Geology and Petrology of Core Samples Taken from The Boyd Mine of The Ducktown Mining District in East Tennessee

by
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Abstract

This project investigates the origin of a copper ore deposit in Ducktown, TN, located in the Tennessee Copper Basin. This deposit was a crucial source of copper from the mid to late 1800s through the 1960s. During the peak of production, the economic importance of the deposit attracted numerous geologists to study the rocks of the ore deposits and their surrounding areas. Despite thorough studies conducted at the time, a consensus on the origin of the deposit remained elusive.

Recent advancements in understanding ore mineral formation and analytical methodologies allow a better understanding of the conditions that form copper ores. This project focuses on core samples extracted from the Boyd mine in Ducktown. Utilizing polarized light microscopy, core samples are classified according to their mineralogical relationships. X-ray diffraction (XRD) examines crystal habits and polymorphs, confirming the mineralogical composition.

The minerals in the rocks surrounding the ore form during the regional metamorphism of rocks deposited in an ocean-floor environment. The sulfide minerals that make up the ore suggest a volcanic origin. The structure of the ore deposits suggests the ore was introduced before regional metamorphism, meaning they formed when these rocks were still the ocean floor and were likely along the rift where seafloor spreading was occurring.

Table of Contents

List of Figures

I. Introduction

This project investigates the origin of a copper ore deposit in Ducktown, TN, located in the Tennessee Copper Basin, tucked right in the southeast corner of Tennessee. This deposit served as a crucial source of copper from the mid to late 1800s through the 1960s, with significant economic implications. However, extensive mining and ore processing during this period adversely affected the surrounding landscape and ecosystems. Although efforts have been made to restore the local environment, ongoing challenges persist. During the peak of production, the economic importance of the deposit attracted numerous geologists to study the rocks of the ore deposits and their surrounding areas. Despite thorough studies conducted at the time, a consensus on the origin of the deposit remained elusive.

Recent advancements in understanding ore mineral formation and analytical methodologies allow a better understanding of the geologic conditions that form copper ores. This project focuses on core samples extracted from the Boyd mine in Ducktown. Utilizing polarized light microscopy, core samples are classified according to their mineralogical relationships. X-ray diffraction (XRD) is used to examine crystal habits and polymorphs, thereby confirming the mineralogical composition and potentially discovering minerals not identified by polarized light microscopy.

The rocks under study originate from an area subjected to significant regional metamorphism during the formation of the Appalachian Mountains. By studying the core samples using modern polarized light microscopy and XRD, it is possible to identify the pre-metamorphic rock type and geological setting in which the ores formed. The research

results may be applied to exploration efforts for geologically similar ore deposits worldwide, including critical minerals needed for green energy technologies.

II. Historical Context

The copper deposits in the area were first discovered in 1843 and were being extensively mined by the 1850s. The original ore mined in the area mostly came from the surface and was made up of black copper-bearing rock with copper concentrations estimated to be around fifteen percent by weight. Once this ore began to run out in the 1920s, digging in the area started for a more yellow-gold-colored ore in the rocks below ground, with a much more variable copper content ranging from almost no copper up to around fifteen percent (Ezzell, 2018). This gold-colored ore is found in the core samples available for study. The ore from the Boyd mine has very little copper and was primarily used as an iron mine.

Extracting copper and other metals from the sulfide ore released vast amounts of sulfur dioxide in the air, which reacted with atmospheric moisture to form sulfuric acid and precipitated in the area as acid rain. The acid rain killed off all the remaining vegetation in the area after most of the trees nearby had been used to fuel the smelting furnaces. Additionally, all the mines in the area were open pit mines with many tunnels going underground. Today, these areas are at extreme risk of collapse if they haven't already. This activity left a large area with no vegetation, rapid erosion, contaminated soil, and unstable earth. Because of this, Ducktown, TN, could be seen from space as a large red patch for many years. The effects can still be seen today but have drastically

improved since environmental remediation projects began in the 1960s. Much vegetation has returned, and all mines are permanently closed to the public. Much of the mine waste is still present and leaching harmful contaminants, but they are actively being contained and treated.

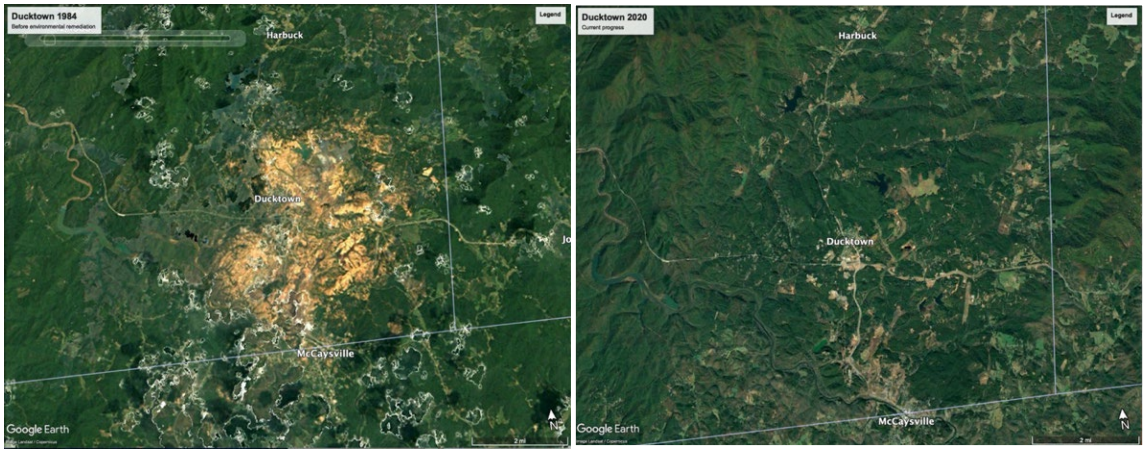

Figure 1. Satellite images of Ducktown, TN, before and after much of the vegetation returned. (Google Earth)

Figure 2. A large pile of mine waste known as slag, is still present in Ducktown, TN, and has even been built on. (Ryan Barnes 01/03/2024)

Figure 3. Leachate runoff from the giant pile of slag that is being contained and treated. (Ryan Barnes 01/03/2024)

Figure 4. A collapsed mine in Ducktown, TN. (Ryan Barnes 01/03/2024)

III. Geologic Setting

The rocks that make up the southern Appalachian Mountains have a long-complicated history spanning over a billion years, including several continents, ancient sea floors, and volcanic activity. The rocks that make up the Appalachian Mountains date from 1.1 billion to 298 million years old. The rock types found in the region include metamorphic rocks, including gneisses, schists, phyllites, quartzites, and marbles; intrusive igneous rocks, such as granites and pegmatites; and sedimentary rocks, such as sandstone, limestone, shales, coal, and conglomerates (Clark, 2007).

The Appalachian Mountains began rising during the Alleghenian Orogeny, a mountain-building event caused by the collision of the North American and North

African tectonic plates between 299 and 251 million years ago (Rafferty, 2007). This event caused the rocks in the area to bend, crack, and push up on each other, forming the mountains we see today. They, however, looked very different from the Appalachians of today as the uplifted rocks were then weathered by glaciers and precipitation, rounding the peaks and forming the familiar ridges and valleys that we are used to seeing today (Dykeman, 2023).

The rocks being focused on in this study come from a small area in the southern Appalachians in Ducktown, Tennessee. They are composed of metamorphosed sandstones, schists, and unusual deposits of sulfide minerals that contain a commercially significant amount of copper. These rocks lie at the crest of an anticline, a large fold in the layers of rock caused by regional stresses during the formation of the Appalachian Mountains. The ore bodies are nearly vertical lenses concentrated along faults within the anticline. Faults are where rock layers have broken and are displaced from their original position.

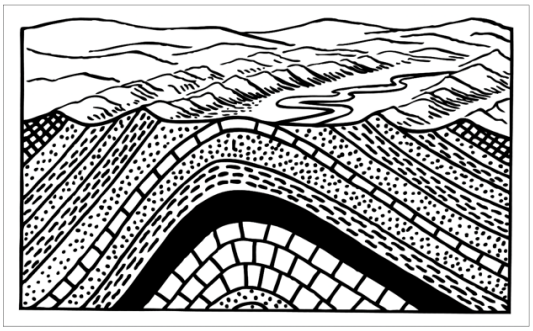

Figure 5. Structural cross-section of an Anticline (public domain)

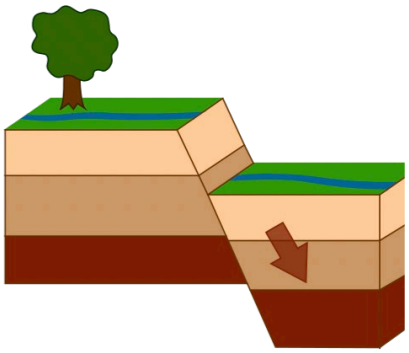

Figure 6. Structural cross-section of a normal fault (public domain)

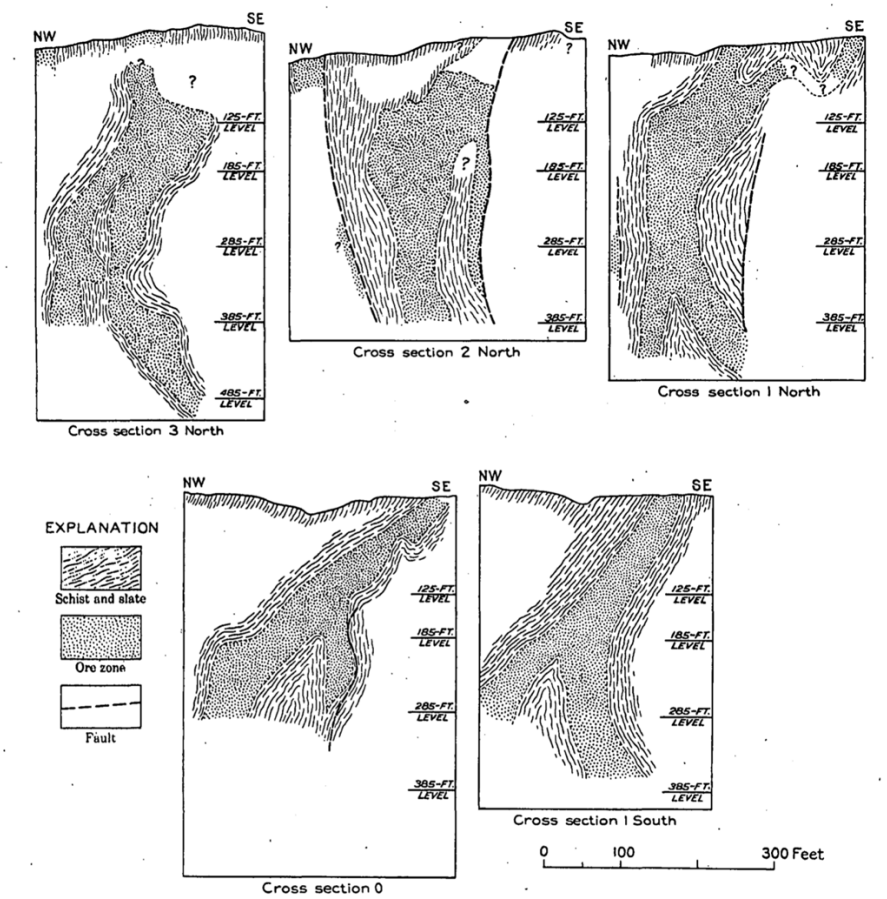

Figure 7. Historical cross-sections of one of the Culchote Vein, which was the target of Boyd Mine (Emmons et al., 1926 fig 13)

