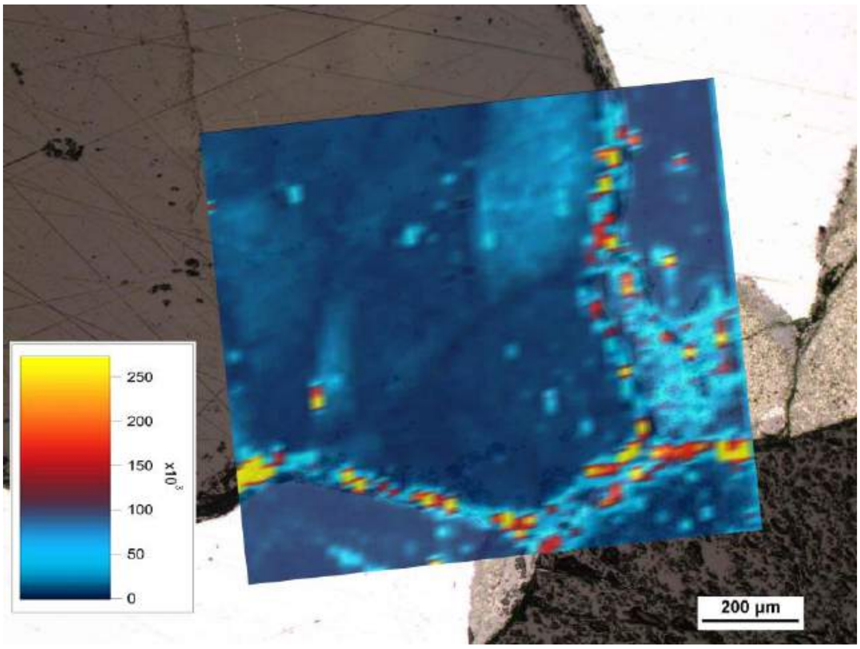
Al diffusion patterns



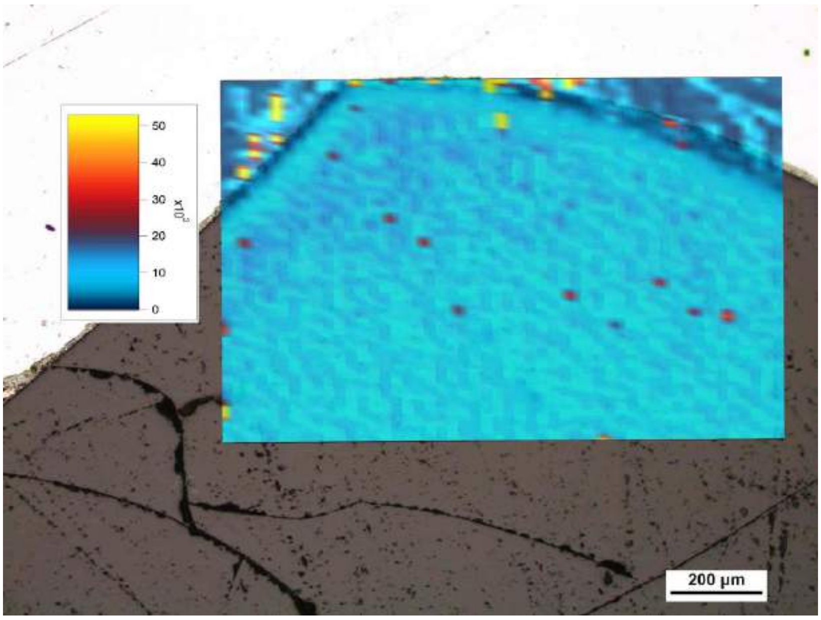
Al diffusion in Admire sample



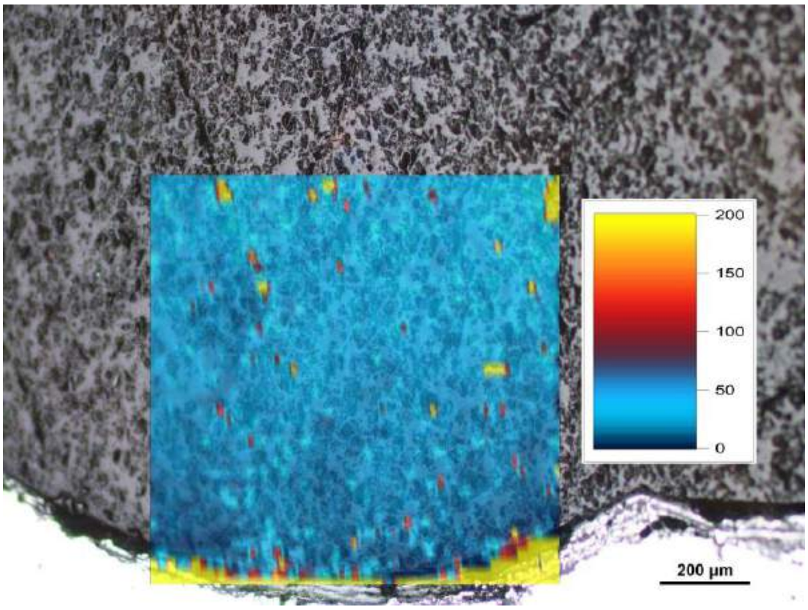
Al diffusion in Admire sample



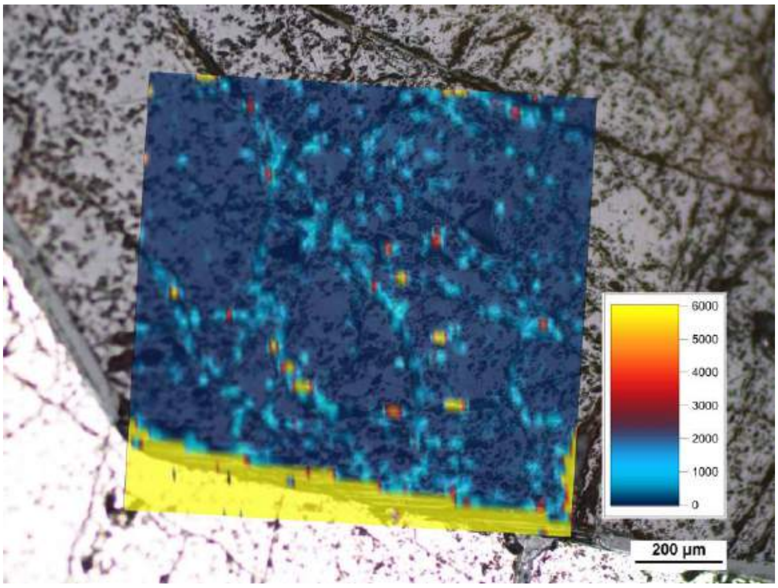
Al diffusion in Albin sample



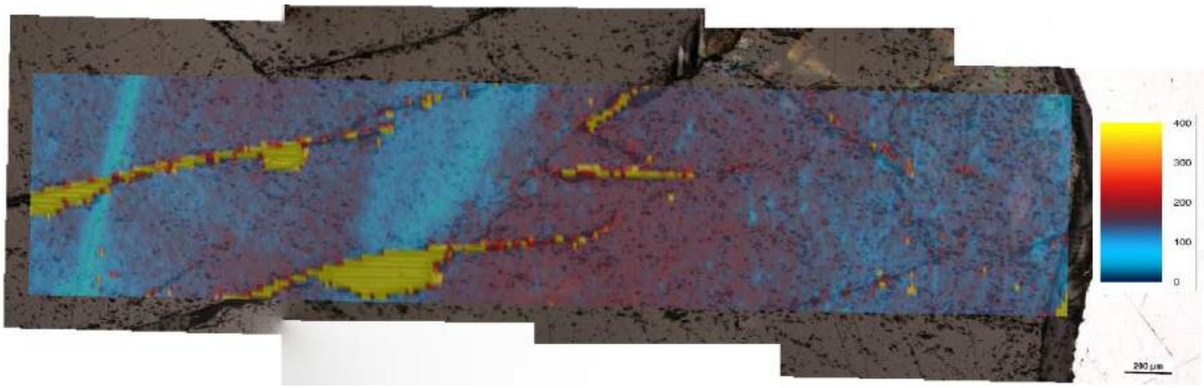
Al diffusion in Brahin sample



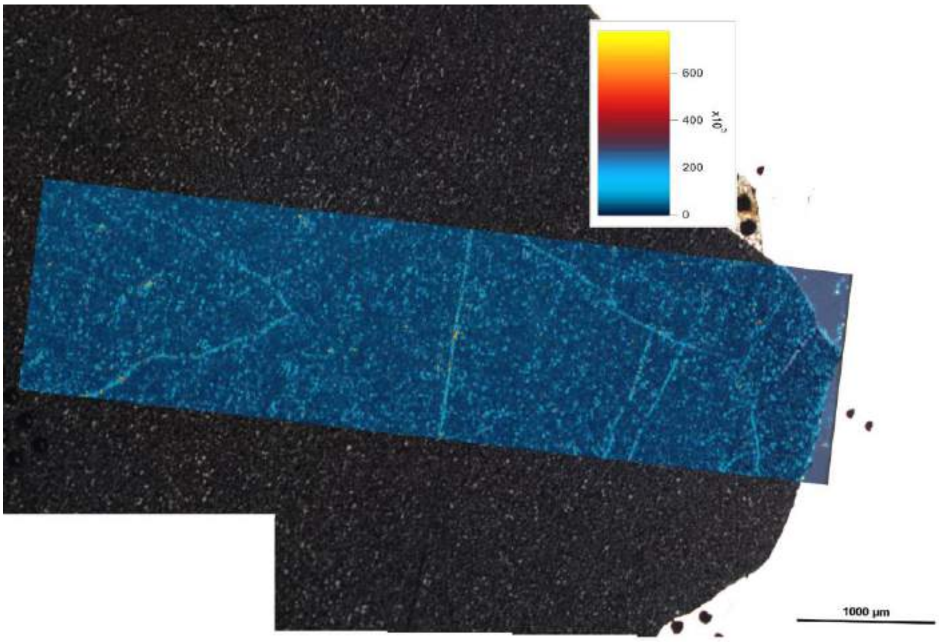
Al diffusion in Brenham sample



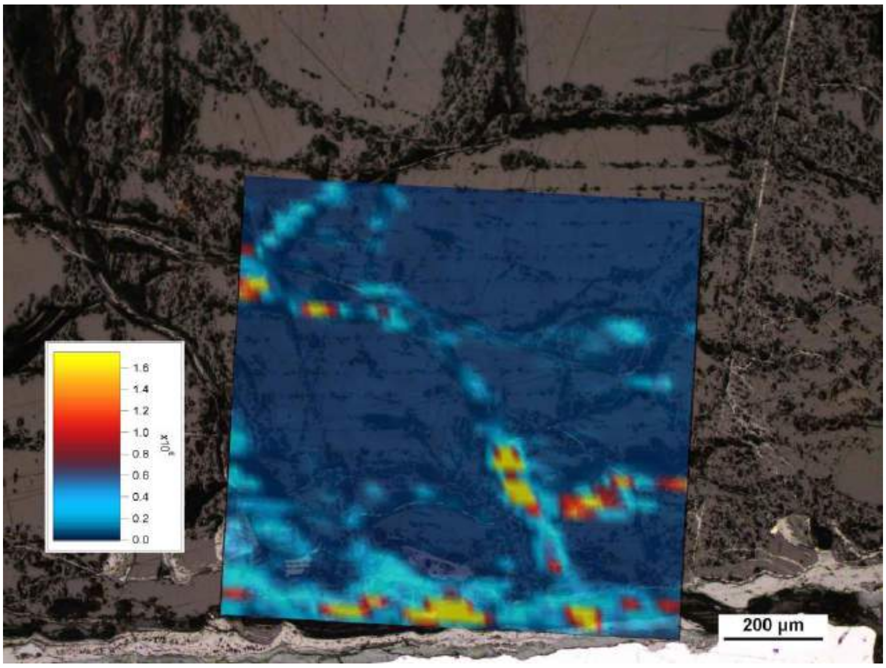
Al diffusion in Brenham sample



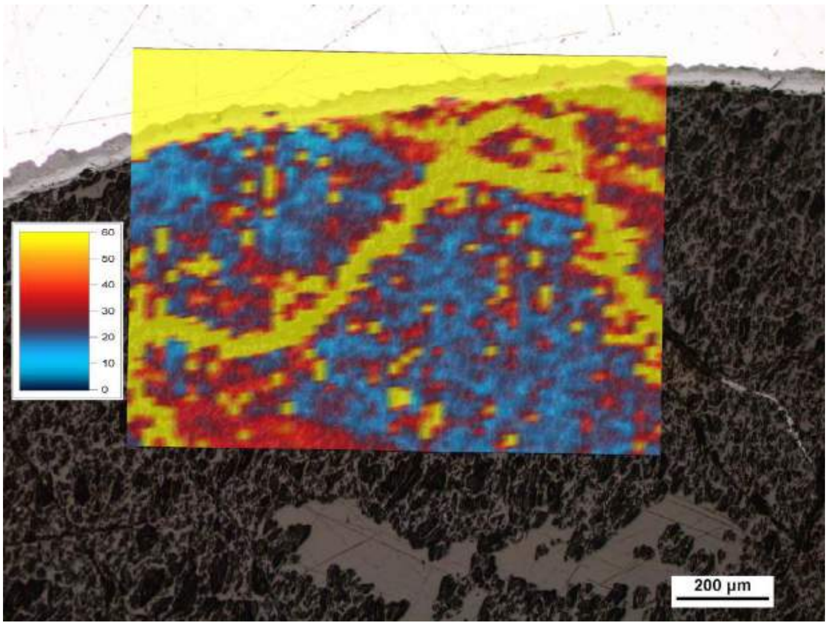
Al diffusion in Esquel sample



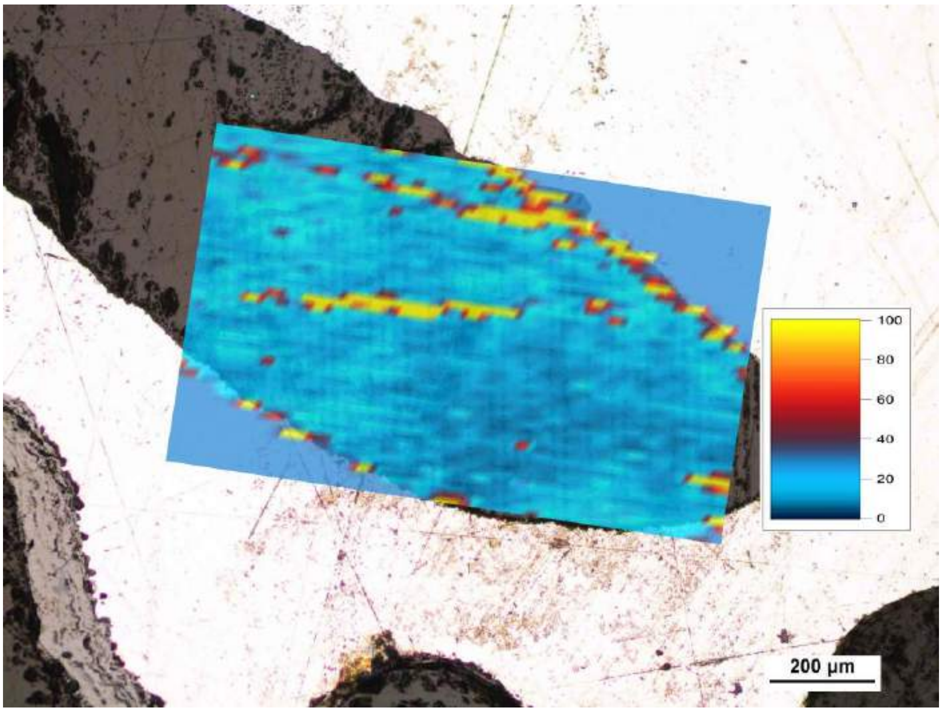
Al diffusion in Glorieta Mountains sample



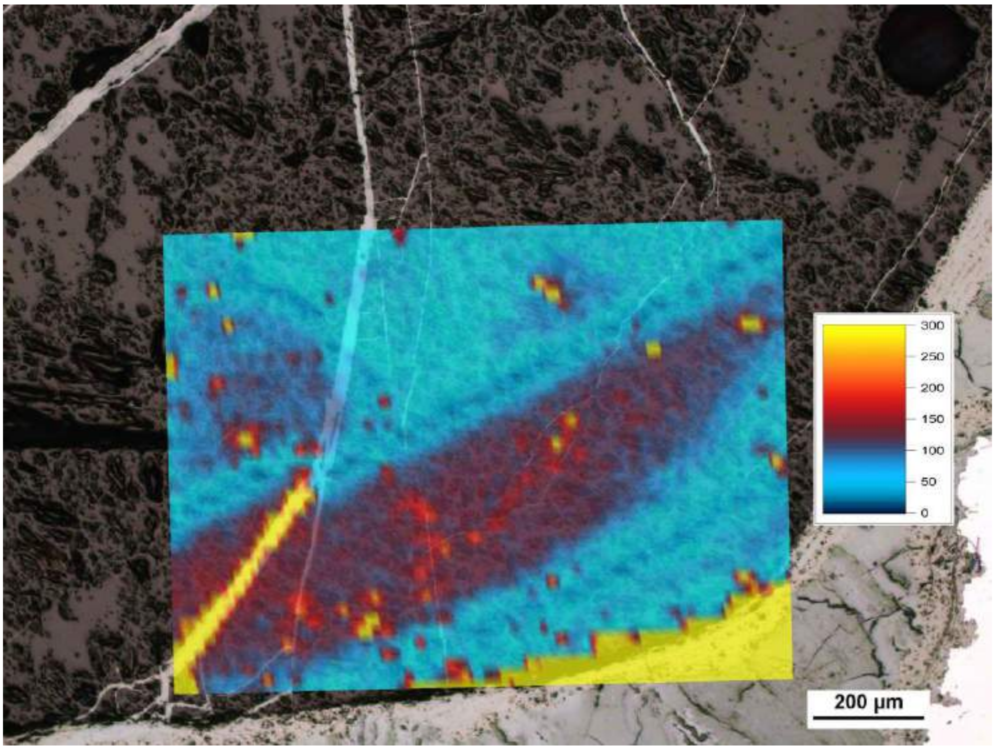
Al diffusion in Huckitta sample



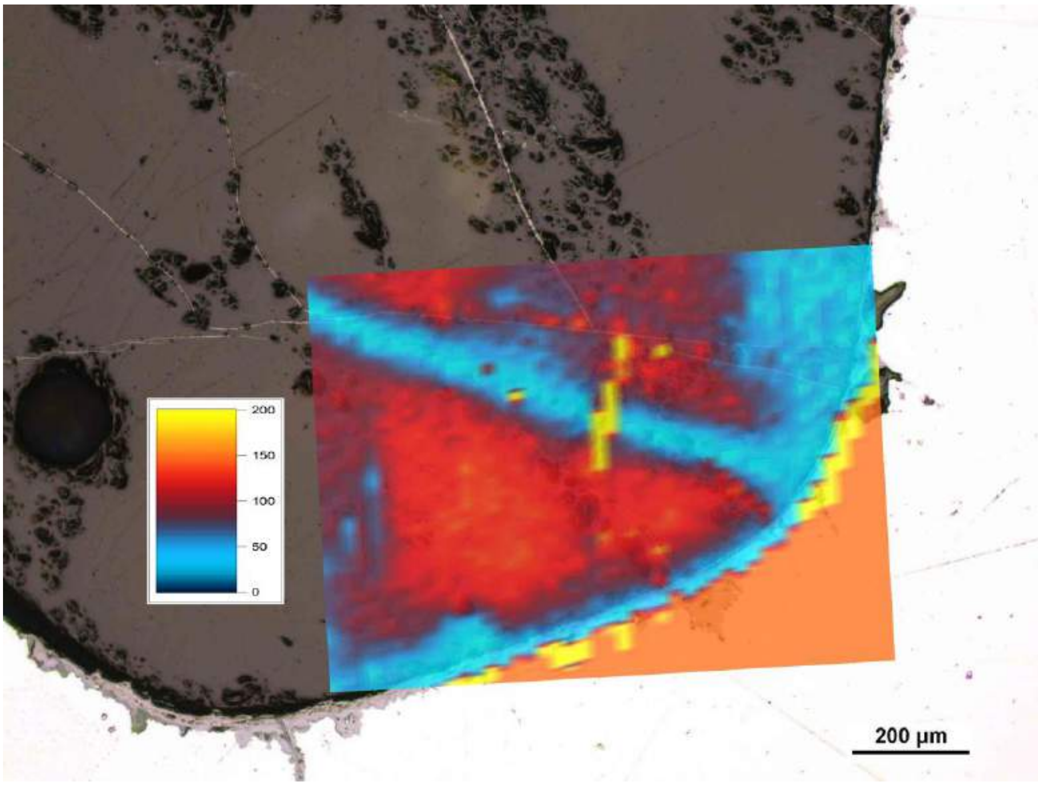
Al diffusion in Imilac sample



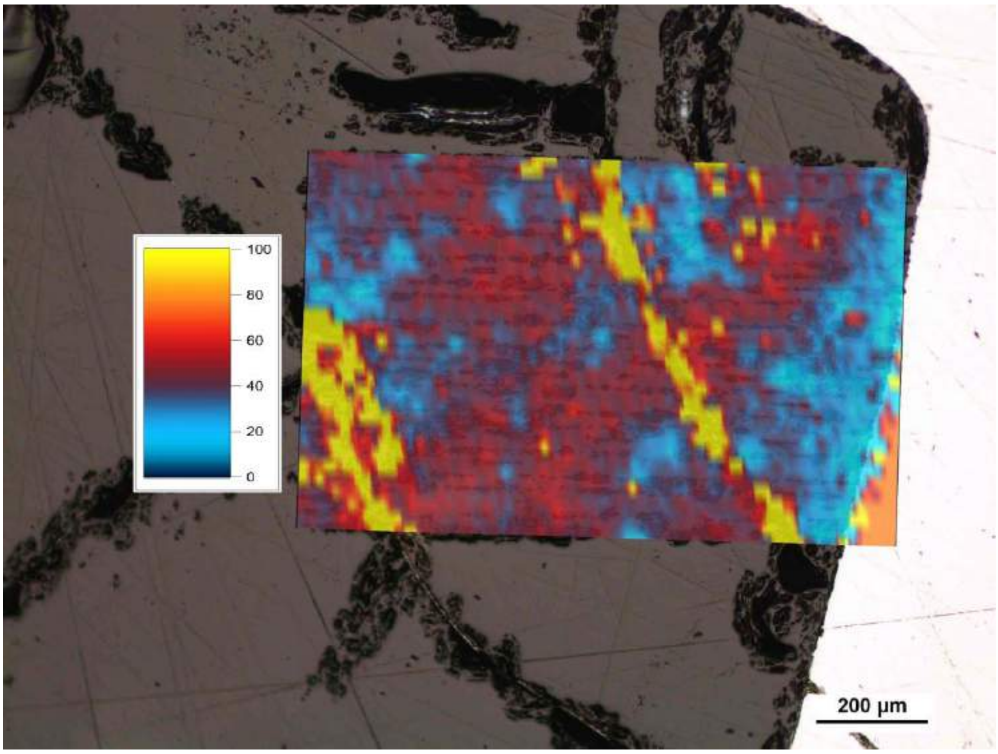
Al diffusion in Imilac sample



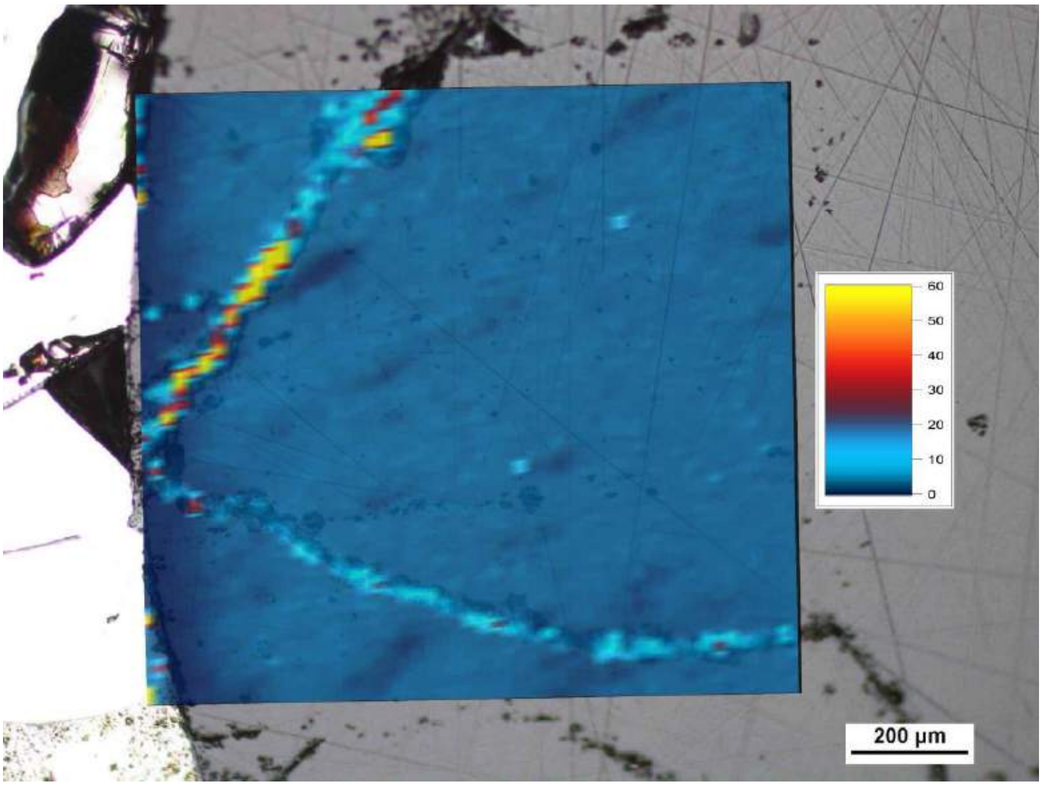
Al diffusion in NWA sample



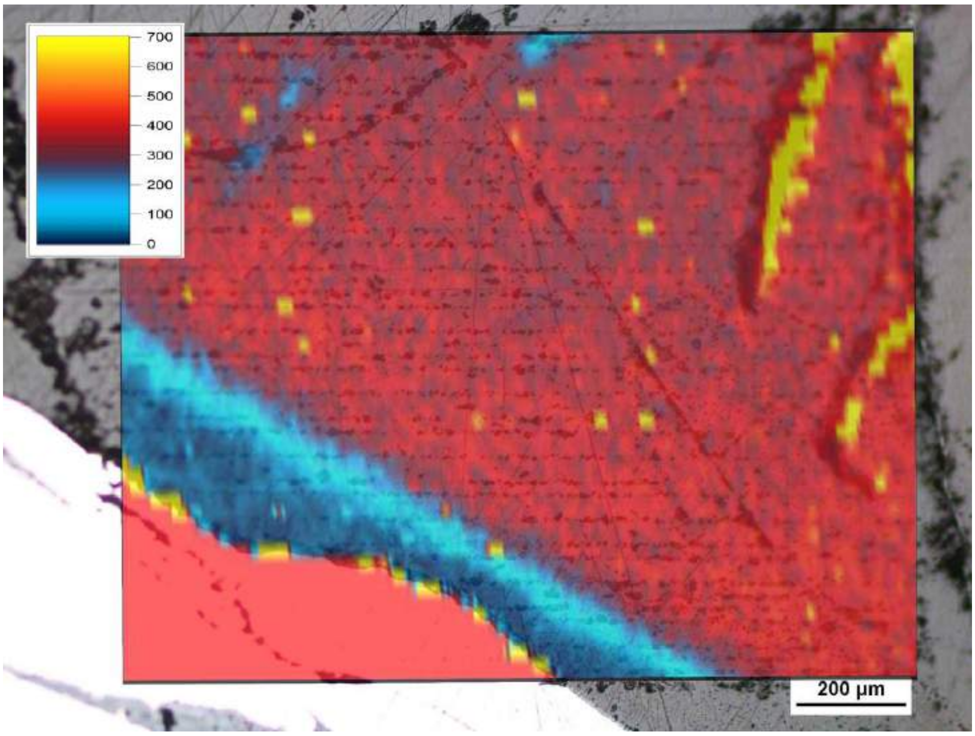
Al diffusion in NWA sample



Al diffusion in Seymchan sample

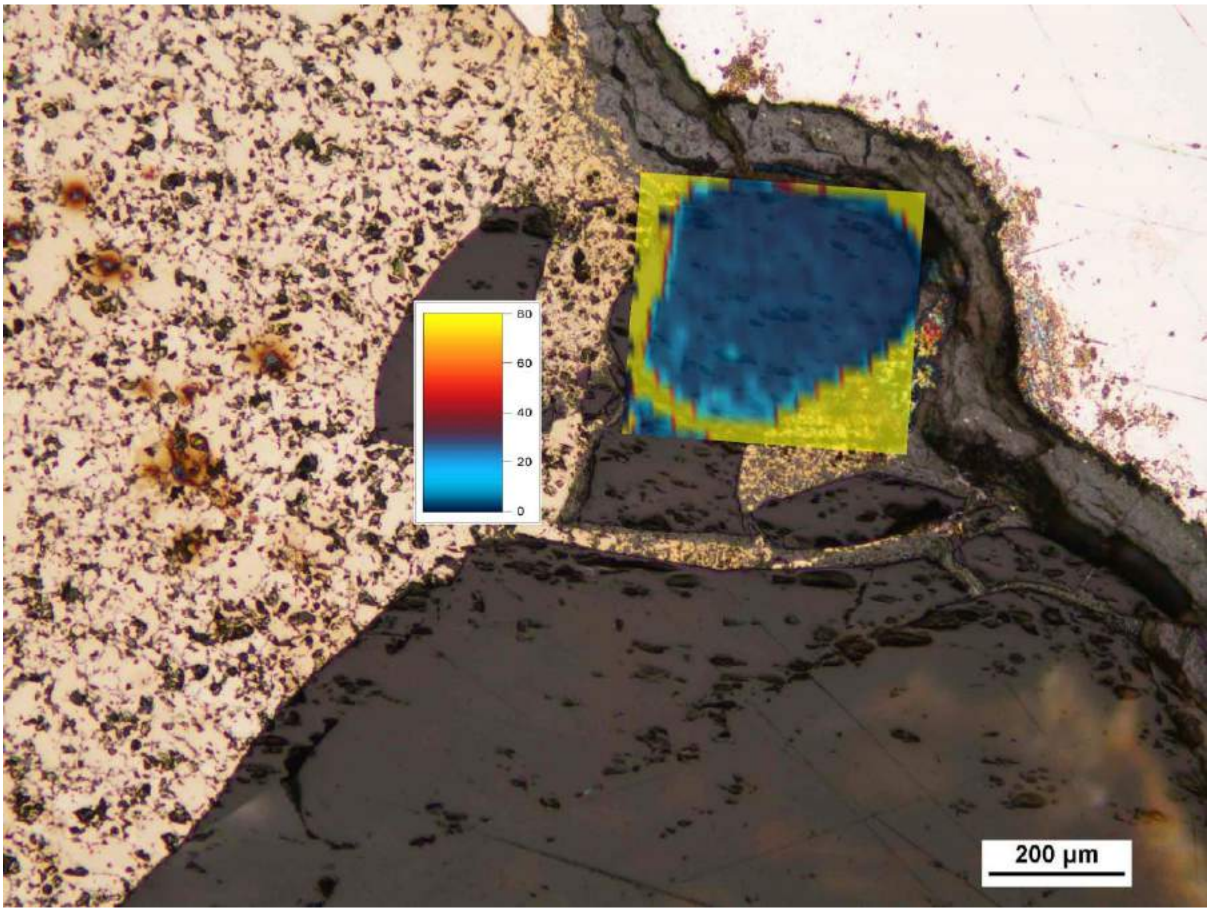


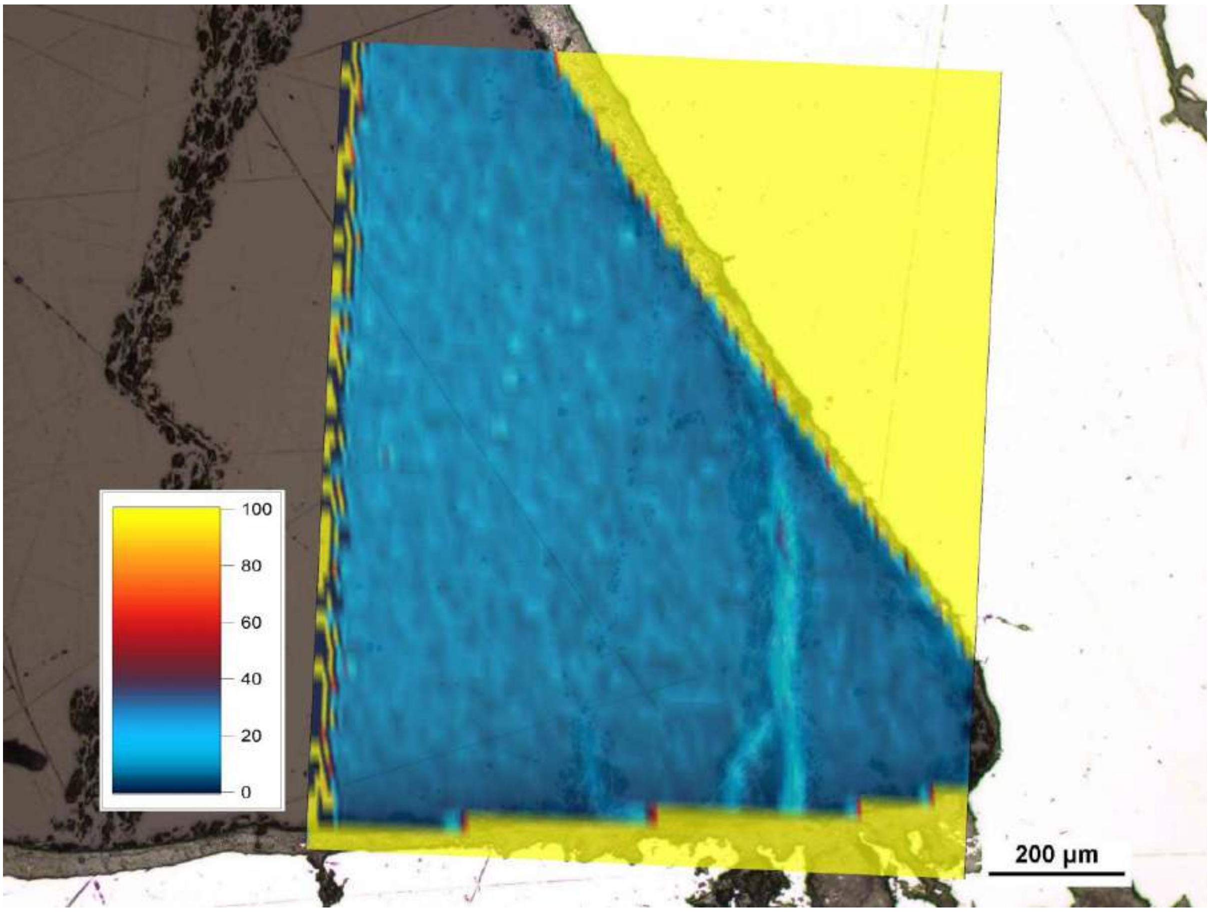
Al diffusion in Springwater sample

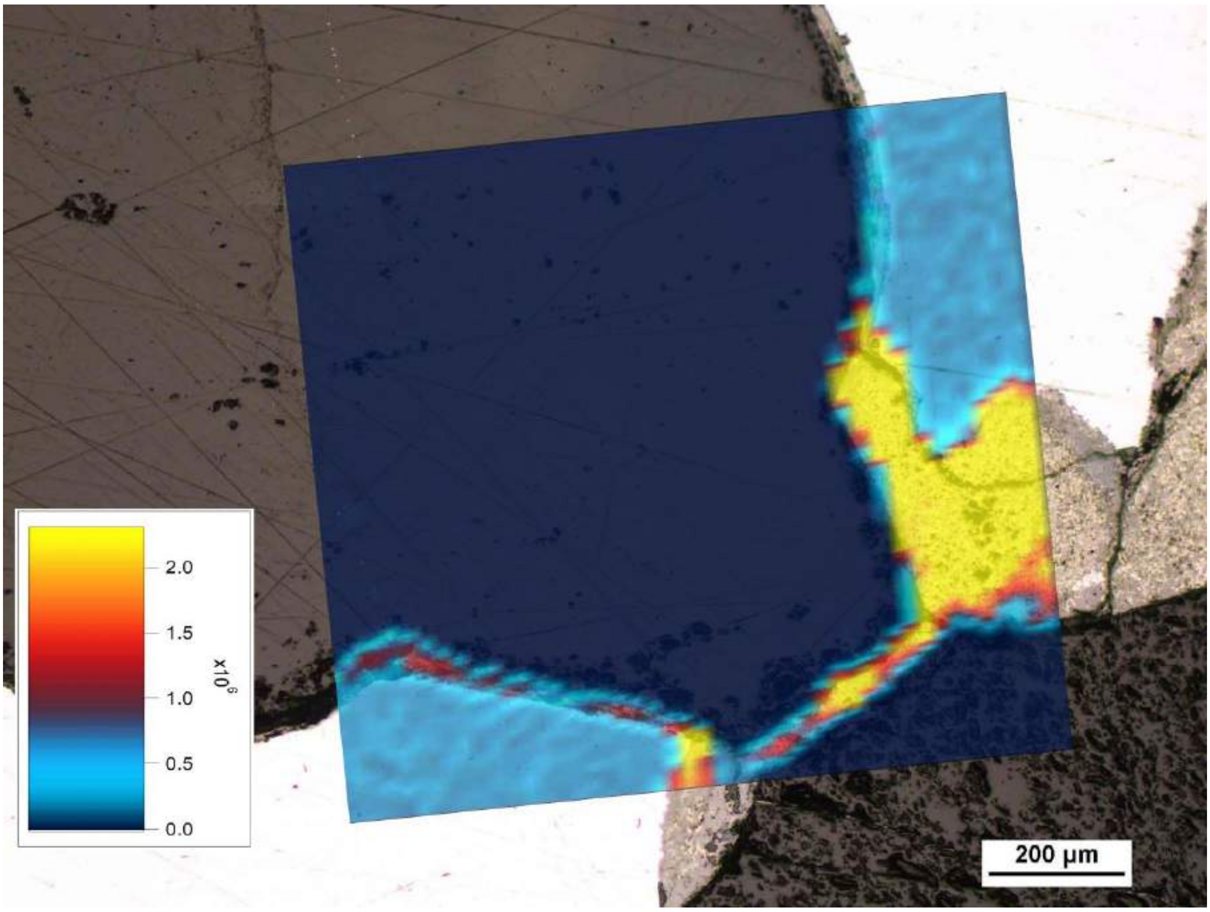


Al diffusion in Springwater sample

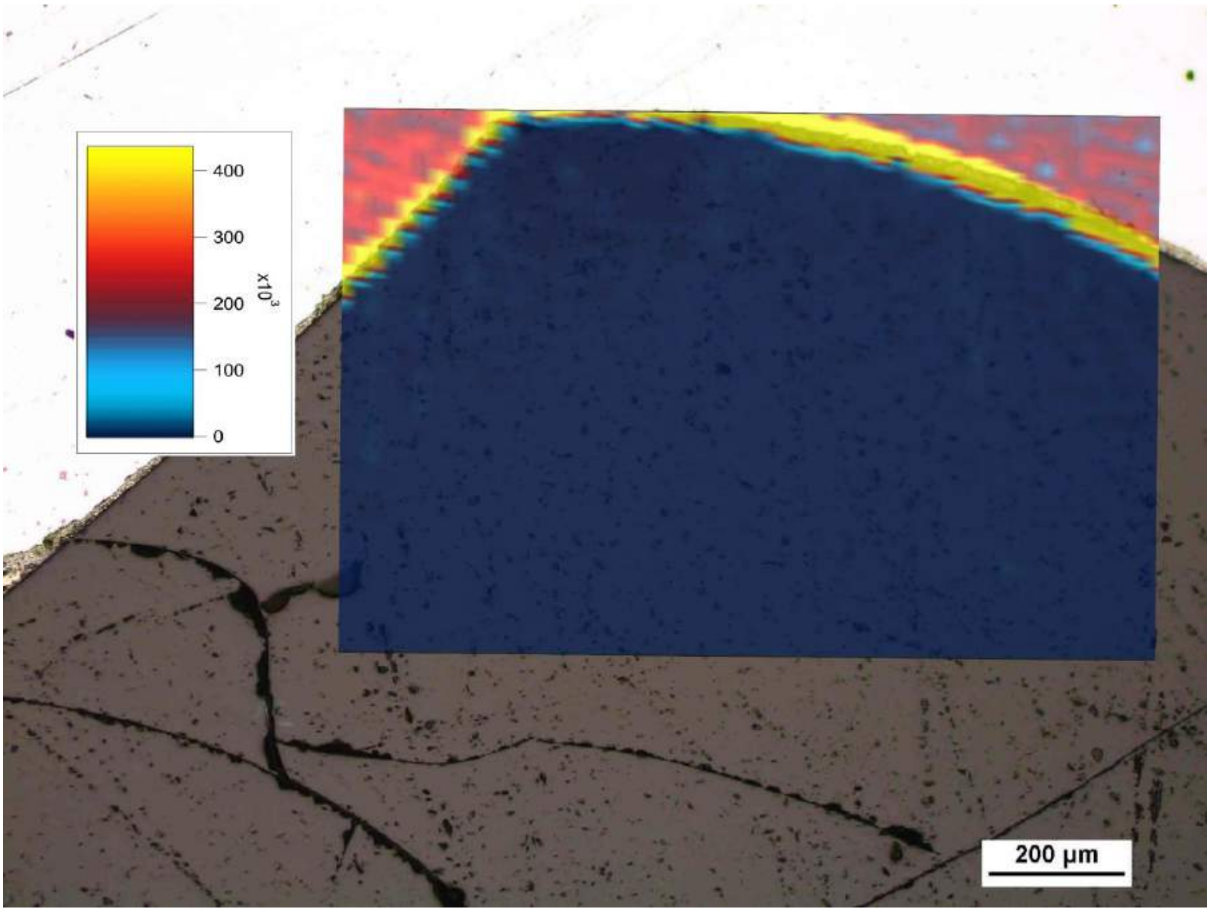
Co Diffusion patterns

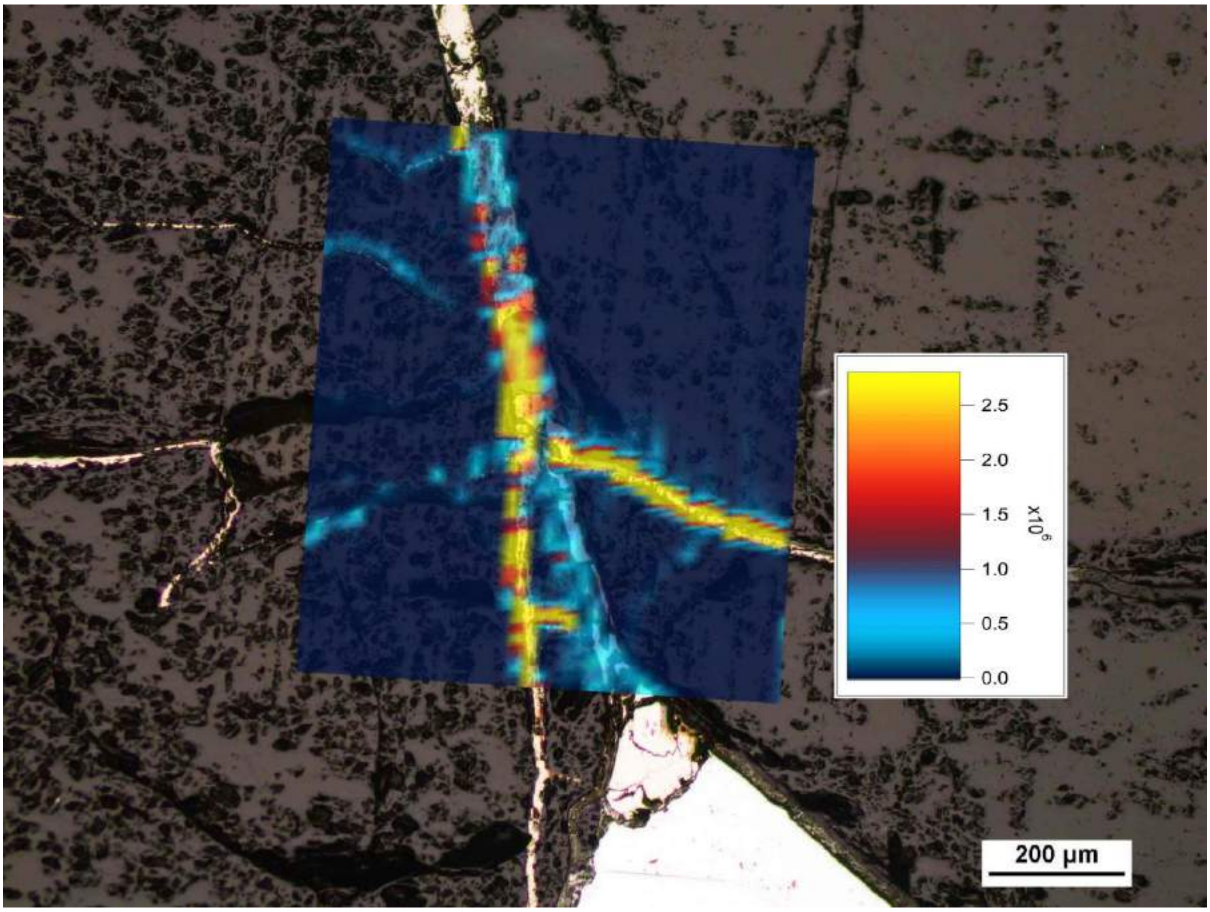

80
60
40
20
0
200 µm

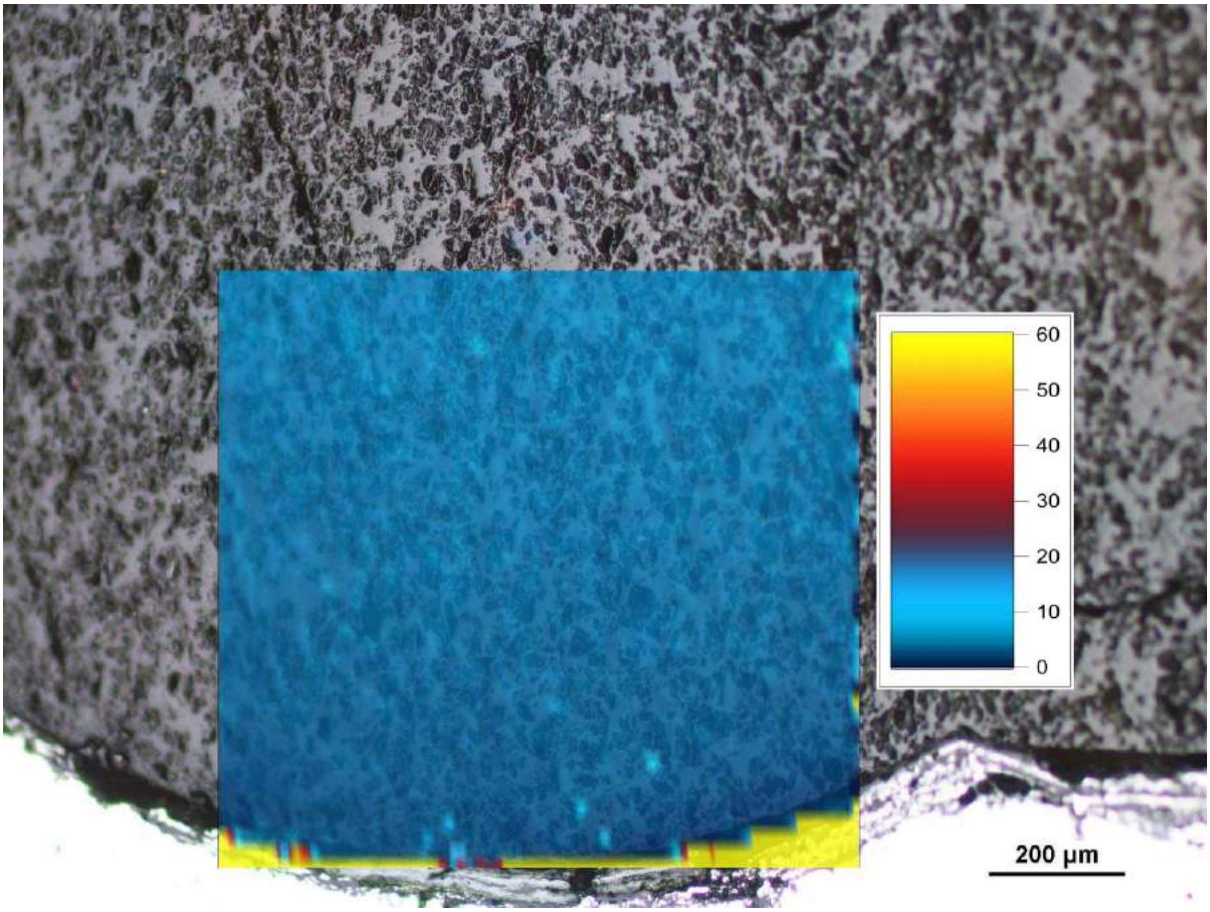

100
80
60
40
20
0
200 µm



2.0
1.5
1.0
0.5
0.0
x10^6
200 µm


400
300
200
100
0
x10^3
200 µm


2.5
2.0
1.5
1.0
0.5
0.0
x10^6
200 µm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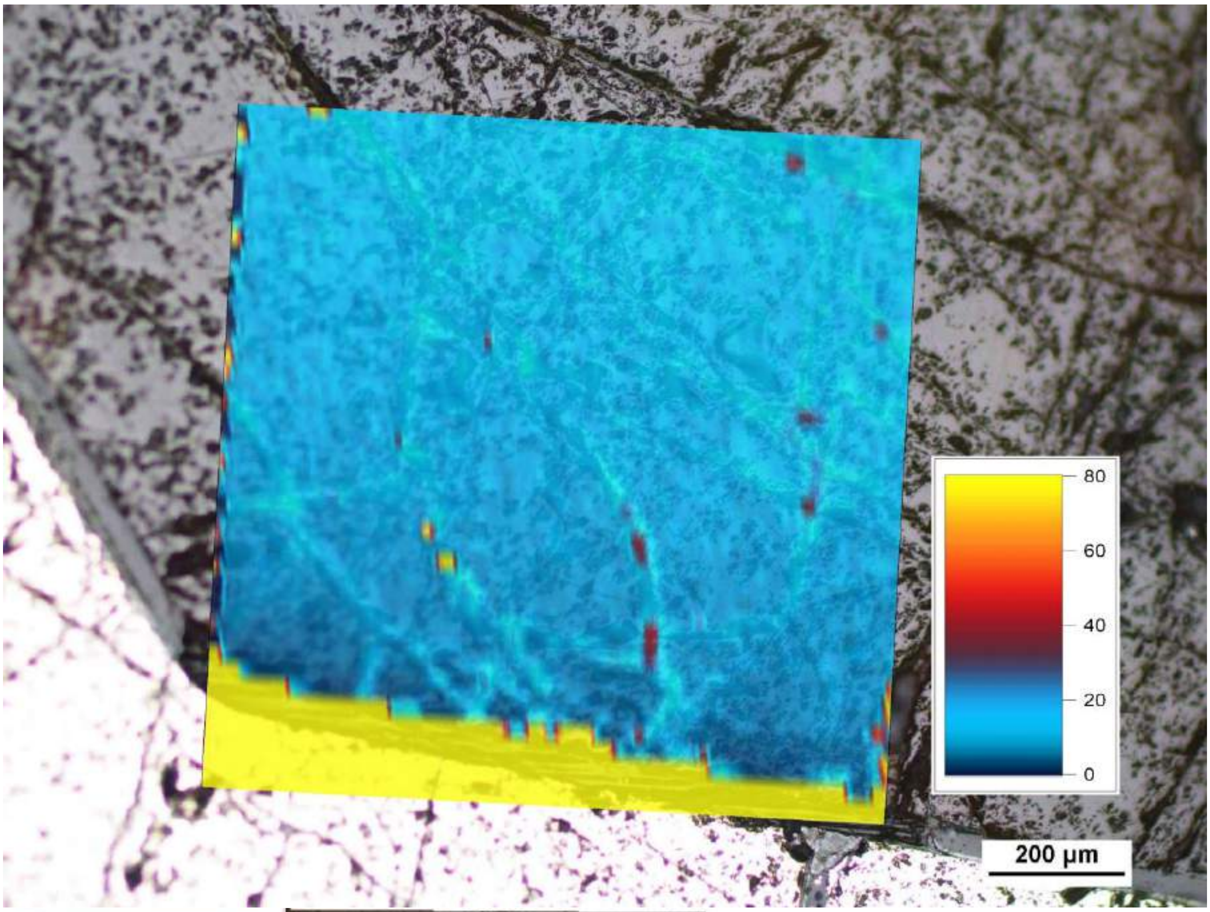
50
40
30
20
10
0
200 µm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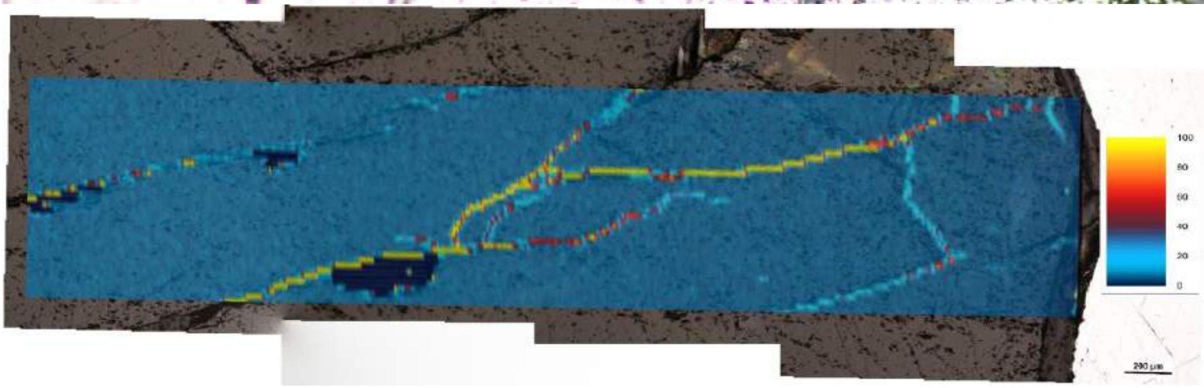
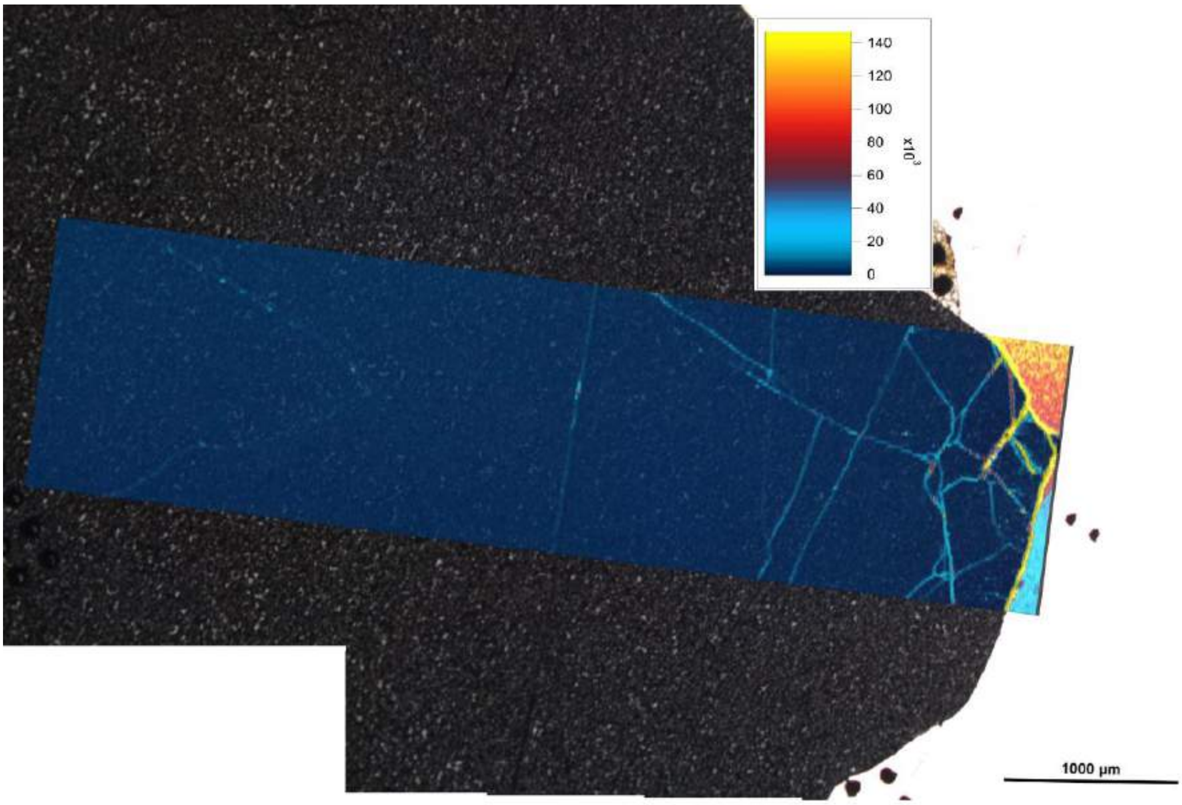
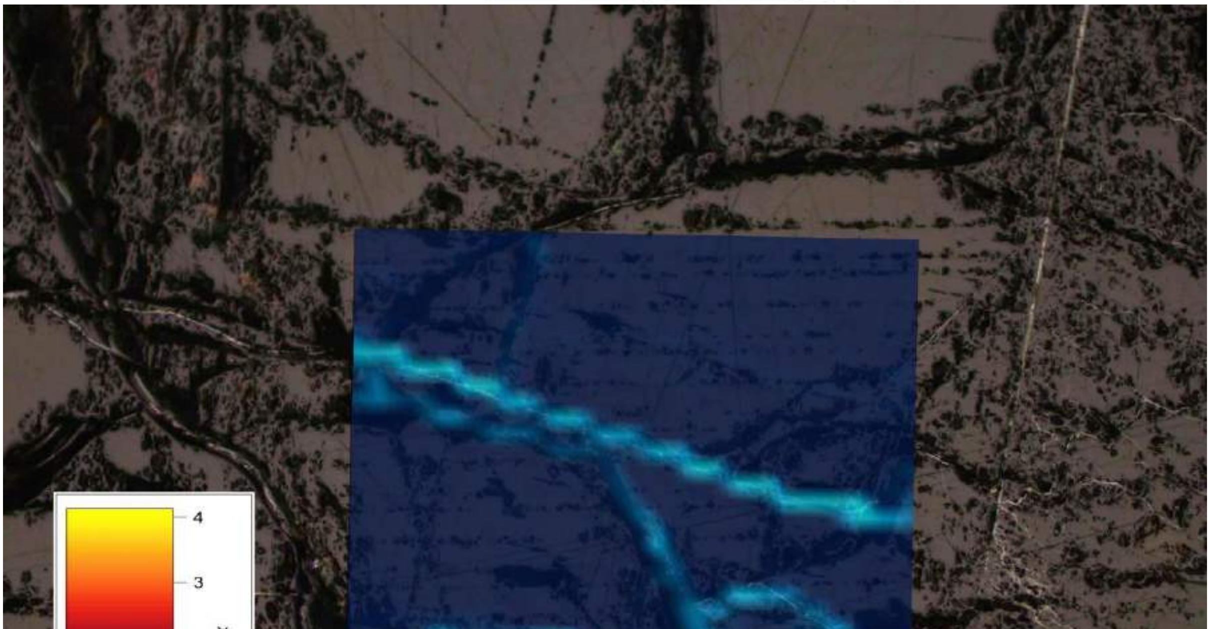
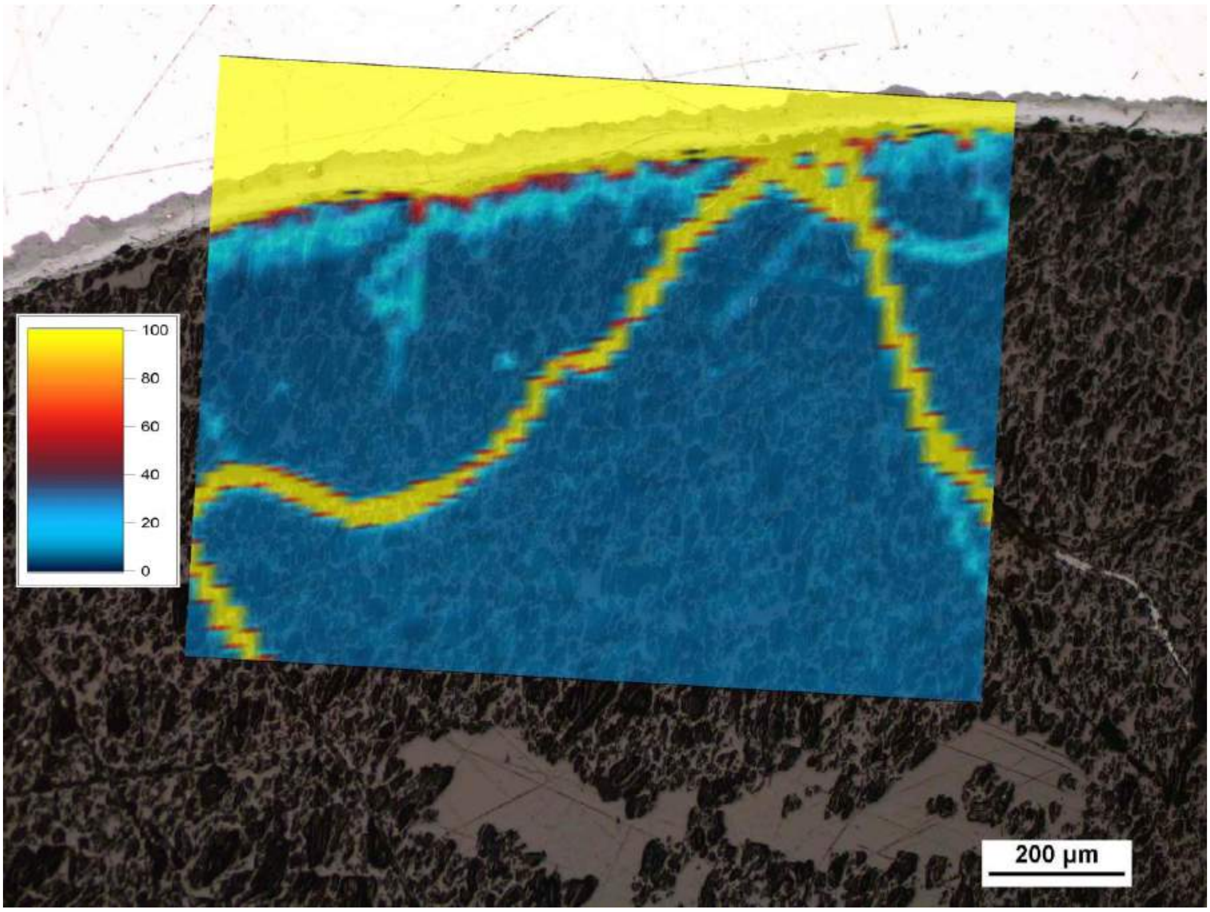
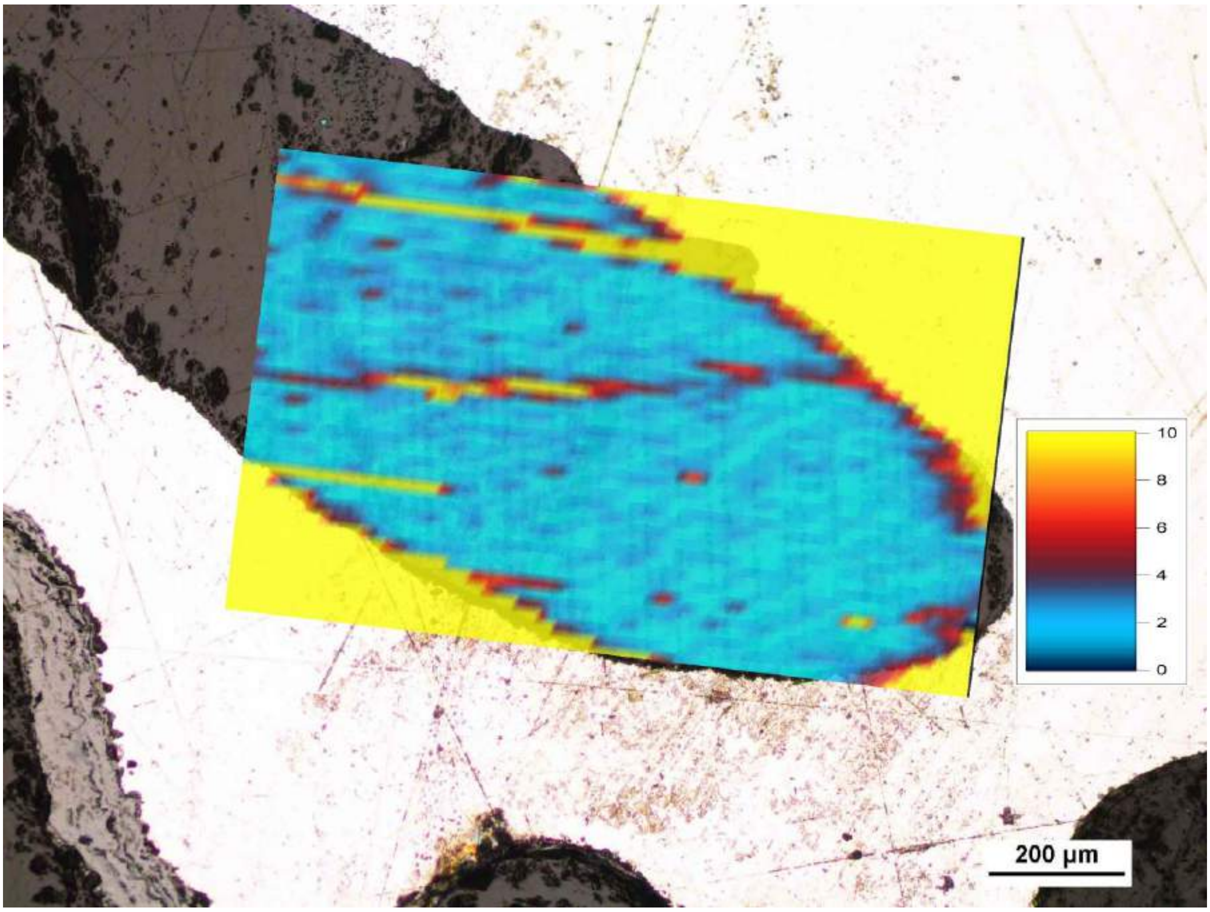
60
40
20
0
200 µm

