VOLT carbon technologies	Document Code	R_02	Date
	Document Number	0004	01DE25

Berkwood Zone 3 – Metallurgical Assessment and Dry Separation Performance Report

Signatures on File

RECORD OF CHANGES		
ISSUE	DESCRIPTION	DATE
1	First Edition of the report	2025-02-24
2	First draft of the Results Report	2025-02-27
3	Final Edition of Report and Magnified Imaging Added	2025-03-07
4	Updated with QP Statement	2025-12-01

EXECUTIVE SUMMARY

This report summarizes Volt Carbon's metallurgical analysis of grab samples obtained during prospecting of Green Battery Minerals' (GEM) Berkwood Zone 3 mineral property. Following metallurgical testing the rocks were processed using Volt Carbon's proprietary dry separation technology.

Four bags of rocks were provided to Volt Carbon on February 14th 2025. Each bag of rocks was sampled. The samples were crushed for metallurgical testing and dry separation trials. The total carbon content (C_t) of the crushed samples was between 18.43% to 46.17% (**Table 2**), with an average graphitic carbon content (C_g) of 21.64%.

Utilizing Volt Carbon's dry separation techniques, the material was purified. The separation yielded an average C_t of 89.8%. Bag 3 showed the highest average C_t of 97.0%, as detailed in **Table 3**. The resulting graphite flake sizes were analyzed.

It was found that C_t and C_g were highest above +35M, suggesting the presence of high purity large flakes within the separated sample.

Overall, the dry separation process was found to be highly effective in improving the C_t. This study confirms that material from Zone 3 has the potential to be effectively processed through dry separation.

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1. PURPOSE

The purpose of this report is to analyze the grab samples provided by GEM and to determine their carbon content and suitability for dry processing. The rocks were crushed and tested using TGA and XRF. After which the material was dry processed using Volt's proprietary air classifier. Following dry separation, the material was tested for carbon content using TGA and sieved to determine the flake size distribution.

2. OVERVIEW OF TESTING

Thermogravimetric Analysis (TGA) was used to determine carbon content and X-ray fluorescence (XRF) was used to evaluate the composition of the crushed ore before dry separation. This initial analysis allowed for the identification of key elements present in the samples, as well as the initial C_t.

Following the dry separation processes, TGA was conducted to evaluate the C_t. This test enabled the determination of the C_t and C_g in the separated materials, providing insight into the effectiveness of the dry separation process. XRF testing was conducted to determine the samples' elemental composition after the dry separation process.

2.1 TGA

The feedstock and dry separated ore samples were subjected to direct analysis using a Mettler Toledo TGA2 unit for TGA. This analytical method measures the total mass, as well as the change in mass of the samples as they are exposed to controlled temperature increases, allowing for precise determination of their thermal decomposition behavior. The TGA settings are outlined in Table 1.

The objective of this test is to identify the decomposition fractions of the material. This provides valuable information on the thermal stability of the ore, the content of volatile compounds, and, most importantly, the carbon fraction within the sample. By measuring the mass loss at different temperature points, the TGA analysis helps isolate the C_t and C_g and differentiate it from other minerals or impurities present in the sample. This method ensures accurate characterization of the C_g in the ore, serving as a critical metric in assessing the ore's C_t and C_g, both before and following the dry separation process.

The TGA graphs outlining each sample's TGA steps can be found in Appendix B.

Table 1. TGA Testing Procedure

Step #	Starting Temp (°C)	Ending Temp (°C)	Duration (mins)	Heating Rate (K/min)	Flow Rate (ml/min)	Gas Used	Purpose
1	25.0	600.0	11.5	50	50	N_2	Burn off/evaporate moisture and volatiles in the sample
2	600.0	1000.0	40	10	50	Air	Burn off any combustible material and graphite present in the sample
3	1000.0	1000.0	30	30	50	Air	Burn off any inorganic filler material in the sample

2.2 XRF

X-ray fluorescence (XRF) was employed to analyze the elemental composition of the Berkwood Zone 3 ore samples, providing detailed data on the major, minor, and trace elements present. The analysis was conducted using an Elvatech ProSpector 3 XRF unit, which detects the characteristic X-ray emissions produced when elements in the sample are excited by an X-ray source. Each chemical element emits radiation at a unique energy spectrum, allowing for precise identification and quantification of its presence in the sample.