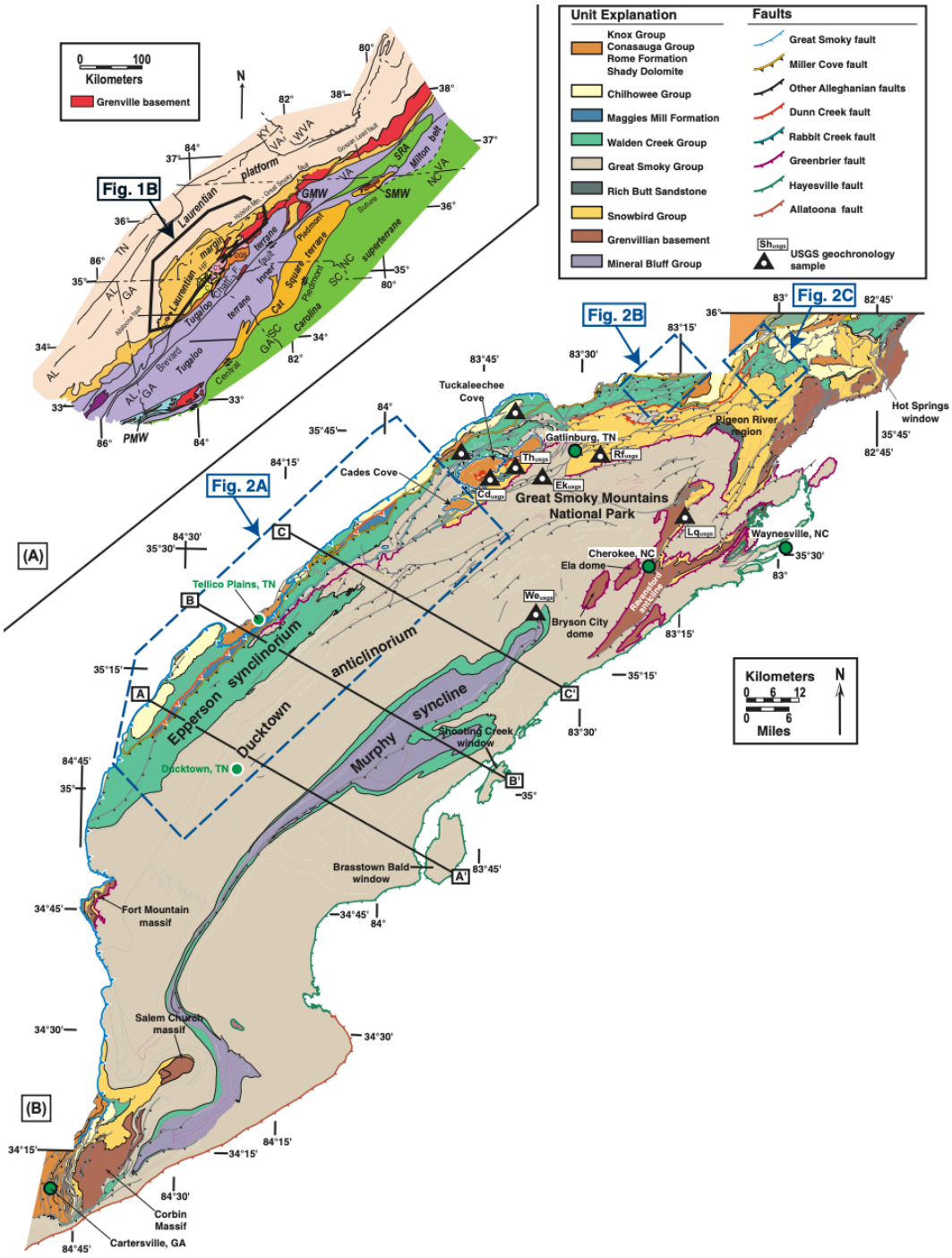

Figure 8. A generalized geologic map of the Southern Appalachians with Ducktown, TN labeled. The rocks under study are part of the great smoky group and come directly from Ducktown, TN. The lines labeled A-A', B-B,' and C-C' have corresponding geologic cross sections in Figure 9. (Thigpen et al., 2016)

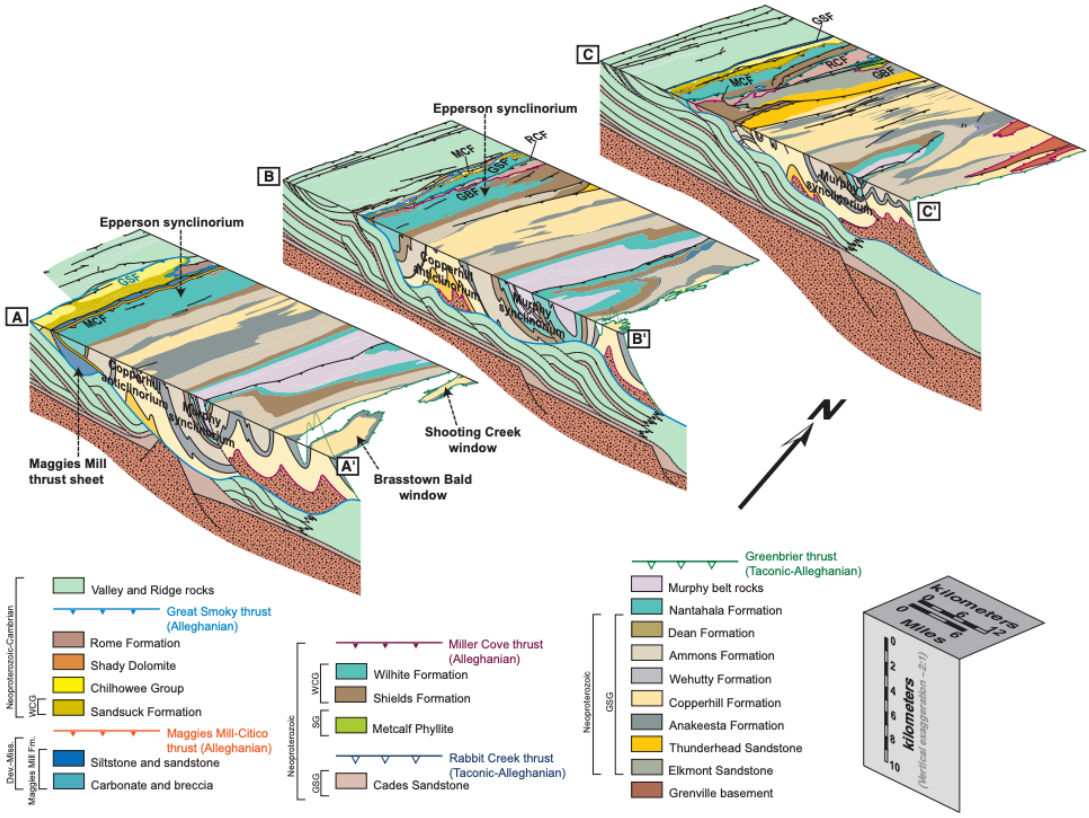

Figure 9. Geologic cross sections from Figure 8. These represent the subsurface structure of the rock formations created during the formation of the southern Appalachian Mountains. The ore bodies are at the crest of the Copperhill anticlinorium in the Copperhill Formation. (Thigpen et al., 2016)

IV. Geologic History

The geologic conditions resulting in the formation of the copper ore have yet to be agreed upon. The biggest question is if the ore deposit formed before or after regional metamorphism during the formation of the southern Appalachian Mountains. The assemblages of the sulfide minerals suggest a volcanic origin, but this would also mean an igneous rock should be immediately associated with the deposit. Still, other processes have modified the accessory minerals and the surrounding rocks so much that a definitive history is challenging to interpret. We know the area underwent regional metamorphism during the formation of the Appalachian Mountains, that there has been contact metamorphism from nearby igneous rocks that are not associated with the formation of the ore, and that hydrothermal fluids have replaced and modified some minerals (Emmons et al., 1926; Ross et al., 1935).

V. Methods

1. Sample Source

The samples analyzed in this project are historic core samples taken from the ore deposits of the Boyd Mine located in Ducktown, TN. These core samples were likely taken in the early half of the 1900s while the Boyd mine was still active. The Boyd mine was not a copper mine but the only iron mine in Ducktown. The cores were donated by the Burra Burra Museum in Ducktown, TN.

2. Polarized Light Microscopy

This analytical method requires preparing the core samples collected from the study area to be made into thin sections. To do this, the core samples, cylinders of rock between one and five inches long with a diameter of about an inch, were cut into rectangular sections slightly smaller than a standard microscope slide. The prepared rock sections were then appropriately labeled and sent to an external lab where the samples were epoxied onto microscope slides and ground to about thirty micrometers thick, enough for light to pass through the translucent minerals in the rocks. The prepared microscope slides were then returned.

The prepared thin-section microscope slides can then be viewed in a petrographic scope, which shines polarized light through the slide rather than regular light as the polarized light interacts with translucent minerals, and these interactions can be used to identify the minerals visible in the slide. The polarized light increases the contrast between mineral grains and provides interference colors that assist in mineral identification. This helps in identifying transparent minerals.

3. X-ray Diffractometry

This analytical method requires the samples to be ground into a fine powder and bombarded with X-rays. The unique chemical composition and crystalline arrangement of atoms in each mineral results in a unique diffraction pattern for each mineral. The

sample diffraction patterns are used to identify minerals not transparent to light and to discriminate among varieties of transparent minerals identified using polarized light microscopy. Each X-ray diffraction peak (measured as a 2-theta angle) represents a specific plane of atoms in a mineral. We obtain a spectrum of diffraction peaks by analyzing diffraction peaks from many crystals at random orientations. The spectrum includes peaks from every mineral in the sample. Comparison of the 2-theta angles to a known database allows for identifying minerals based on their unique chemical compositions and crystal structures.

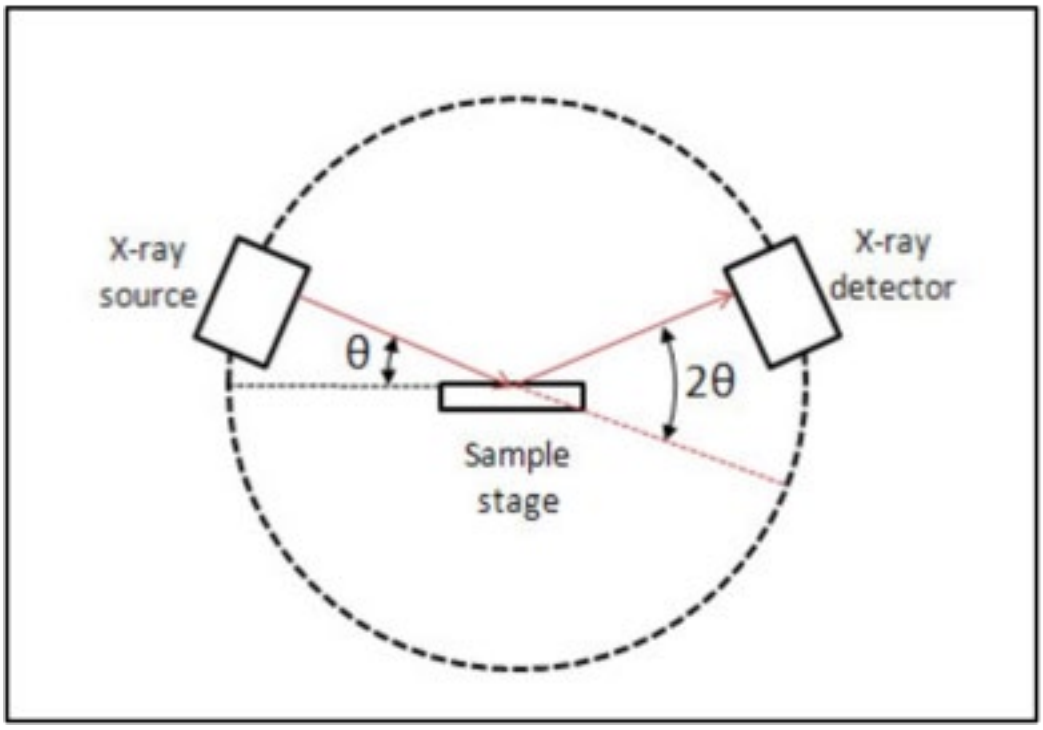

Figure 10. Schematic of XRD components

(https://xrd.co/component-parts-x-ray- diffractometer/)

VI. Polarized Light Microscopy

Each of the following images was taken through a petrographic scope at 4x magnification, and the width of each image is approximately 4 millimeters. Minerals are identified based on crystal shape, interference colors, contrast, and how the polarized light interacts with each crystal as the stage is rotated. The minerals are labeled in each figure in shorthand and are explained in the figure captions. Listed below are the minerals identified in thin section.

Actinolite (ac) - $Ca_2(Mg_{4.5–2.5}Fe^{2+}_{0.5–2.5})Si_8O_{22}(OH)_2$

Anorthite (an) - $CaAl_2Si_2O_8$

Apatite (an) - $Ca_5(PO_4)$

Calcite (ca) - $CaCO_3$

Diopside (di) - $CaMgSi_2O_6$

Garnet (ga) - $R_3R_2(SiO_4)_3$

Quartz (qr) - SiO_2

Titanite (ti) – $CaTiSiO_5$

Tremolite (tr) - $Ca_2Mg_5Si_8O_{22}(OH)_2$

Zircon (zr) – $ZrSiO_4$

Figure 11. This image represents the mineral assemblage above the ore zone. The most prominent feature is the parallel pale green-brown actinolite (ac) crystals. This indicates the mineral formed under intense pressure, causing the preferred orientation. Also present are tremolite (tr) crystals, which share the parallel orientation and are an alteration product of actinolite (ac). Quartz (qr) is visible and fills spaces between the actinolite (ac). Brightly colored zircon (zr) crystals are spread throughout the actinolite (ac) and are surrounded by halos caused by radiation damaging the surrounding actinolite (ac). The

black crystals are opaque minerals that cannot be identified and are either native metals, oxide minerals, or sulfide minerals.