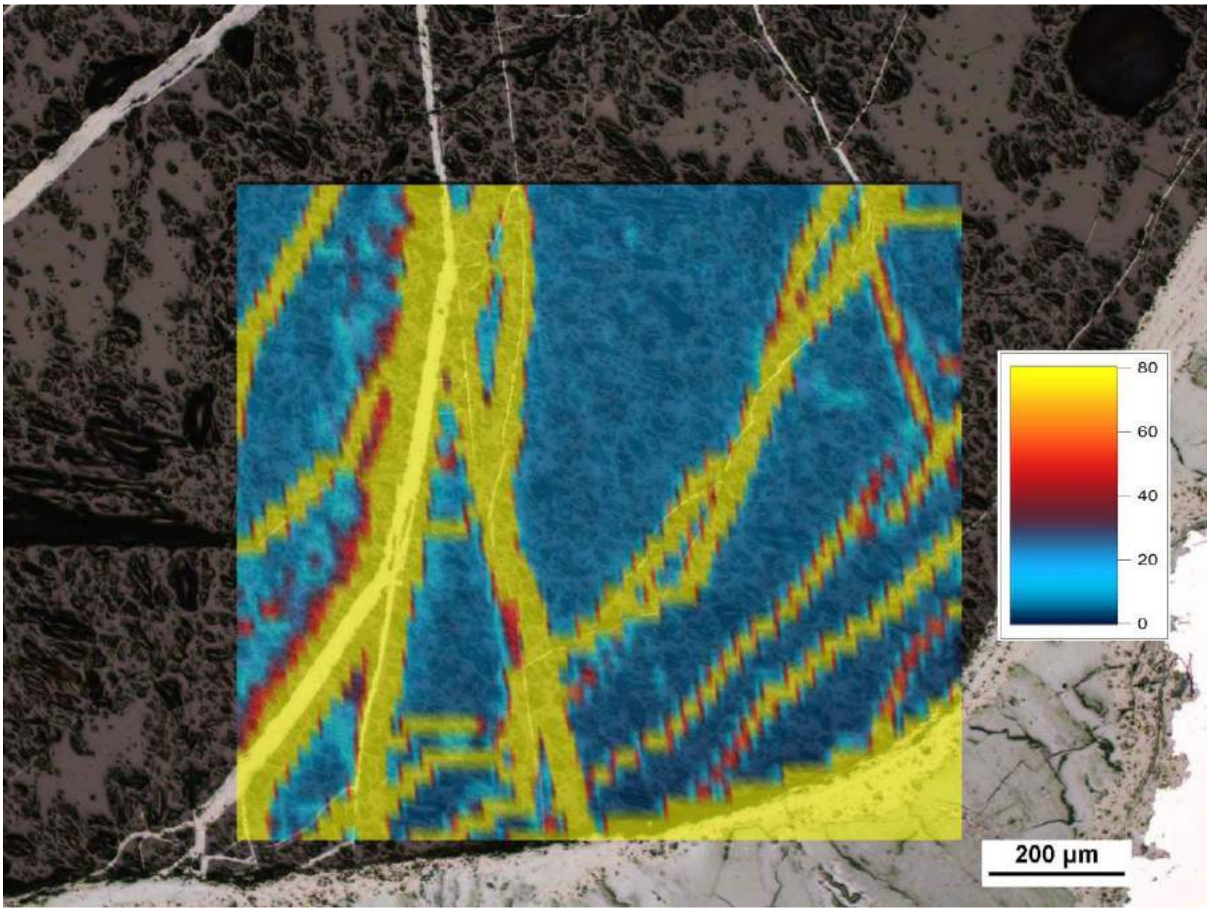

100
80
60
40
20
0

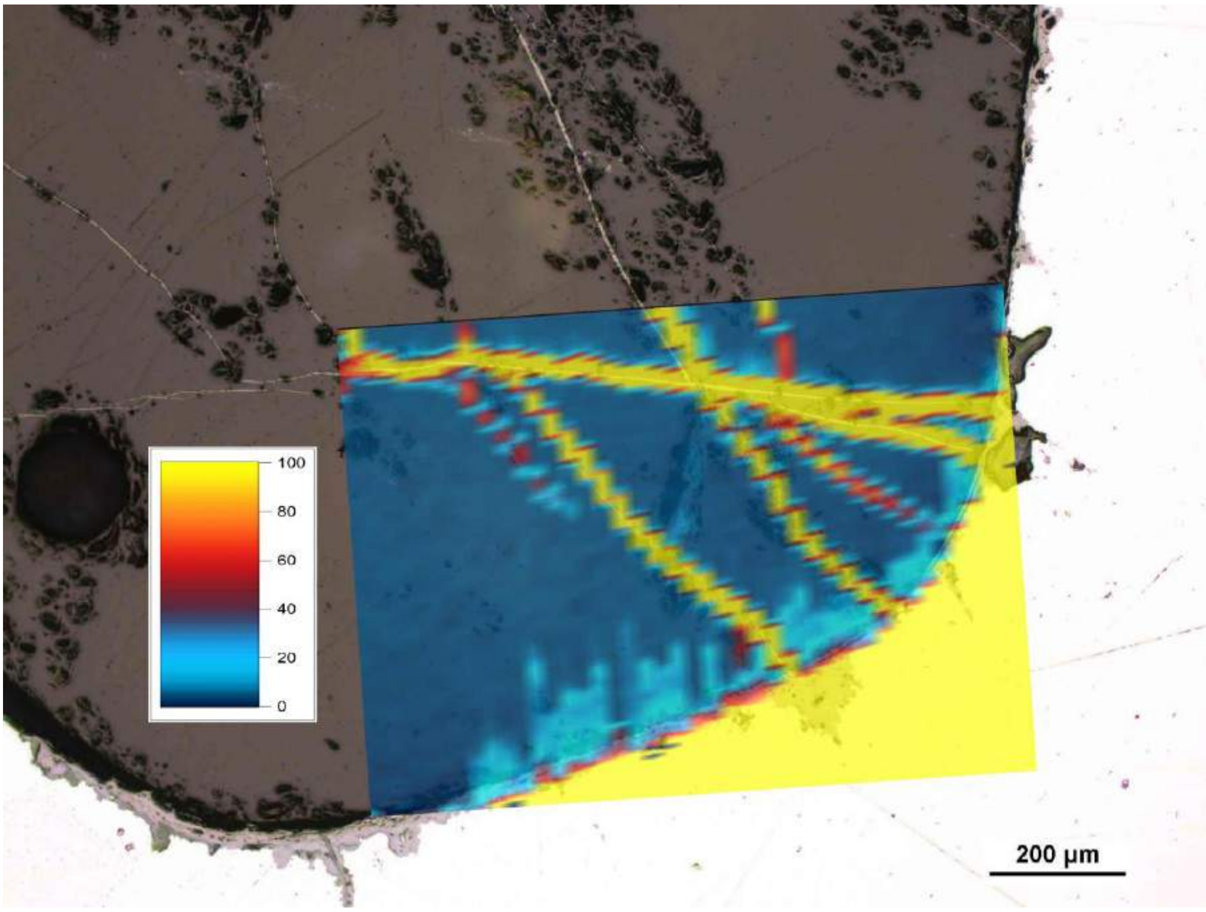

140
120
100
80
60
40
20
0
x10^3
1000 µm

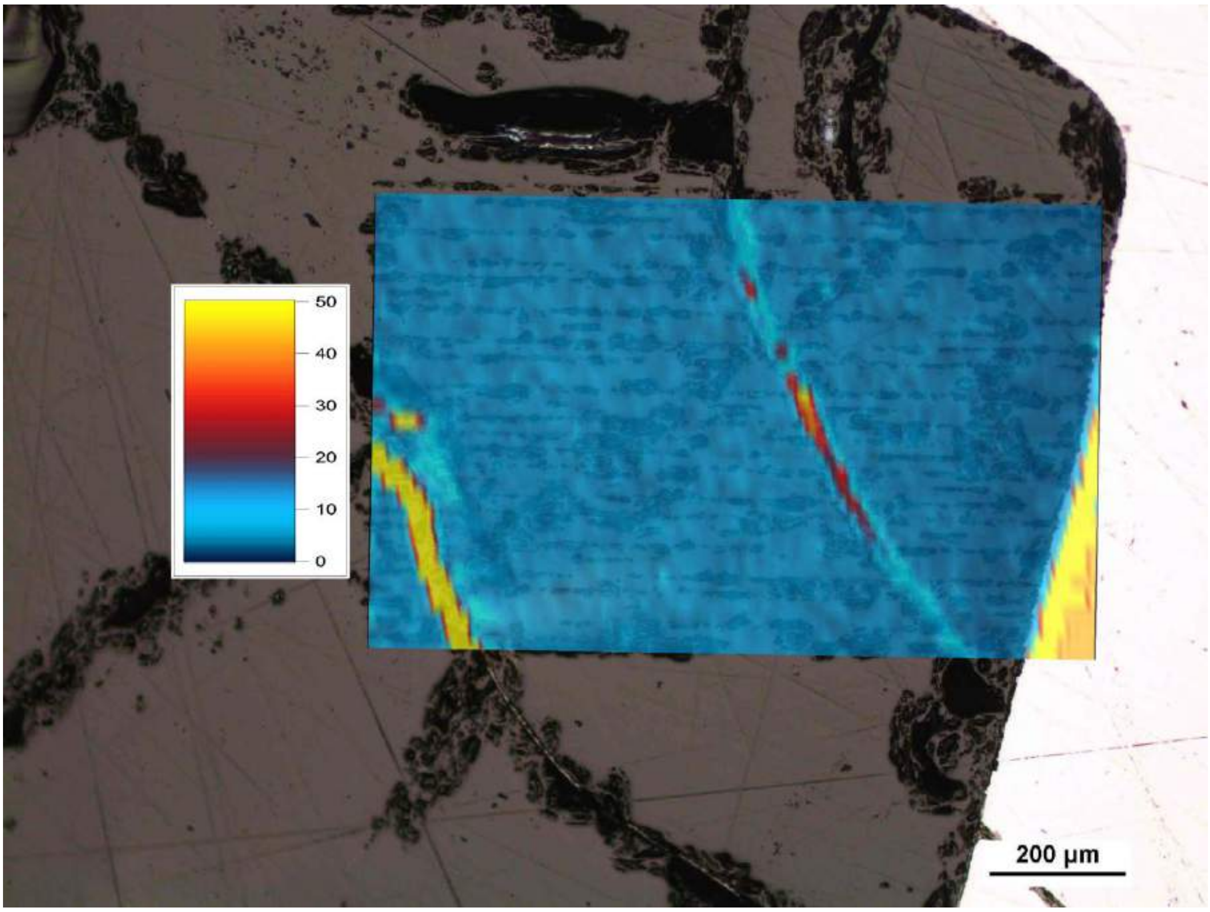

4
3
2
1
0
x10^6
200 µm


100
80
60
40
20
0
200 µm

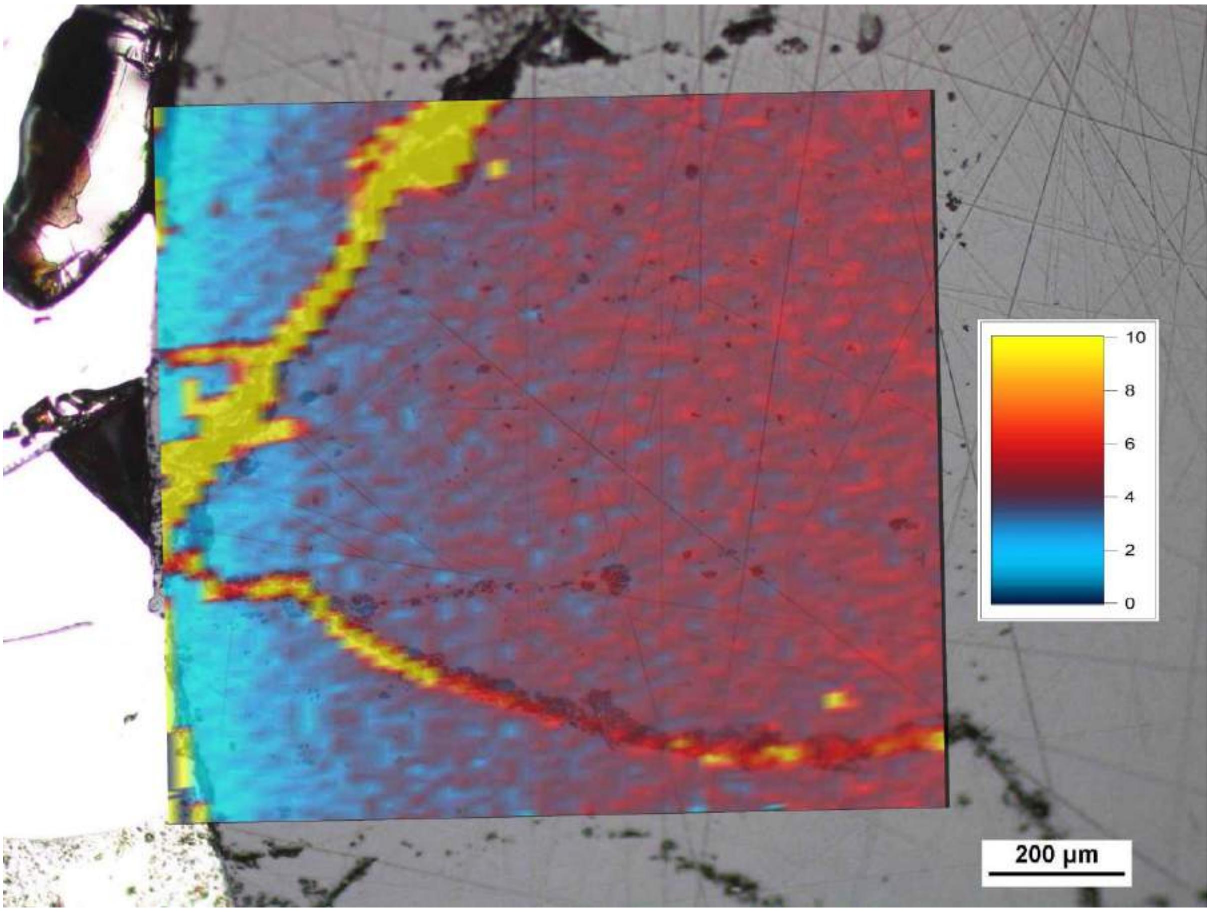

10
8
6
4
2
0
200 µm

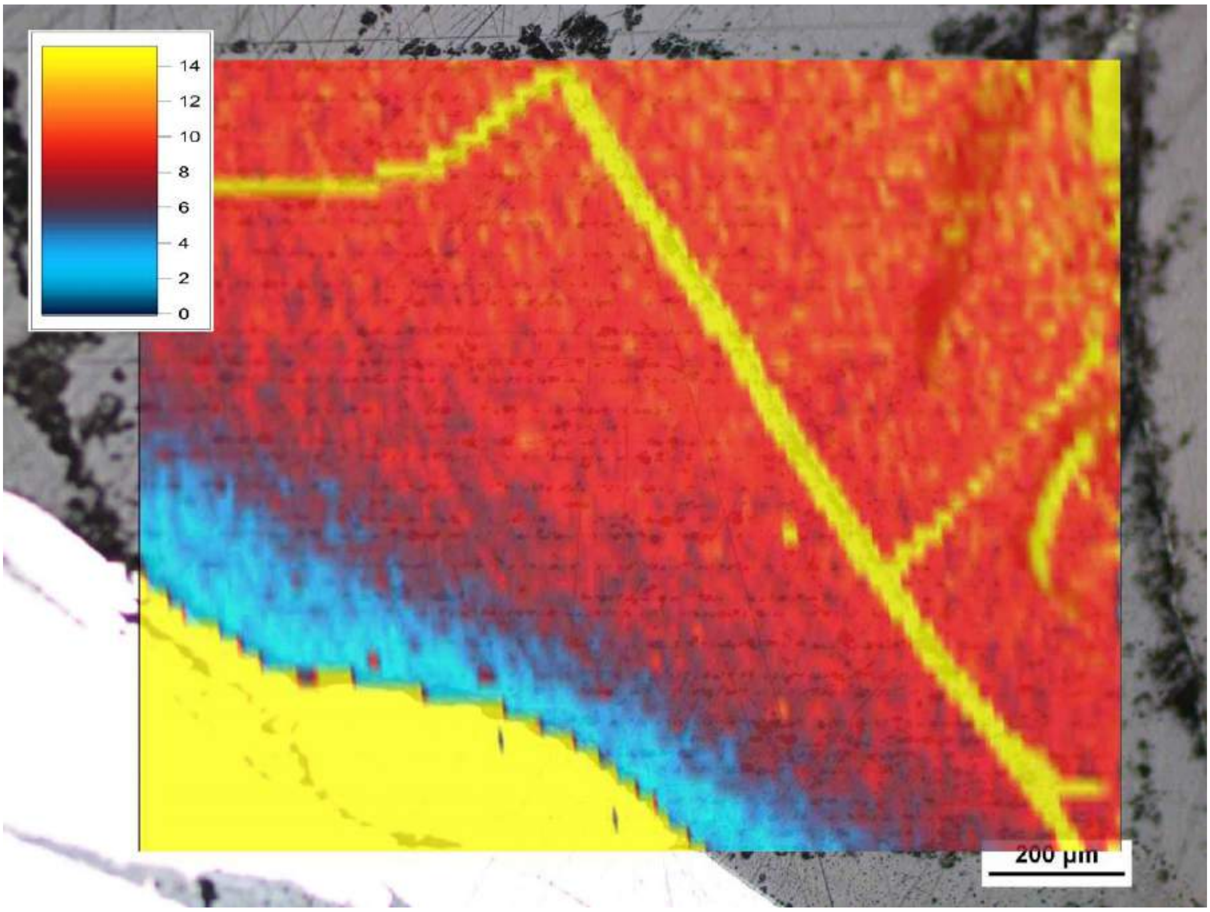

80
60
40
20
0
200 µm


100
80
60
40
20
0
200 µm

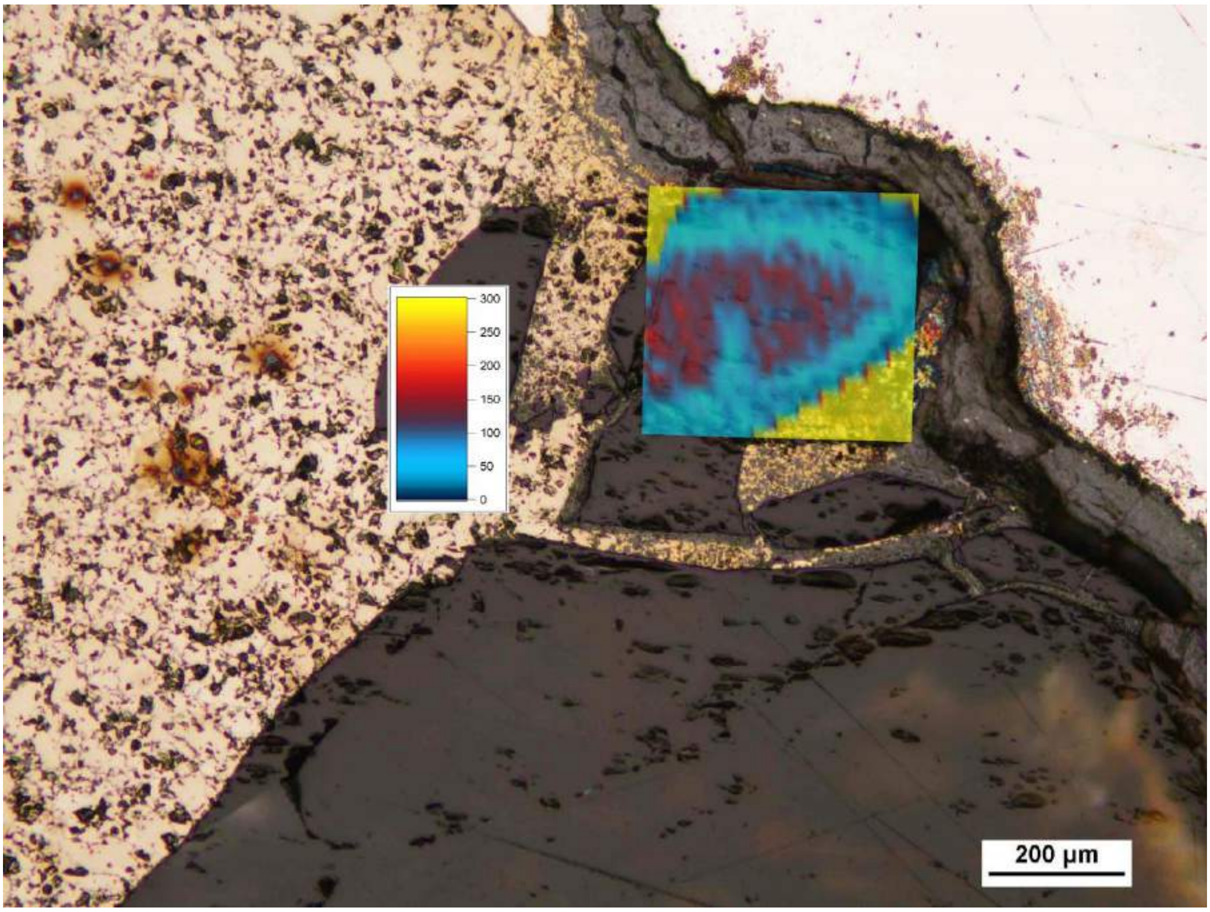


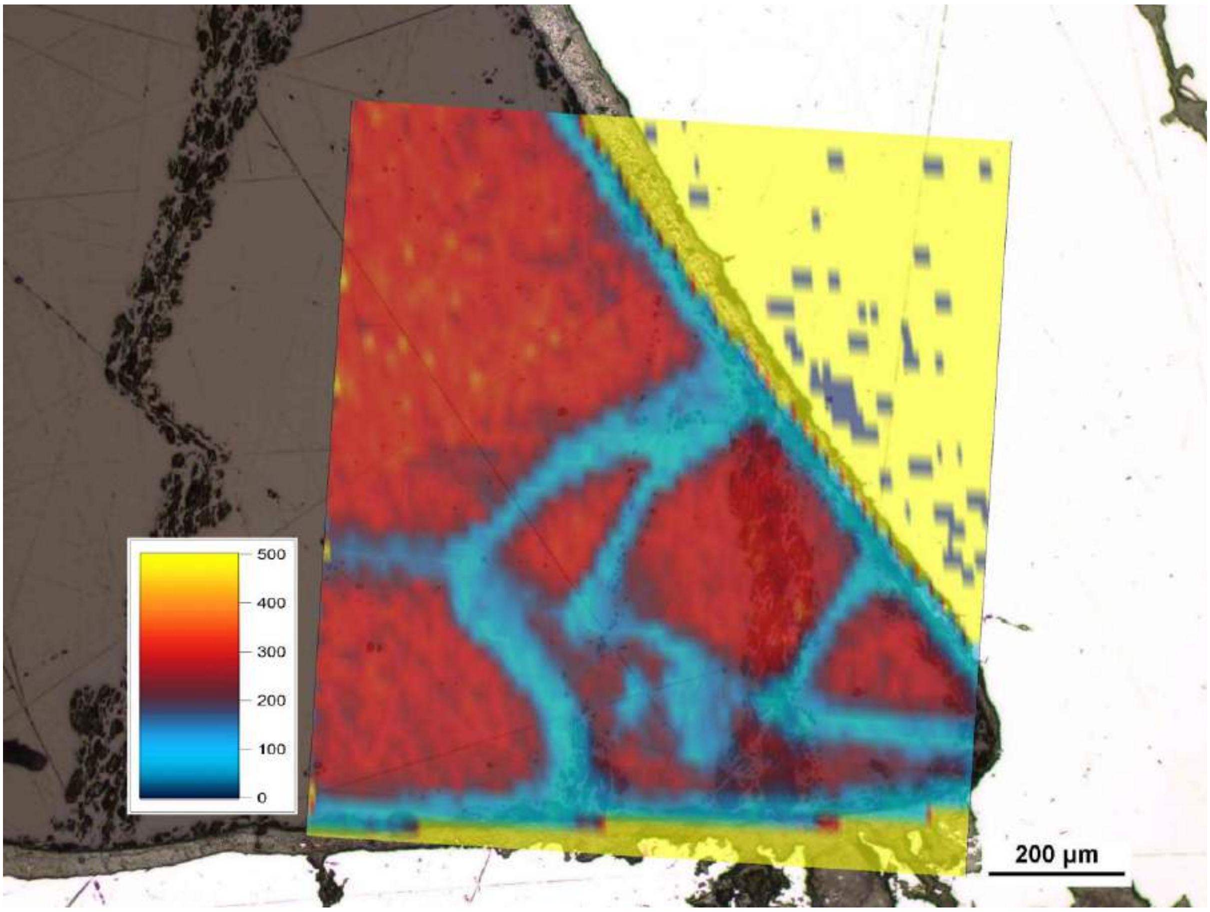
50
40
30
20
10
0
200 µm

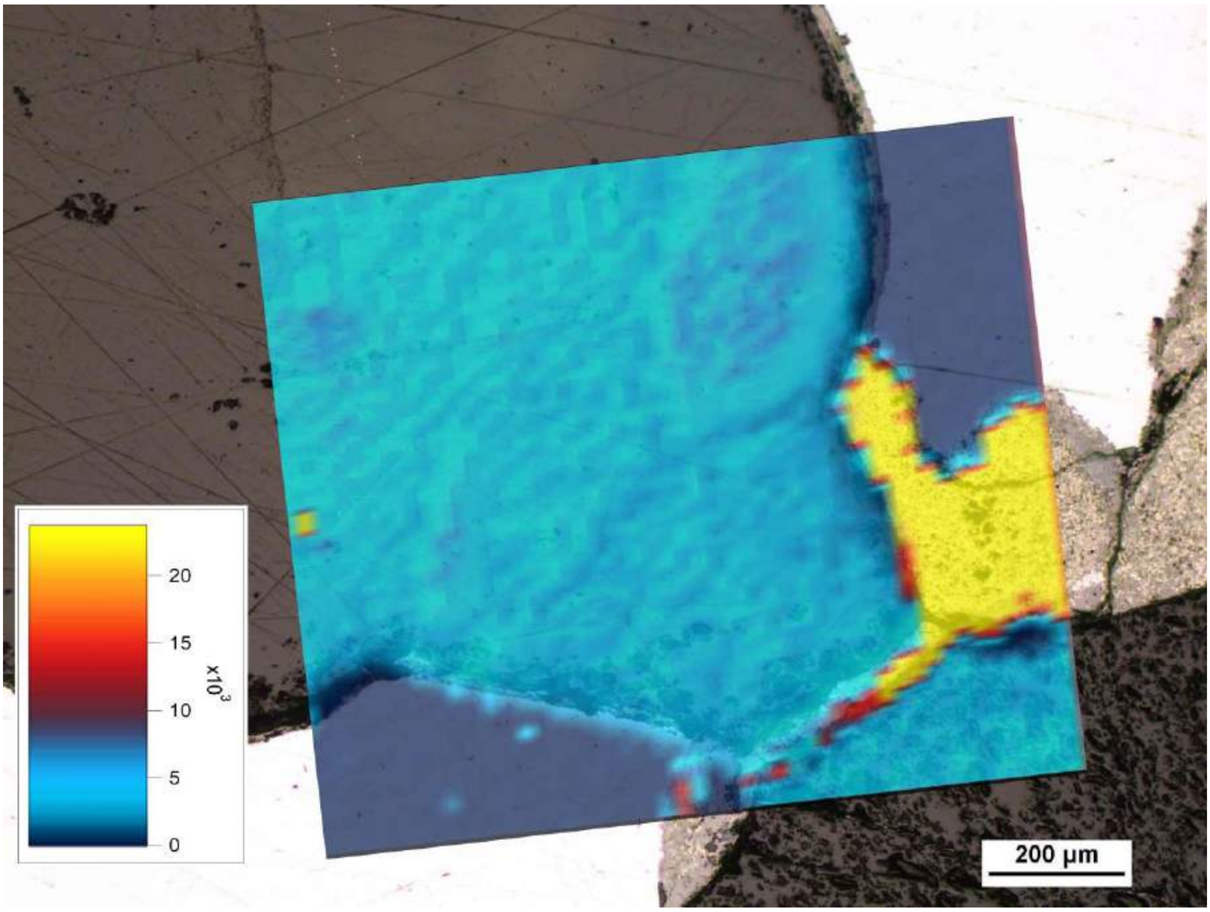

10
8
6
4
2
0
200 µm

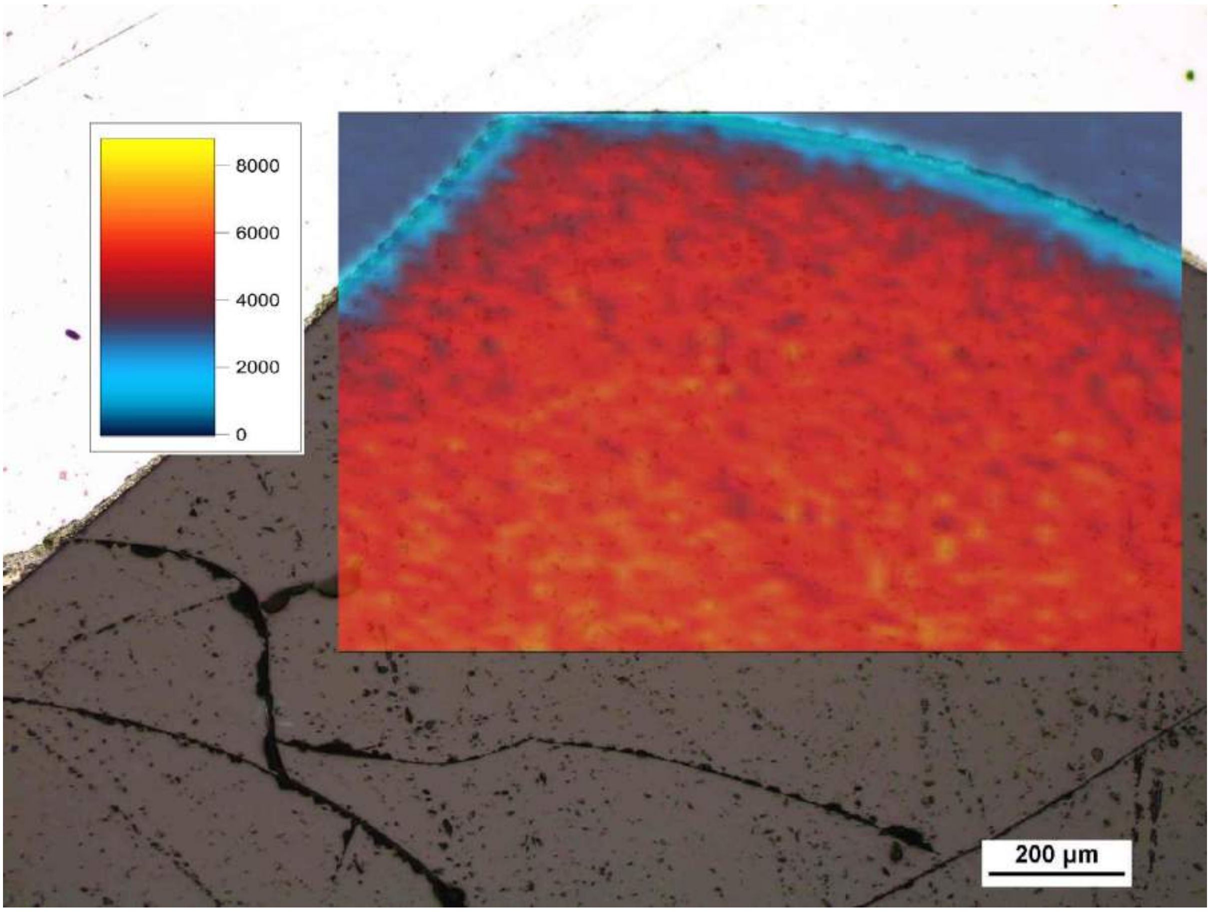


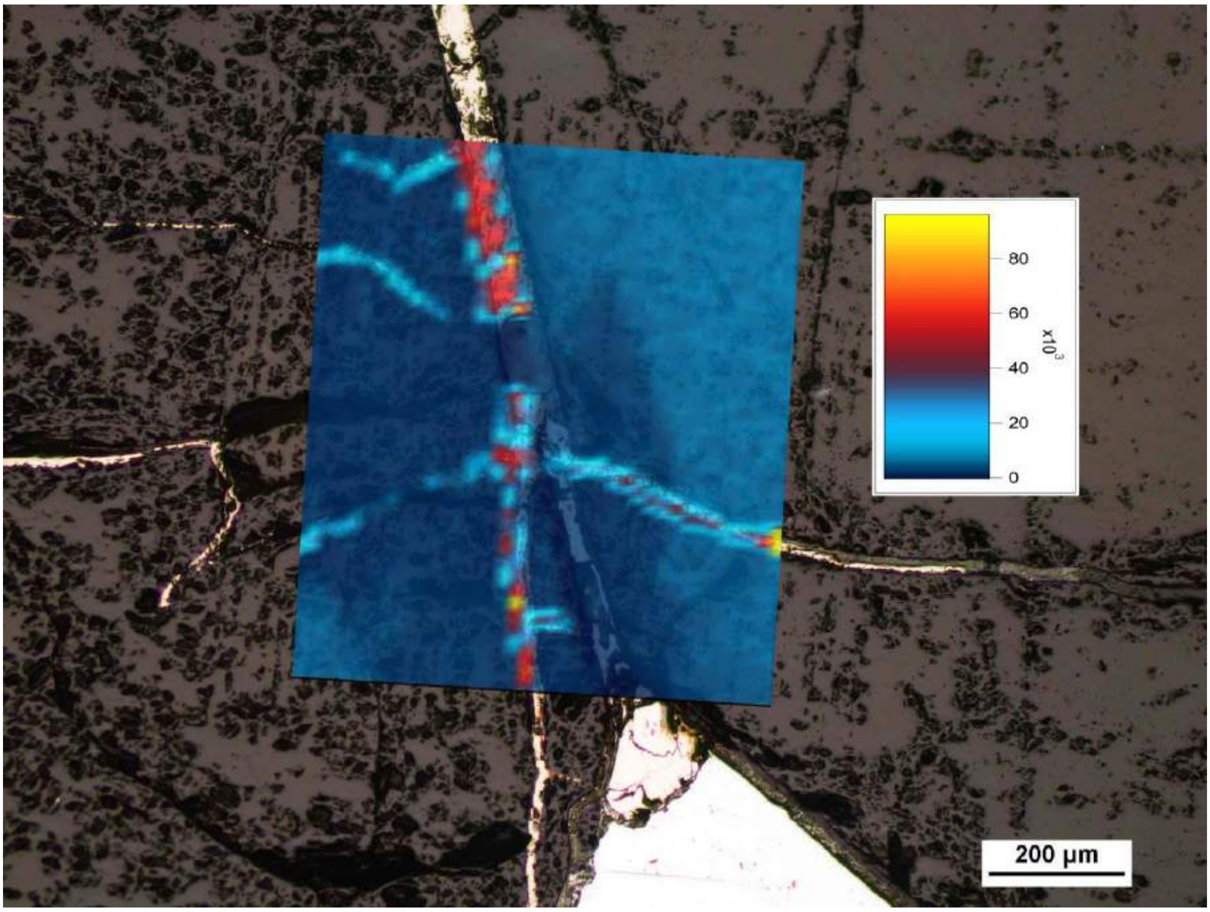
Cr diffusion patterns

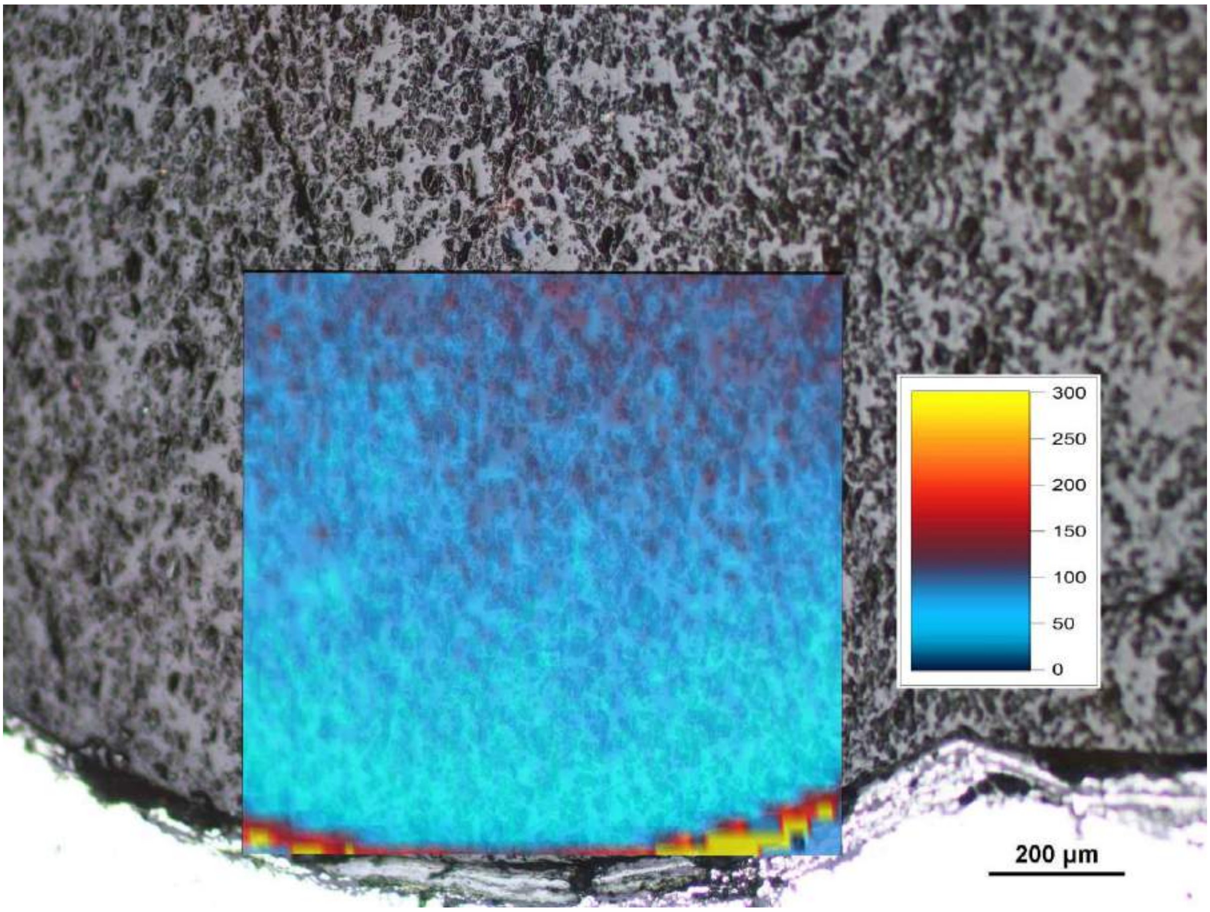

300
250
200
150
100
50
0
200 µm


500
400
300
200
100
0
200 µm

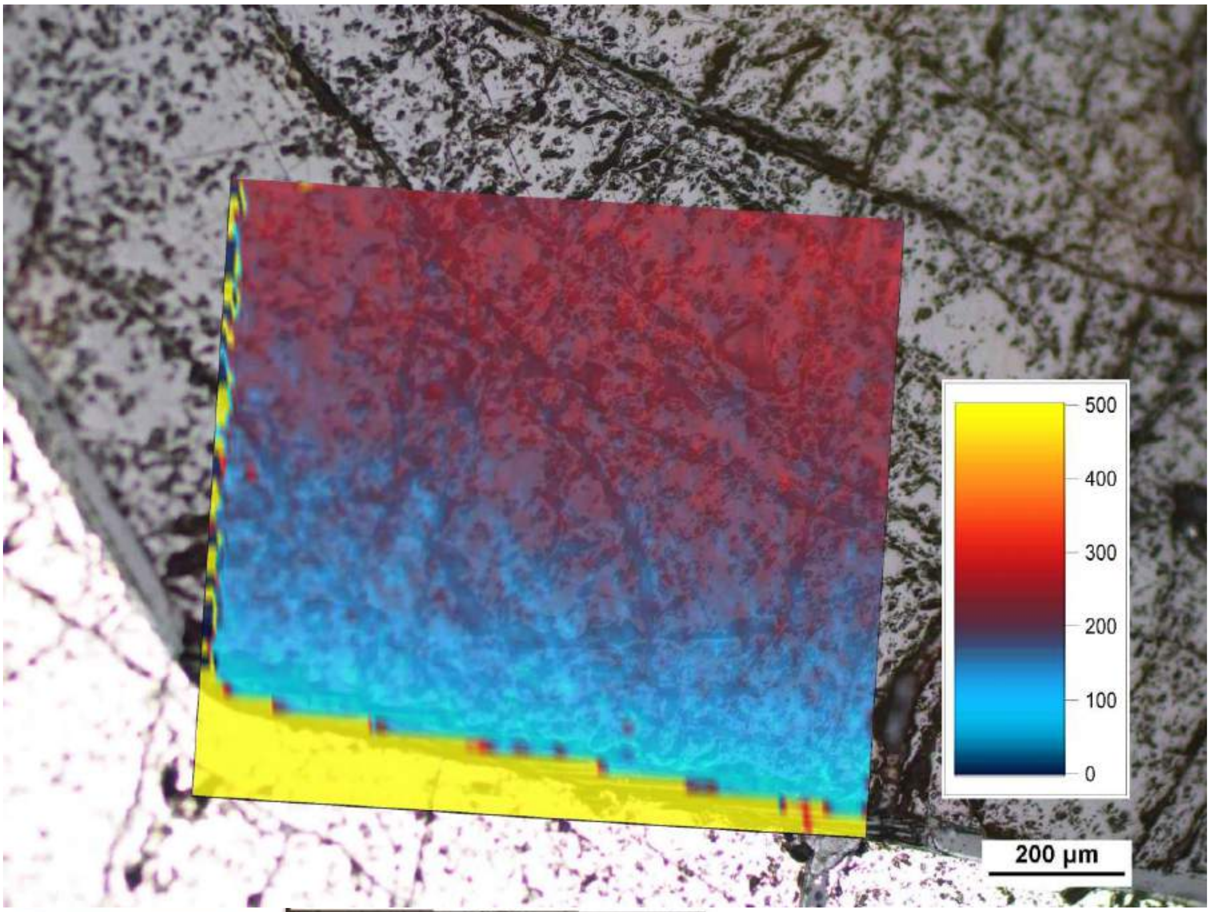

20
15
10
5
0
x10^3
200 µm

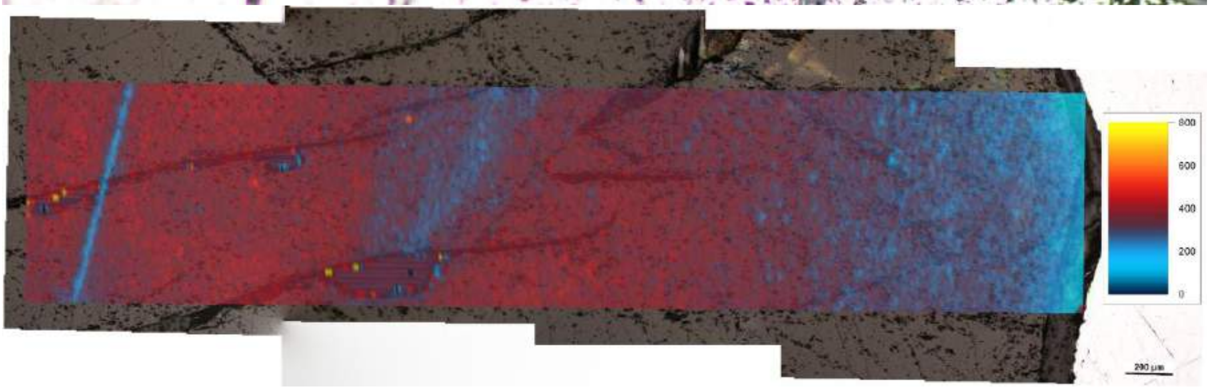

8000
6000
4000
2000
0
200 µm

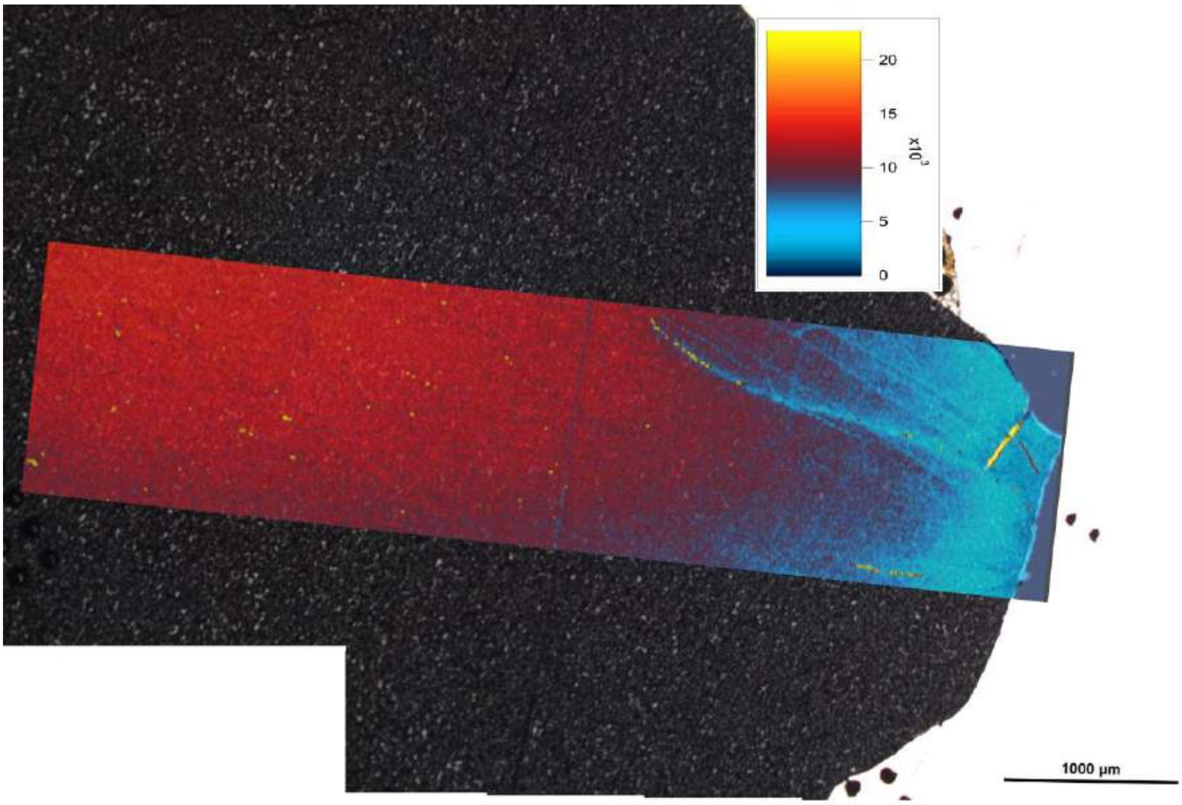

80
60
40
20
0
x10³
200 µm

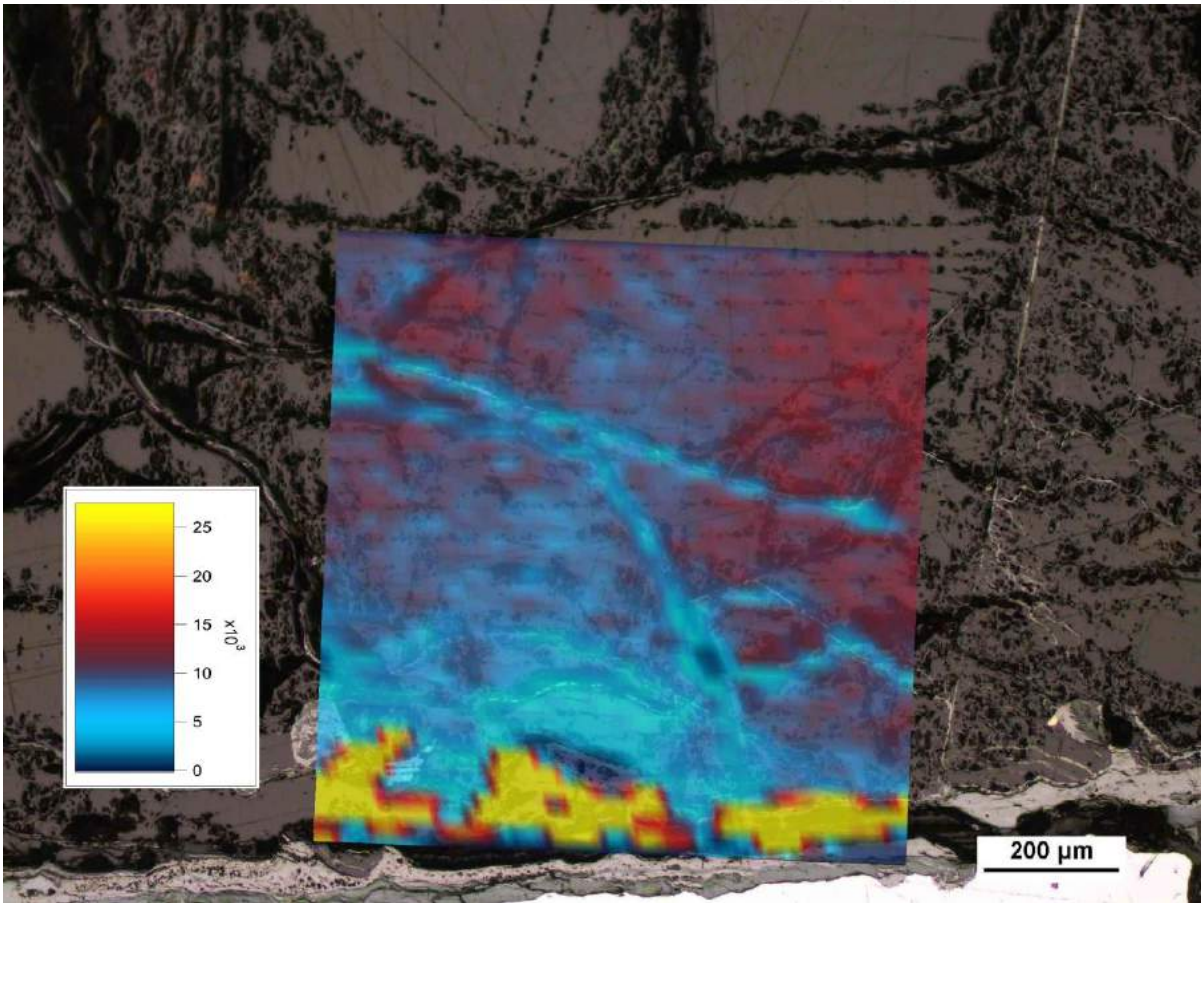


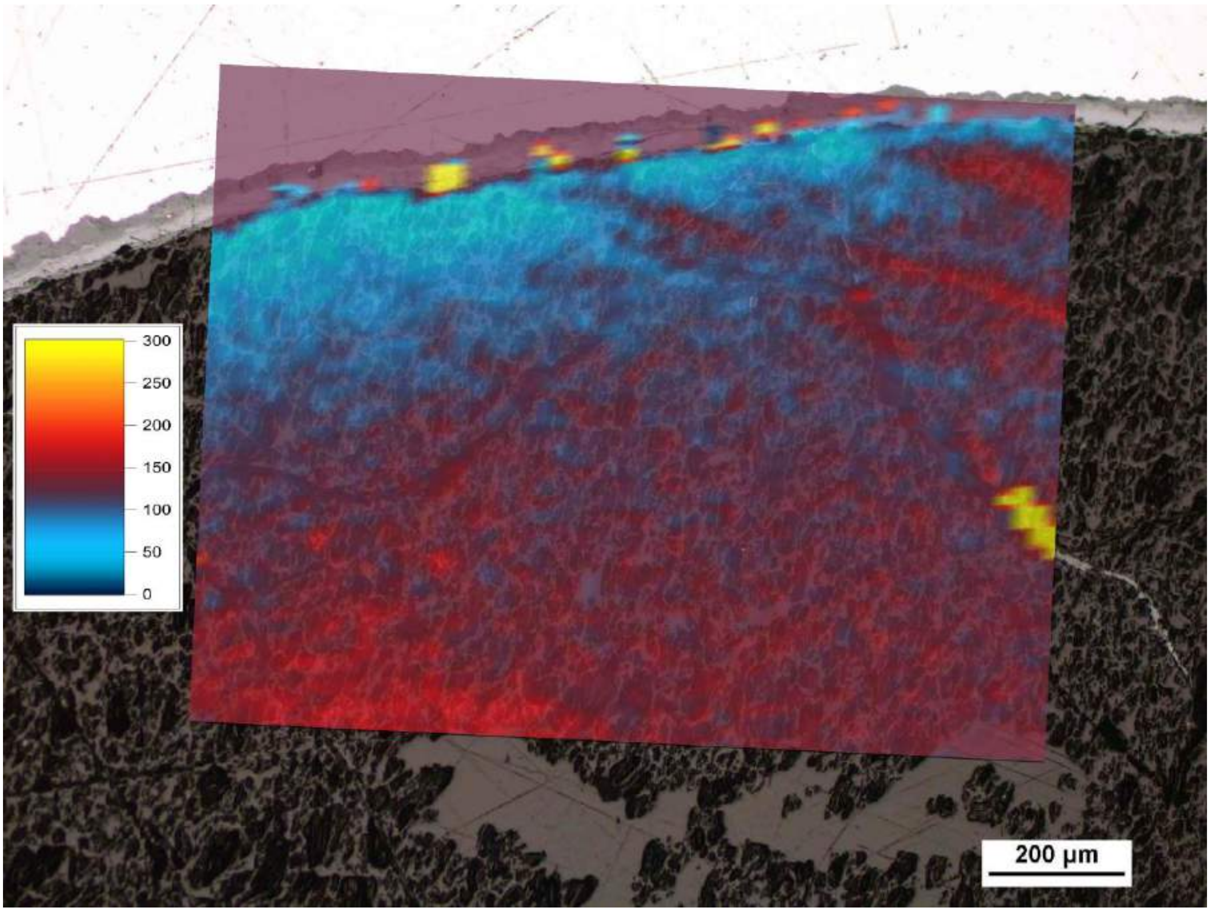
300
250
200
150
100
50
0
200 µm


500
400
300
200
100
0
200 µm

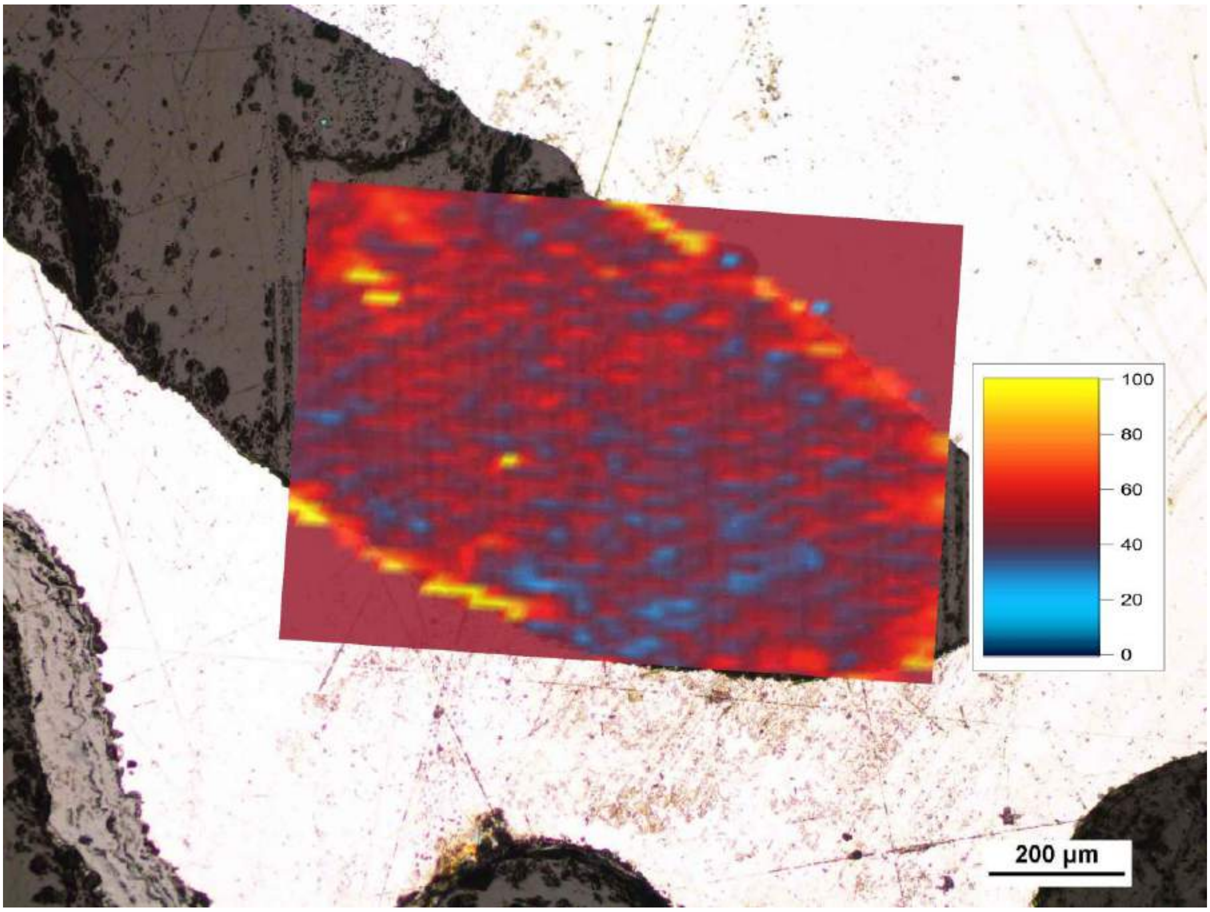

800
600
400
200
0
200 µm

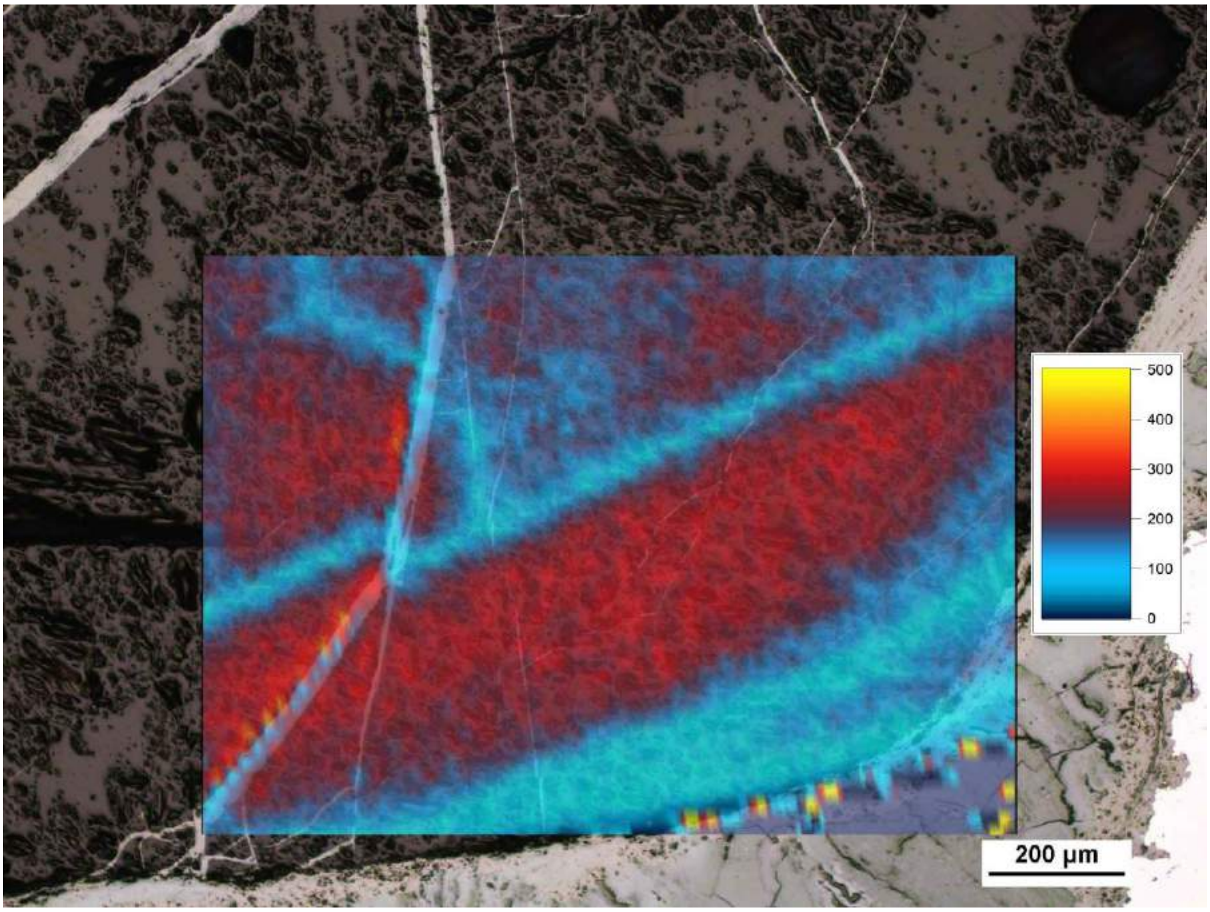

20
15
10
5
0
x10^3
1000 µm

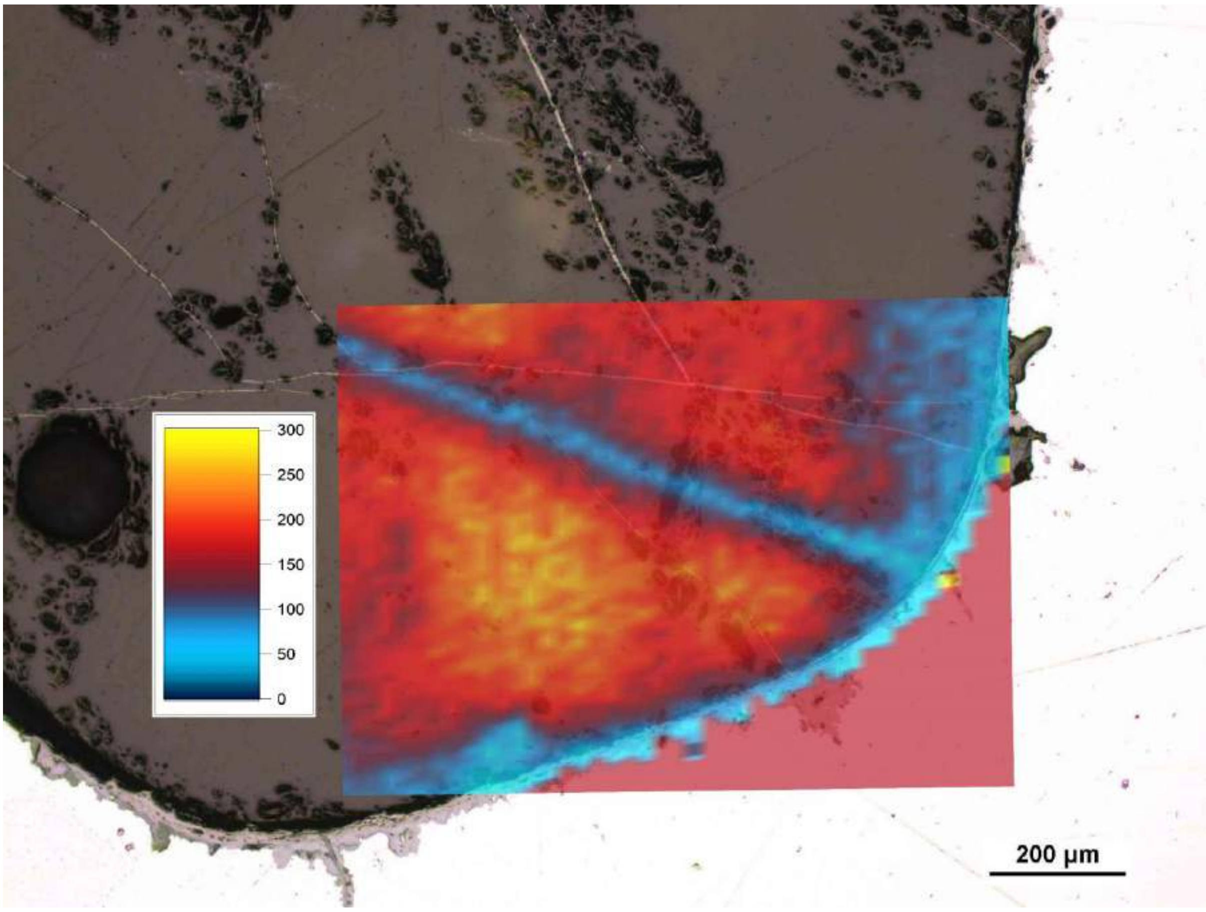

25
20
15
10
5
0
x10^3
200 µm

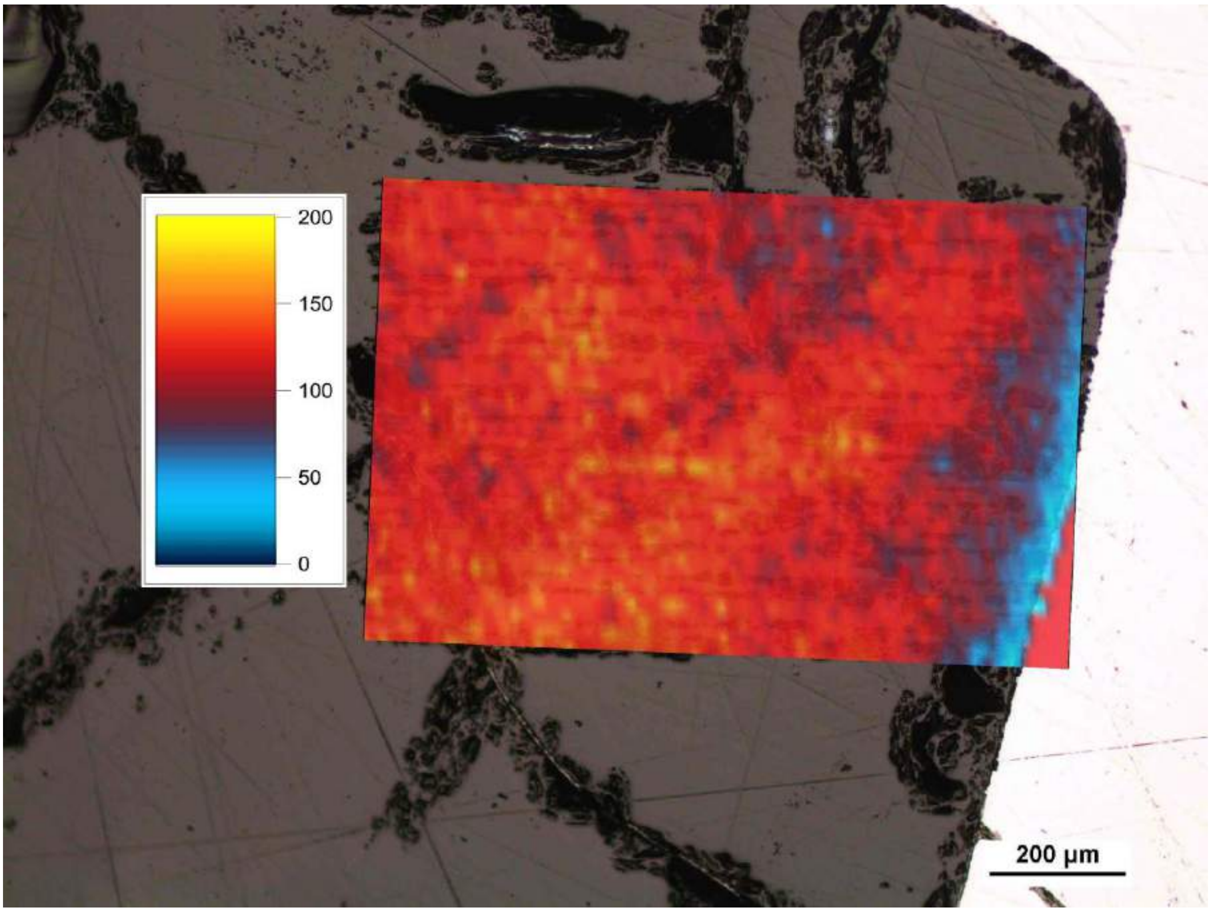


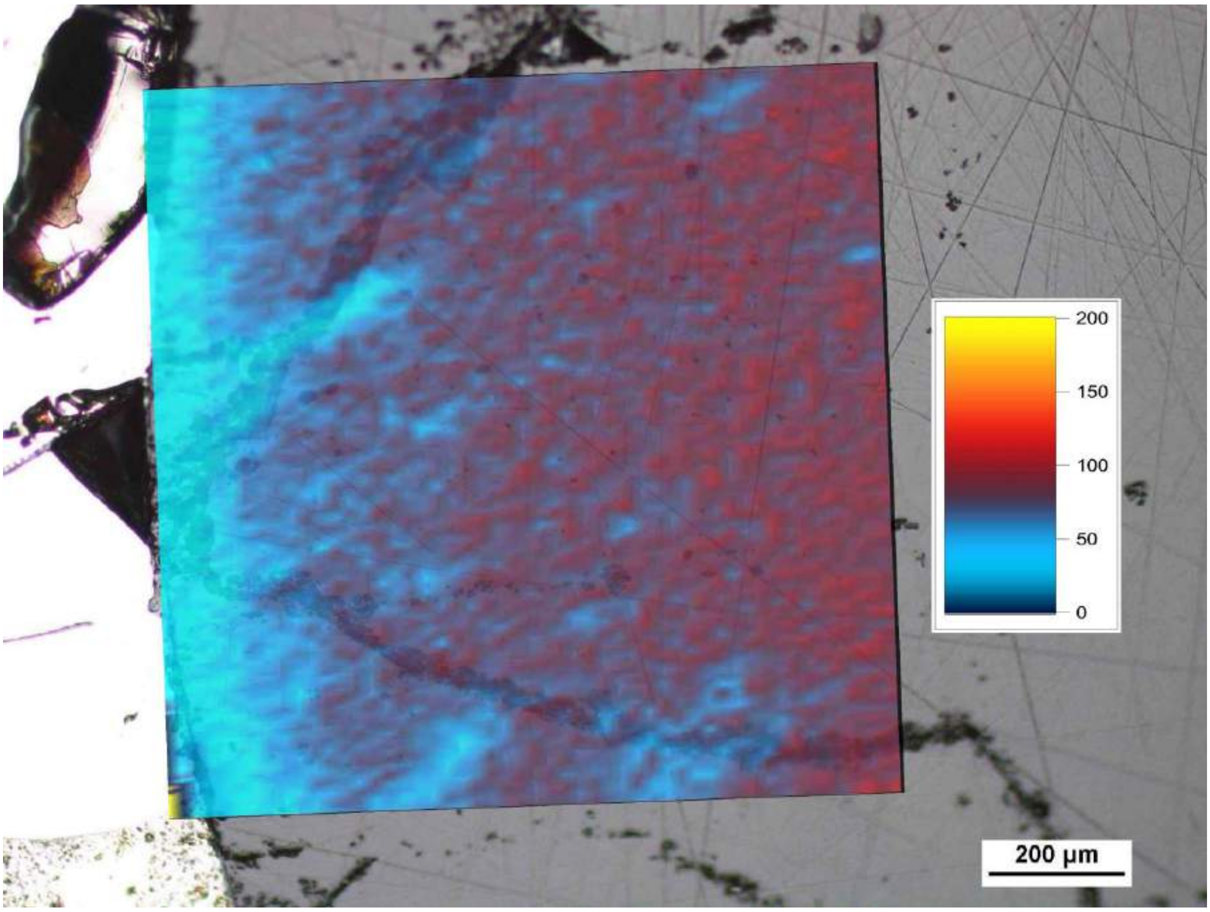
300
250
200
150
100
50
0
200 µm

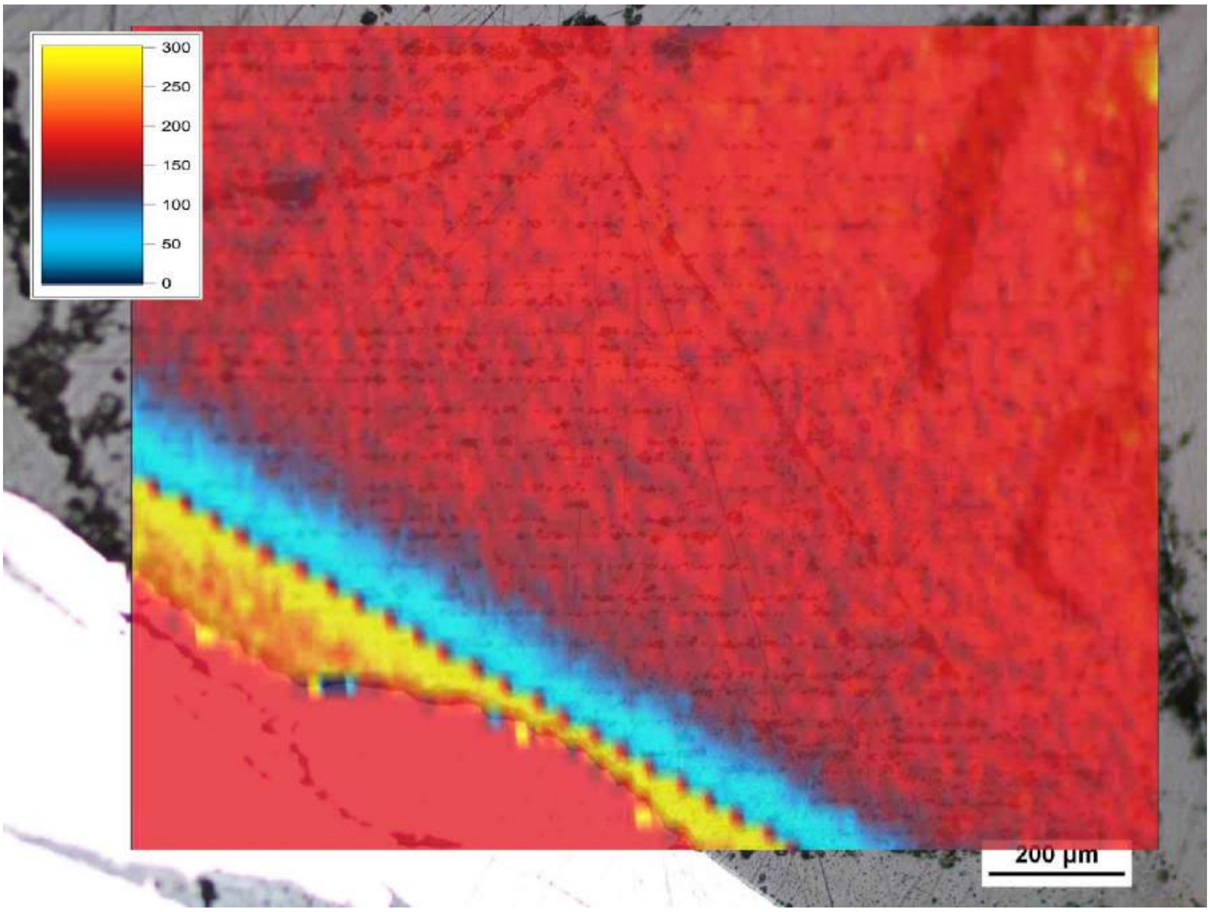

100
80
60
40
20
0
200 µm


500
400
300
200
100
0
200 µm

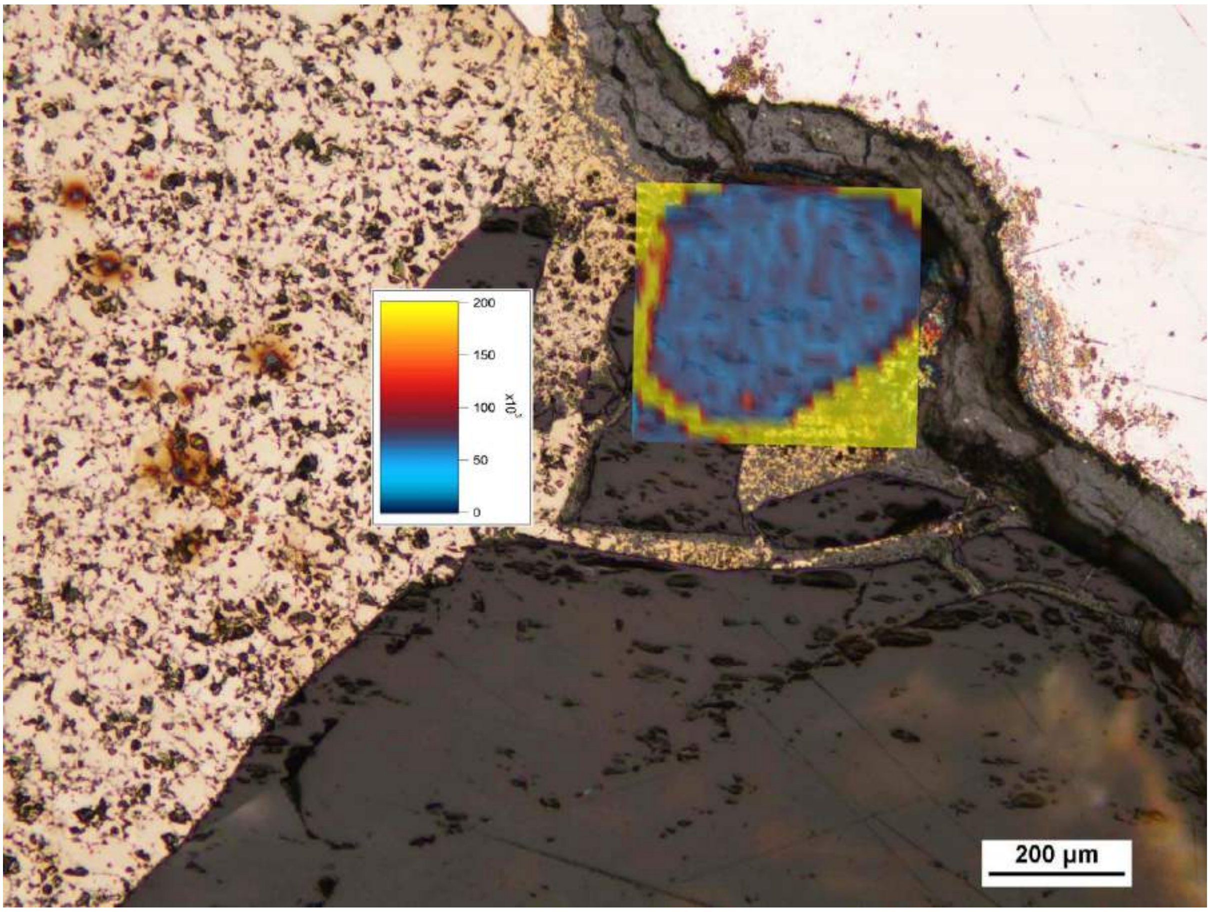

300
250
200
150
100
50
0
200 µm

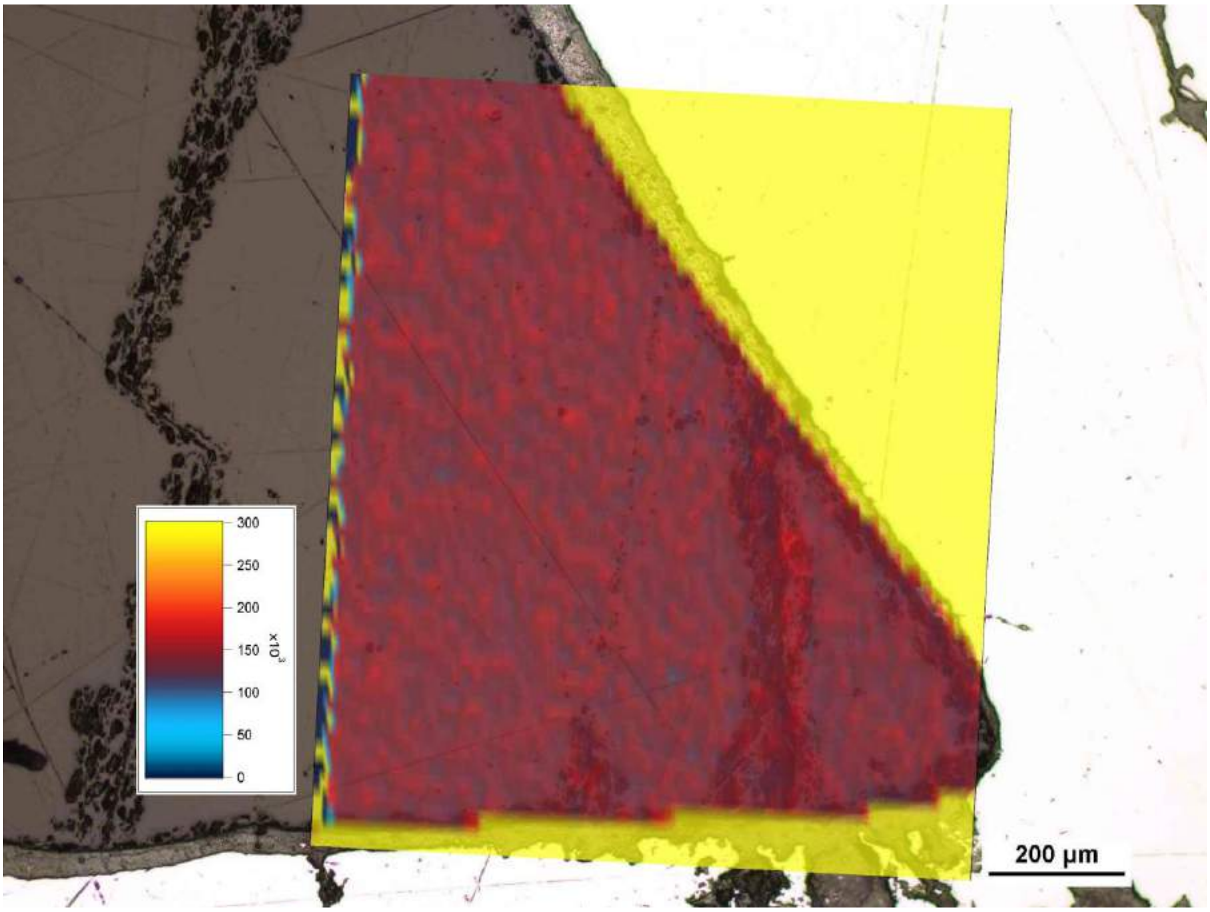

200
150
100
50
0
200 µm

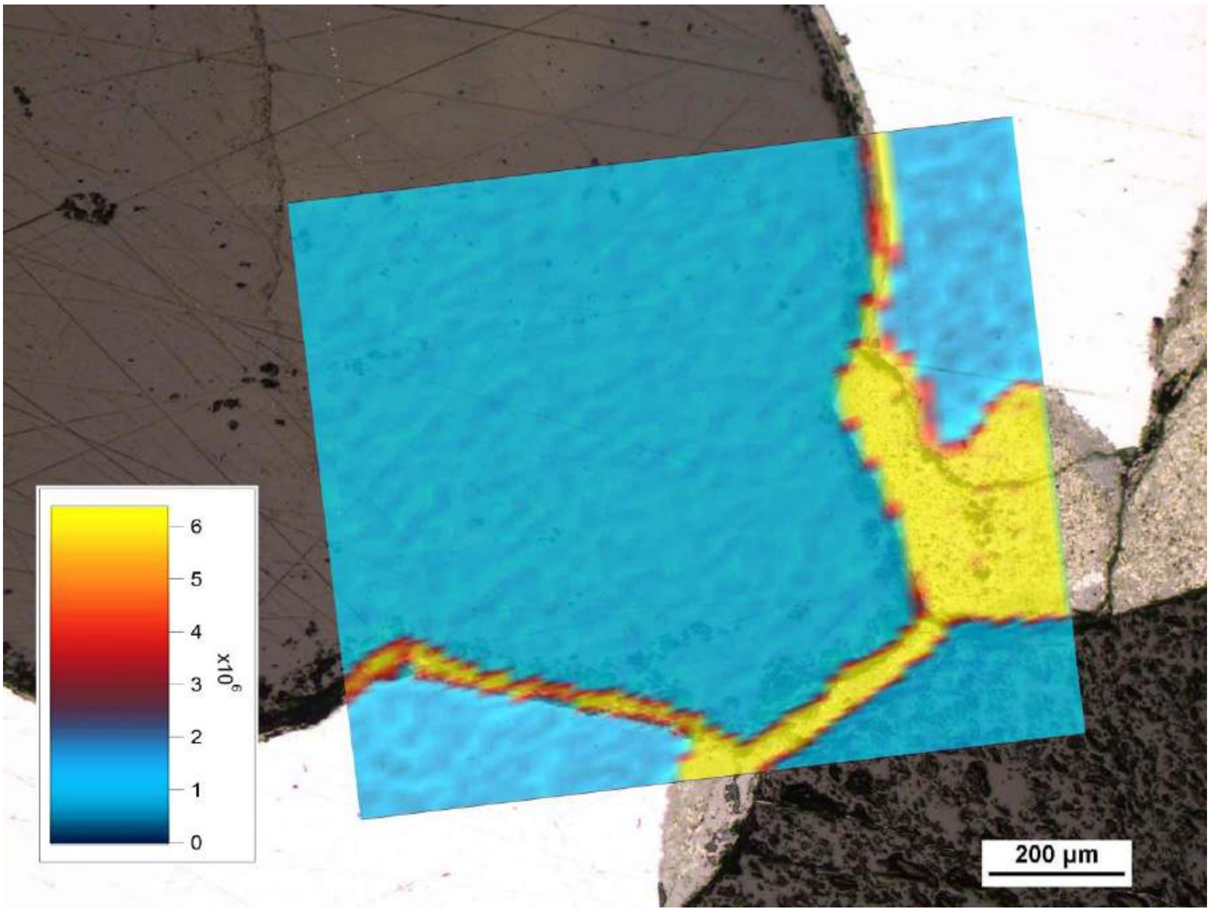

200
150
100
50
0
200 µm



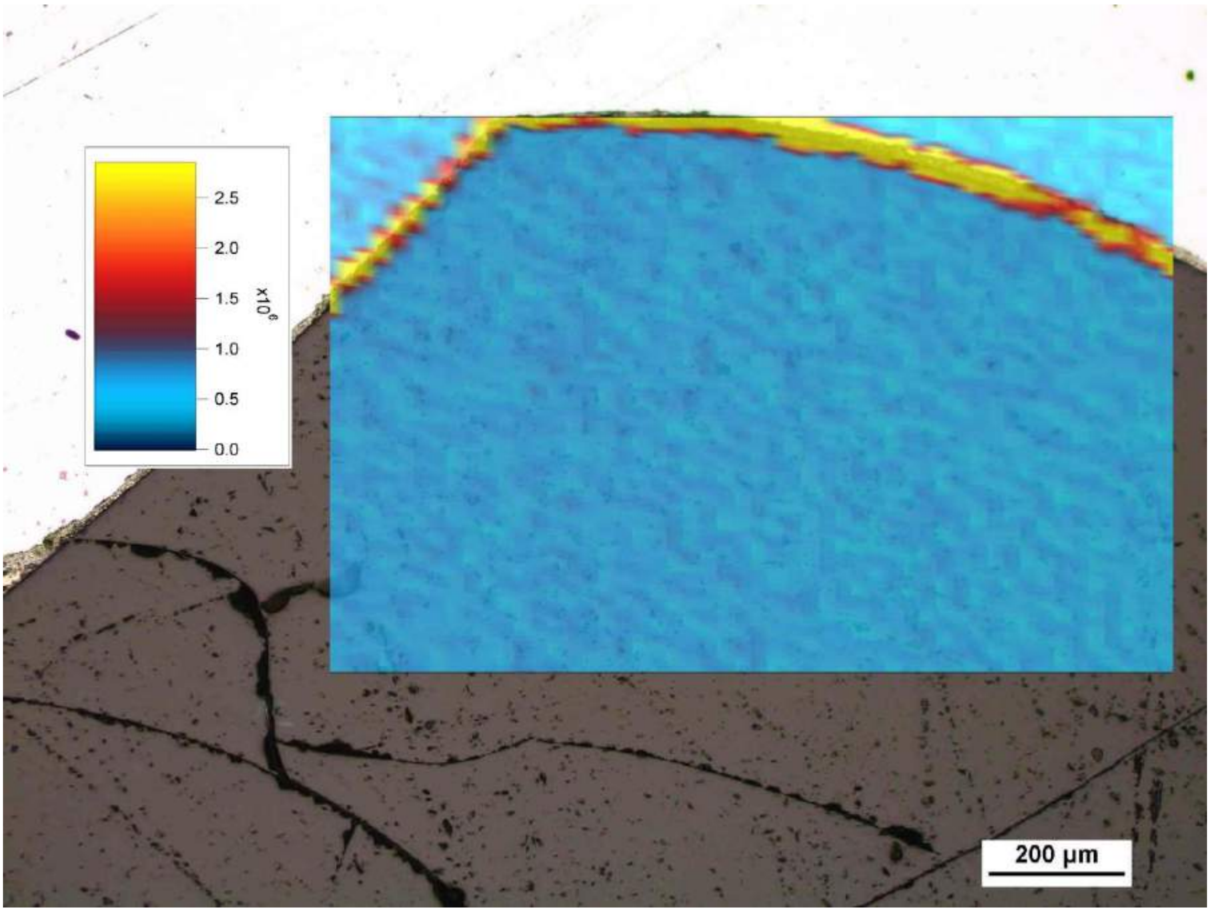
Fe diffusion patterns


200
150
100
50
0
x10³
200 µm