Samples were analyzed using the "Soil Mode" setting on the ProSpector 3 for a duration of 45 seconds. This mode is optimized for geological samples, enabling accurate detection of a wide range of elements, from high concentrations of major elements to trace amounts of minor elements. The elemental composition results were recorded in parts per million (ppm), with associated measurement errors included to ensure statistical accuracy. This analysis provided essential data on the mineralogical profile of the ore. This is crucial for understanding the behavior of different elements during the subsequent dry separation process and their potential impact on the purity of the extracted graphite.

3. BERKWOOD ZONE 3 ORE RESULTS

3.1 BERKWOOD ZONE 3 BEFORE DRY SEPARATION

The Berkwood Zone 3 grab samples were received in four separate bags and crushed at Volt Carbon's Scarborough facility. The results of the Thermogravimetric Analysis (TGA) conducted on the crushed material at Volt Carbon's Guelph laboratory from each bag are summarized in **Table 2**.

The C_t and C_g values indicate that the feedstock from Bag 4 had the highest C_t, ranging from 36.92% to 46.17%. The average C_t across all bags is 32.84%. This analysis provides preliminary information on moisture and volatile content, combustible content (C_g), ash residue, and the C_t of each feedstock sample.

It is noted that the moisture and volatile content is high. In subsequent testing, the material will be dried prior to TGA.

Table 2. Zone 3 – Feedstock - TGA Results

Sample Name	Moisture and Volatiles (%)	Combustible (%)	C_g (%)	Ash (%)	C_t (%)
Berkwood Zone 3 Bag 1 - 1	11.79%	19.62%	12.05%	56.55%	31.66%
Berkwood Zone 3 Bag 1 - 2	15.21%	12.00%	6.43%	66.36%	18.43%
Berkwood Zone 3 Bag 2 - 1	9.90%	9.26%	18.35%	62.49%	27.61%
Berkwood Zone 3 Bag 2 - 2	6.63%	12.87%	27.52%	52.98%	40.39%
Berkwood Zone 3 Bag 3 - 1	2.20%	7.64%	10.79%	79.36%	18.43%
Berkwood Zone 3 Bag 3 - 2	8.09%	12.19%	30.94%	48.78%	43.13%
Berkwood Zone 3 Bag 4 - 1	1.26%	6.51%	39.66%	52.57%	46.17%
Berkwood Zone 3 Bag 4 - 2	4.07%	9.49%	27.43%	59.01%	36.92%

3.2 BERKWOOD ZONE 3 AFTER DRY SEPARATION

The crushed Berkwood Zone 3 ore samples were subjected to dry separation at Volt Carbon's Scarborough facility. The crushed rock was separated into a near graphite concentrate, then sieved for samples. The results of the Thermogravimetric Analysis (TGA) performed at Volt Carbon's Guelph laboratory on the dry separated graphitic material from each bag at are summarized in **Table 3**.

Bag 3 exhibited the highest C_t, and C_g after dry separation with an average content of 97.0%, and 85.4% respectively. The average C_t across all bags was 89.8%. Flake sizes of +35M and above were found to contain the highest C_t and C_g. Bags 1 and 3 displayed the most suitability to dry processing, with higher resultant C_t and C_g (*see **Table 3***).

Table 3. Zone 3 - Dry Separated Sample - TGA Results

Sample Name	Moisture and Volatiles (%)	Combustible (%)	C_g (%)	Ash (%)	C_t (%)
Bag 1 +25M	-4.69%	14.25%	83.5%	6.94%	97.75%
Bag 1 +45M	0.7%	13.9%	79.5%	5.9%	93.41%
Bag 2 +45M	5.6%	10.1%	69.2%	15.1%	79.40%
Bag 2 +60M	0.2%	10.7%	71.3%	17.8%	82.13%
Bag 3 +25M	-0.37%	12.24%	85.9%	2.22%	98.14%
Bag 3 +35M	-0.17%	11.14%	84.8%	4.24%	95.94%
Bag 4 +60M	1.3%	17.0%	65.1%	16.6%	82.10%

3.3 XRF RESULTS BEFORE DRY SEPARATION

Table 4 presents the XRF results for the crushed feedstock before dry separation. The major elements identified in all samples include Ca, Fe, K, Si, Ti, Zn, and light elements such as Mg and Al, which are common rock-forming elements found in graphitic ores. Both silicon (Si) and iron (Fe) were present in significant amounts across all samples.