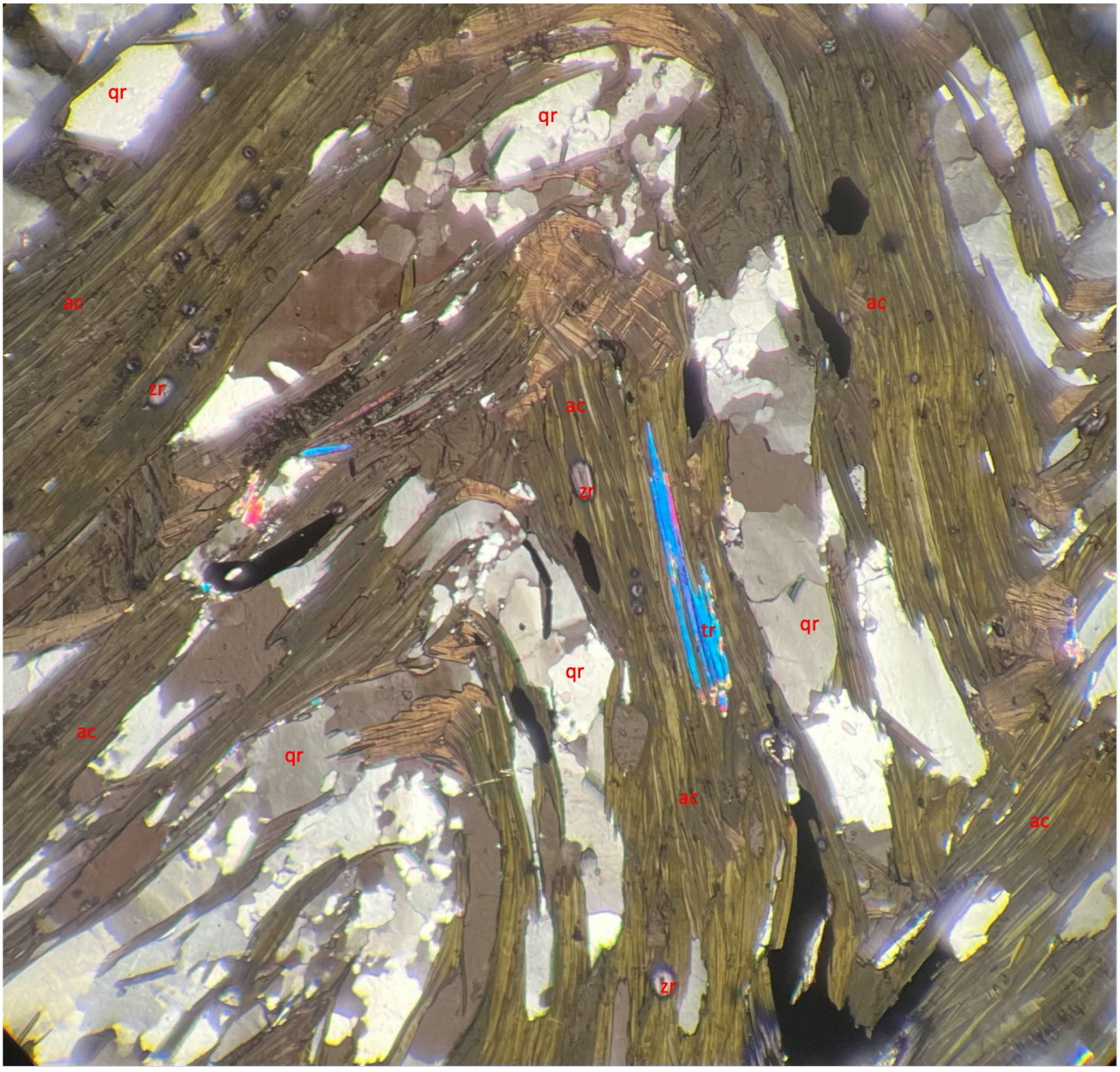

Figure 12. This image is still above the ore zone but closer. The minerals remain the same, but there is more quartz (qr), which appears more fractured and broken up. The actinolite (ac) and tremolite (tr) have bent and broken on a microscopic scale, producing

a texture known as crenulation. This means additional forces (likely due to local faulting in the ore zone) were applied after the formation of the parallel crystals, bending them.

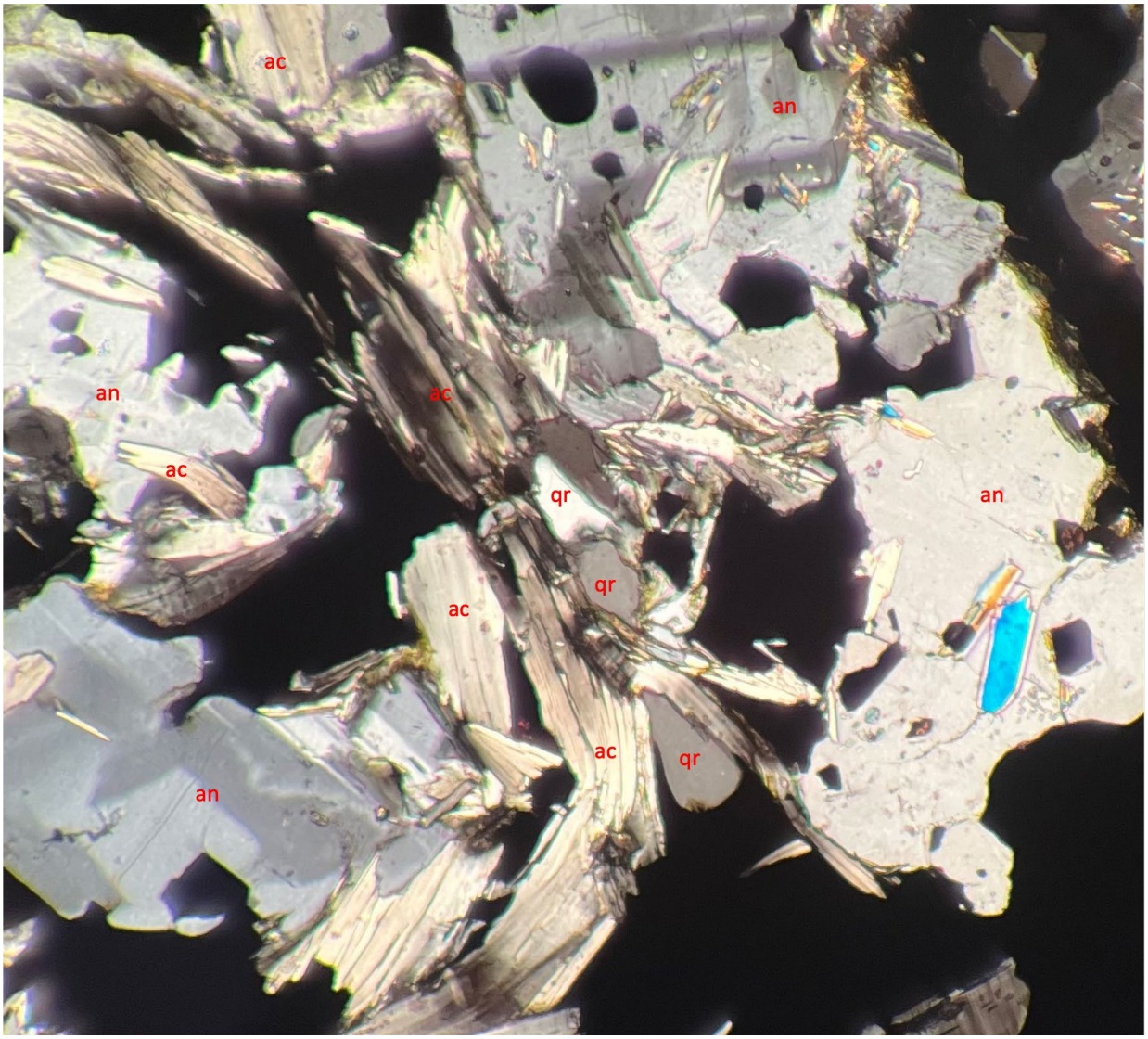

Figure 13. This image comes from the top of the ore zone. We can see bent and broken actinolite (ac) crystals with anorthite (an) and opaque minerals filling the cracks. The anorthite (an) also contains inclusions of actinolite (ac) and opaque minerals. Some grains of quartz (qr) with the actinolite (ac). This appears to be a fault breccia. These minerals were likely broken apart by the local faulting, which allowed the anorthite (an) to fill in the gaps created by this process.

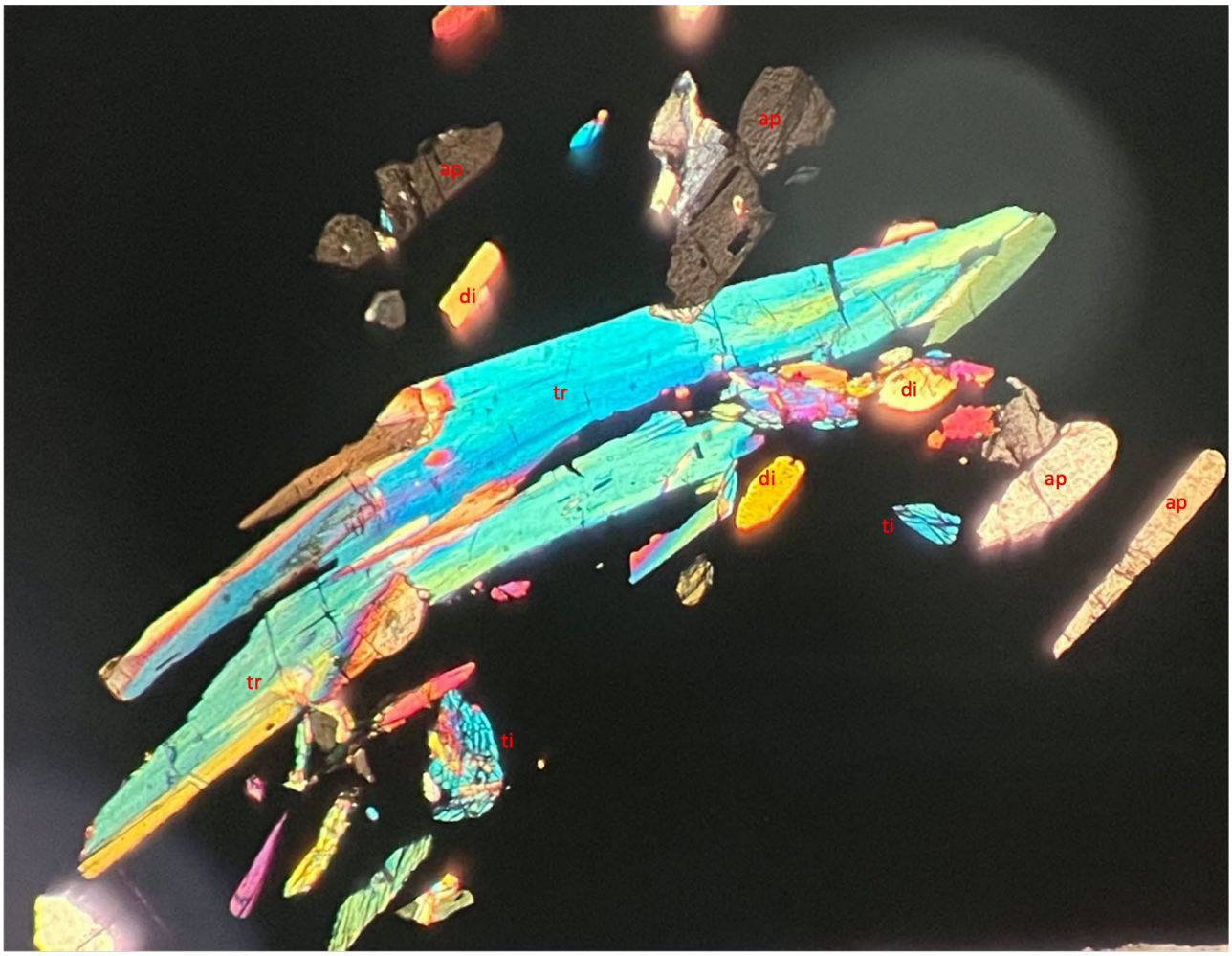

Figure 14. This image comes from the ore zone. The most prominent feature is the bent and cracked tremolite (tr) crystal, indicating the forces applied. There are also fractured apatite (ap) crystals, some having inclusions. Additionally, there are minor well-developed diopside (di) and titanite (ti) crystals with distinctive cleavage.