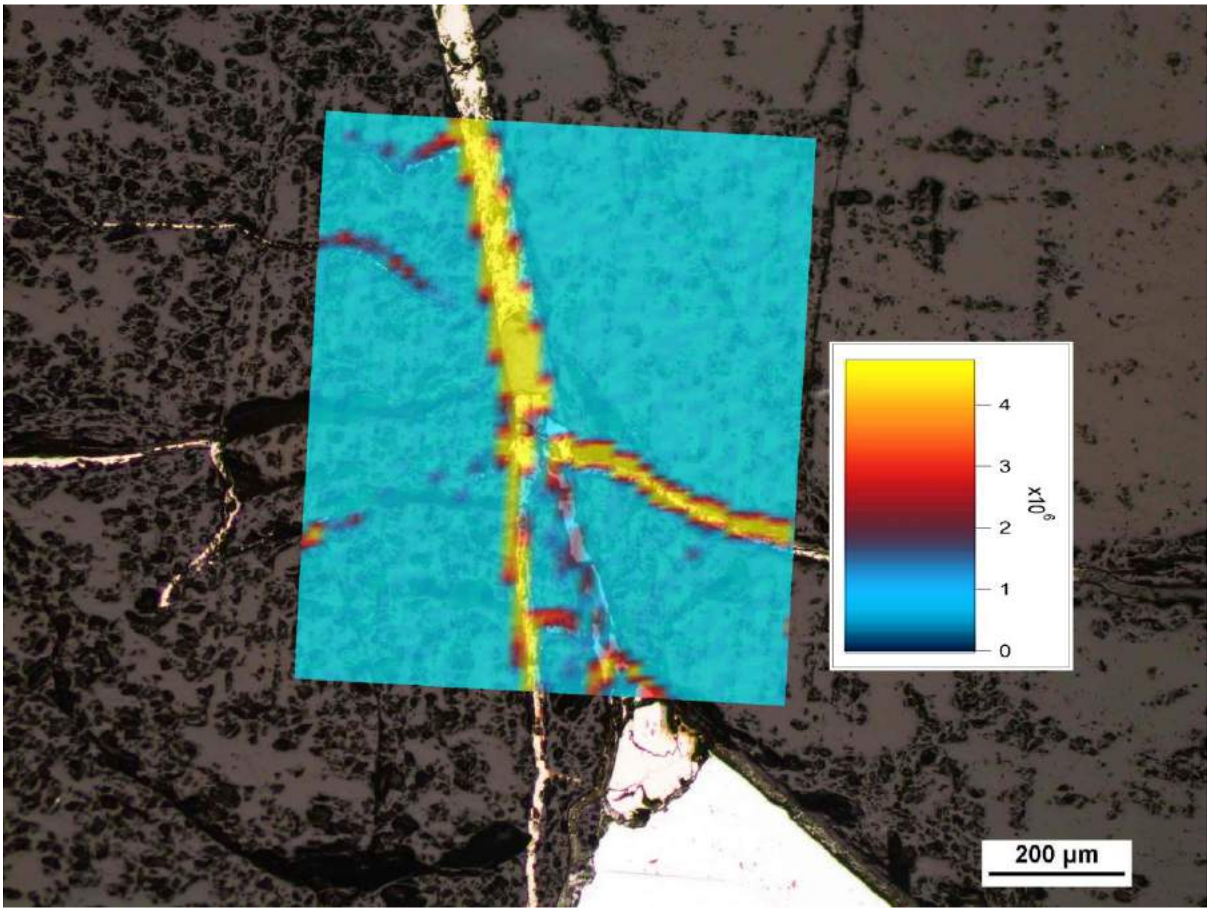

300
250
200
150
100
50
0
x10^3
200 µm



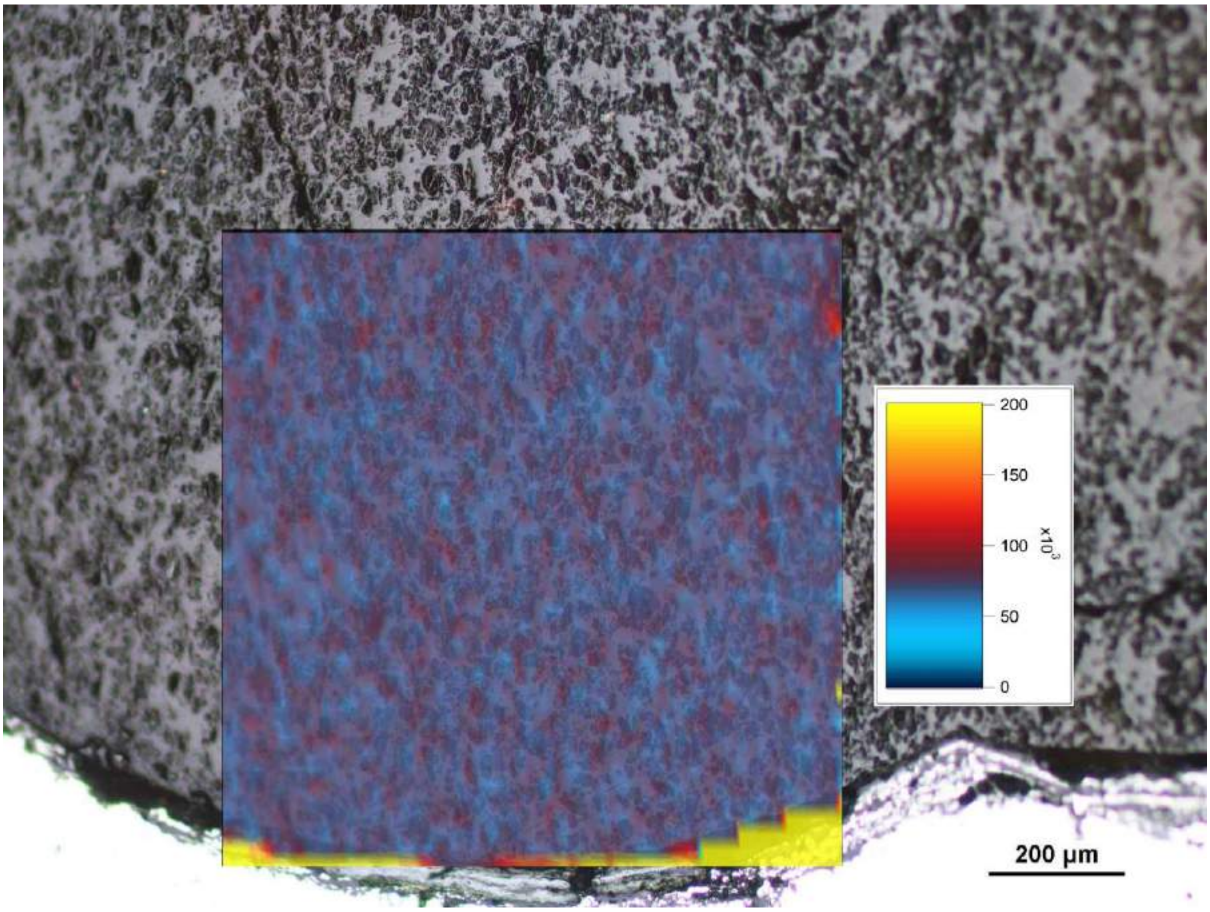
6
5
4
3
2
1
0
x10^6
200 µm

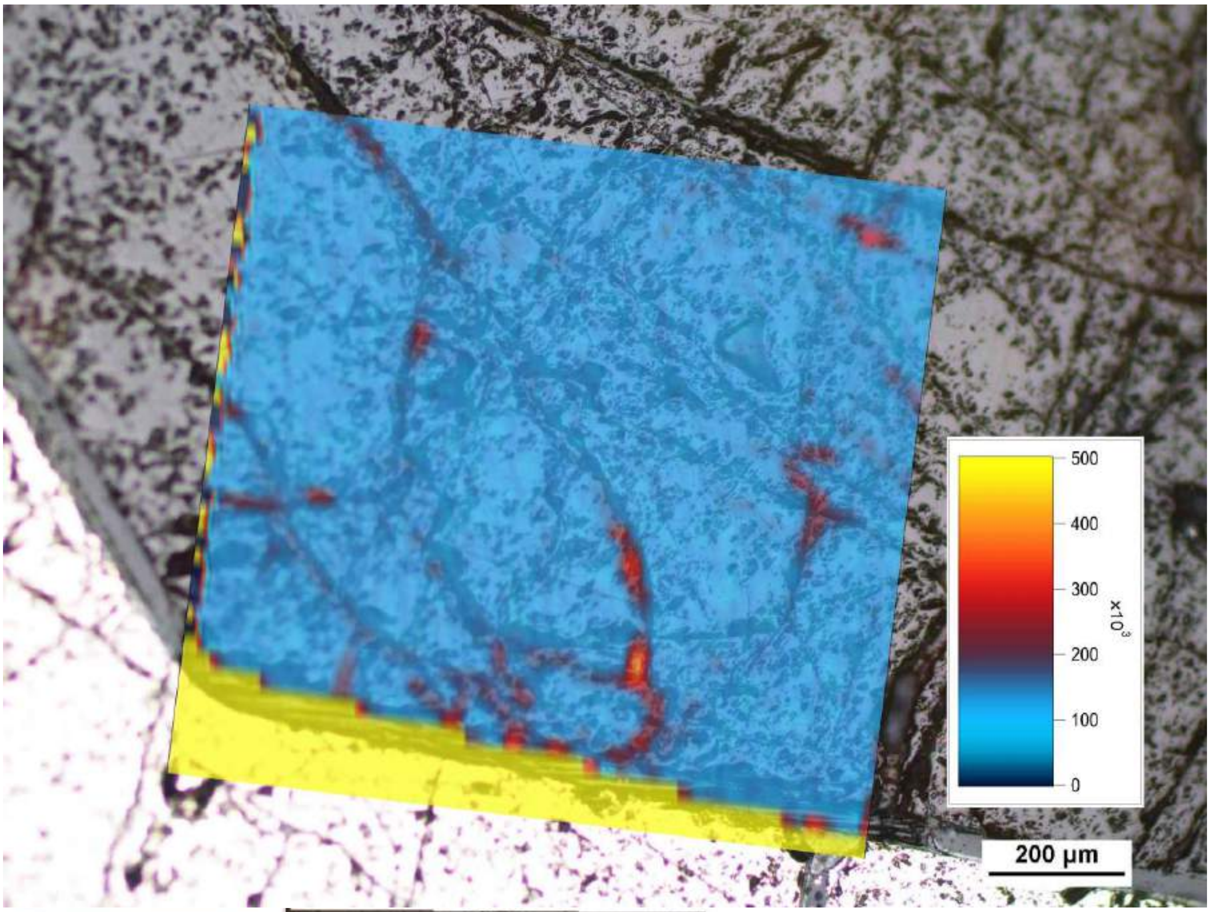


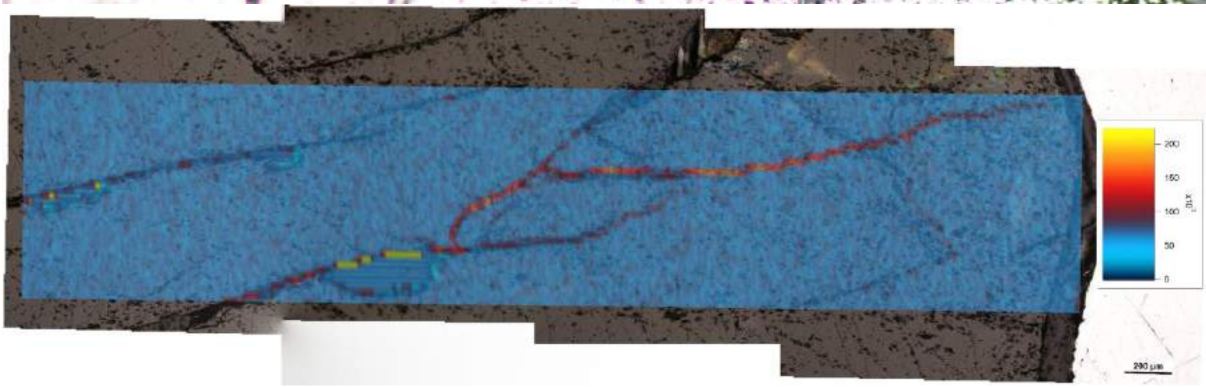
2.5
2.0
1.5
1.0
0.5
0.0
x10^6
200 µm

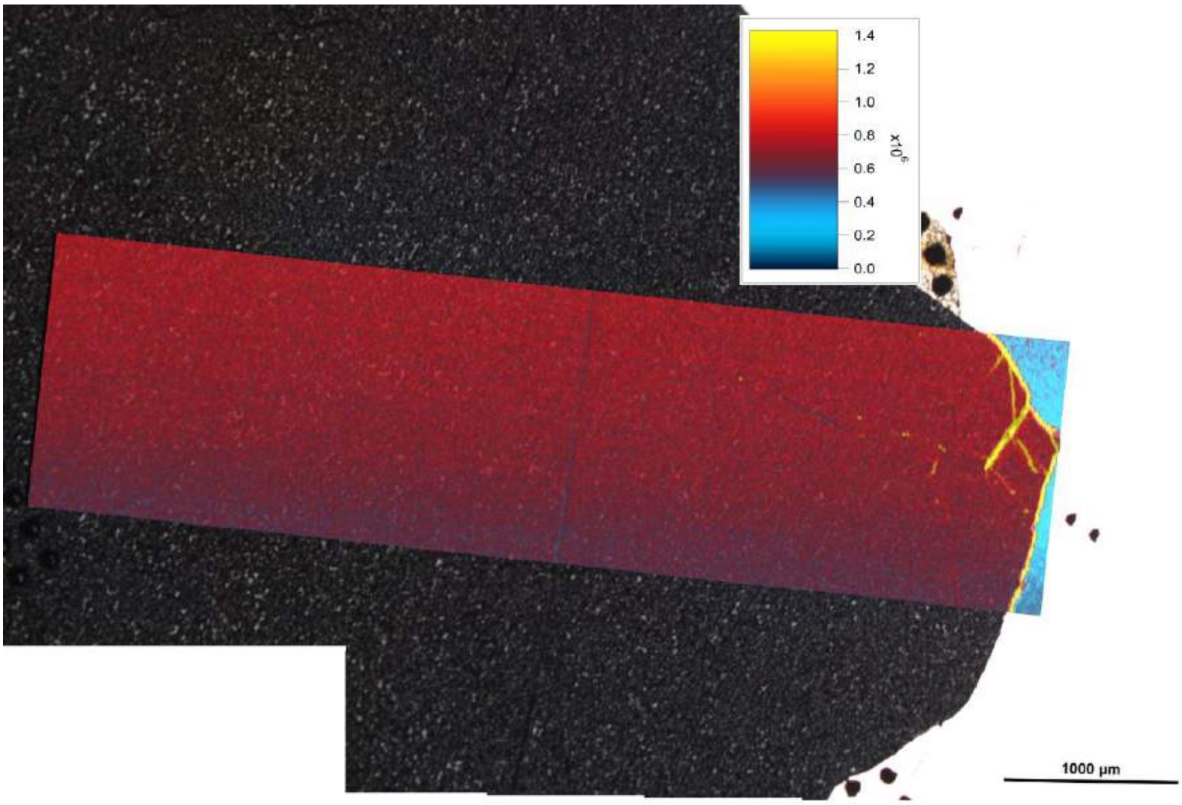


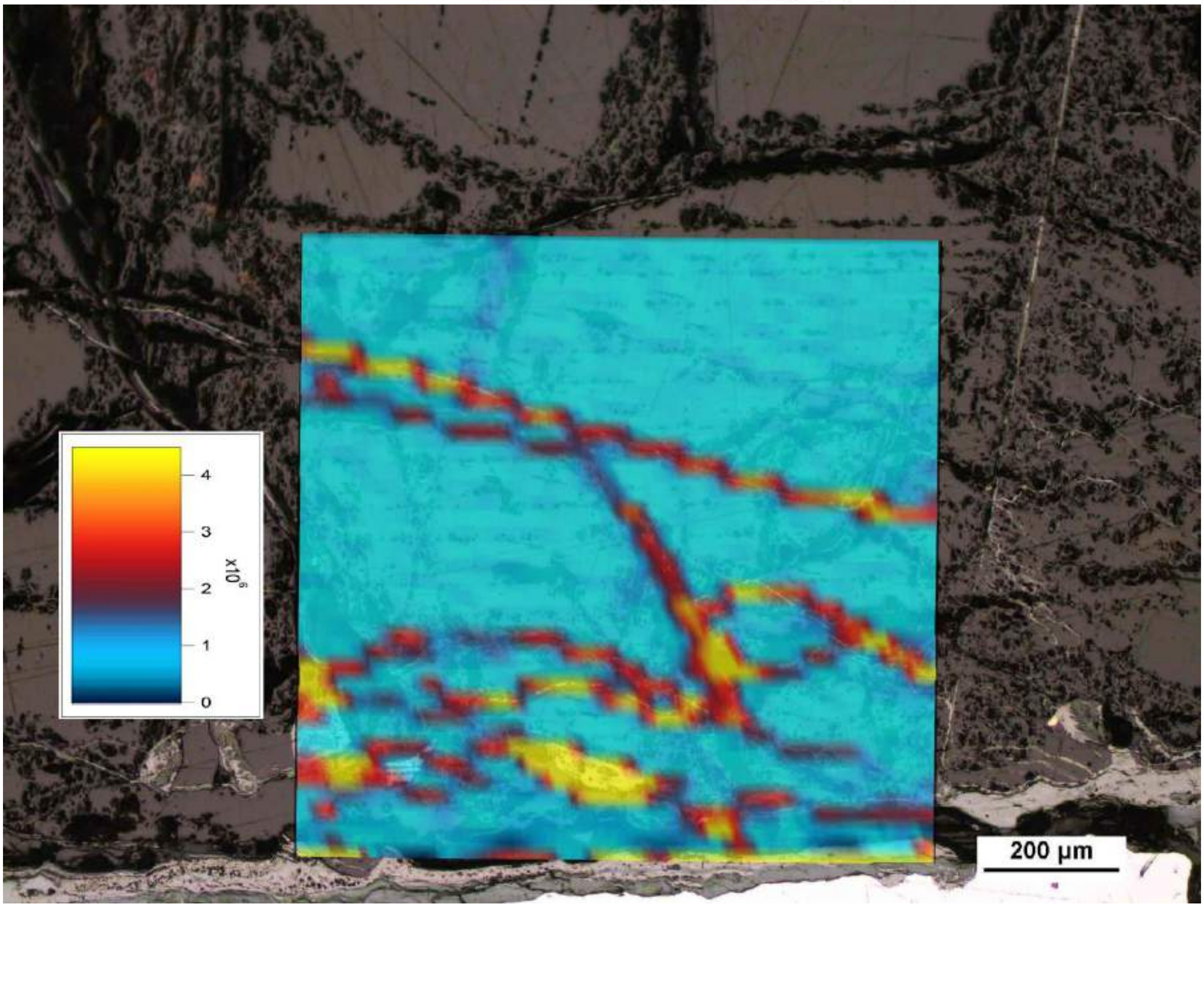
4
3
2
1
0
x10^6
200 µm

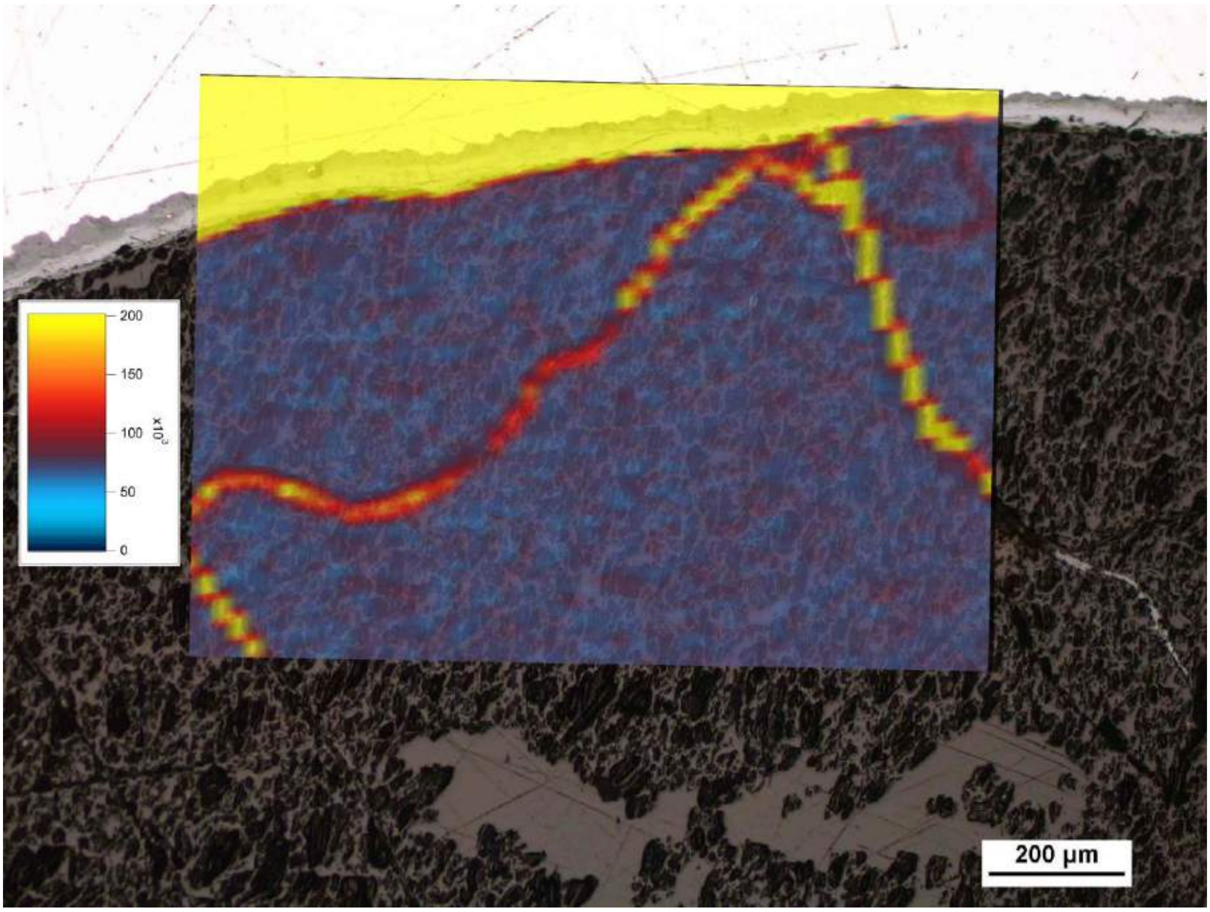

200
150
100
50
0
x10^3
200 µm

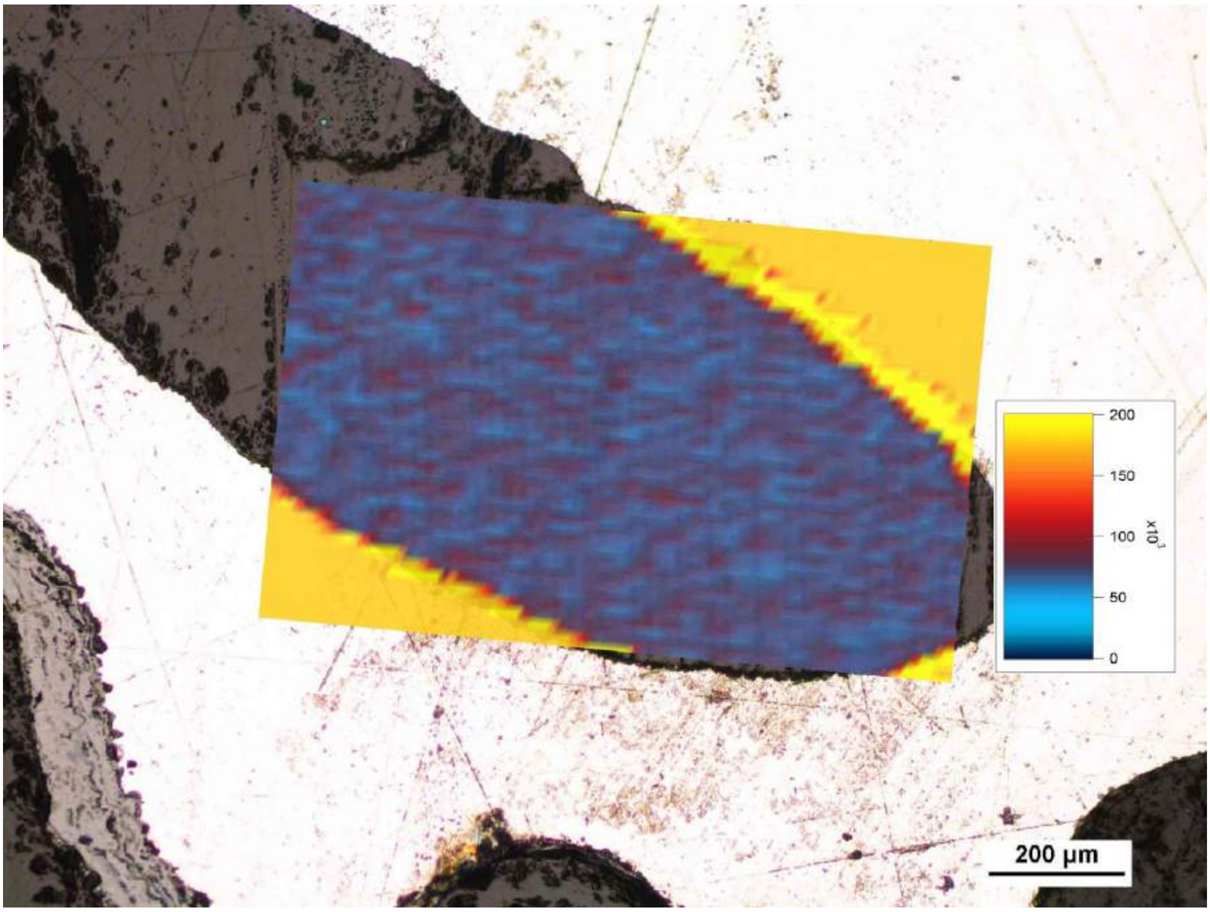

500
400
300
200
100
0
x10^3
200 µm



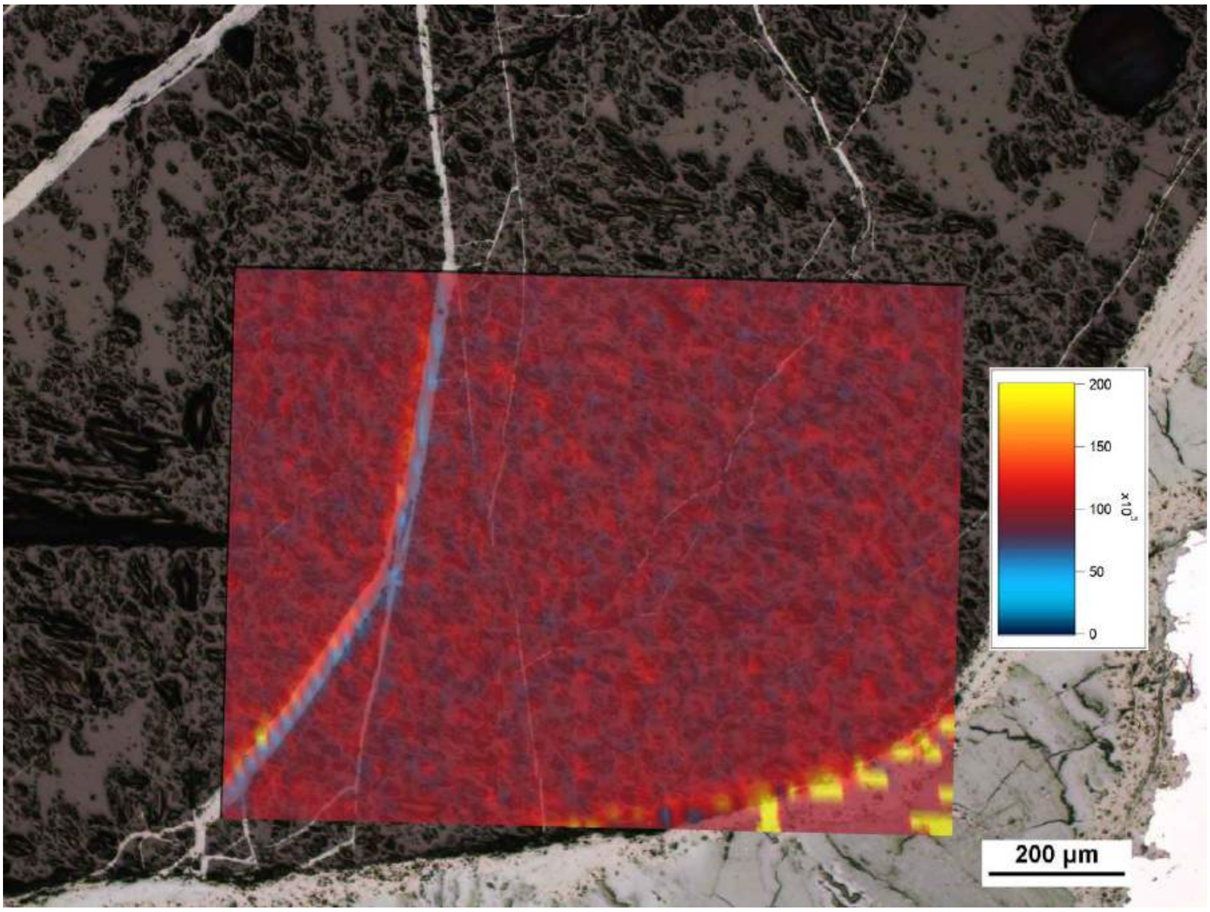

1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
1000 µm

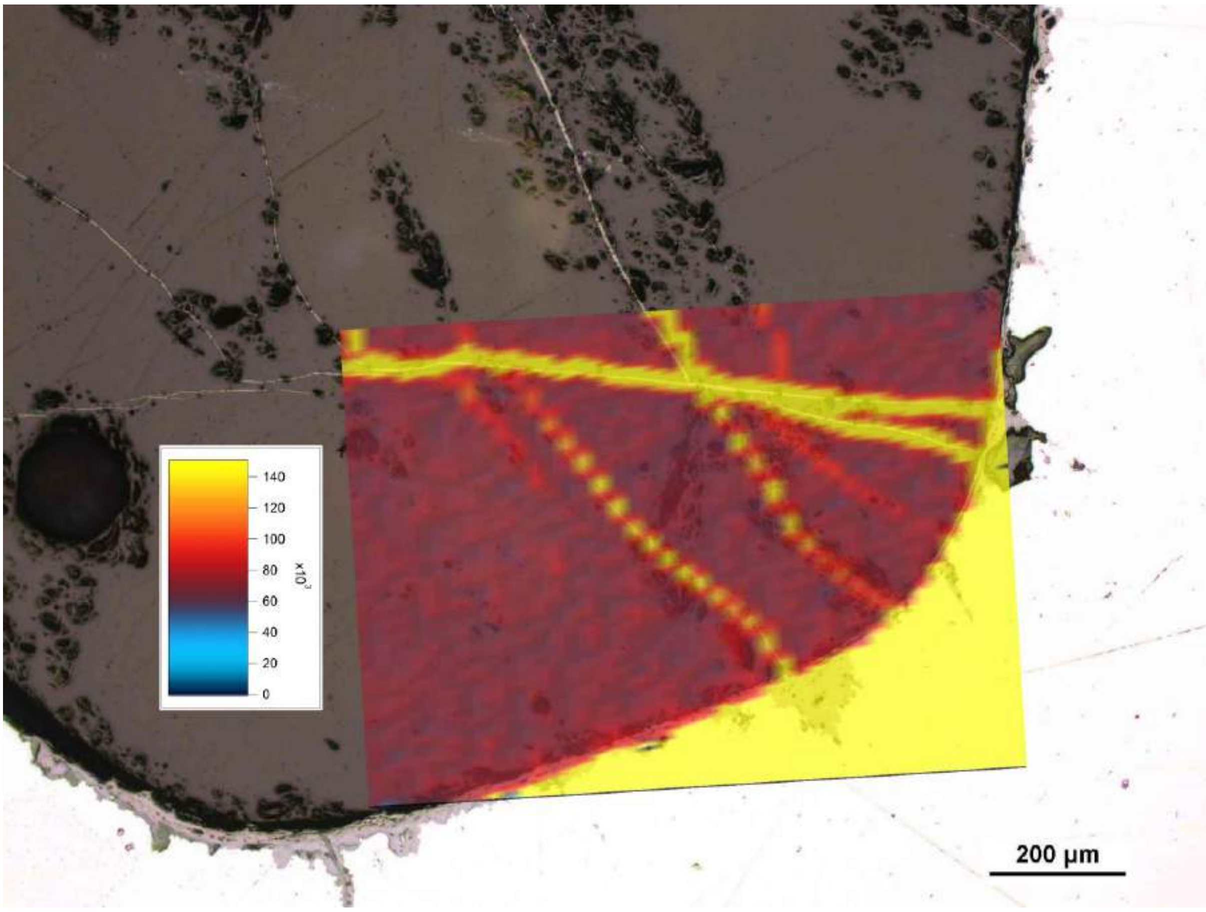

4
3
2
1
0
x10^6
200 µm


200
150
100
50
0
x10^3
200 µm

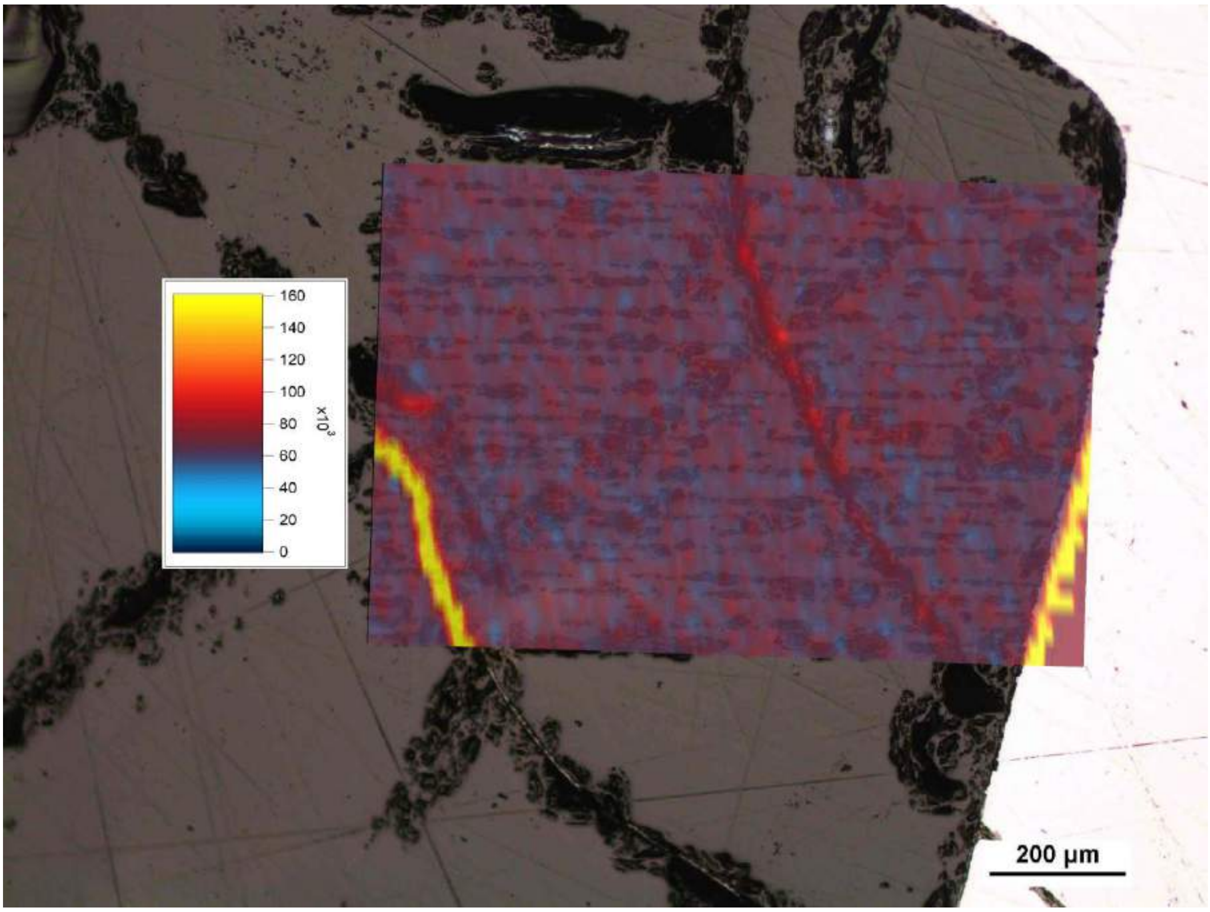


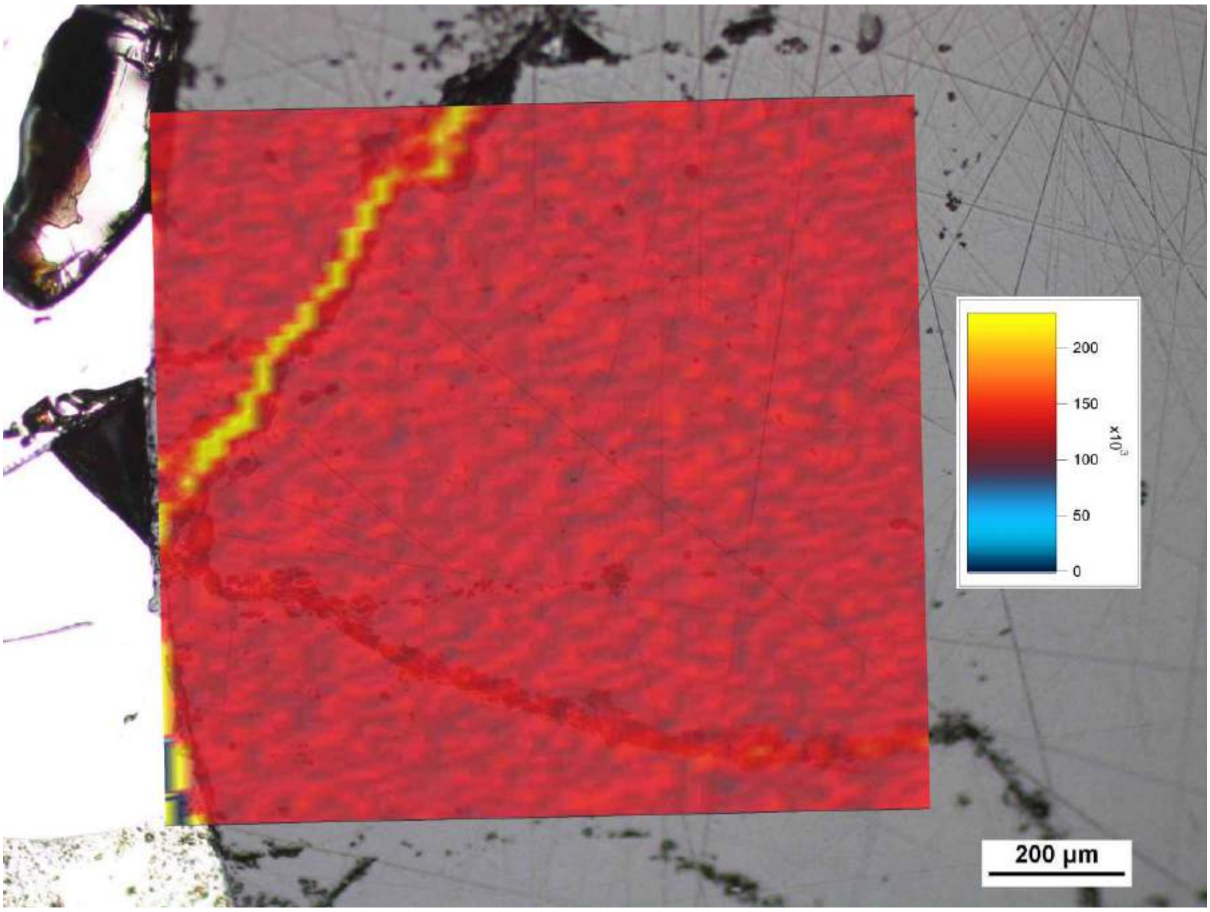
200
150
100
50
0
x10^3
200 µm

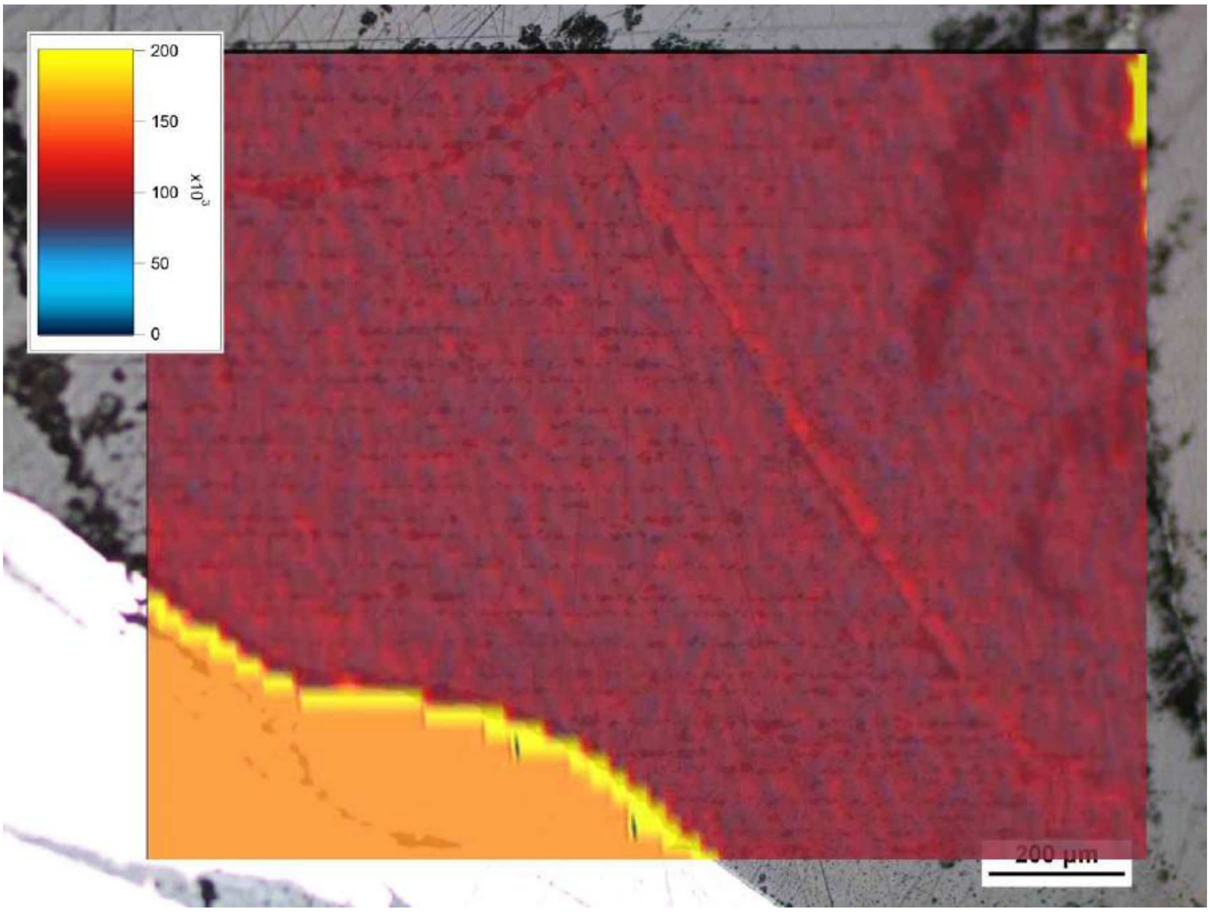

200
150
100
50
0
x10^3
200 µm



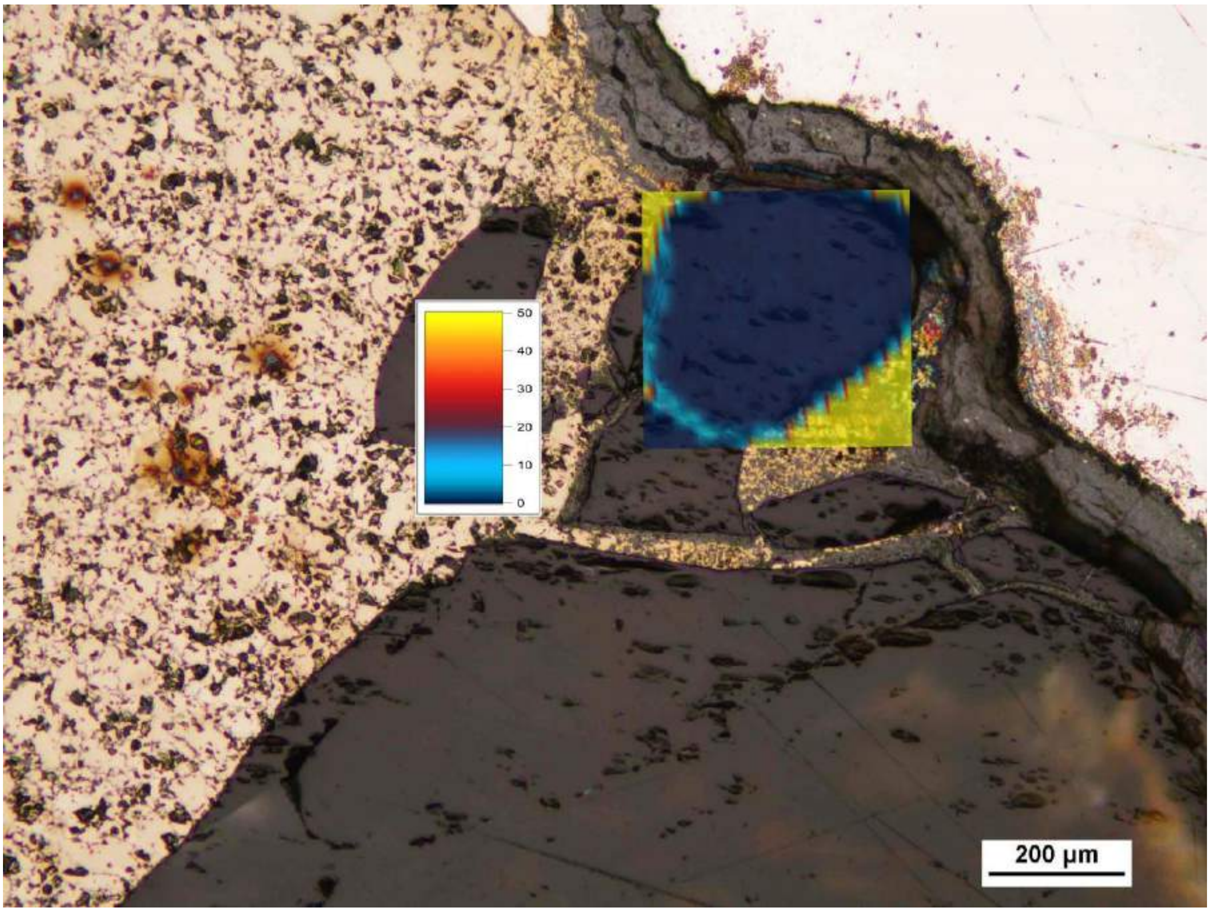
140
120
100
80
60
40
20
0
x10^3
200 µm

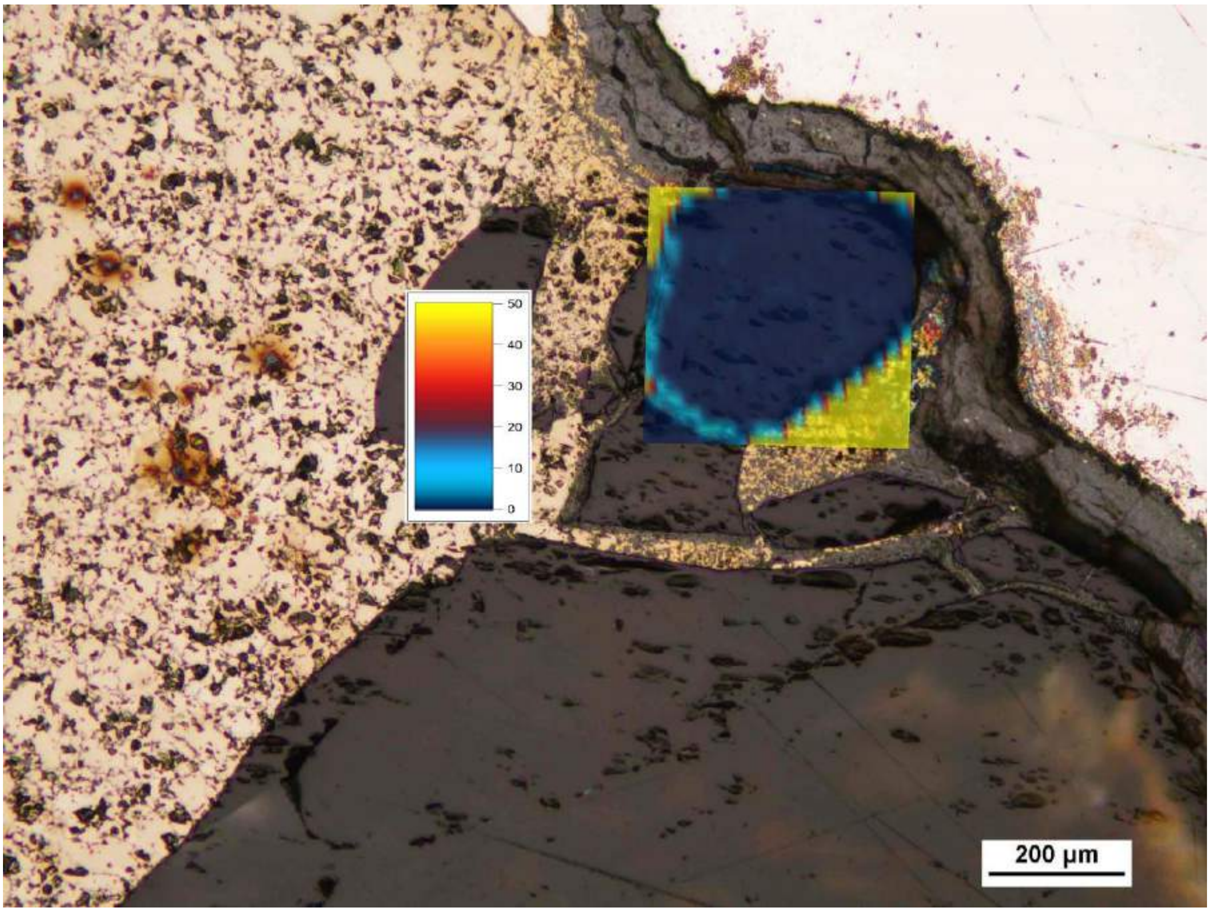

160
140
120
100
80
60
40
20
0
x10³
200 µm


200
150
100
50
0
x10^3
200 µm

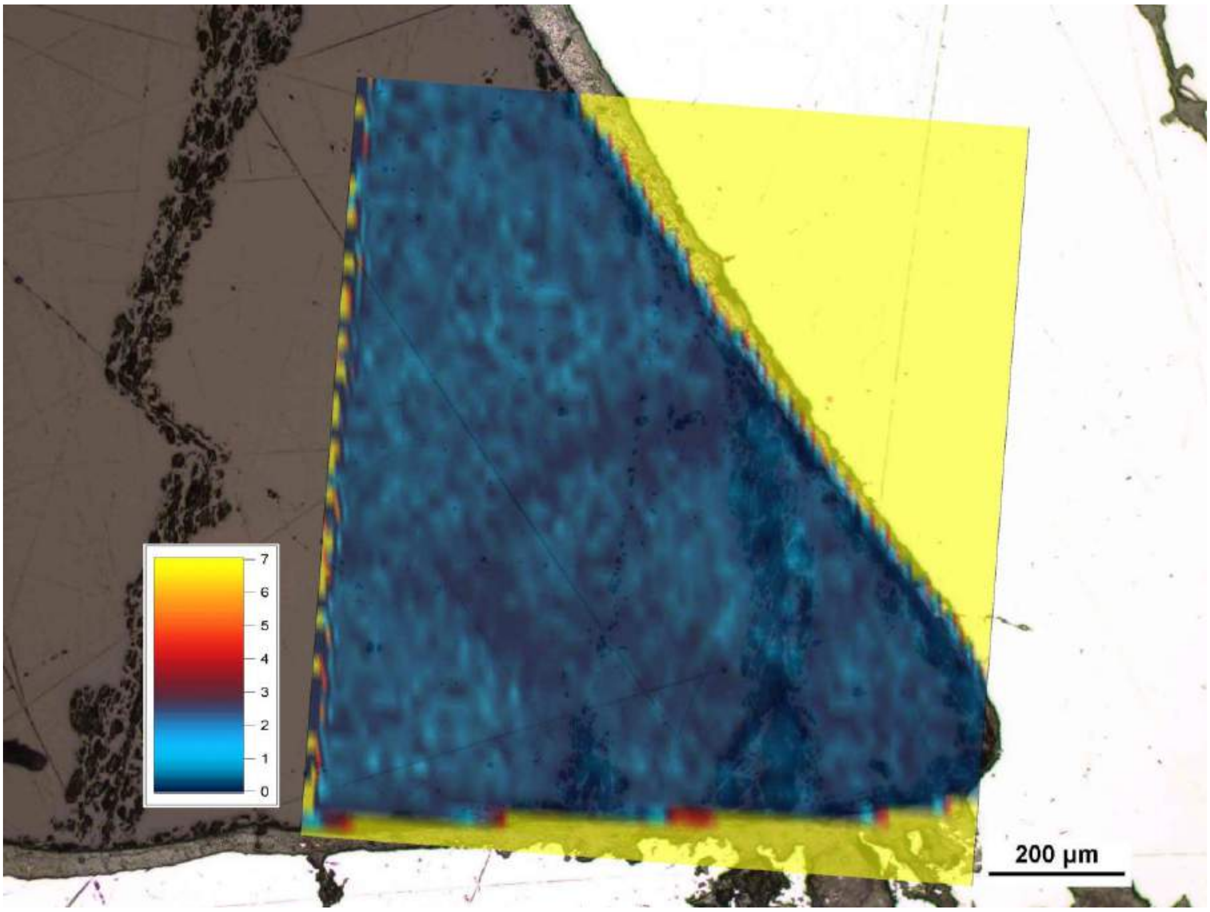


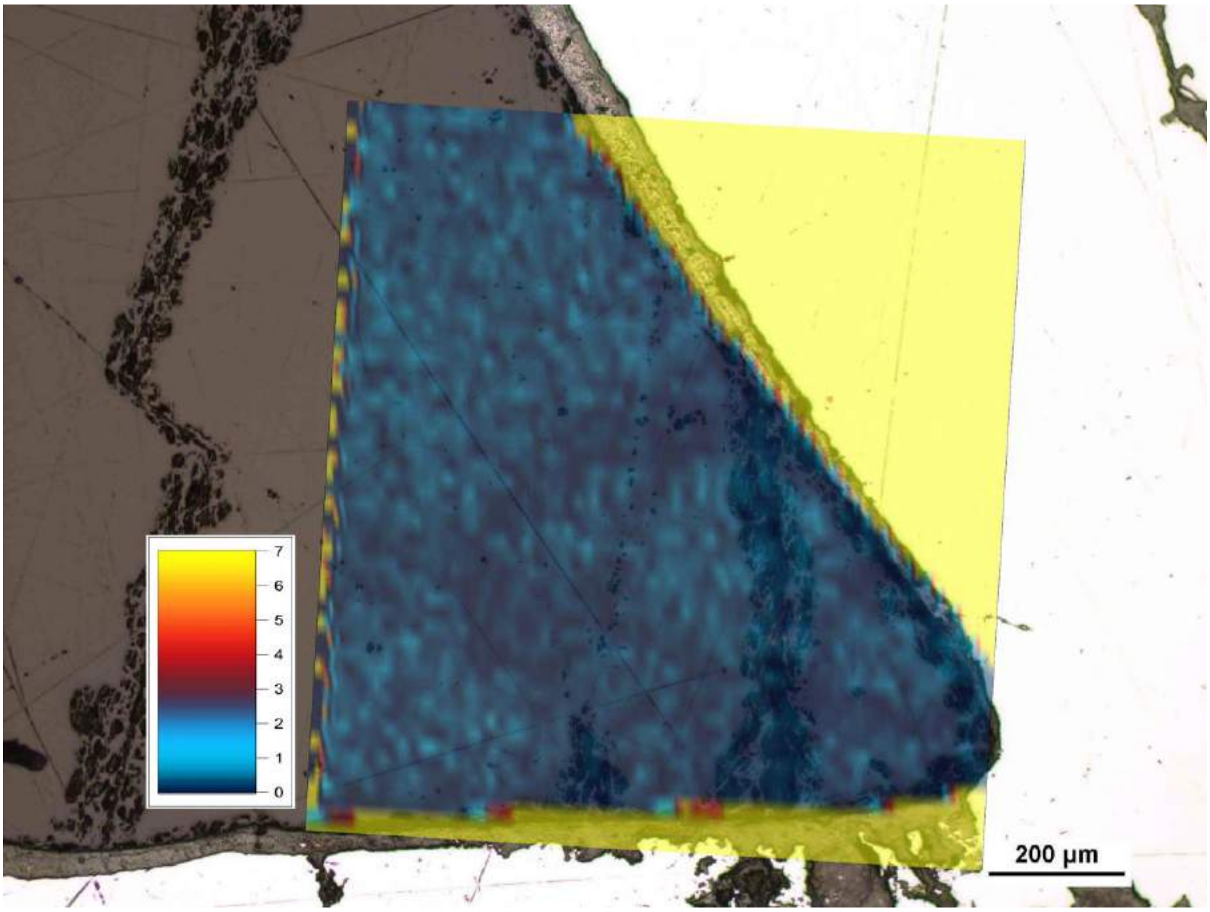
Ga diffusion patterns

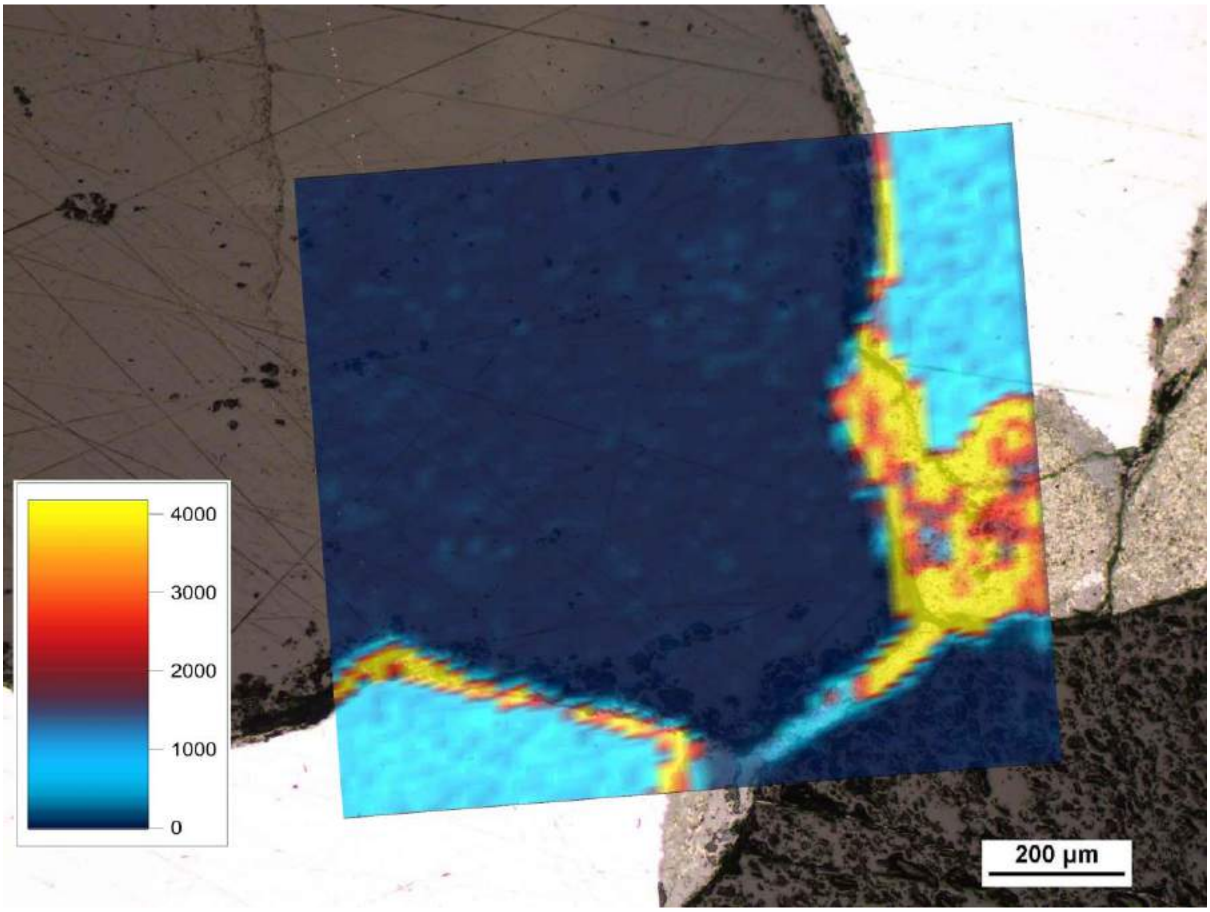

50
40
30
20
10
0
200 µm



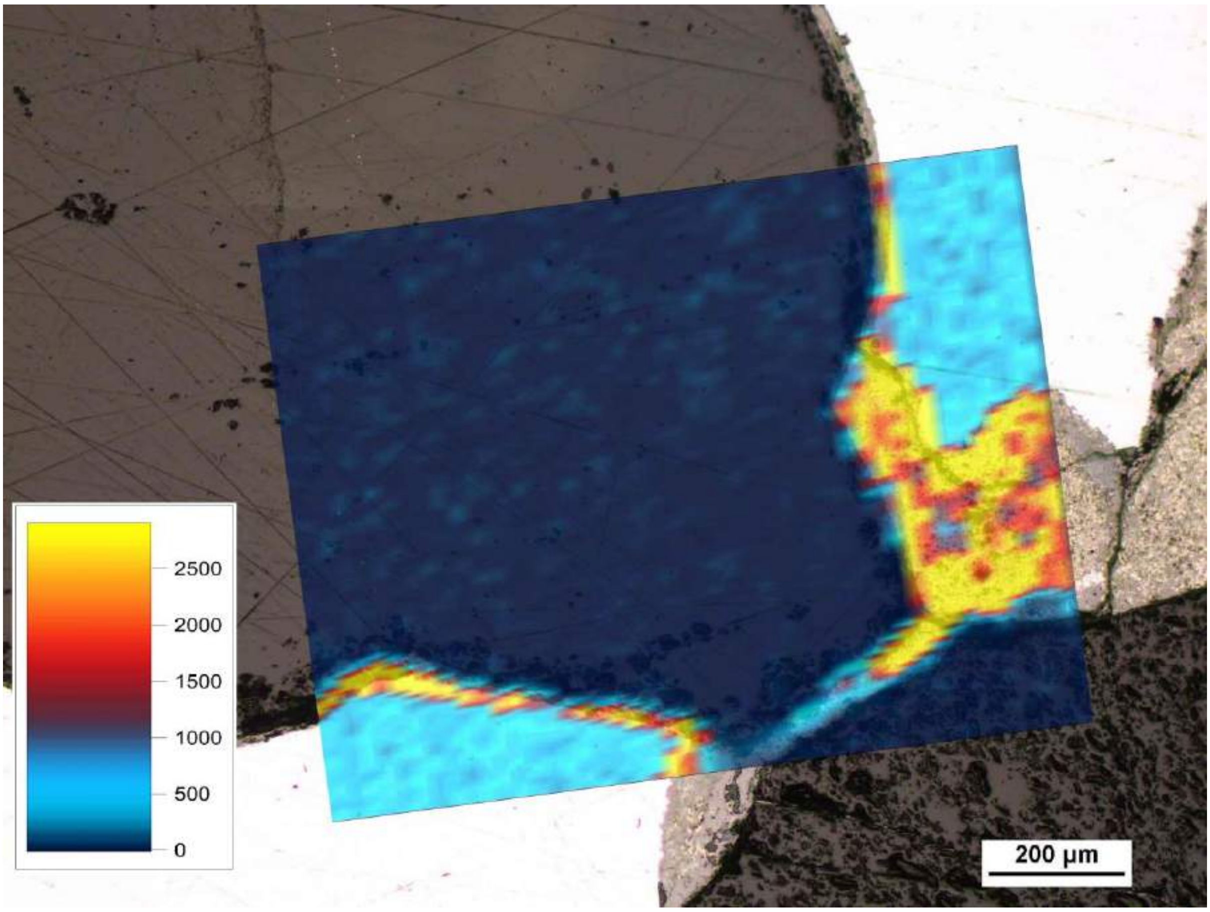
50
40
30
20
10
0
200 µm

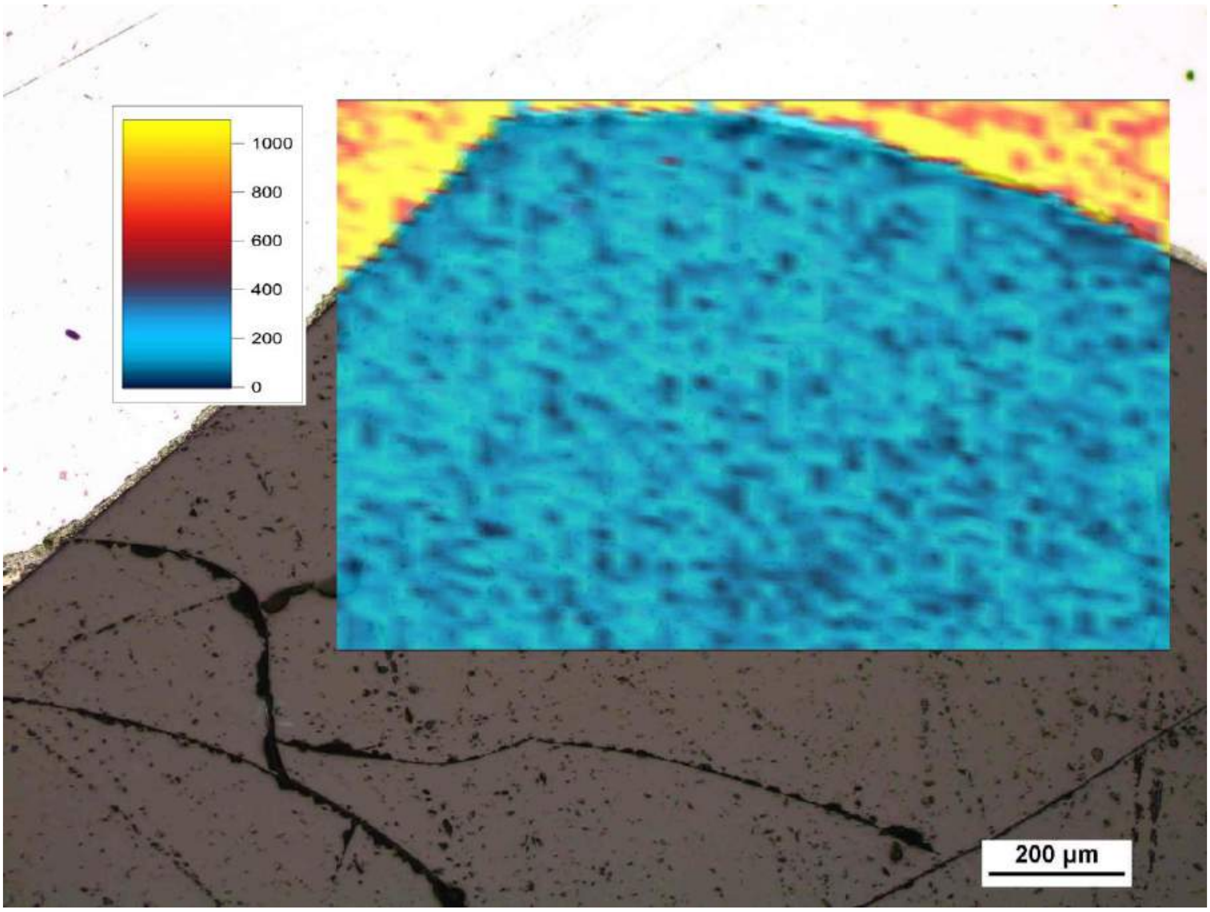

7
6
5
4
3
2
1
0
200 µm

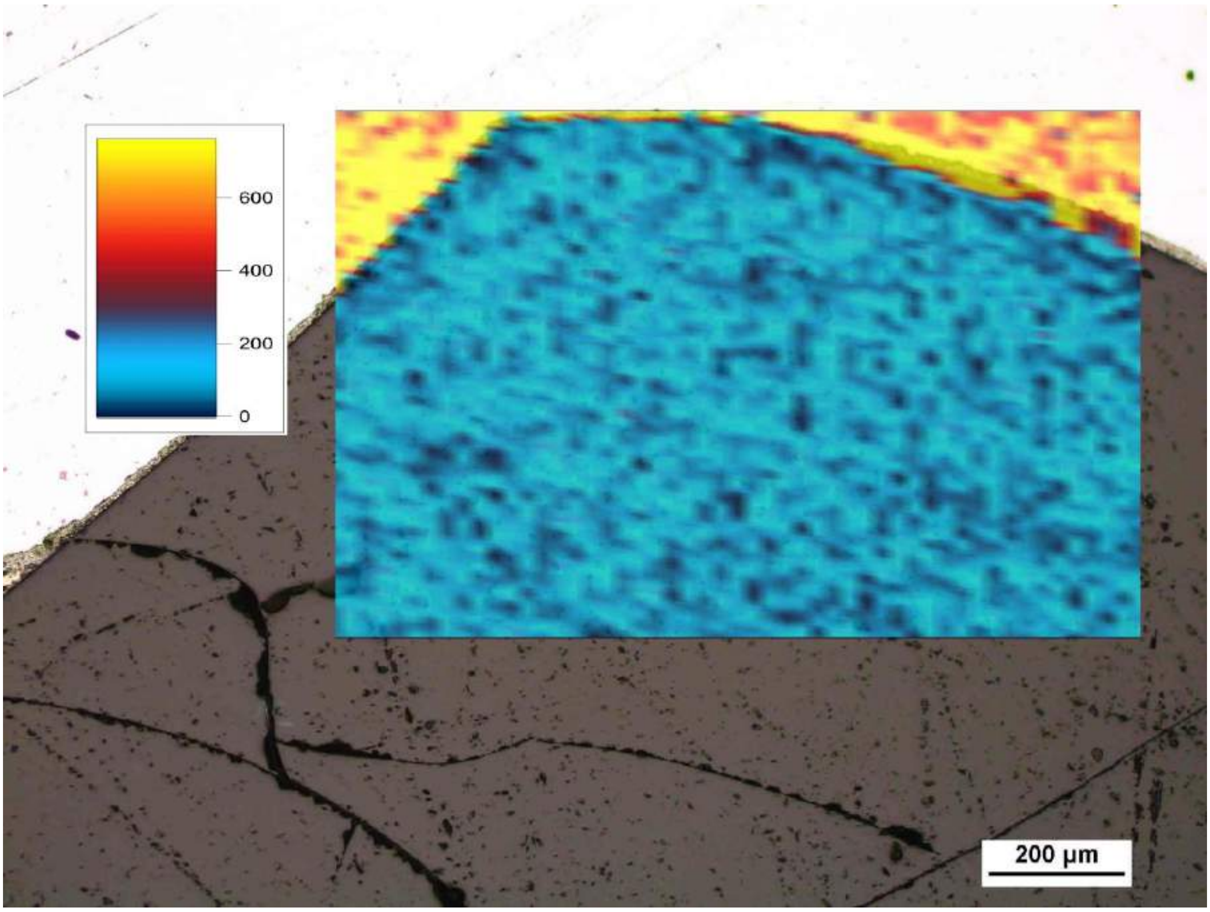

7
6
5
4
3
2
1
0
200 µm

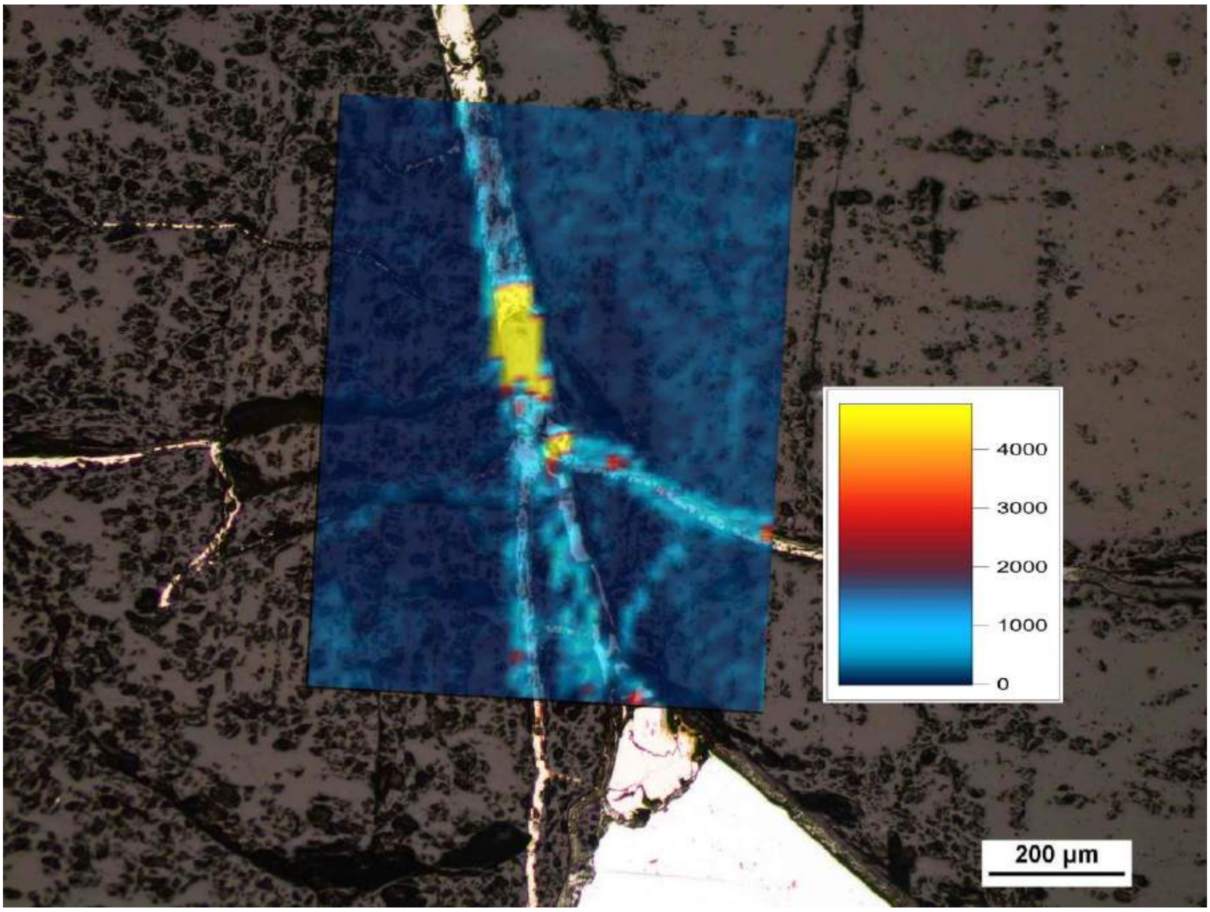


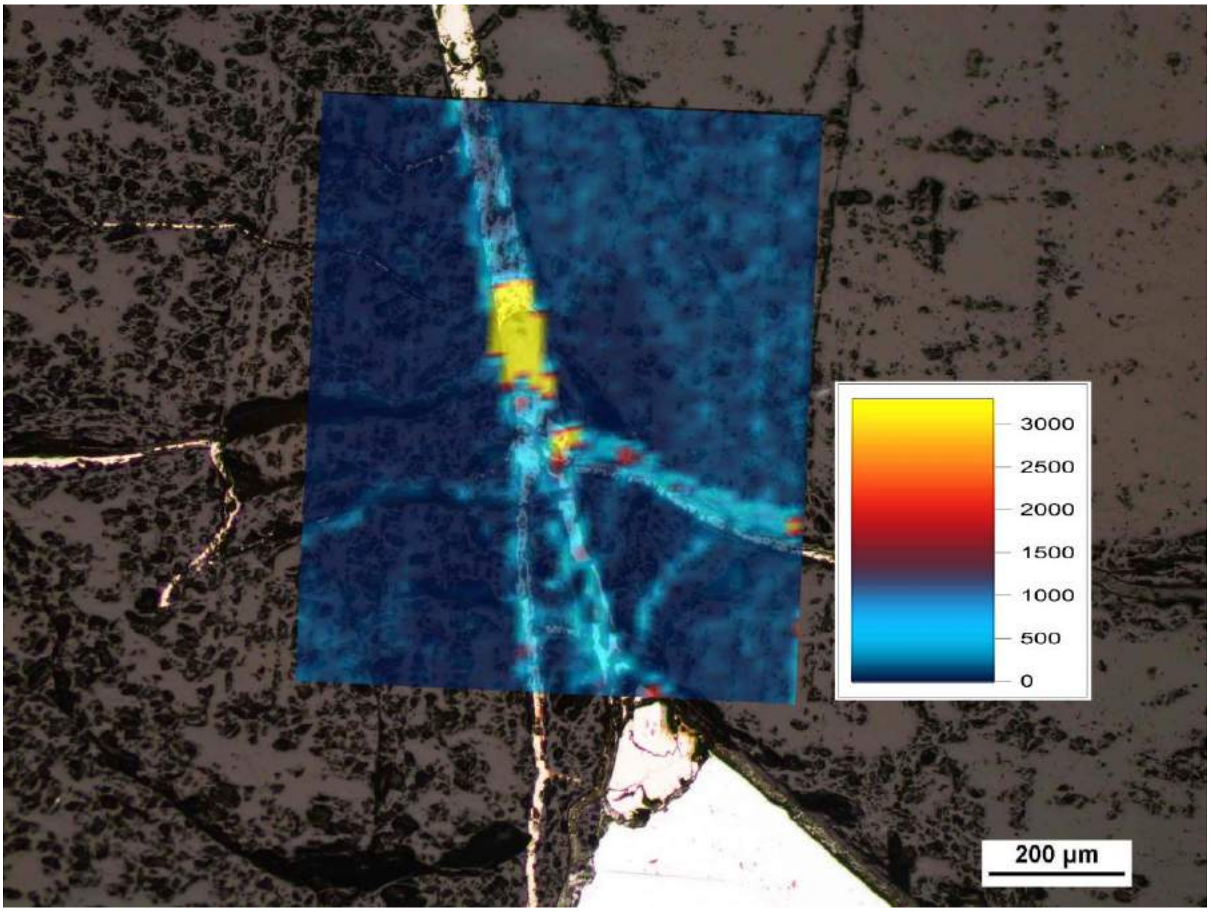
4000
3000
2000
1000
0
200 µm

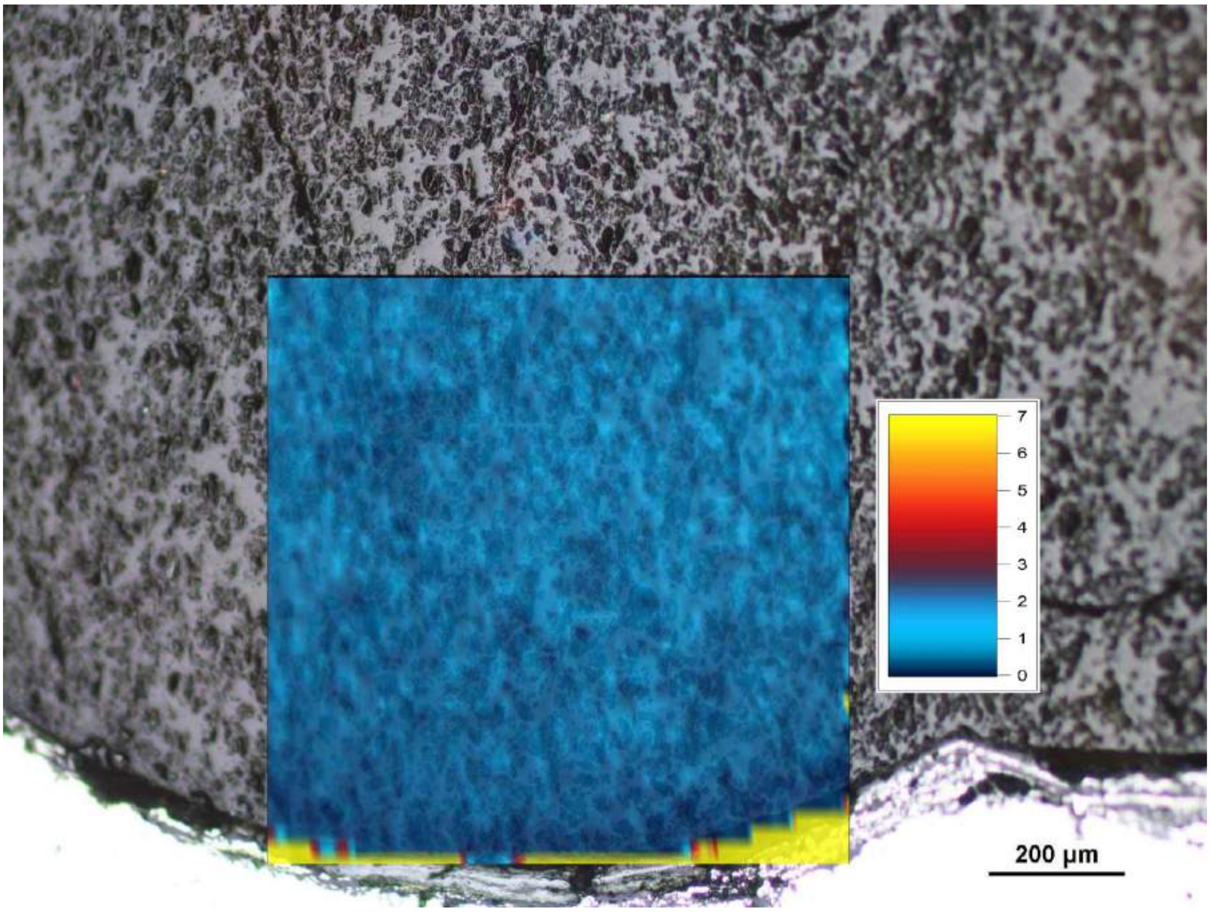

2500
2000
1500
1000
500
0
200 µm

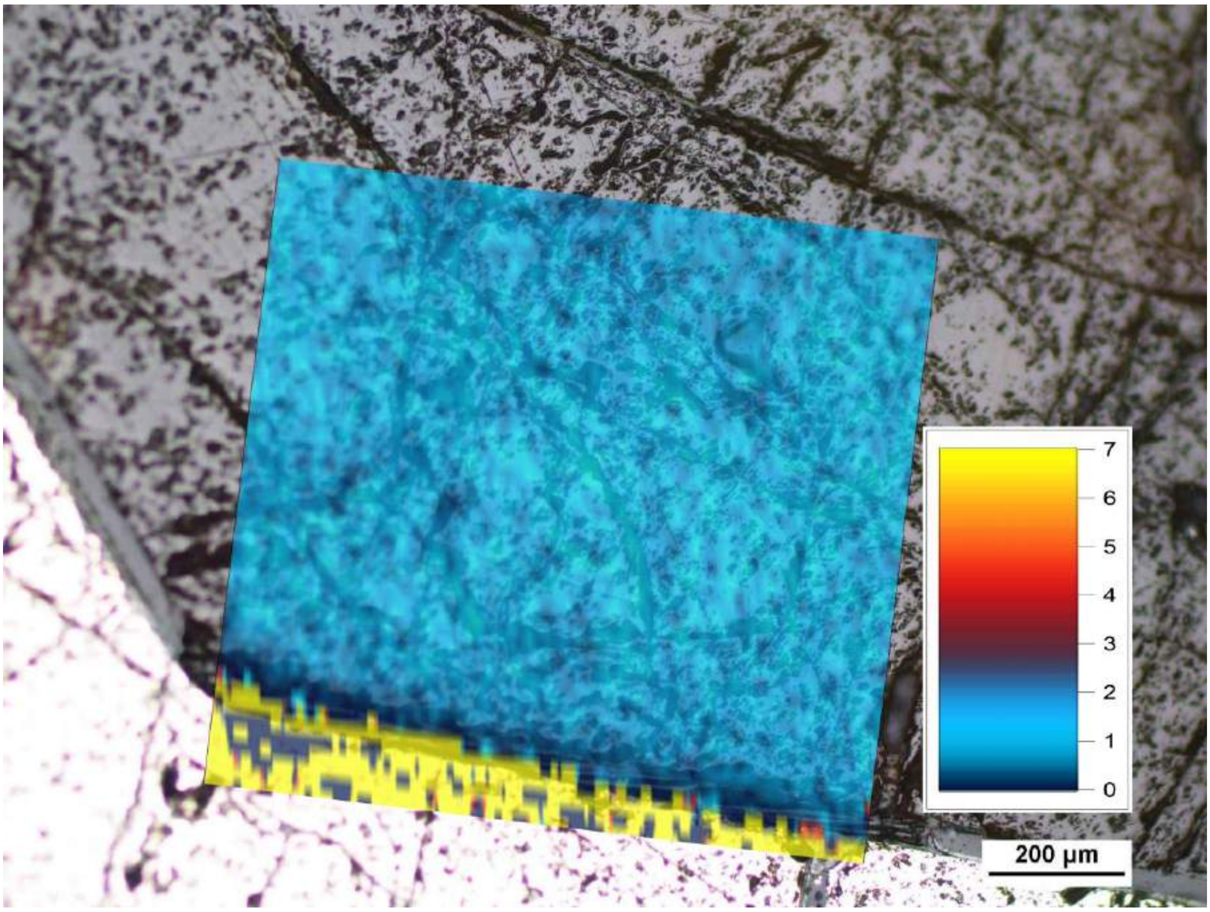

1000
800
600
400
200
0
200 µm

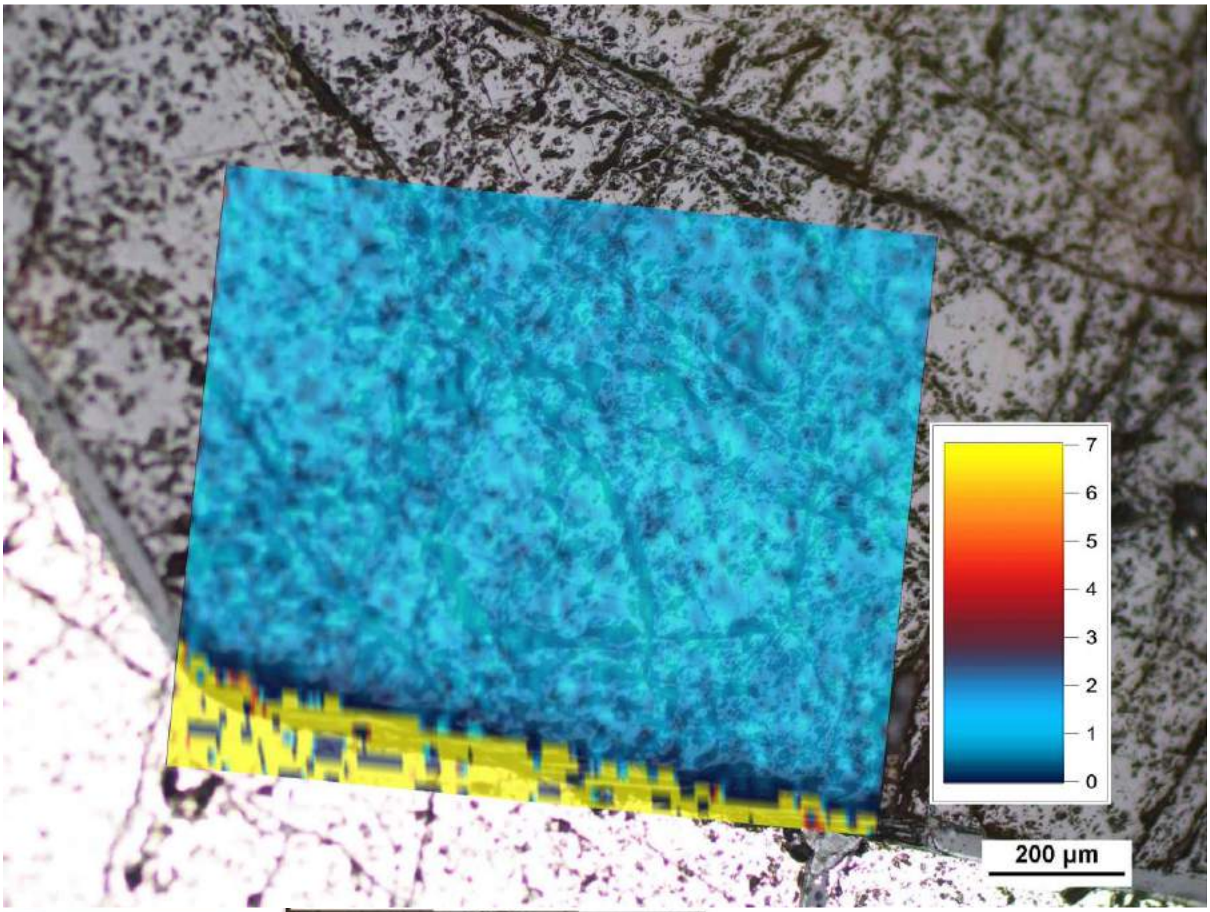

600
400
200
0
200 µm

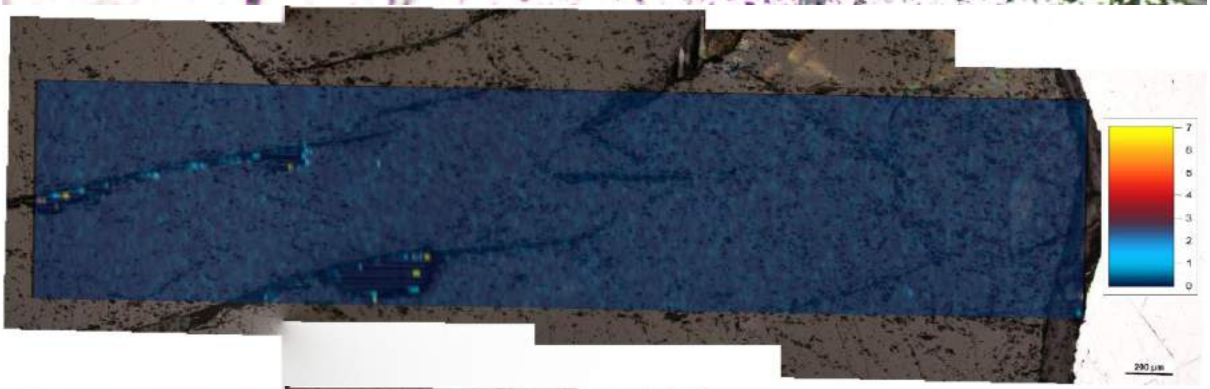

4000
3000
2000
1000