Table 4. Berkwood Zone 3 Crushed Feedstock before Dry Separation XRF Results (ppm)

Element	Bag 1	Bag 2	Bag 3	Bag 4
Si	170000±22000	120000±30000	149000±17000	245000±13000
Ca	1410±140	2120±160	25280±250	5470±110
K	9800±300	3800±300	17600±300	3840±190
Ti	2390±90	820±110	14450±120	1630±40
V	1360±40	940±50	5130±70	414±22
Cr	60±30	100±30	140±30	36±13
Mn	337±12	516±18	770±14	130±6
Fe	113900±800	160000±1000	47700±300	23200±140
Co	-	400±60	-	-
Ni	-	178±10	-	-
Cu	63±4	1053±12	47±3	65±2
Zn	356±5	2212±18	361±4	243±3
Sr	65±2	21±3	209±2	60±1
Ag	8±12	-	-	-
Cd	-	-	-	-
Sn	130±30	180±30	73±18	-
Au	-	37±9	-	4±2
Pb	177±4	716±11	140±3	126±2
*L.E.	700000±5000	709000±4000	739000±4000	720000±5000

**Light Elements (L.E.) include elements up to Magnesium.*

3.4 XRF RESULTS AFTER DRY SEPARATION

Table 5 presents the XRF results for collected and combined dry-separated graphite from all four bags. A high content of silicon (Si) and iron (Fe) was found. The 87.1 - 87.3% light elements concentration is likely primarily contributed by the C_g.

Table 5. Berkwood Zone 3 Dry Separated XRF Results (ppm)

Element	Sample 1	Sample 2	Sample 3
Si	83000±24000	83000±24000	80000±24000
Ca	6100±150	6070±150	6120±150
K	2800±300	2600±300	2700±300
Ti	1140±60	1150±60	1160±60
V	890±30	870±30	890±30
Cr	254±23	260±23	260±23
Mn	172±11	167±11	177±11
Fe	34690±190	34640±190	34940±190
Co	-	-	-
Ni	-	-	-
Cu	54±3	55±3	54±3
Zn	565±5	562±5	567±5
Sr	6±2	5±2	5±2
Ag	-	-	-
Cd	-	-	-
Sn	47±18	-	-
Au	-	-	-
Pb	160±4	160±4	160±4
*L.E.	871000±4000	871000±4000	873000±4000

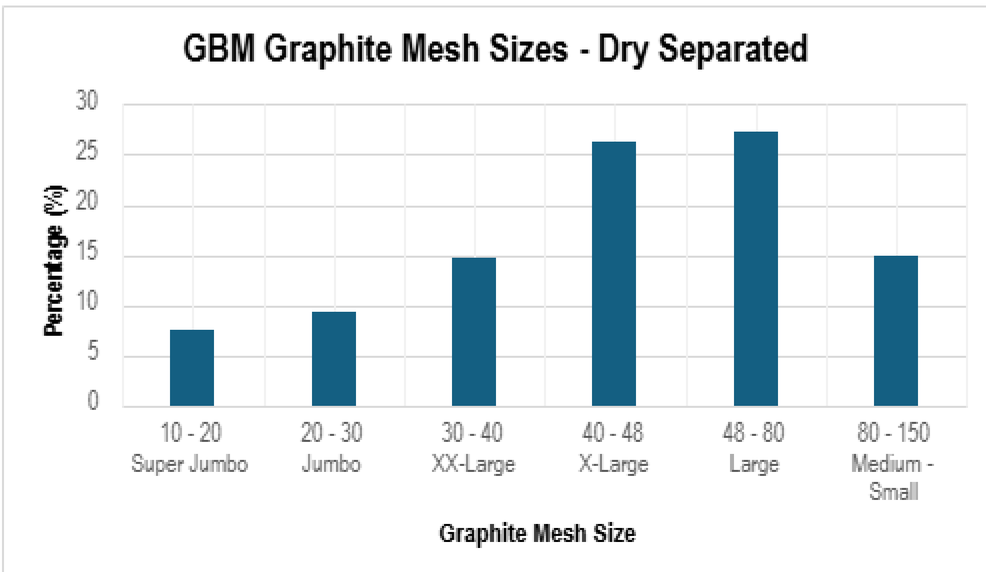
**Light Elements (L.E.) include elements up to Magnesium.*