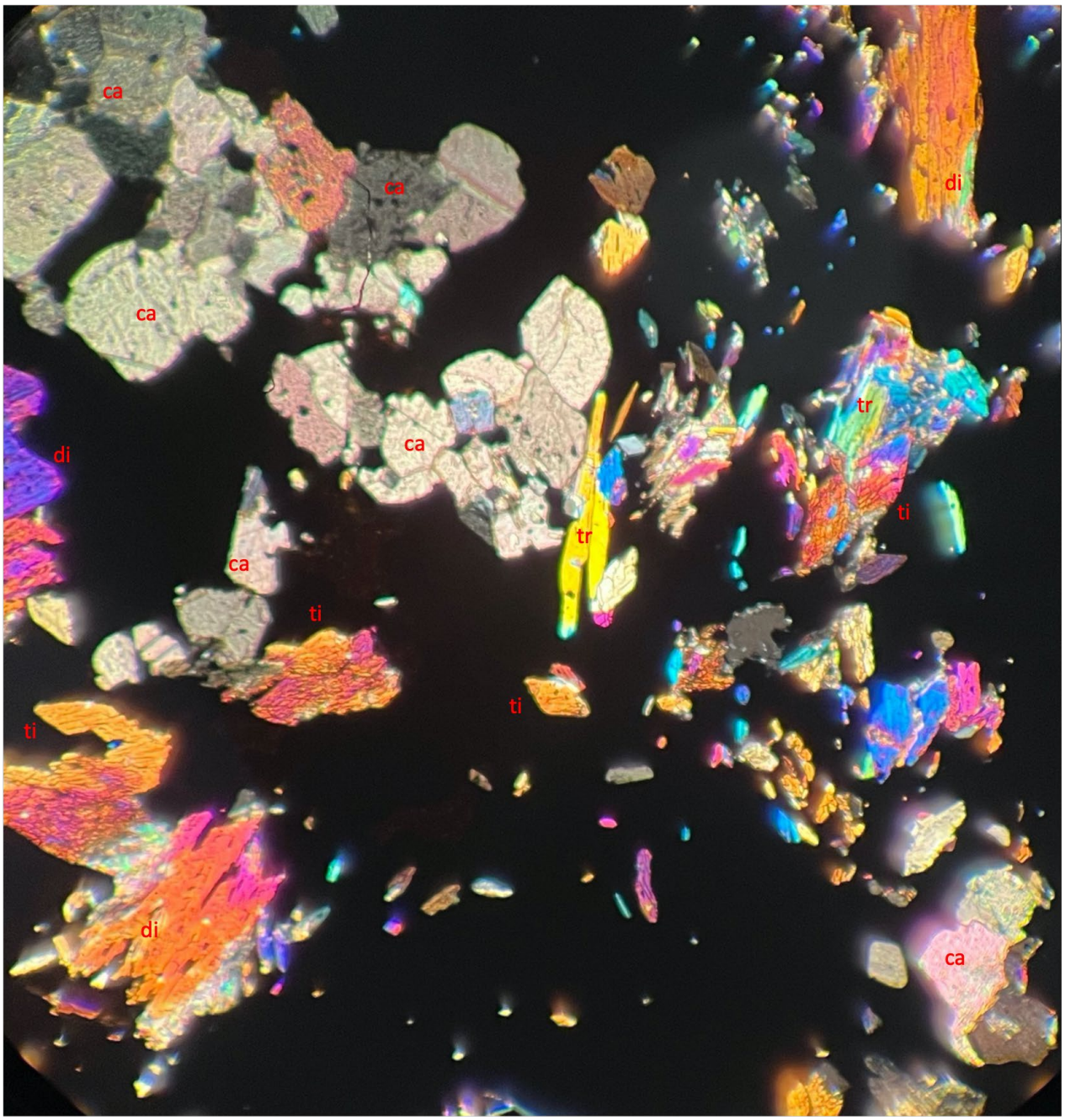

Figure 15. This image comes from deeper in the ore zone. Some larger diopside (di) and titanite (ti) are present with the smaller tremolite (tr), with some appearing intergrown and partially dissolved. We also see calcite (ca), which does not show evidence of regional metamorphism and appears texturally to have been hydrothermally altered.

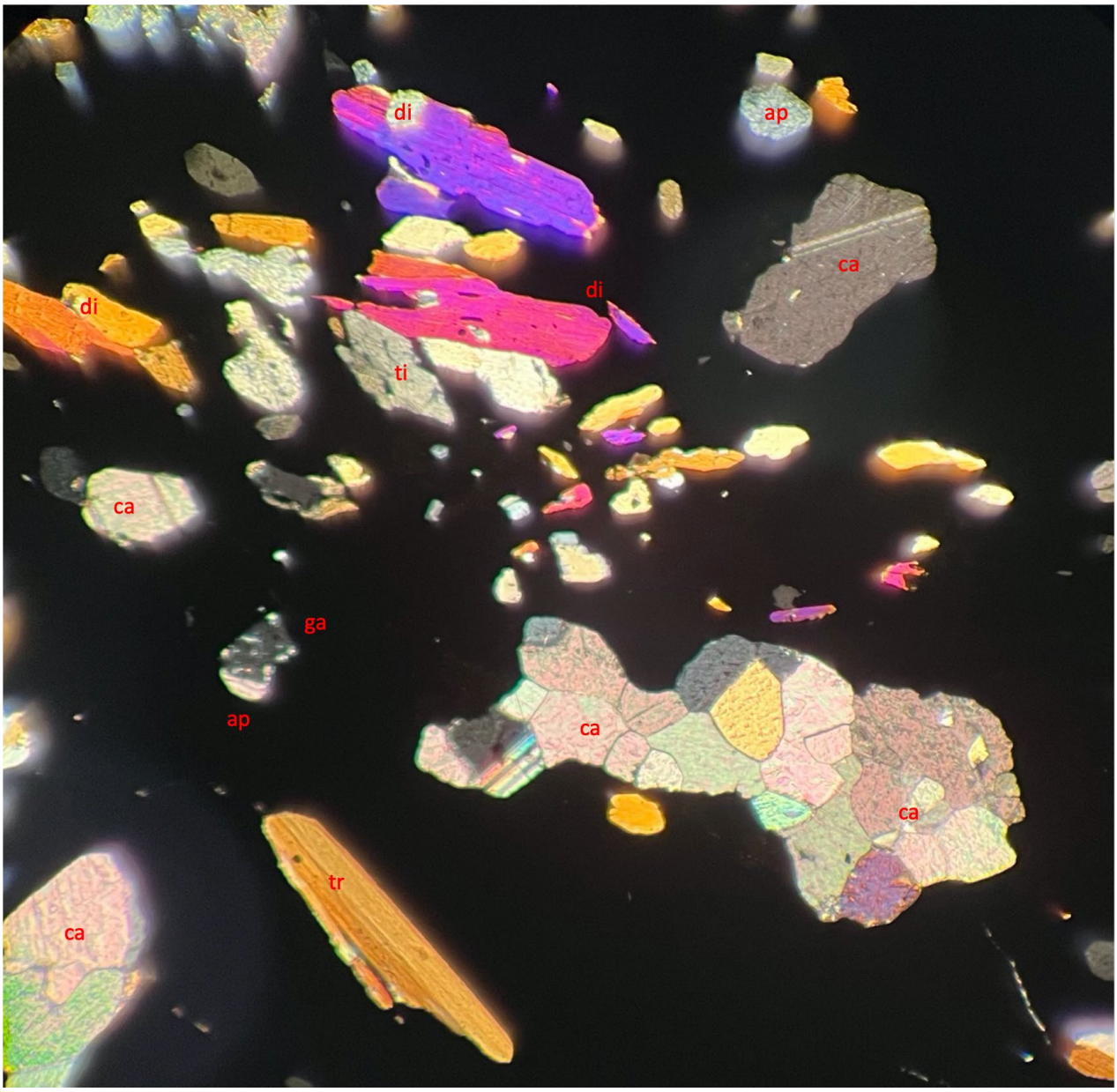

Figure 16. This image comes from the lower ore zone. The diopside (di), titanite (ti), and calcite (ca) are present. Small garnet (ga) crystals are also present, and one has partially replaced an apatite (ap) grain. The diopside (di) crystals appear larger and more well-developed, and the calcite has less hydrothermal alteration.

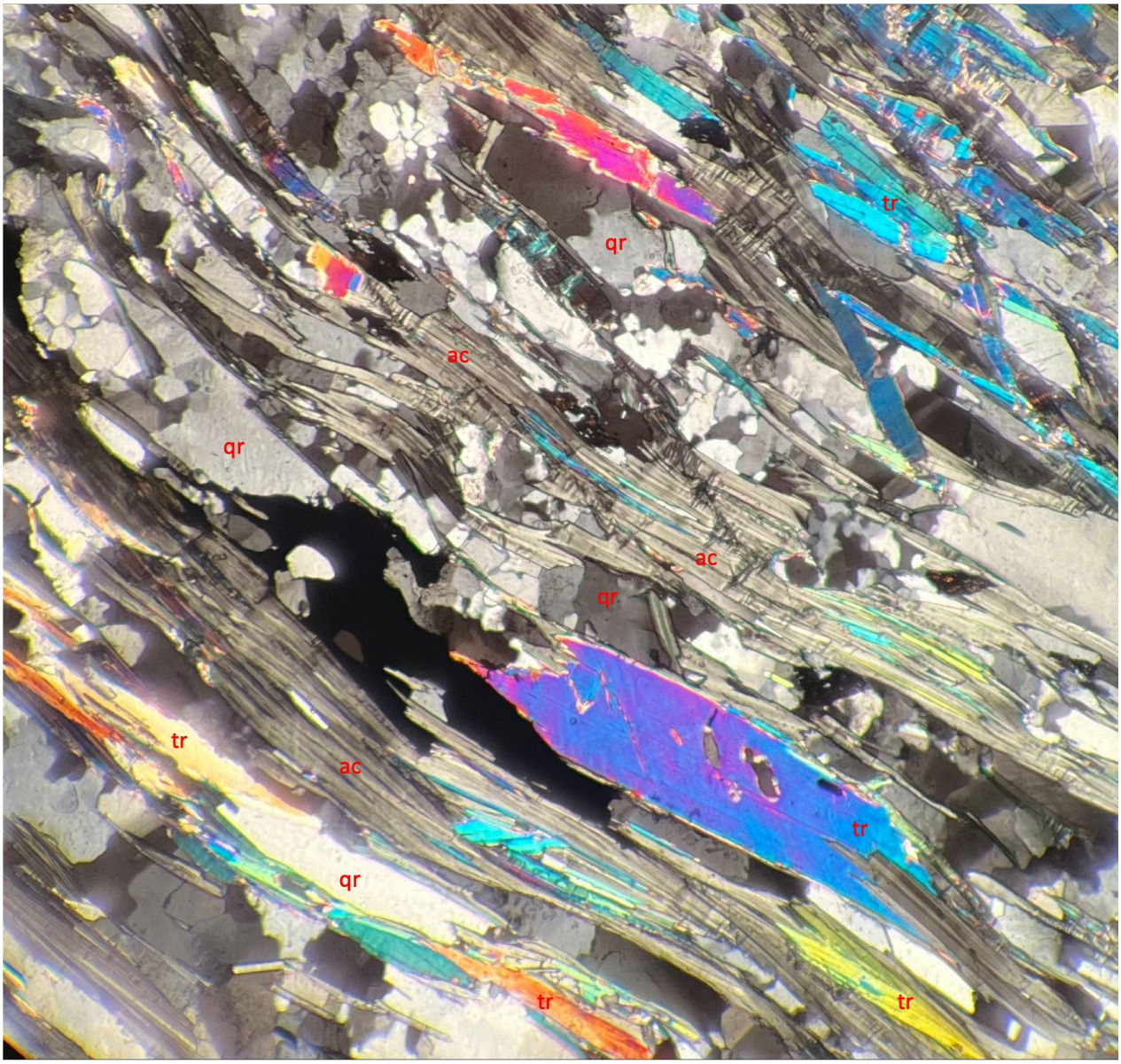

Figure 17. This image comes from below the ore zone. These samples exhibit the same mineralogy as above the ore zone, but the actinolite (ac) and tremolite (tr) show evidence of alteration by hydrothermal fluids. Quartz (qr), and opaque minerals occupy the spaces between them.