0
200 µm

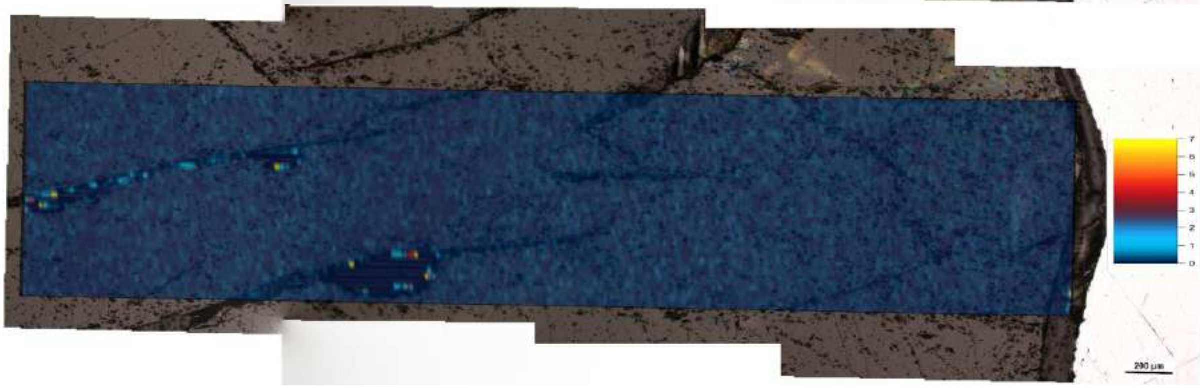

3000
2500
2000
1500
1000
500
0
200 µm

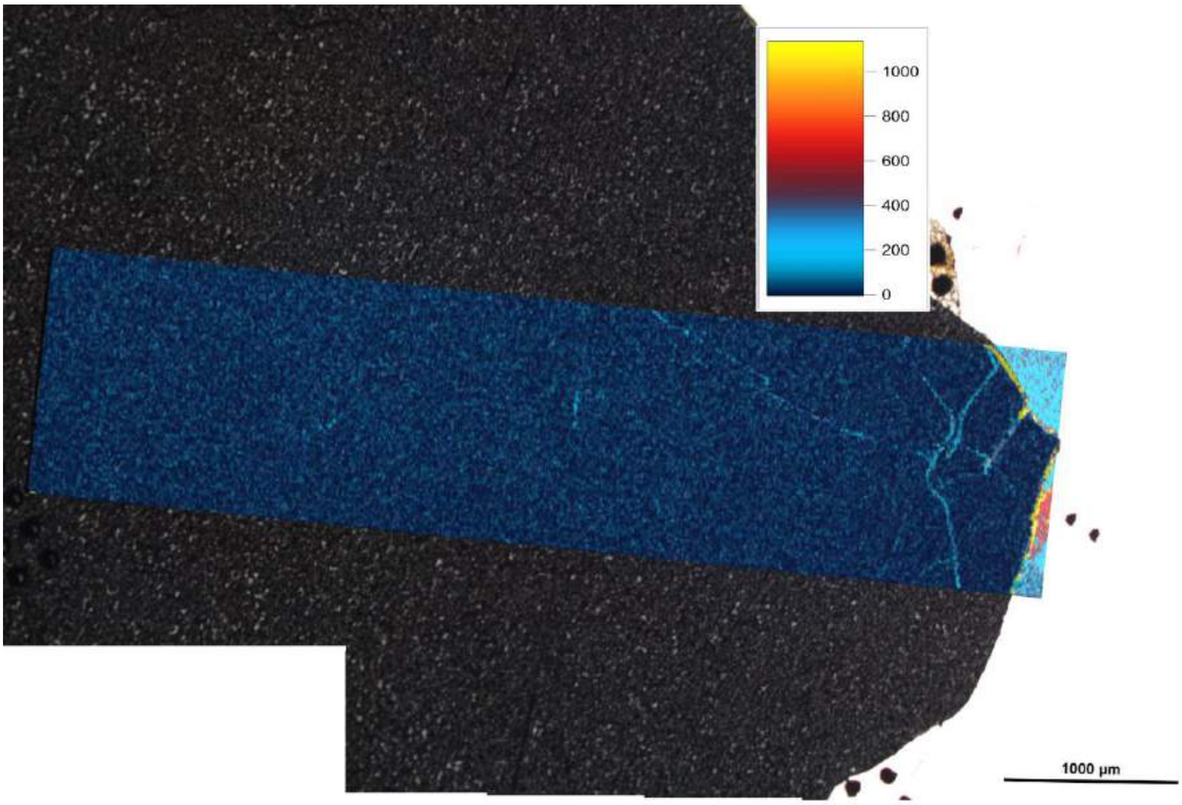

7
6
5
4
3
2
1
0
200 µm


7
6
5
4
3
2
1
0
200 µm

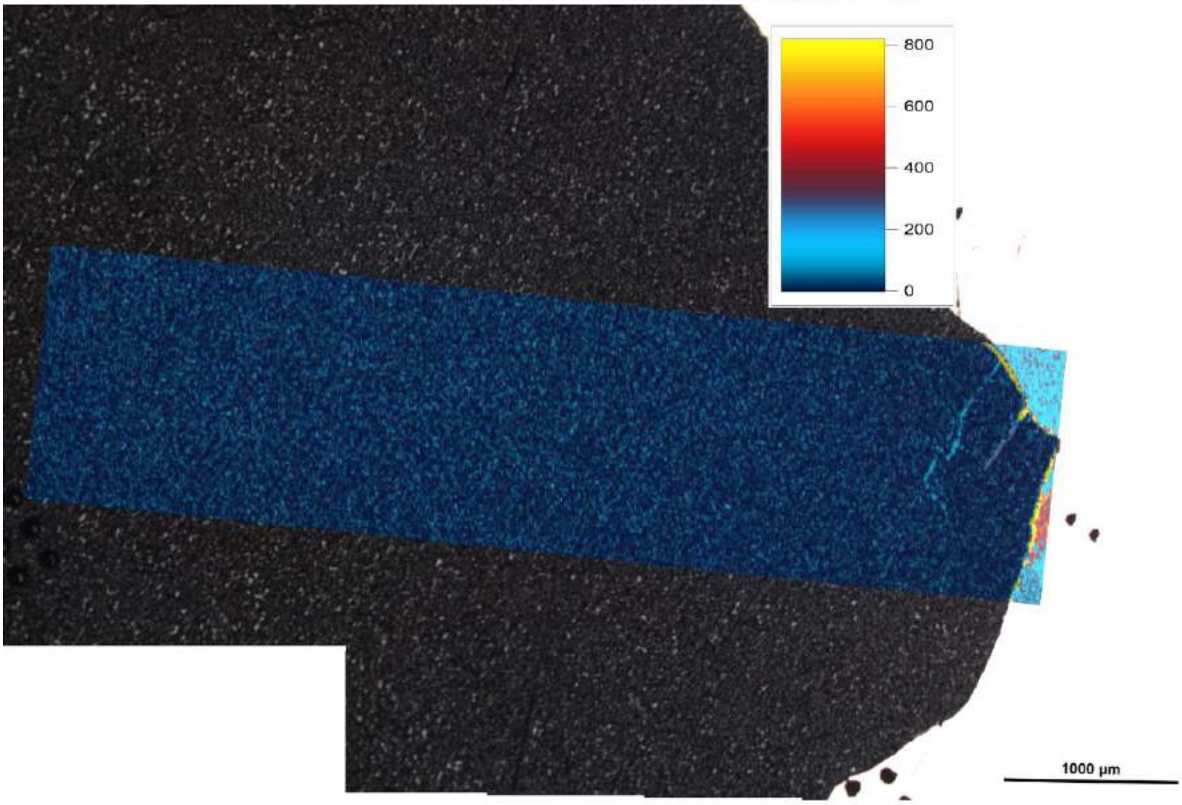

7
6
5
4
3
2
1
0
200 µm



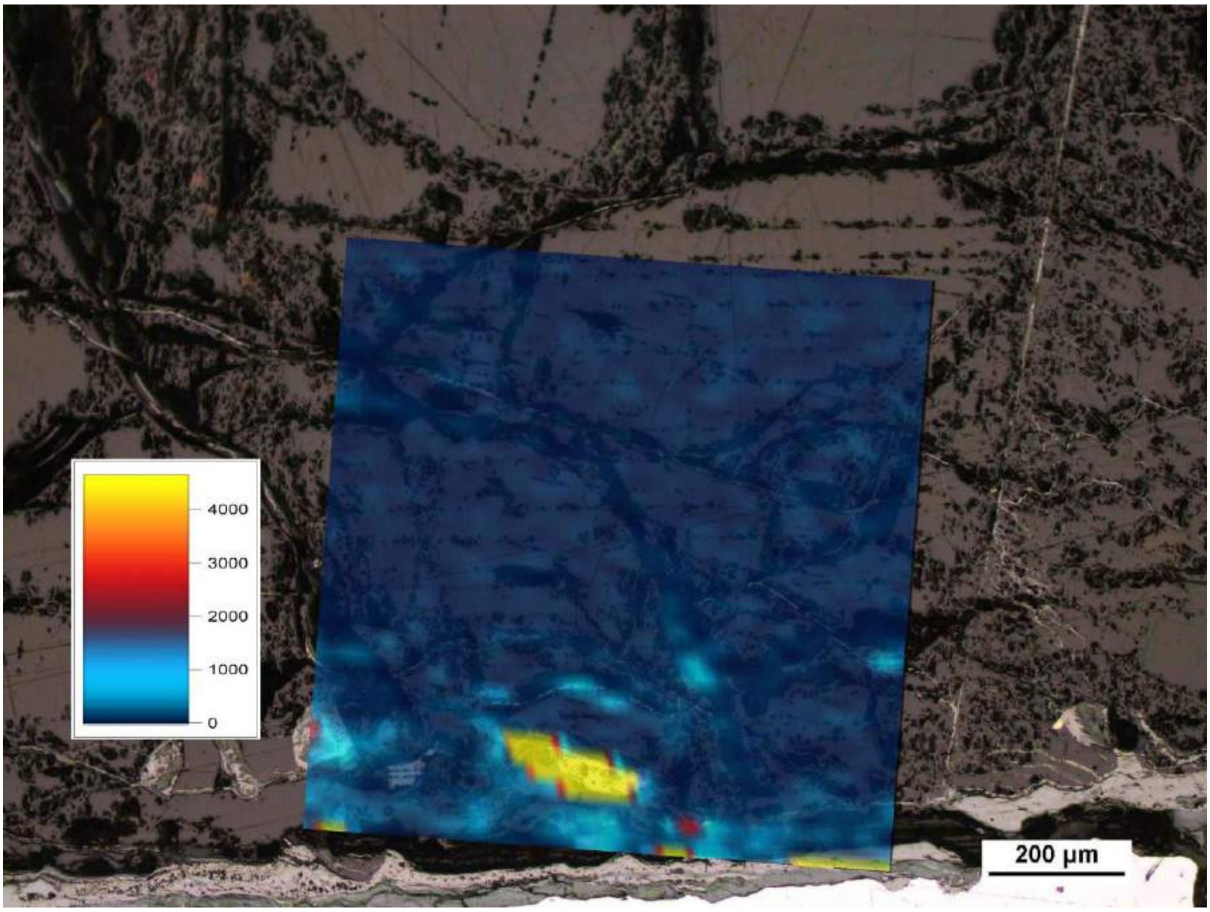


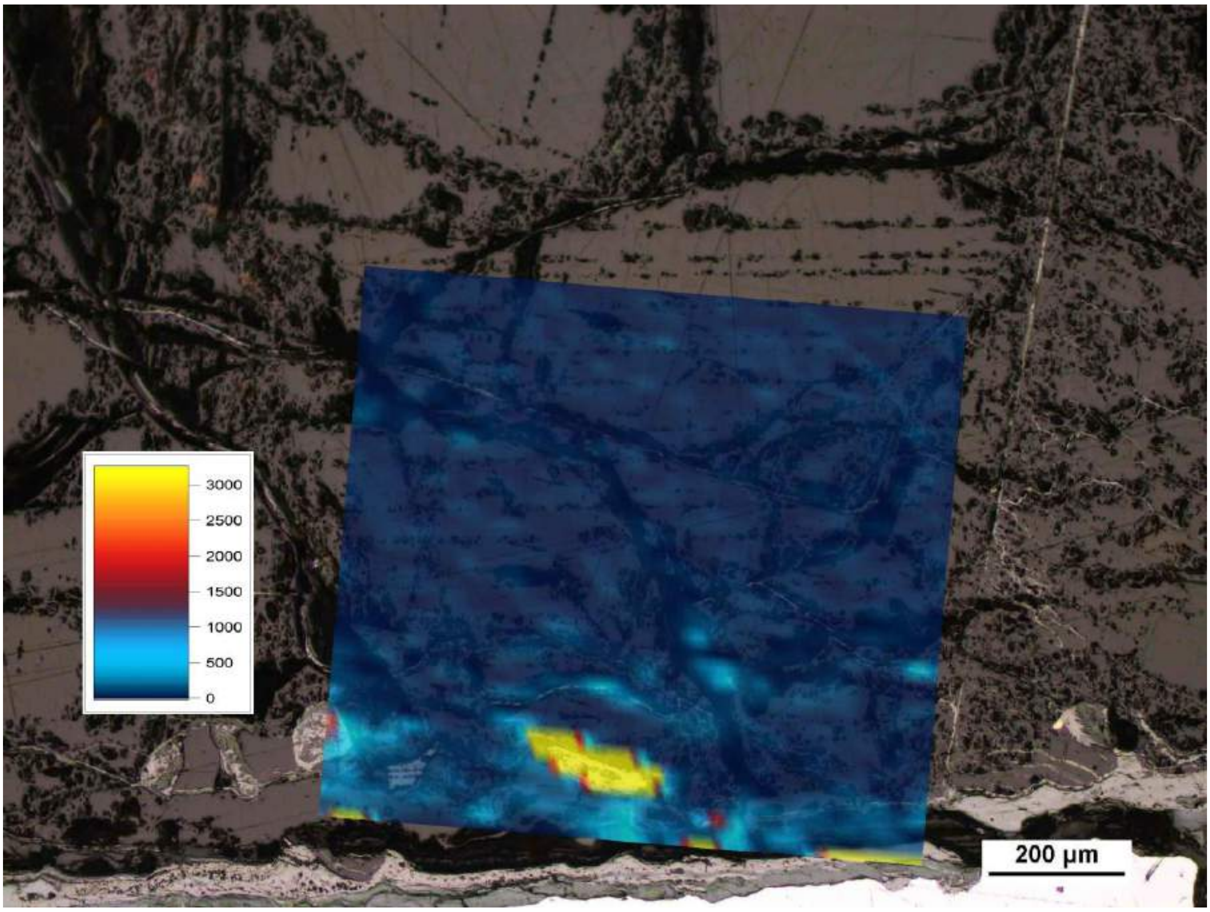


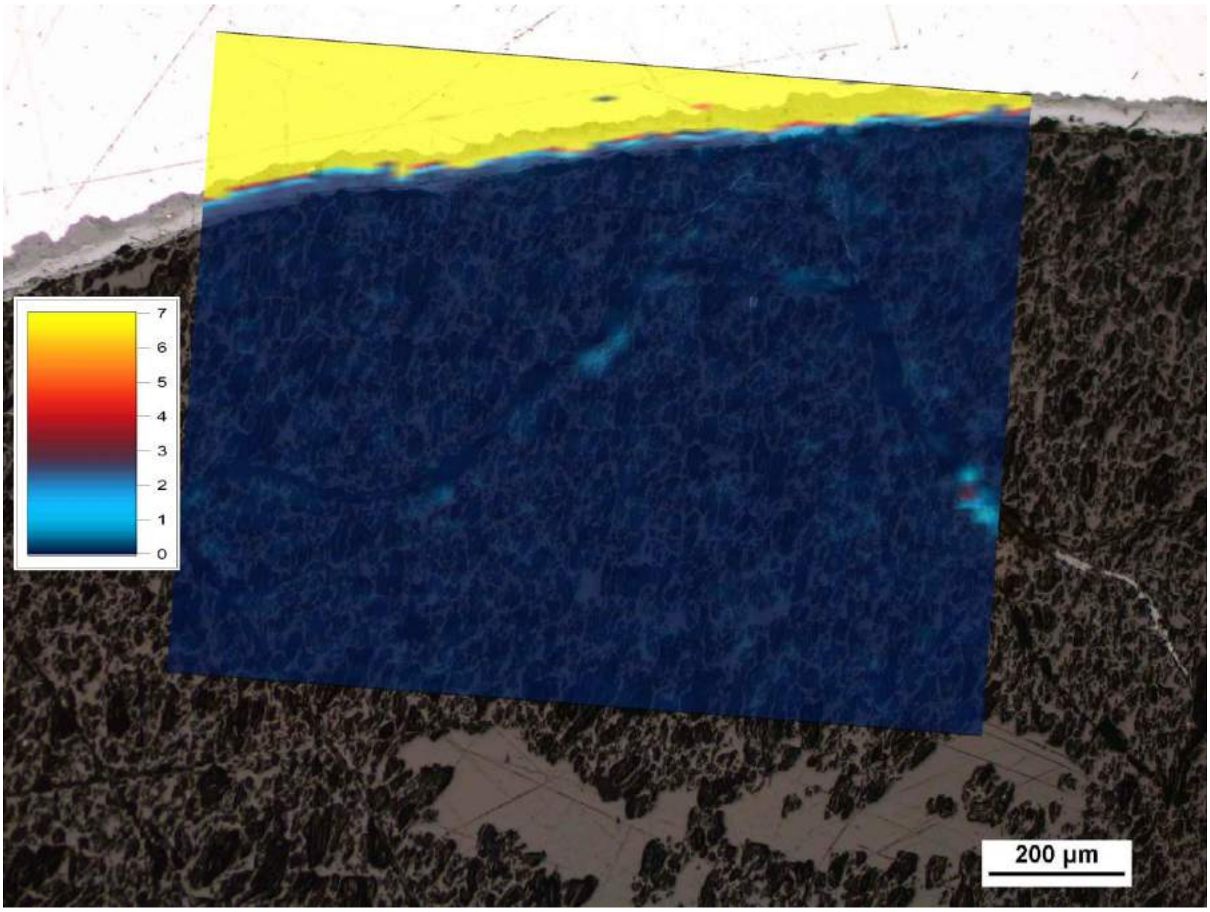
1000
800
600
400
200
0
1000 µm

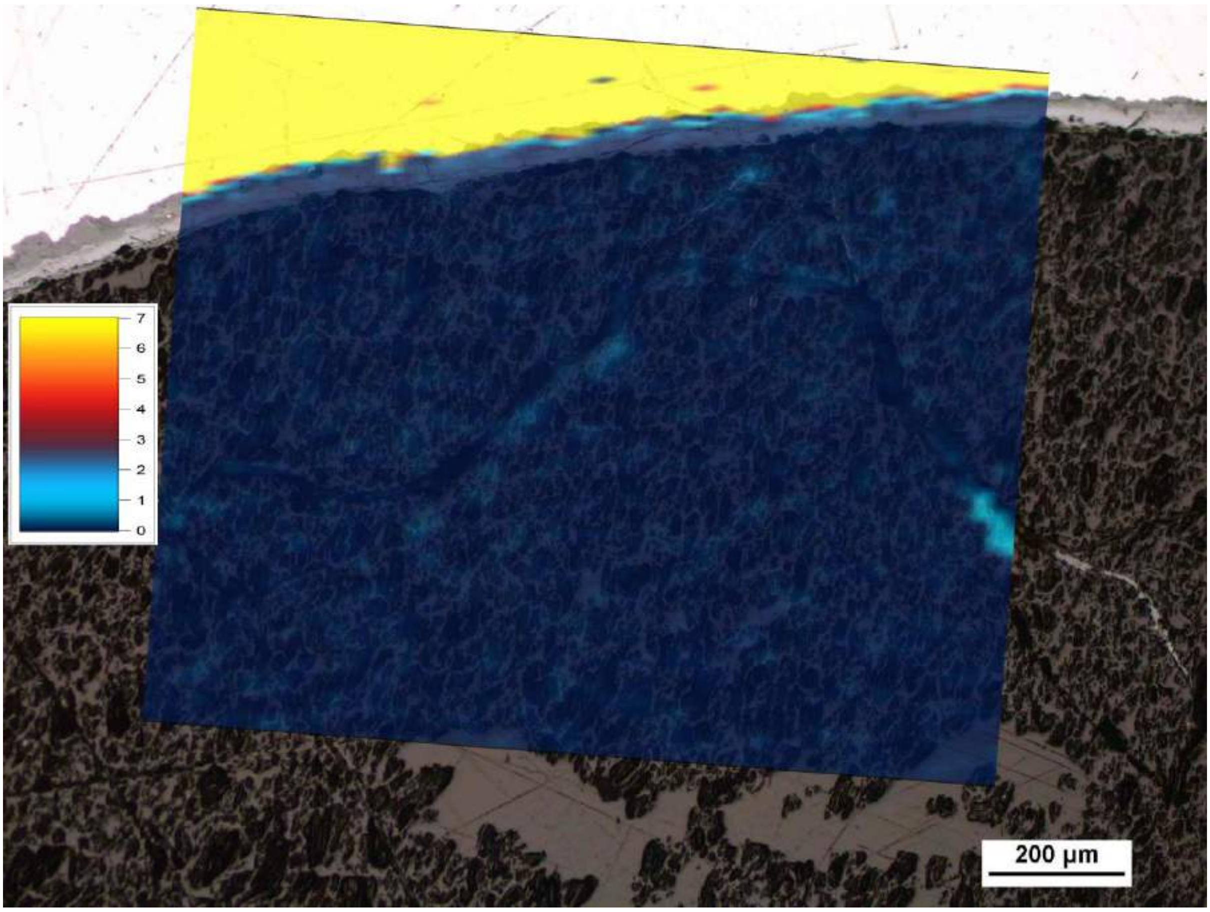


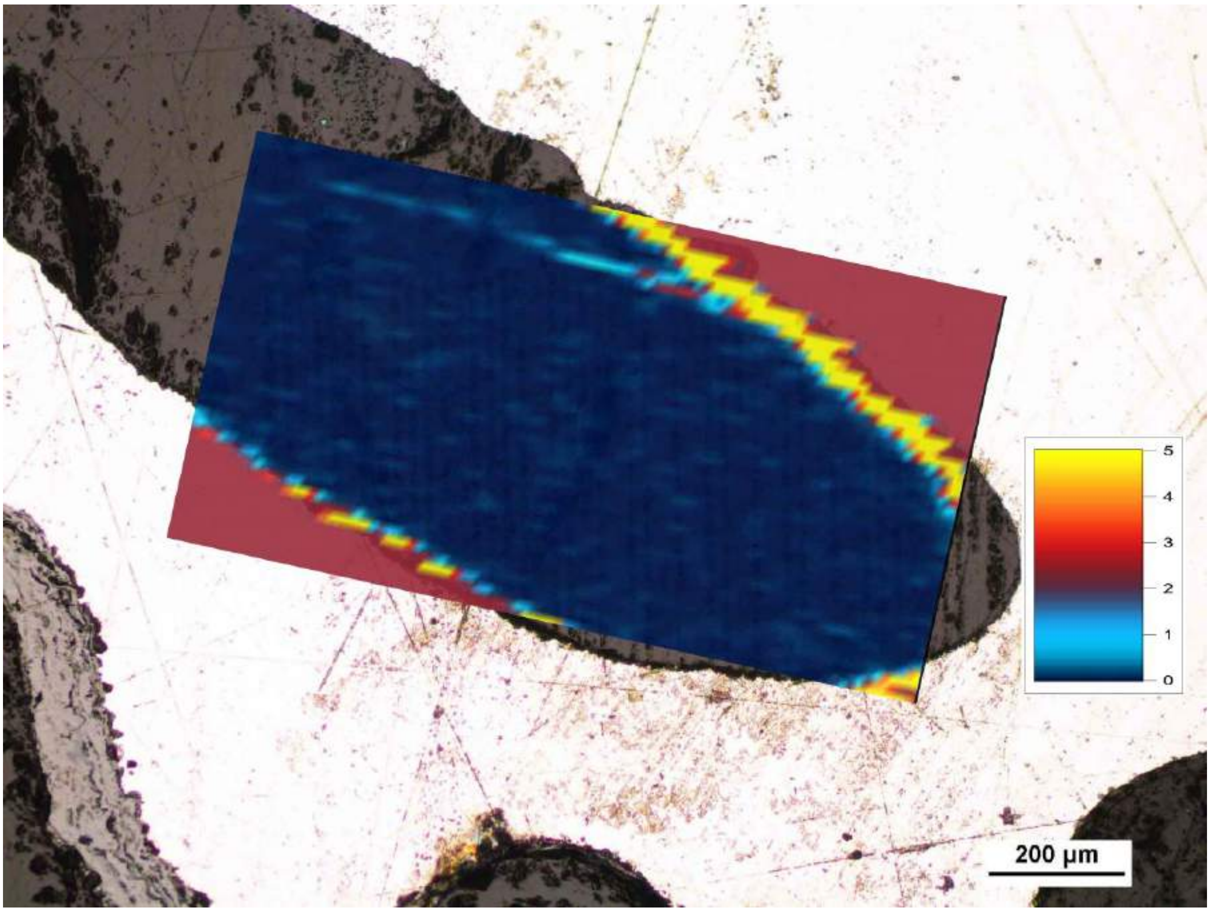
800
600
400
200
0
1000 µm

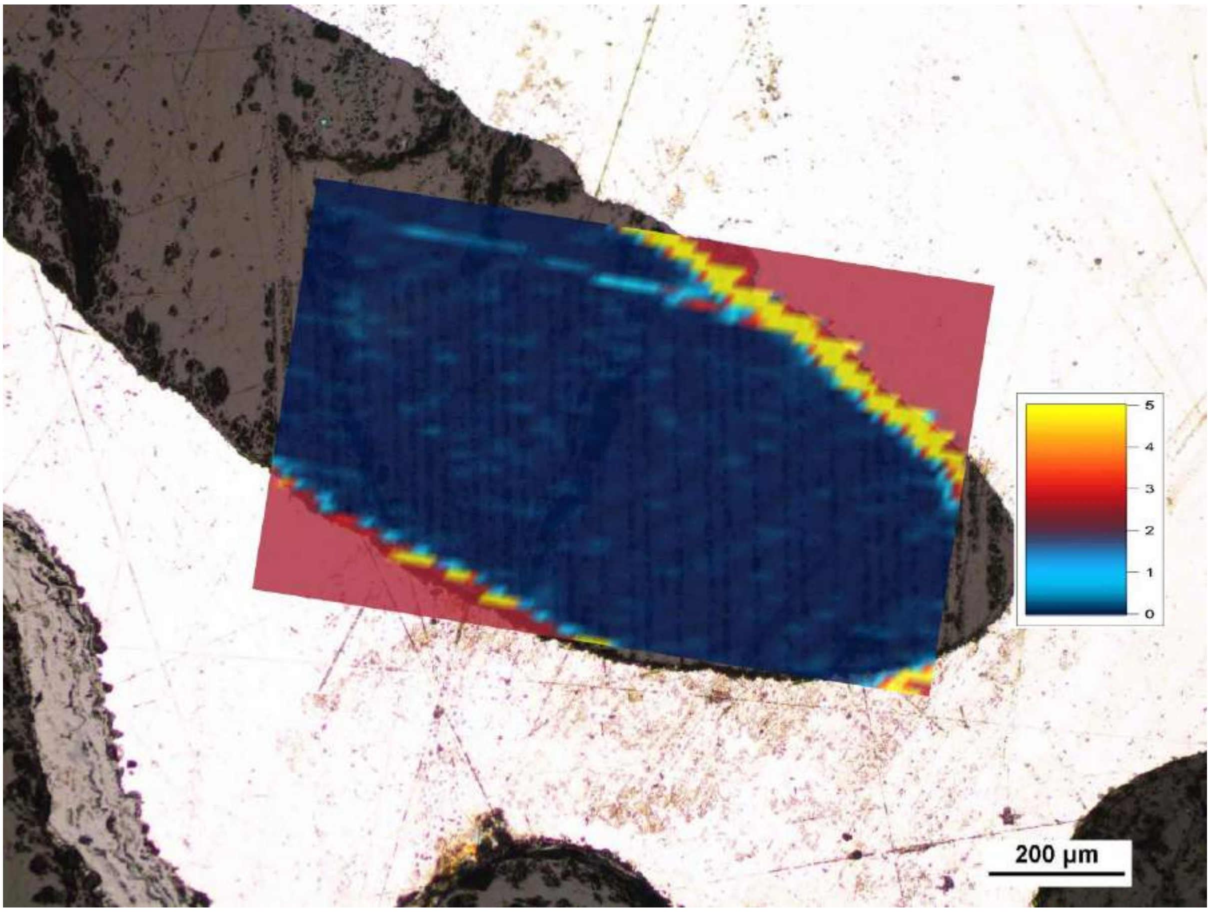

4000
3000
2000
1000
0
200 µm


3000
2500
2000
1500
1000
500
0
200 µm

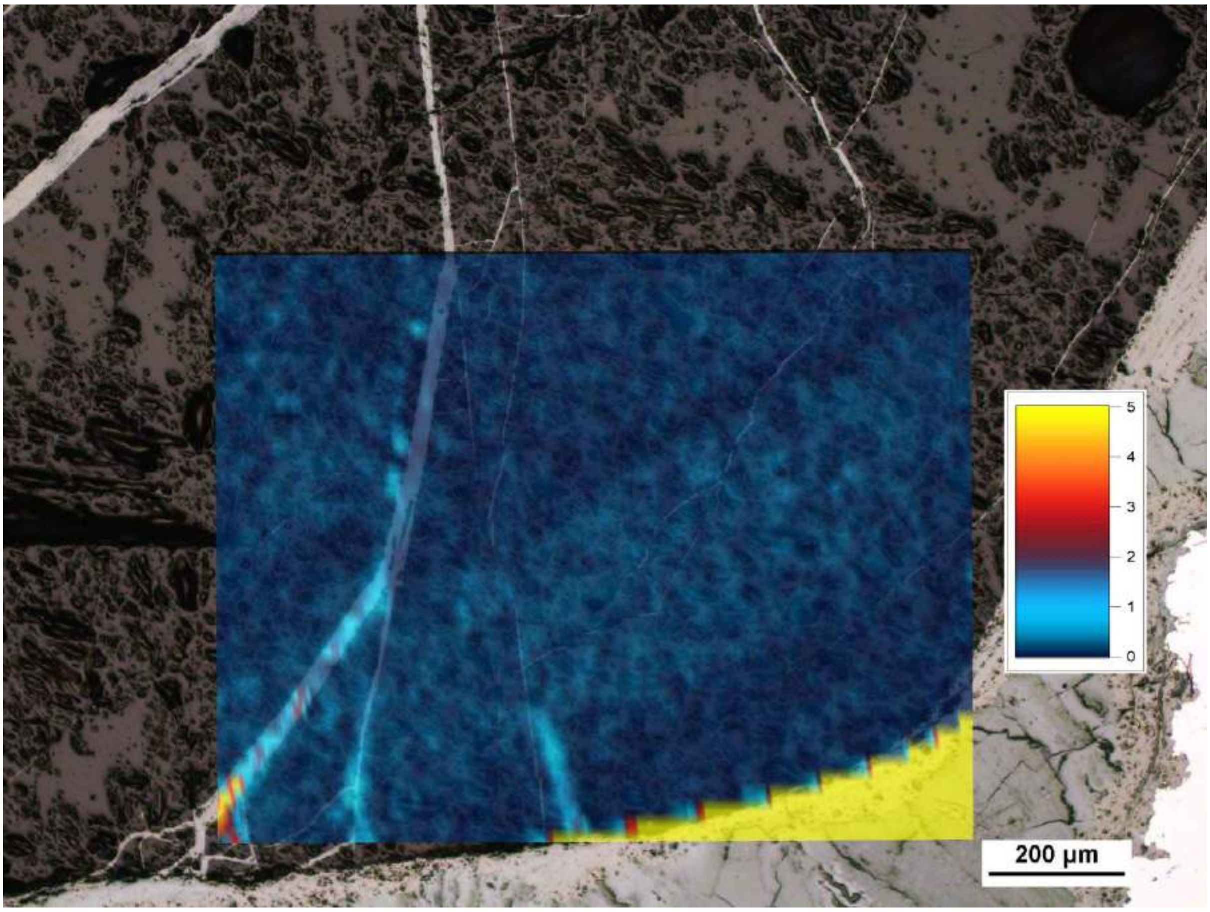

7
6
5
4
3
2
1
0
200 µm


7
6
5
4
3
2
1
0
200 µm

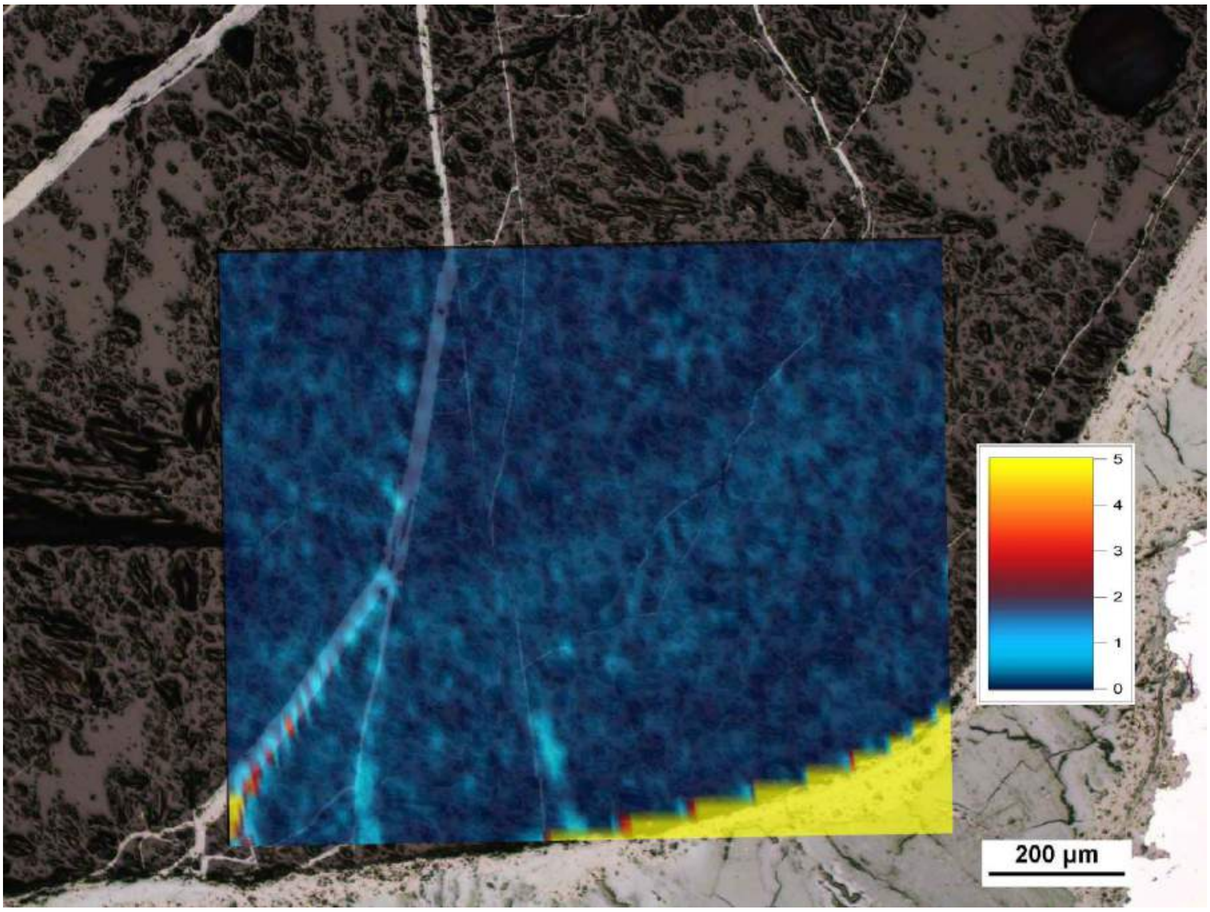

5
4
3
2
1
0
200 µm



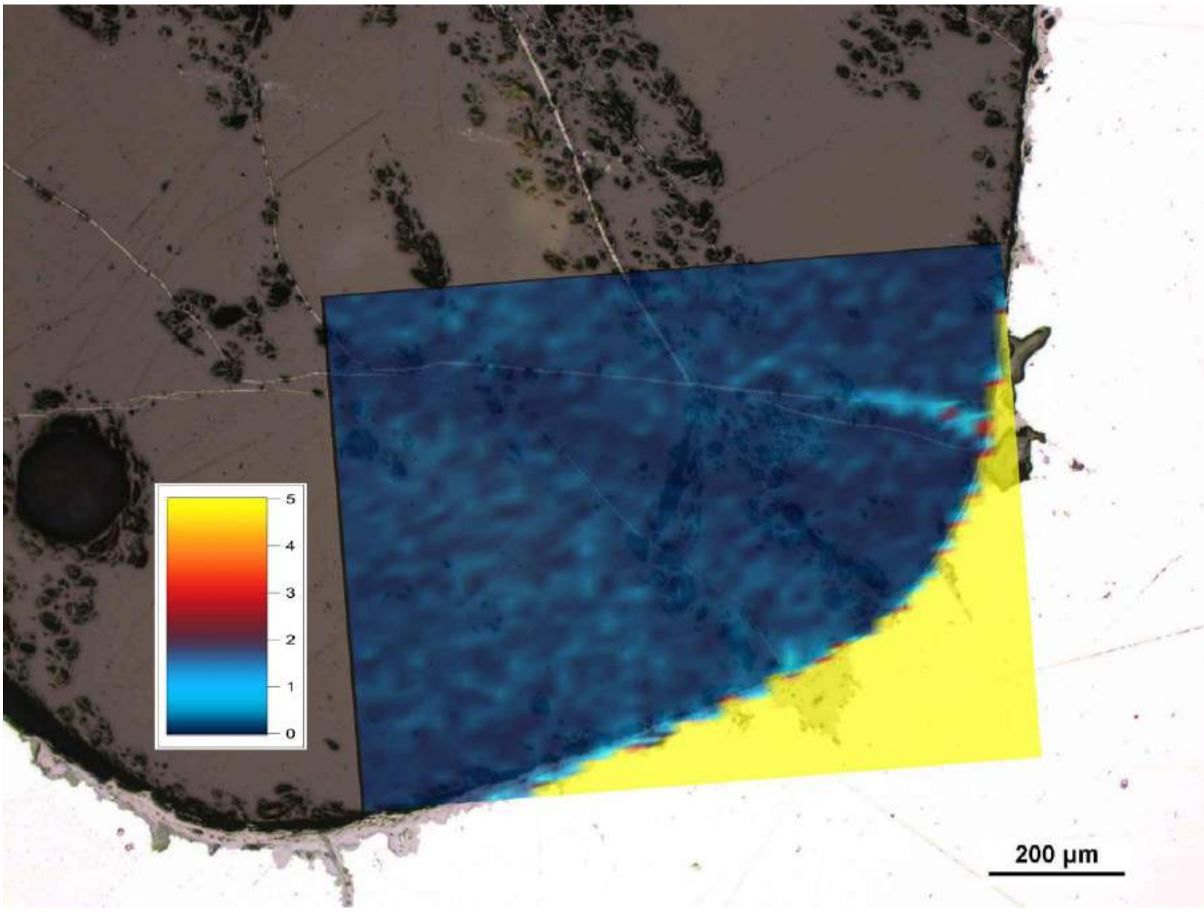
5
4
3
2
1
0
200 µm

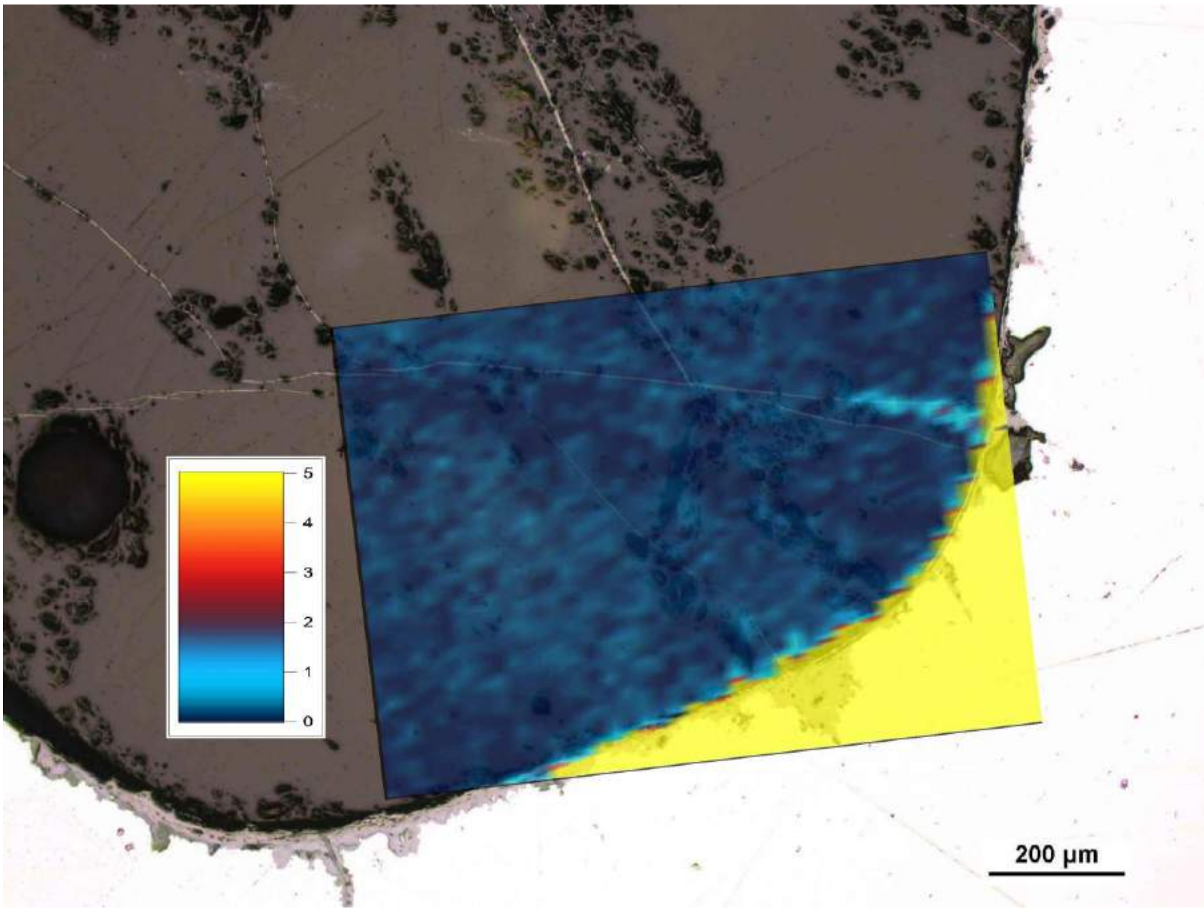


5
4
3
2
1
0
200 µm

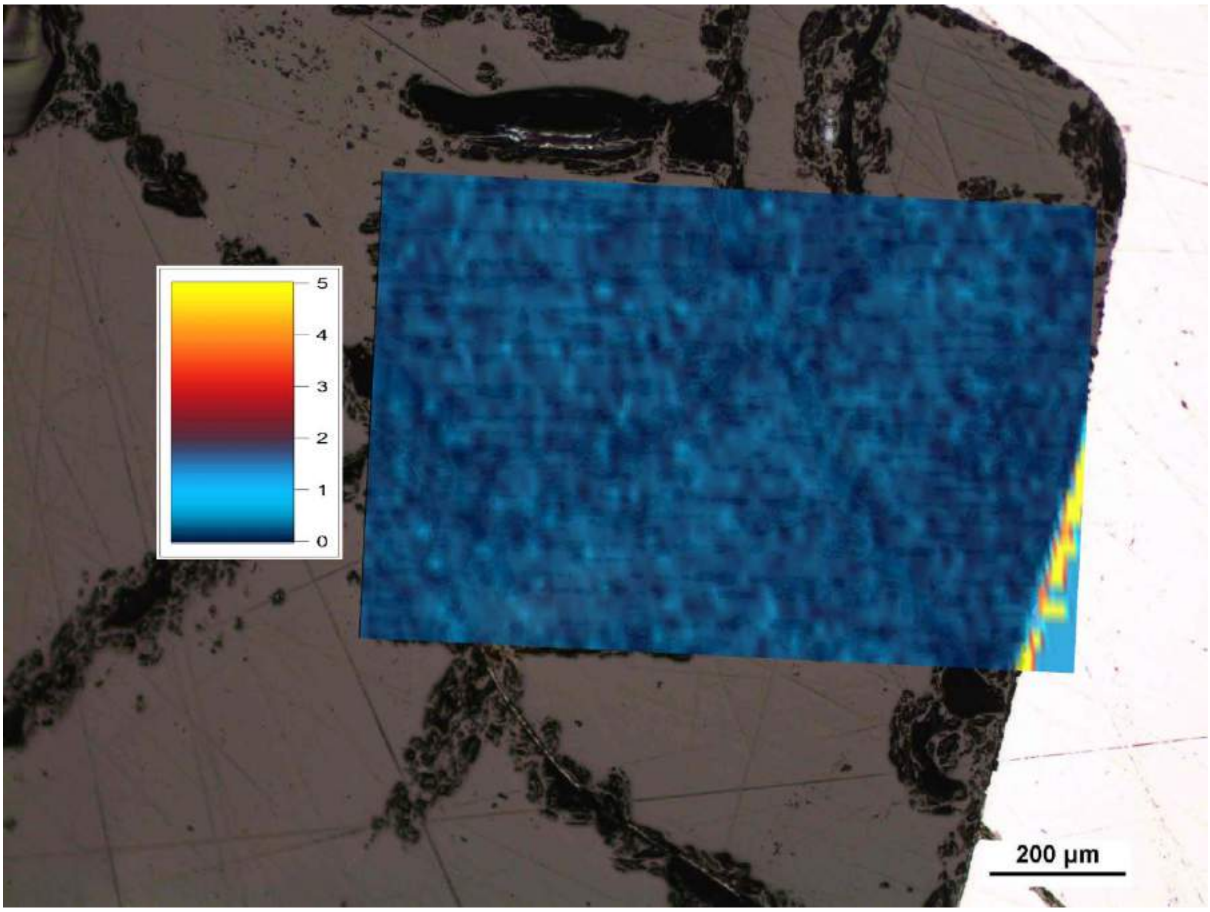


5
4
3
2
1
0
200 µm

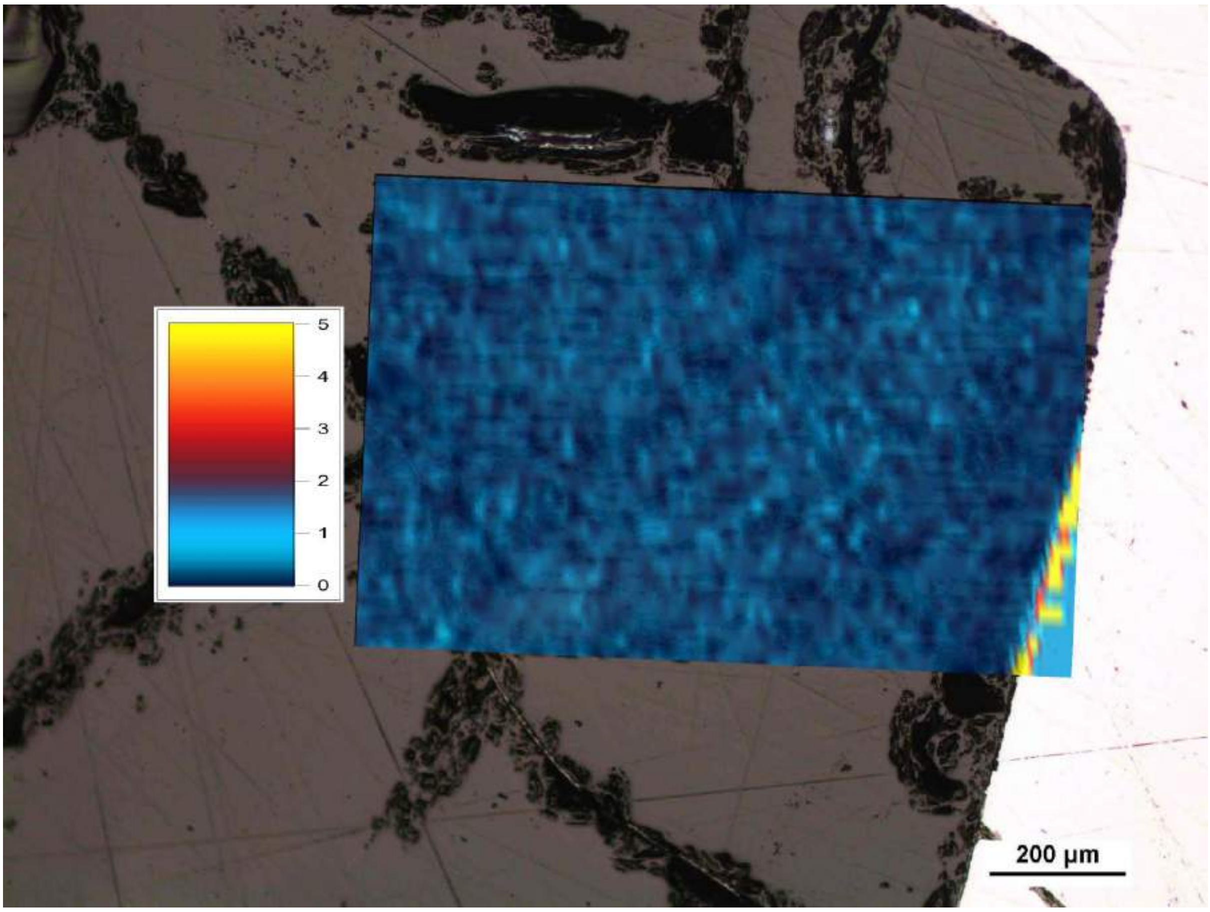

5
4
3
2
1
0
200 µm

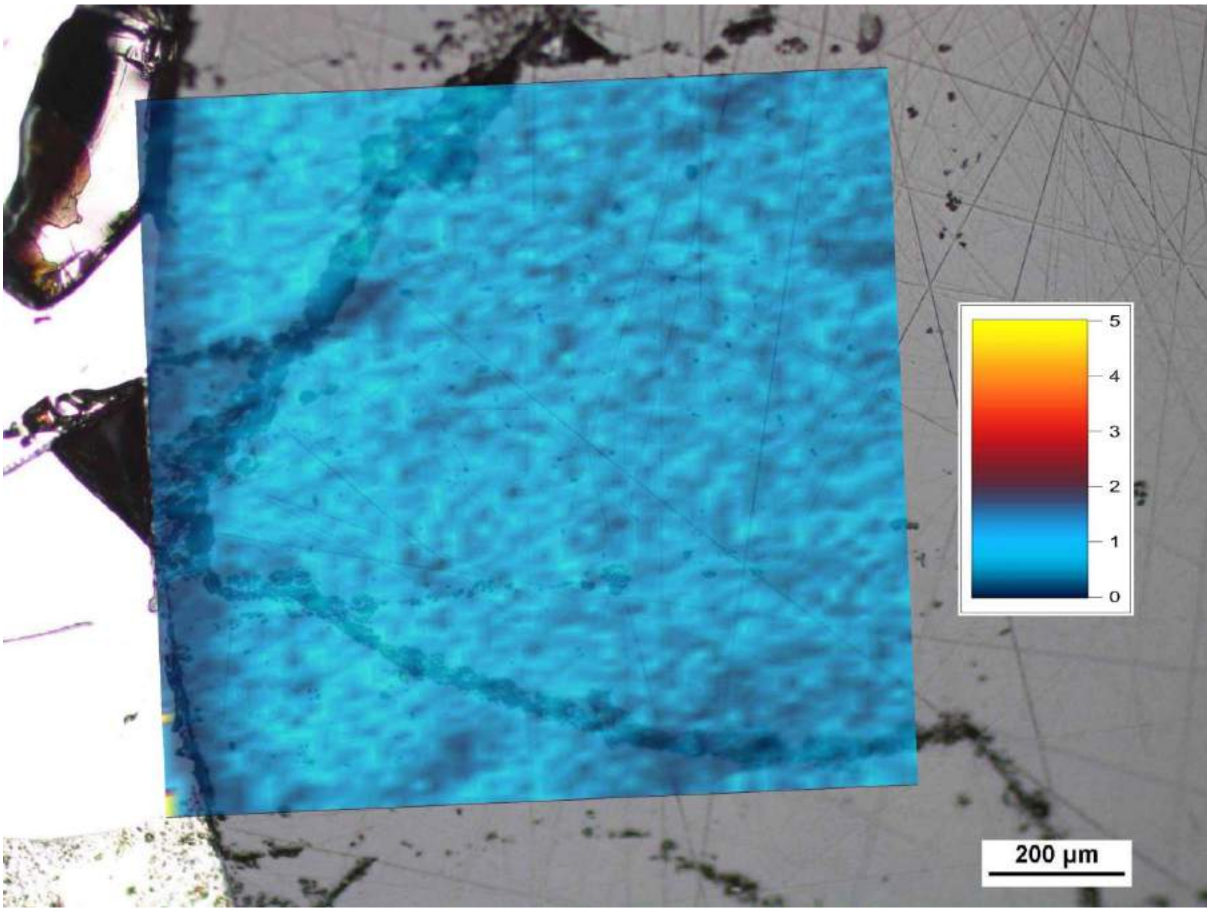


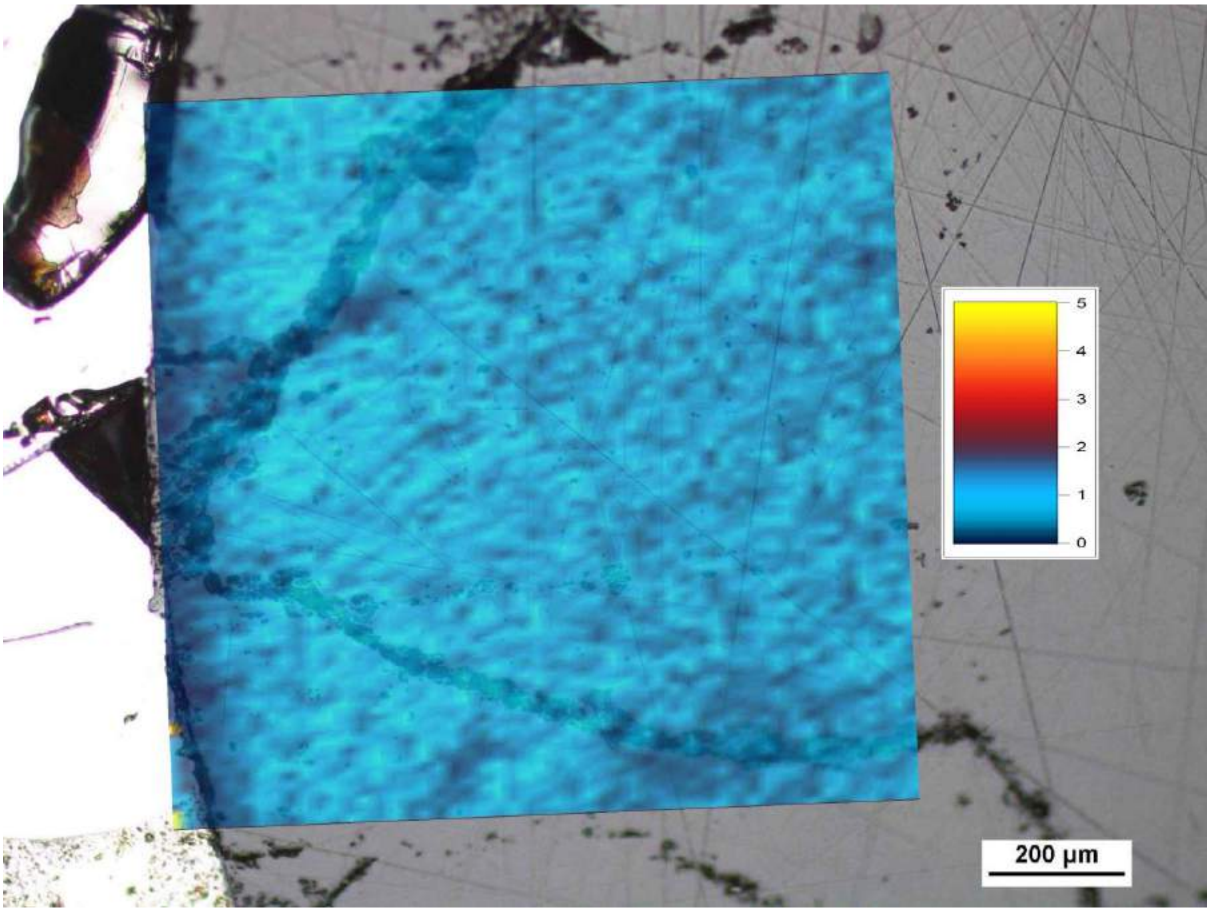
5
4
3
2
1
0
200 µm

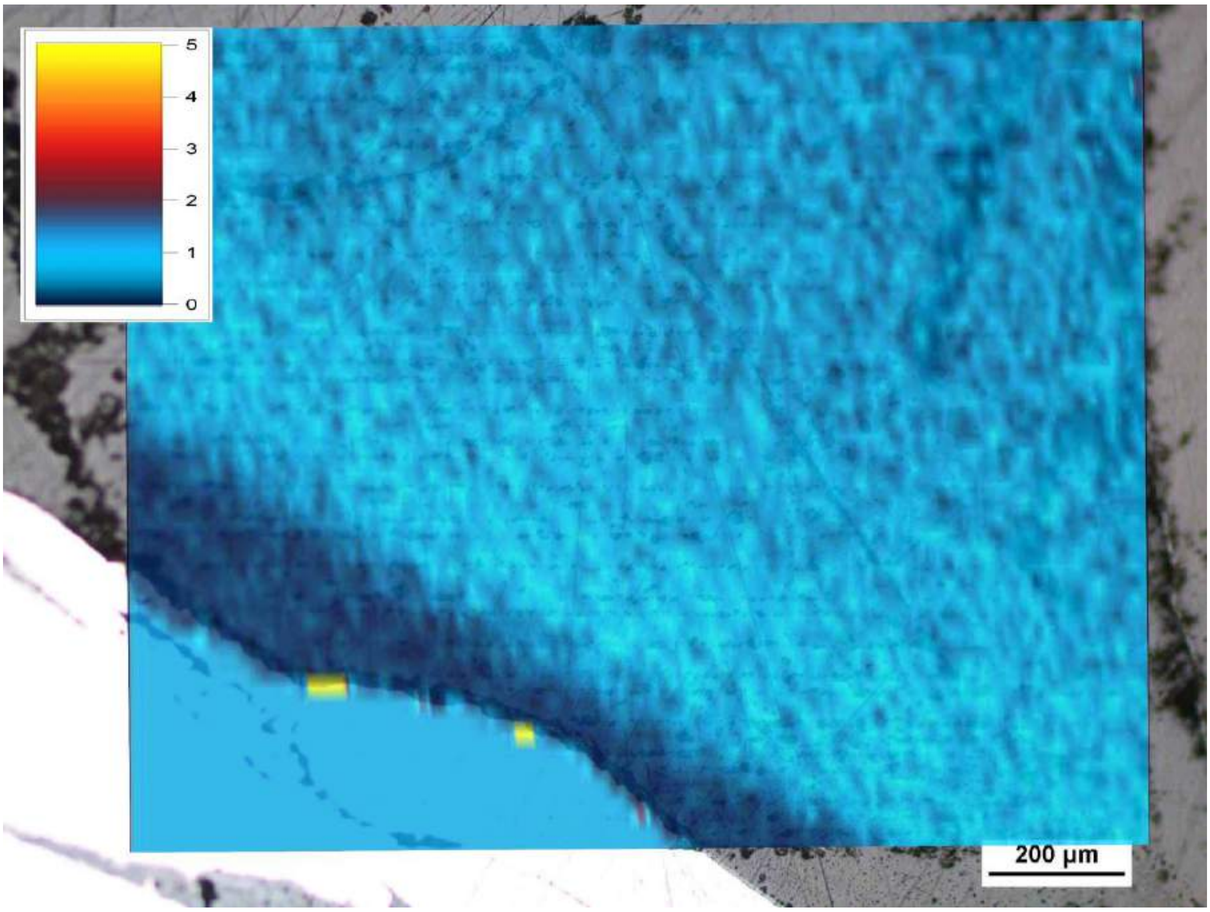


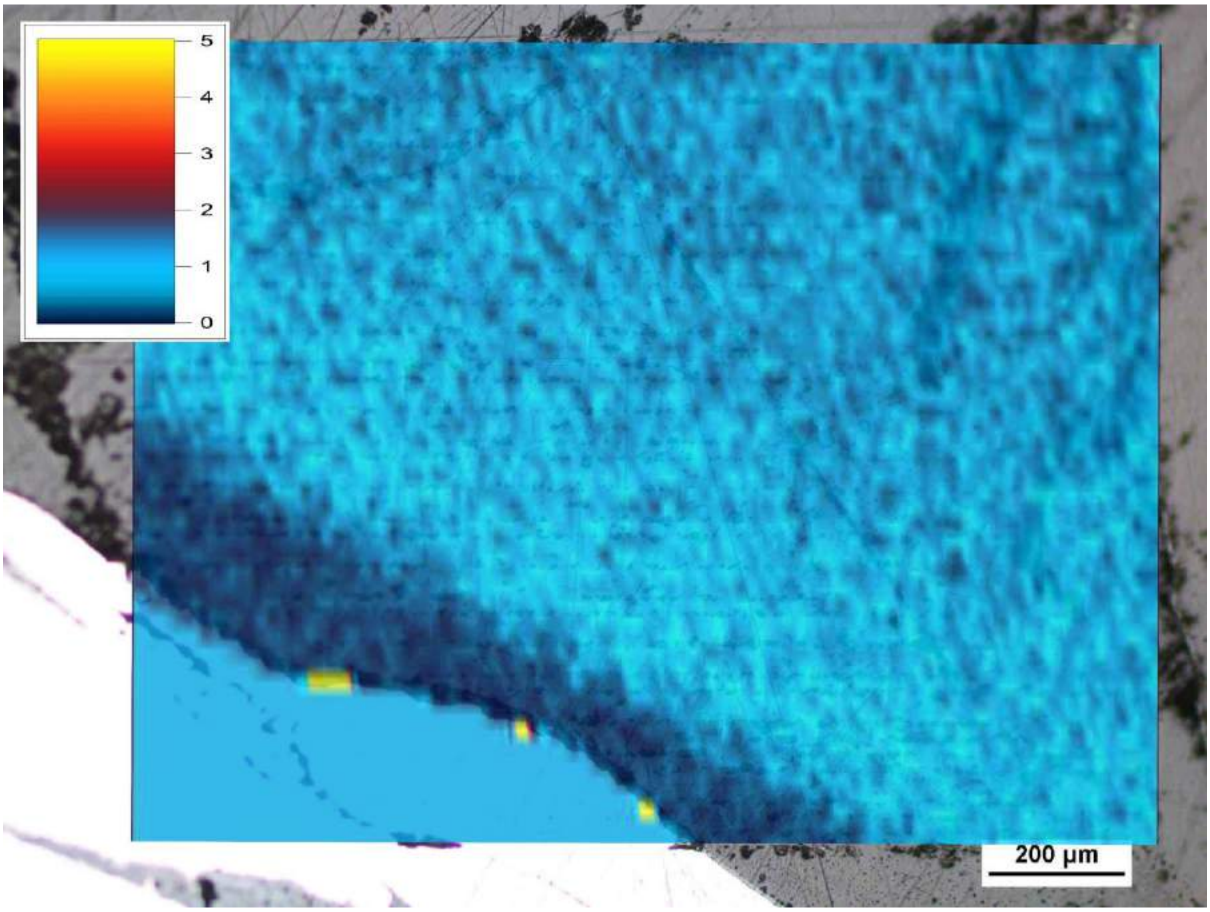
5
4
3
2
1
0
200 µm


5
4
3
2
1
0
200 µm

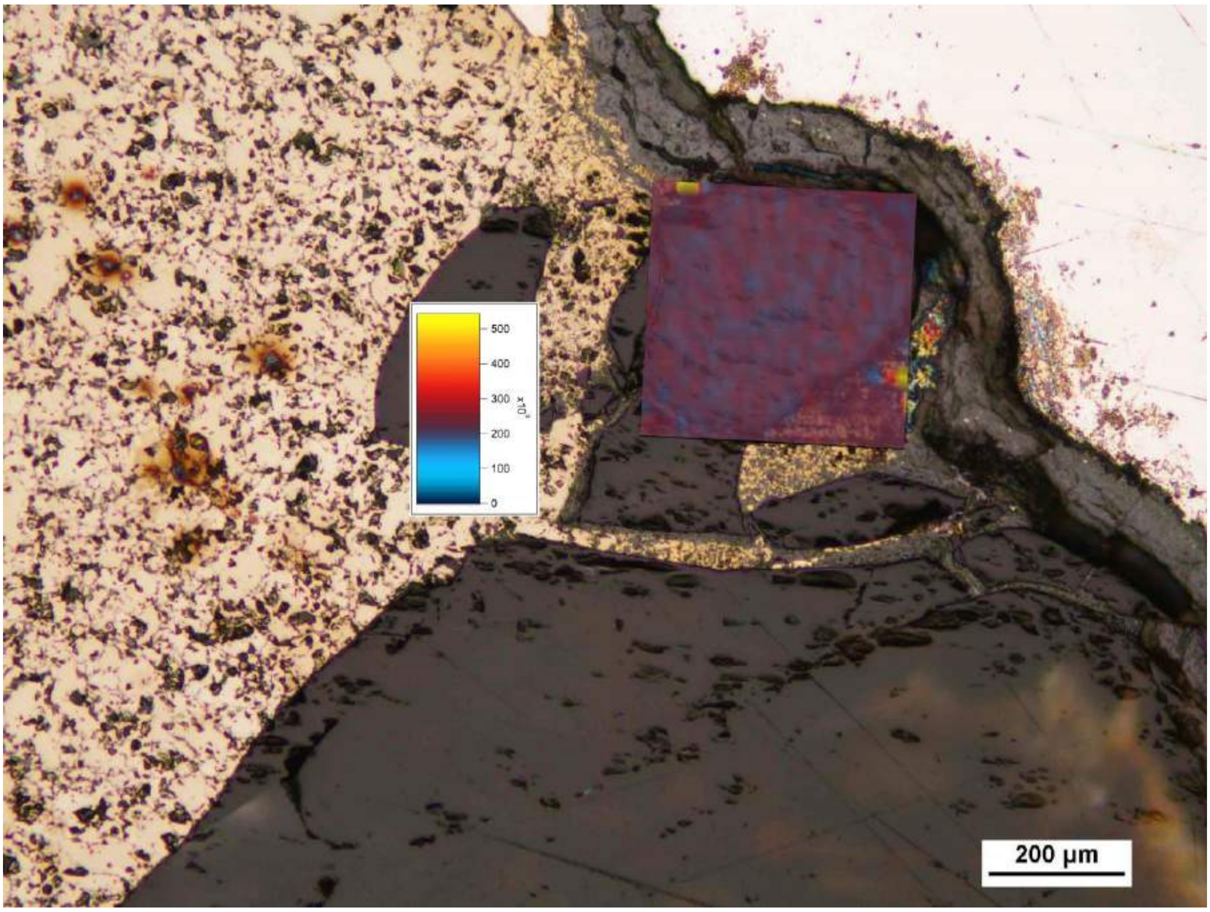

5
4
3
2
1
0
200 µm

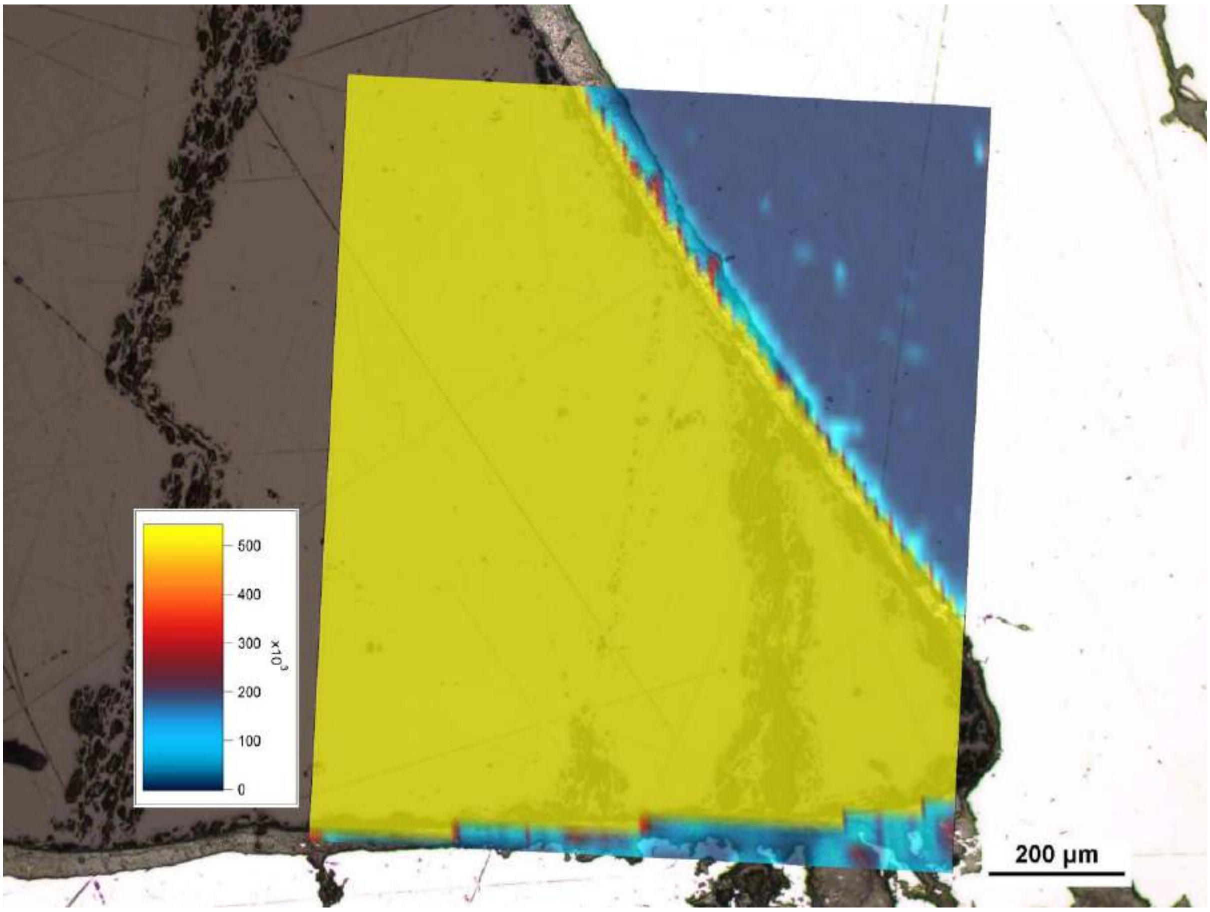

5
4
3
2
1
0
200 µm

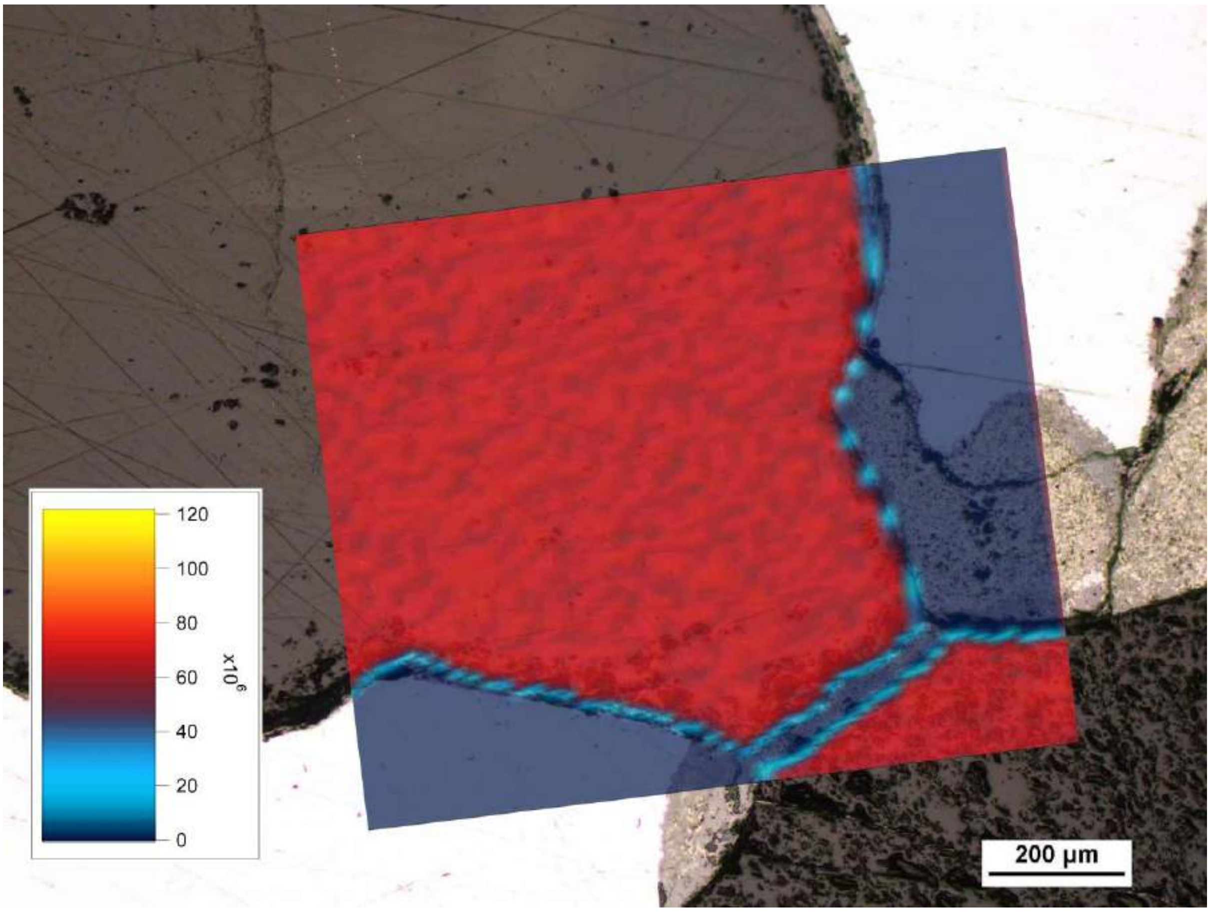

5
4
3
2
1
0
200 µm



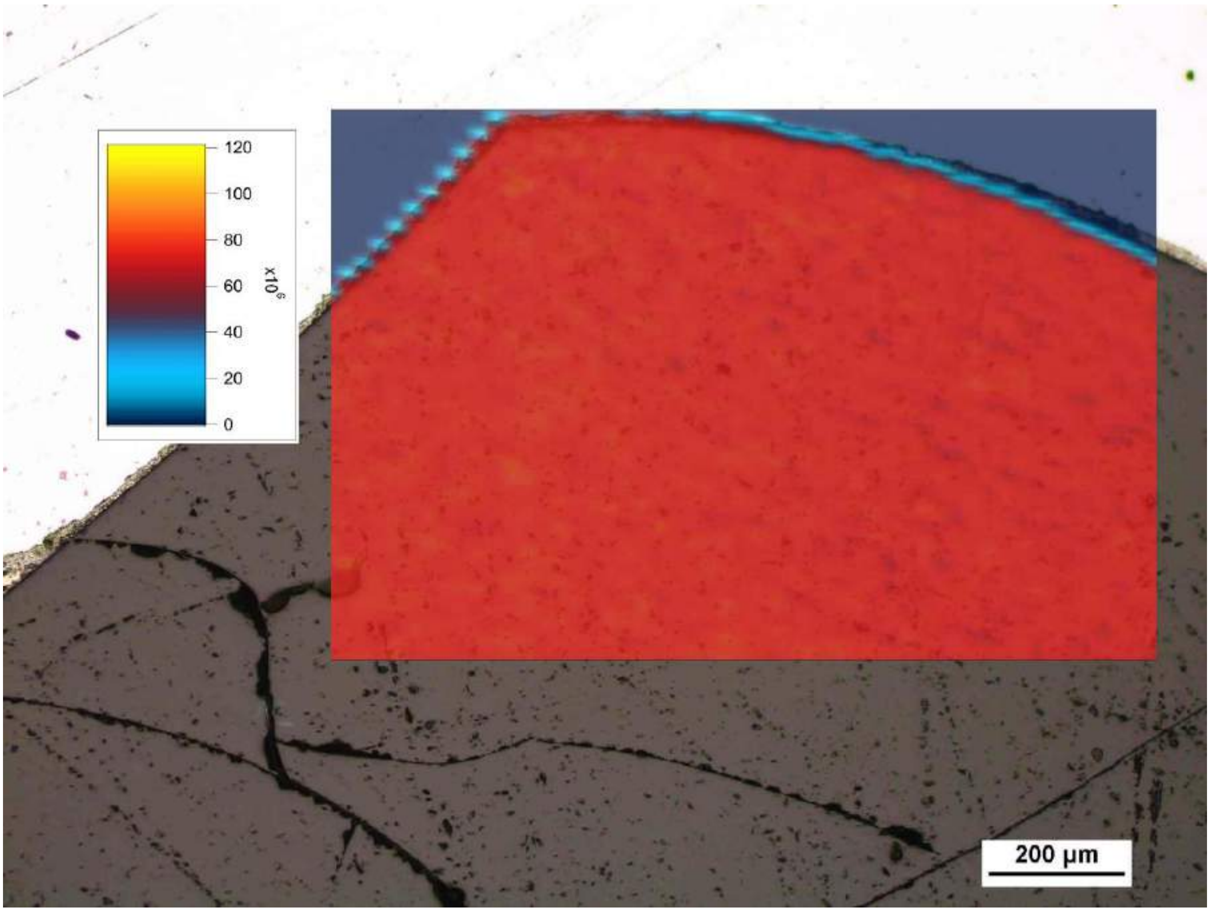
<u>**Mg diffusion patterns**</u>

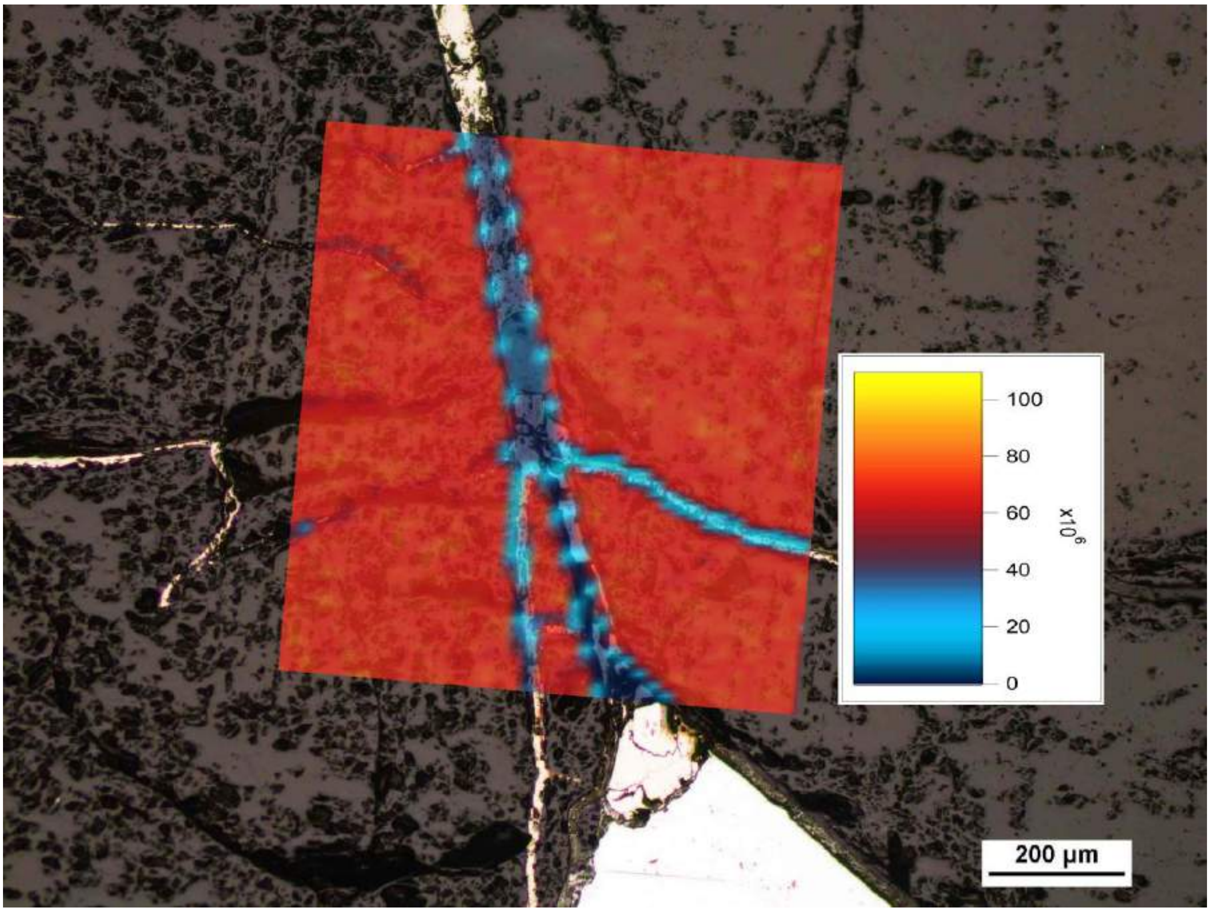

500
400
300
200
100
0
x10
200 µm

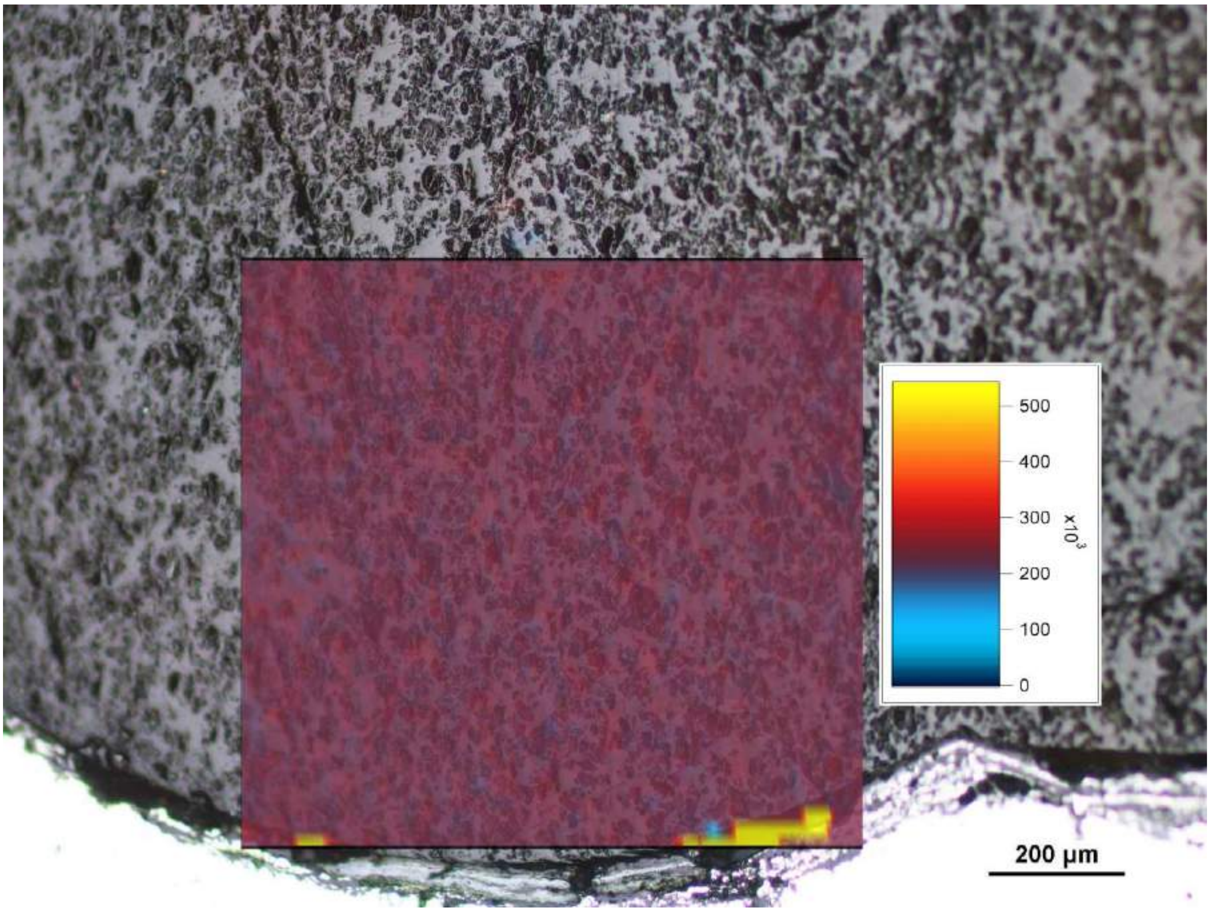

500
400
300
200
100
0
x10^3
200 µm

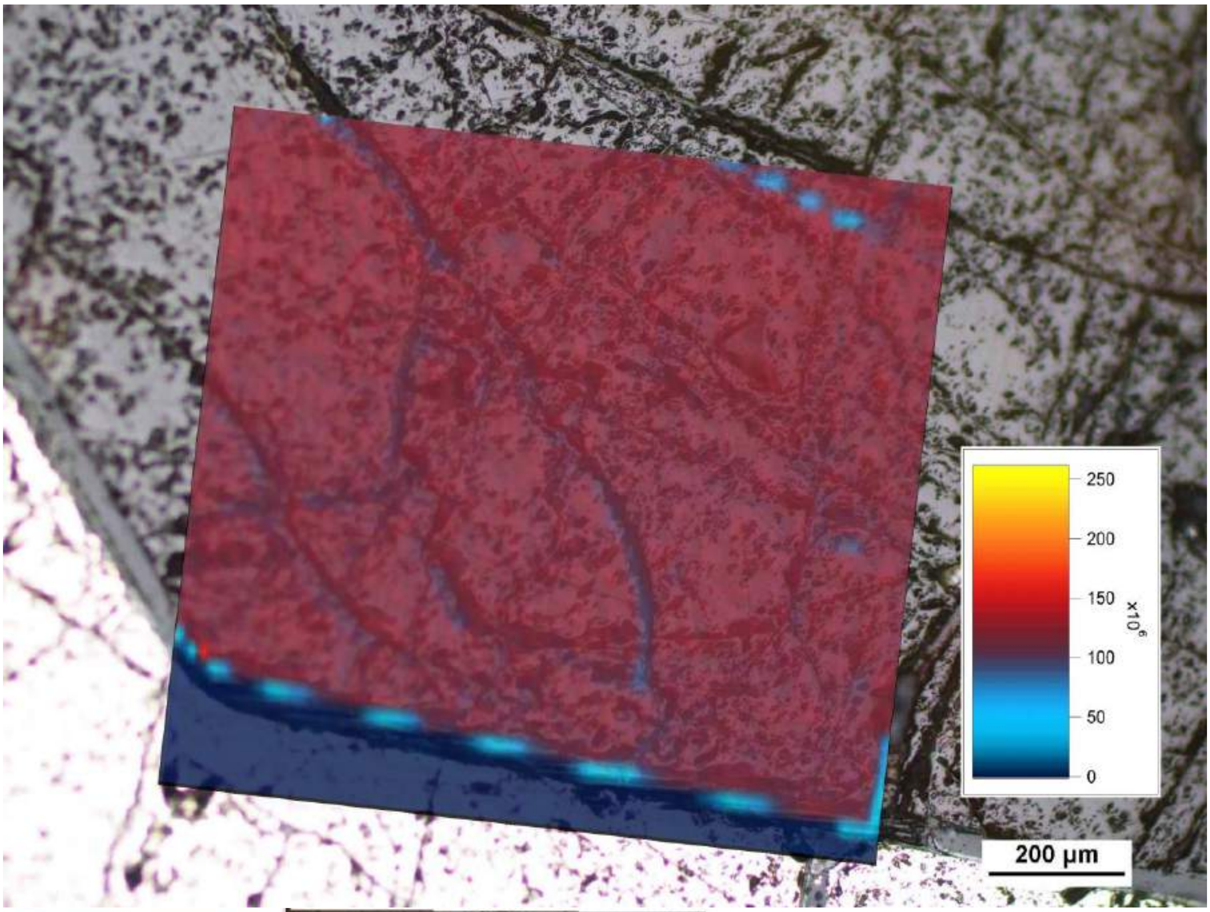


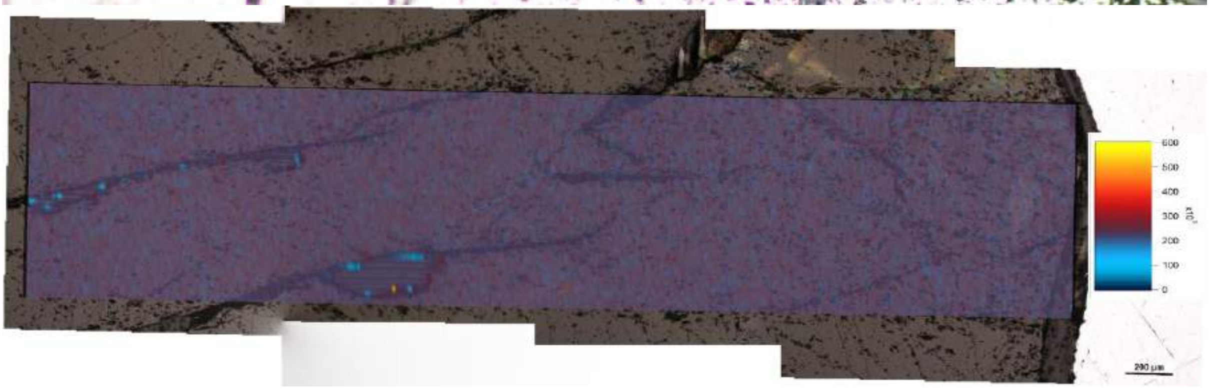
120
100
80
60
40
20
0
x10^6
200 µm

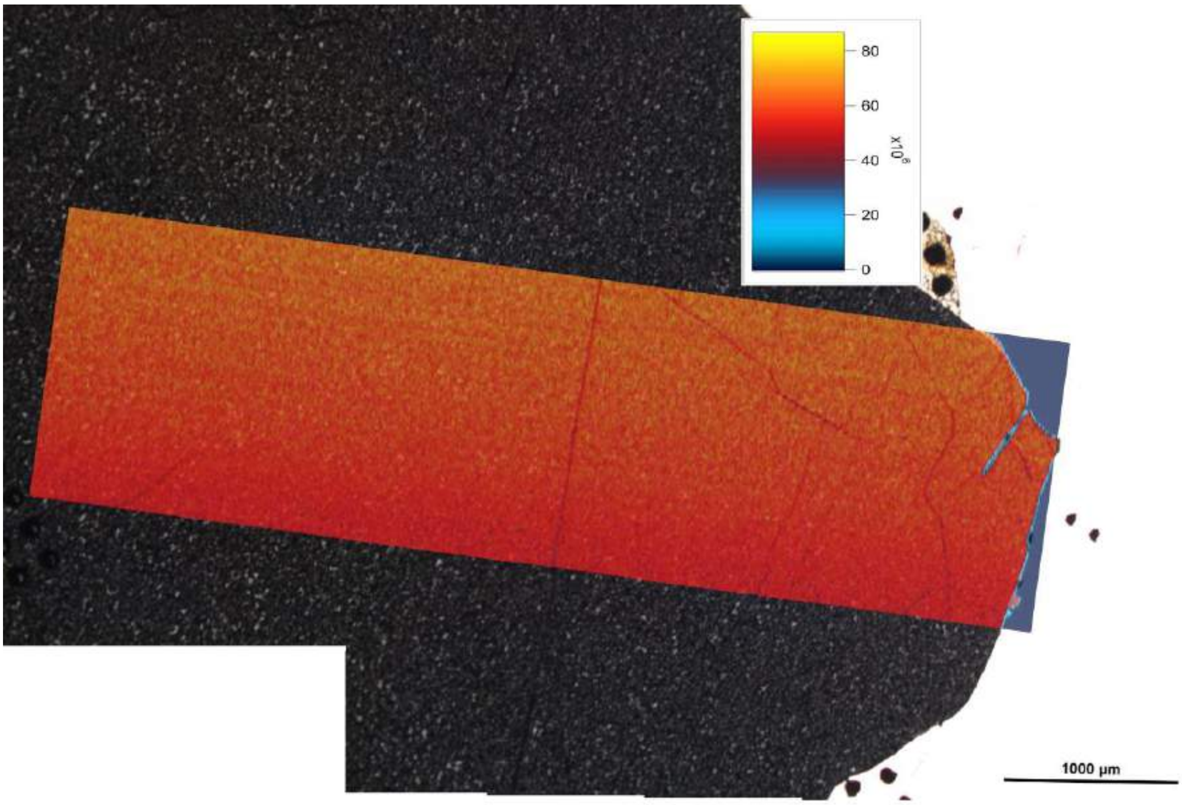

120
100
80
60
40
20
0
x10^6
200 µm