4. EXTRACTED GRAPHITE - FLAKE SIZE DISTRIBUTION

Graphite was extracted from the dry separated grab samples. The extracted material was sieved into various screens. The material from each screening was weighed and a flake size distribution graph was plotted (See Figure 2).

All graphite flakes were larger than 150 mesh. The two largest groups collected were Large flake (+50 to -80 mesh) at 27.3% and X-Large flake (+40 to –48 mesh) at 26.2%. The remaining flake sizes distribution were 14.8% Medium to Small flakes (+80 to –150 mesh), 14.6% XX-Large flakes (+30 to -40 mesh), 9.38% Jumbo flakes (+20 to -30 mesh), and 7.51% Super Jumbo flakes (+10 to -20 mesh).

Figure 2. Berkwood Zone 3 Flake Size Distribution



5. CONCLUSION

Berkwood Zone 3 samples were analyzed using TGA. The average C_t and C_g were found to be 32.84% and 21.65% respectively.

Before dry separation, the crushed feedstock was examined using XRF to determine its composition. A high concentration of silicon (Si) and iron (Fe) was found (*see **Table 4***).

After conducting the dry-separation process on the crushed rock samples, the C_t and C_g reached up to 98.14%, and 85.9% respectively. It is noted that large flakes of +35M and above recorded the highest purity, with an average C_t of 97.28%. Samples from bags 1 and 3 obtained the highest C_t, with an average C_t of 95.58%, and 97.04% respectively. Bag 2 and 4 samples were less pure, with average carbon contents of 80.77% and 82.10%.

The dry separated material was then analyzed using XRF to validate the percentage of light elements against the TGA results. The high percentage of light elements correlates with a high C_t, consistent with the TGA findings. It was noted that iron (Fe) levels, ranging between 3.46-3.49%, could be significantly reduced in future trials.

The flake size distribution indicated that 85.16% of flakes were +80 mesh. These flakes could be valuable for industrial applications. The -80 mesh flakes would also have potential for further refinement into battery grade anodes.

All materials were visually inspected using digital microscopy, as documented in Appendix C. Graphite flakes from each batch were liberated from the host material without chemical processing.

In conclusion, the Berkwood Zone 3 grab samples appear to have high graphitic content from the TGA results. Initial flake size distribution results indicate the presence of high purity large flakes, which is suitable for industrial applications. It is recommended that these results be considered for further exploration planning on the property.

6. QUALIFIED PERSON STATEMENT

I, V-Bond Lee, P.Eng., am a Professional Engineer registered in the Province of Ontario with over 35 years of engineering experience in advanced materials, product development, motion systems, and industrial process design. I also have more than six years of direct experience in graphite processing and purification technologies, including thermogravimetric analysis (TGA), XRF characterization, air-classifier dry separation, and metallurgical workflow development.

I am a Qualified Person for the purposes of NI 43-101 with respect to metallurgical and process engineering information. I have reviewed the analytical methods, procedures, and metallurgical results presented in this report, including all TGA, XRF, dry-separation testing, and flake-size characterization.

In my professional opinion, the metallurgical work described herein was conducted using appropriate laboratory practices, calibrated analytical equipment, and validated engineering methodologies. I have reviewed and approved the technical content of this report that pertains to metallurgical and process engineering.