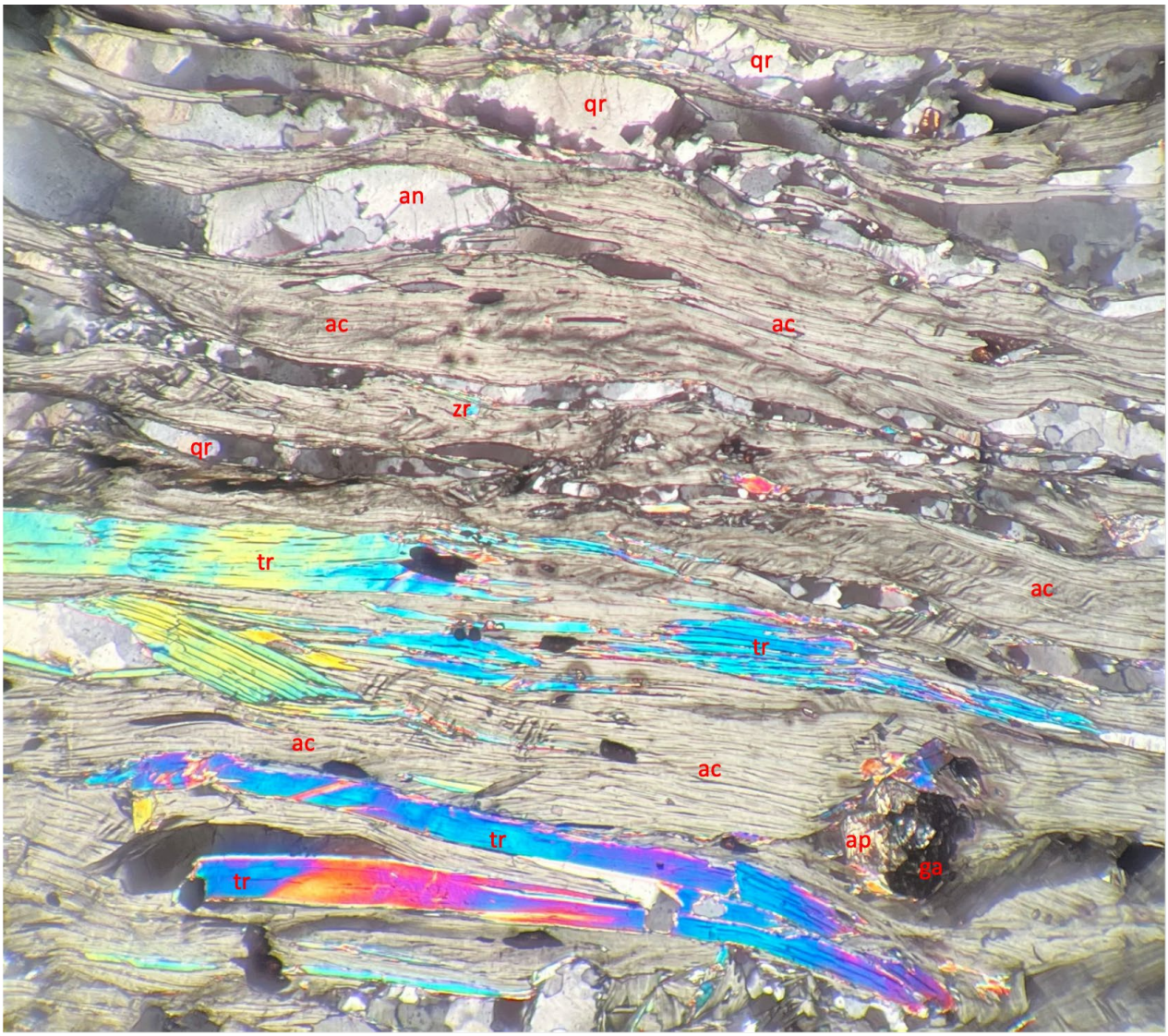

Figure 18. This image comes from a sample even deeper beneath below the ore zone. There is less quartz (qr) and anorthite (an), and a garnet (ga) is embedded in the finer-grained actinolite (ac) and tremolite (tr). It appears to be replacing an apatite (ap) crystal.

VII. X-ray Diffractometry

XRD results were similar throughout the core sample; the same peaks were picked up in each sample at various intensities. Representative spectra from above, below, and within the ore zone were chosen for annotation. The XRD confirmed the presence of actinolite, tremolite, pyrrhotite, and pyrite (an iron sulfide mineral also known as fool's gold). With more elemental data, the software can make more accurate deductions to identify more peaks as different minerals, as many peaks represent several minerals.

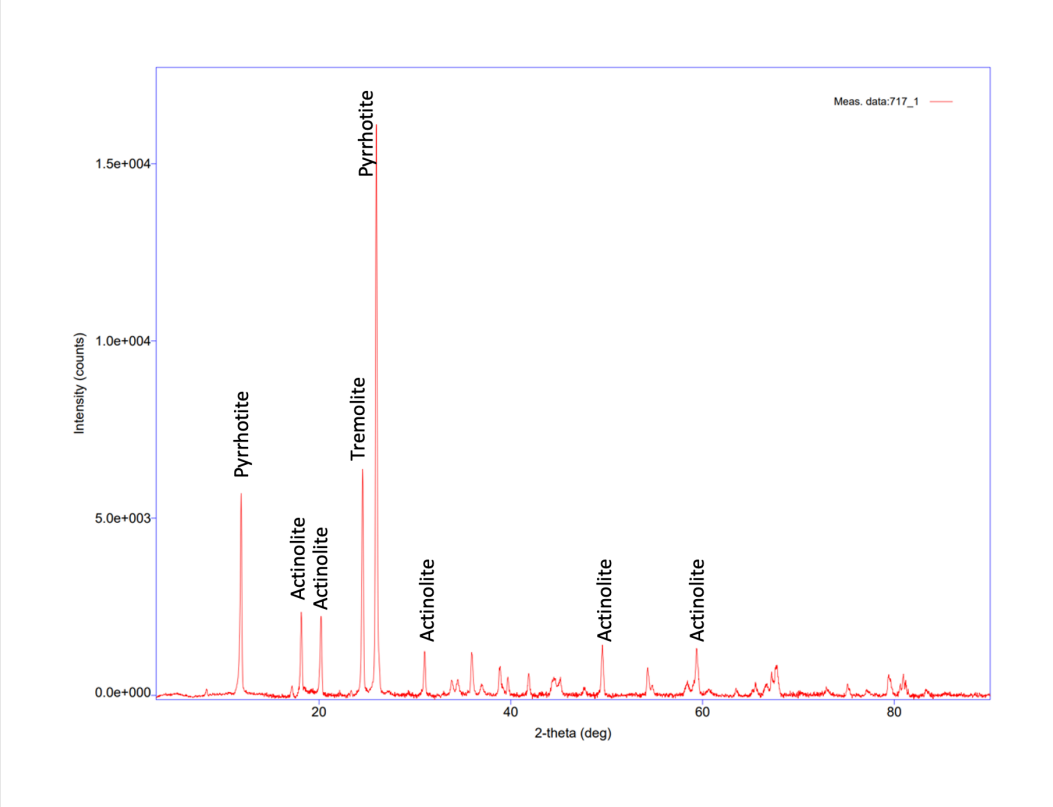

Figure 19. Annotated XRD spectra analysis of above the ore zone.

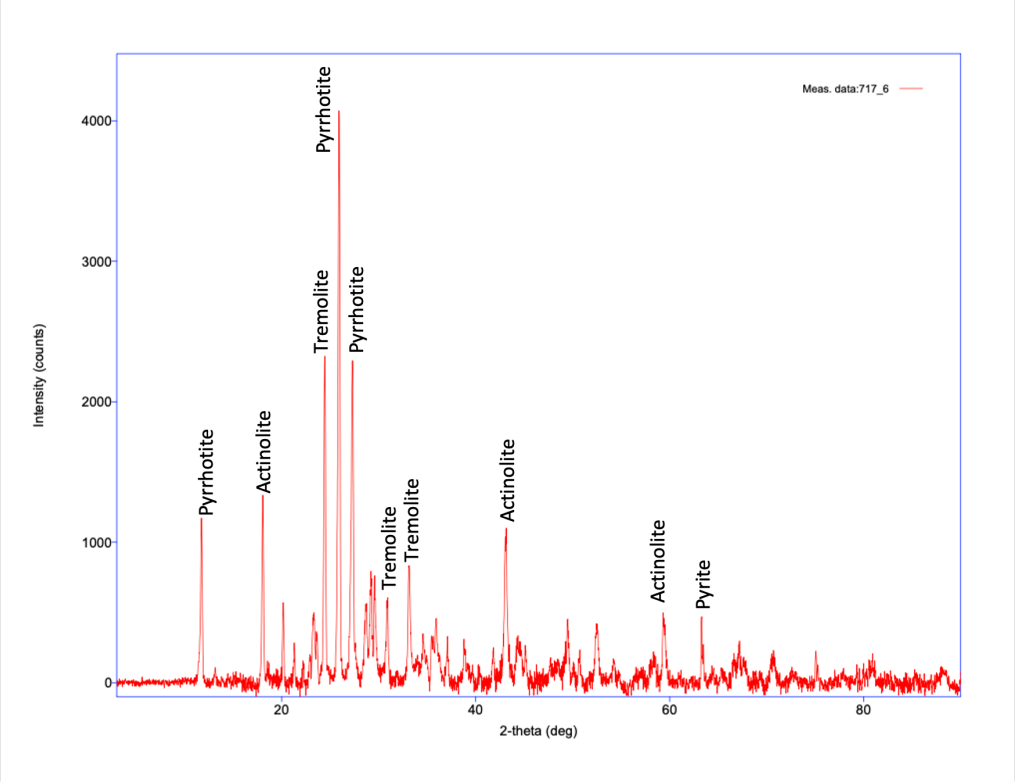

Figure 20. Annotated XRD spectra analysis of the ore zone.

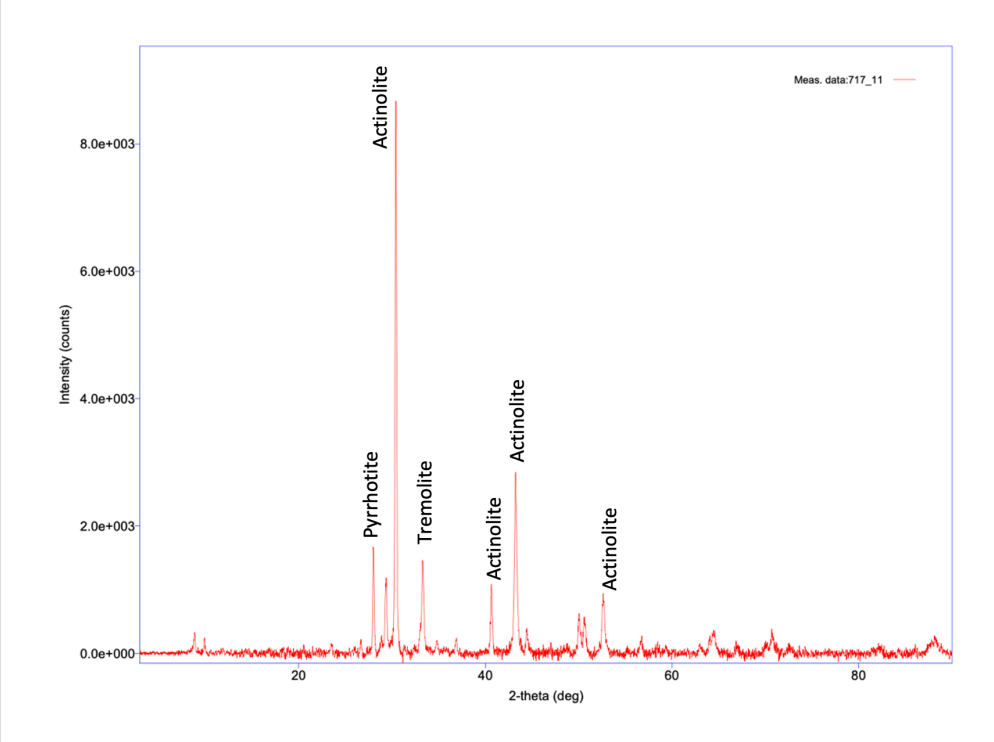

Figure 21. Annotated XRD spectra analysis of below the ore zone.

VIII. Interpretations

The pyrrhotite-rich ore suggests this is a Volcanically Hosted Massive Sulfide deposit (VHMS). The high amount of iron in the sulfide minerals also indicates that the volcanic system had to be mafic, which means it had much iron. These deposits form below the surface of the ocean floor in areas of active tectonic activity (Mcphie et al., 2015),

Actinolite is a common metamorphic mineral in metamorphosed marine sediments and is easily altered to tremolite (Haldar, 2020). The bent and broken crystals filled with the sulfide minerals suggest that actinolite or the minerals altered to actinolite were present when the sulfide was introduced. The sulfide was likely introduced while the rocks were beneath the sea floor before the regional metamorphism.

Quartz and zircons resist mechanical weathering and metamorphic processes and are common in marine sediments (Malode, 2022). Meaning these are likely leftover remnants of the original ocean floor sediment.

Anorthite is a mineral formed in the metamorphism of calcium-rich rocks or ultramafic igneous rocks (Haldar, 2020). It is likely a product of the super-heated fluids containing the sulfides interacting with the host rock or a later event that introduced hydrothermal fluids.

Diopside and titanite can form in igneous rocks and contact metamorphism (Haldar, 2020). The crystal shapes, lack of inclusions, and exclusivity in the sulfide suggest that these minerals formed with or after the sulfide.