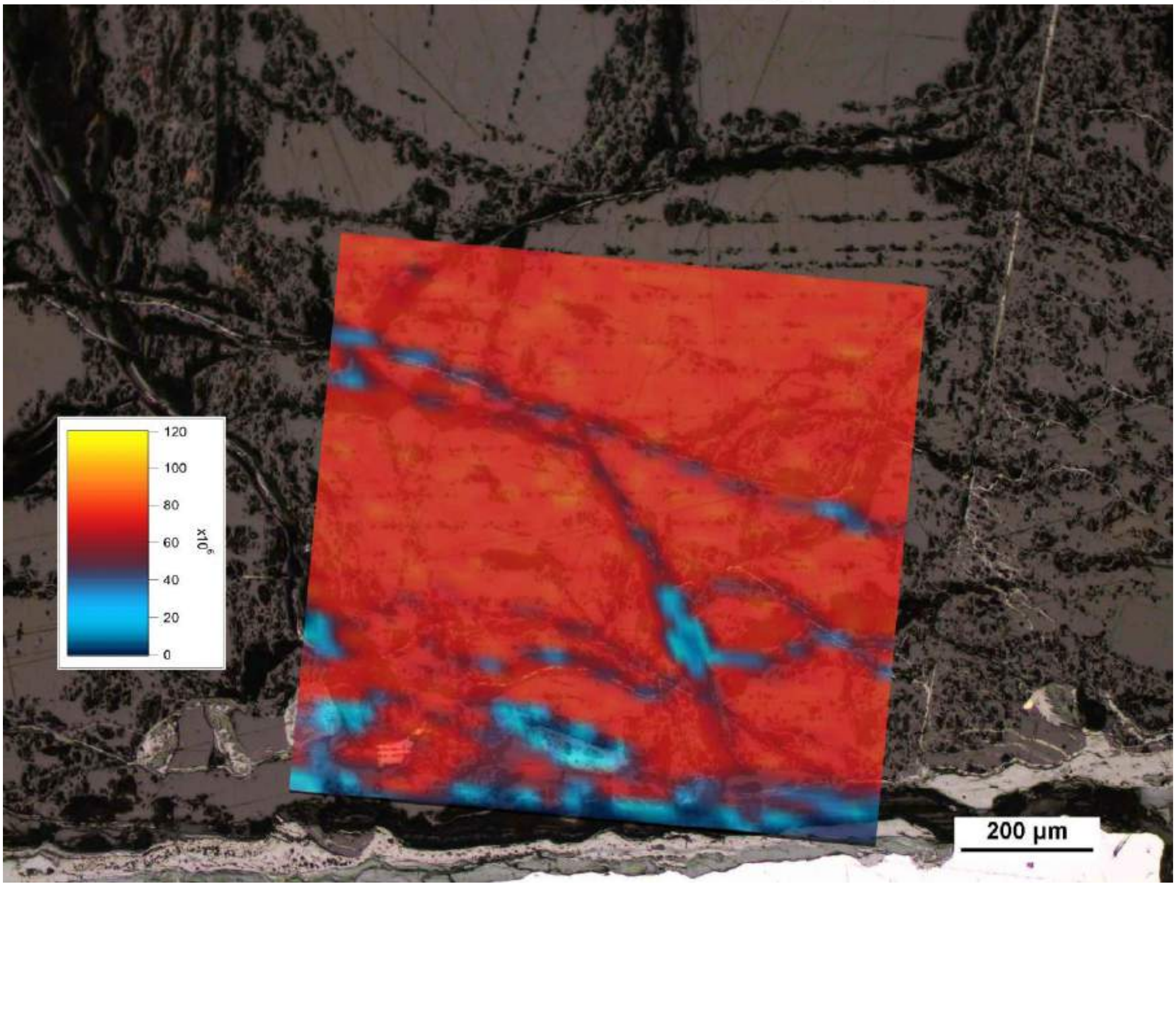

100
80
60
40
20
0
x10^6
200 µm

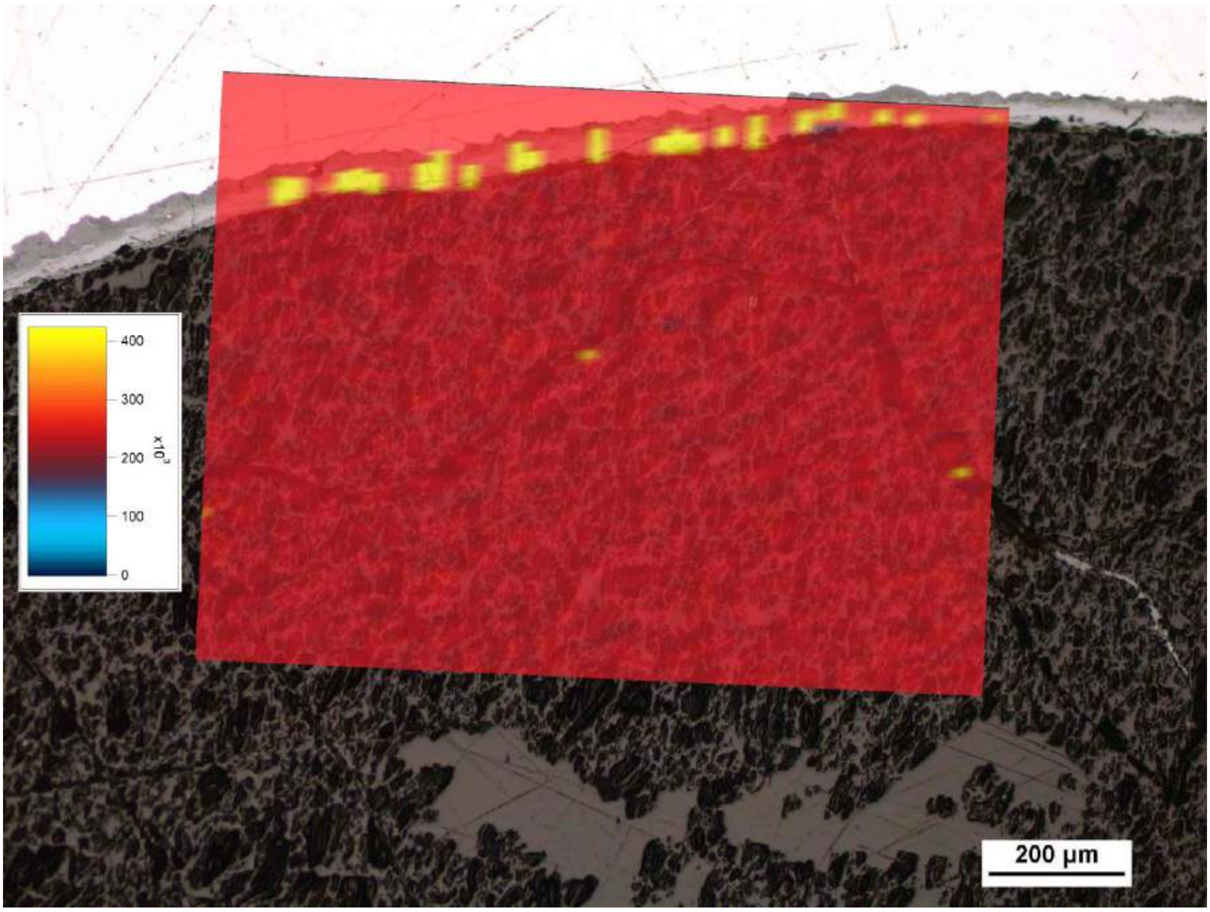

500
400
300
200
100
0
x10³
200 µm

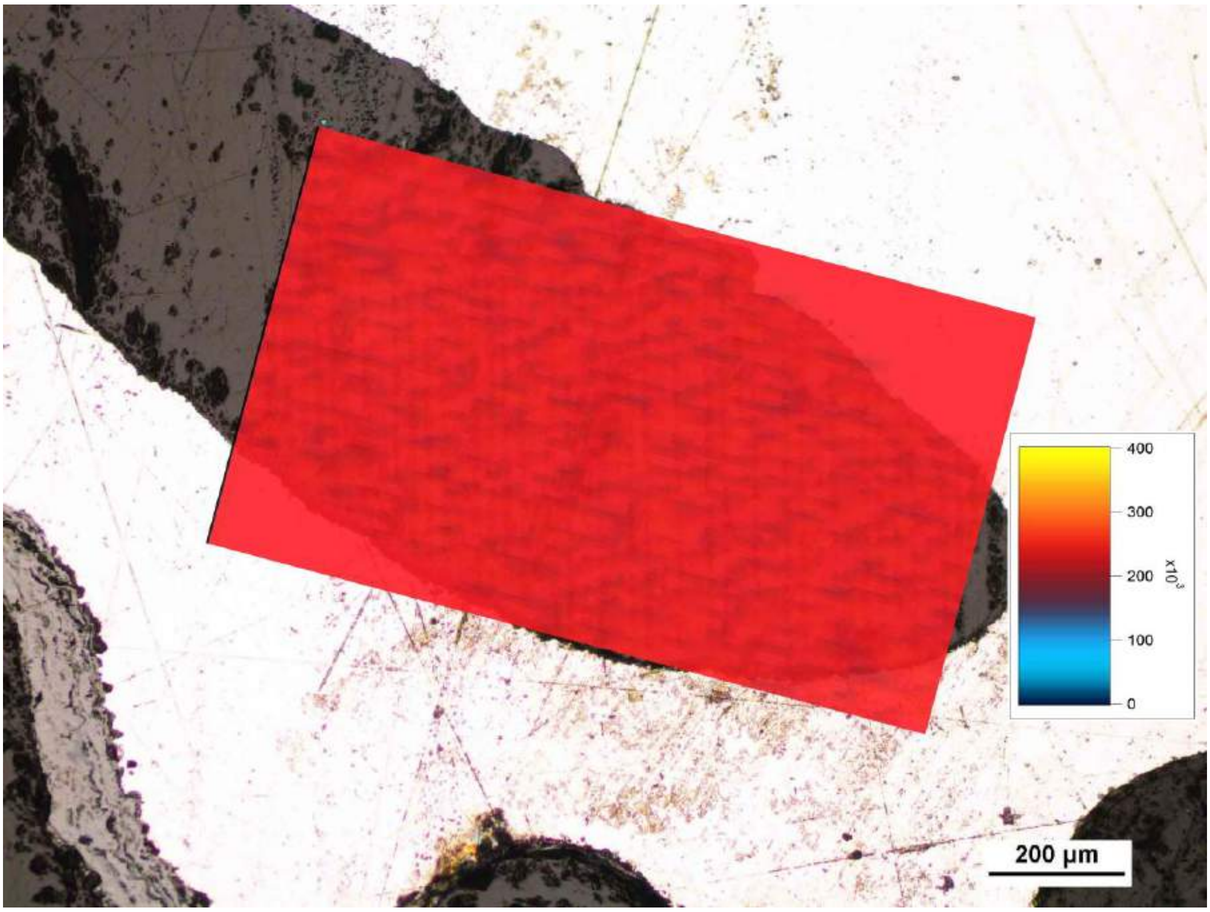

250
200
150
100
50
0
x10^6
200 µm


600
500
400
300
200
100
0

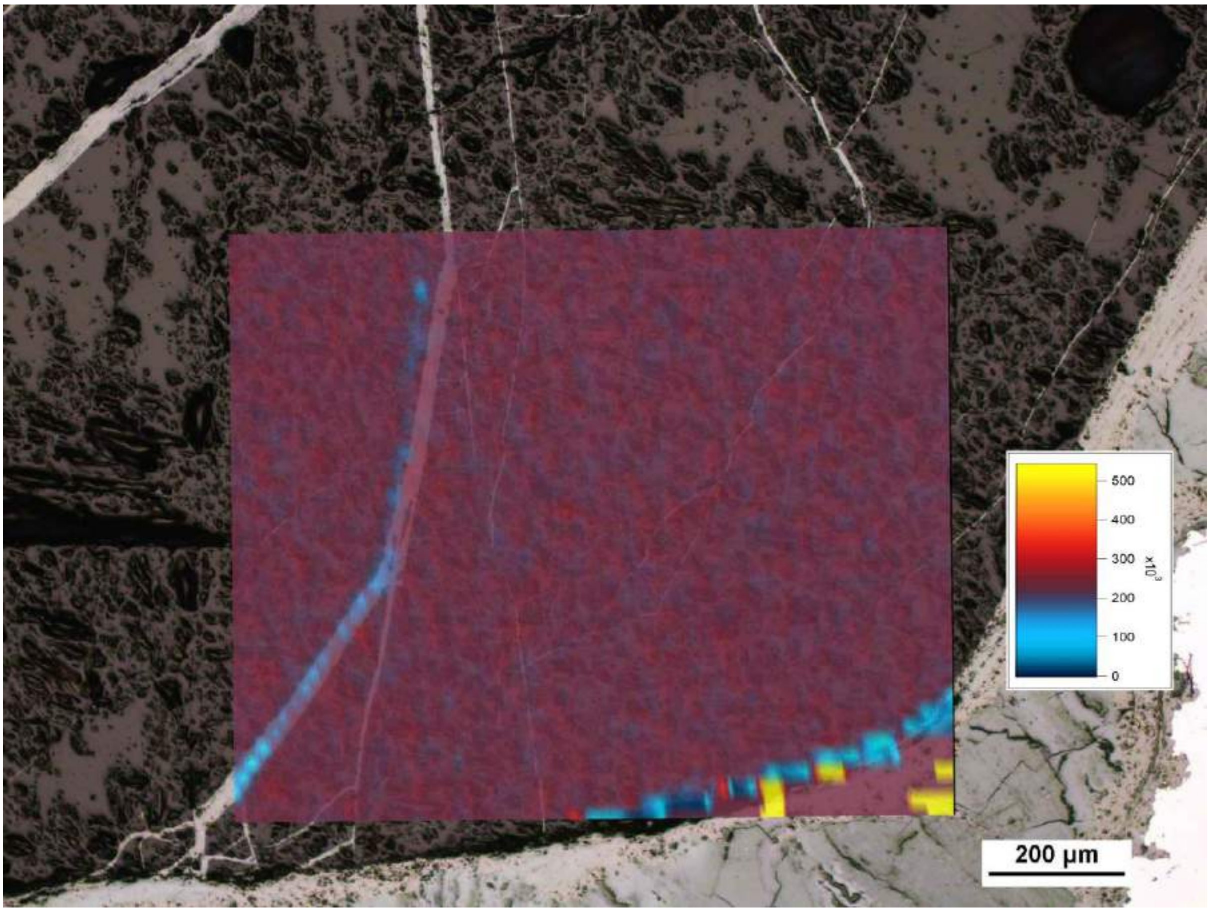

80
60
40
20
0
x10⁶
1000 µm

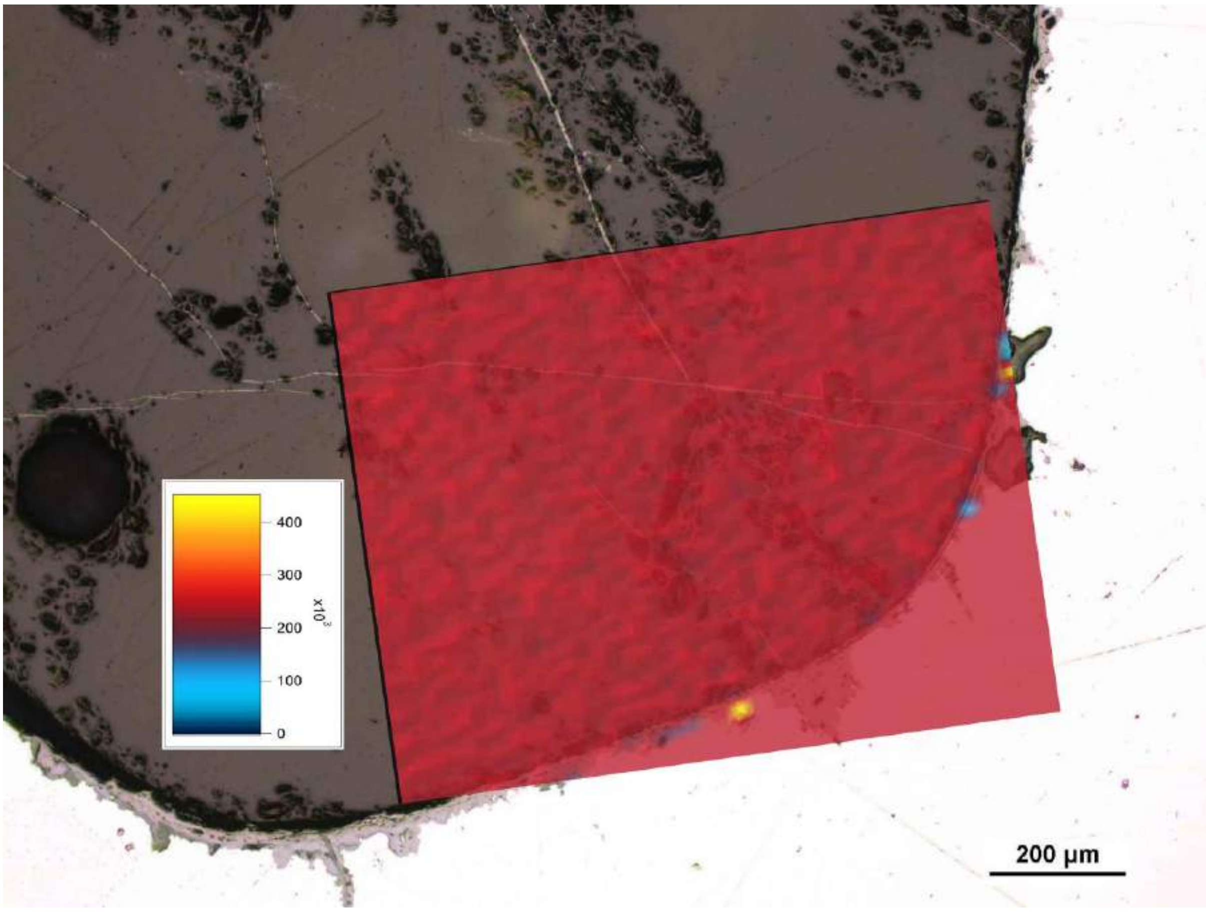

120
100
80
60
40
20
0
x10⁶
200 µm

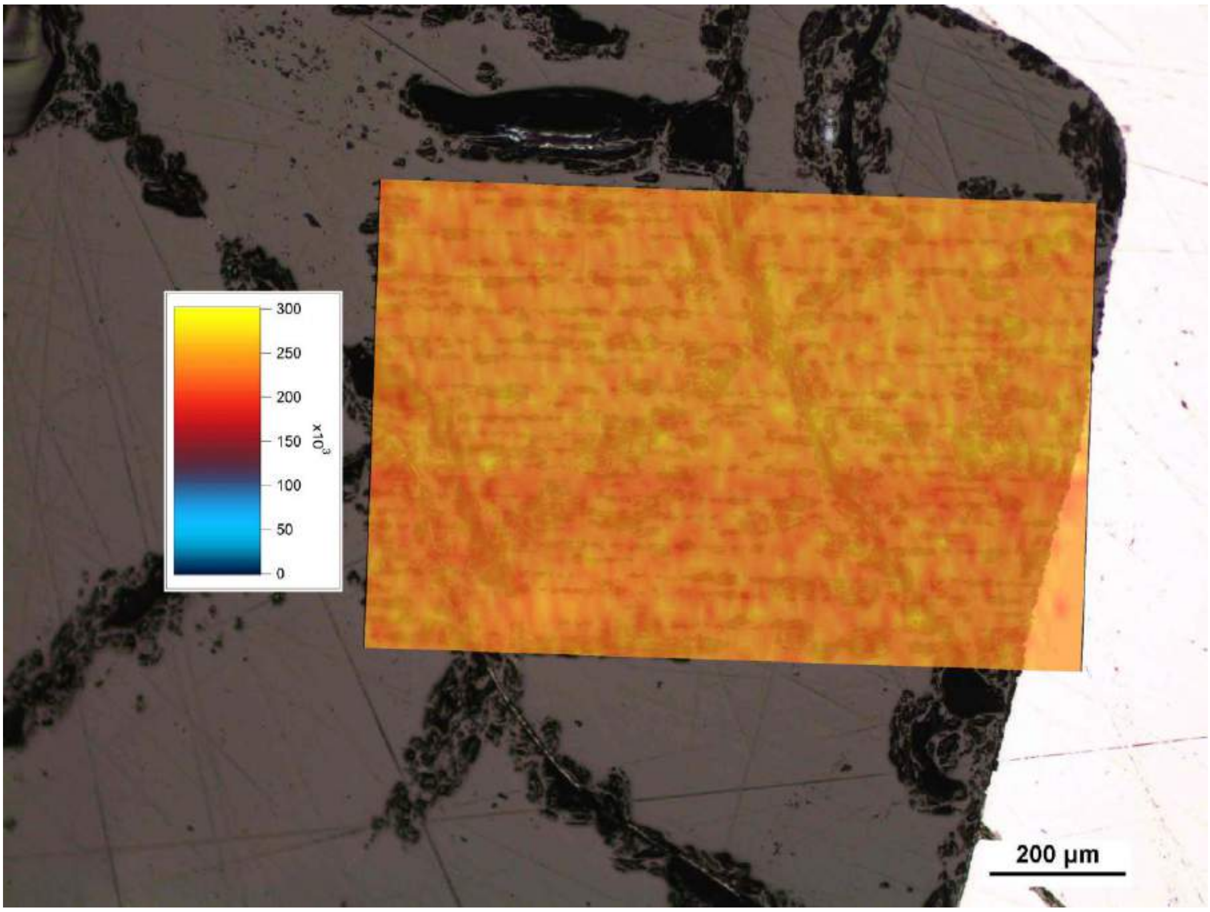

400
300
200
100
0
x10³
200 µm

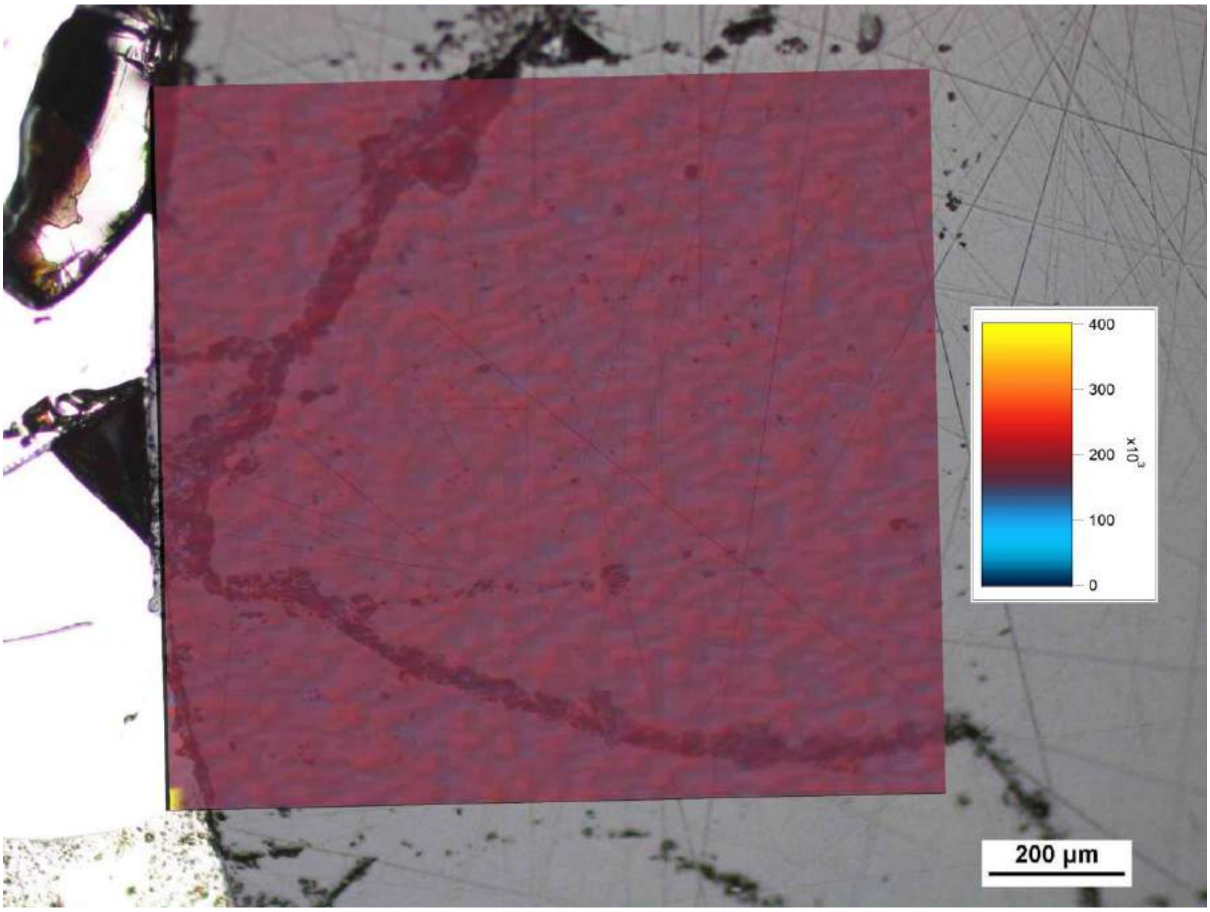


400
300
200
100
0
x10^3
200 µm

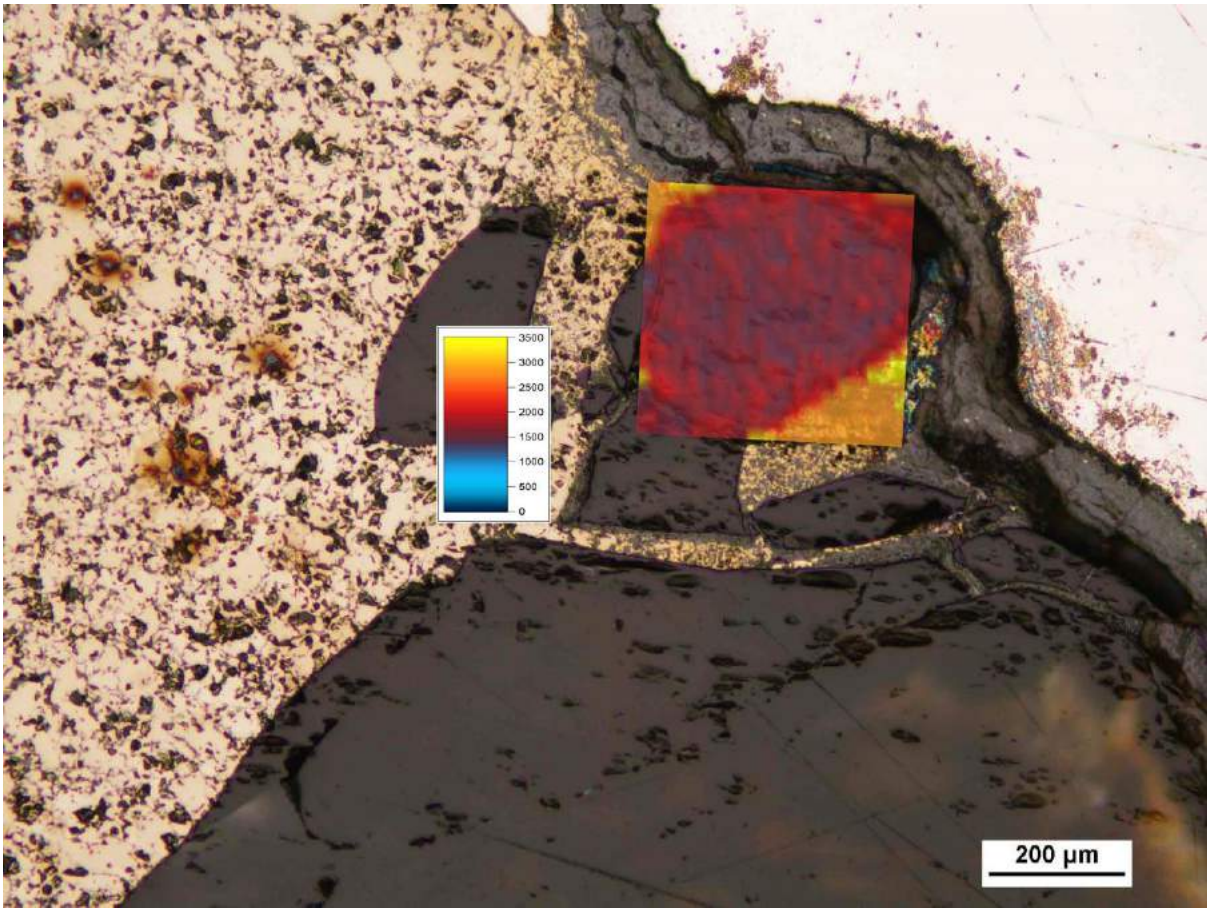

500
400
300
200
100
0
x10^3
200 µm


400
300
200
100
0
x10^3
200 µm

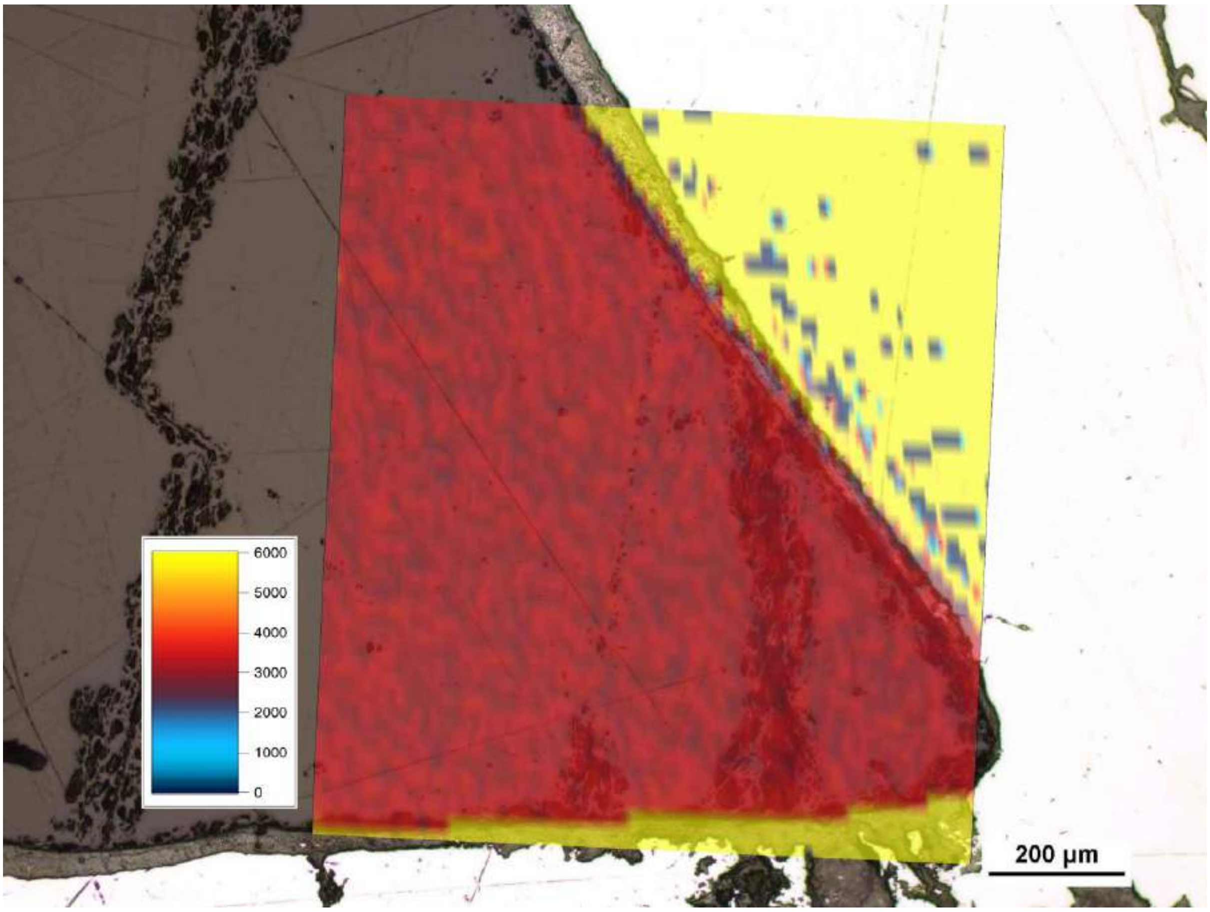

300
250
200
150
100
50
0
x10^3
200 µm


400
300
200
100
0
x10^3
200 µm

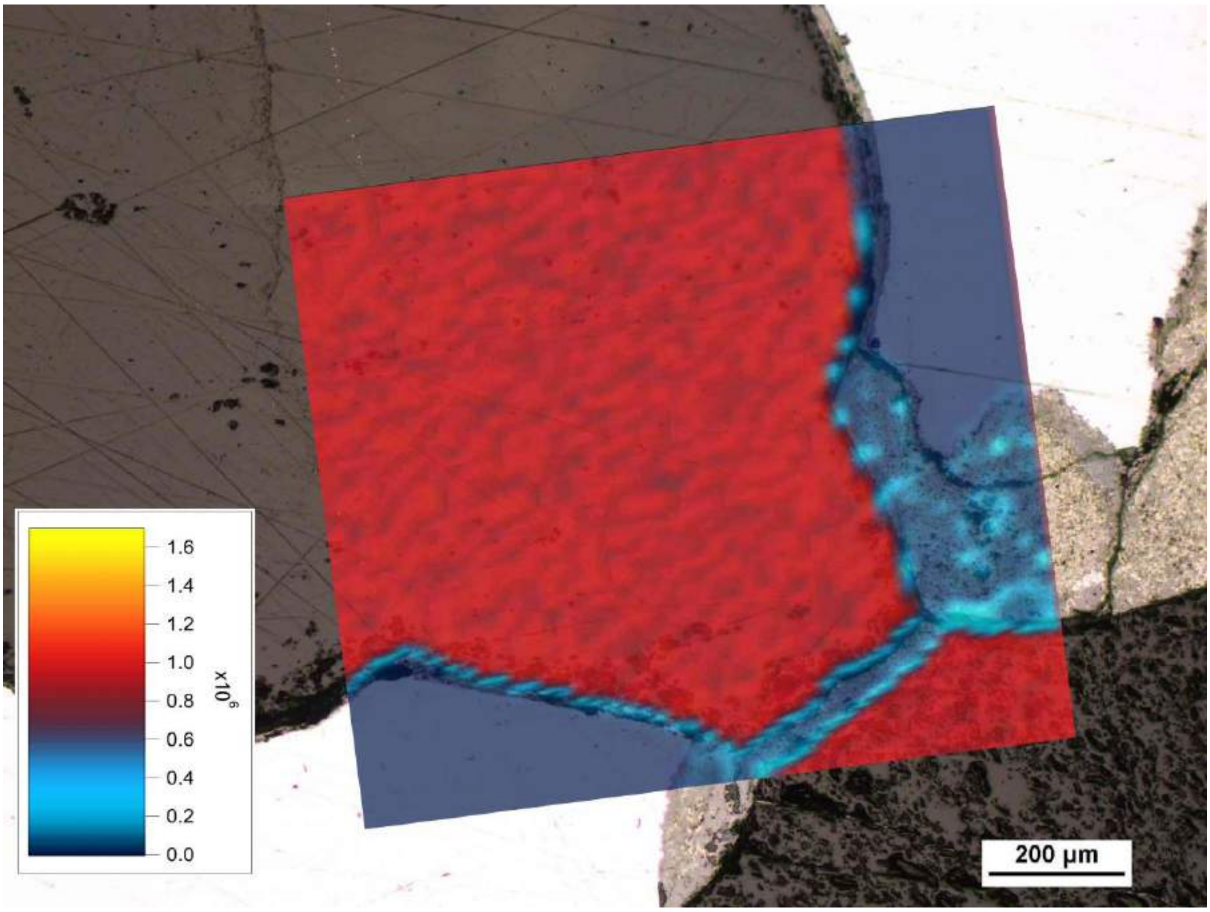
Mn diffusion patterns

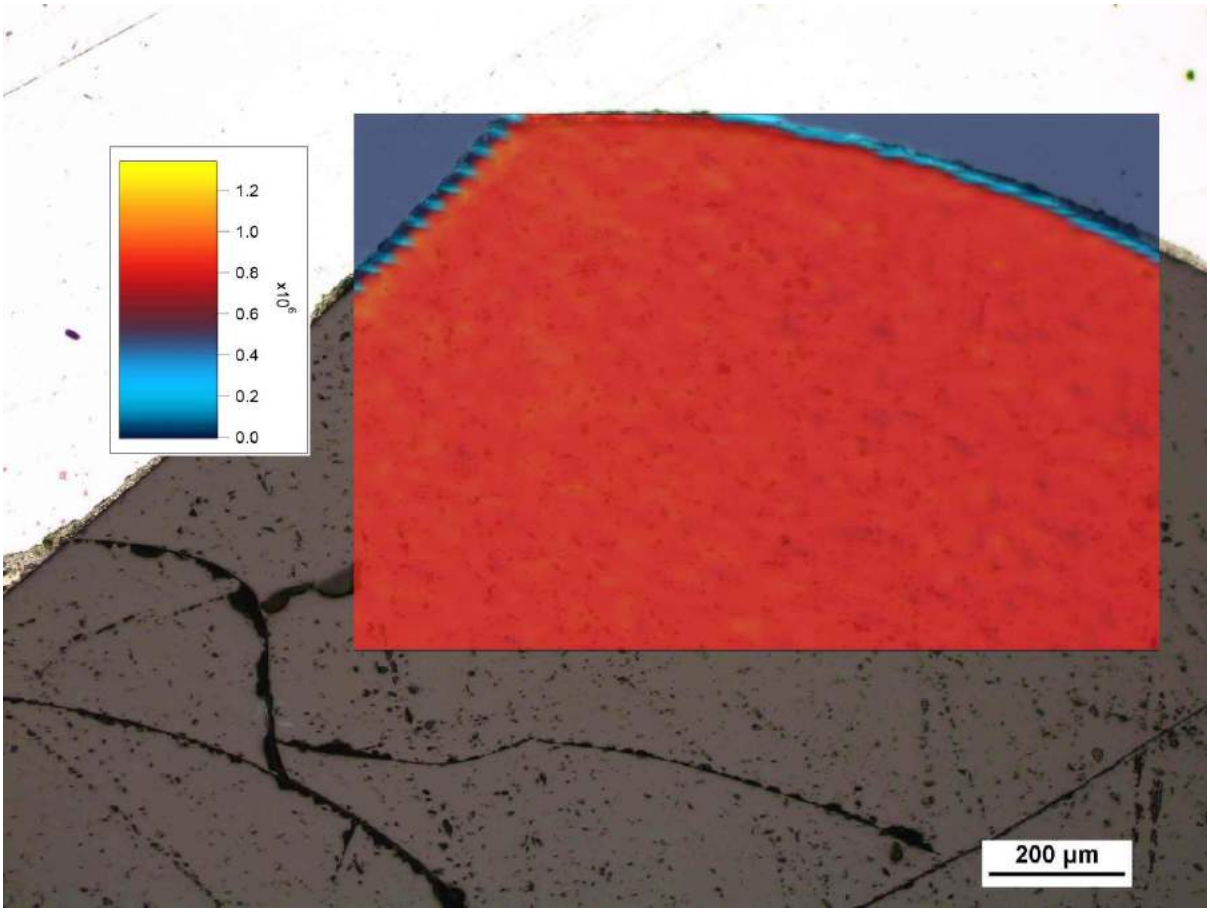


3500
3000
2500
2000
1500
1000
500
0
200 µm

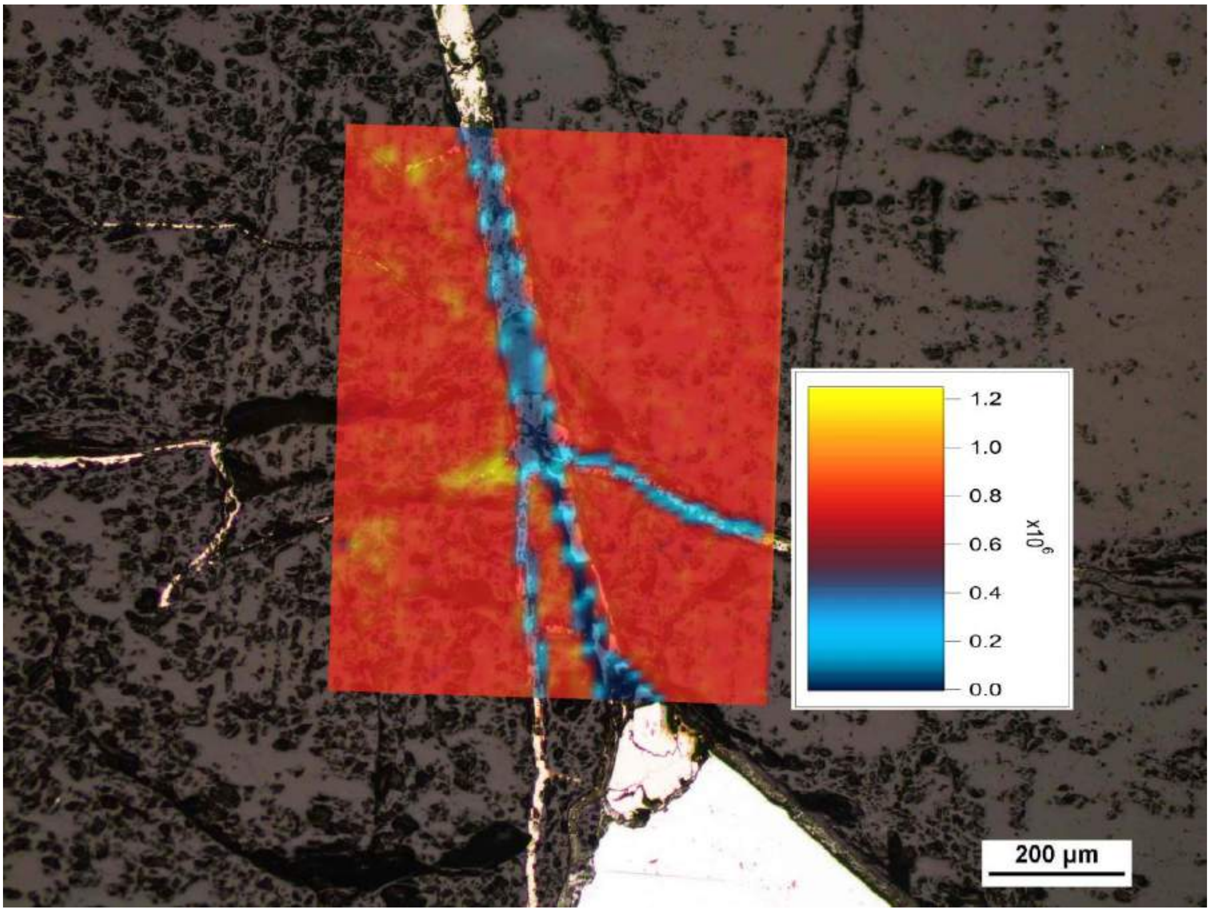


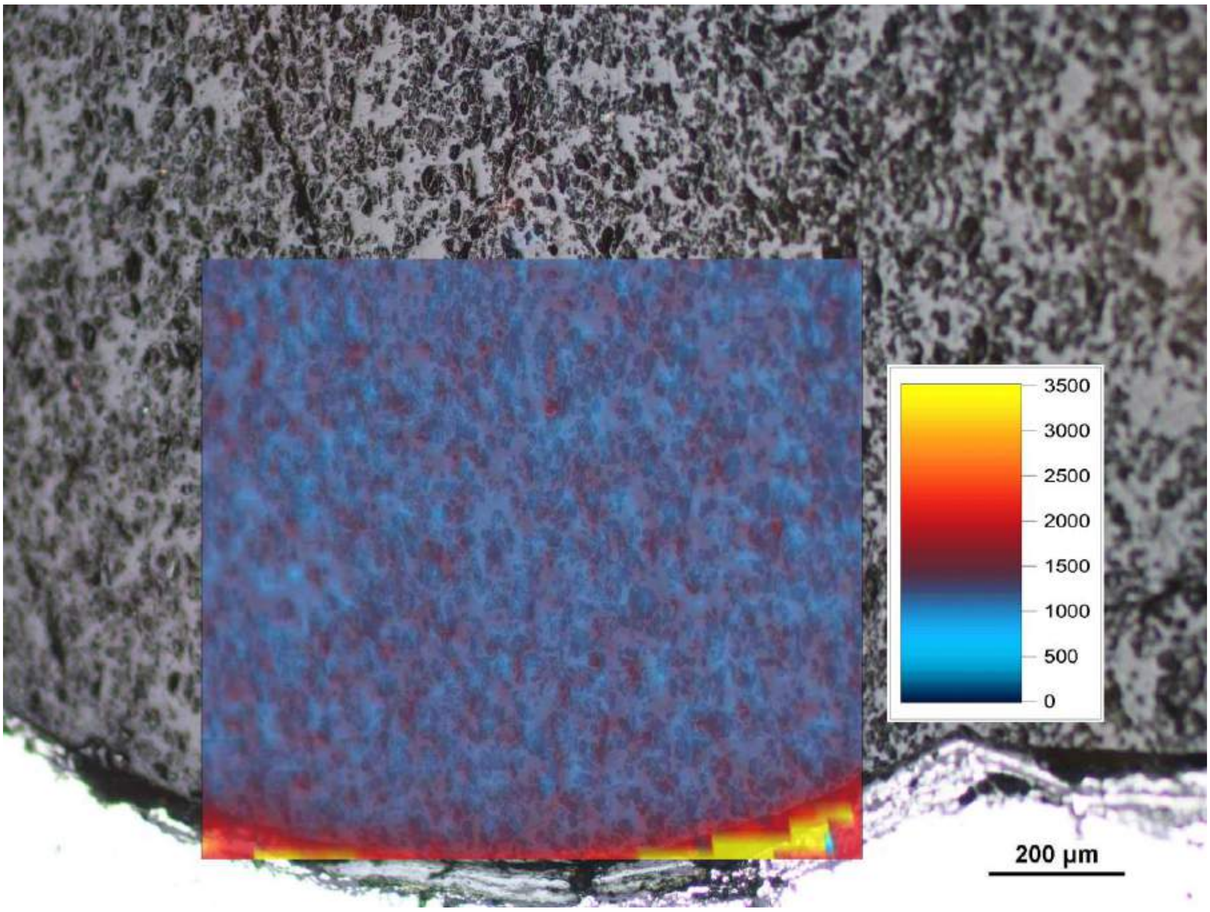
6000
5000
4000
3000
2000
1000
0
200 µm

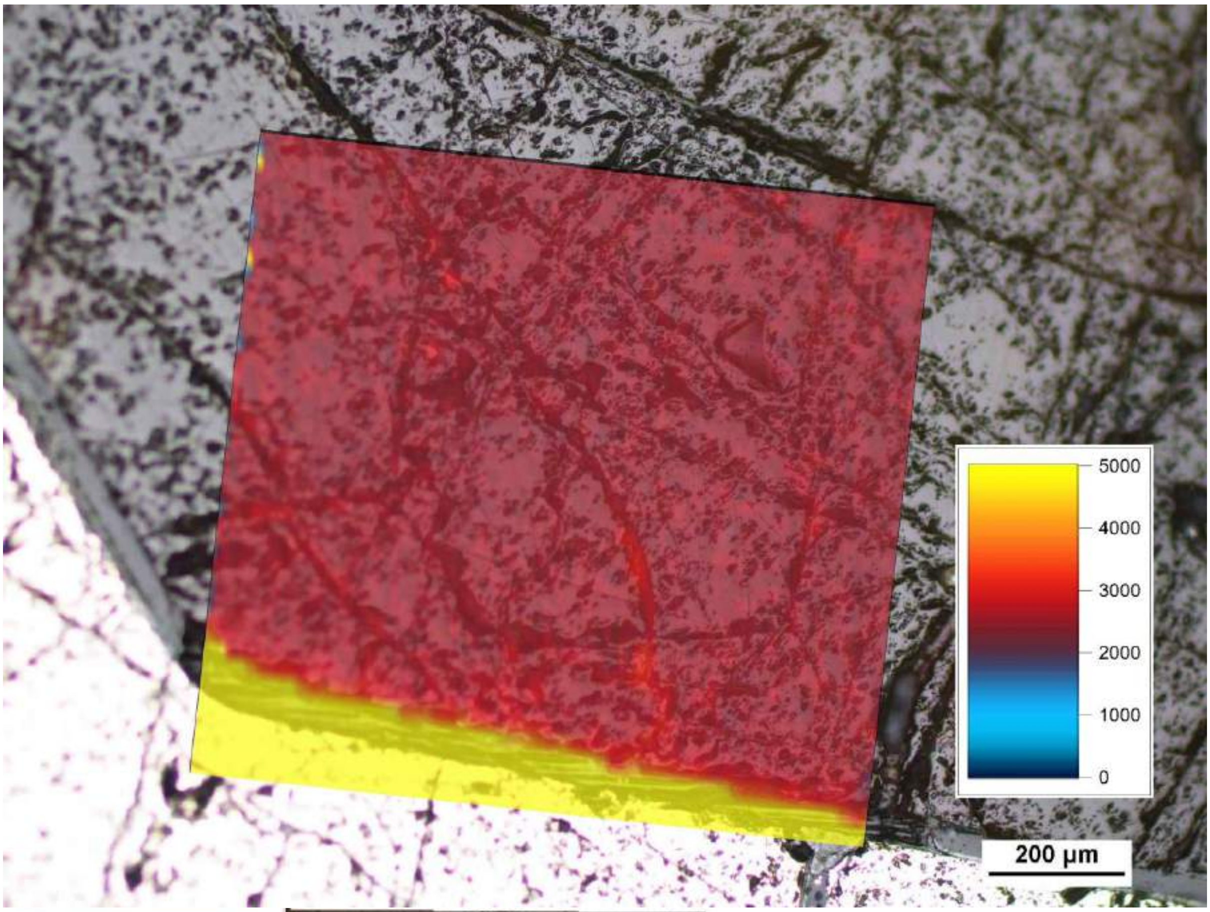

1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm



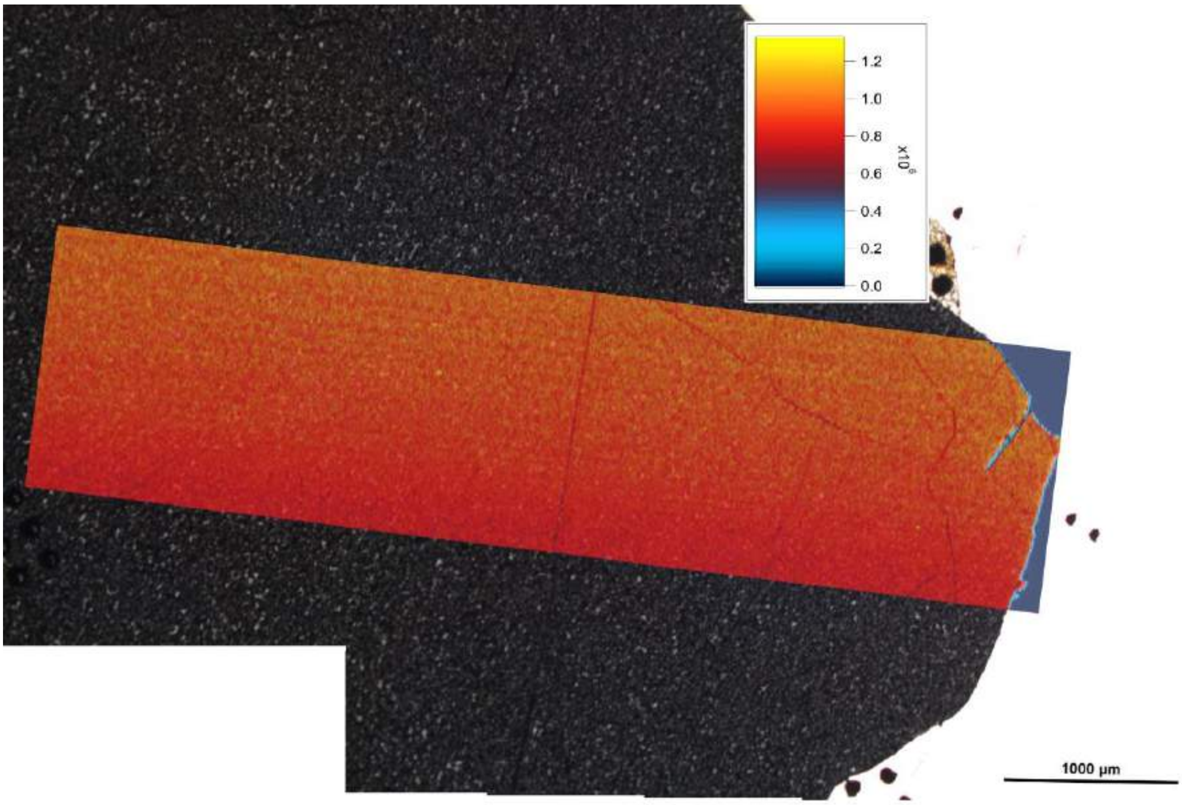
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm


1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm

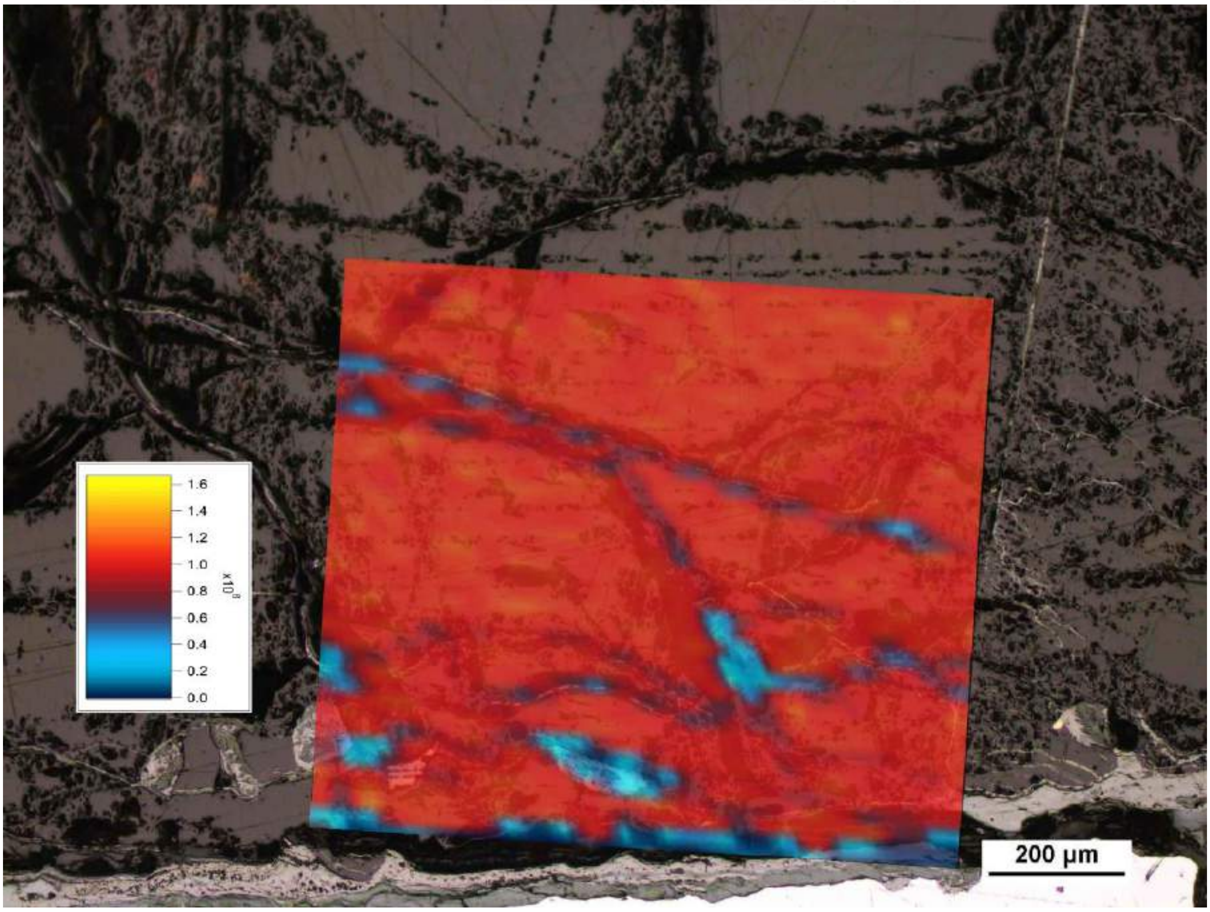

3500
3000
2500
2000
1500
1000
500
0
200 µm


5000
4000
3000
2000
1000
0
200 µm

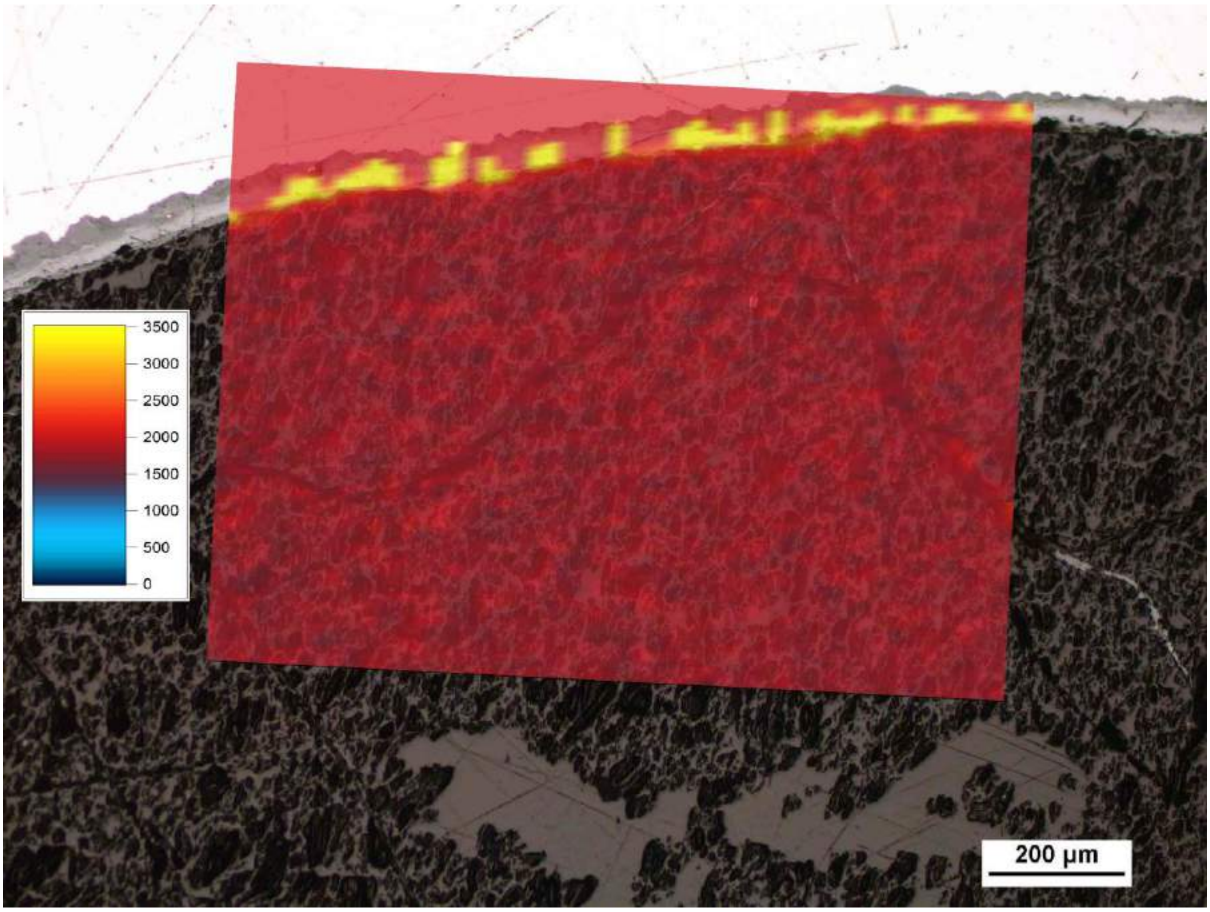

3000
2500
2000
1500
1000
500
0



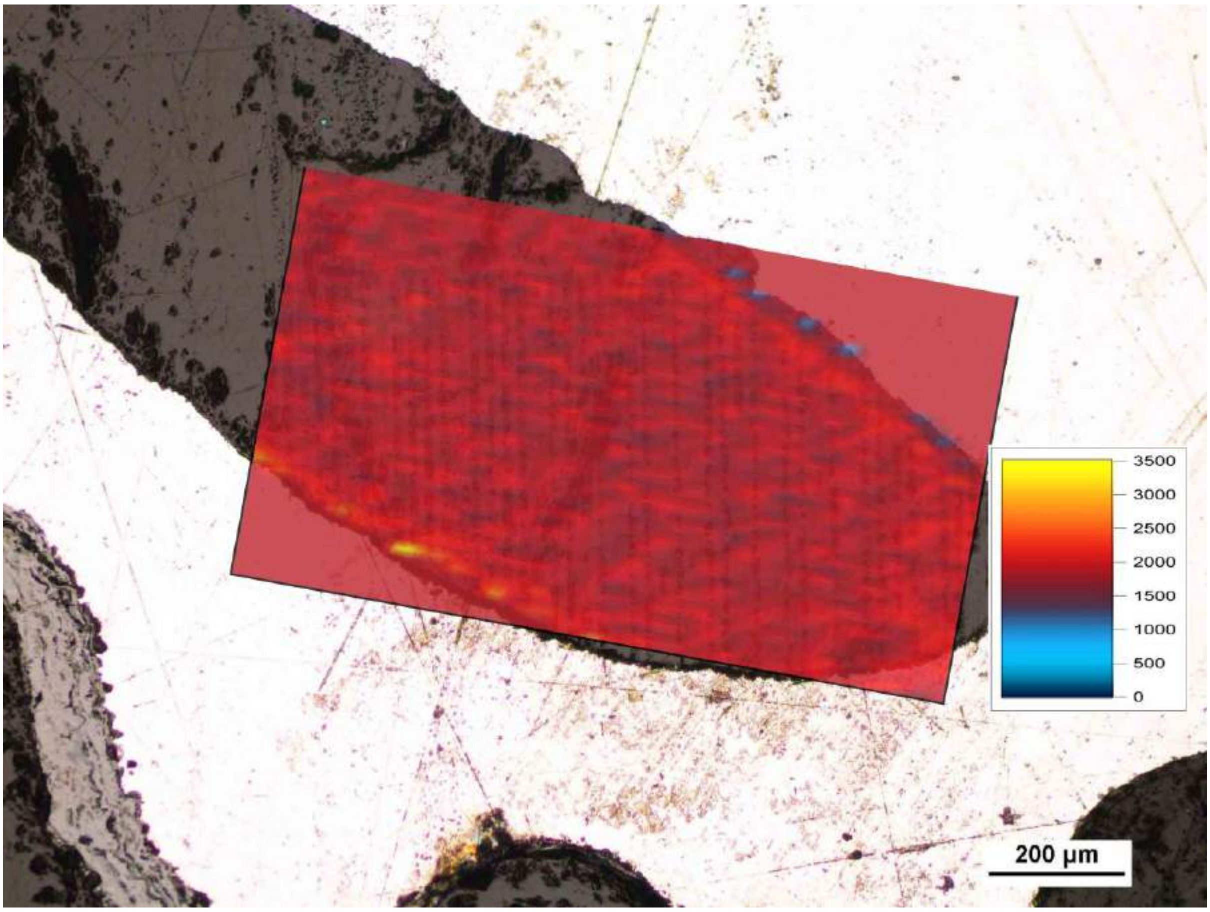
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
1000 µm

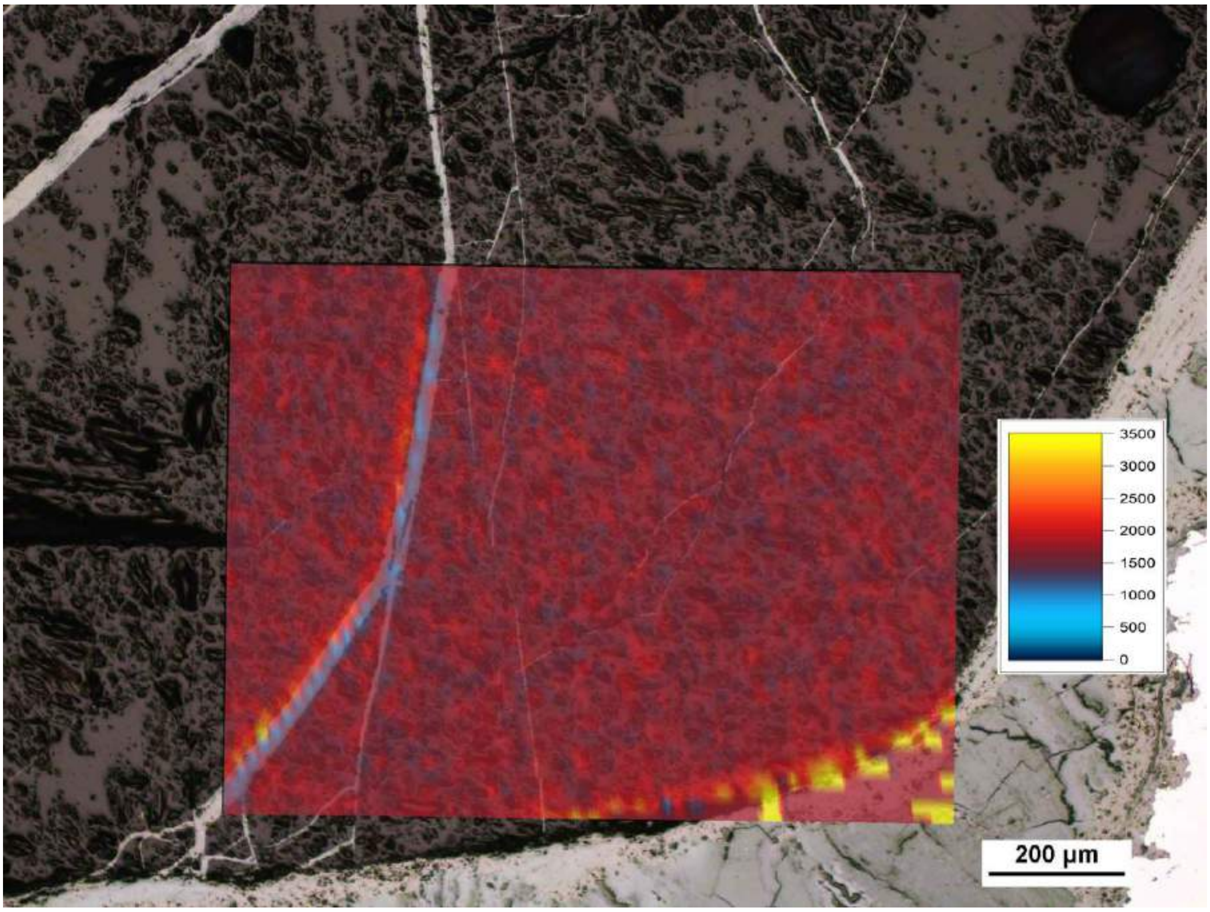


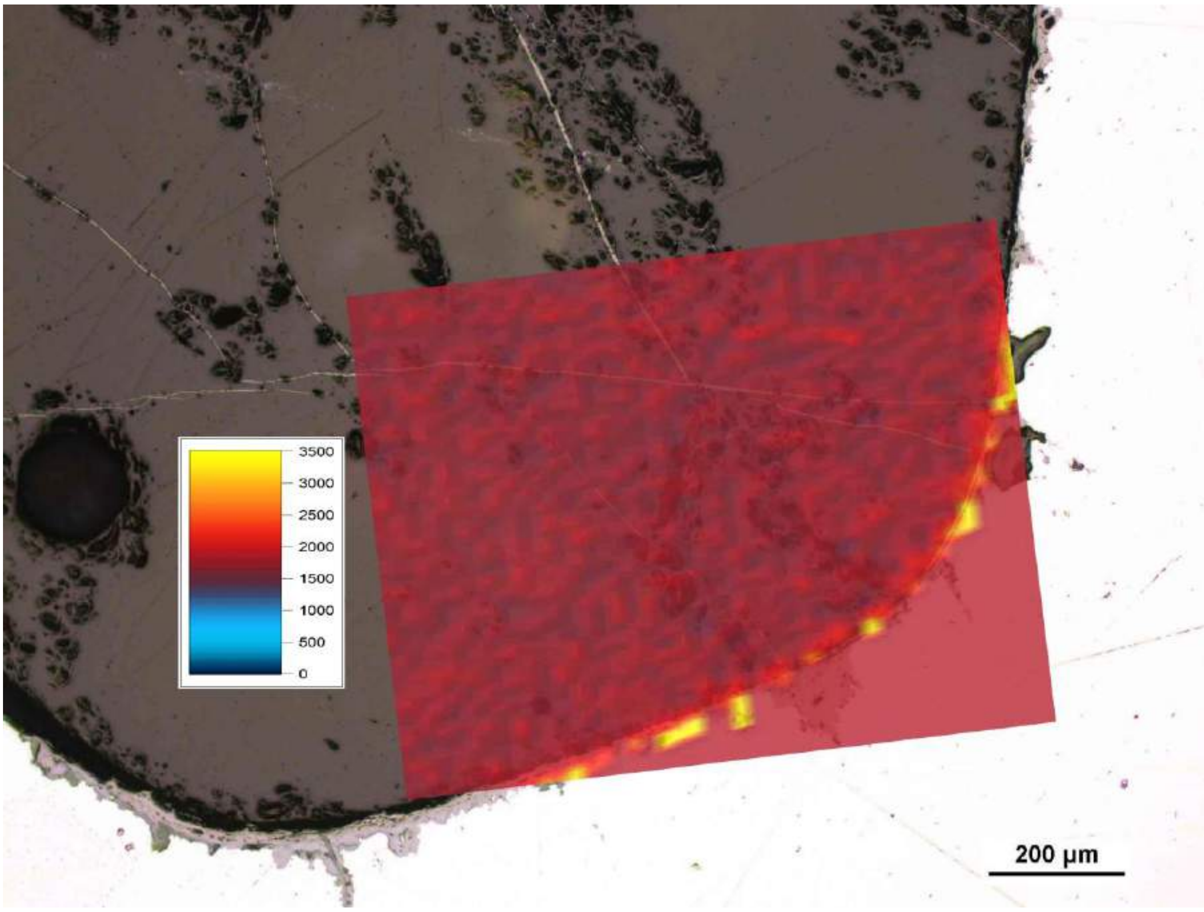
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm

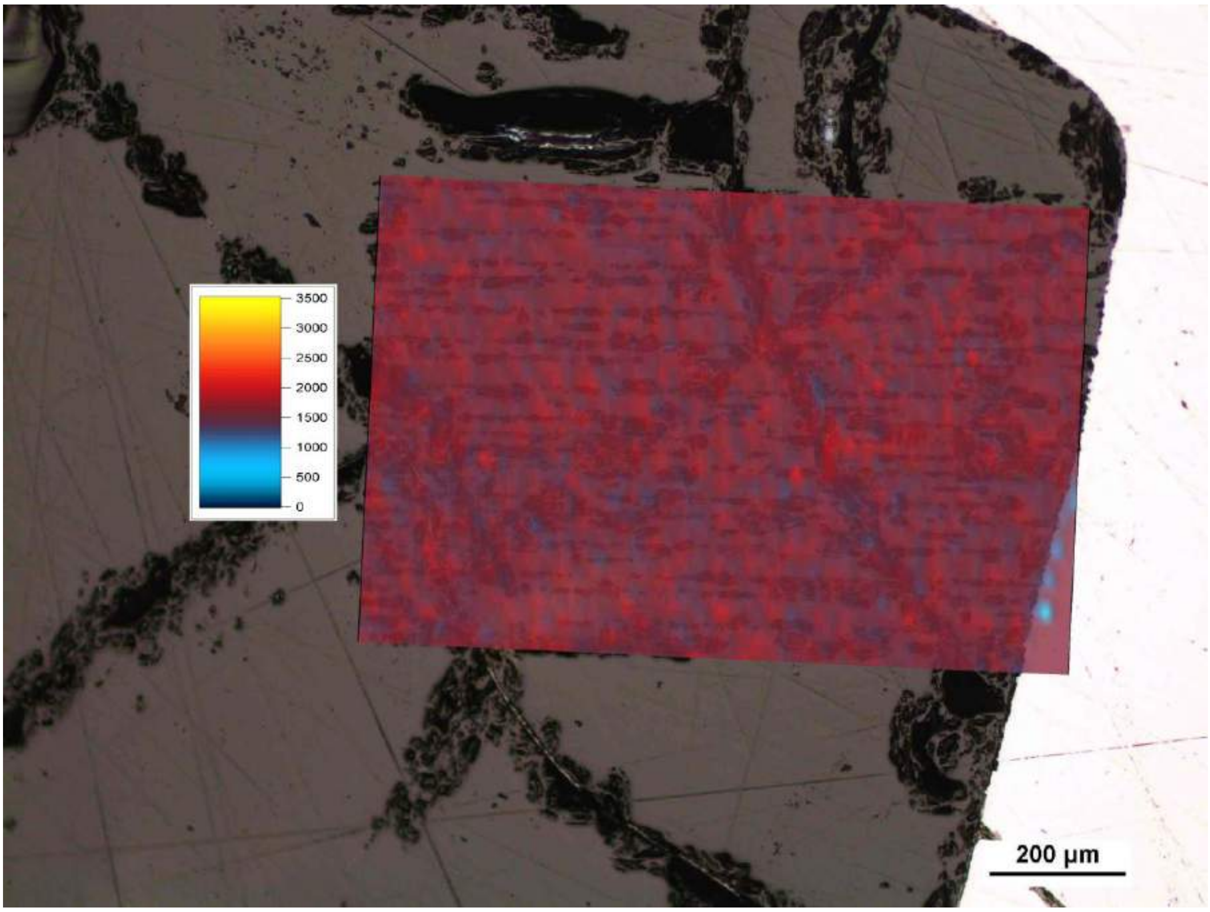


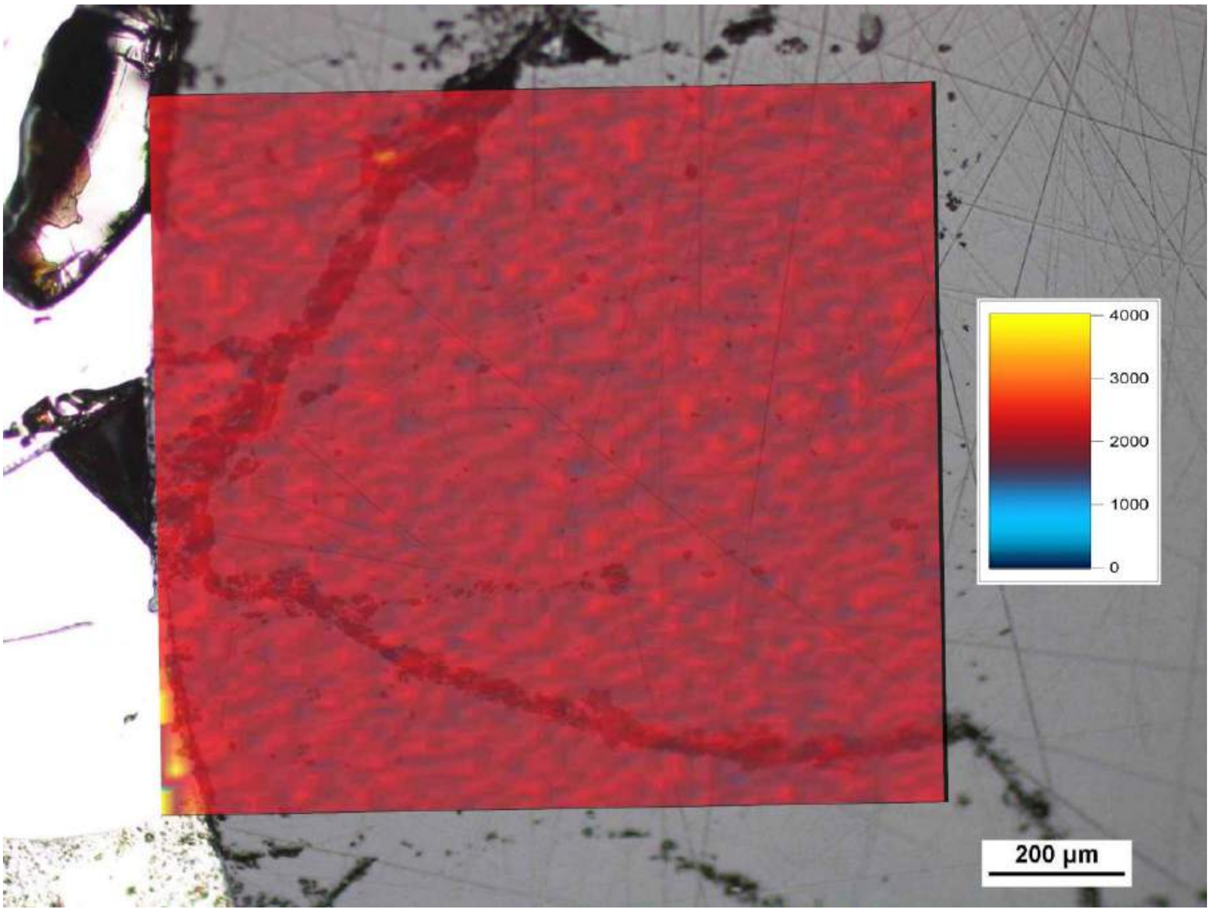
3500
3000
2500
2000
1500
1000
500
0
200 µm