DocuSigned by:
E4BB665386BA4DC...

V-Bond Lee, P.Eng.
CEO, President, and Chairman of the Board
Volt Carbon Technologies Inc.

APPENDIX

APPENDIX A

A. Quality Control

The testing equipment, TGA and XRF involved in the analysis of the crushed graphitic material's dry-separated samples was calibrated using certified standards and blanks.

A.1 TGA Calibration Using Curie Temperature Standards

TGA cell temperature calibration was performed using three Curie standard materials (Isatherm, Nickel, and Trafoperm), shown in Table 11. The materials were heated in an empty-tared TGA pan. At the Curie temperature, the magnetic properties of the material disappeared, and a sharp weight gain or loss was observed, which is ideal for calibration. Calibration of the TGA ensured reproducibility and precision of the test results.

Table 14. Temperature Calibration Parameters

Material	True Value	10.00 K/min	+/-	Curve
Trafoperm (751 ^{0}C)	751.00	752.92	5.0	Calib TGA Standard Trafoperm (751 ^{0}C)
Isatherm (162 ^{0}C)	162.00	164.82	5.0	Calib TGA Standard Isatherm (162 ^{0}C)
Nickel (354 ^{0}C)	354.00	350.91	5.0	Calib TGA Standard Nickel (354 ^{0}C)

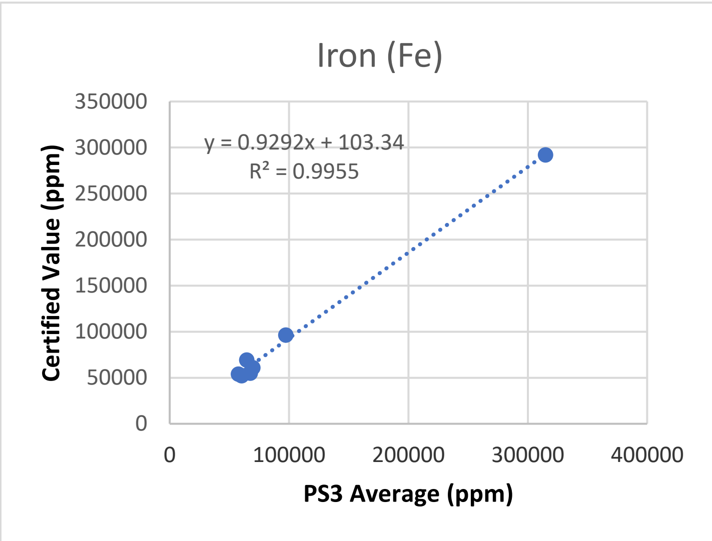
A.2 XRF Calibration Using Certified Standards

Standard samples with known and certified compositions were used for calibration. Standard calibration in soil mode was used. The performance of the spectrometer was evaluated using linear regression of the results versus the established concentrations for the CRMs (Control Reference Materials). The chosen beam time study was 45 seconds. Table 12 lists the CRMs used to evaluate the accuracy and precision of the XRF measurement.

Each CRM was tested 3 times, whose average was plotted against the certified value provided by OREAS. The linear equation provided the factor and offset values needed to calibrate the spectrometer. The elements calibrated include – Fe, Mn, S, Ca, Cr, Ni, K, Si, Ti, Co, and Cu.

Table 6. CRMs used for XRF calibration

Sample	Type	Classification
OREAS 135b	Zn-Pb-Ag Ore	sulphide graphitic state
OREAS 315	Zn-Pb-Ag Ore	sulphide graphitic state
OREAS 316	Zn-Pb-Ag Ore	sulphide graphitic state
OREAS 317	Zn-Pb-Ag Ore	sulphide graphitic state
OREAS 354	Zn-Pb-Ag sulphide Ore	sulphide
OREAS 401	Fe Ore	hematite
OREAS 406	Fe Ore	hematite
OREAS 70b	Ni sulphide Ore	ultramafic
OREAS 73b	Ni sulphide Ore	ultramafic
OREAS 74b	Ni sulphide Ore	ultramafic
OREAS 75b	Ni sulphide Ore	ultramafic
OREAS 76b	Ni sulphide Ore	ultramafic
OREAS 77b	Ni sulphide Ore	ultramafic