Apatite is found in all rock types, and since it is found throughout the core samples, it was likely present in the marine sediments; apatite can turn into garnet through intense heat and pressure (Malode, 2022).

Calcite is a soft mineral very susceptible to dissolution and deposition by fluids (Malode, 2022). The calcite present in the samples does not appear to have been strained through regional metamorphism. This means the calcite present likely formed much later after regional metamorphism.

Based on the evidence, mafic volcanism likely introduced the pyrrhotite into calcium-rich marine sediments before the regional metamorphism. During regional metamorphism and the anticline formation, there was a period of local faulting at the sulfide lenses. After this, several events continued altering the rocks and their minerals. Further study is needed to determine the specific volcanic mechanism, the following sequences of alteration, and the relative dating of said events.

IX. Summary

This corner of Tennessee was the site of one of the worst ecological disasters in the history of this state. The rocks that were mined have a long and complex history. The story likely starts in a paleo-ocean near a rift at a mid-ocean ridge. The mantle's magma upwelling likely super-heated water in the sediment while enriching it with sulfide minerals. The fluids then dissolved some portion of the sediment and deposited the sulfide minerals in its place. These rocks were then buried under more sediment, which led to the beginning of regional metamorphism. Eventually, the paleo-ocean began to

close, leading to the Alleghenian orogeny and further regional metamorphism, with the bending of the rocks and crystals seen in thin sections. The faulting also likely occurred around this time as well. After this several more stages of alteration modified some accessory minerals and introduced some new ones, such as the anorthite filling in the fault breccias, and the introduction of calcite.

These are just preliminary deductions based on thin section analysis and XRD spectra analysis, which will likely change in further study. No igneous rock in the area has been associated with these ore deposits to facilitate being introduced volcanically. There is a metamorphosed mafic igneous rock in the area that could be responsible (Emmons et al., 1926). However, it was written off by previous geologists because they believed the ore to have been introduced after the formation of the Appalachian Mountains. With these new interpretations, the igneous rock may be responsible, but samples will need to be located and analyzed for a definitive answer.

X. Future Direction

Further work needs to be done on the surrounding rocks in the area as they may contain more clues as to a definitive origin. Additionally, elemental composition data will be collected on these samples as trace elemental composition could fill knowledge gaps as specific systems produce certain trace elements. The additional elemental data would assist in more accurate XRD interpretations and the identification of more sulfide minerals present. The additional XRF data will be added to the data and interpretations of this report and worked into a manuscript to be published.

Glossary

Cleavage – a planar surface determined by a crystal lattice structure.

Core samples - cylinders of rock taken for various study reasons; in the mining industry, they are mostly taken to check ore quality.

Igneous rock - rock formed by lava or magma that has cooled and solidified.

Intrusive igneous rock – crystallized from magma slowly cooling underground.

Mafic – refers to the color and chemical composition of an igneous rock that is dark colored and contains high concentrations of iron and magnesium.

Metamorphic rock – a rock altered by heat and or pressure.

Orogenesis - the process in which various ore bodies form.

Orogeny is when the earth's crust is bent and deformed to form a mountain range.

Relative dating determines when a rock or geologic feature formed with respect to the rocks immediately surrounding them, such as what was there first, second, third, etc., and no numerical dates are assigned.

Rift – a separation of tectonic plates.

Sea Floor spreading – an area where upwelling magma creates new oceanic crust, pushing the two oceanic plates apart and forming mid-ocean ridges.

Sedimentary rock - made up of sediments that have been cemented together over time.

Sulfide mineral - a mineral with sulfide as the principal anion present, which in most cases is bonded to a metal cation, making these minerals typical targets for mining operations.

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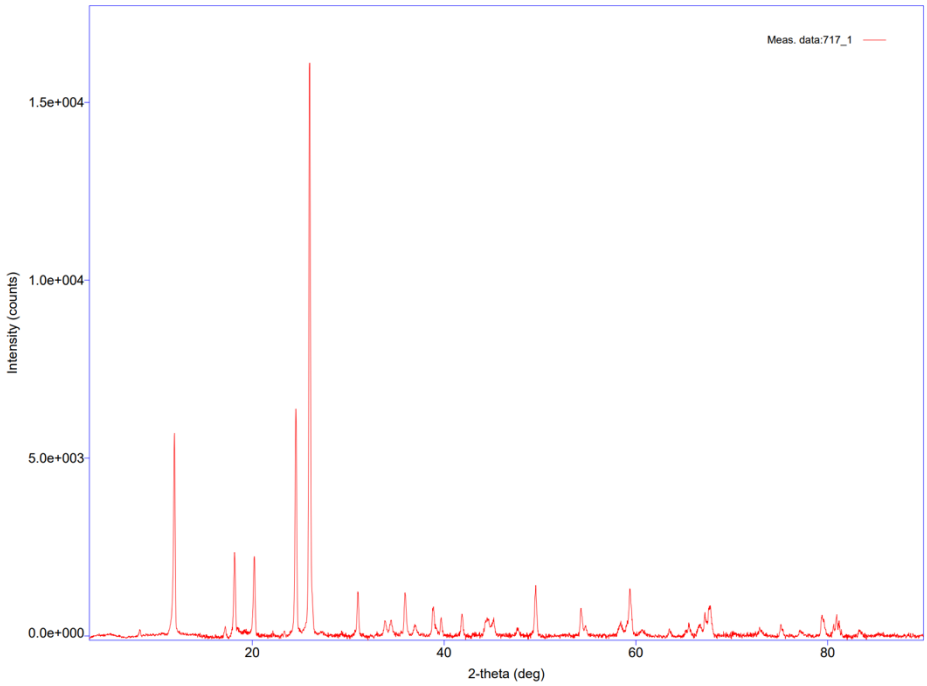
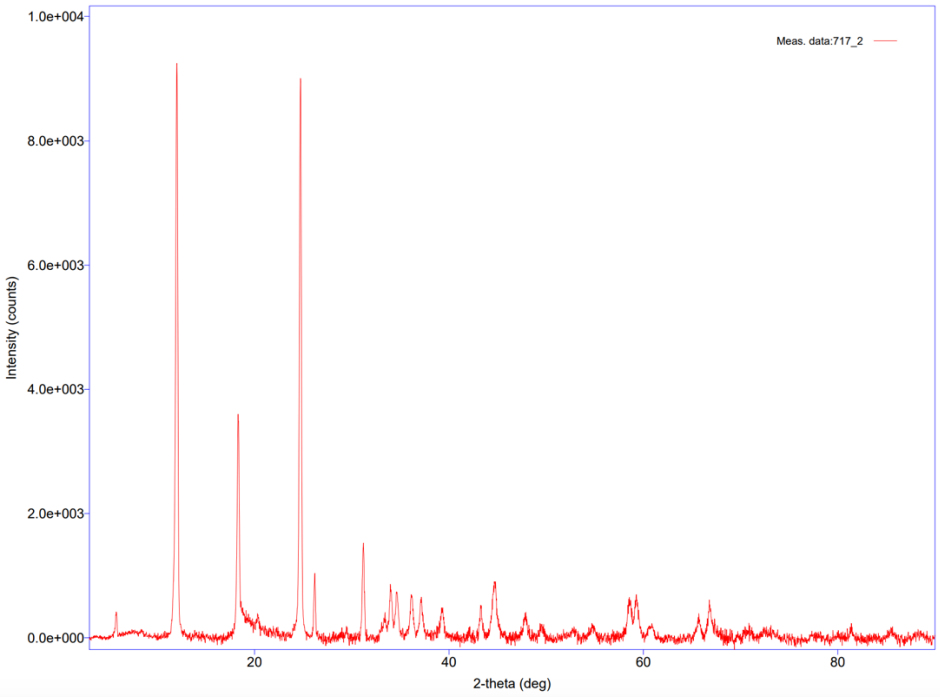
Appendix

The following are the XRD spectra with corresponding tables with minerals indicated. You descend the core sample with the top graph representing the top of the core sample and the last graph representing the bottom of the core sample. Listed in the tables are the minerals the software assigns to each peak, with the closest match being the first listed for each peak.



No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



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2	11.869(2)	Unknown
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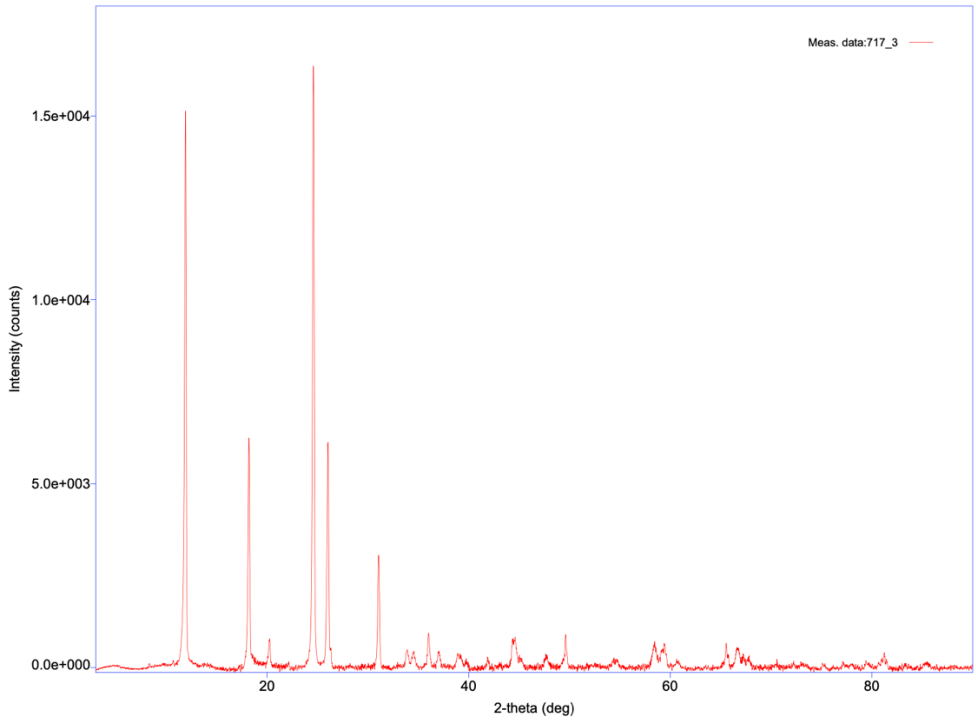
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



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2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
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26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
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30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
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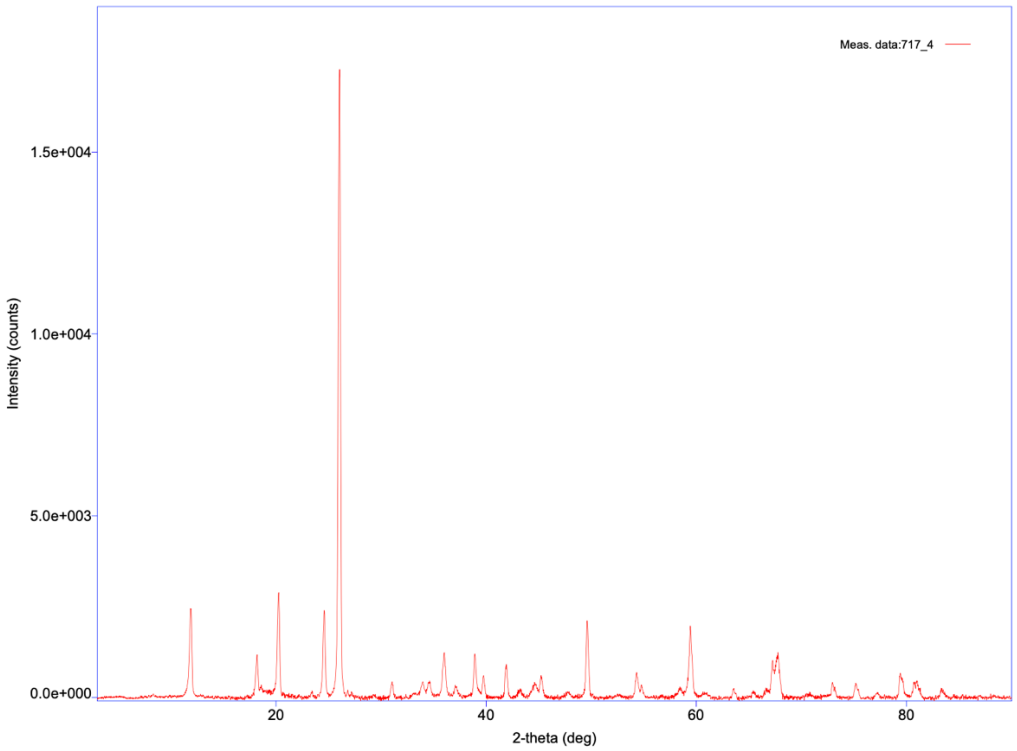
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