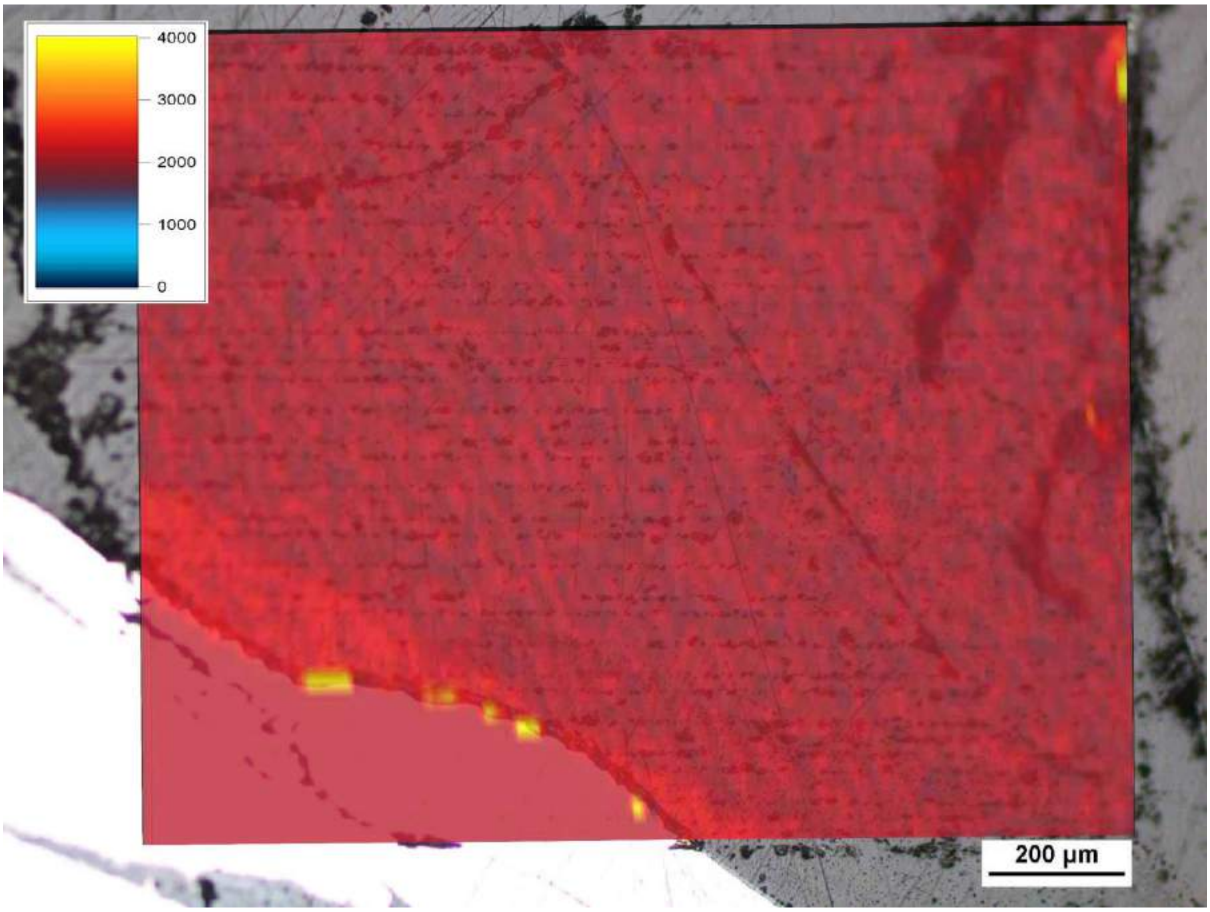

3500
3000
2500
2000
1500
1000
500
0
200 µm


3500
3000
2500
2000
1500
1000
500
0
200 µm

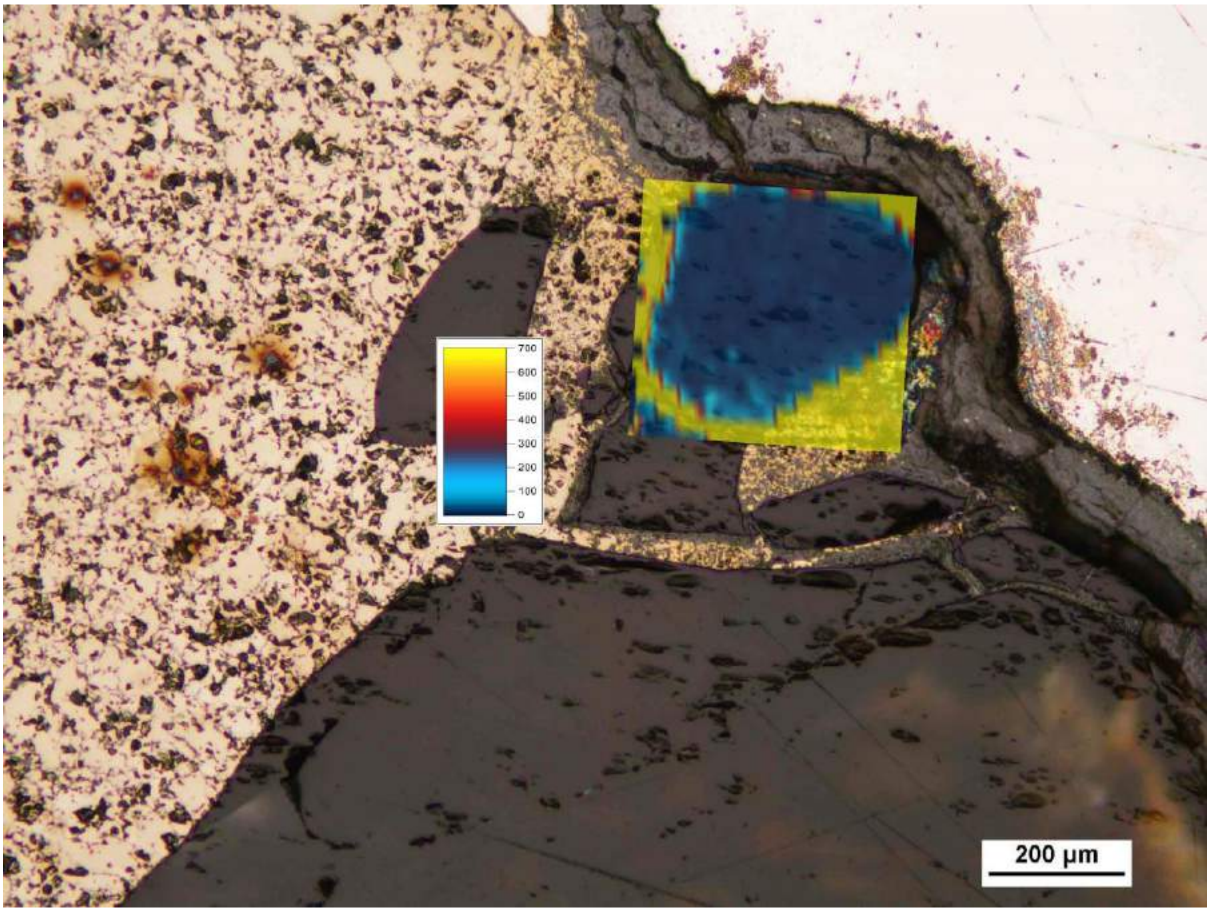

3500
3000
2500
2000
1500
1000
500
0
200 µm

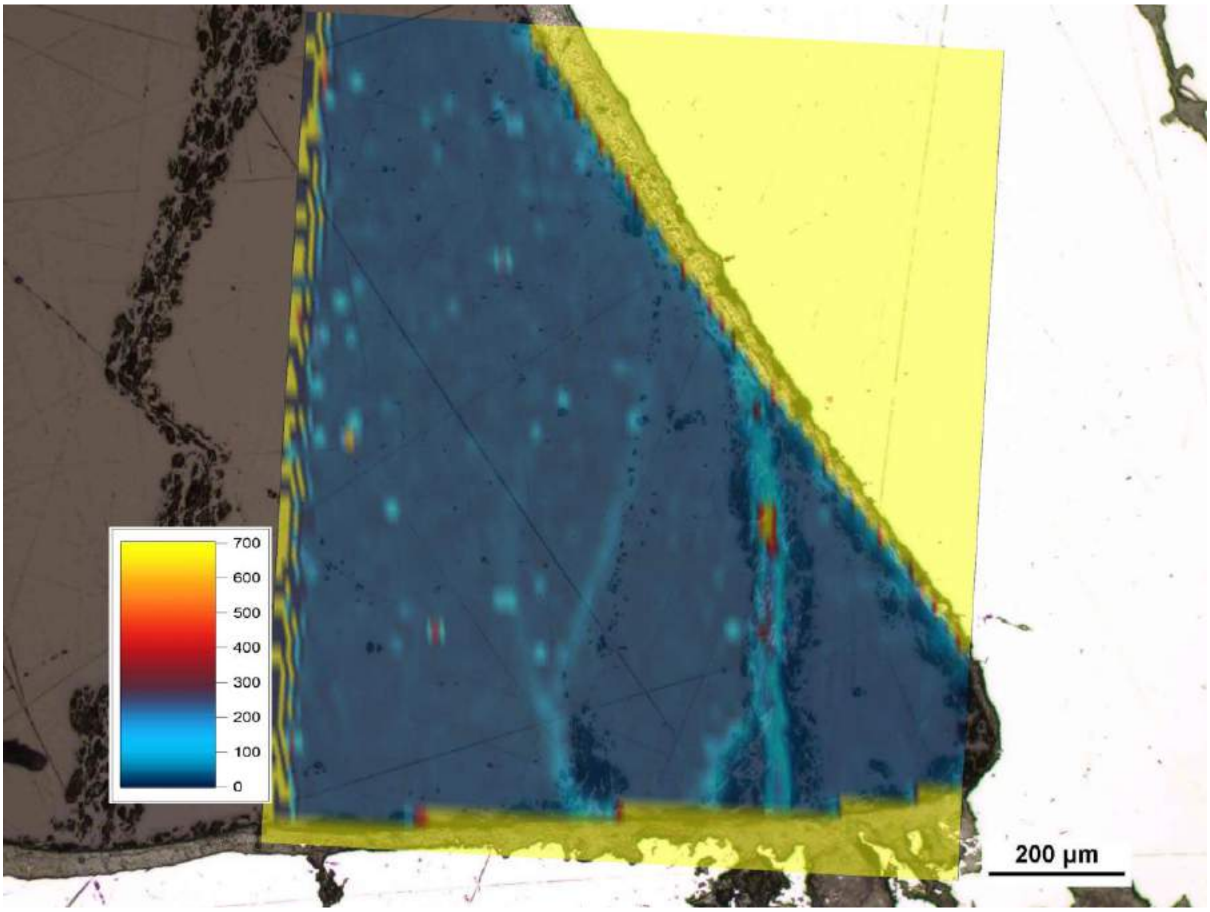

3500
3000
2500
2000
1500
1000
500
0
200 µm

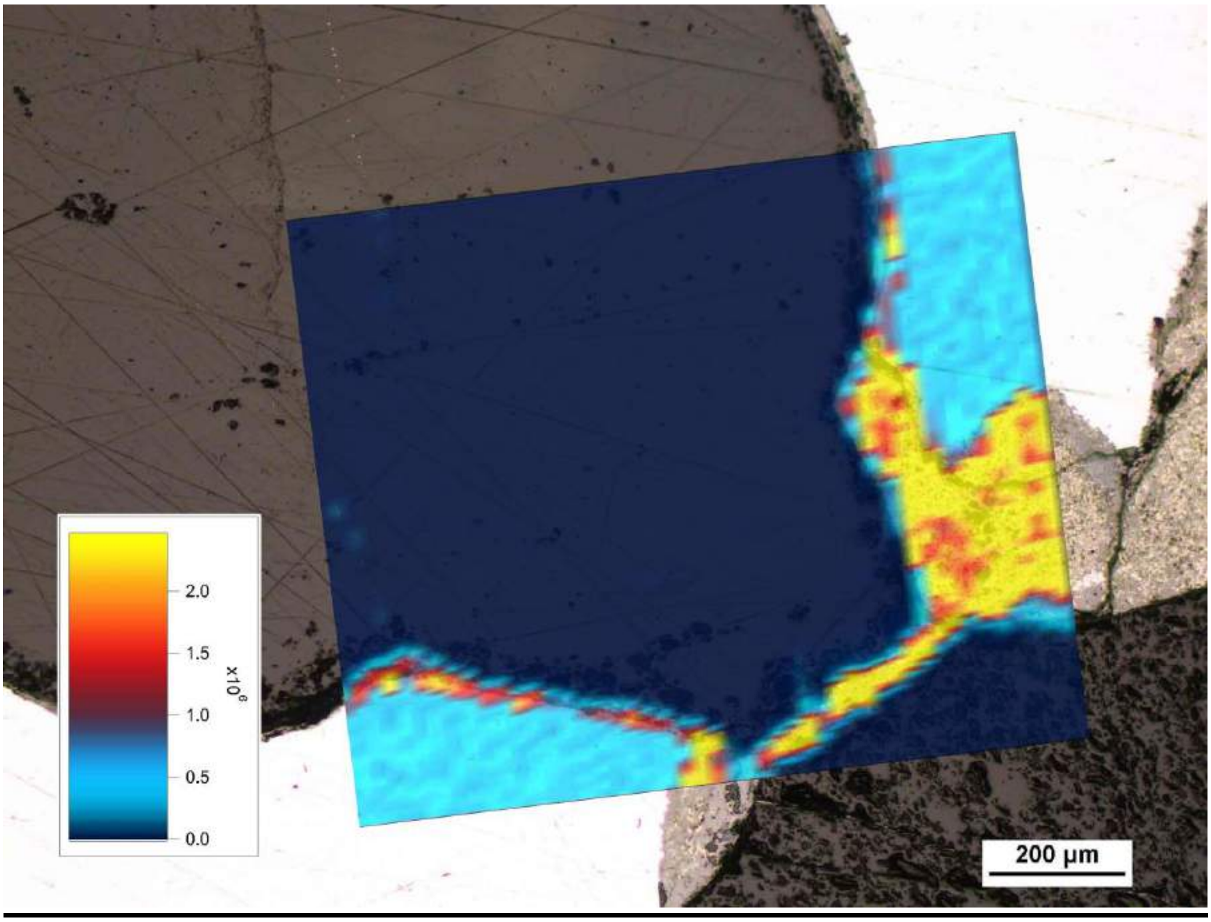

4000
3000
2000
1000
0
200 µm

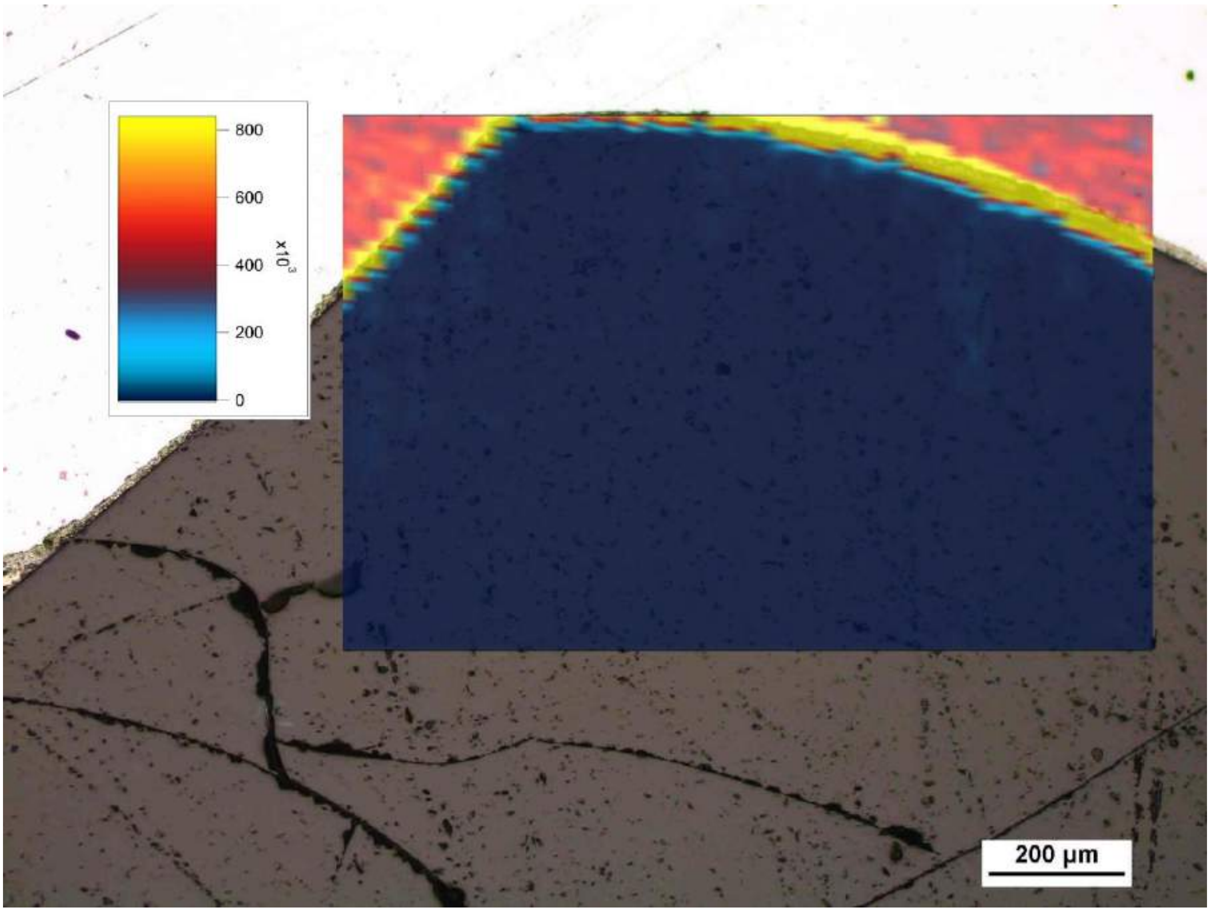


Ni diffusion patterns

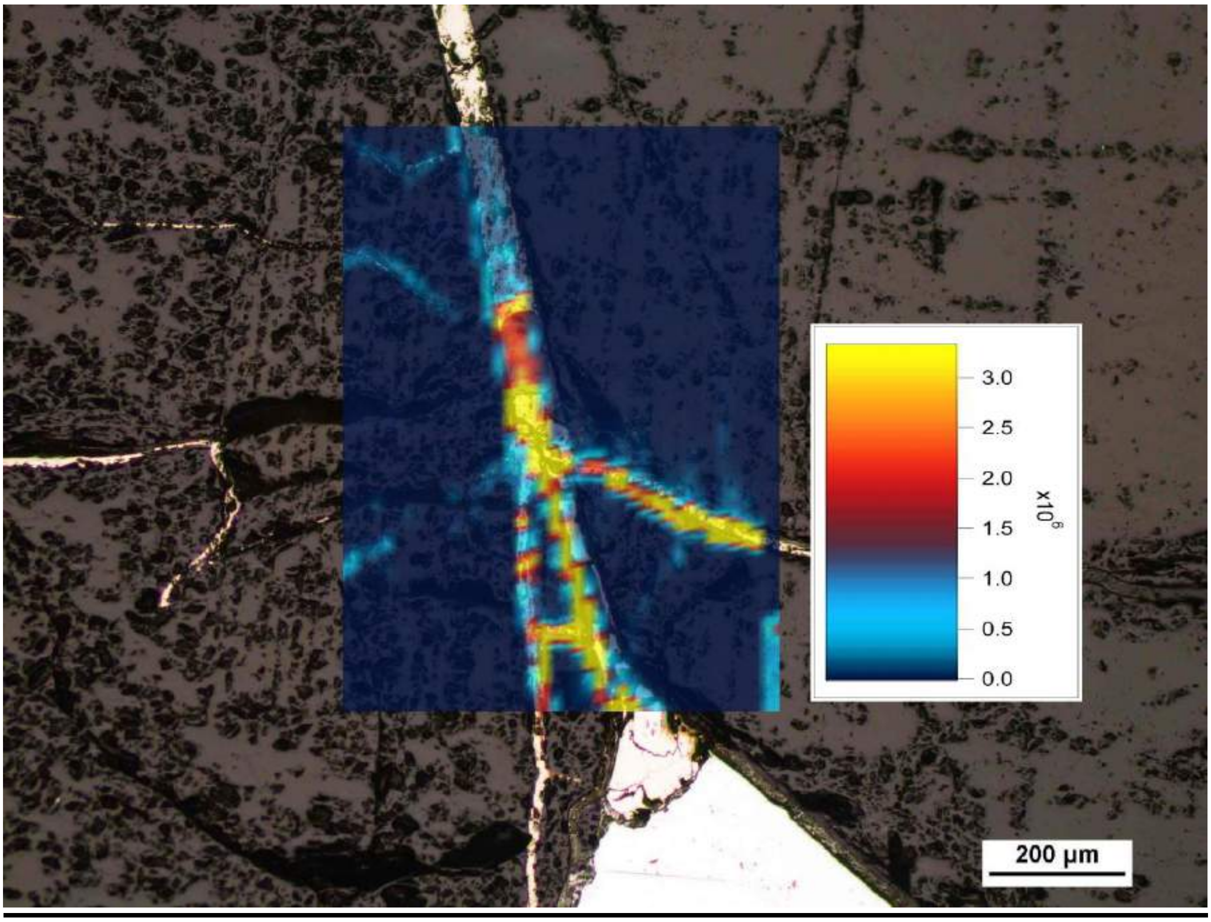

700
600
500
400
300
200
100
0
200 µm

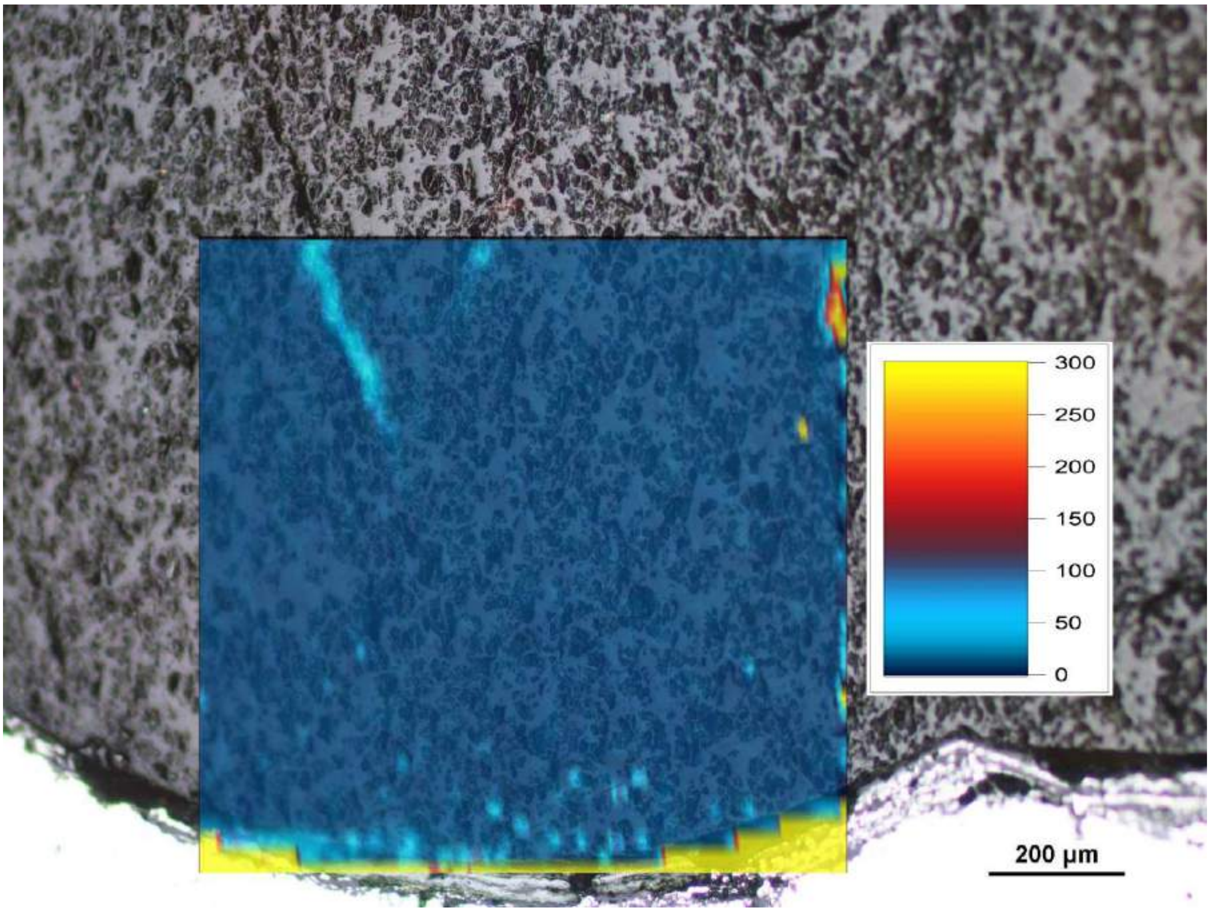

700
600
500
400
300
200
100
0
200 µm

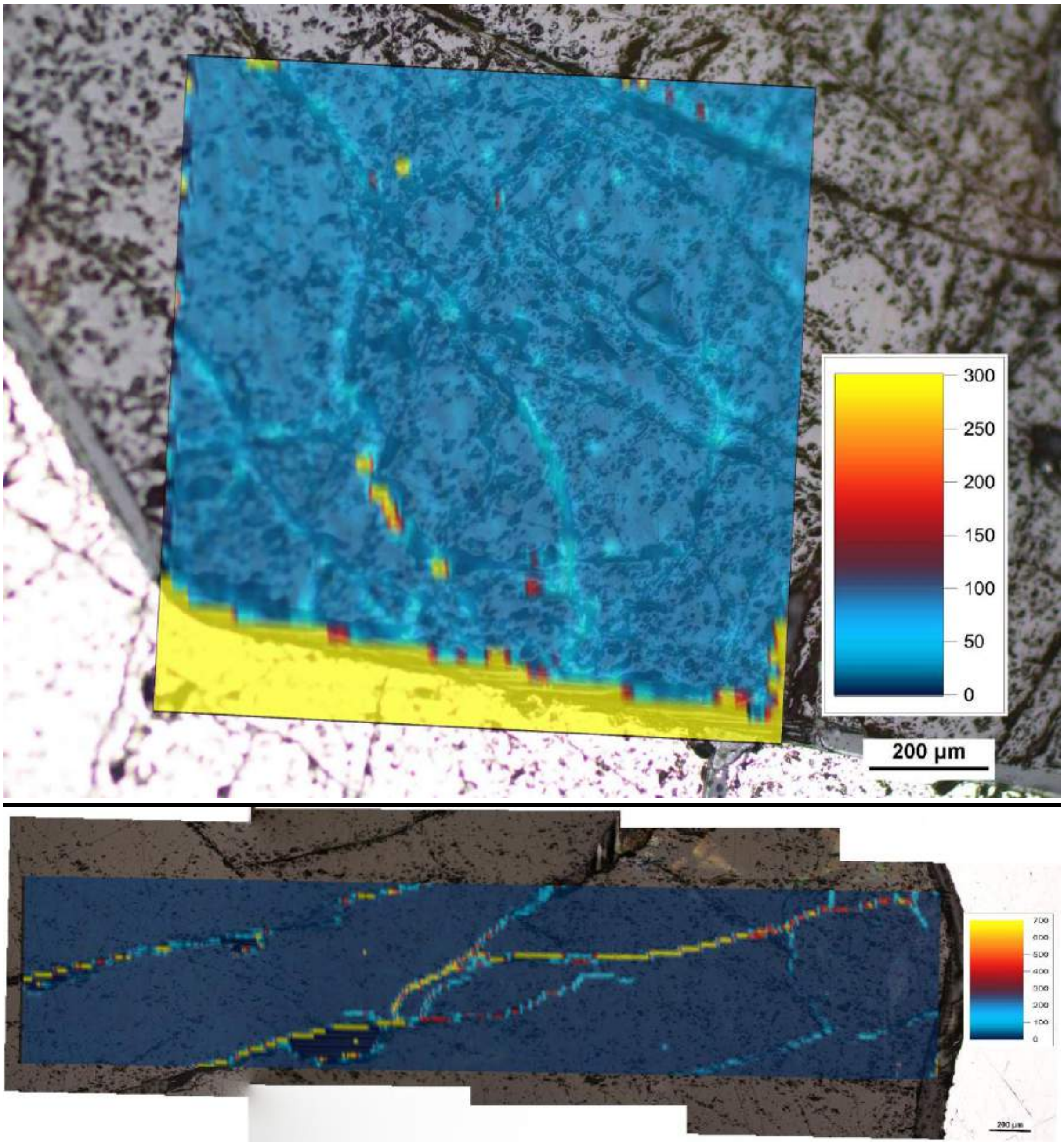

2.0
1.5
1.0
0.5
0.0
x10^6
200 µm

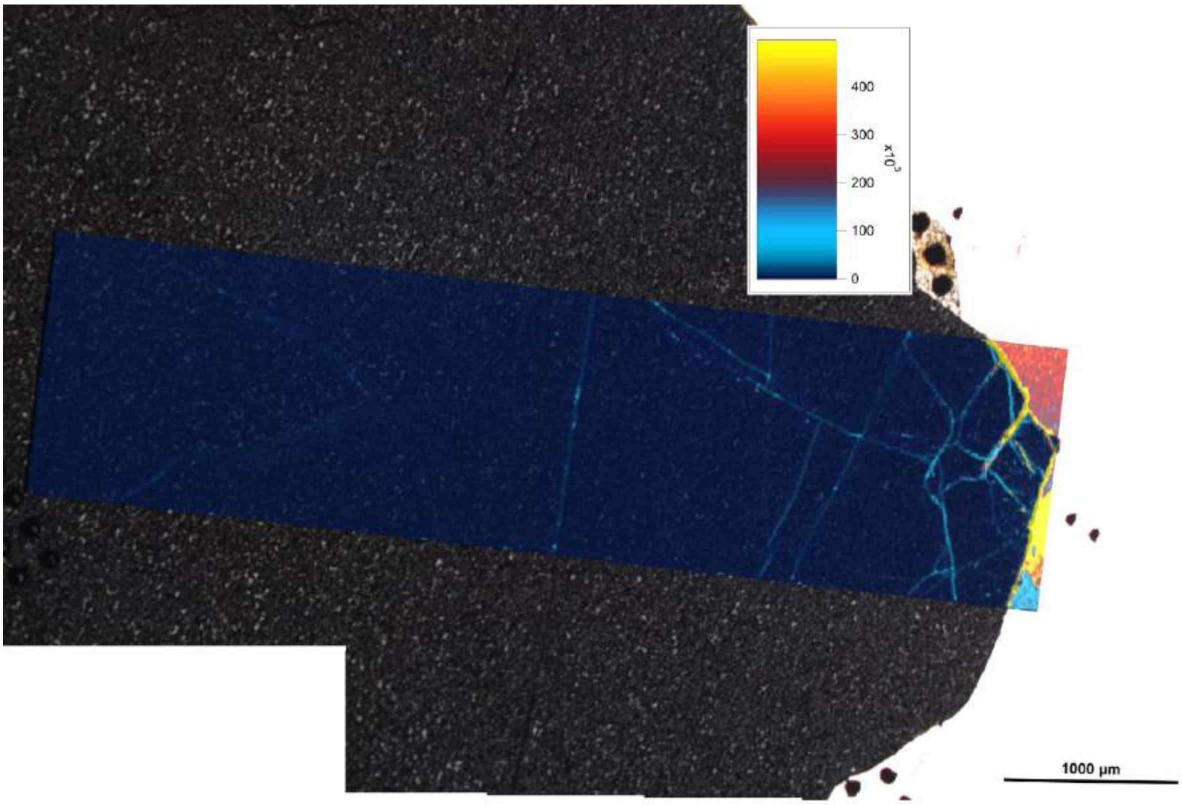


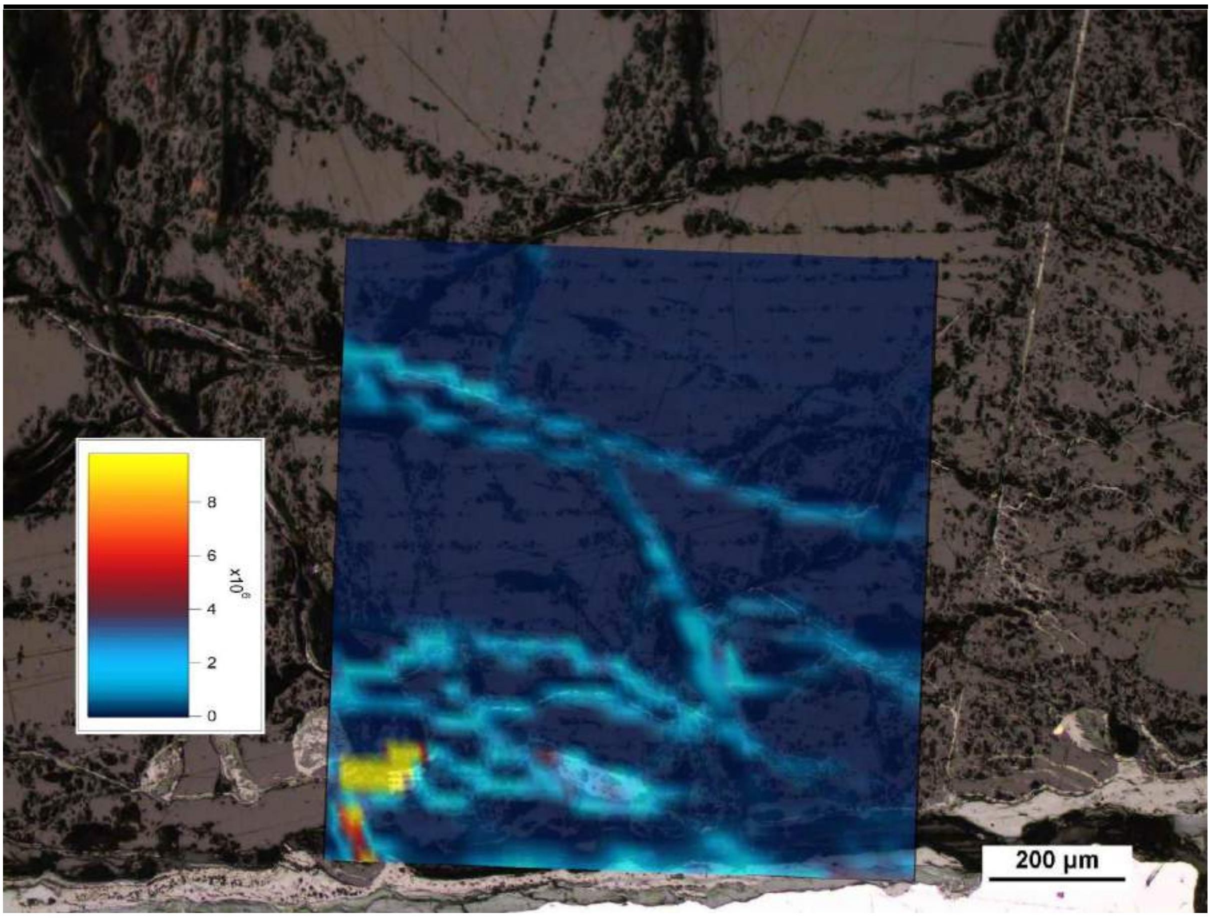
800
600
400
200
0
x10^3
200 µm

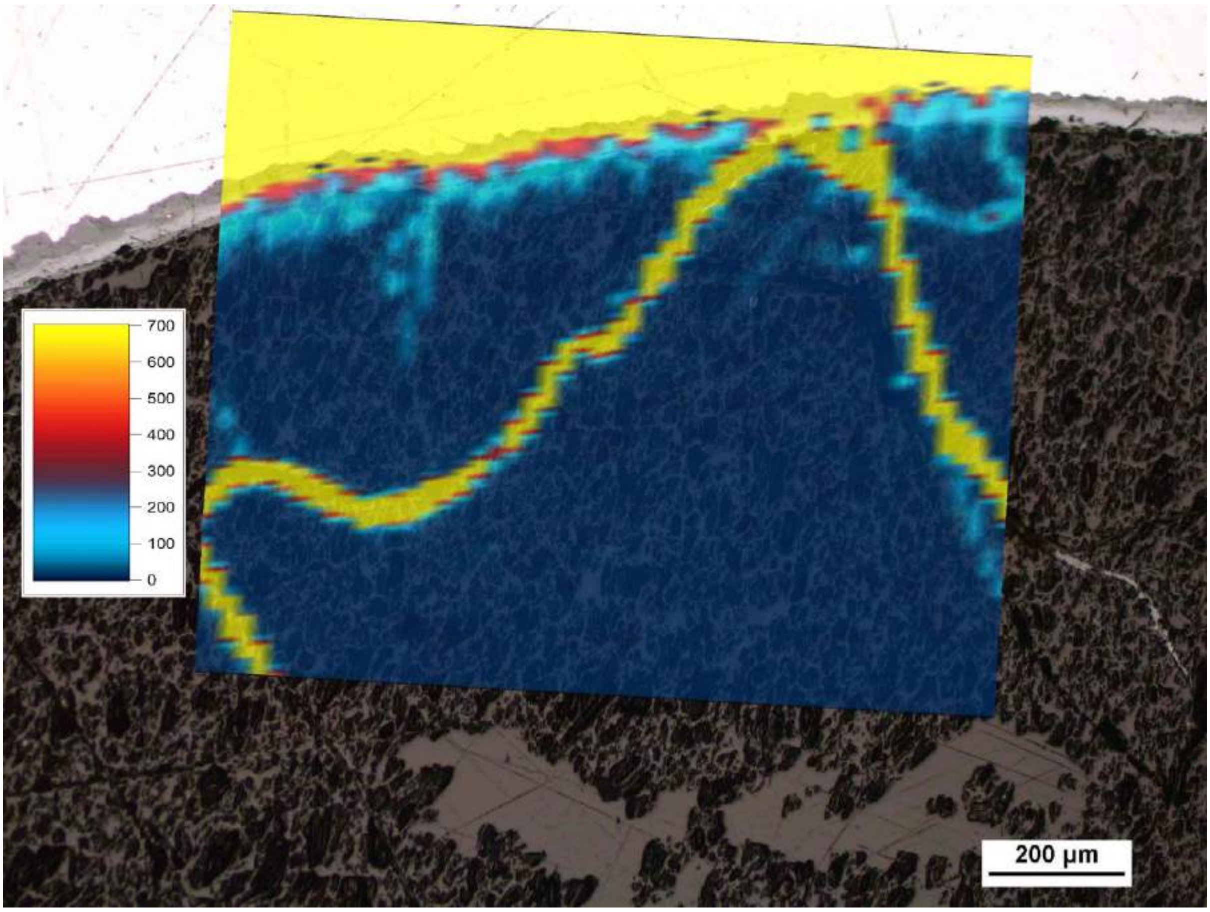

3.0
2.5
2.0
1.5
1.0
0.5
0.0
x10^6
200 µm

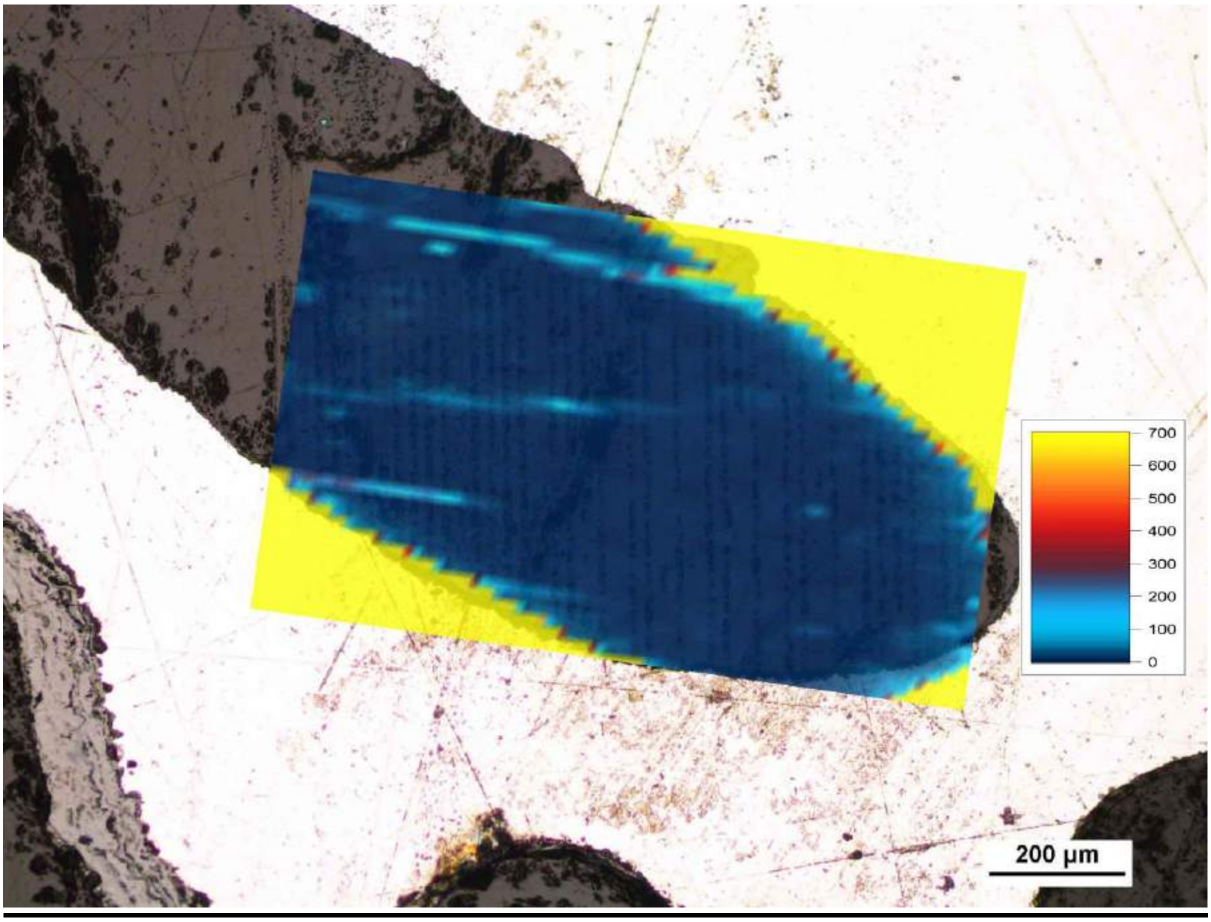

300
250
200
150
100
50
0
200 µm


300
250
200
150
100
50
0
200 µm
700
600
500
400
300
200
100
0

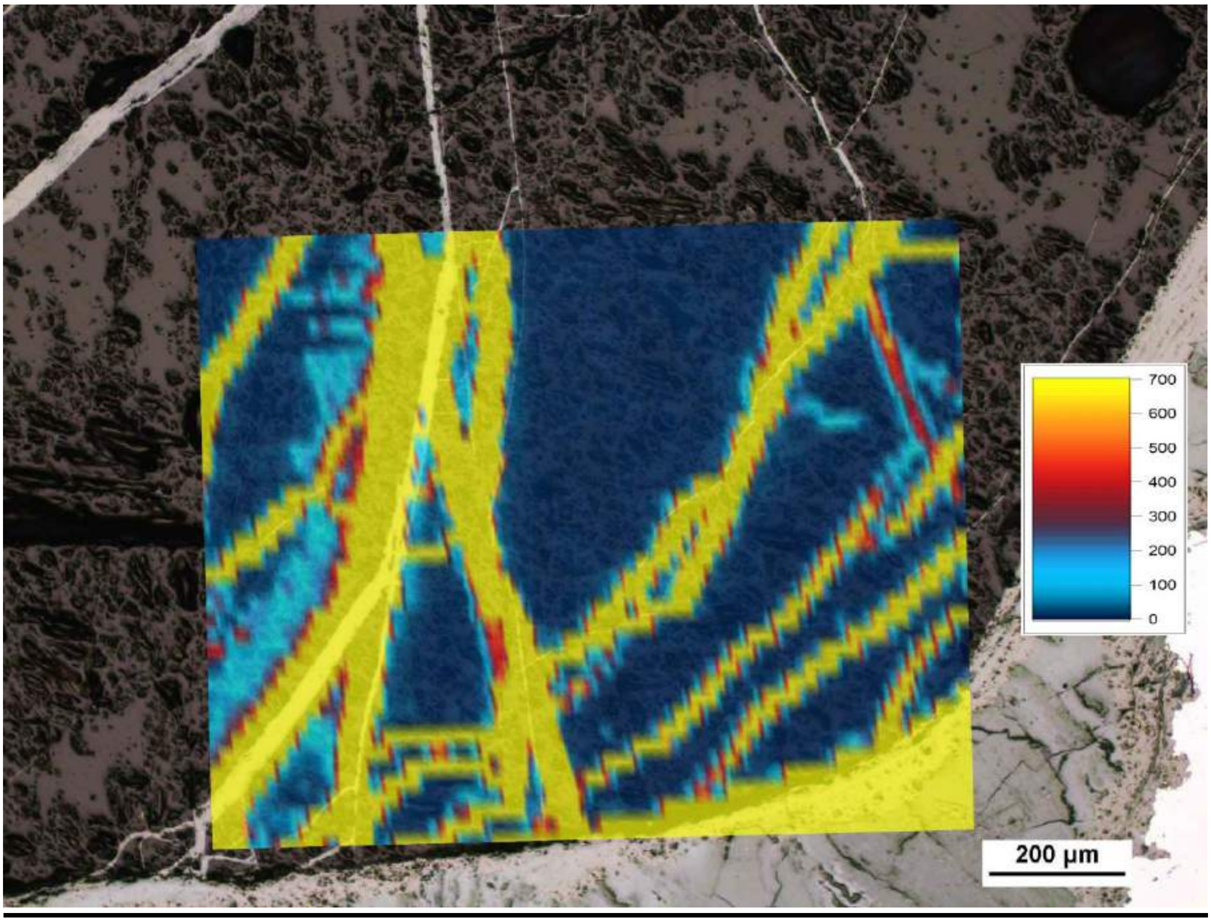

400
300
200
100
0
x10^3
1000 µm

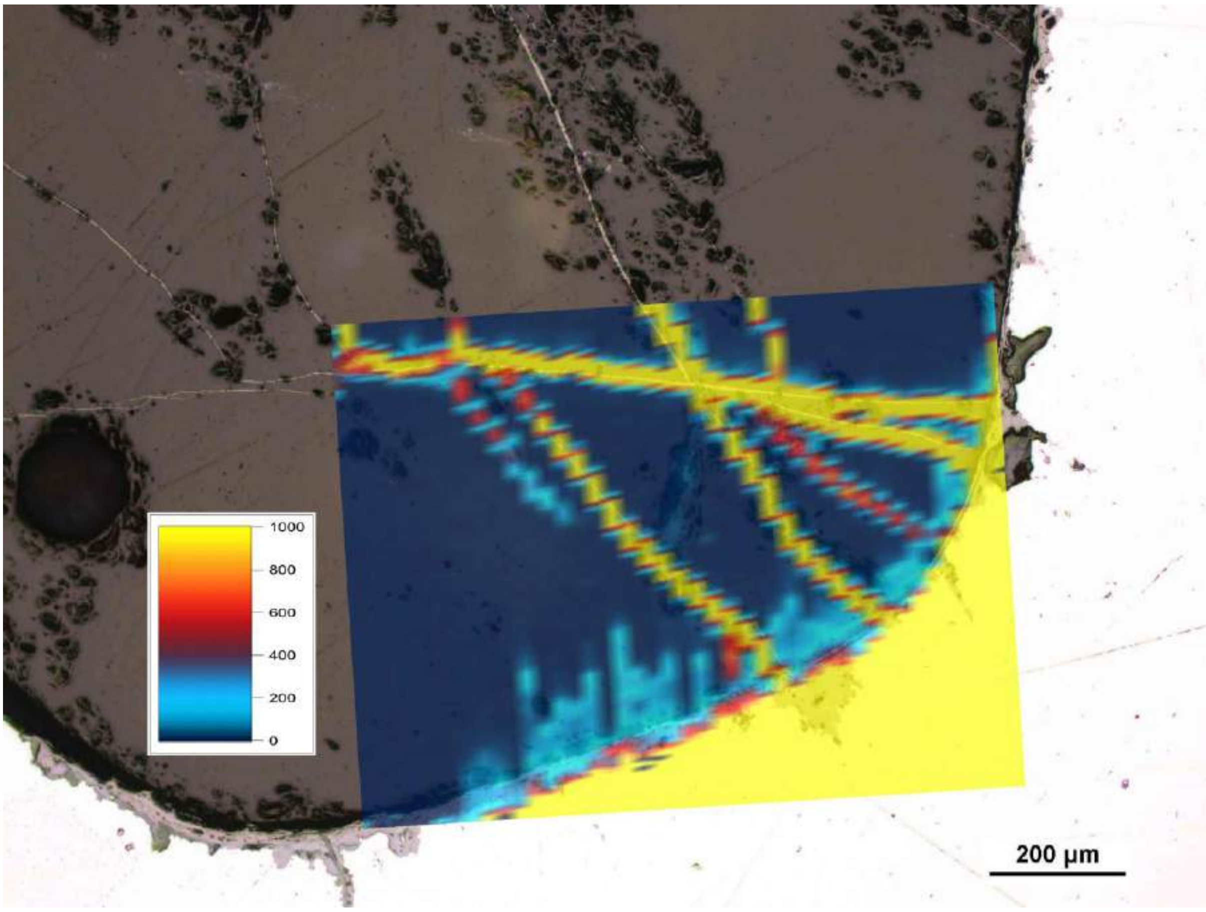

8
6
4
2
0
x10^6
200 µm

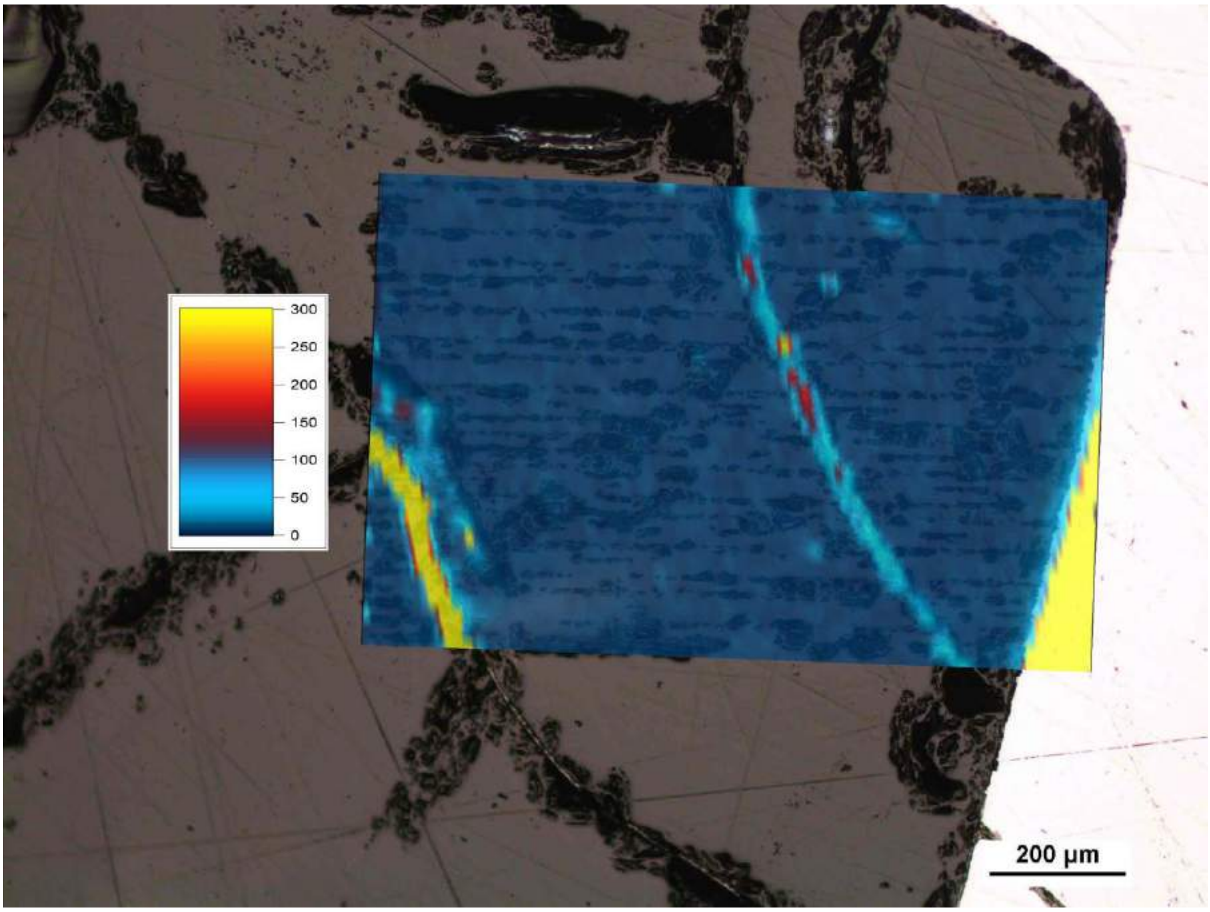

700
600
500
400
300
200
100
0
200 µm



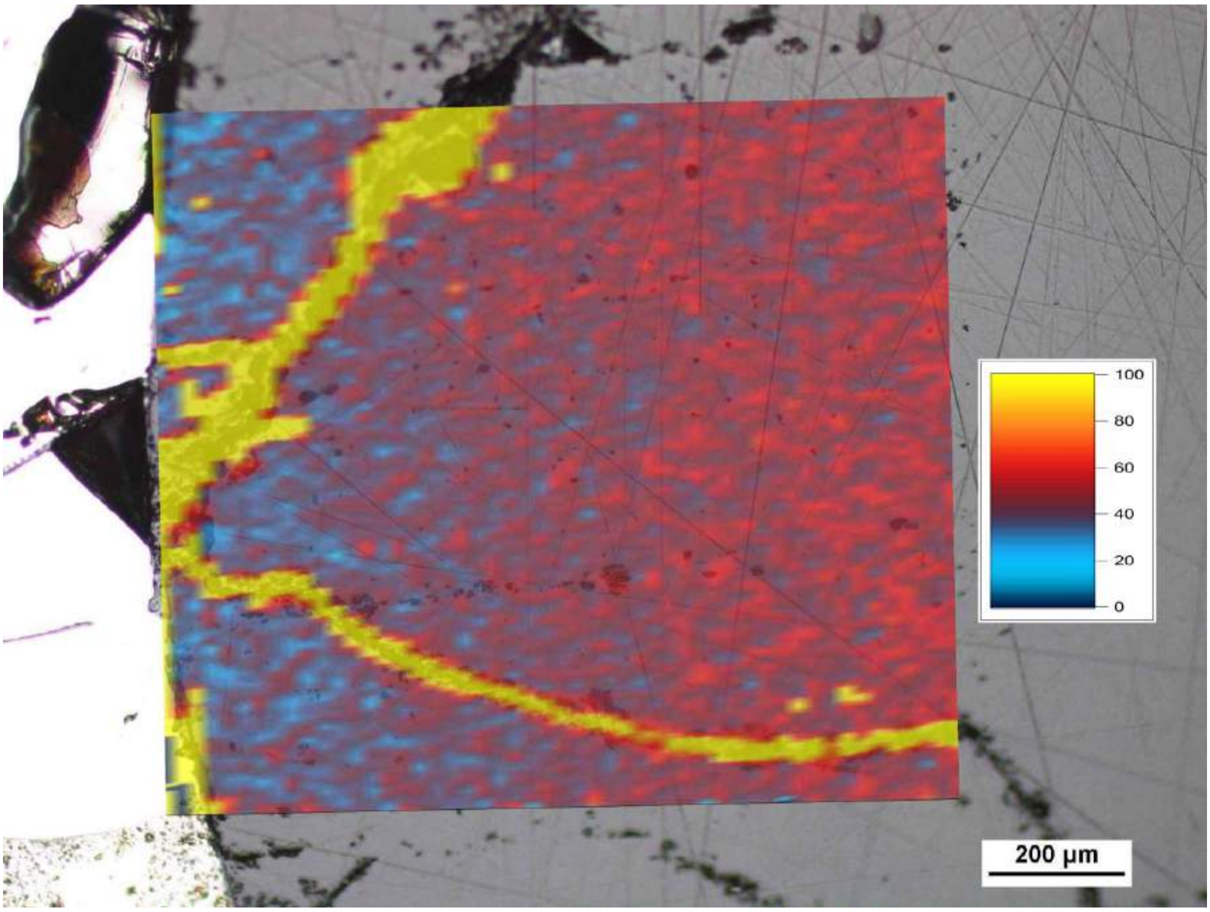
700
600
500
400
300
200
100
0
200 µm

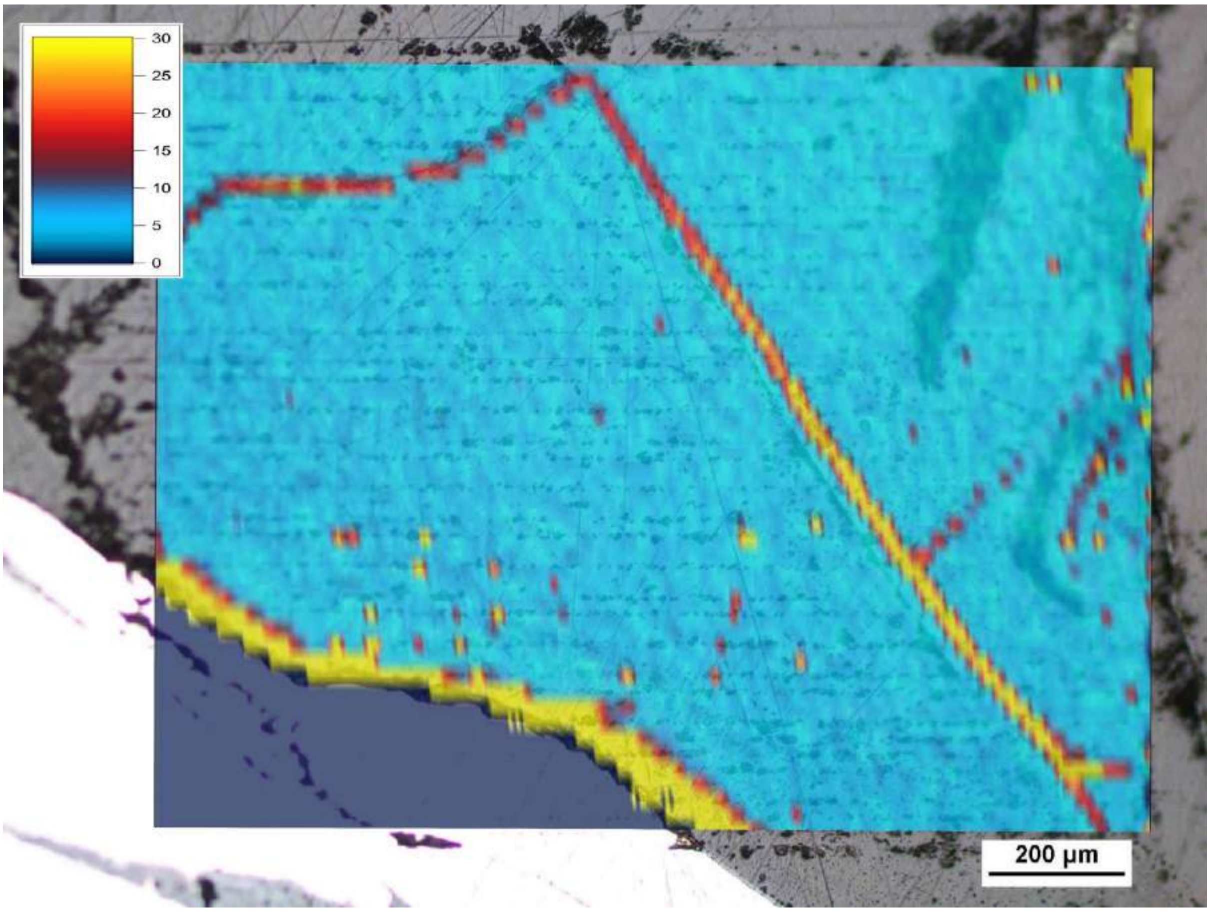

700
600
500
400
300
200
100
0
200 µm


1000
800
600
400
200
0
200 µm

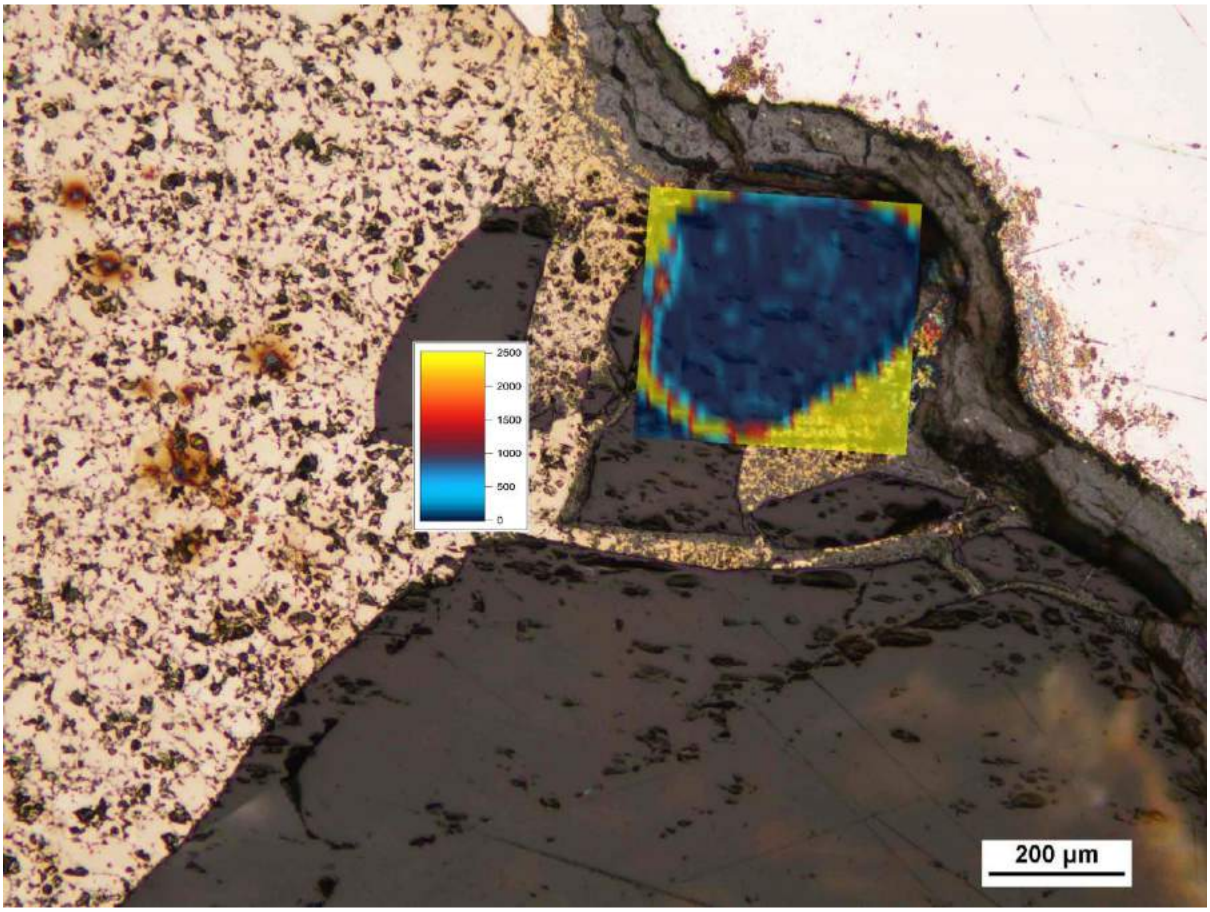


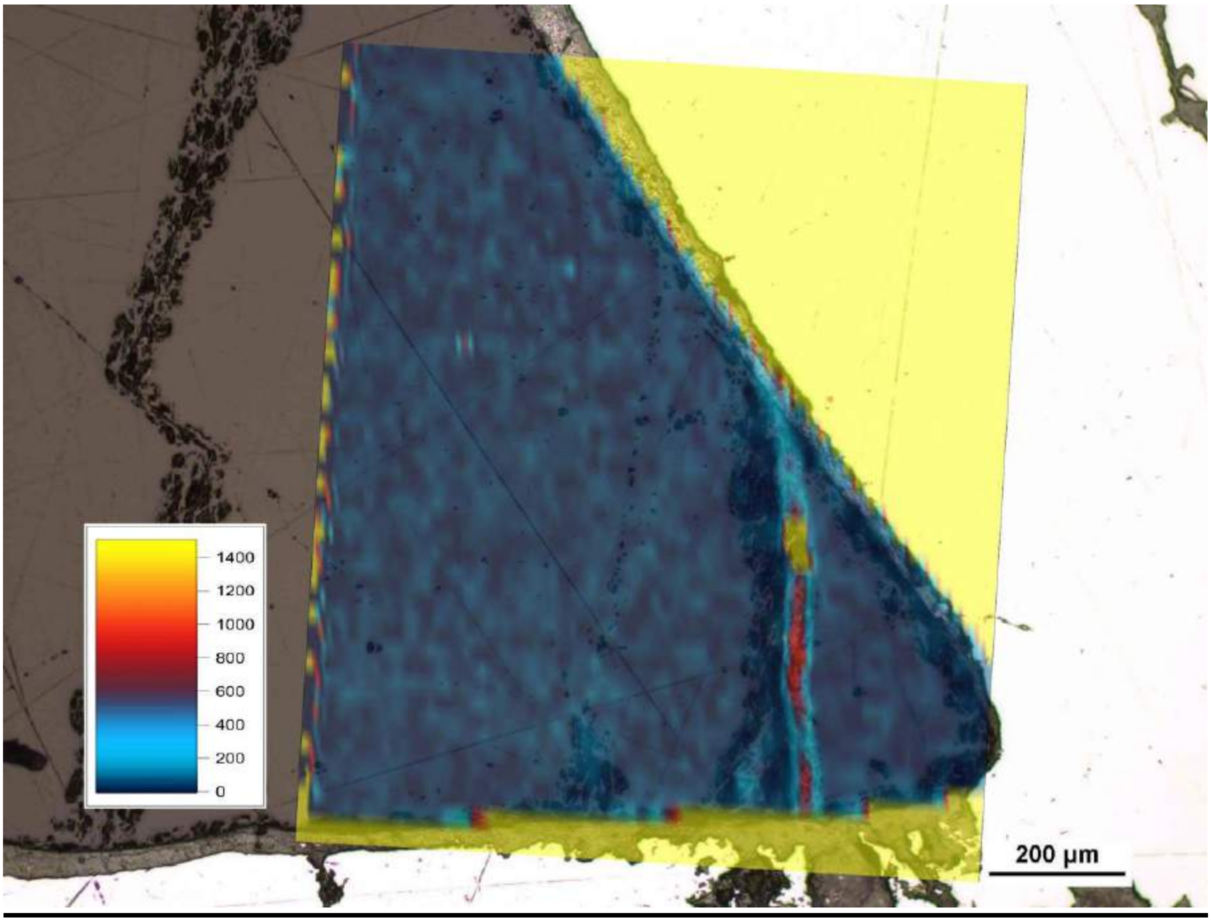
300
250
200
150
100
50
0
200 µm

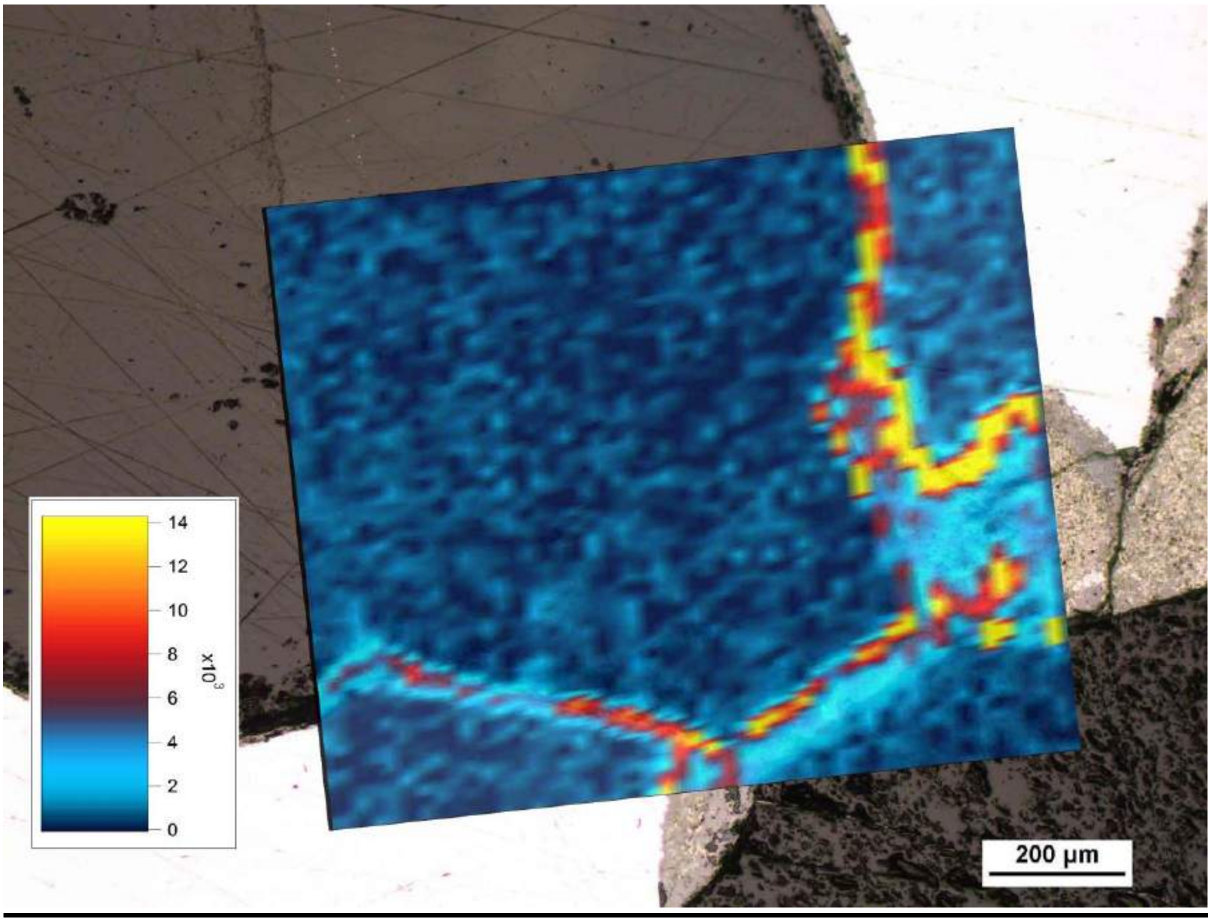

100
80
60
40
20
0
200 µm



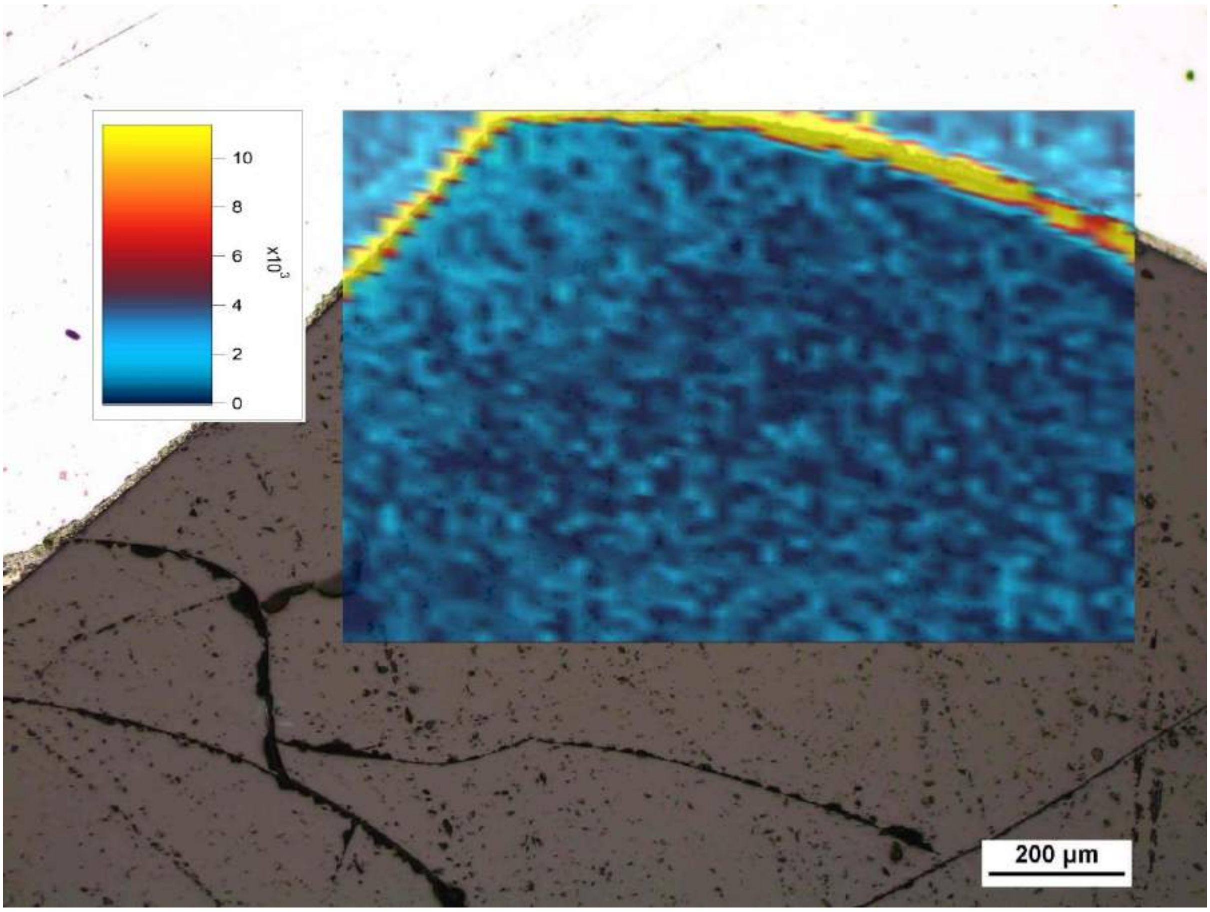
P diffusion patterns

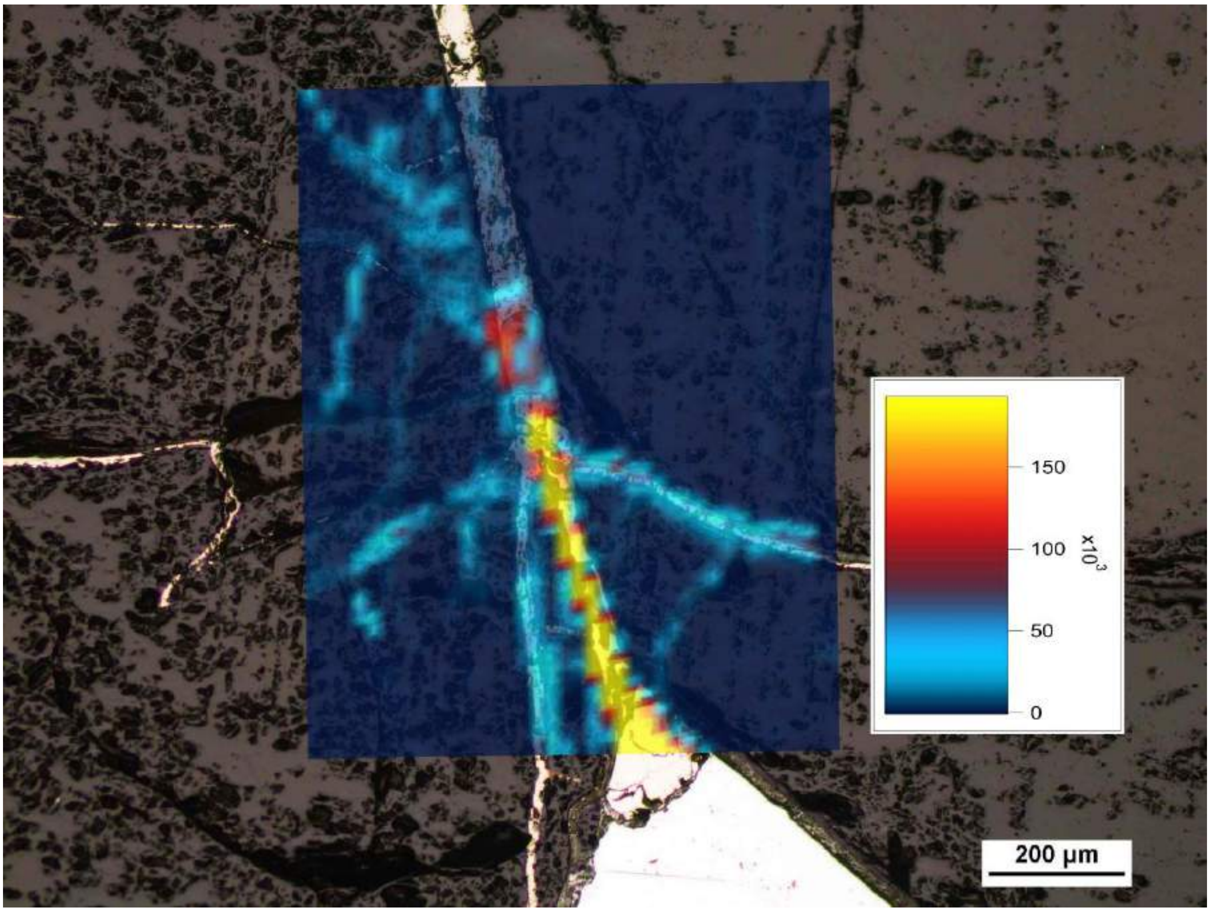

2500
2000
1500
1000
500
0
200 µm

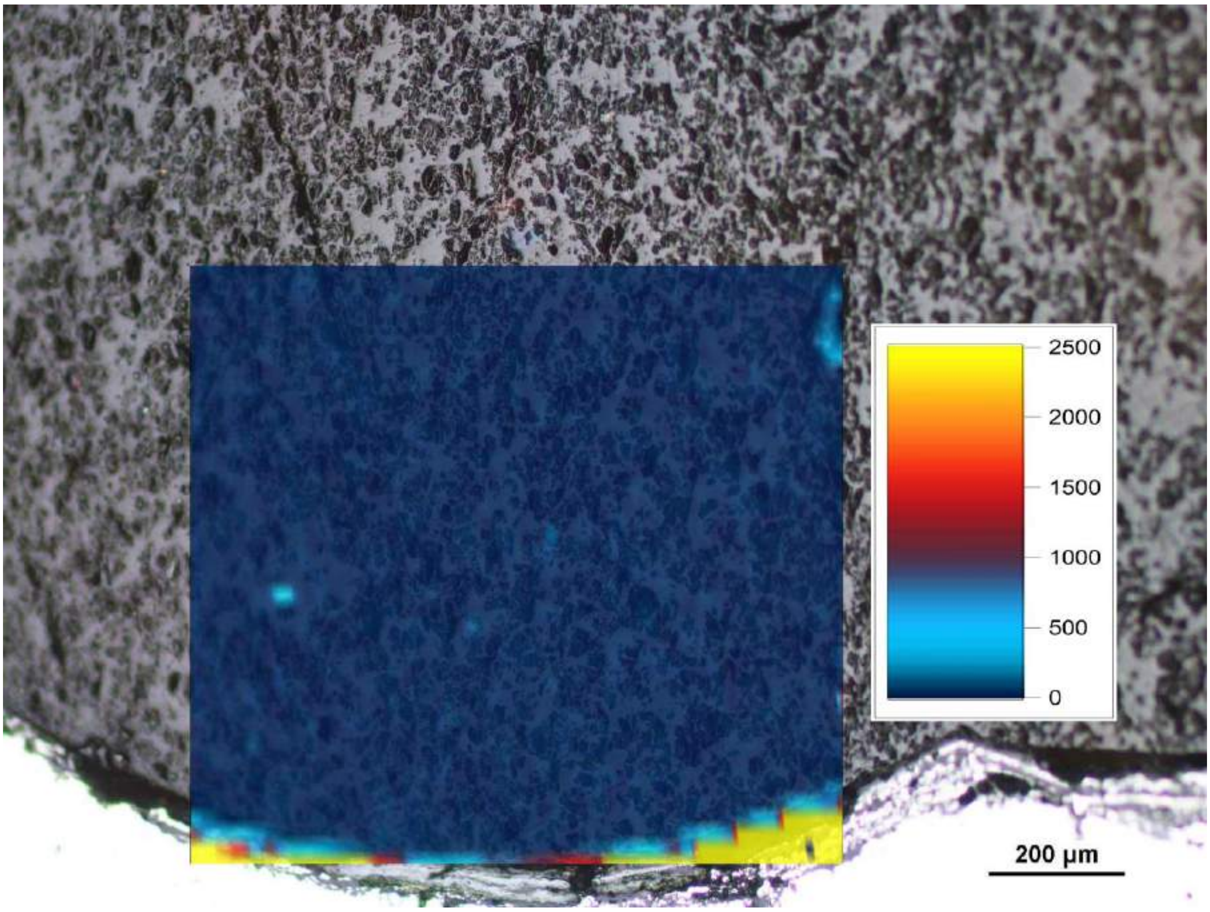

1400
1200
1000
800
600
400
200
0
200 µm



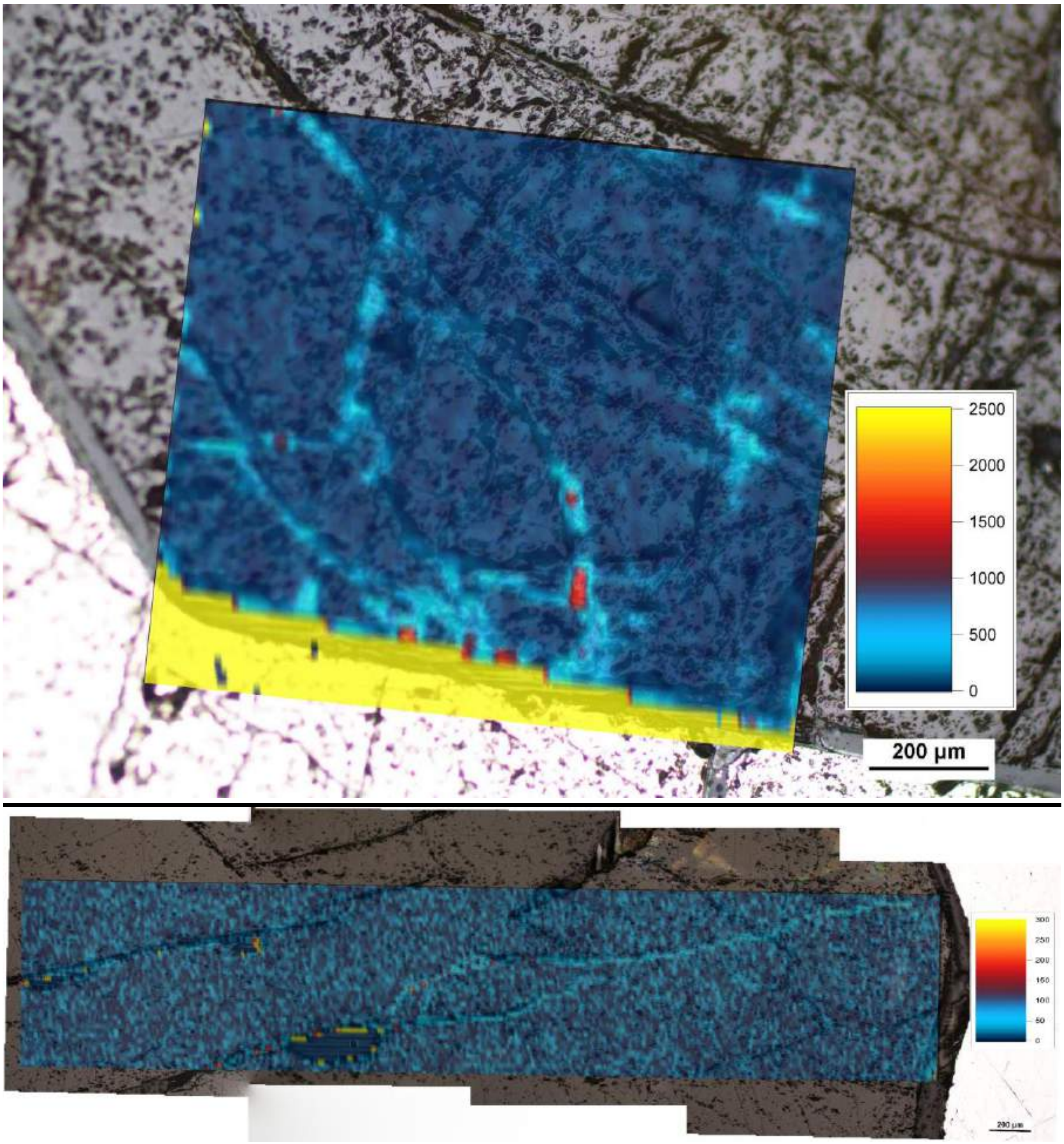
14
12
10
8
6
4
2
0
x10^3
200 µm

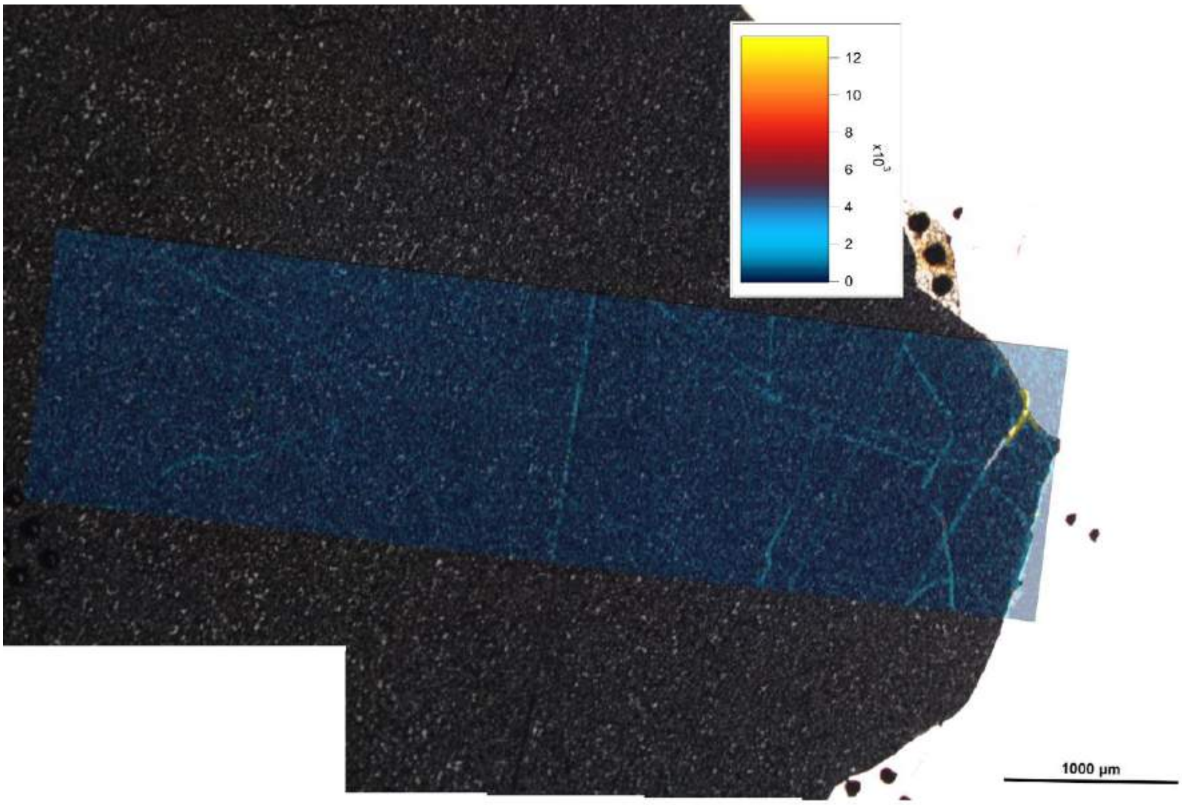

10
8
6
4
2
0
x10^3
200 µm

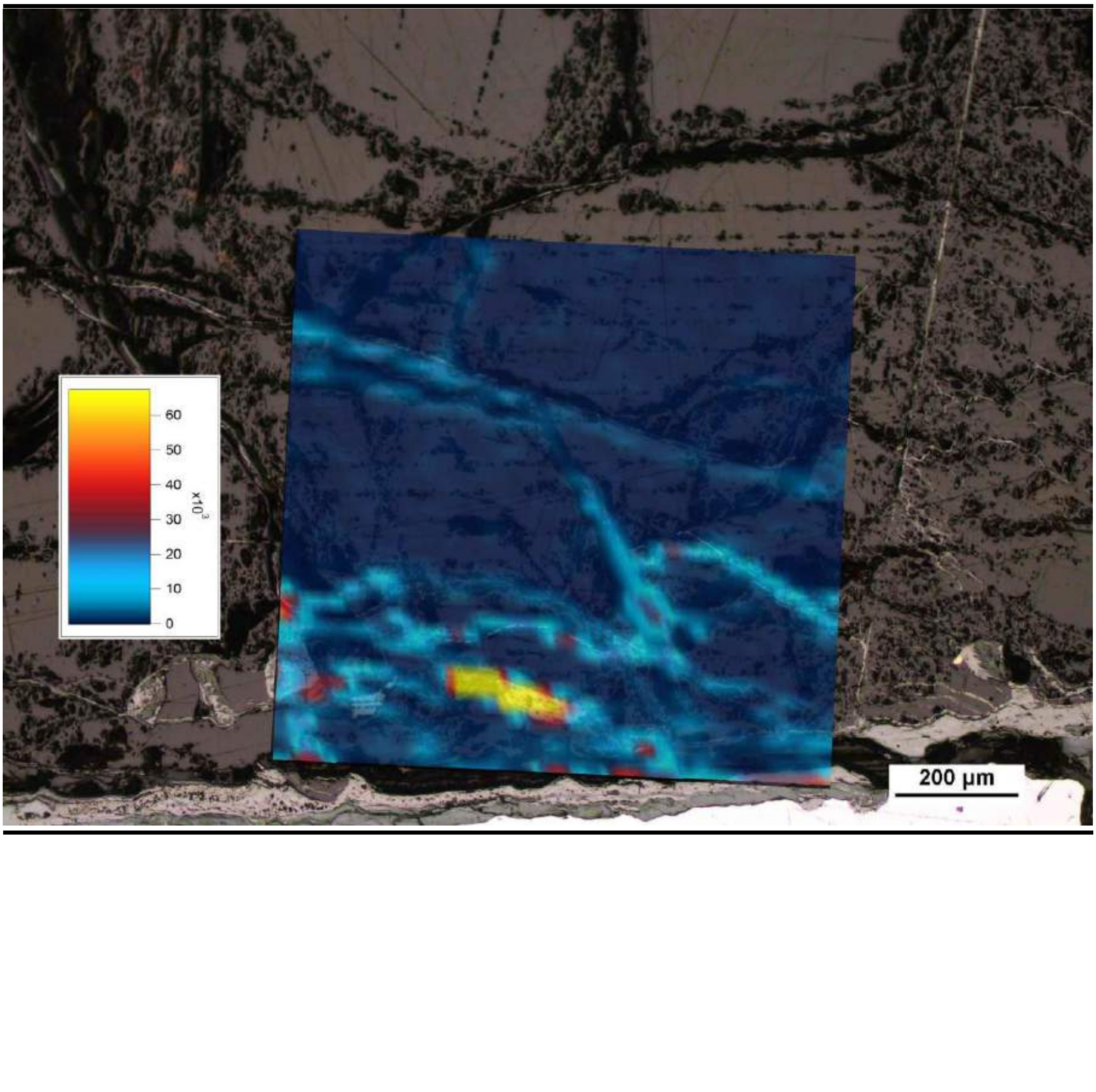

150
100
50
0
x10^3
200 µm

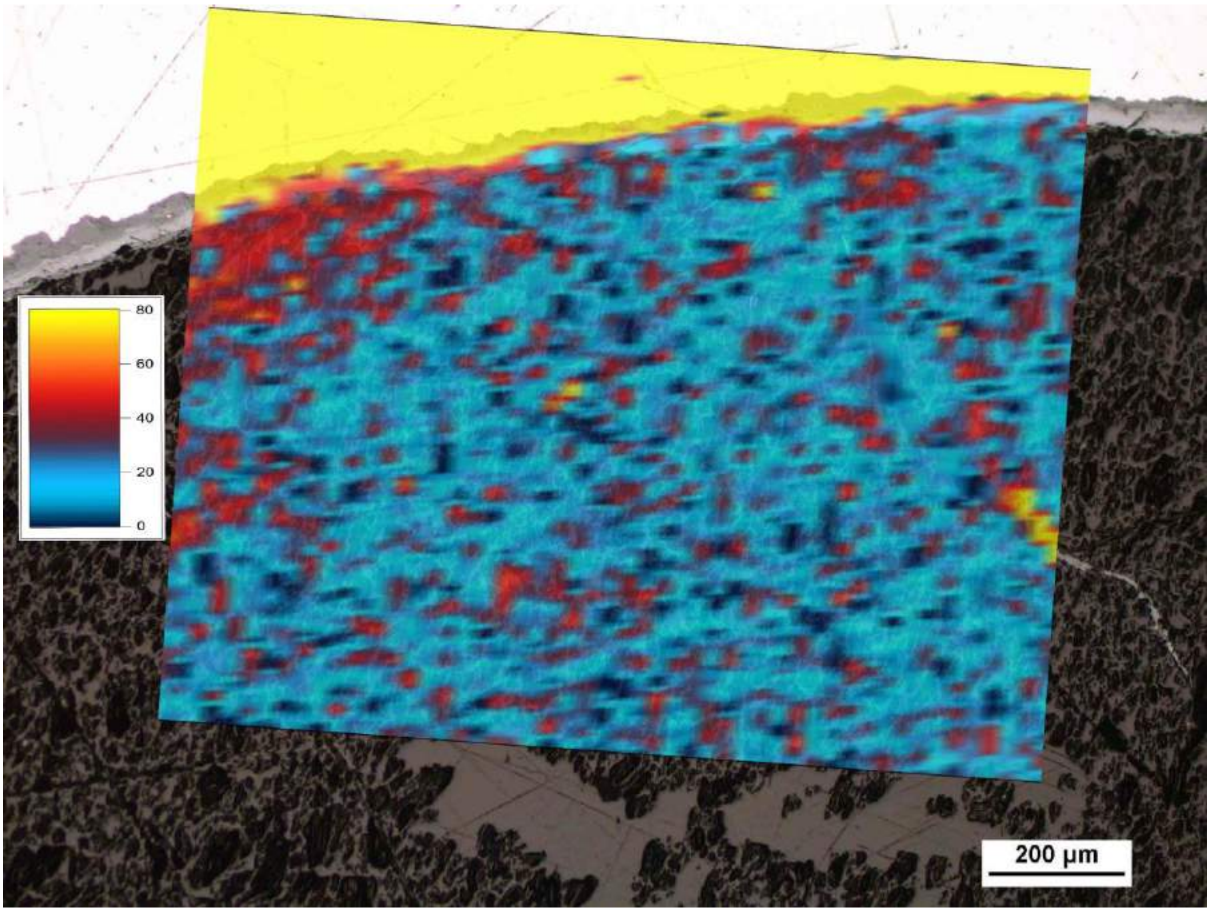


2500
2000
1500
1000
500
0
200 µm

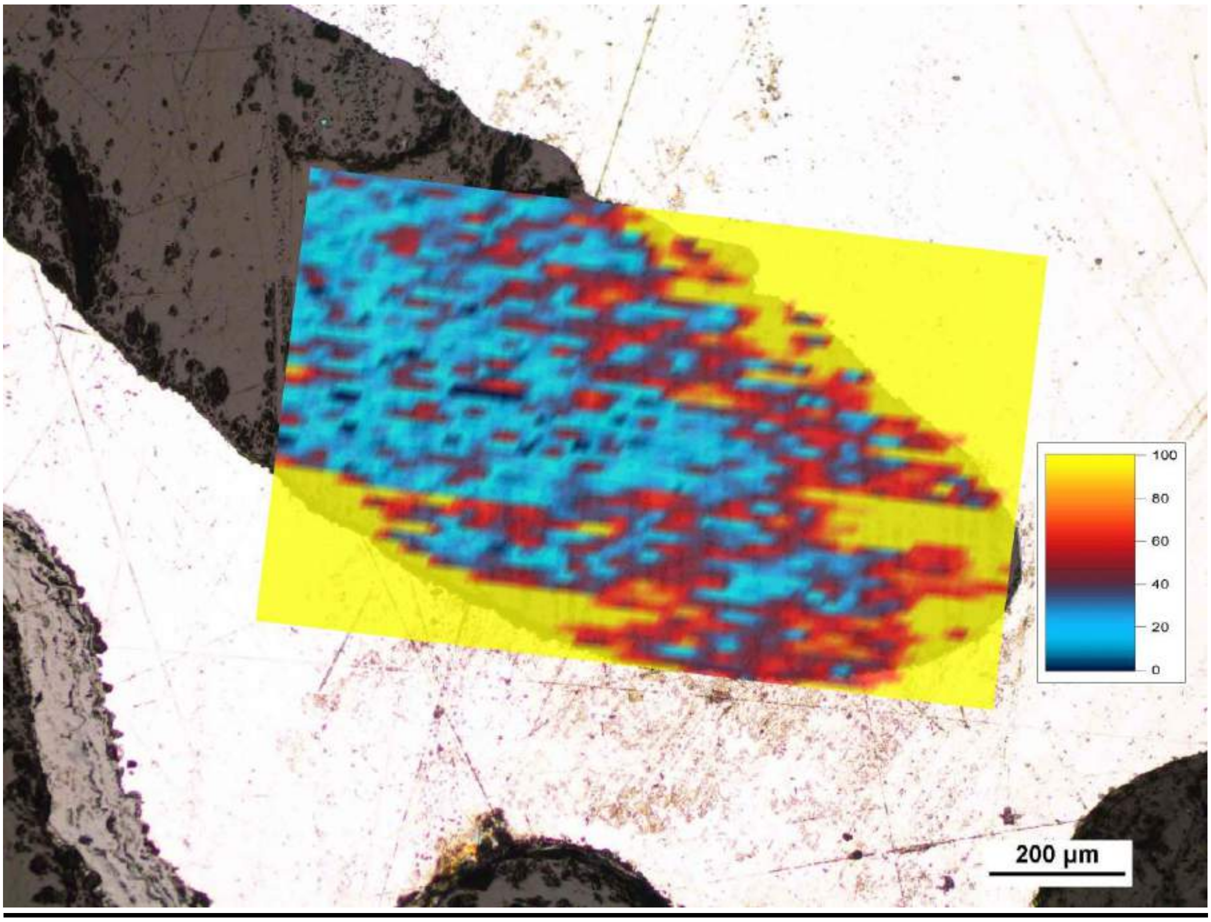

2500
2000
1500
1000
500
0
200 µm

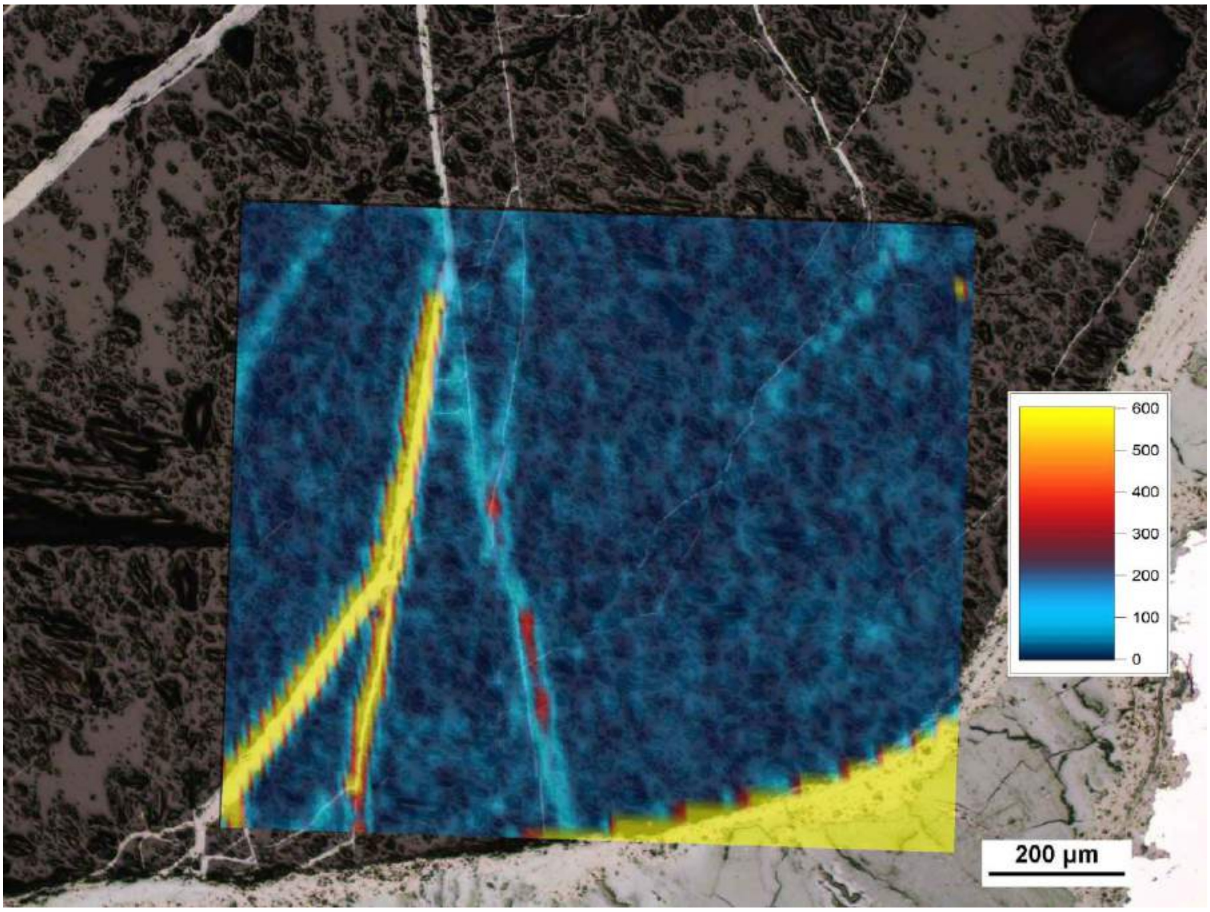

12
10
8
6
4
2
0
x10^3
1000 µm

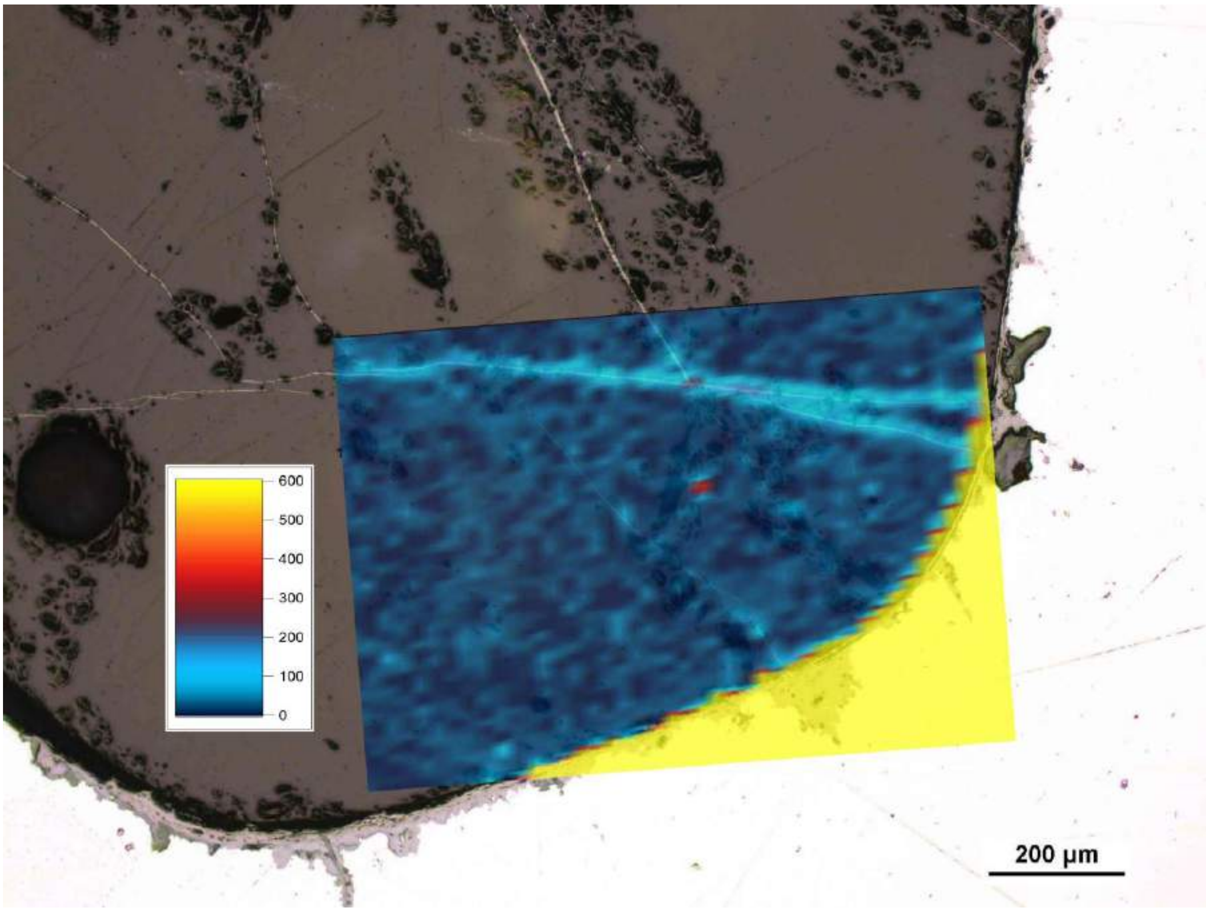

60
50
40
30
20
10
0
x10^3
200 µm

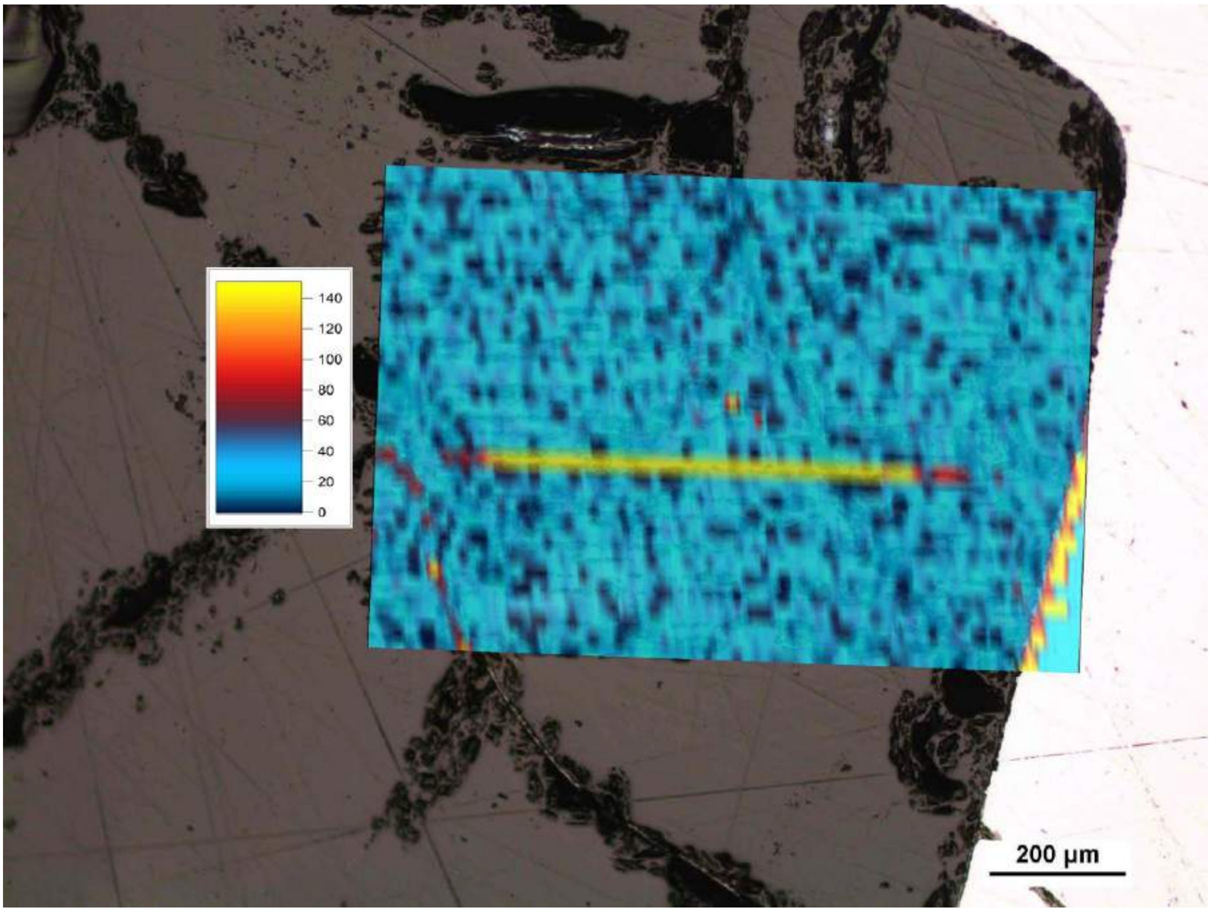


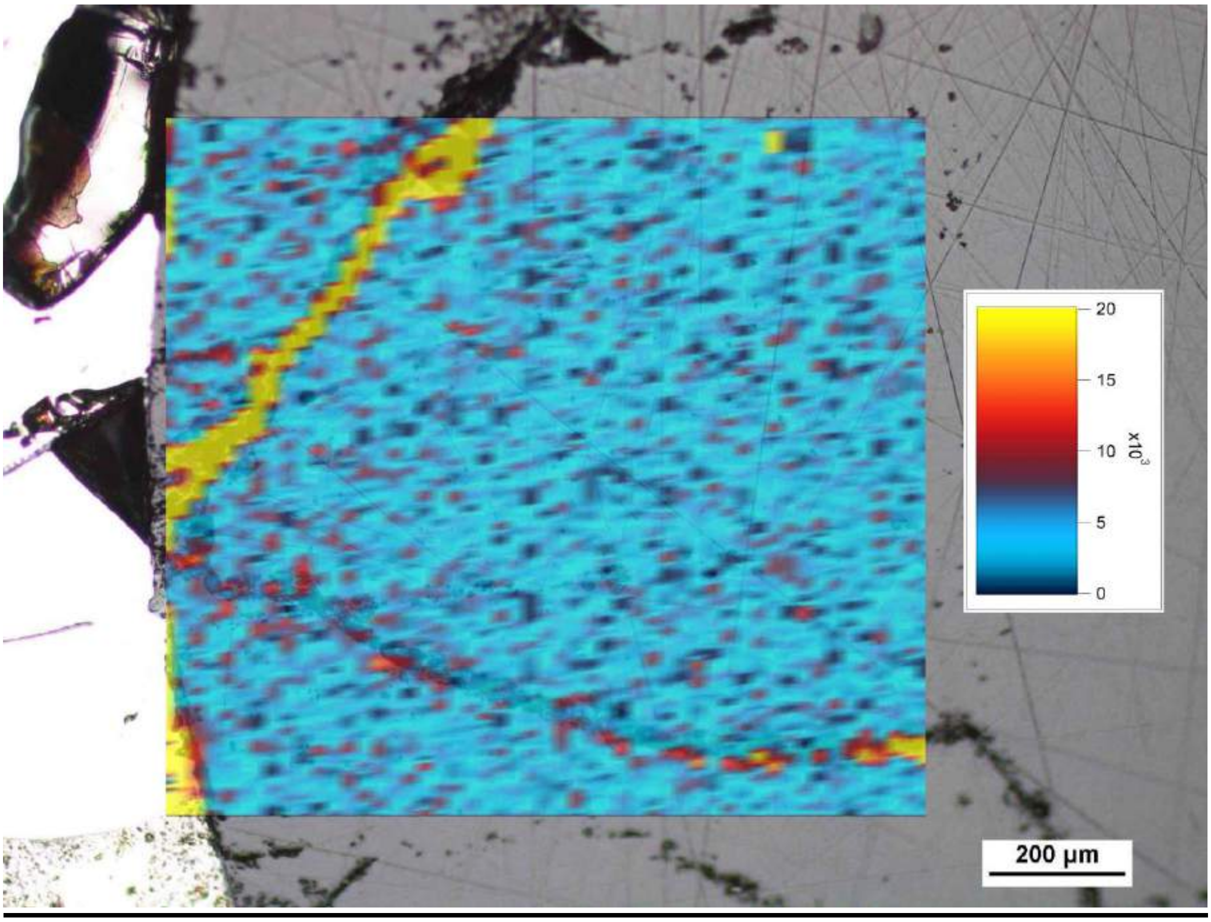
80
60
40
20
0
200 µm


100
80
60
40
20
0
200 µm

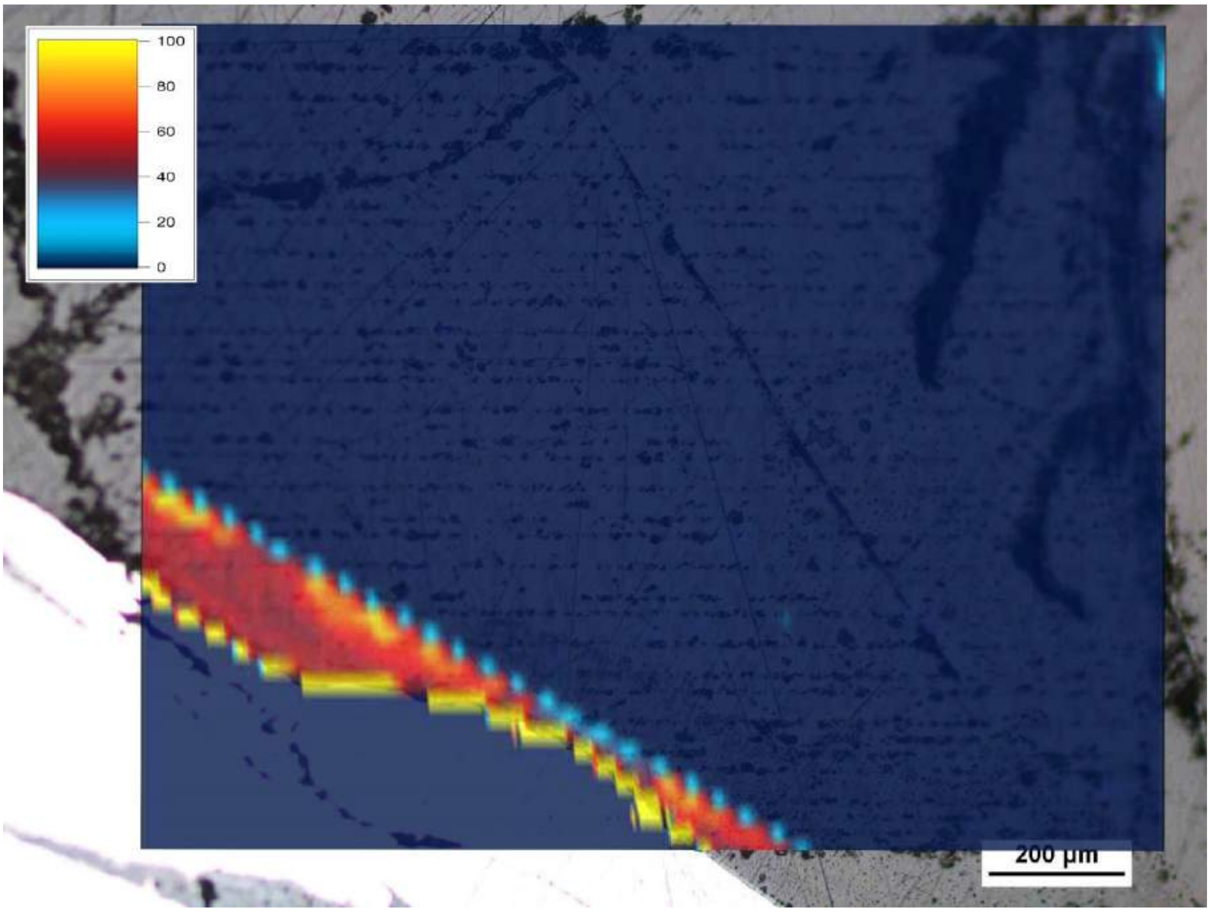

600
500
400
300
200
100
0
200 µm


600
500
400
300
200
100
0
200 µm

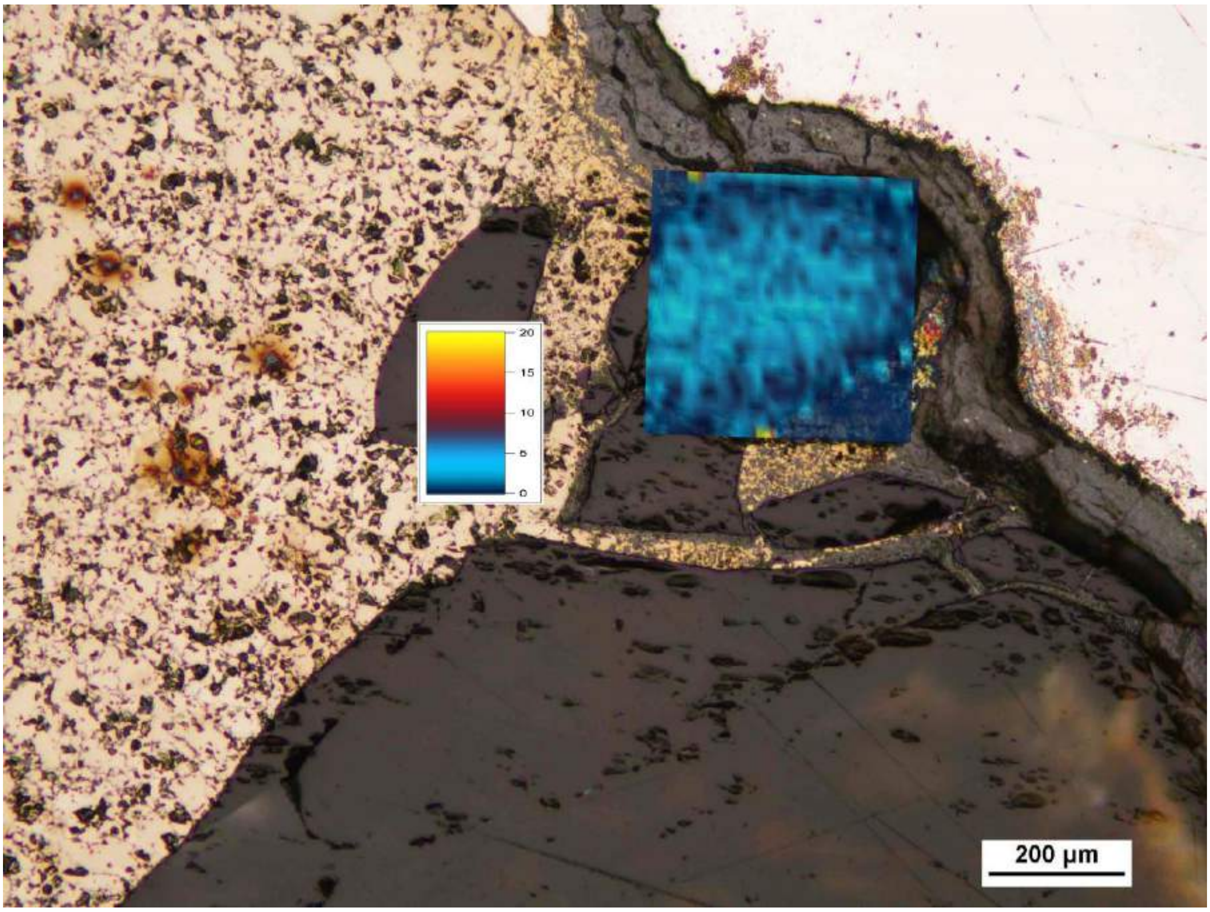

140
120
100
80