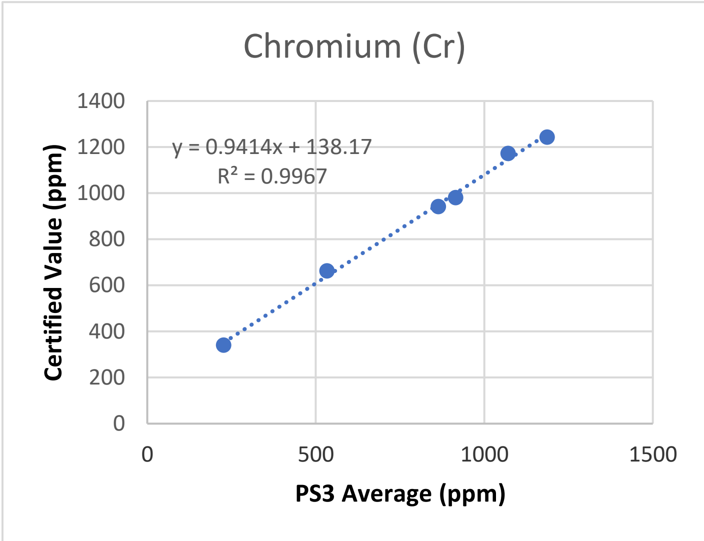
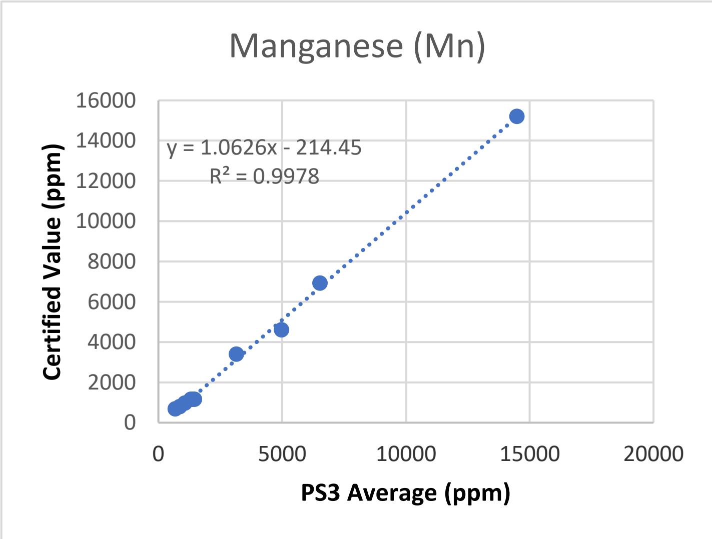