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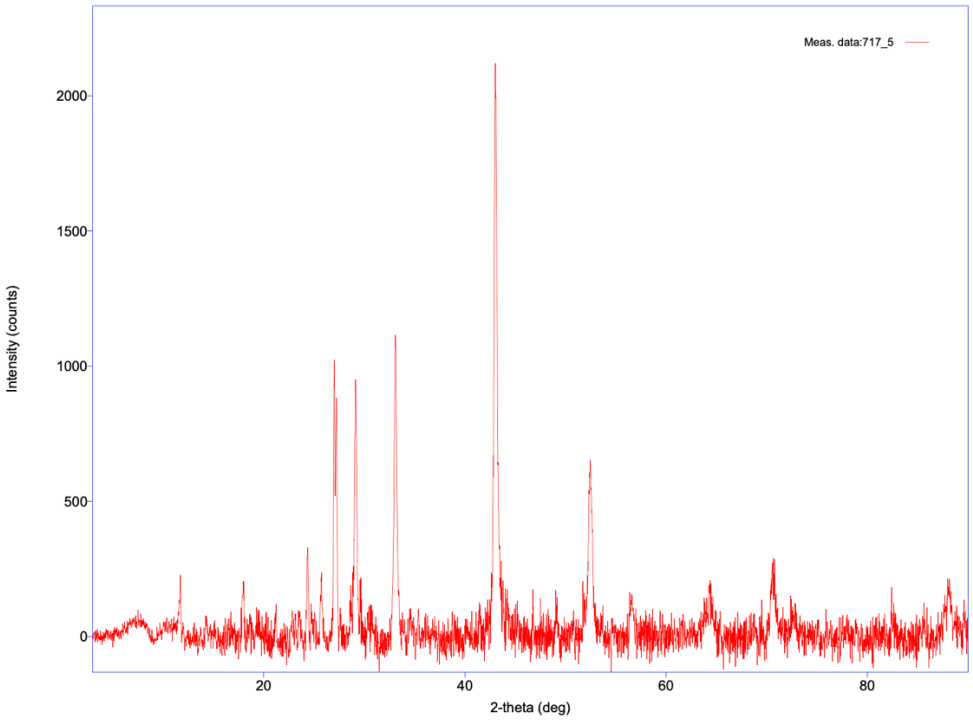
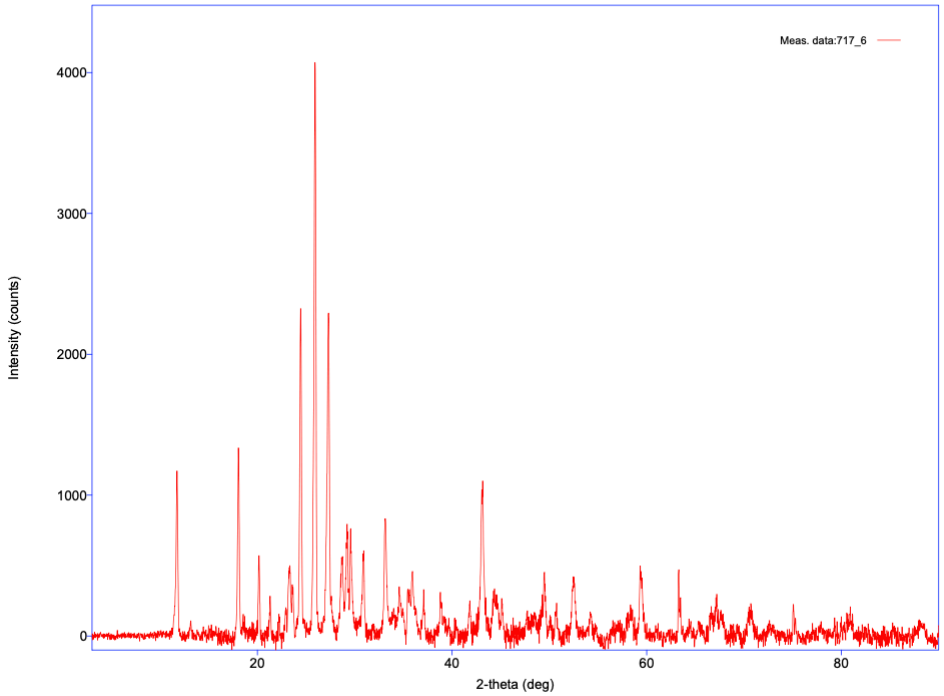
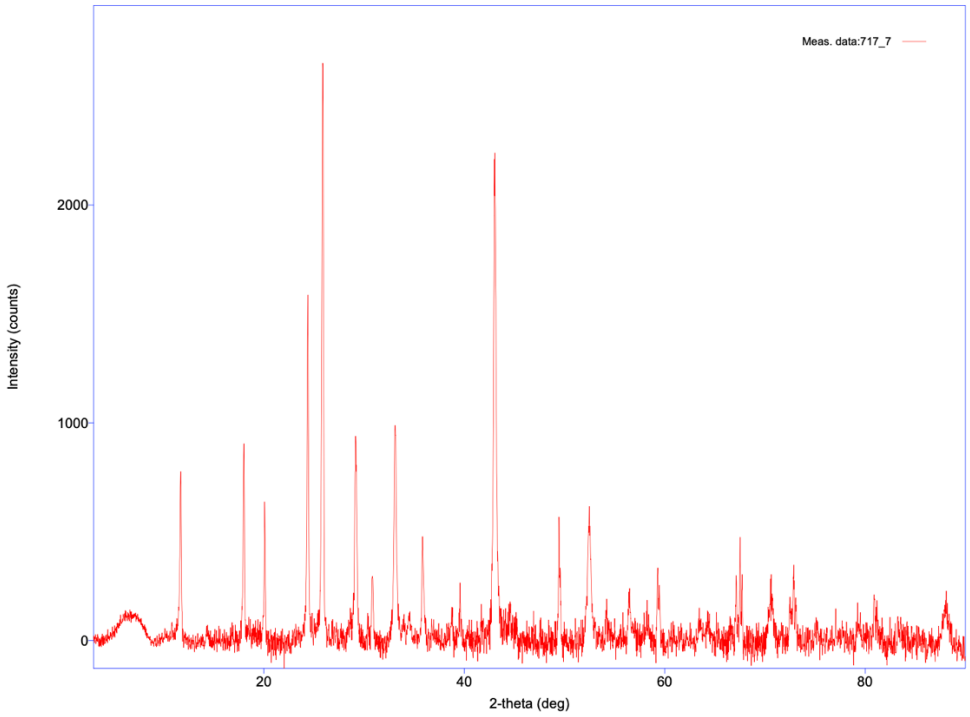
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



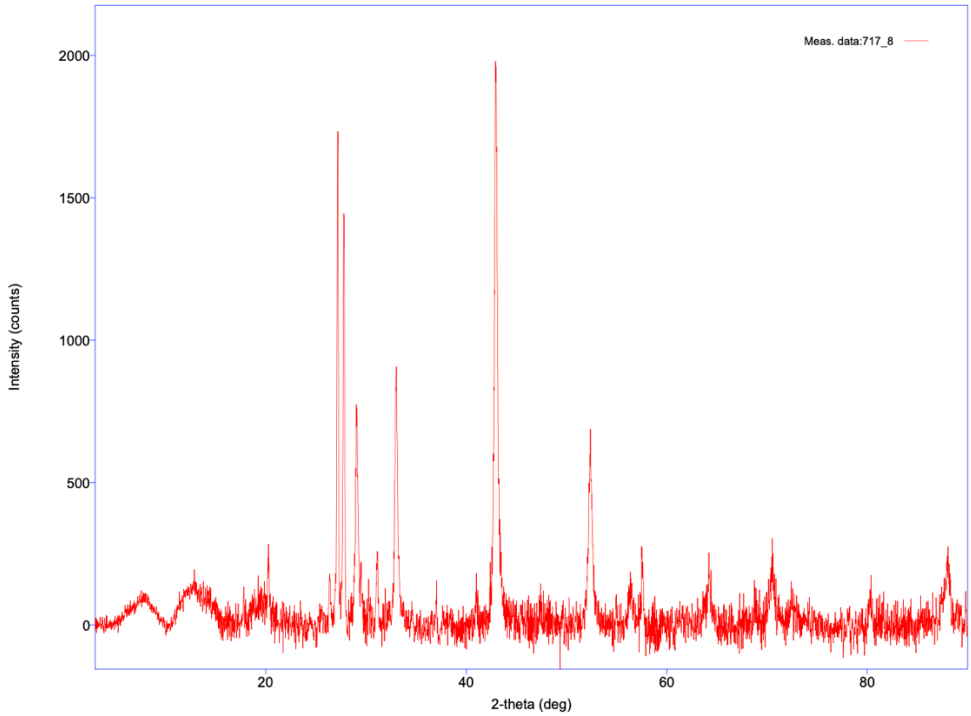
No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



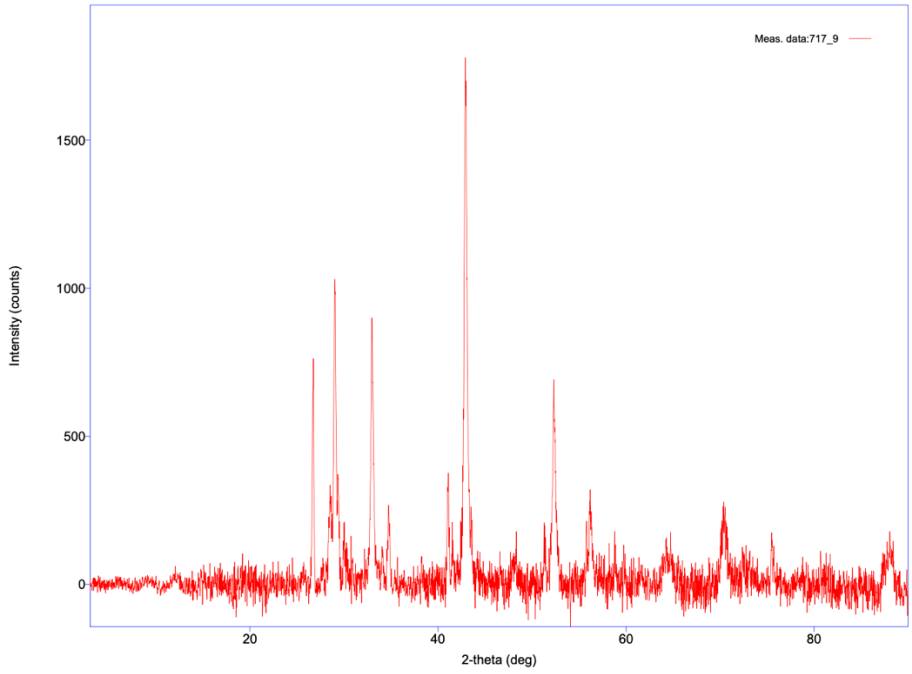
No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



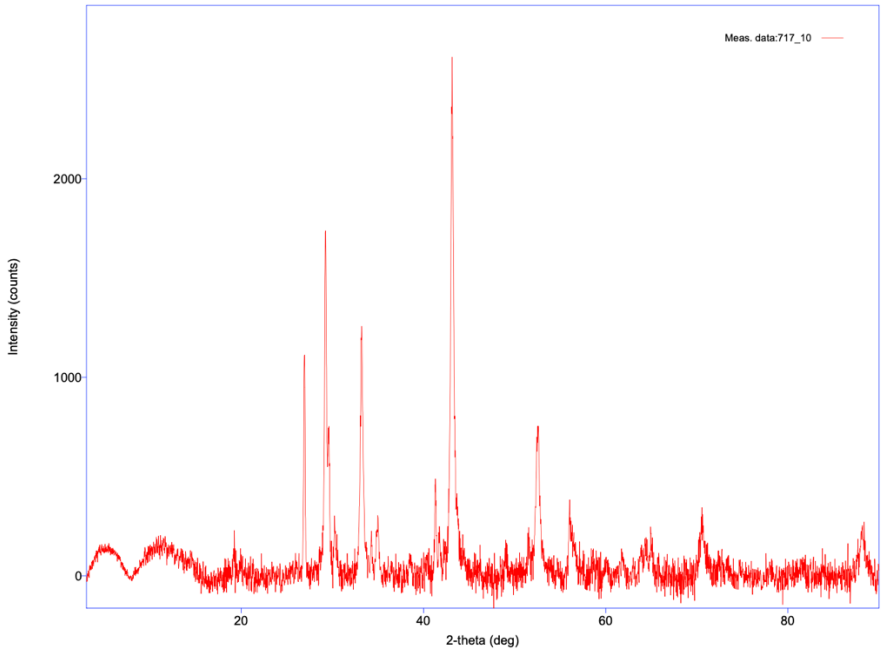
No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