60
40
20
0
200 µm

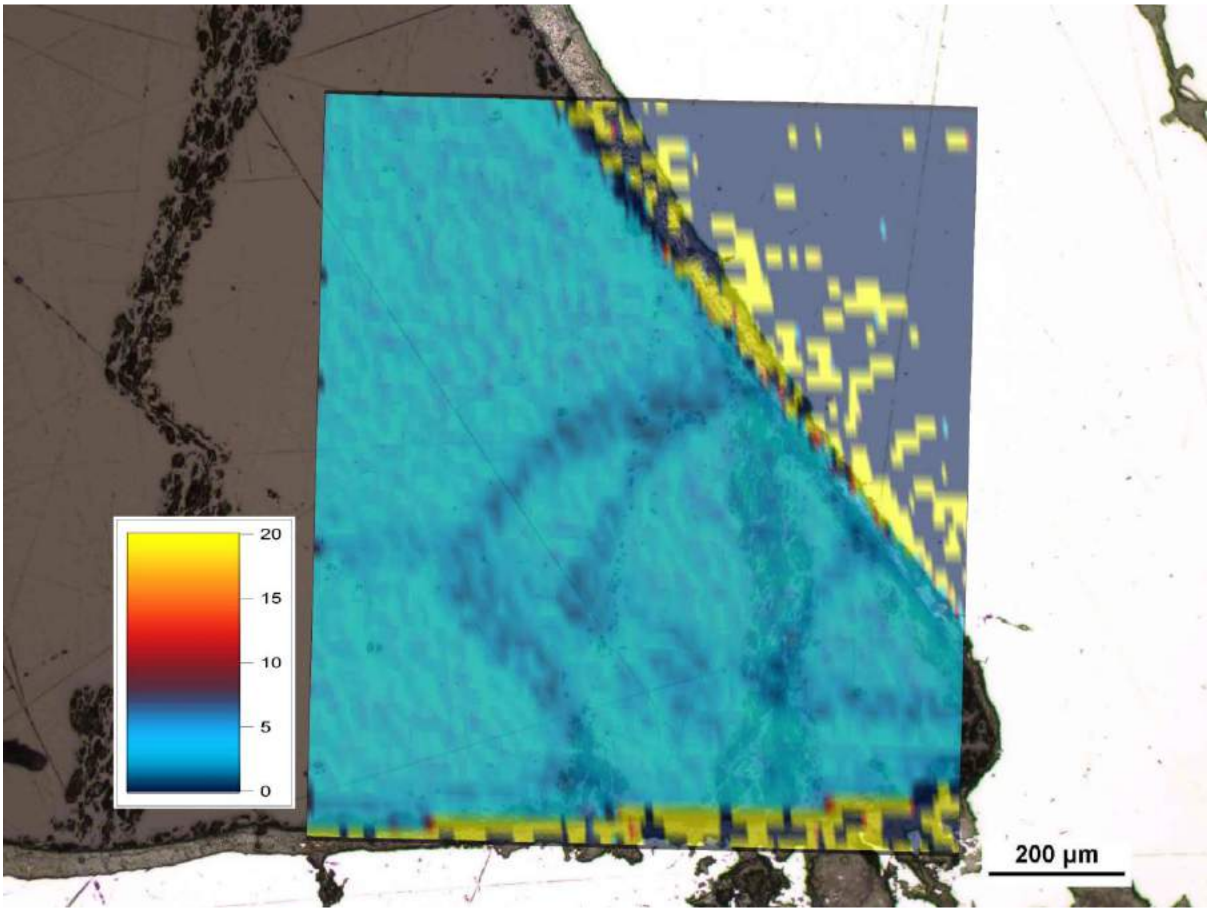


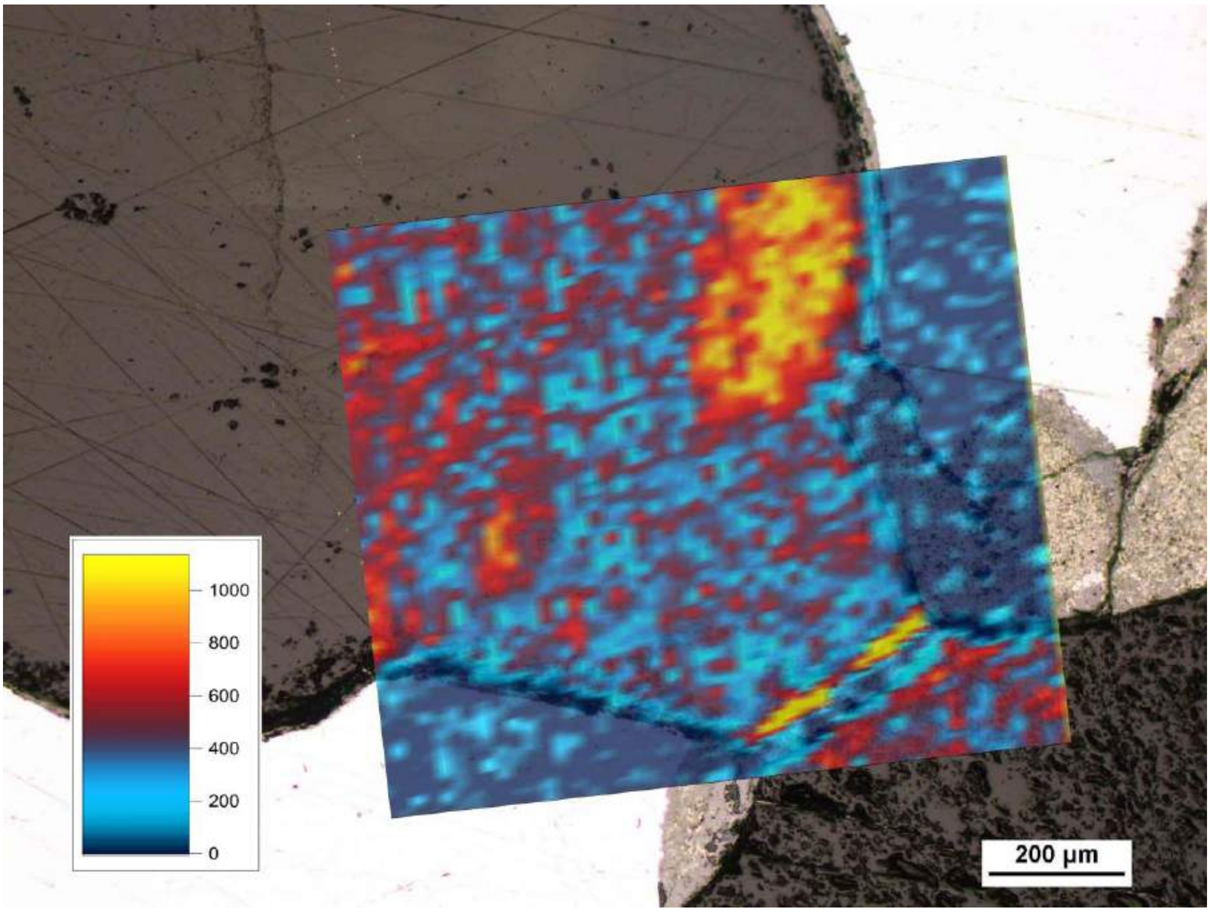
20
15
10
5
0
x10^3
200 µm

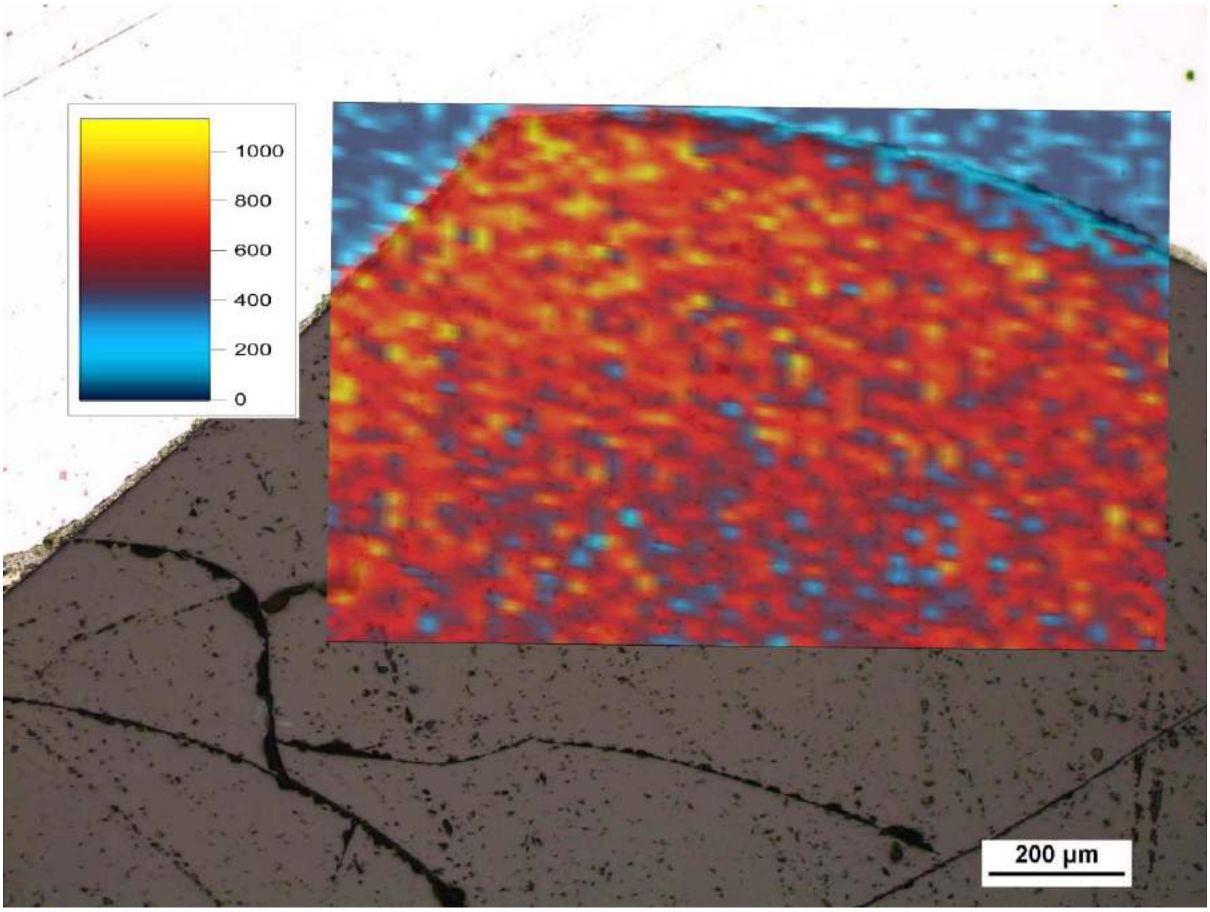


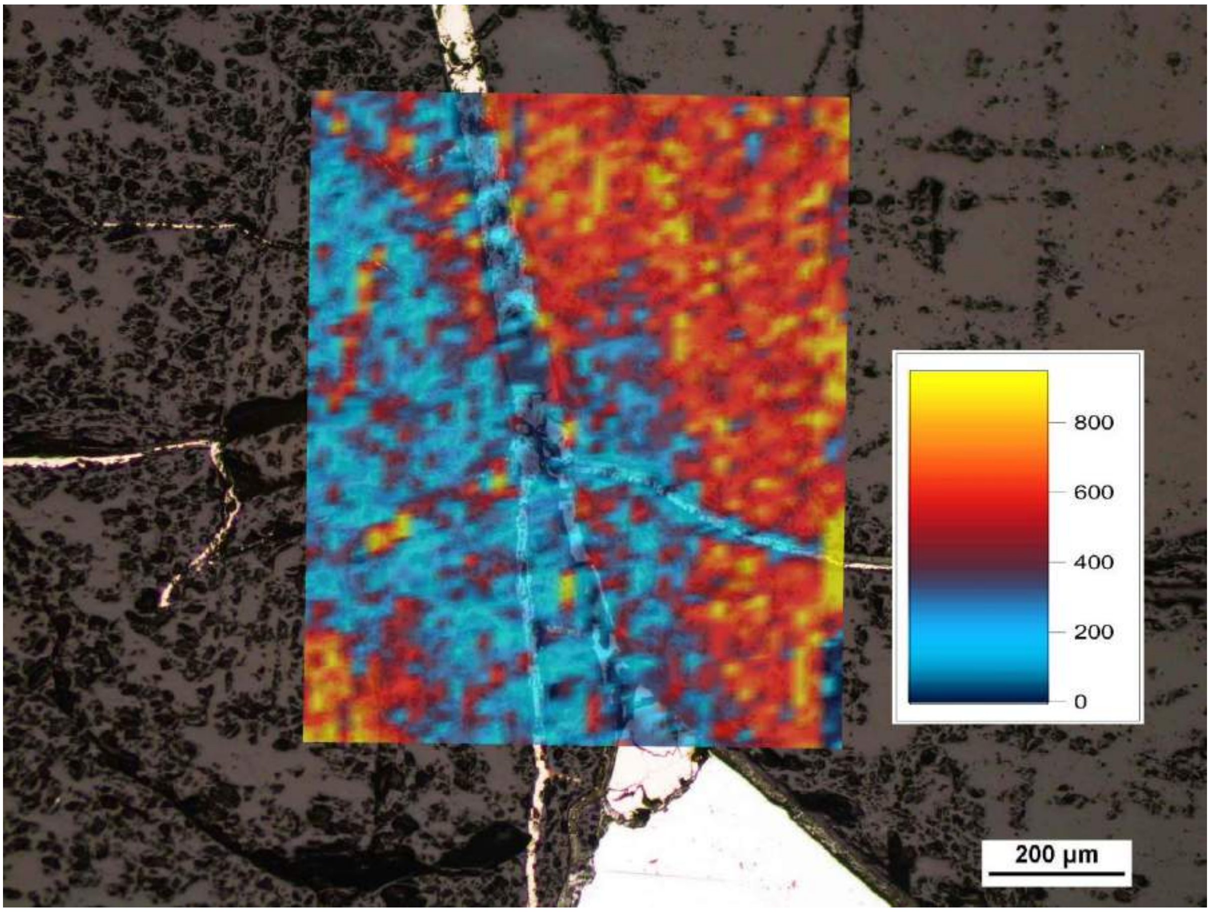
Sc diffusion patterns


20
15
10
5
0
200 µm

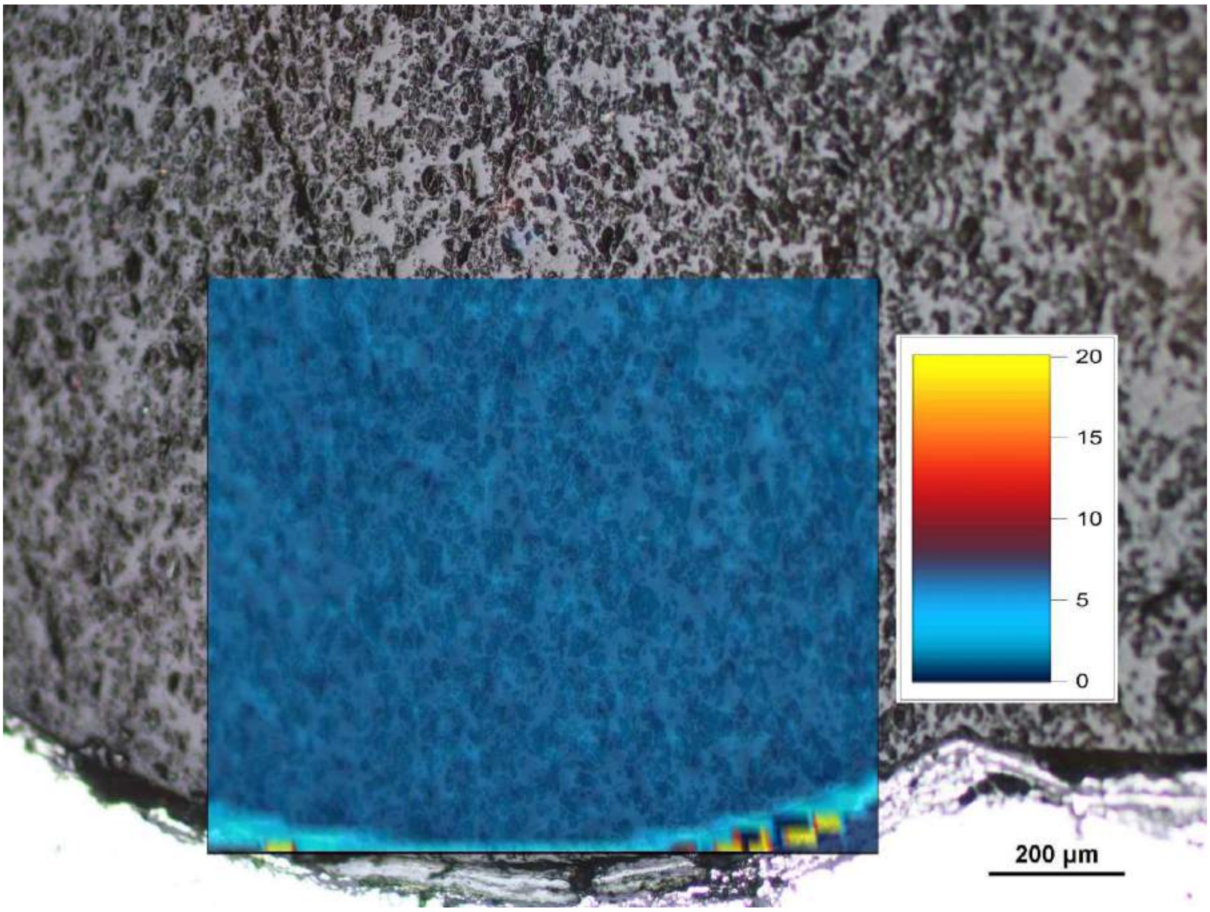

20
15
10
5
0
200 µm

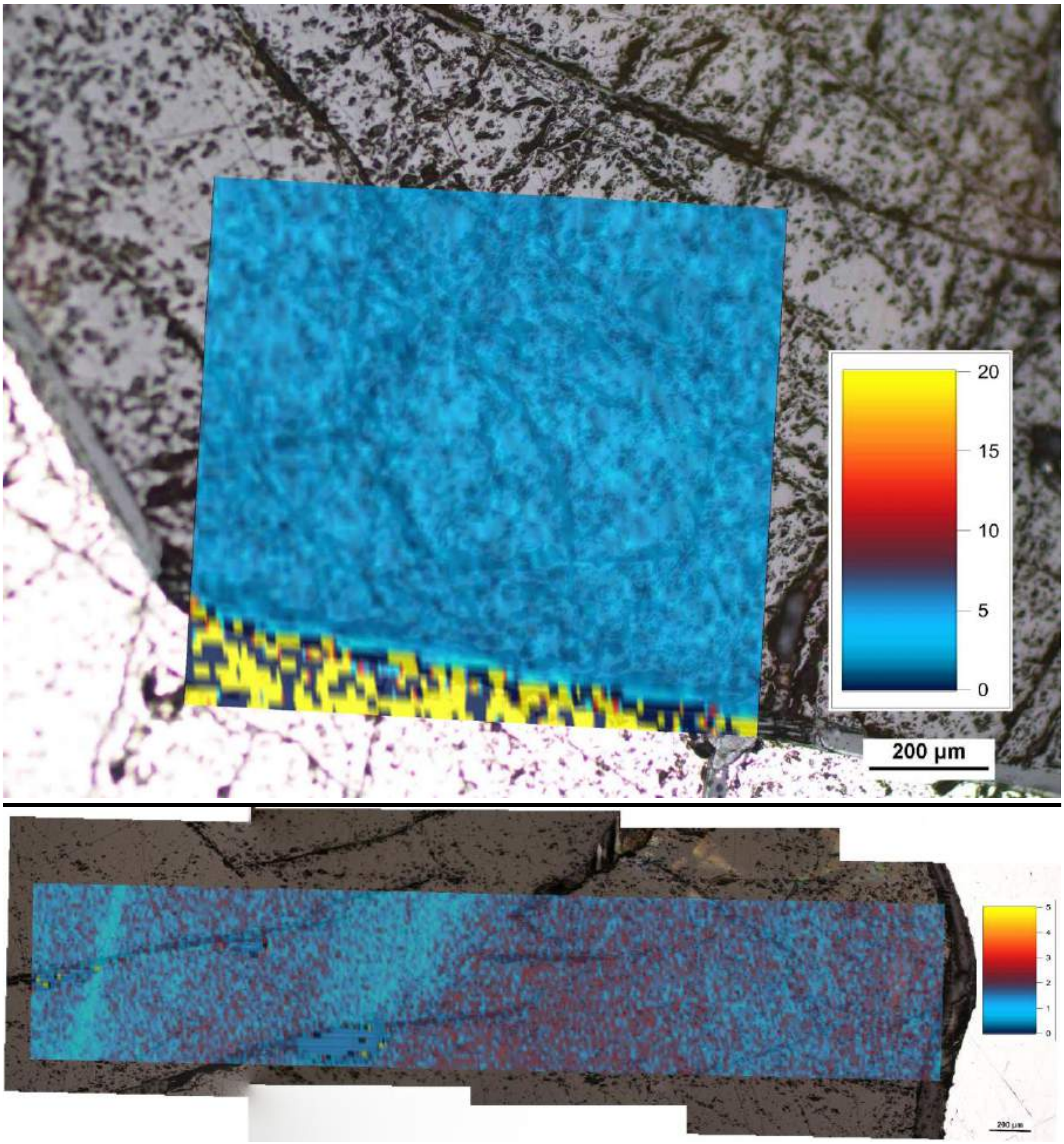

1000
800
600
400
200
0
200 µm


1000
800
600
400
200
0
200 µm

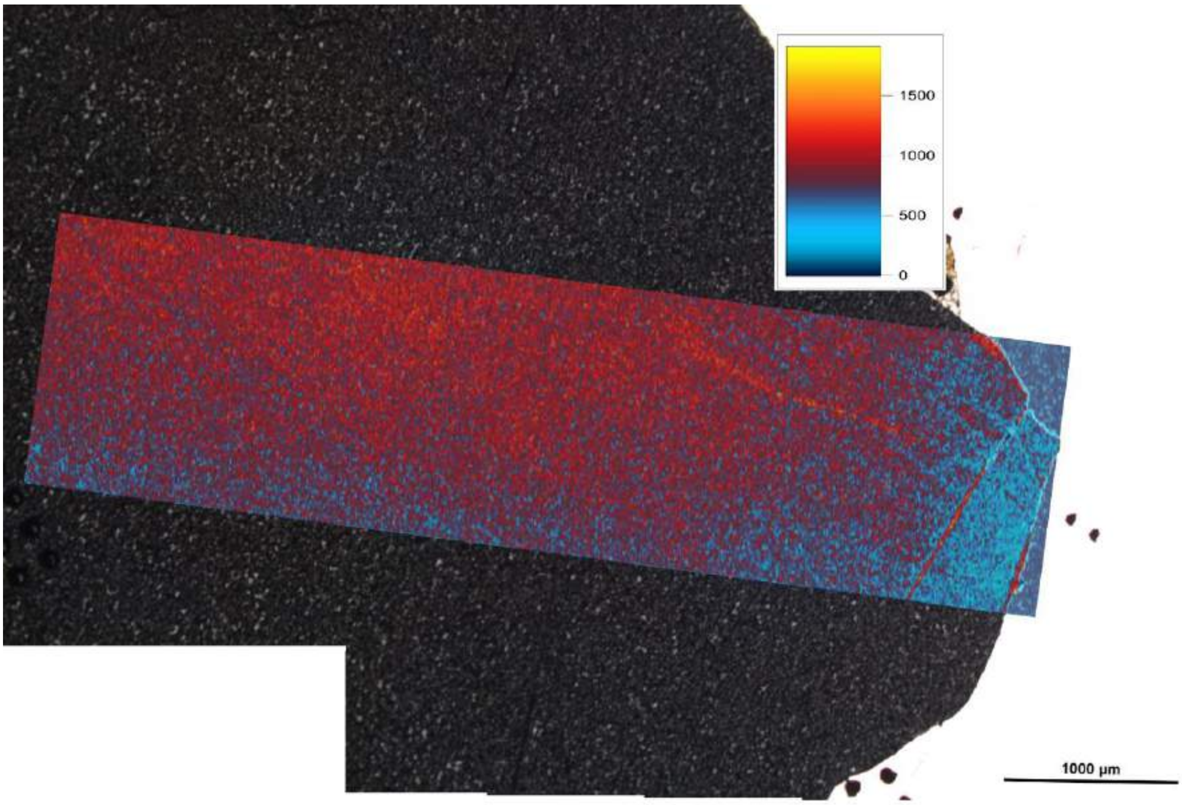


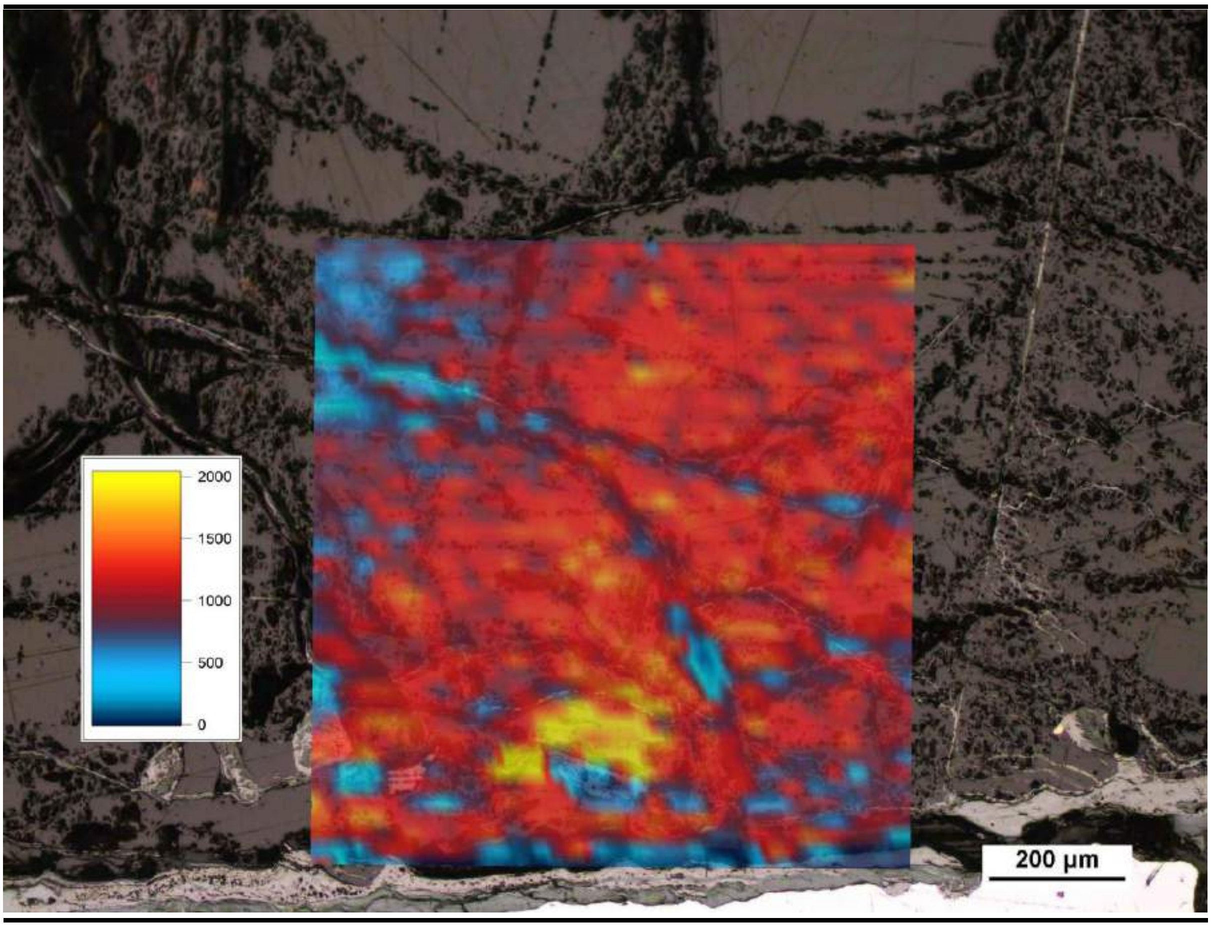
800
600
400
200
0
200 µm

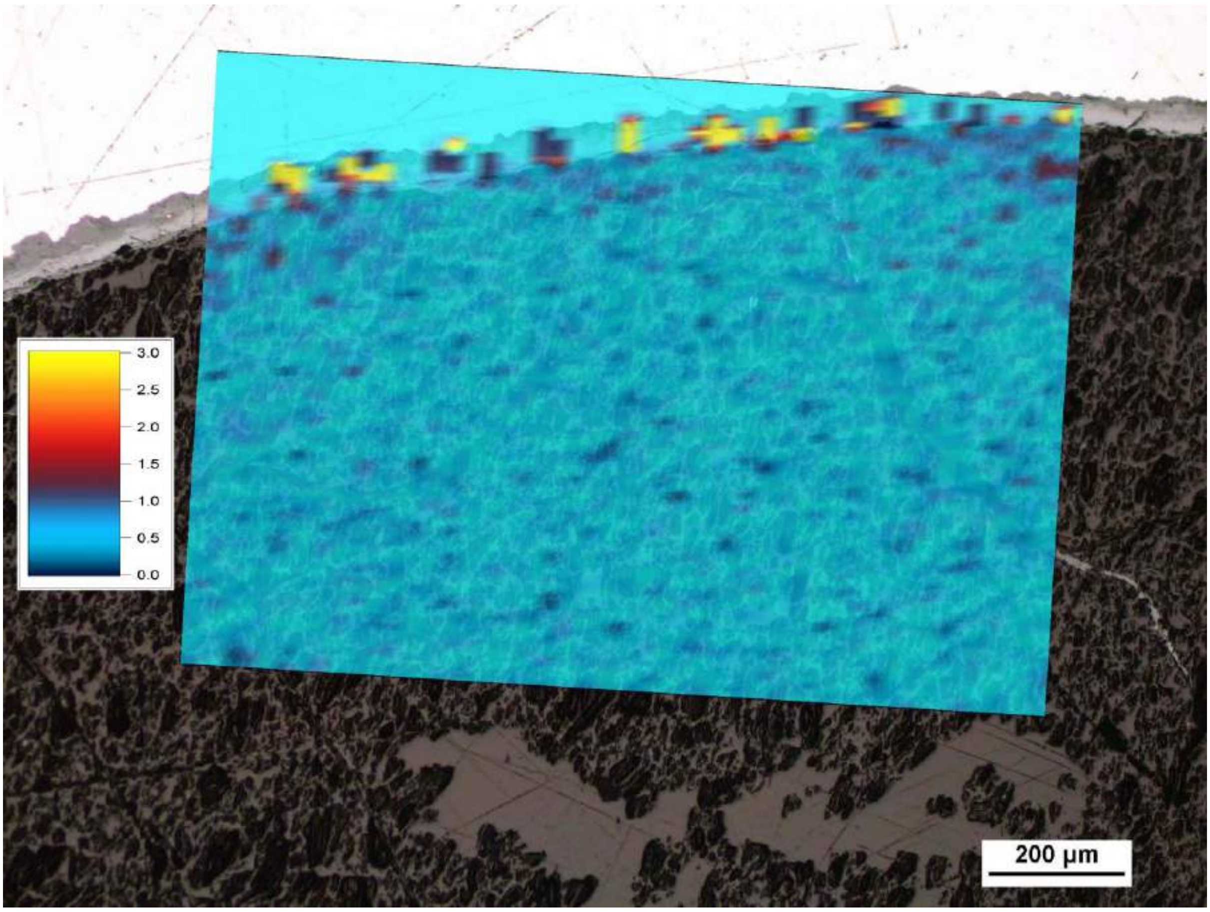

20
15
10
5
0
200 µm

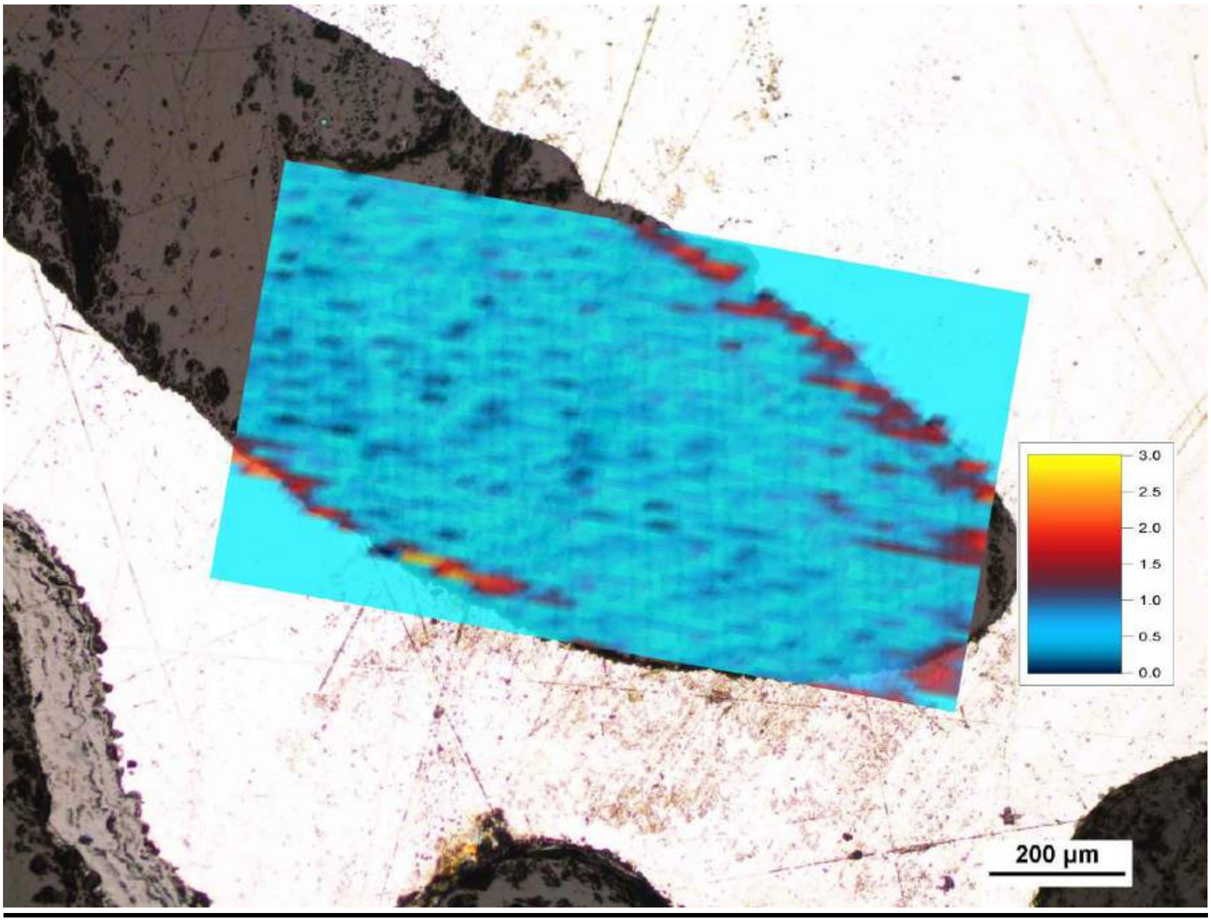


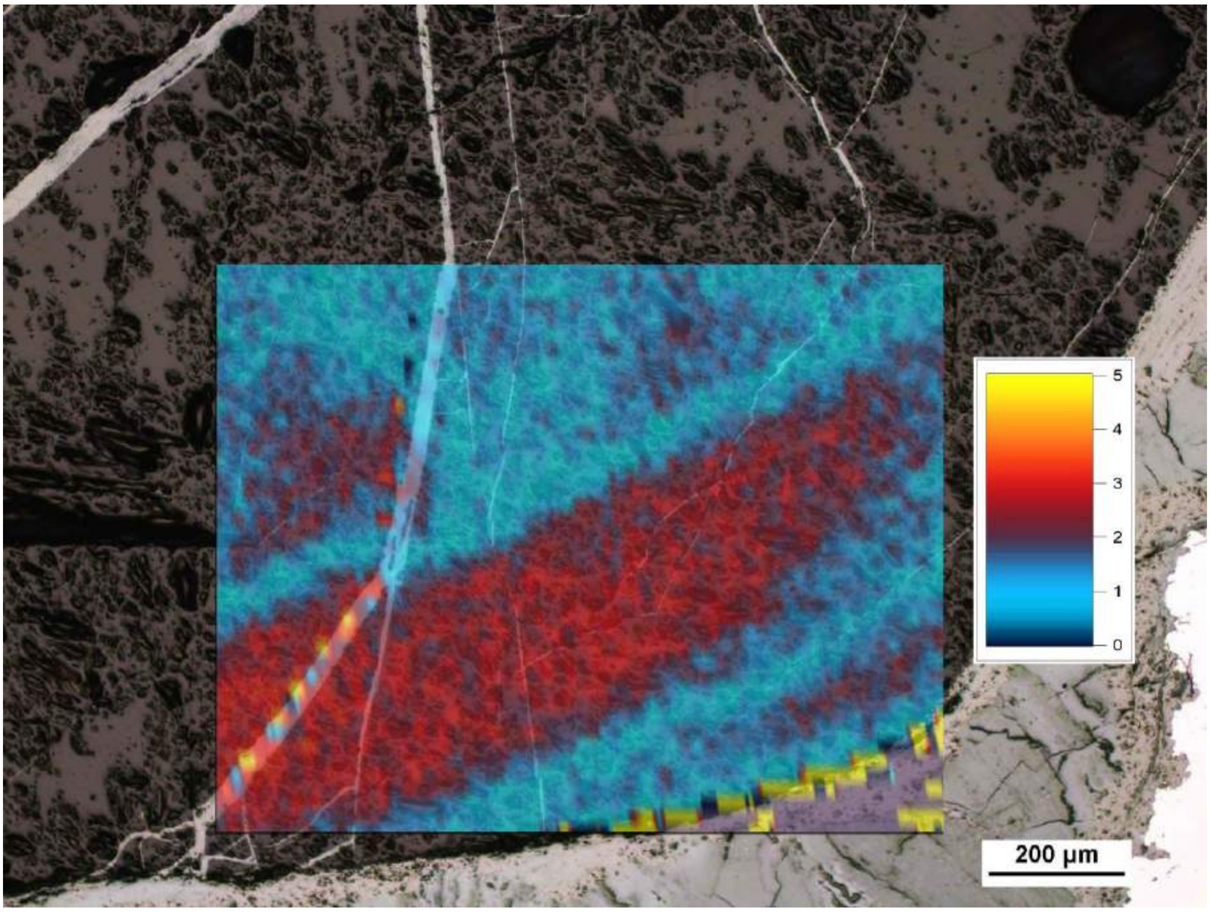
20
15
10
5
0
200 µm


1500
1000
500
0
1000 µm

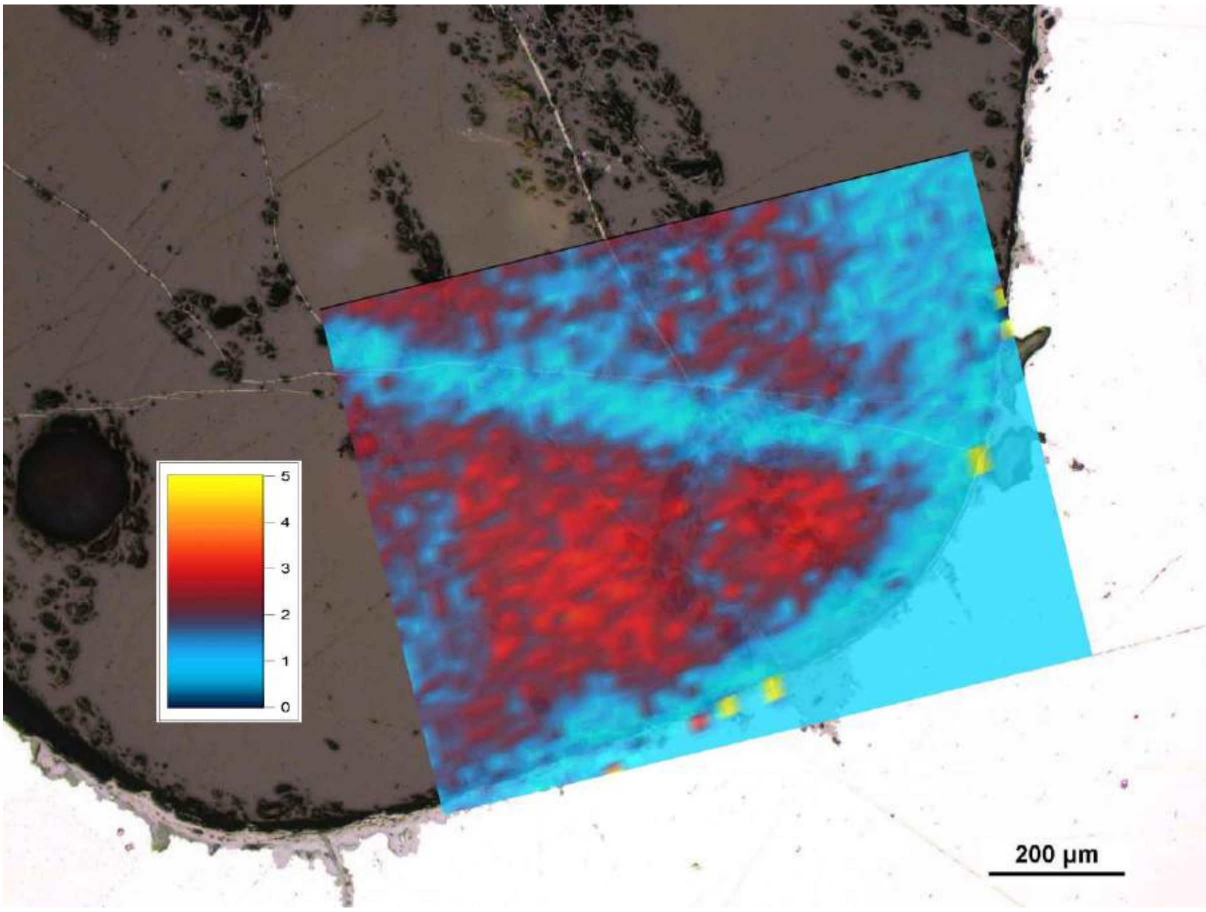

2000
1500
1000
500
0
200 µm

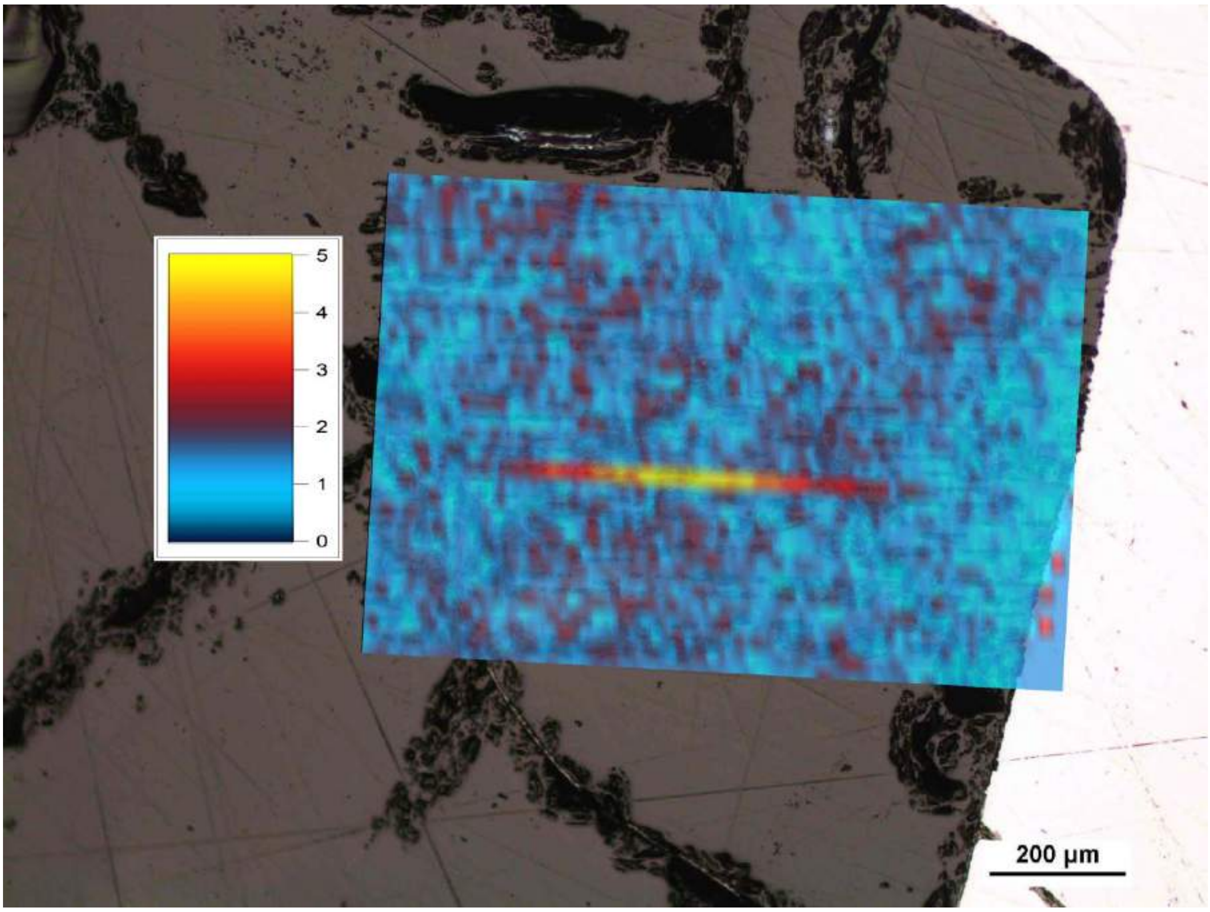

3.0
2.5
2.0
1.5
1.0
0.5
0.0
200 µm

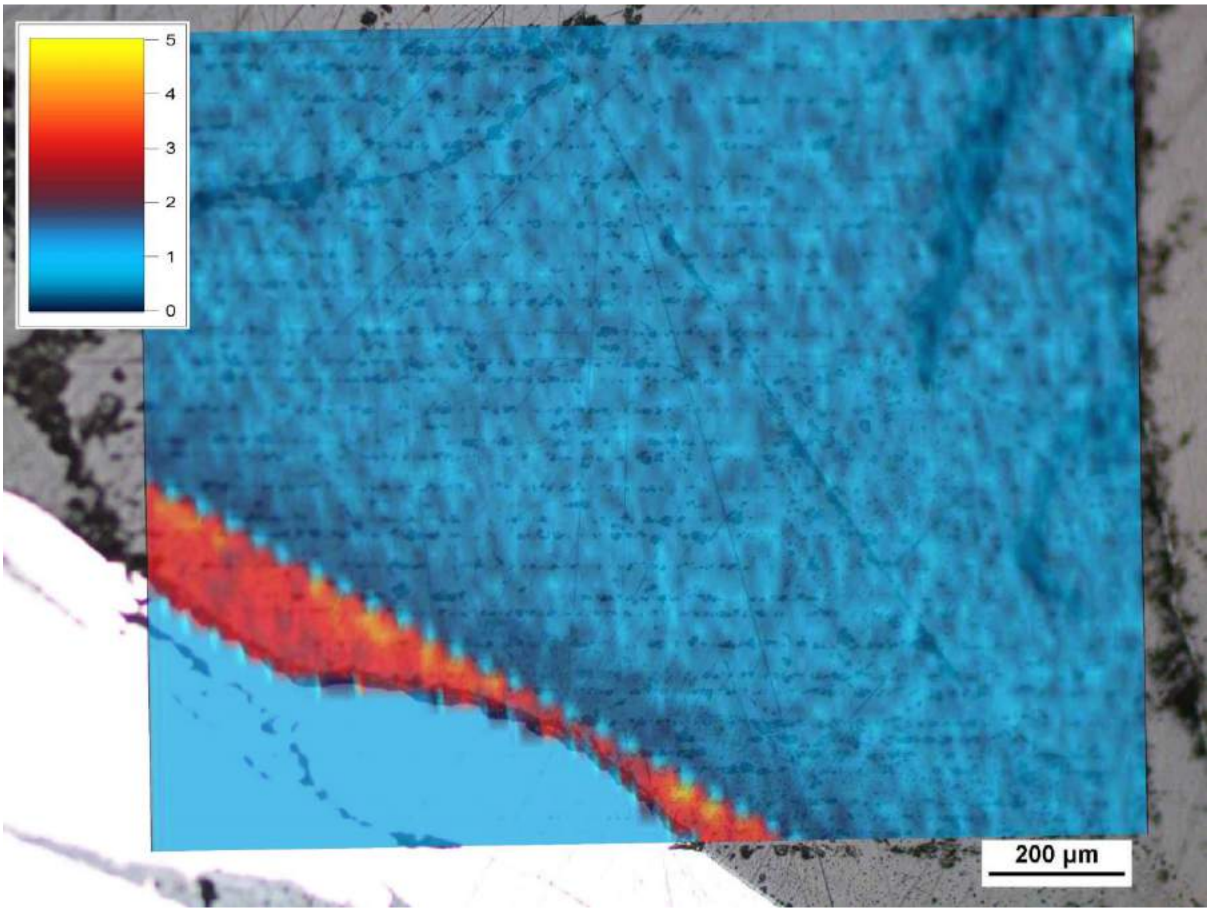

3.0
2.5
2.0
1.5
1.0
0.5
0.0
200 µm



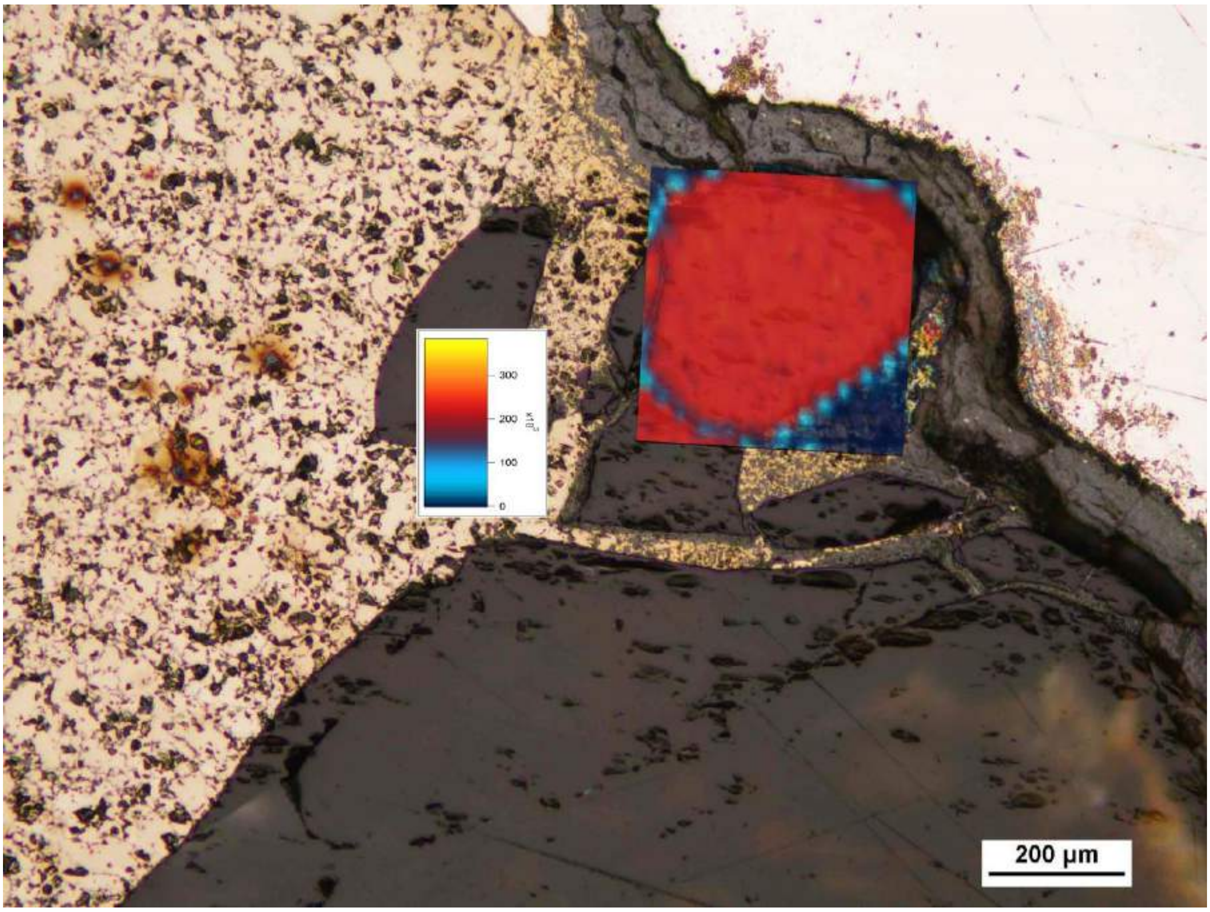
5
4
3
2
1
0
200 µm


5
4
3
2
1
0
200 µm

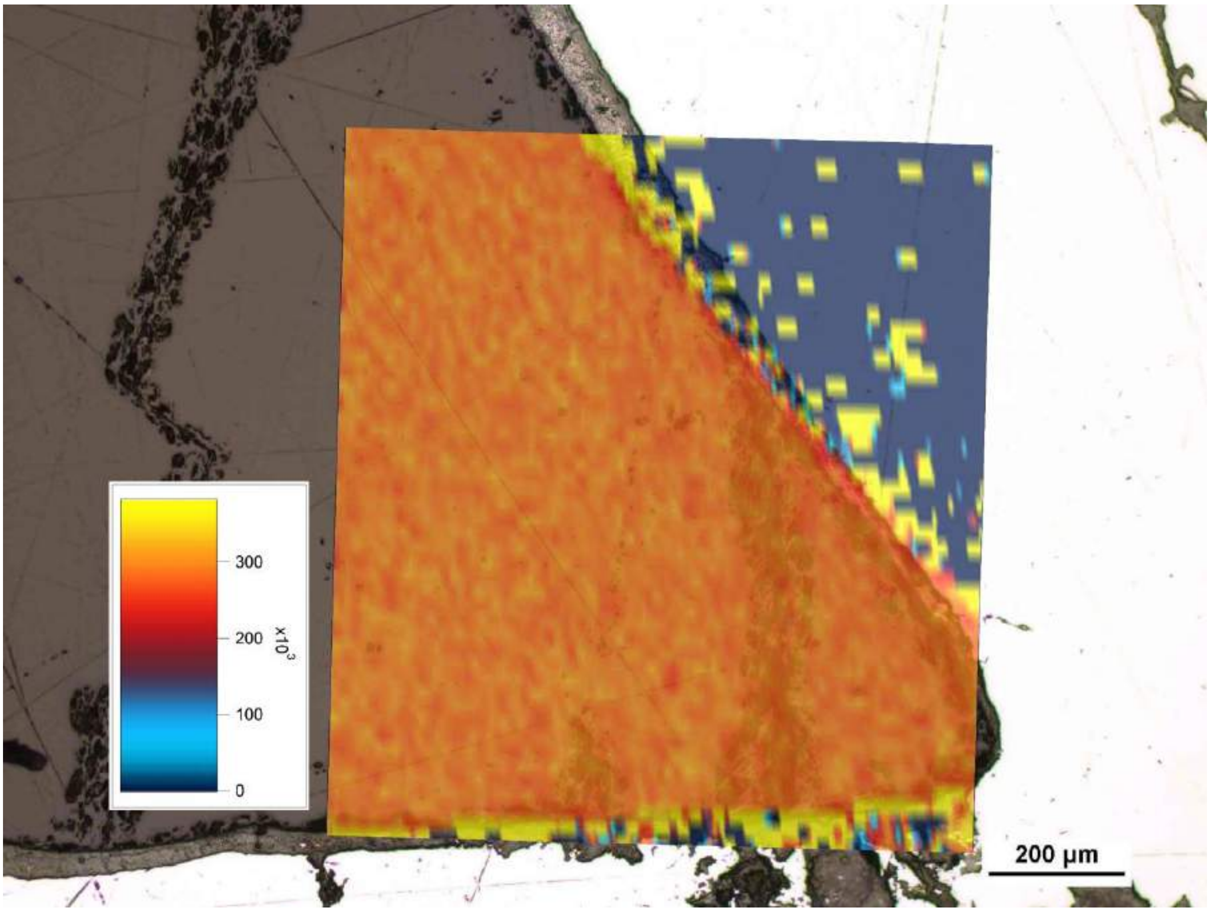

5
4
3
2
1
0
200 µm



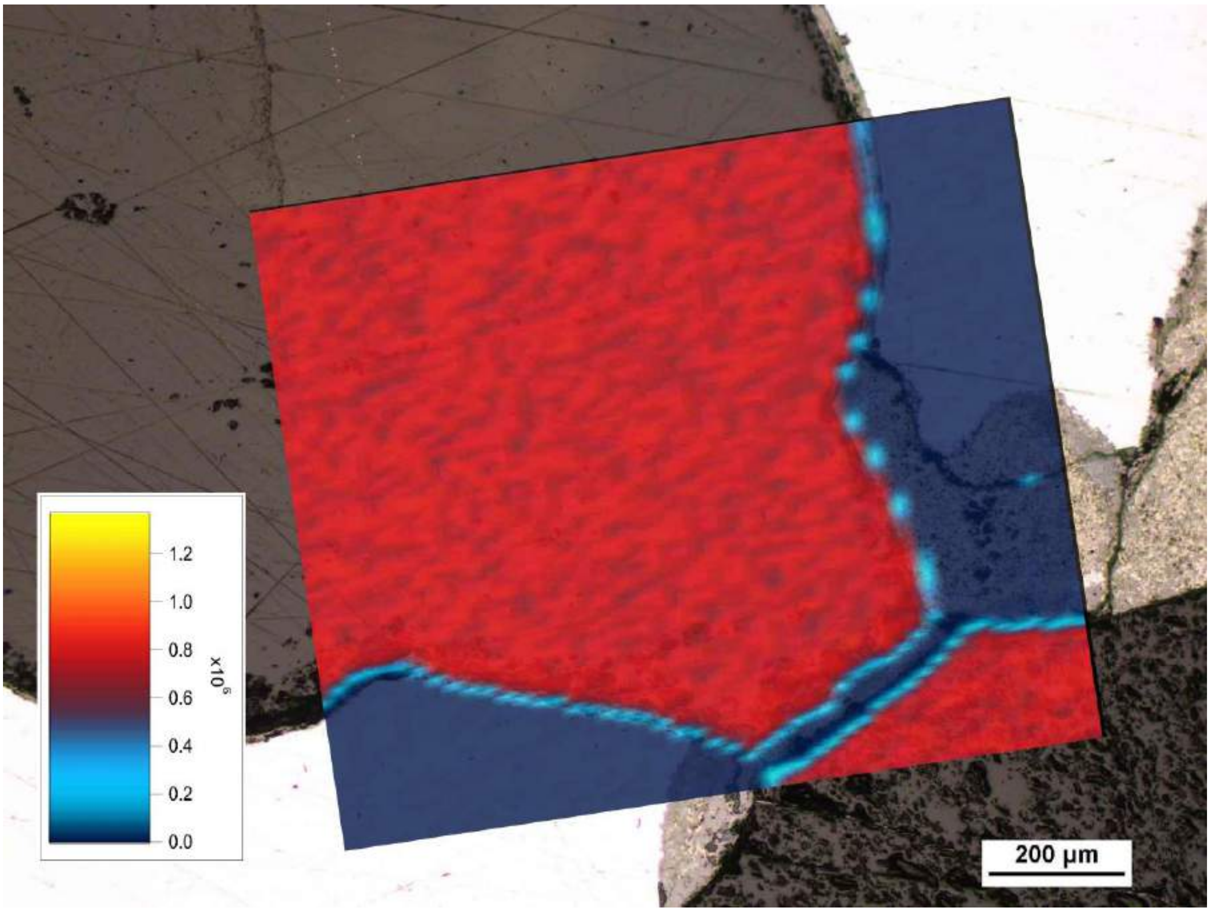
Si diffusion patterns (only in CPS)

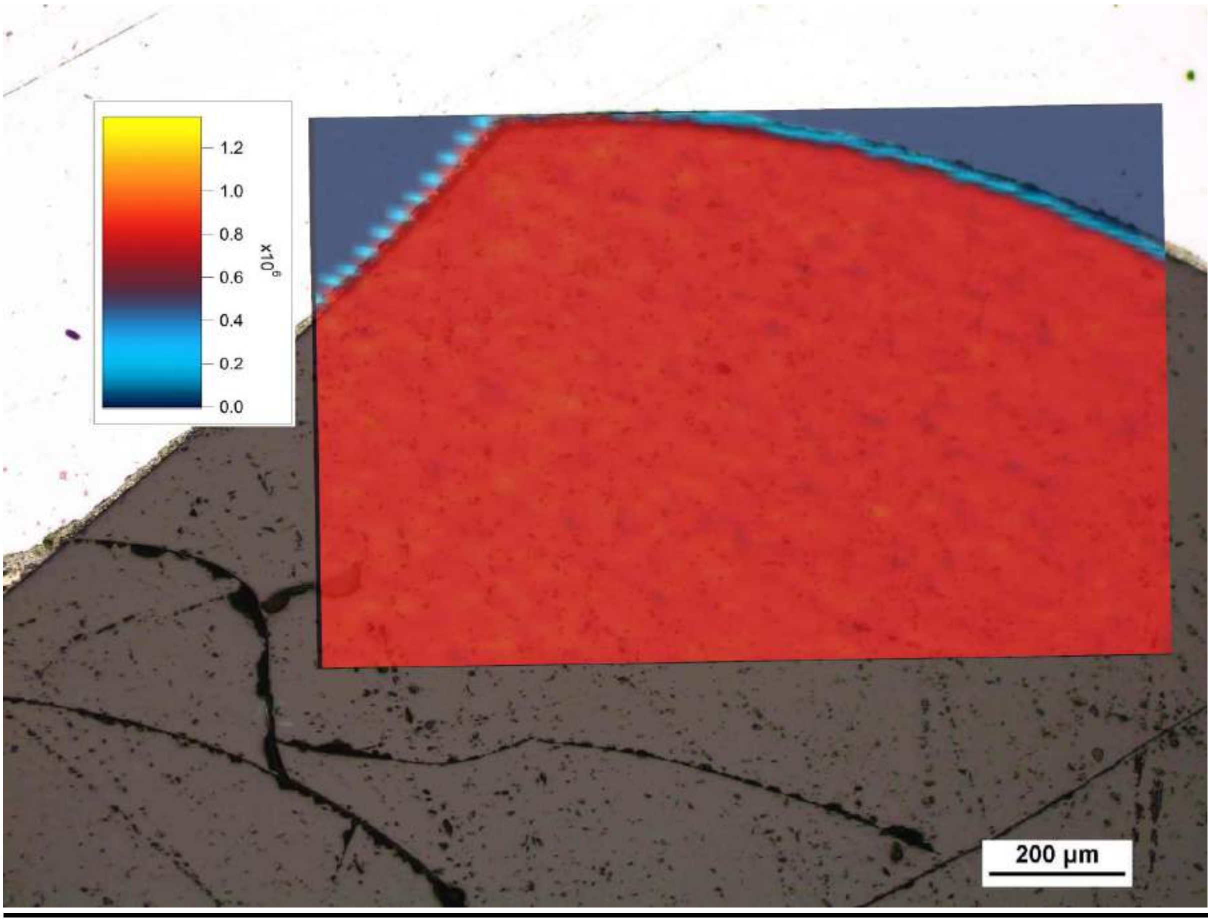


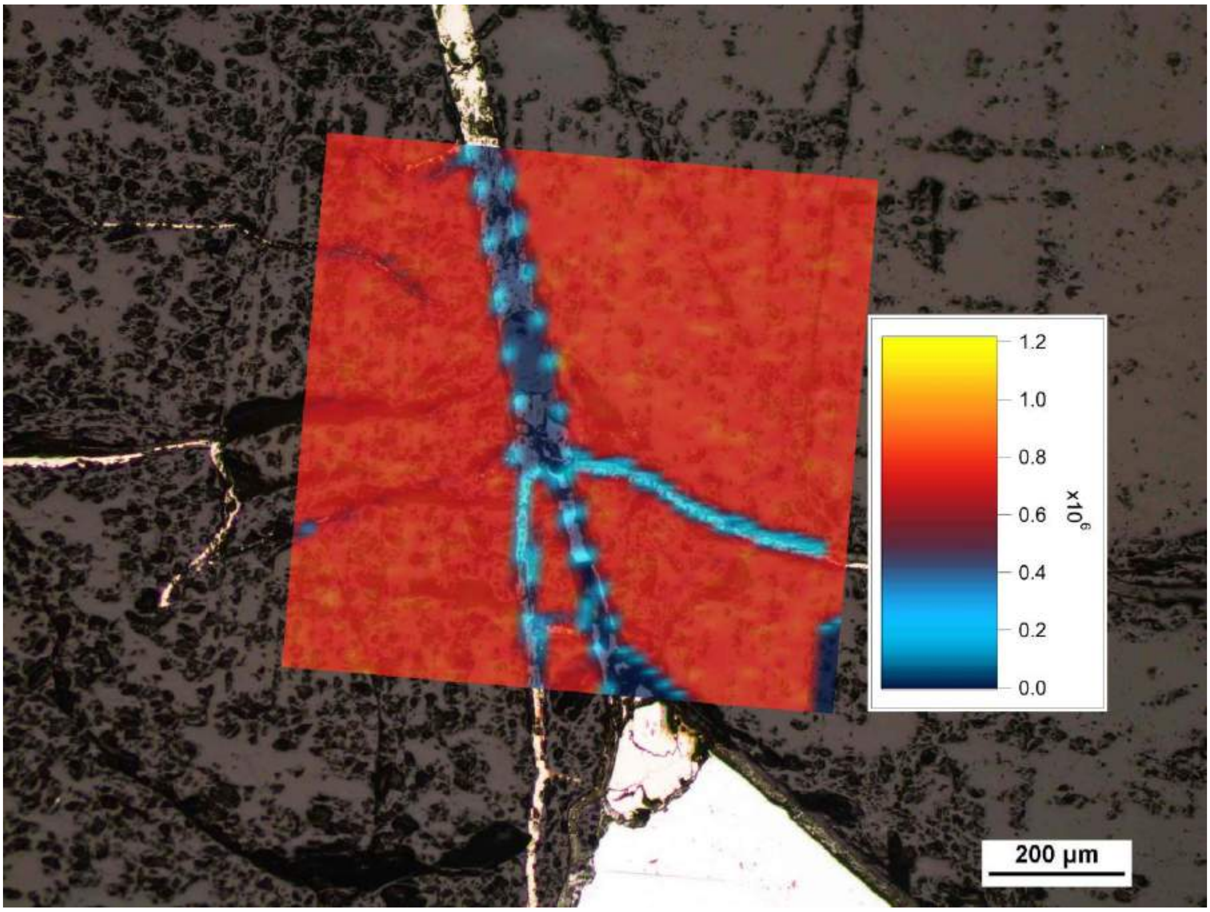
300
200
100
0
x10^3
200 µm

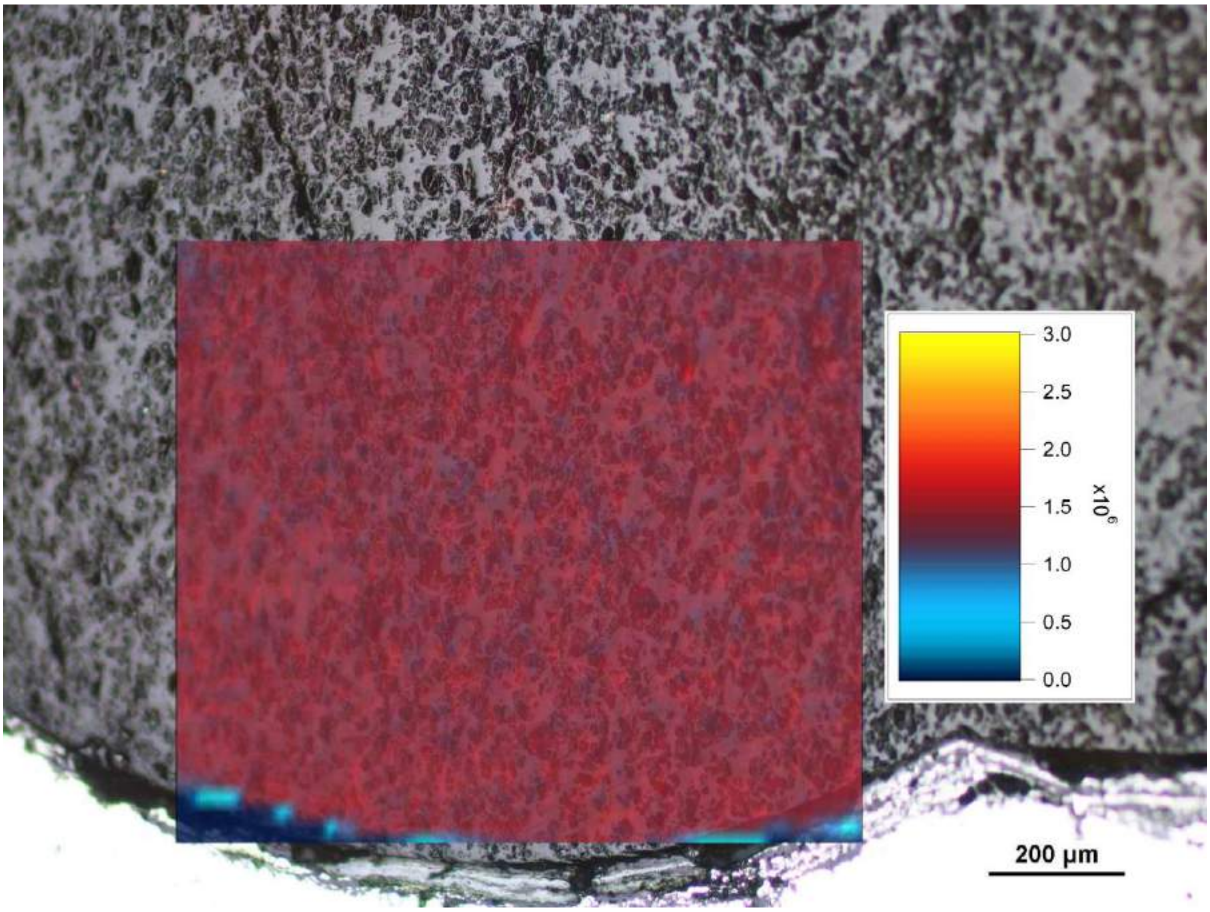


300
200
100
0
x10³
200 µm

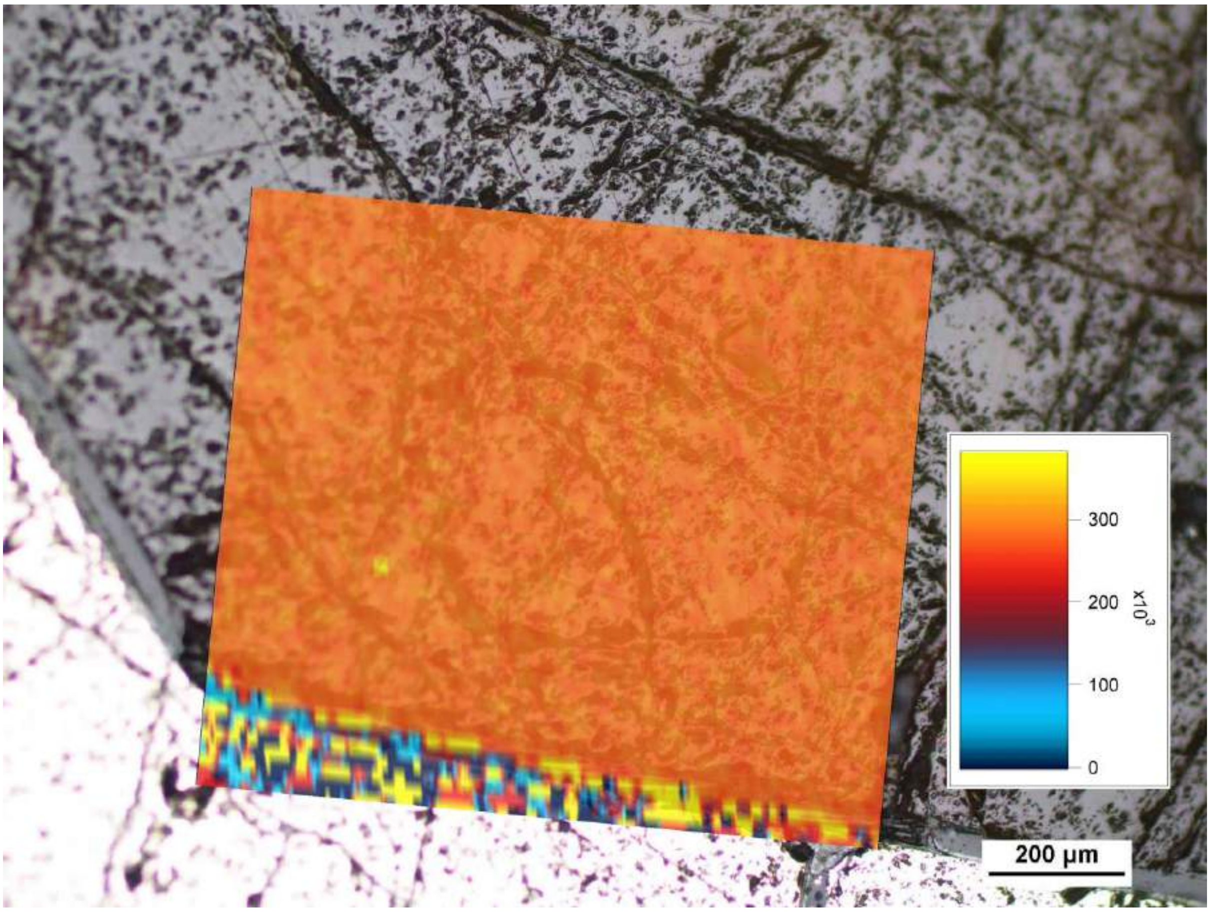

1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm

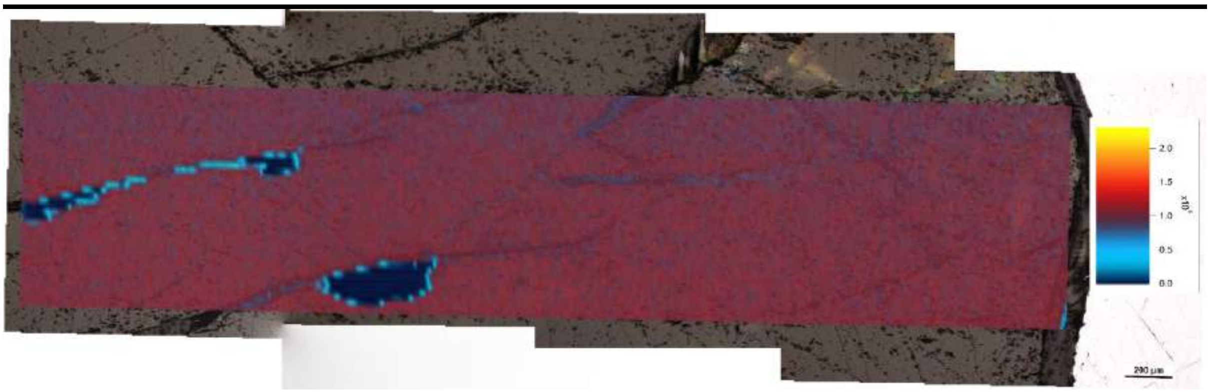

1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm

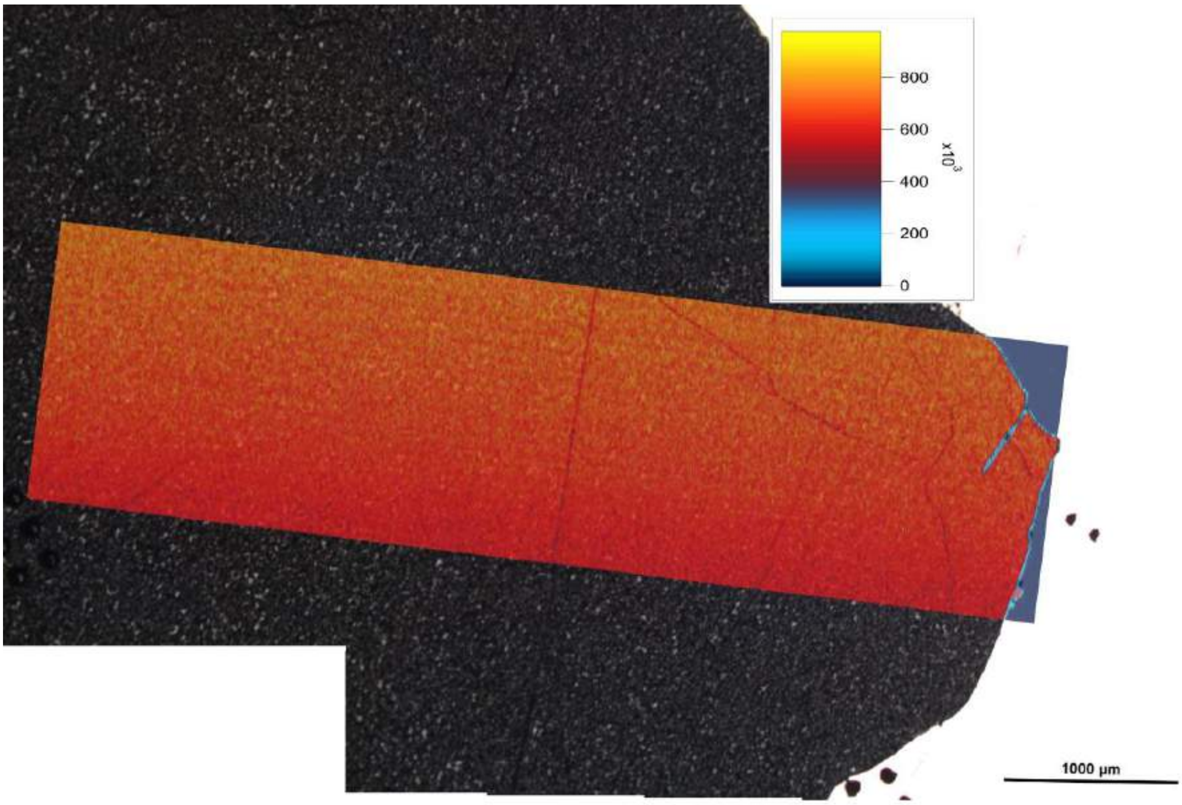

1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm

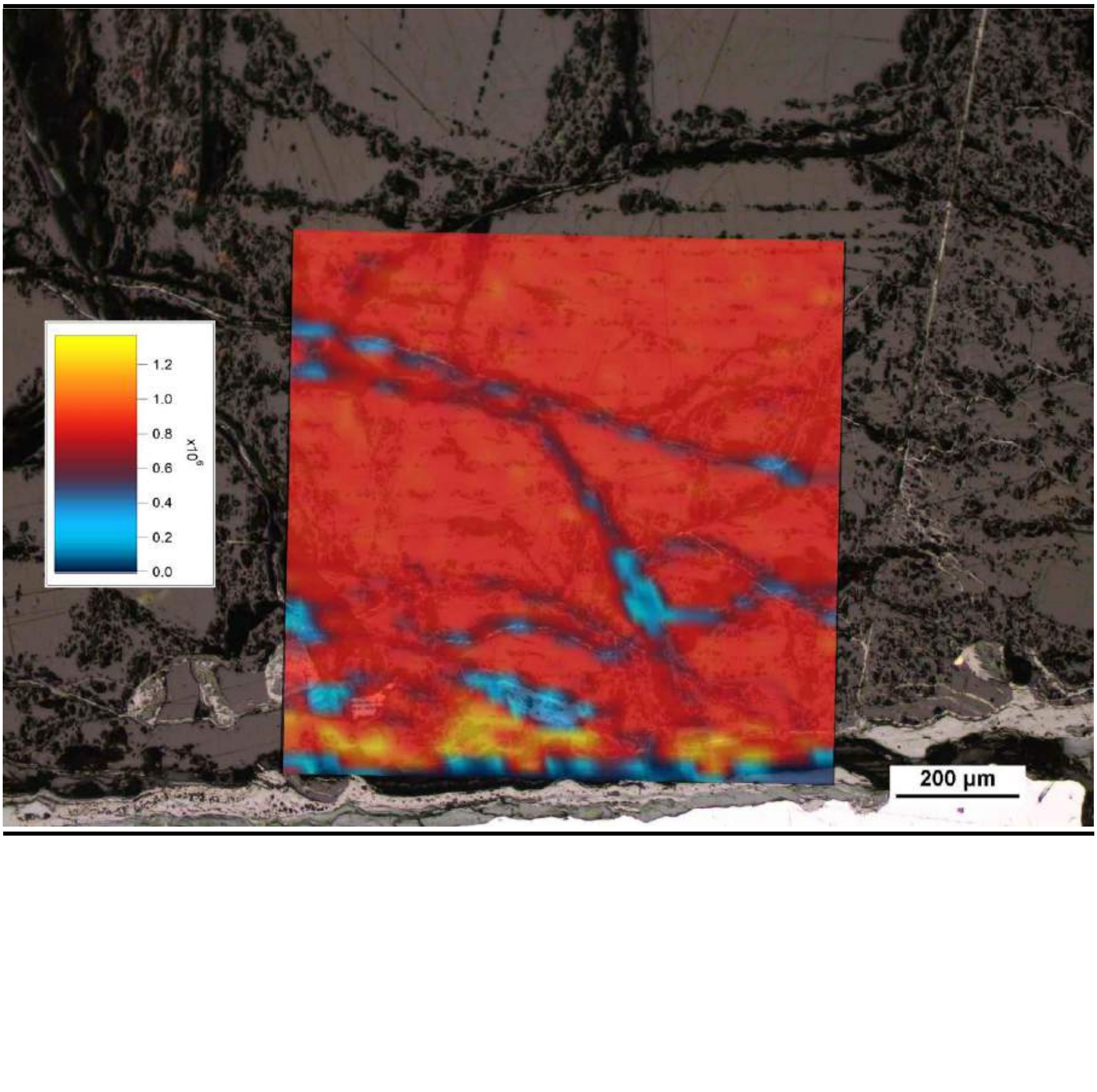


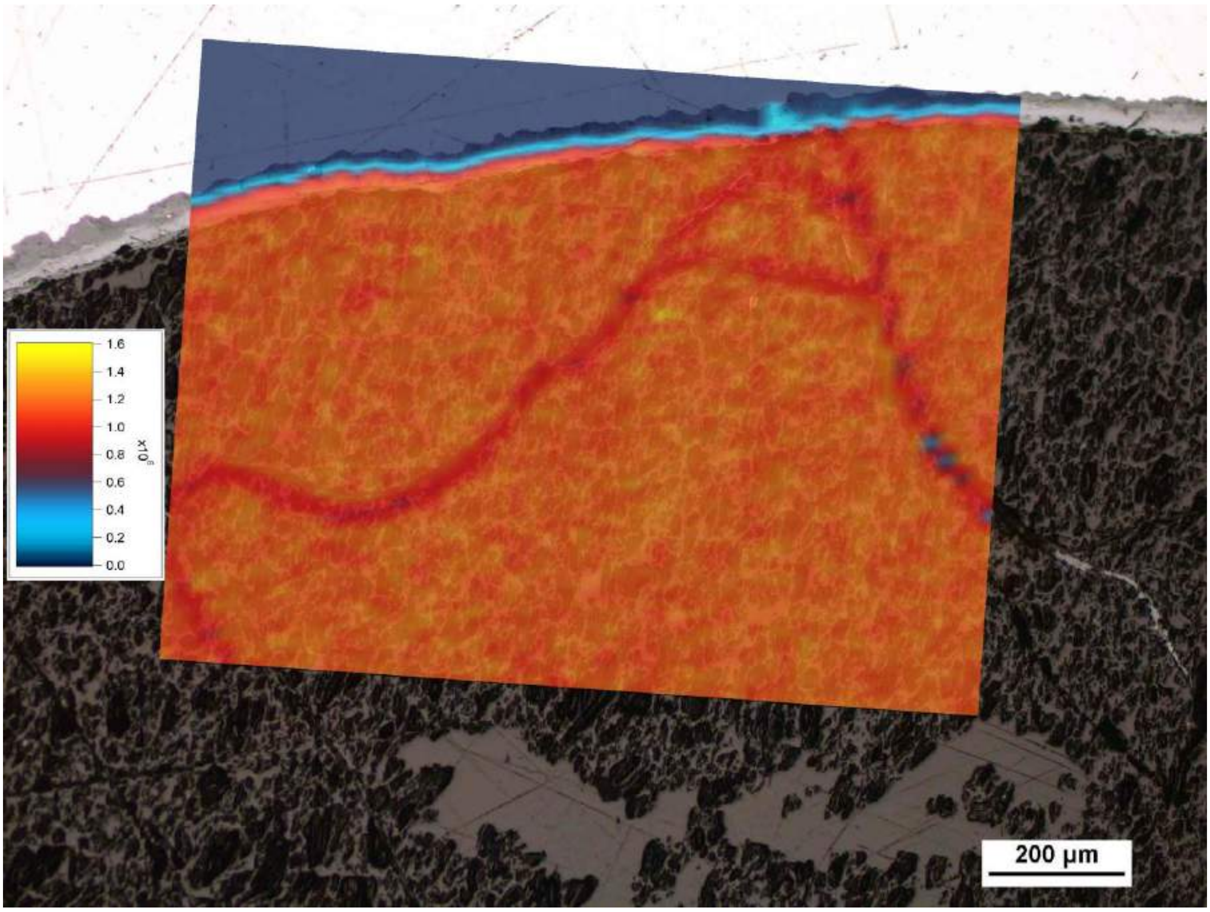
3.0
2.5
2.0
1.5
1.0
0.5
0.0
x10^6
200 µm


300
200
100
0
x10^3
200 µm

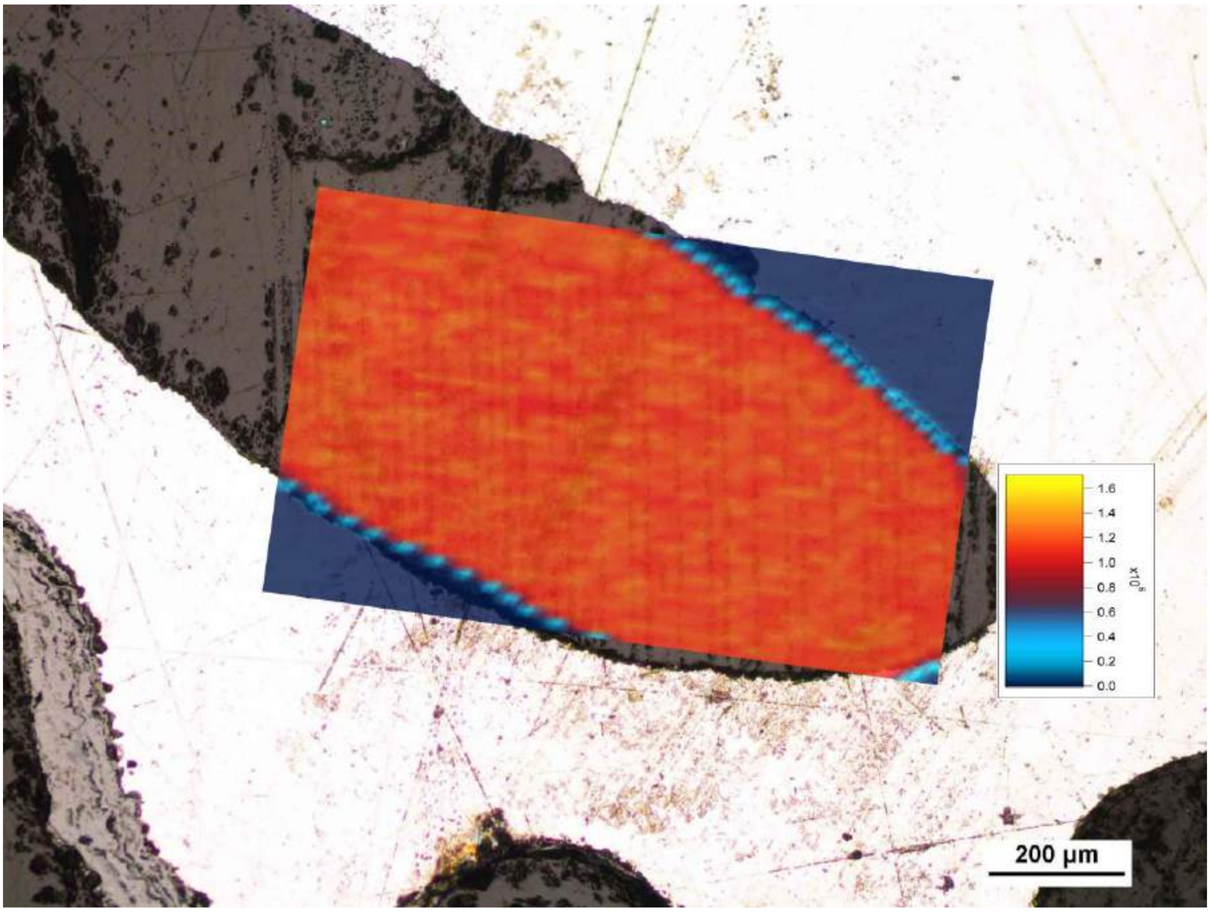

2.0
1.5
1.0
0.5
0.0

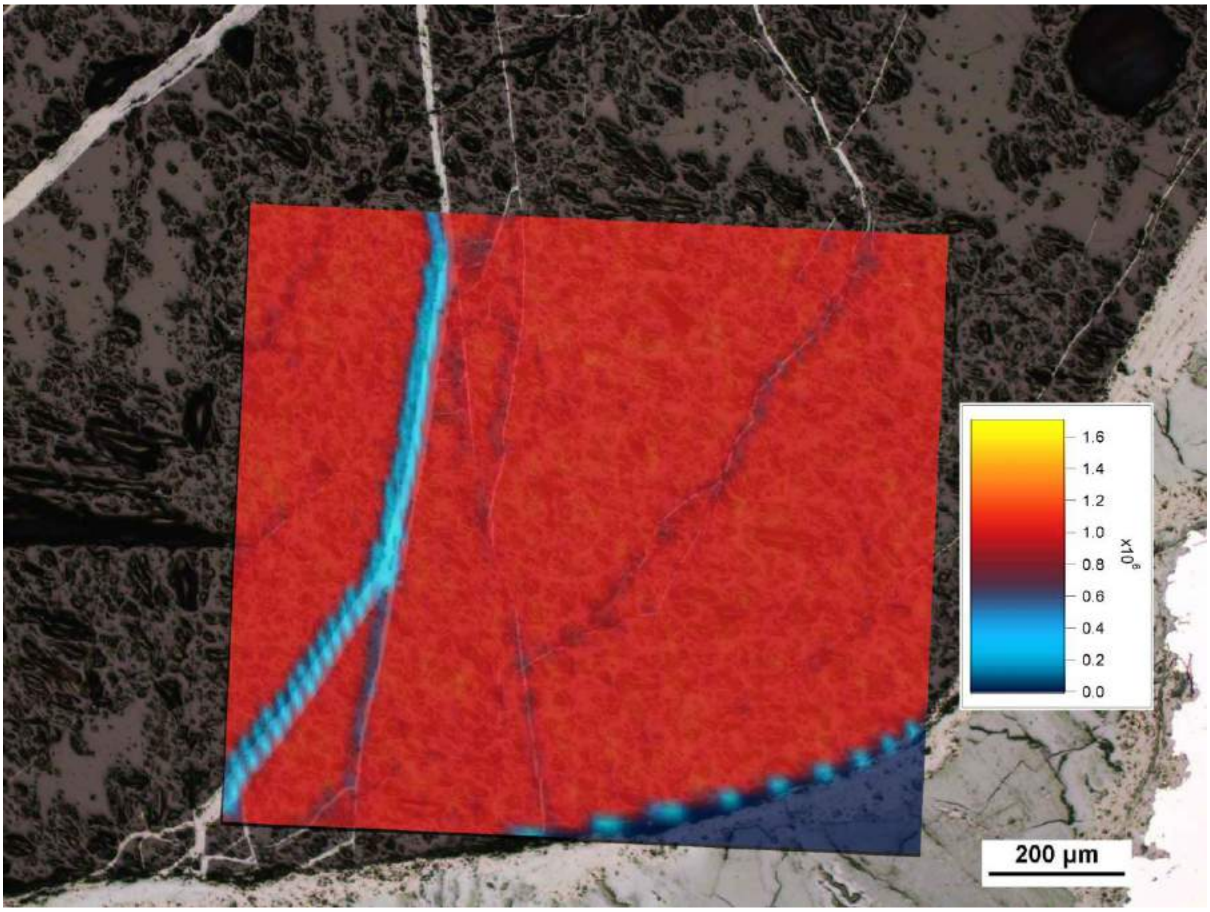

800
600
400
200
0
x10^3
1000 µm

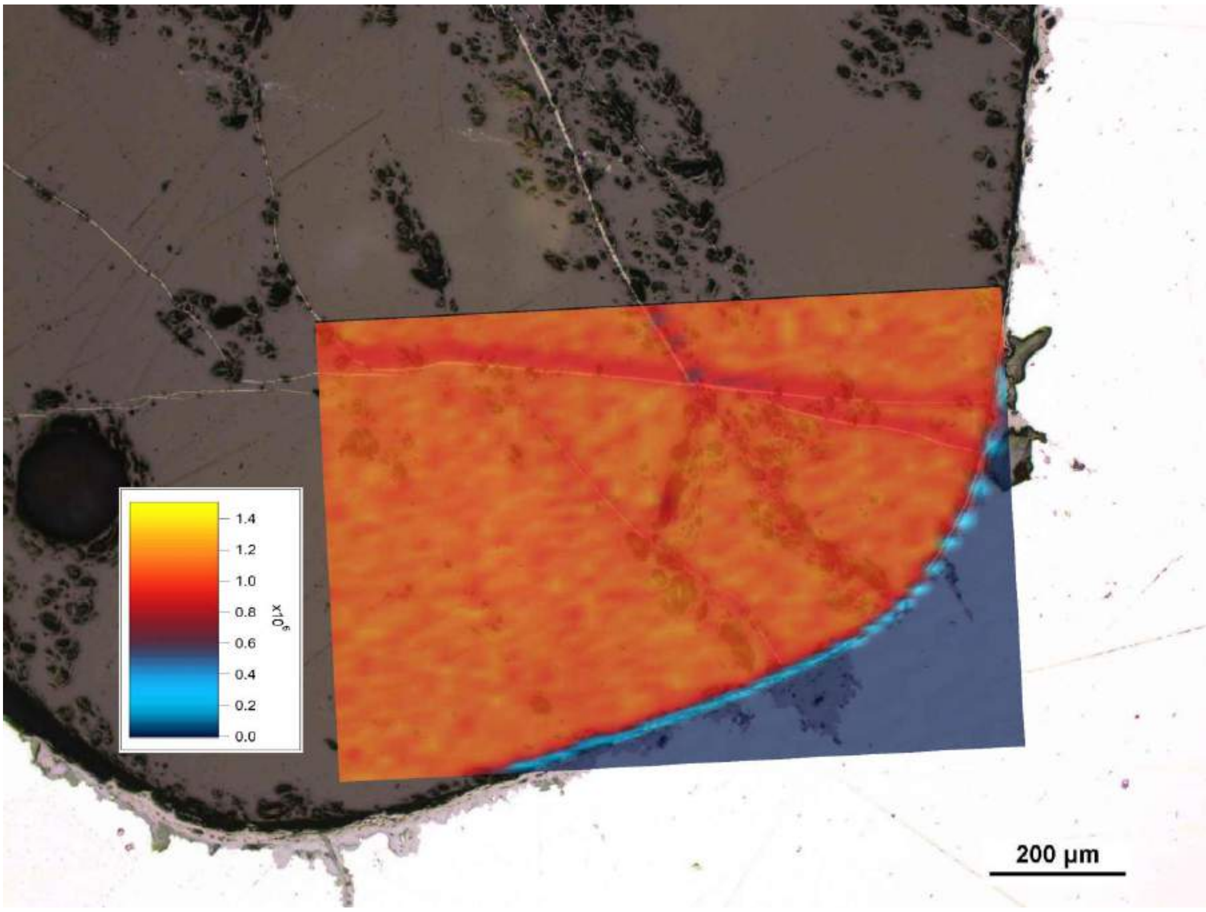

1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm

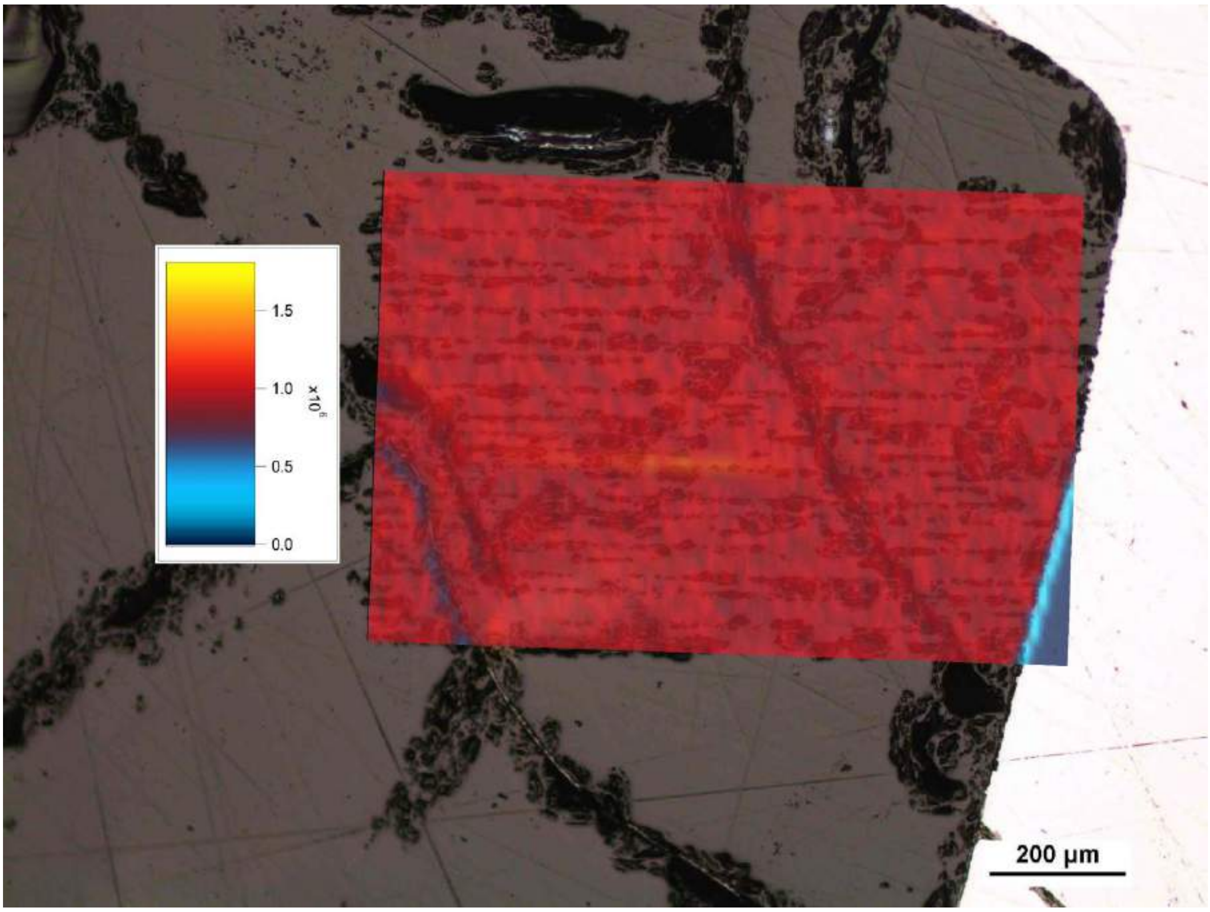


1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10
200 µm

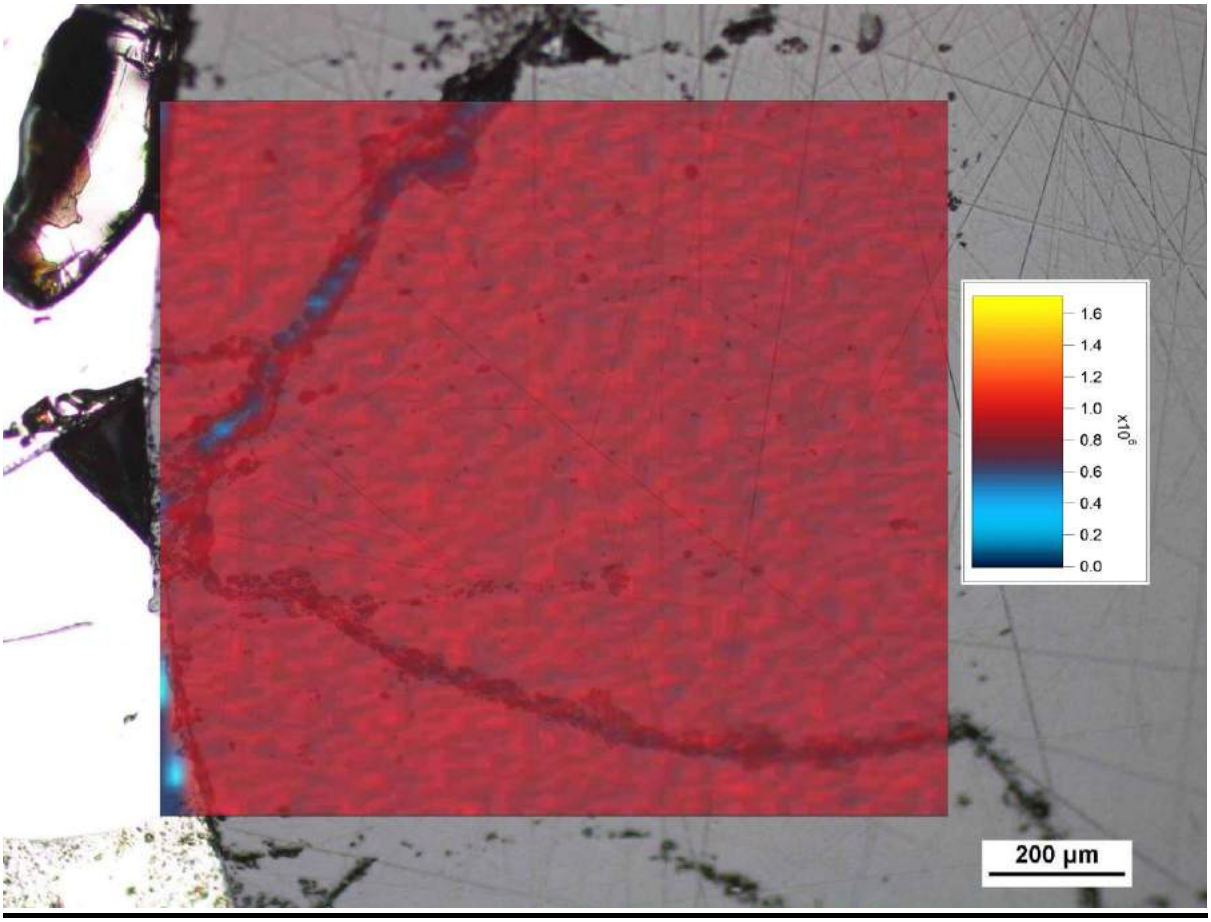

1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm


1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm

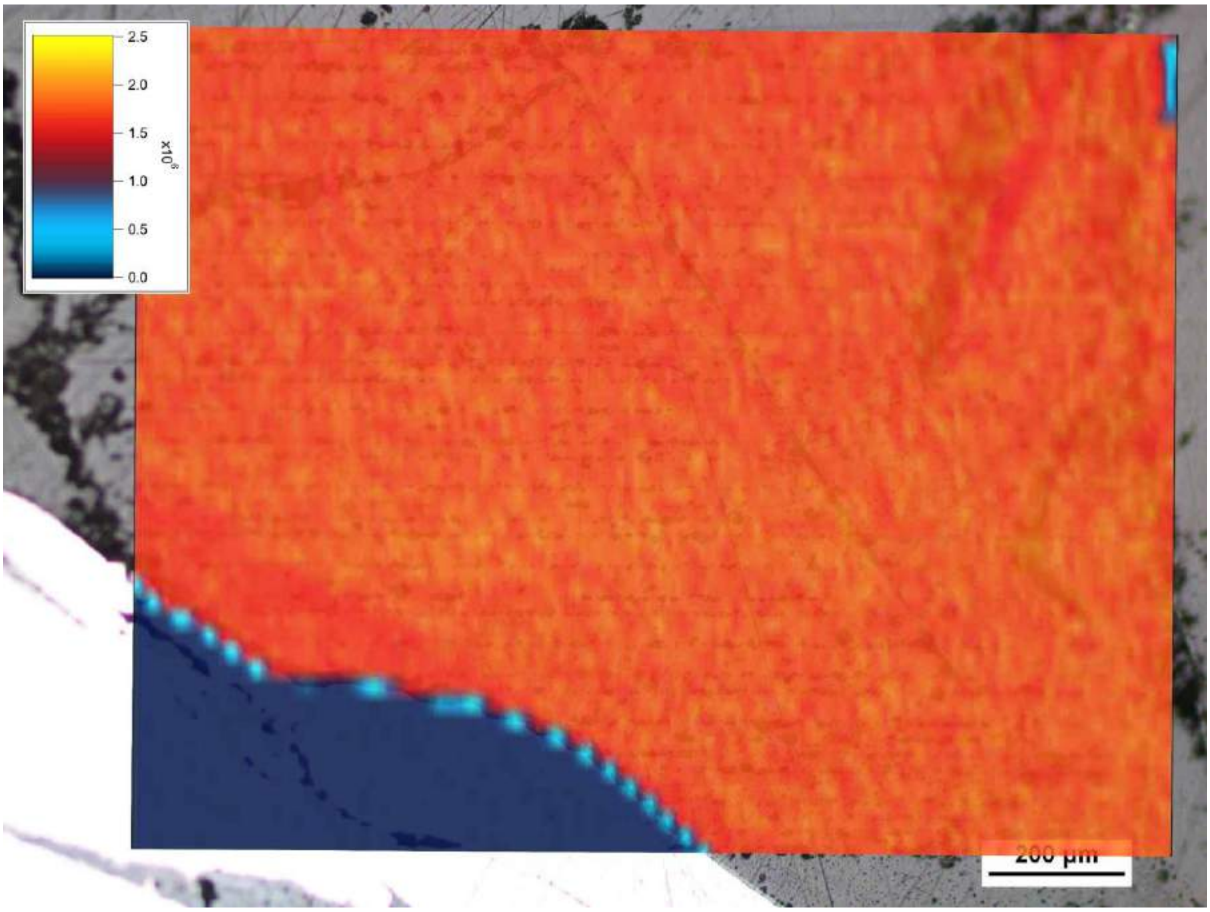

1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10^6
200 µm



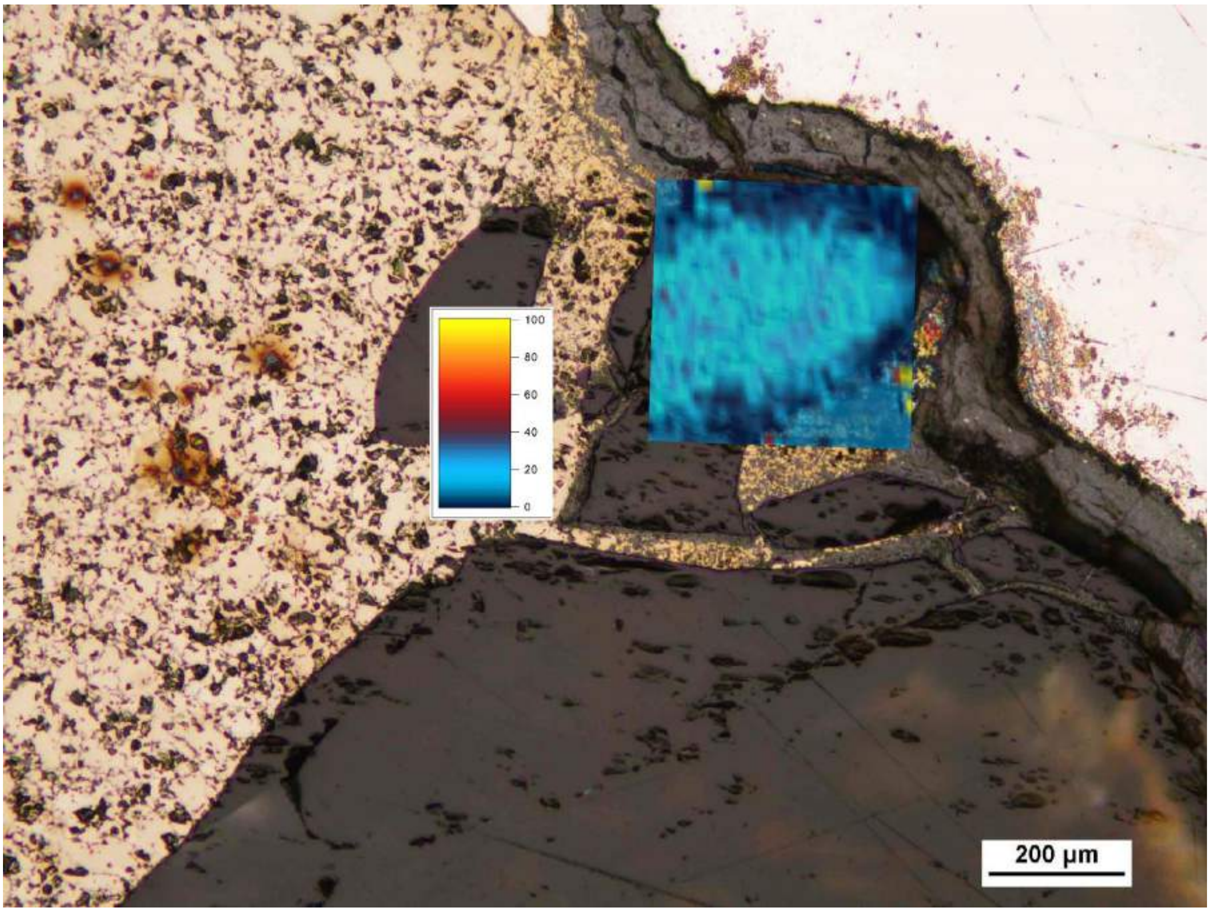
1.5
1.0
0.5
0.0
x10^6
200 µm

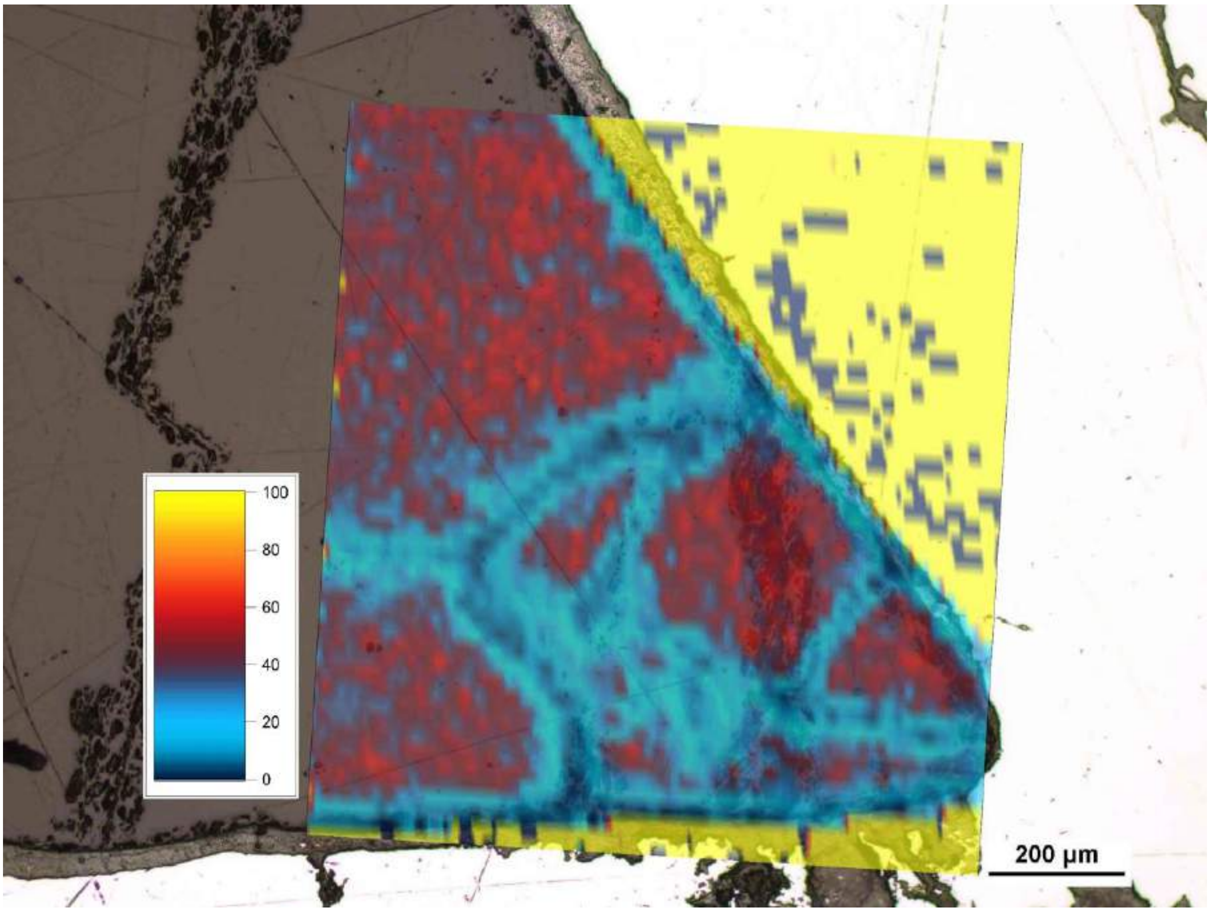


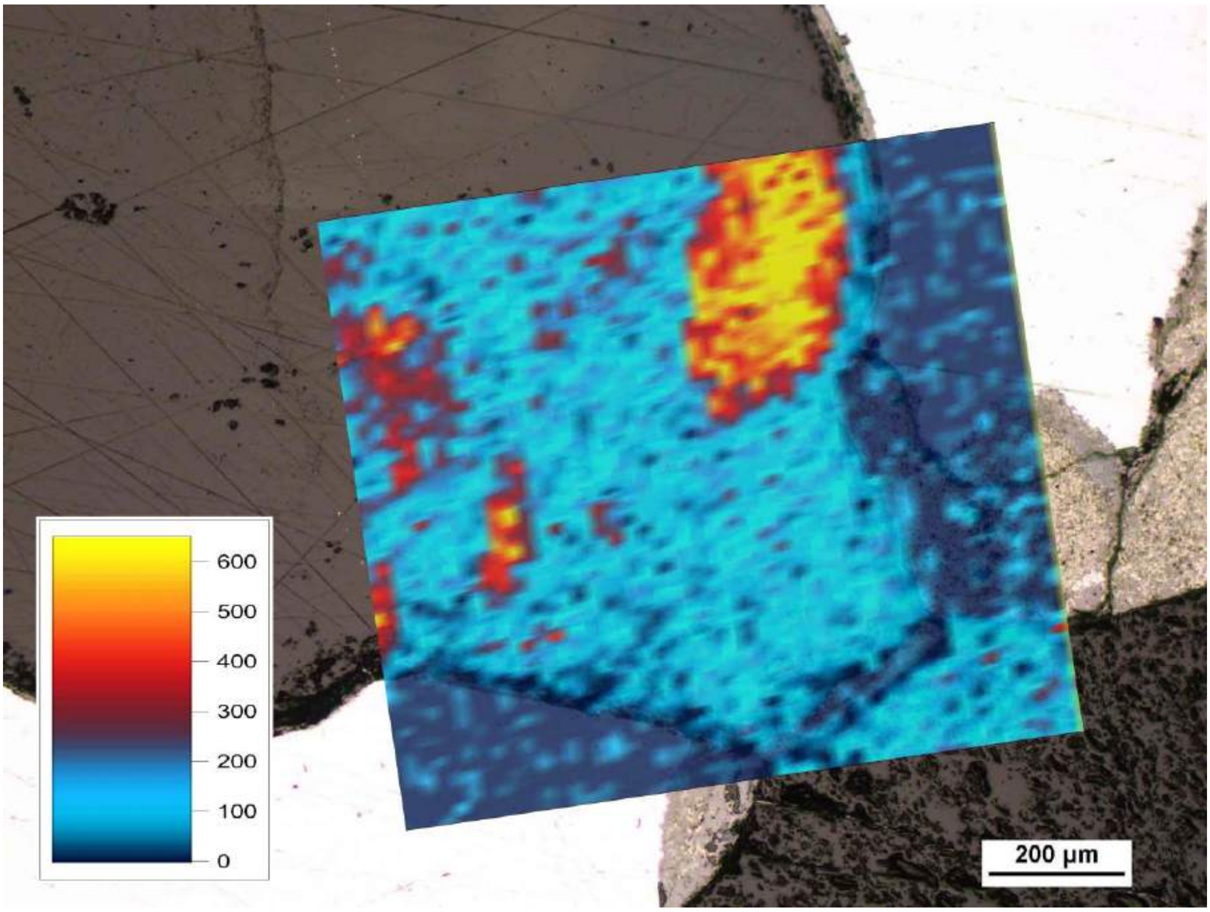
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
x10⁶
200 µm