Figure 4. Calibration Curves for Fe and Cr



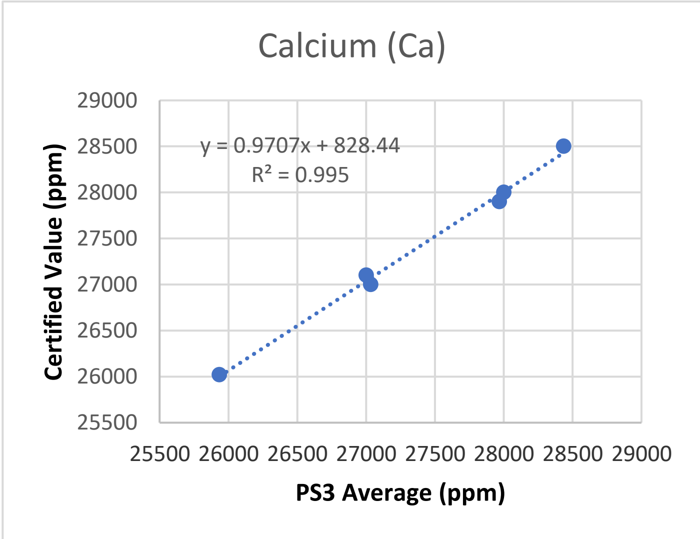


Figure 5. Calibration Curves for Mn and Ca

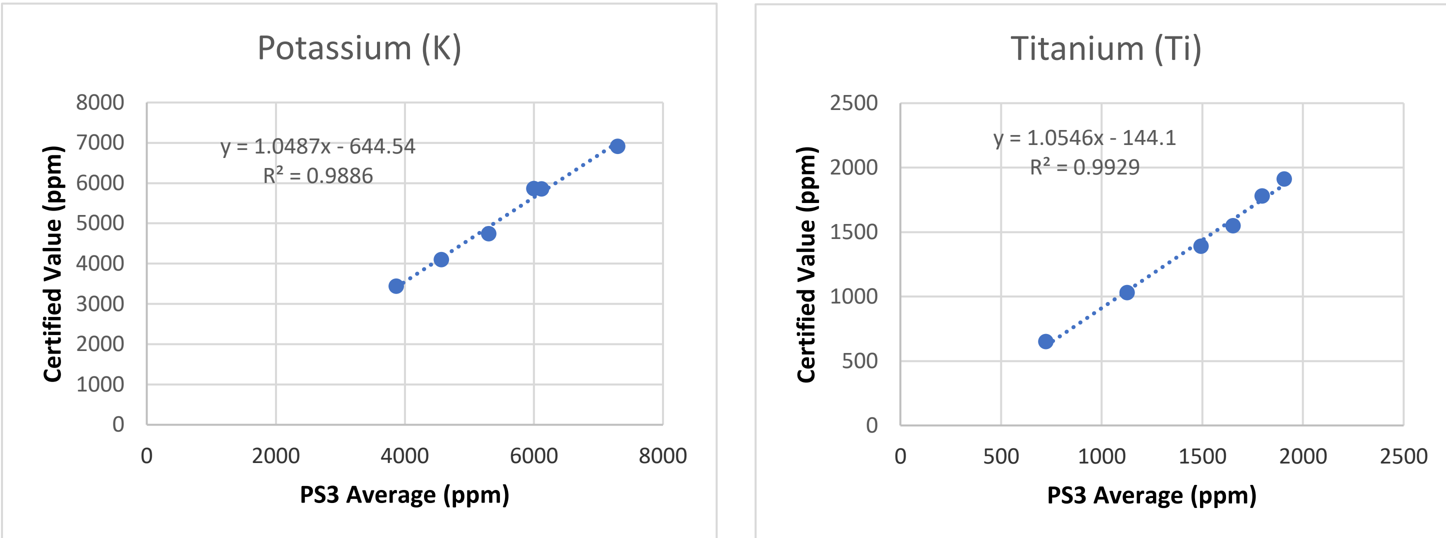


Figure 6. Calibration Curves for K and Ti