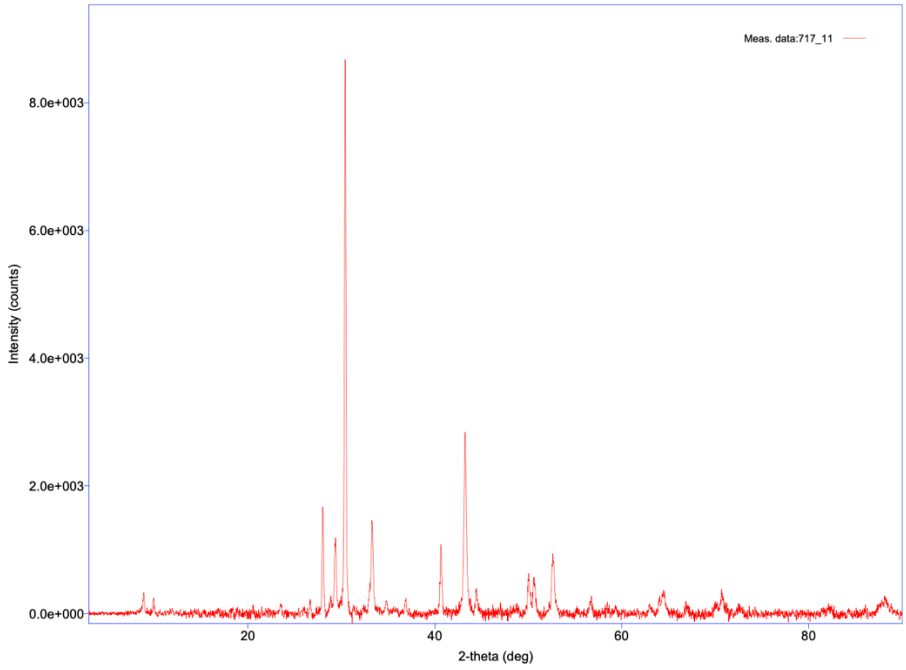
No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



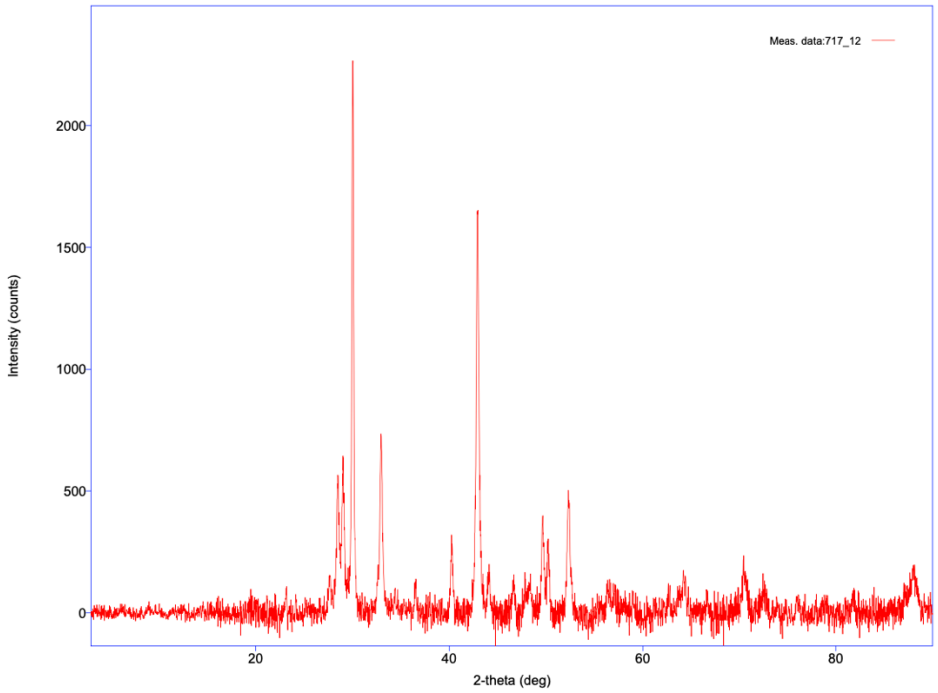
No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



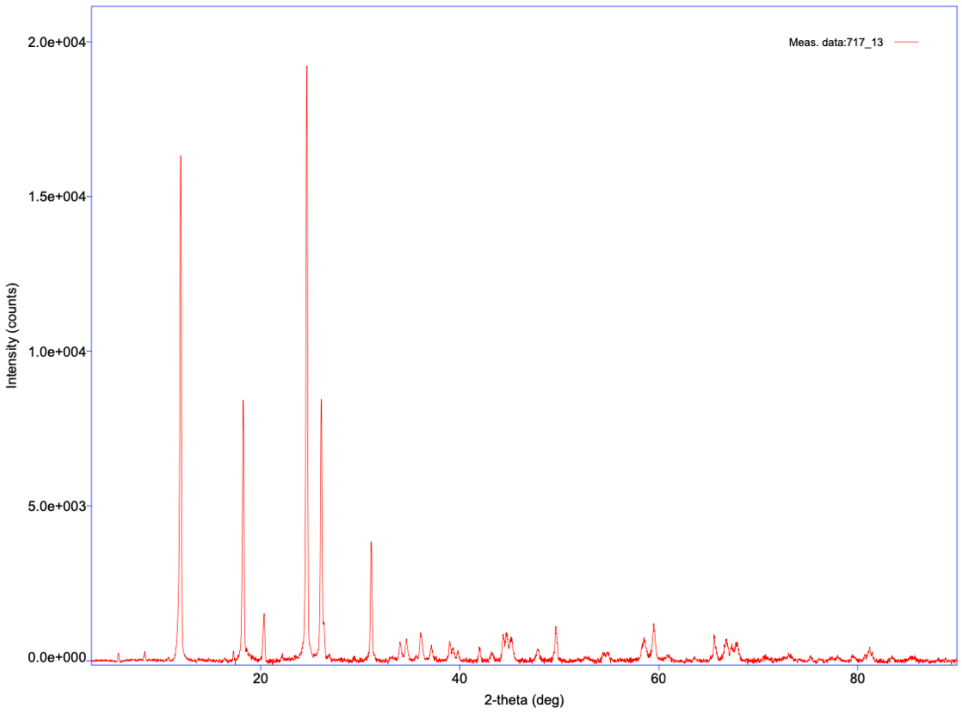
No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2) Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)



No.	2-theta (deg)	Phase name
1	8.28(2)	Unknown
2	11.869(2)	Unknown
3	17.15(3)	Pyrrhotite 6C(0,2,3)
4	18.154(8)	Actinolite(1,1,-1),Apatite-(CaCl) (OH-bearing)(1,1,0)
5	20.203(6)	Actinolite(0,2,1),Pyrrhotite 6C(0,2,5),Tremolite(0,2,1),Zircon(1,0,1),Titanite(0,2,0)
6	23.304(10)	Tremolite(1,3,-1)
7	24.539(2)	Tremolite(2,2,-1),Hematite(0,1,2)
8	25.960(3)	Pyrrhotite 6C(0,2,8),Apatite-(CaCl) (OH-bearing)(0,0,2)
9	30.996(8)	Pyrrhotite 6C(2,0,6),Tremolite(1,5,-1),Apatite-(CaCl) (OH-bearing)(2,1,1),Titanite(2,0,-2)
10	33.833(17)	Pyrrhotite 6C(1,3,8),Pyrite(2,0,0),Tremolite(1,5,1),Apatite-(CaCl) (OH-bearing)(2,0,2),Titanite(1,2,-2),Hematite(1,0,4)
11	34.440(19)	Actinolite(1,1,-2),Pyrrhotite 6C(0,4,6),Apatite-(CaCl) (OH-bearing)(3,0,1)
12	35.500(11)	Tremolite(2,4,1)
13	35.902(7)	Pyrrhotite 6C(1,3,9),Tremolite(2,6,0),Zircon(1,1,2),Titanite(0,2,2),Hematite(1,1,0)
14	36.945(8)	Actinolite(0,2,2),Pyrrhotite 6C(0,0,14),Tremolite(1,7,0),Apatite-(CaCl) (OH-bearing)(2,2,0),Titanite(2,2,-2)
15	38.811(3)	Actinolite(3,5,-1),Pyrrhotite 6C(0,4,9),Quartz high(1,0,2),Zircon(2,2,0),Titanite(1,3,1)
16	39.650(5)	Pyrrhotite 6C(1,3,11),Tremolite(1,1,2),Titanite(2,3,-1)
17	41.837(14)	Actinolite(1,3,2),Pyrrhotite 6C(1,3,12),Tremolite(1,7,1),Titanite(2,0,-3)
18	44.45(3)	Actinolite(0,8,1),Pyrrhotite 6C(1,5,6),Tremolite(0,8,1),Zircon(3,0,1),Titanite(0,0,3),Hematite(2,0,2)
19	45.086(13)	Actinolite(3,5,1),Pyrrhotite 6C(1,5,7),Tremolite(2,0,2),Apatite-(CaCl) (OH-bearing)(4,0,1),Quartz high(2,0,1),Titanite(3,2,-2)
20	47.628(15)	Pyrrhotite 6C(1,5,9),Tremolite(5,1,-1),Titanite(1,4,1)
21	49.540(6)	Actinolite(1,7,-2),Pyrrhotite 6C(0,6,6),Tremolite(1,9,-1),Apatite-(CaCl) (OH-bearing)(1,4,0),Quartz high(1,1,2),Titanite(1,4,-2)
22	54.261(5)	Actinolite(0,0,3),Pyrrhotite 6C(0,0,20),Tremolite(2,2,-3),Apatite-(CaCl) (OH-bearing)(5,0,0),Quartz high(2,0,2),Titanite(1,5,-1)
23	54.707(10)	Actinolite(2,8,-2),Pyrrhotite 6C(2,6,2),Tremolite(3,3,2),Apatite-(CaCl) (OH-bearing)(1,0,4),Titanite(0,3,3)
24	58.428(9)	Actinolite(5,3,1),Pyrrhotite 6C(0,4,18),Tremolite(6,2,-1),Apatite-(CaCl) (OH-bearing)(3,3,1),Titanite(2,5,-1),Hematite(1,2,2)
25	59.381(5)	Actinolite(1,11,-1),Pyrrhotite 6C(4,2,6),Tremolite(1,5,-3),Apatite-(CaCl) (OH-bearing)(4,2,1),Quartz high(2,1,1),Titanite(2,5,0)
26	60.593(18)	Actinolite(6,4,-1),Pyrrhotite 6C(3,5,7),Pyrite(2,2,2),Tremolite(1,11,-1),Zircon(4,1,1),Titanite(1,2,-4)
27	63.487(16)	Actinolite(2,10,-2),Pyrrhotite 6C(0,4,20),Tremolite(2,0,3),Apatite-(CaCl) (OH-bearing)(3,3,2),Zircon(3,0,3),Titanite(2,1,3)
28	65.21(2)	Actinolite(6,6,-1),Pyrrhotite 6C(1,5,18),Tremolite(1,7,-3),Apatite-(CaCl) (OH-bearing)(4,1,3),Quartz high(3,0,0),Zircon(4,0,2),Titanite(1,3,-4)
29	65.536(11)	Pyrite(3,2,1),Tremolite(3,11,-1),Titanite(3,5,-1)
30	66.545(14)	Actinolite(6,0,1),Pyrrhotite 6C(0,4,21),Tremolite(5,3,-3),Apatite-(CaCl) (OH-bearing)(6,0,0),Quartz high(2,1,2),Titanite(2,2,3)
31	67.177(5)	Actinolite(7,1,-1),Pyrrhotite 6C(0,6,17),Tremolite(6,0,1),Quartz high(2,0,3),Titanite(5,1,-1),Hematite(1,2,5)
32	67.617(7)	Actinolite(5,7,1),Pyrrhotite 6C(1,5,19),Tremolite(4,6,-3),Apatite-(CaCl) (OH-bearing)(3,4,0),Quartz high(3,0,1),Titanite(4,4,-1)
33	72.94(2)	Actinolite(3,1,-4),Pyrrhotite 6C(2,8,7),Tremolite(7,3,-2)
34	75.117(11)	Actinolite(6,8,-2),Pyrrhotite 6C(2,8,9),Tremolite(6,6,1),Apatite-(CaCl) (OH-bearing)(1,6,1),Titanite(3,2,-5)
35	77.11(2)	Actinolite(4,0,3),Pyrrhotite 6C(1,9,7),Tremolite(2,10,-3),Titanite(3,6,-2)
36	77.462(16)	Pyrrhotite 6C(2,8,11),Apatite-(CaCl) (OH-bearing)(3,0,5),Titanite(2,4,3)
37	79.388(8)	Actinolite(6,10,-1),Pyrrhotite 6C(0,0,28),Tremolite(3,5,-4),Apatite-(CaCl) (OH-bearing)(7,0,0),Zircon(3,1,4),Titanite(5,4,-2)