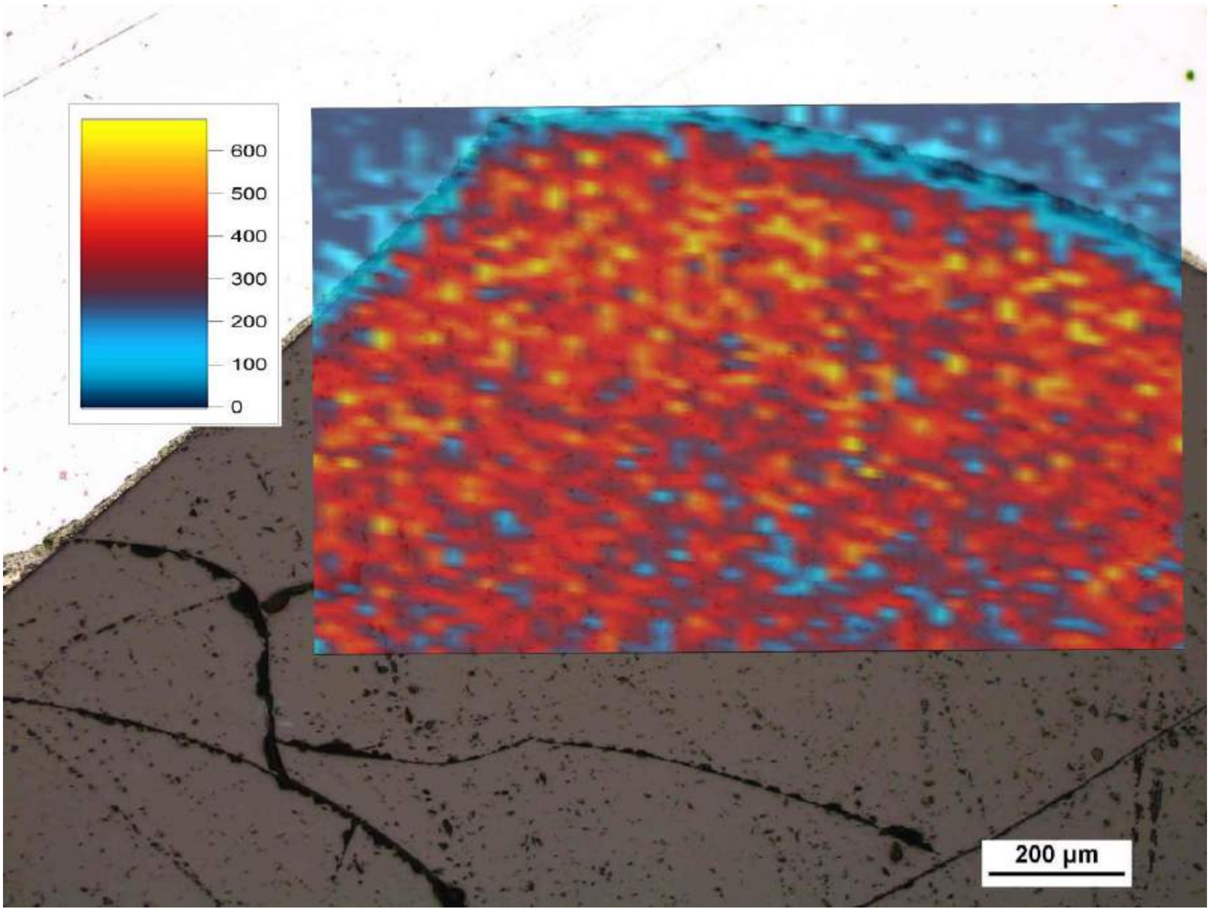
<u>**Ti diffusion patterns**</u>

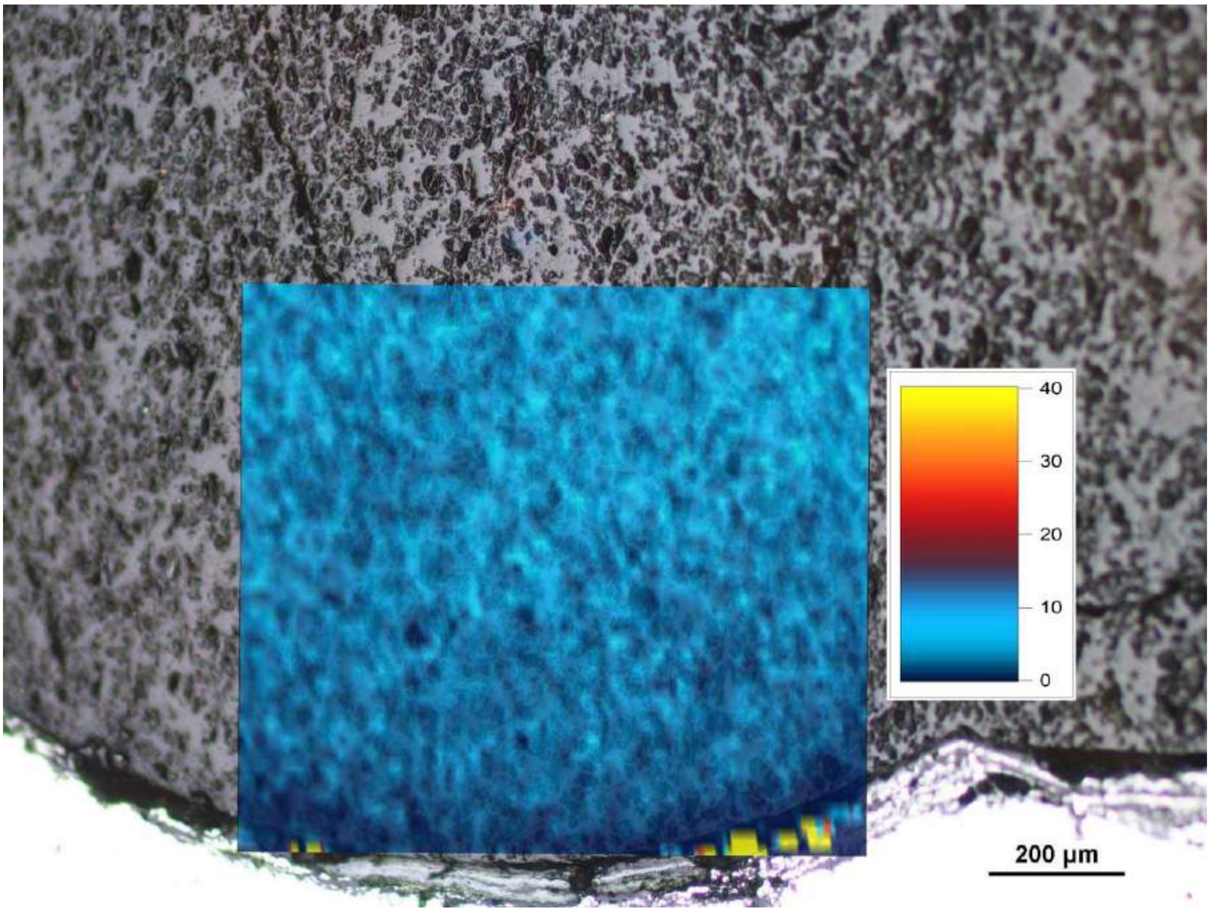

100
80
60
40
20
0
200 µm

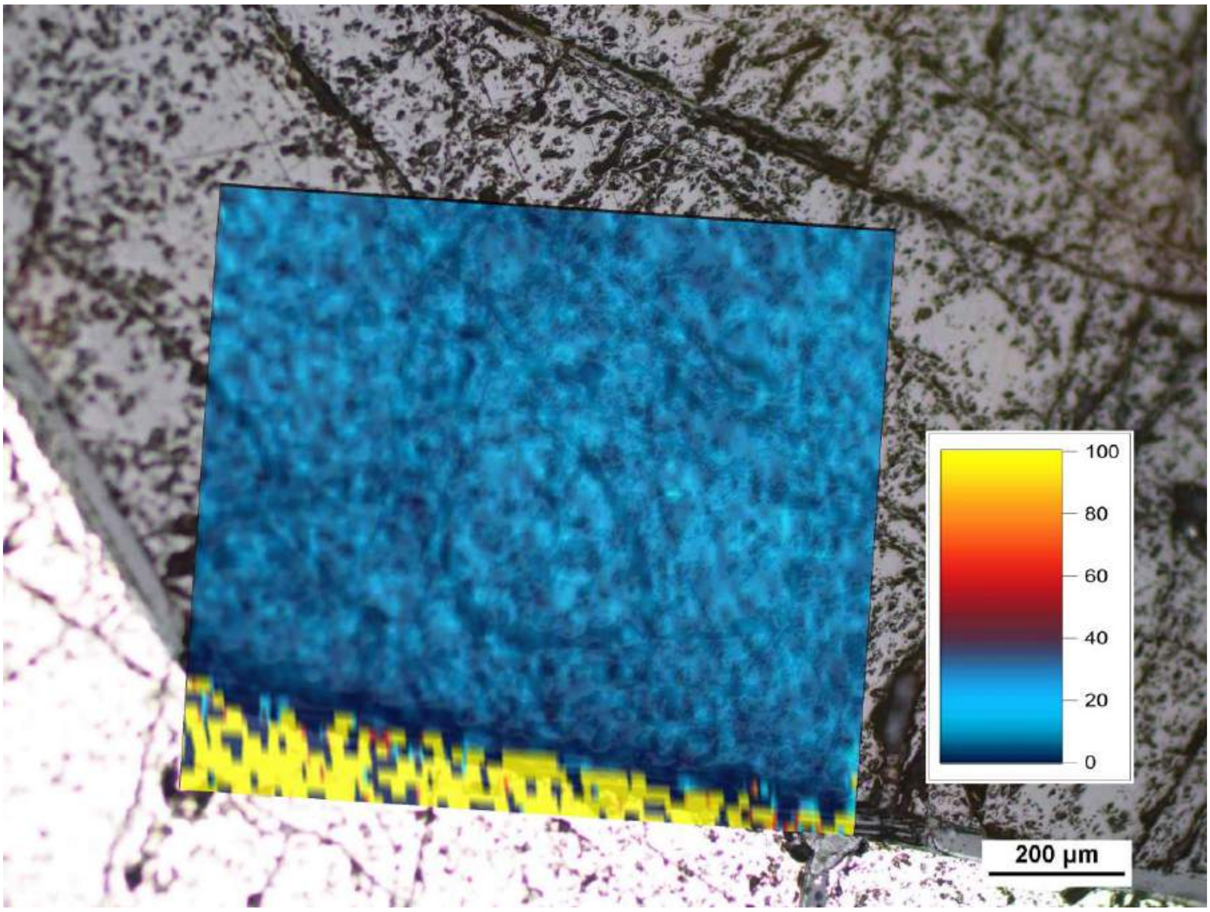

100
80
60
40
20
0
200 µm

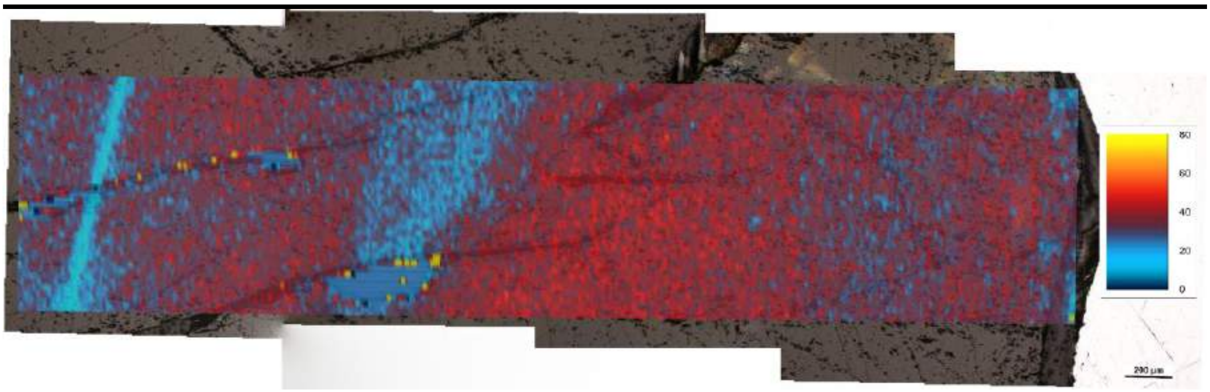


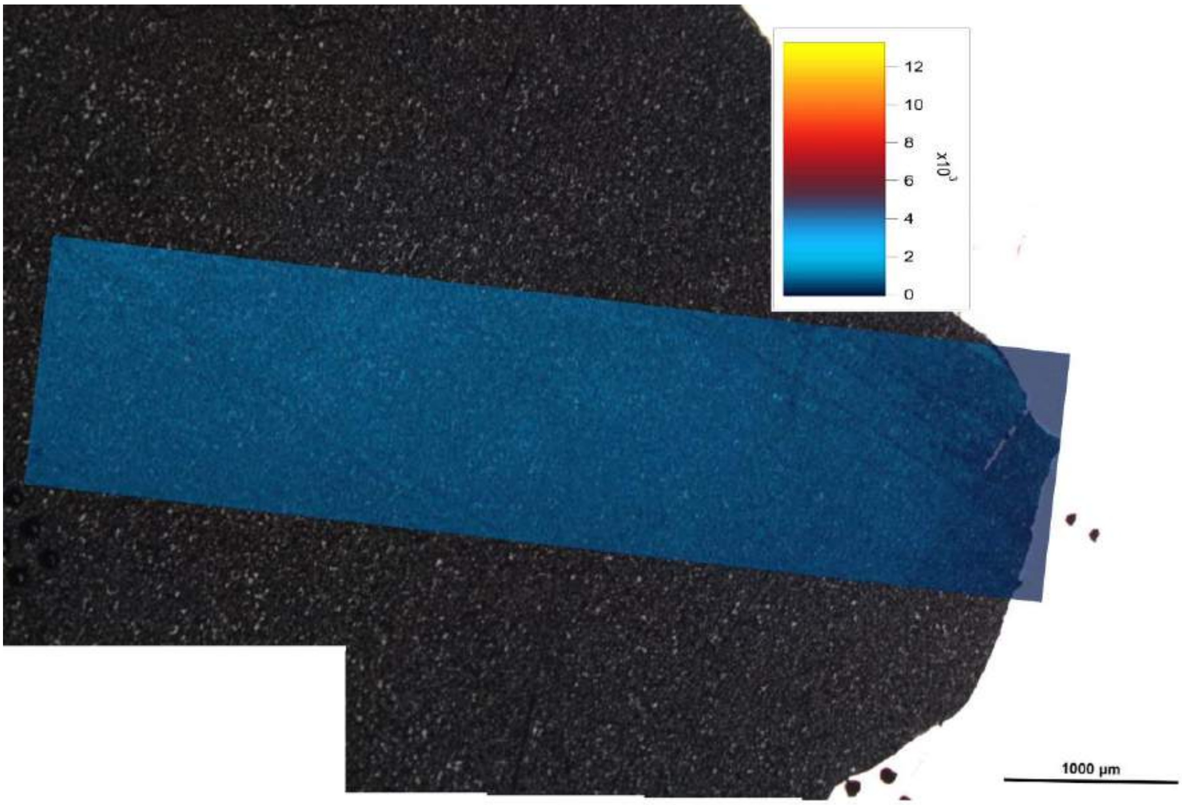
600
500
400
300
200
100
0
200 µm


600
500
400
300
200
100
0
200 µm

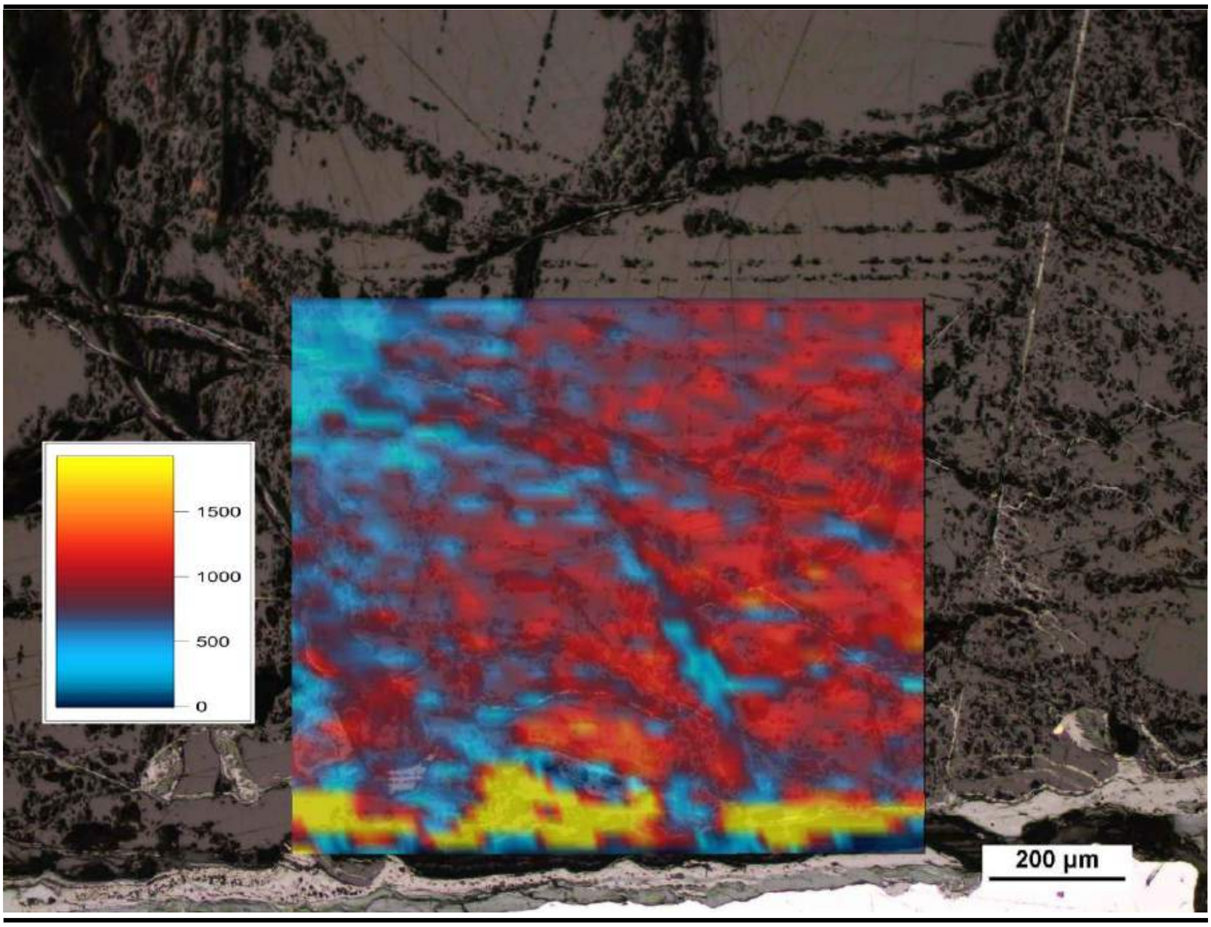

40
30
20
10
0
200 µm


100
80
60
40
20
0
200 µm

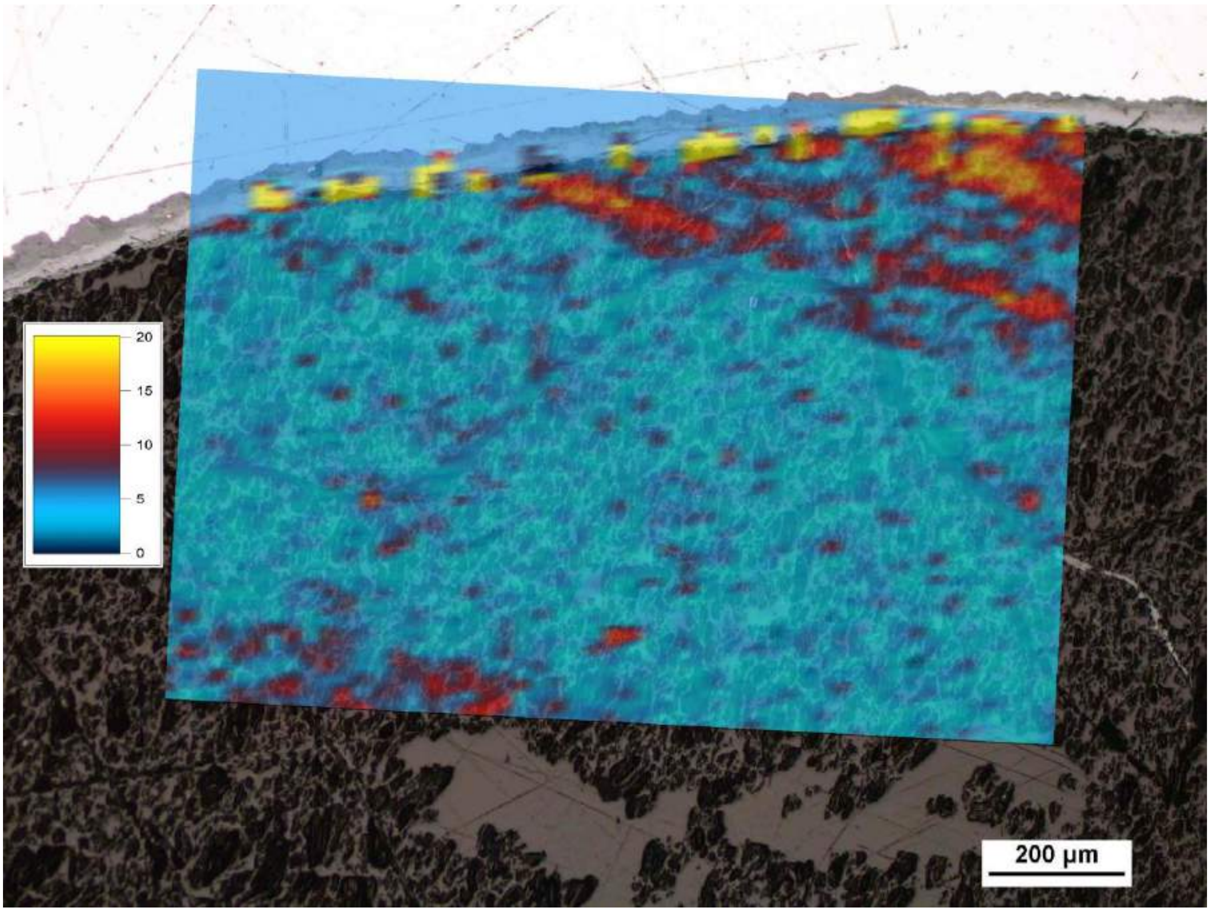

80
60
40
20
0

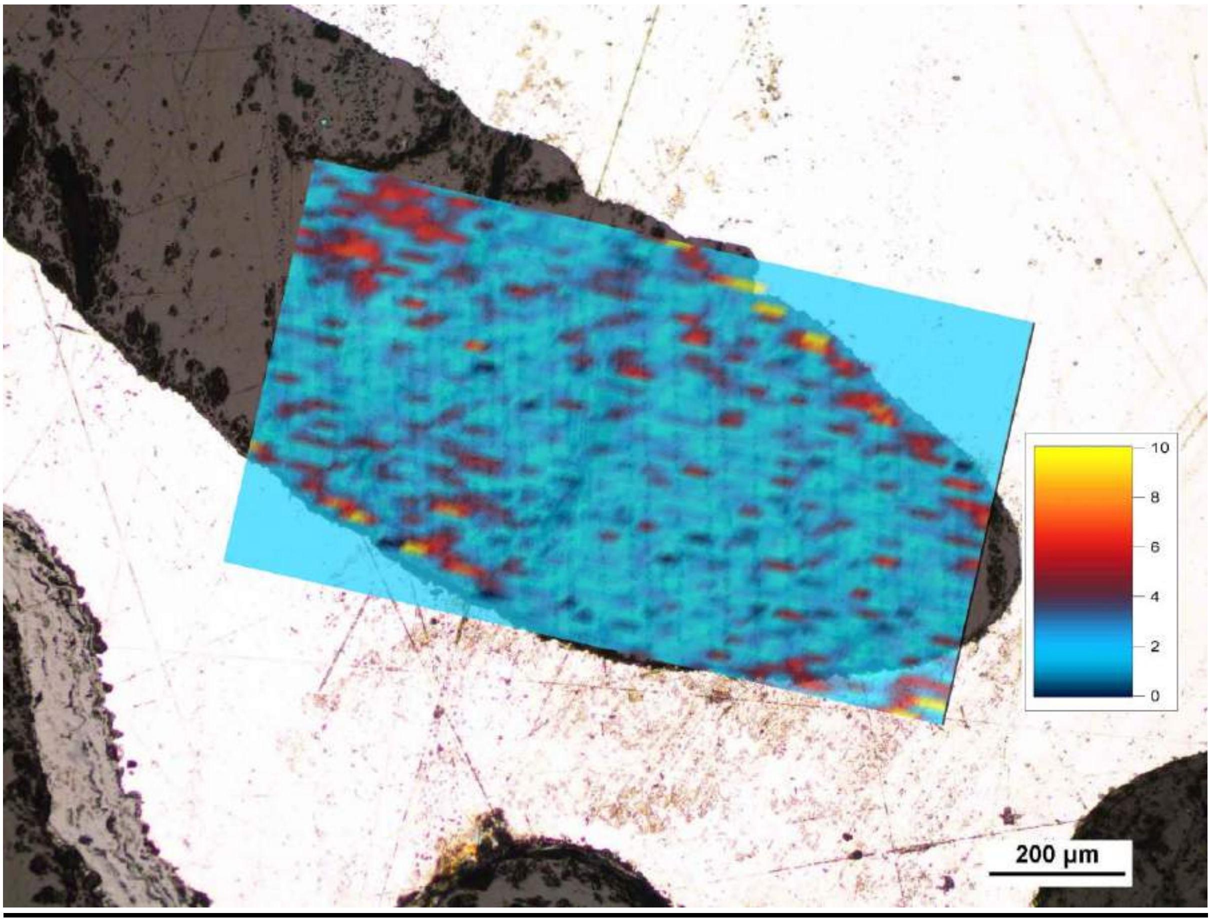


12
10
8
6
4
2
0
x10³
1000 µm

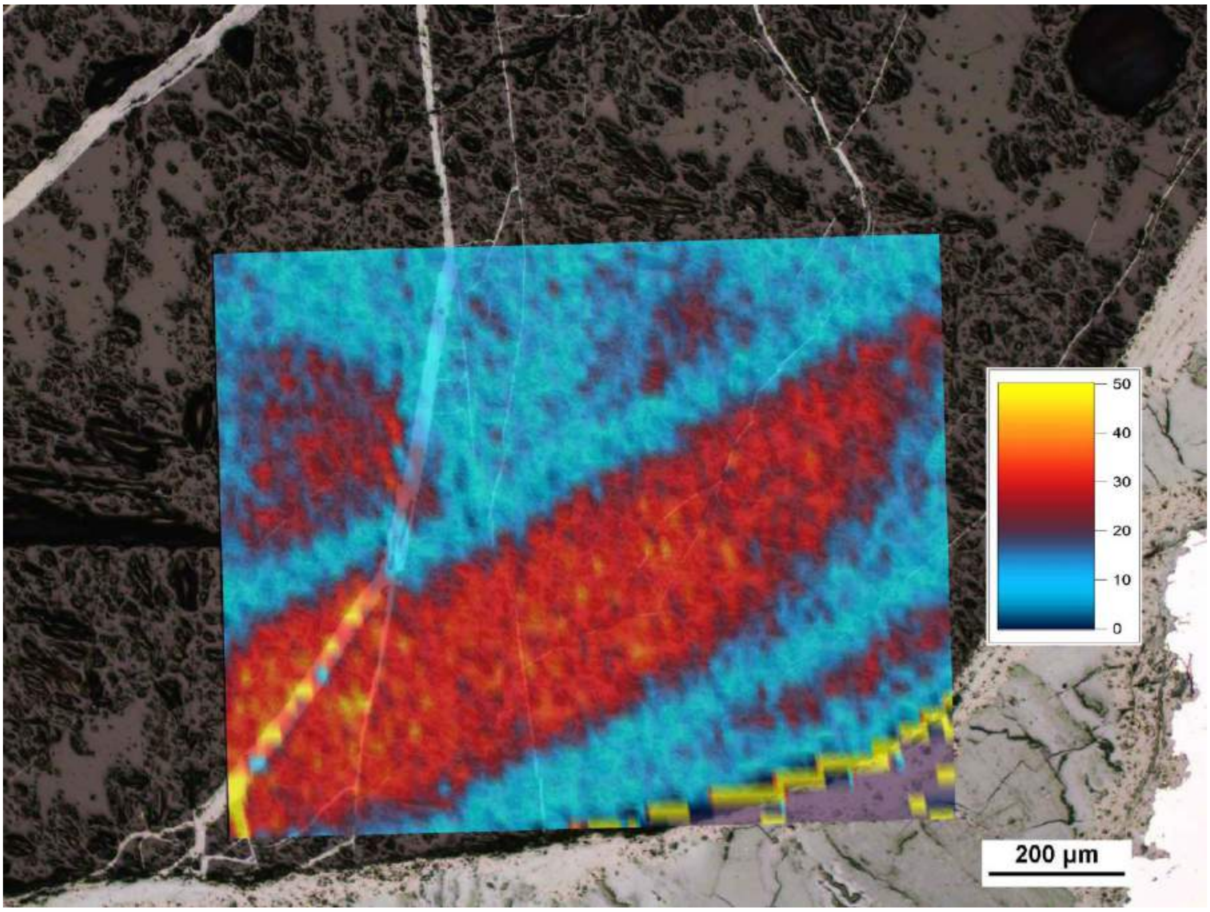


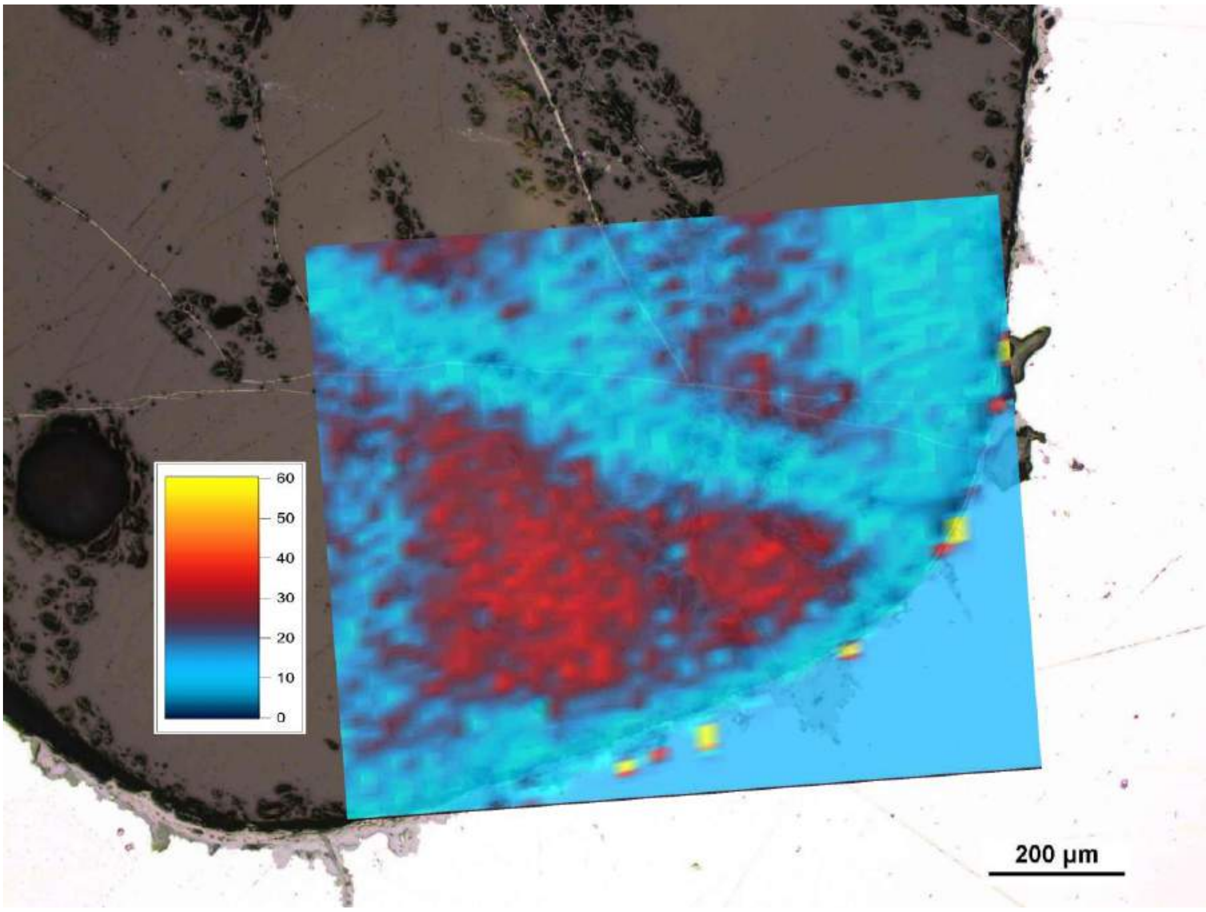
1500
1000
500
0
200 µm


20
15
10
5
0
200 µm

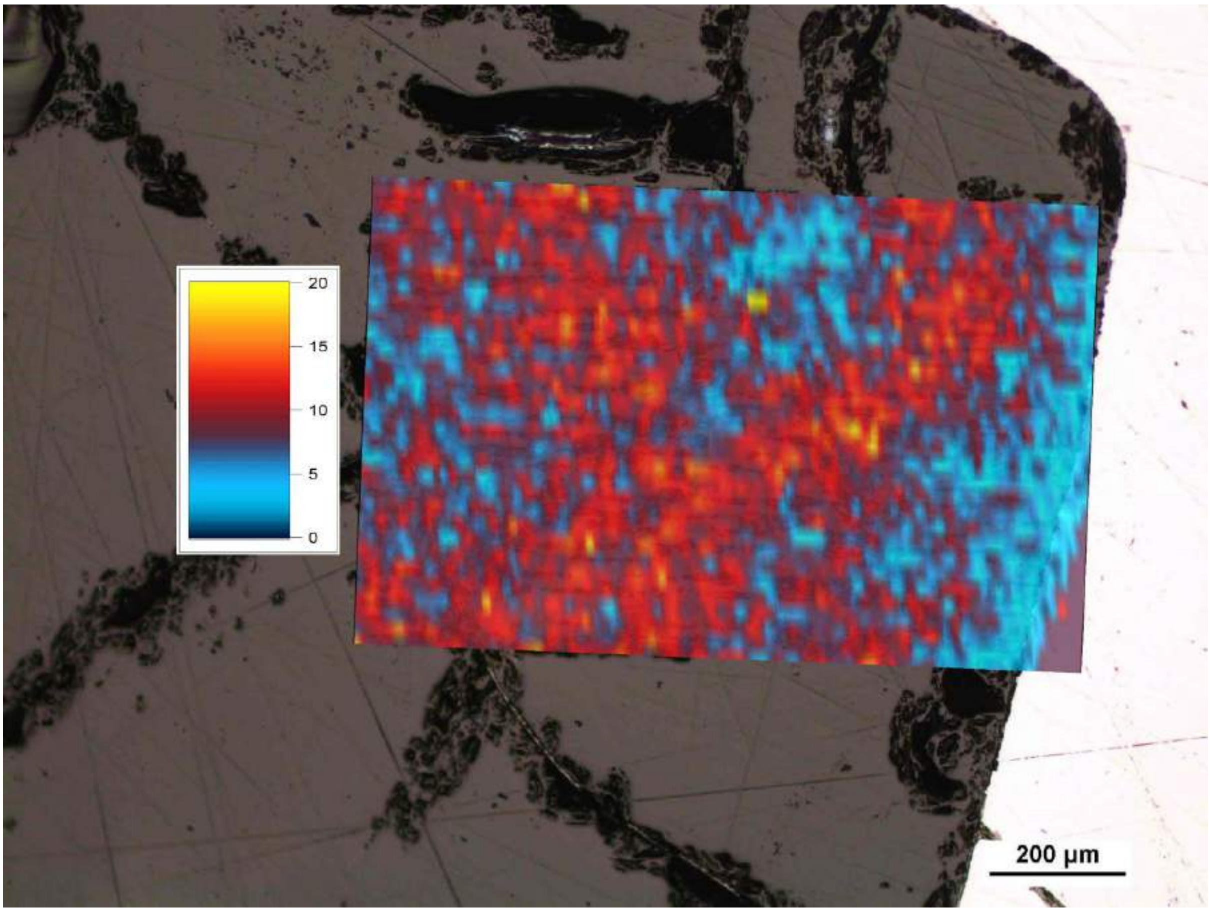


10
8
6
4
2
0
200 µm

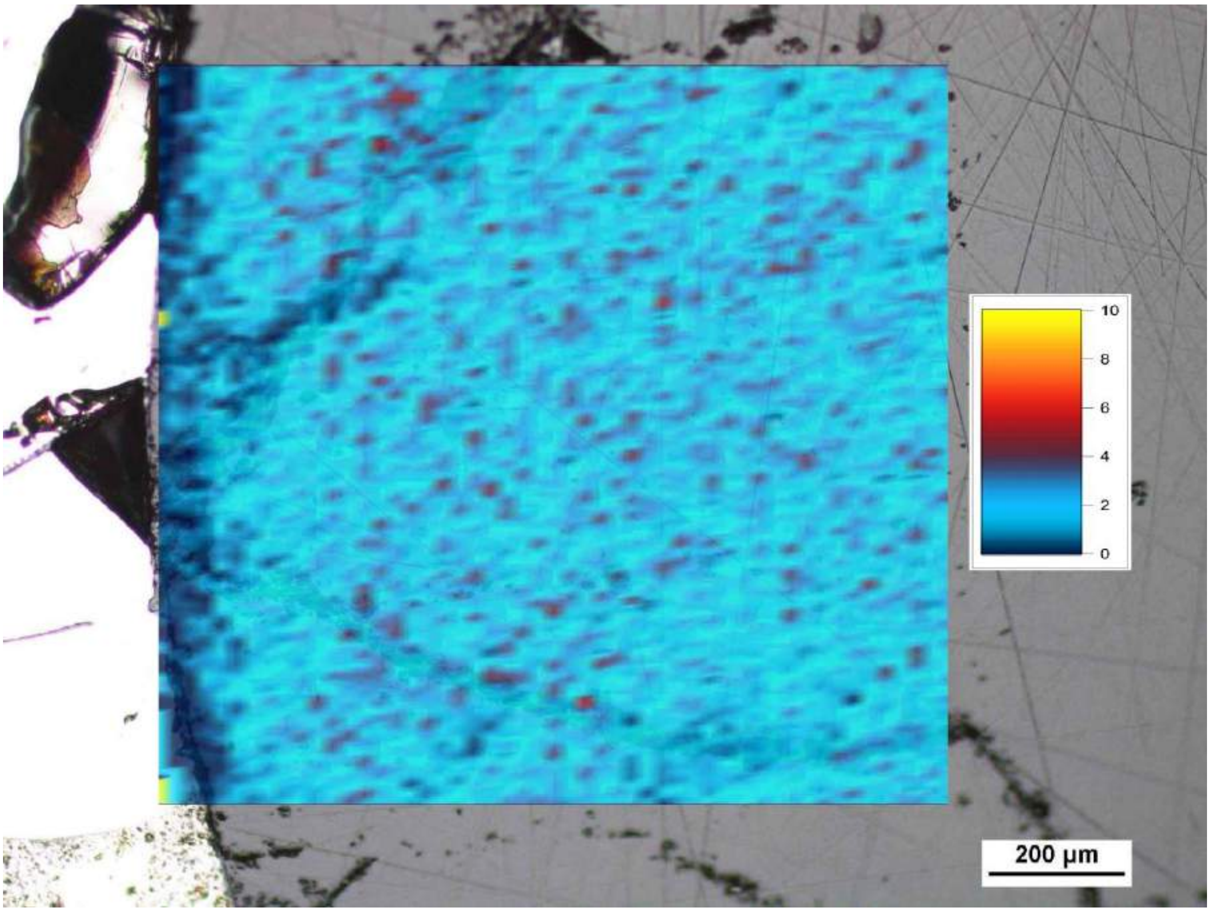

50
40
30
20
10
0
200 µm



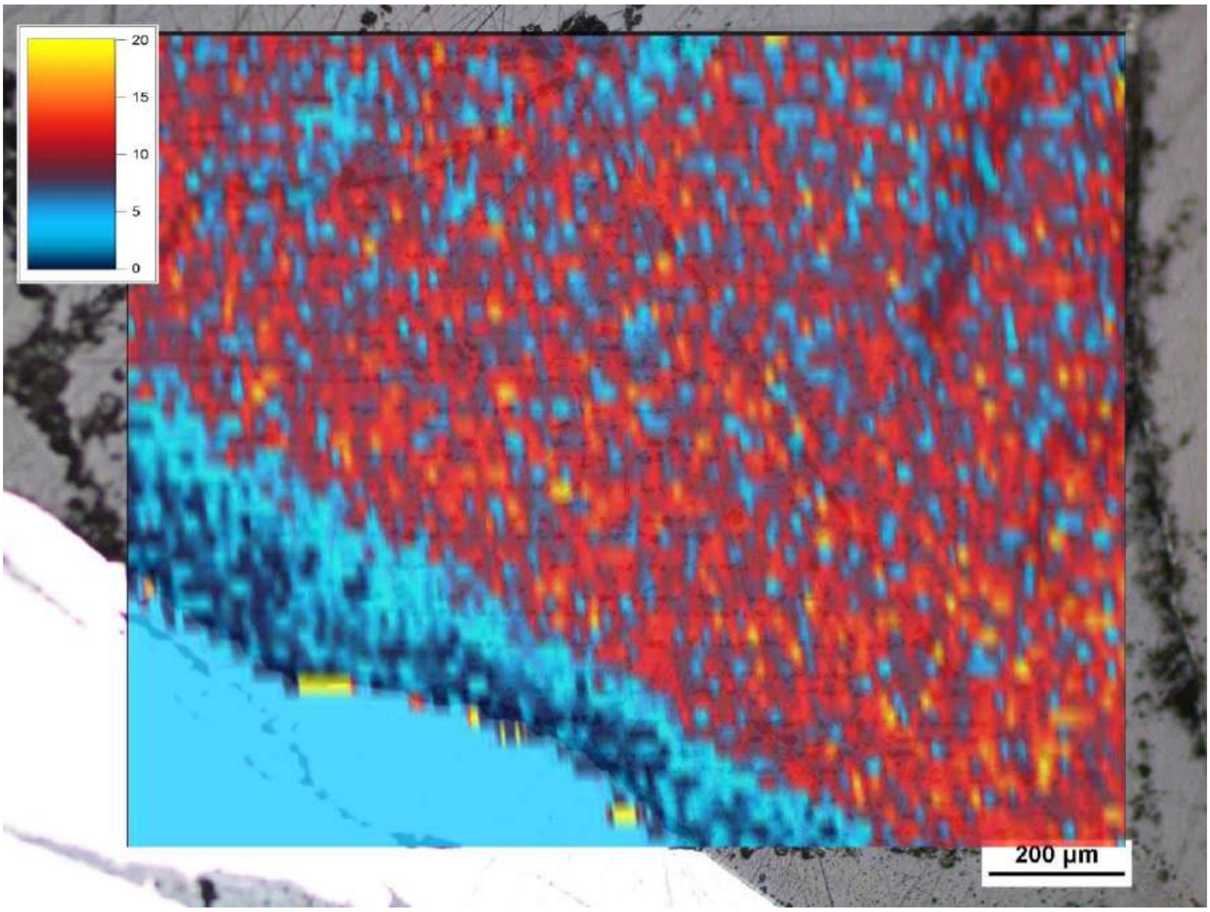
60
50
40
30
20
10
0
200 µm



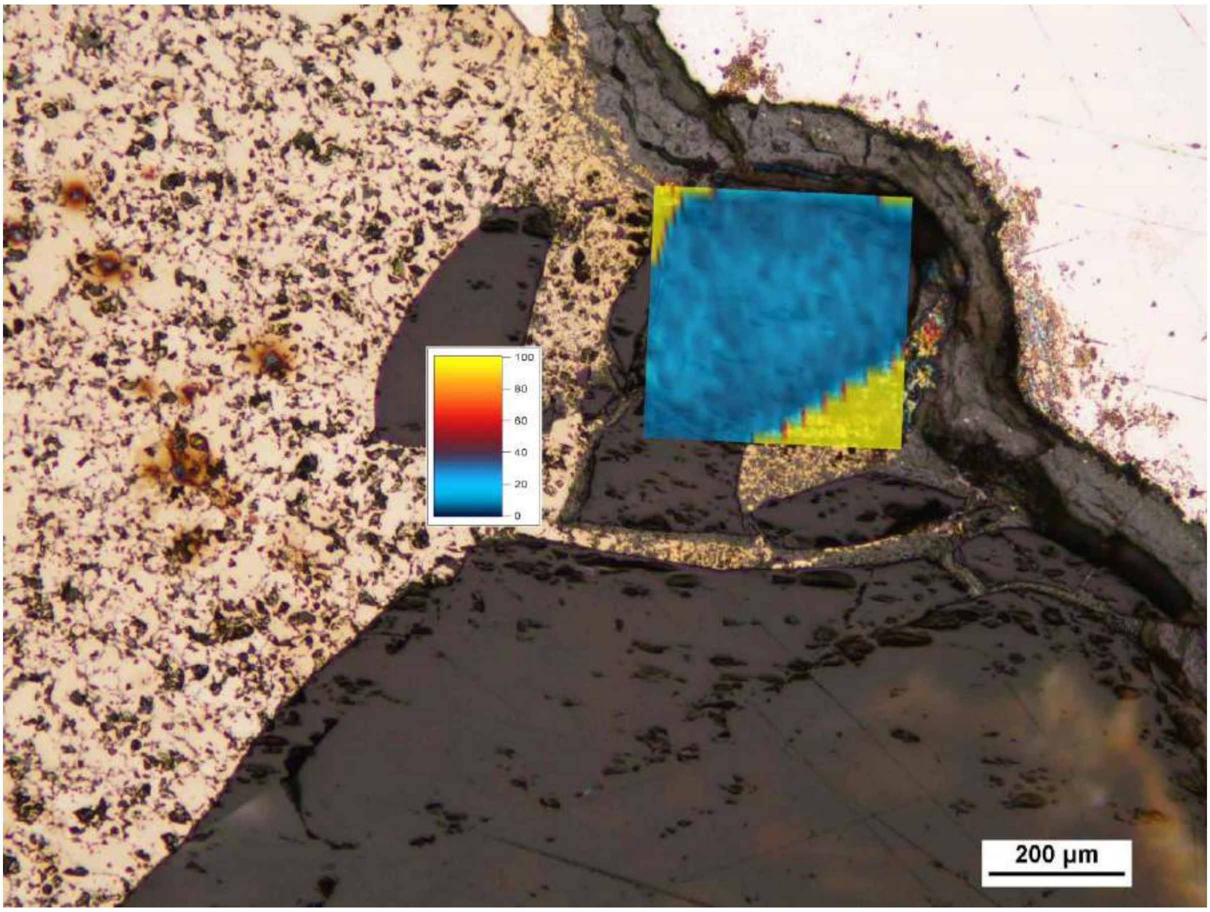
20
15
10
5
0
200 µm

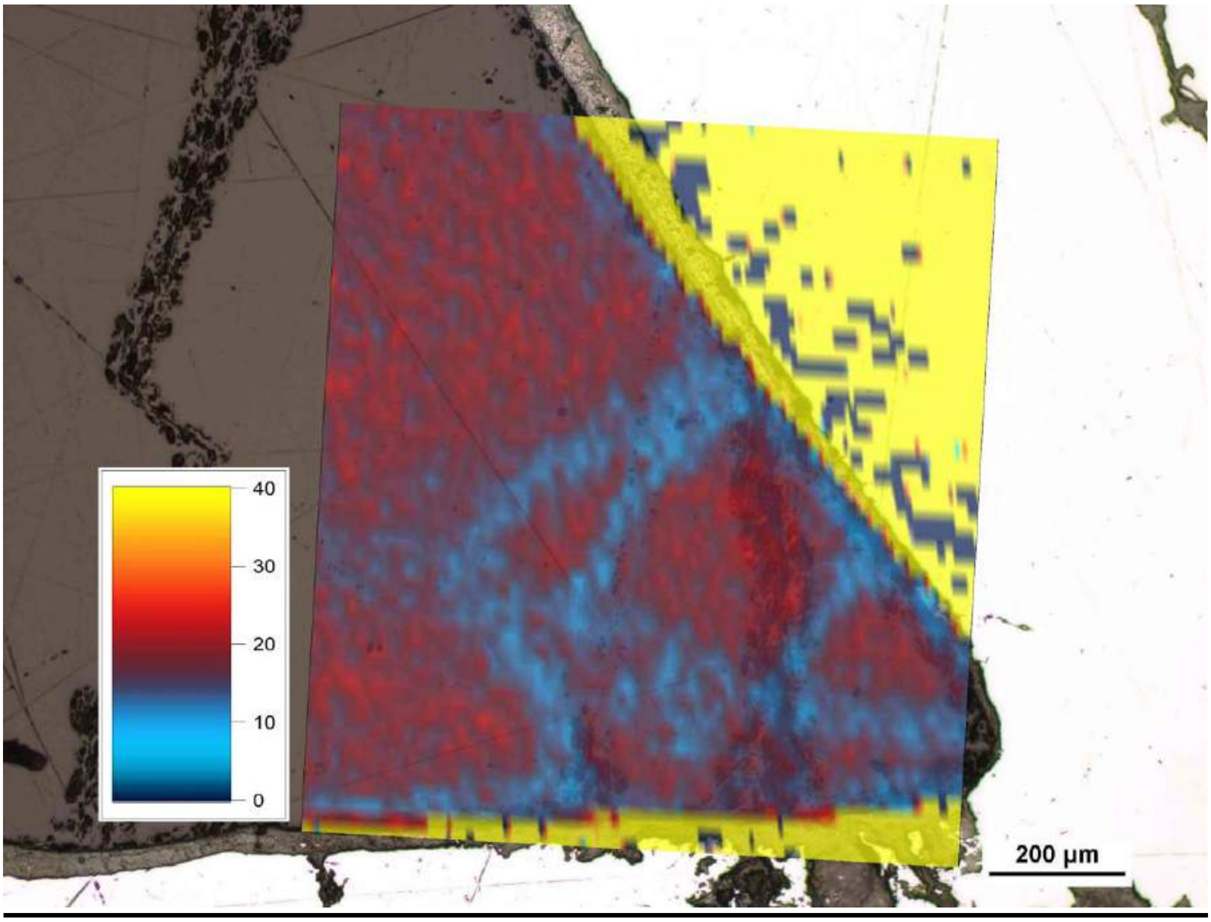


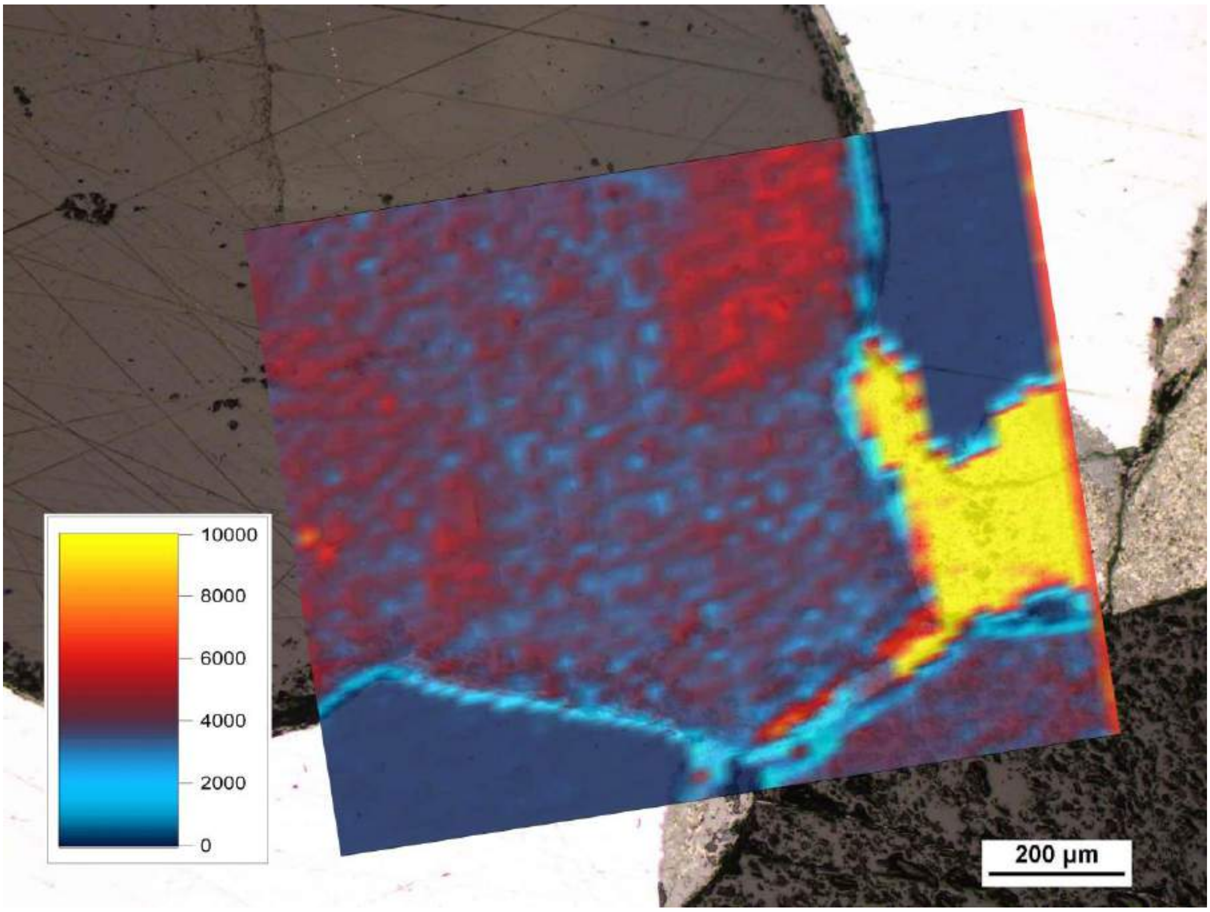
10
8
6
4
2
0
200 µm

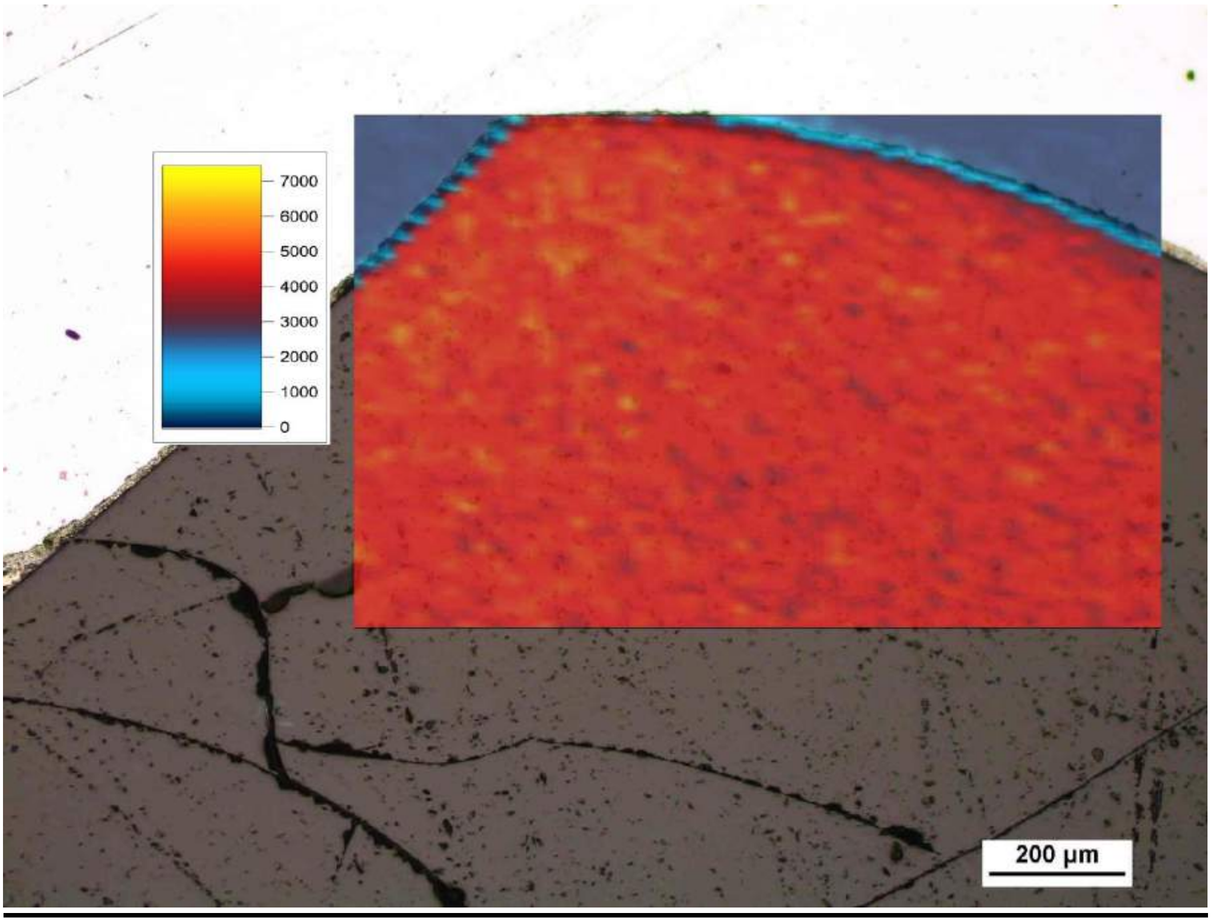


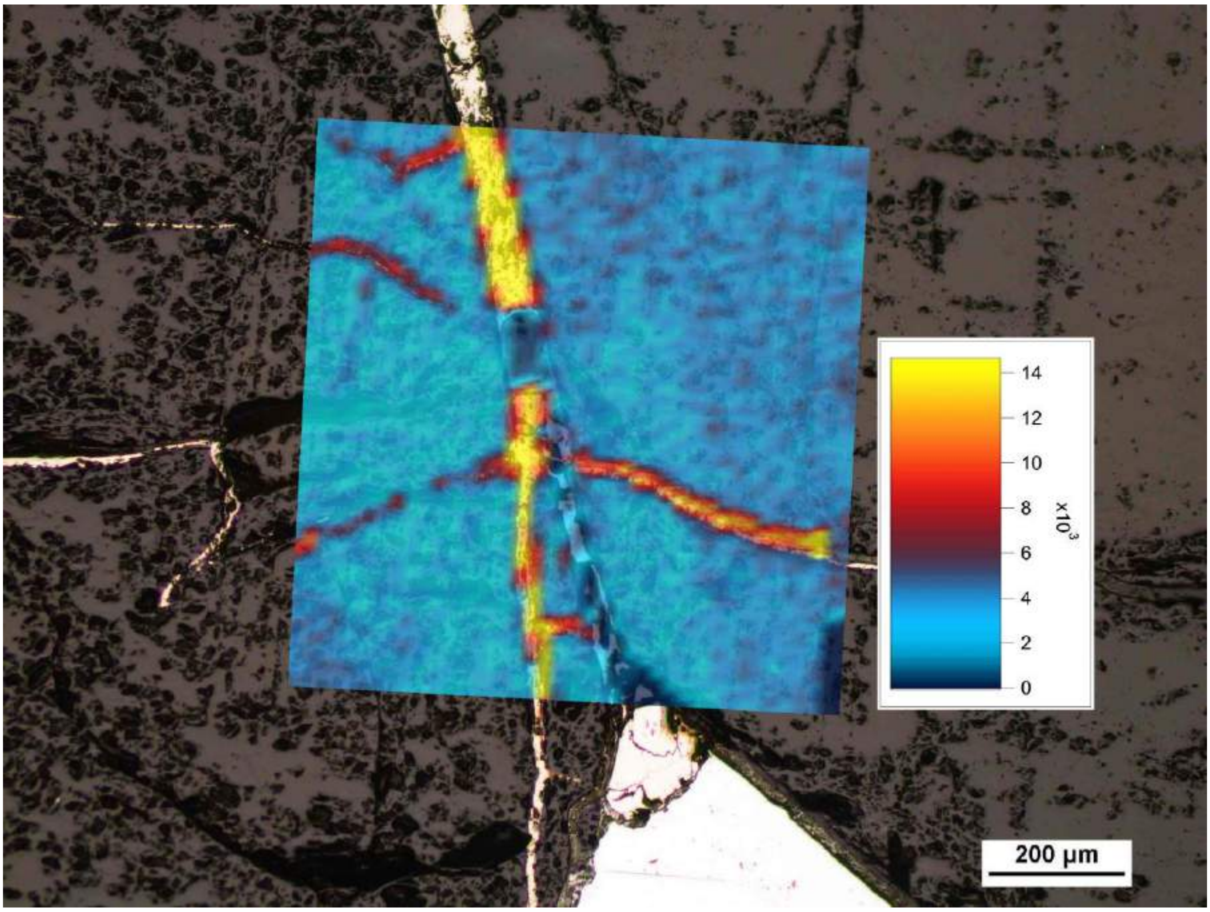
V diffusion patterns

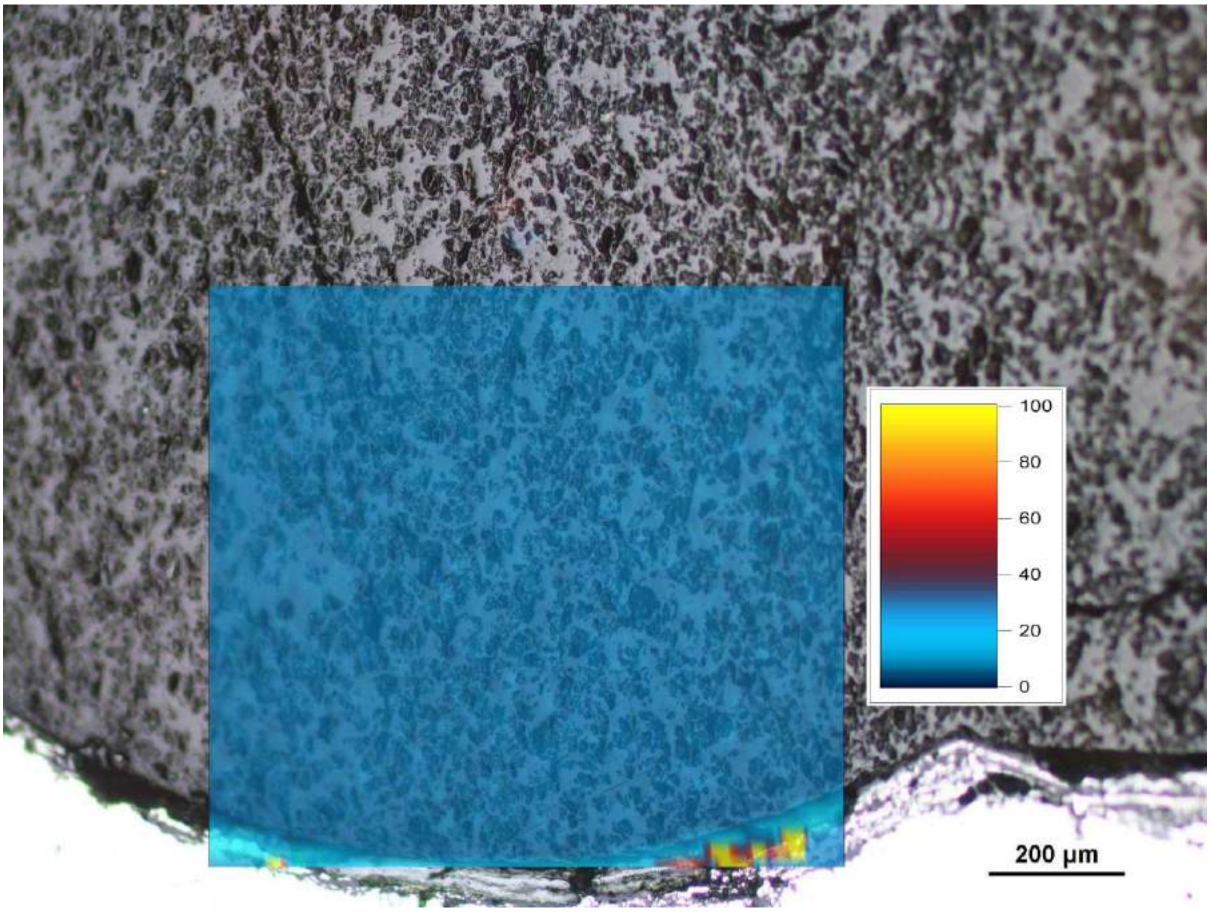

100
80
60
40
20
0
200 µm


40
30
20
10
0
200 µm


10000
8000
6000
4000
2000
0
200 µm


7000
6000
5000
4000
3000
2000
1000
0
200 µm


14
12
10
8
6
4
2
0
x10³
200 µm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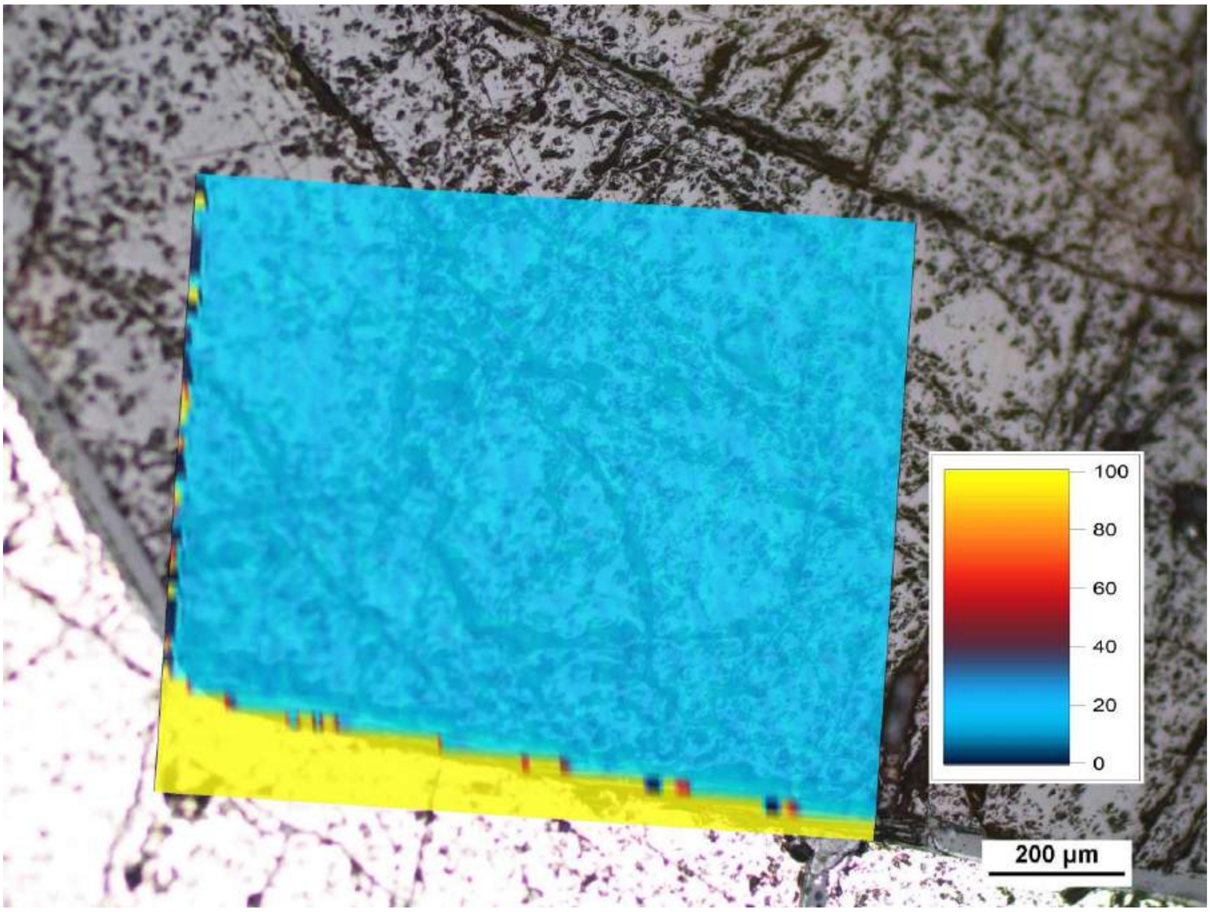
80
60
40
20
0
200 µm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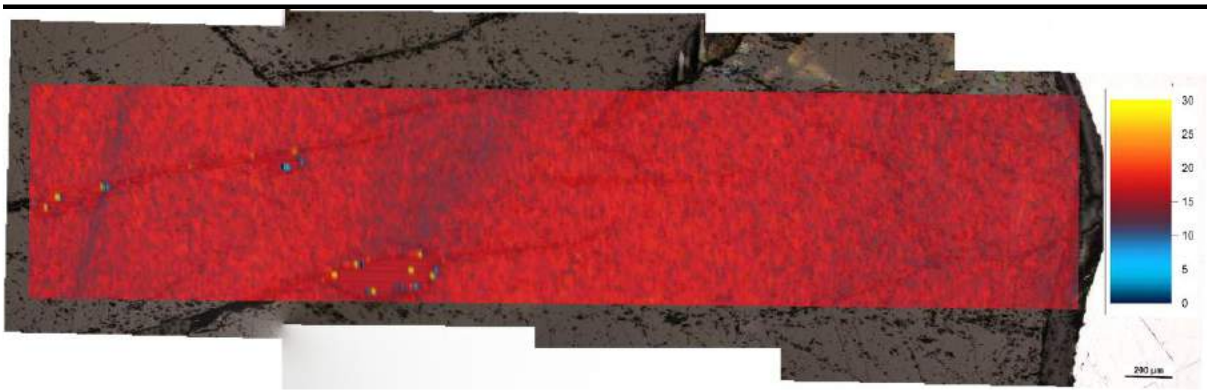
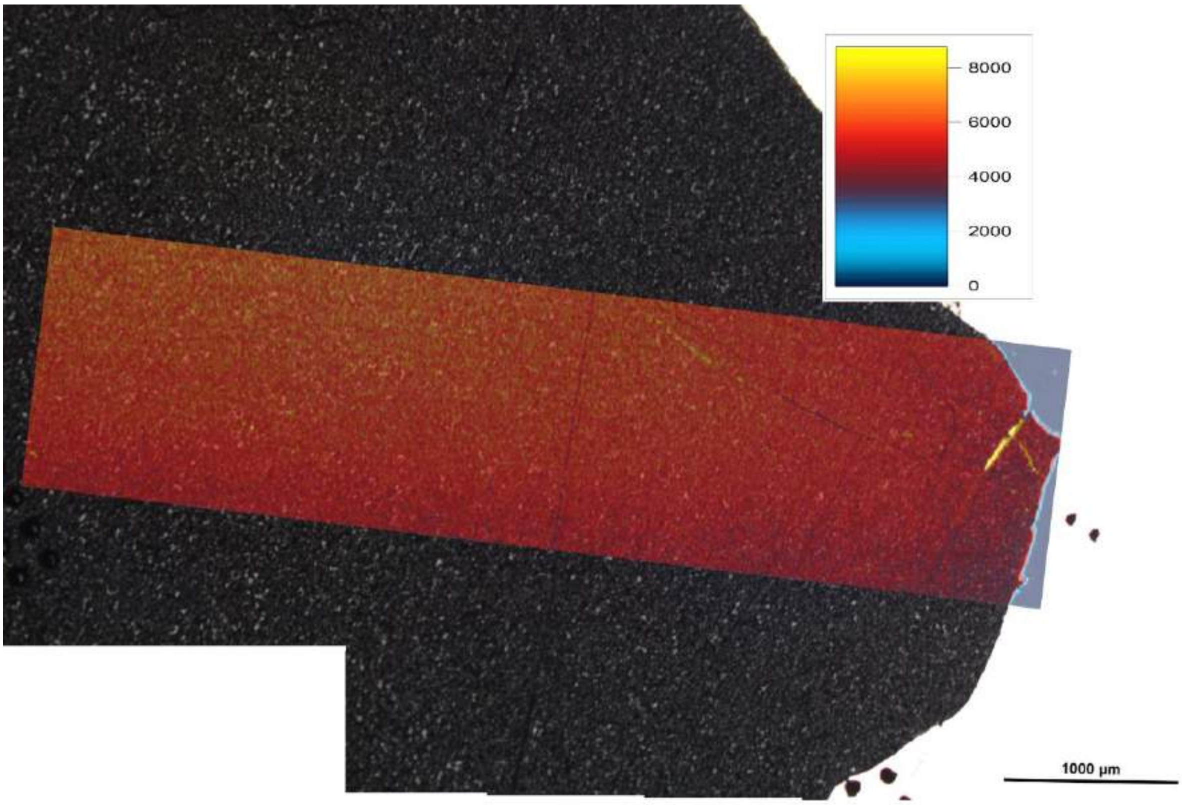
80
60
40
20
0
200 µm


30
25
20
15
10
5
0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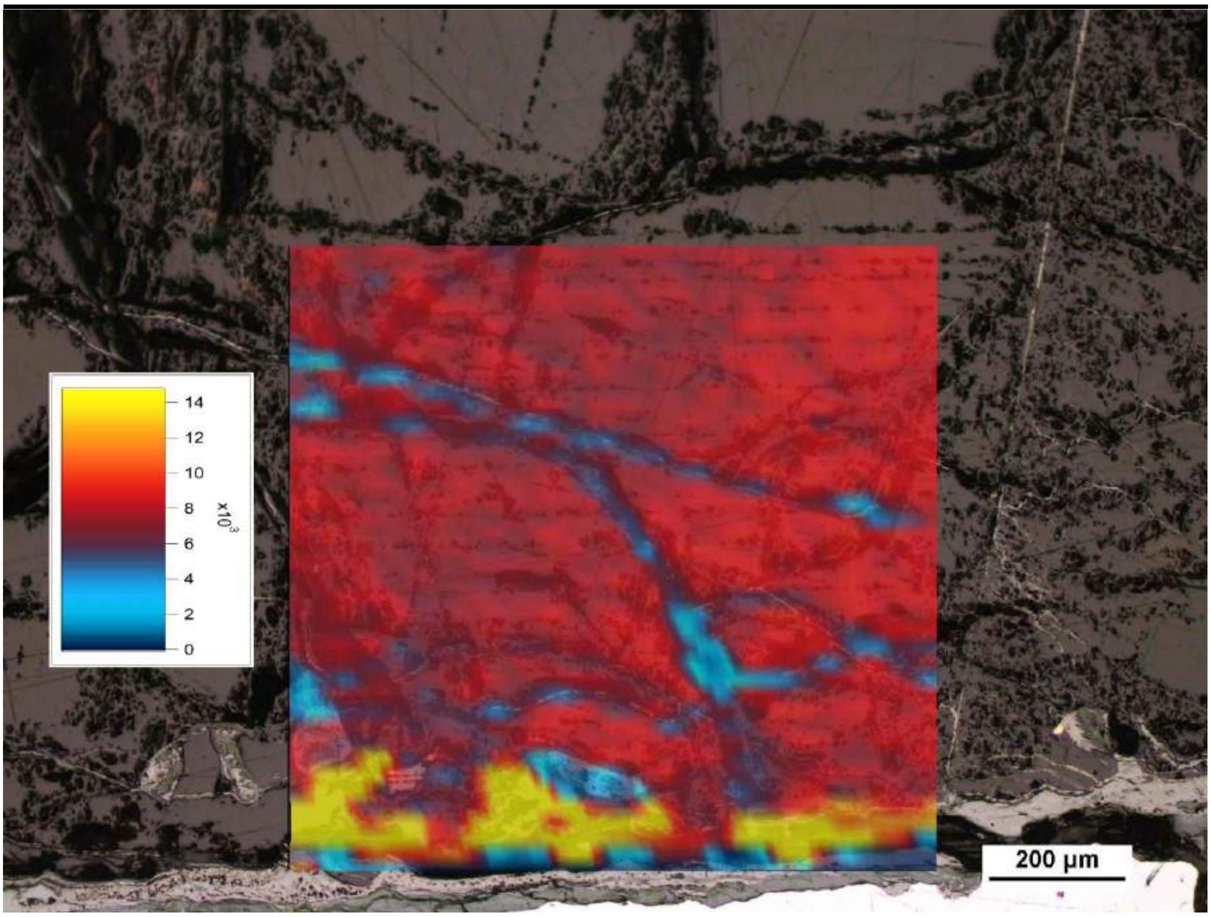
6000
4000
2000
0
1000 µm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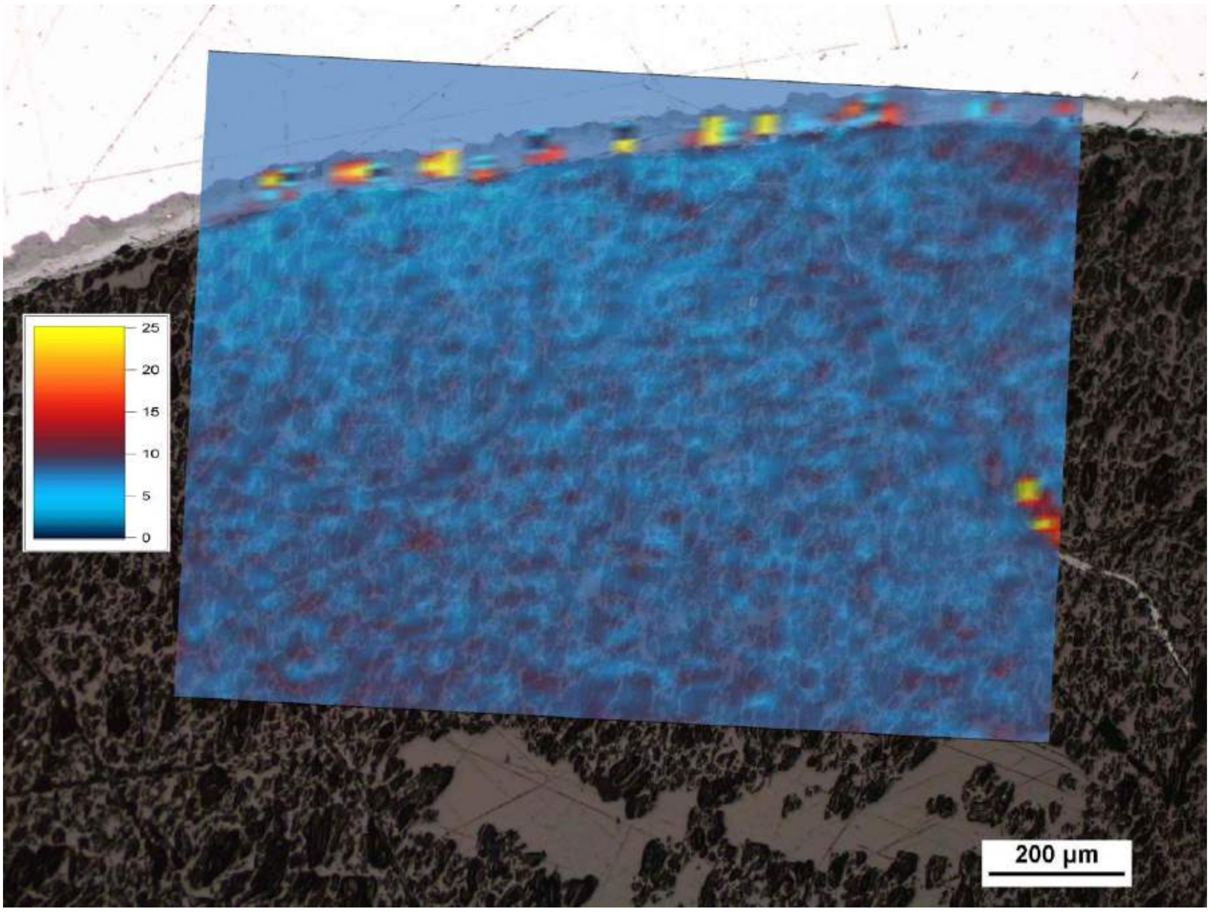
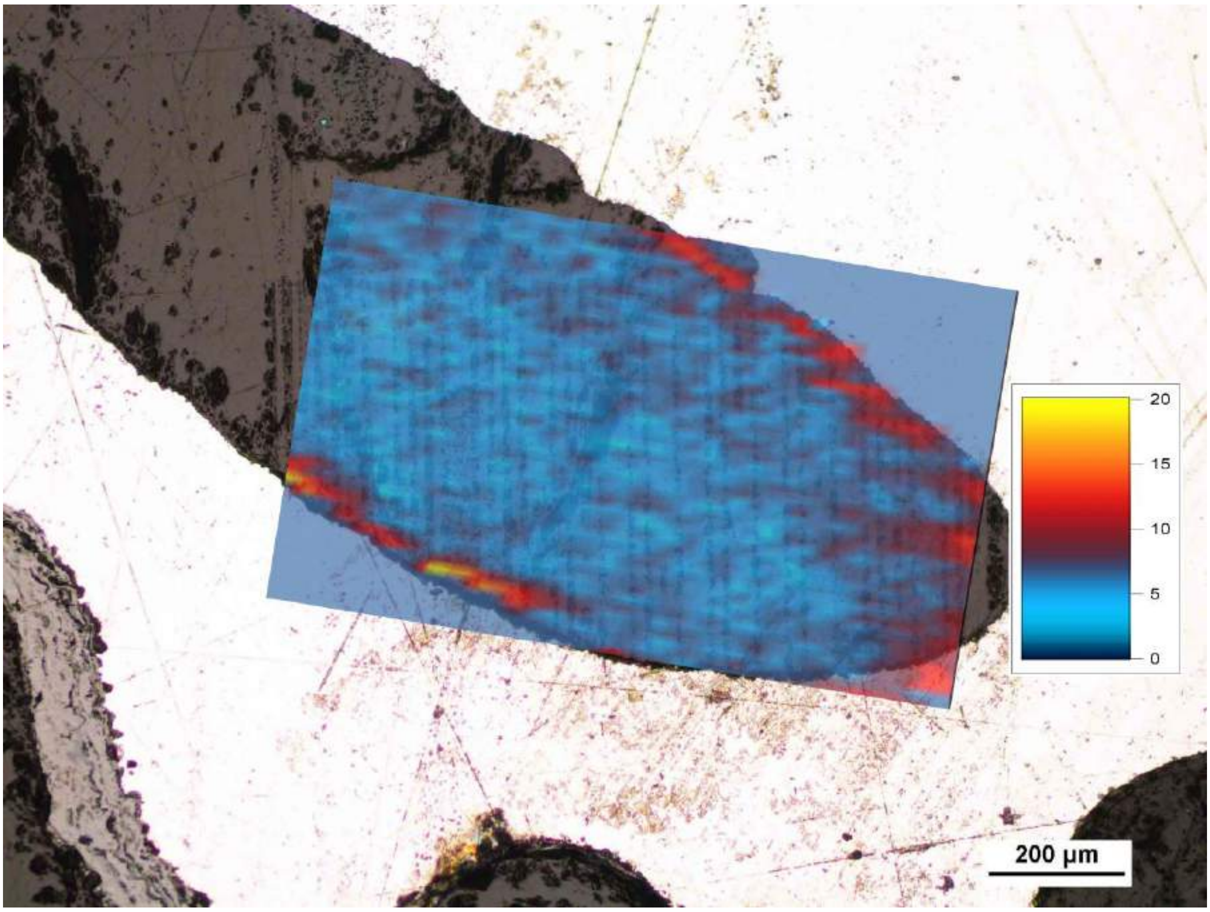
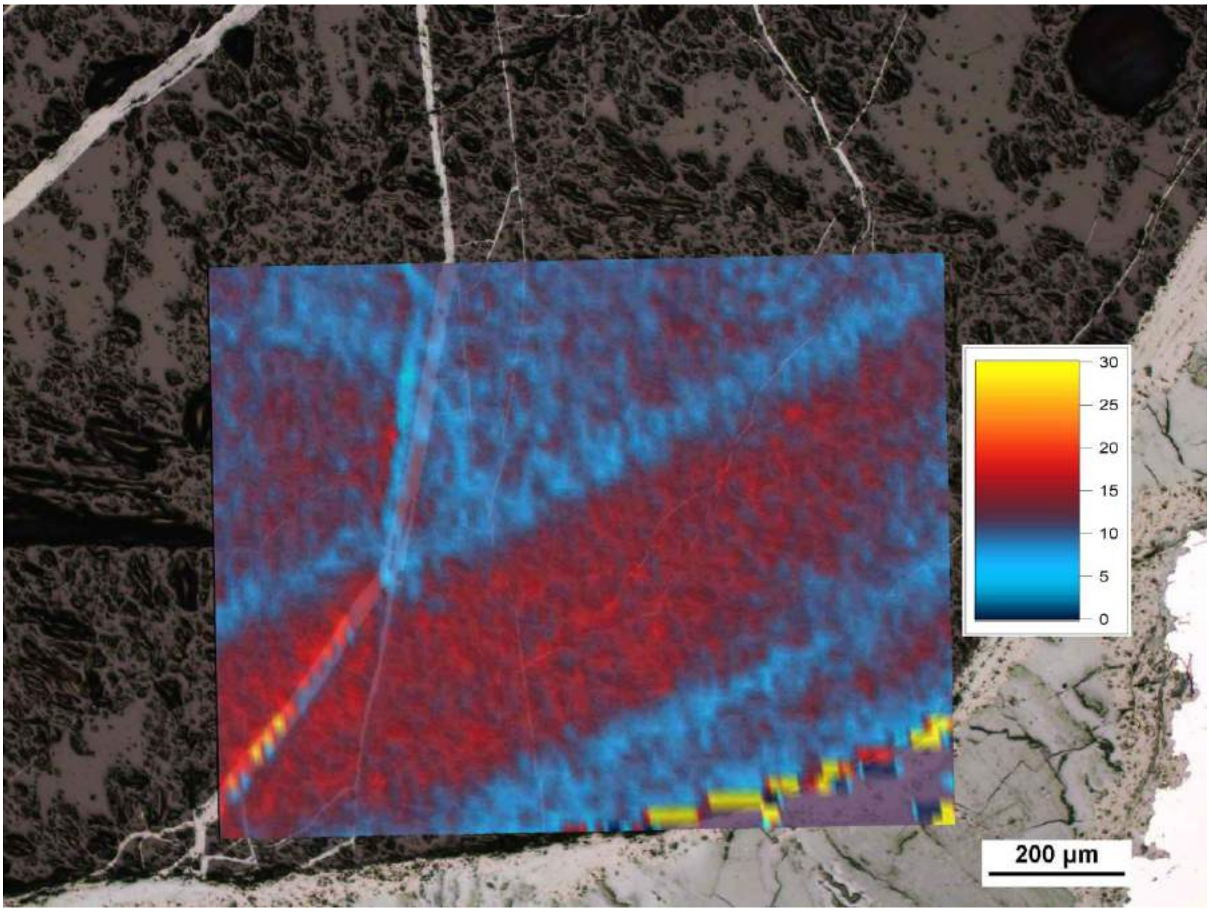
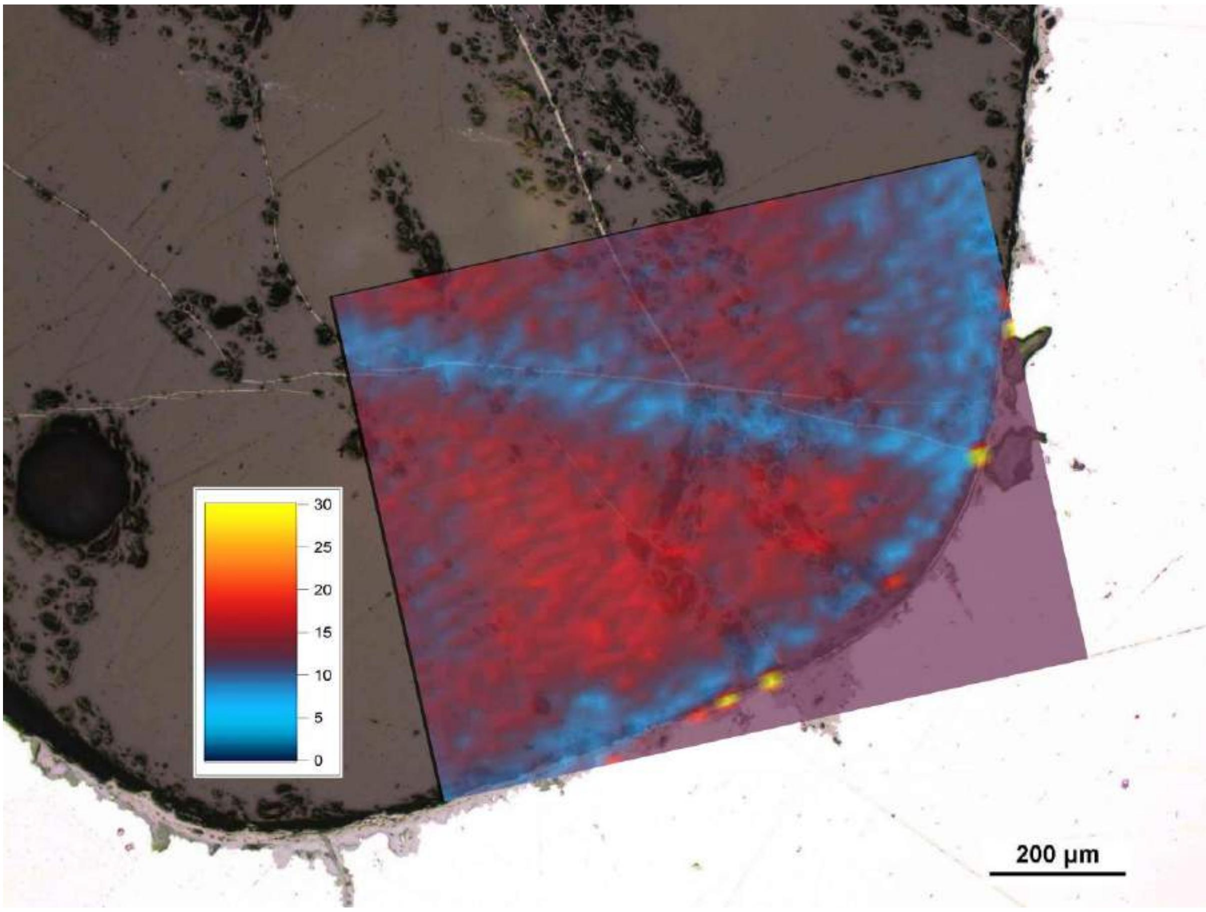
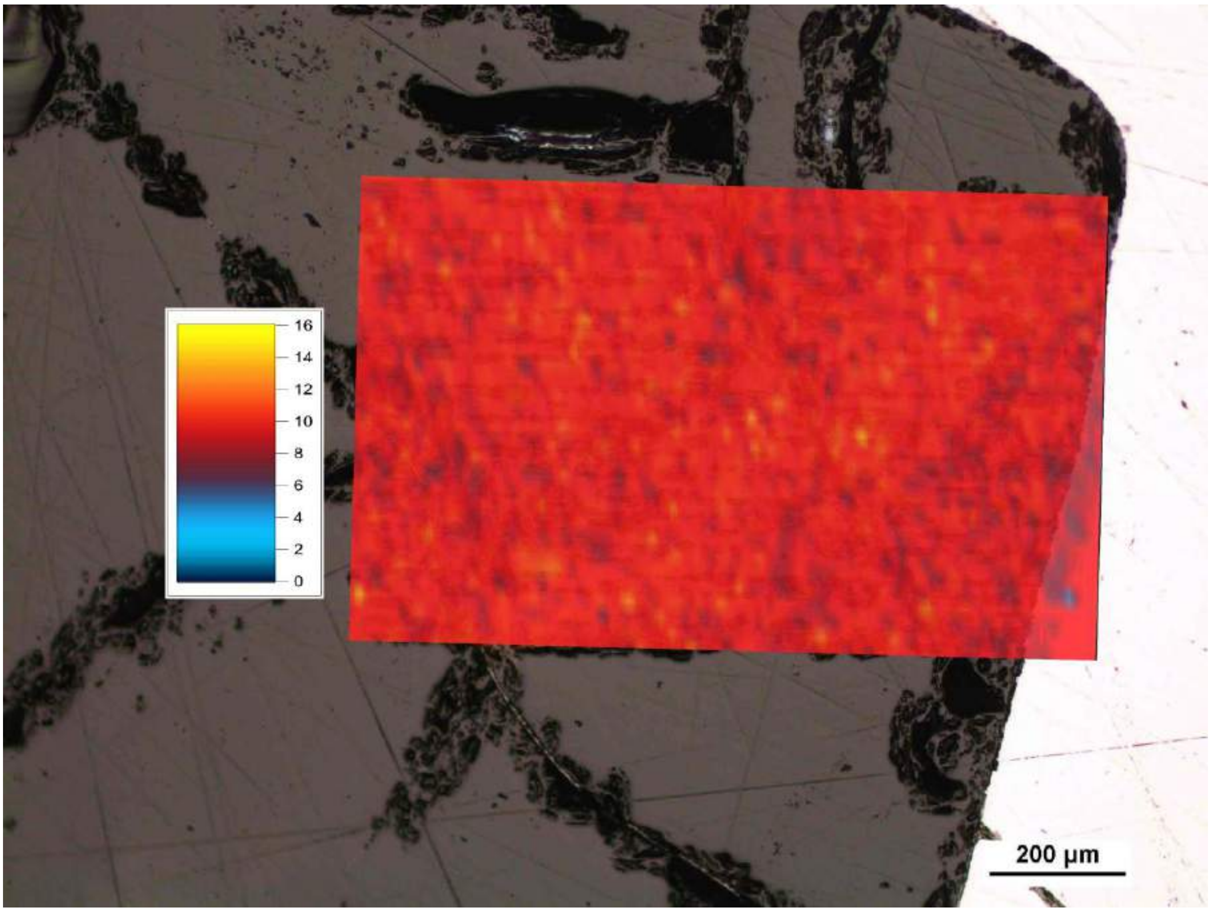
12
10
8
6
4
2
0
x10^3
200 µm

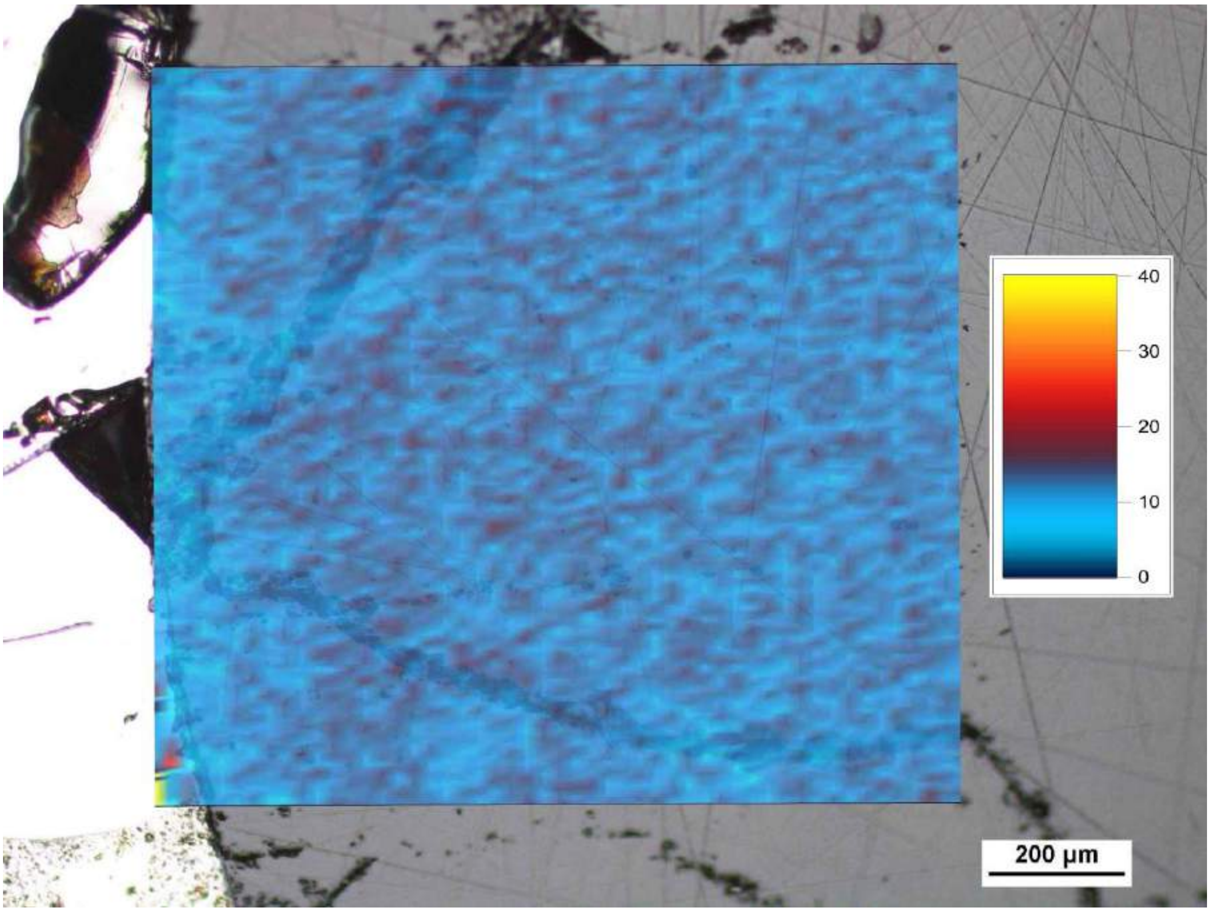

25
20
15
10
5
0
200 µm

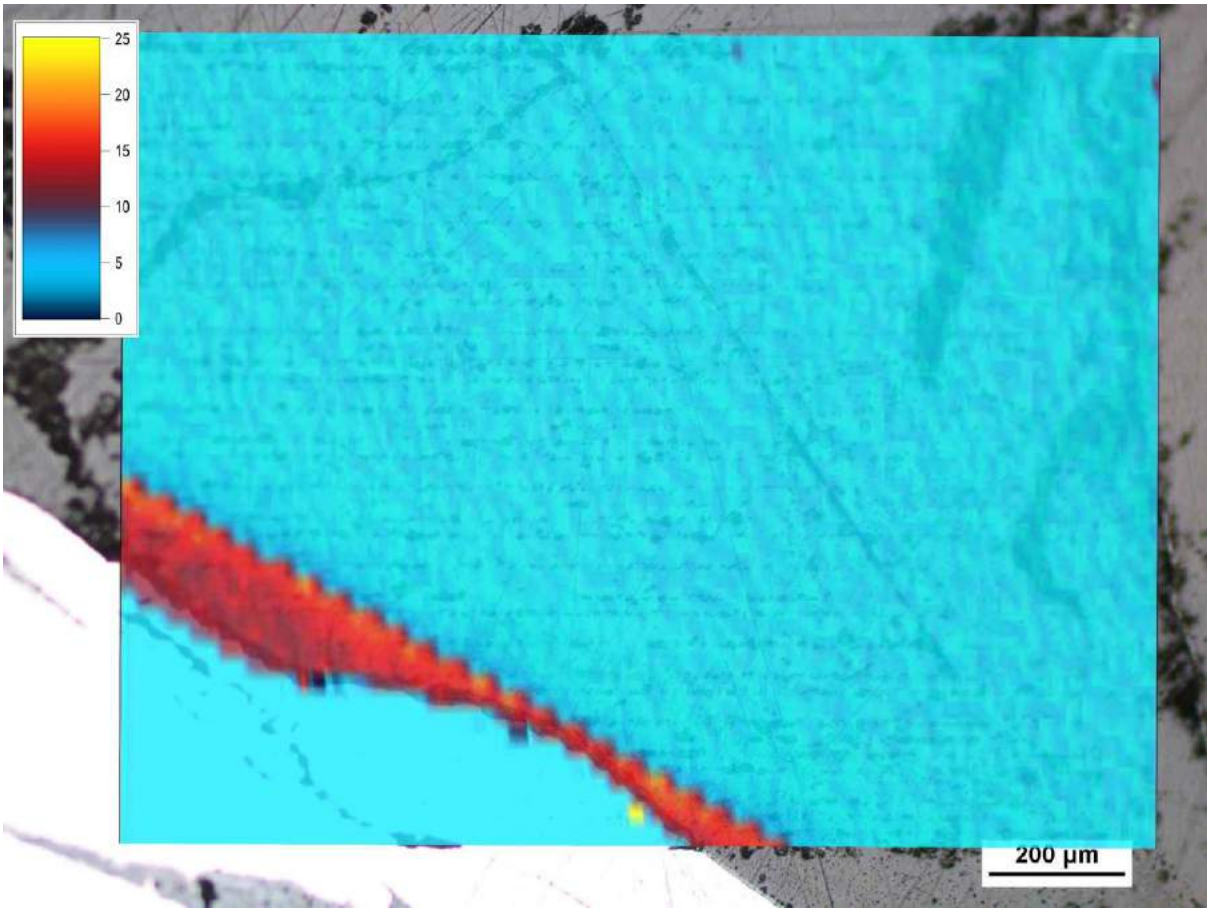

20
15
10
5
0
200 µm


30
25
20
15
10
5
0
200 µm


30
25
20
15
10
5
0
200 µm


16
14
12
10
8
6
4
2
0
200 µm


40
30
20
10
0
200 µm



APPENDIX E: MOUNT IMAGES OF PALLASITE SAMPLES