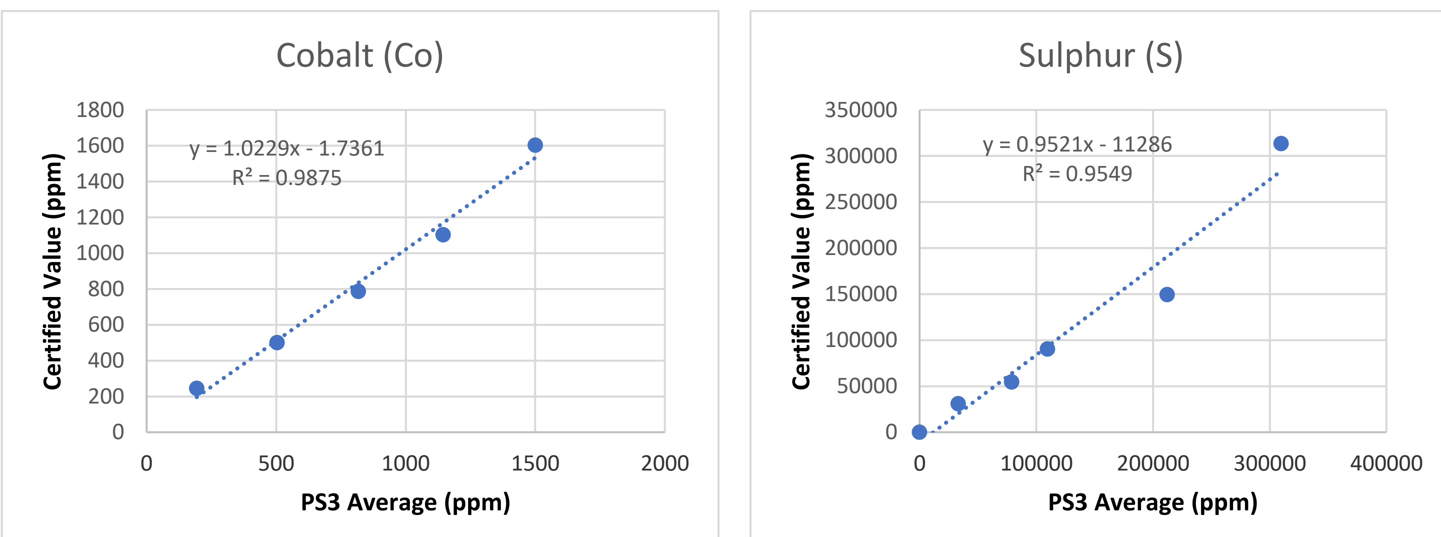
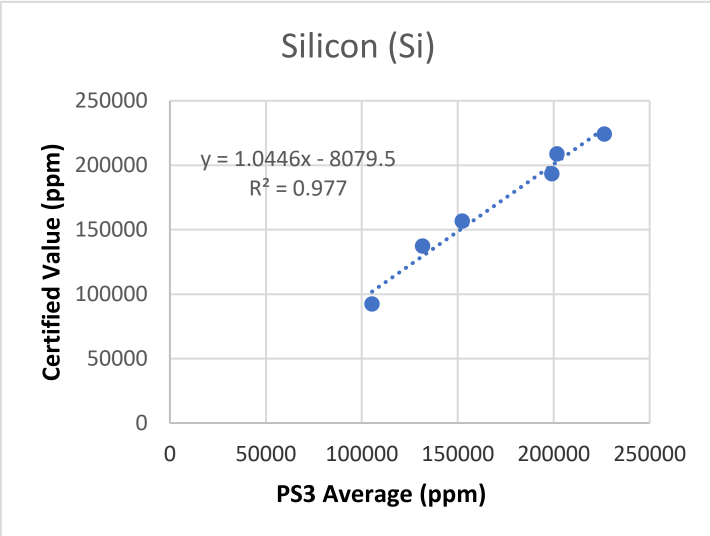


Figure 7. Calibration Curves for Co and S



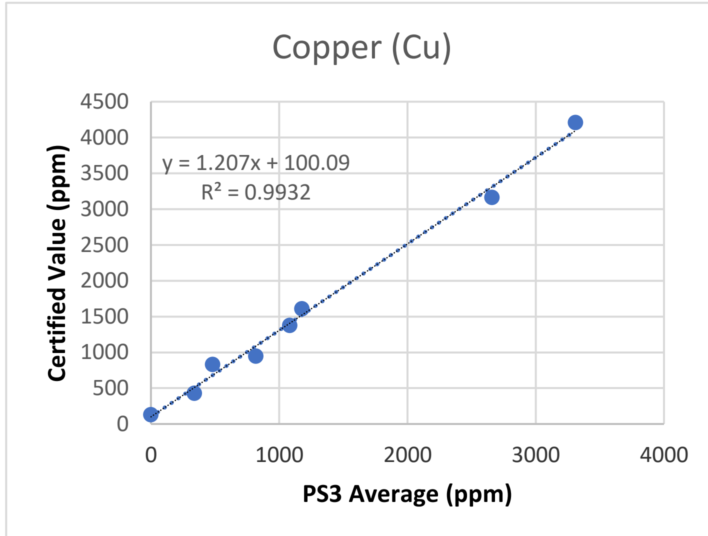


Figure 8. Calibration Curves for Si and Cu

APPENDIX B

B. TGA DATA

Figure 9. Crushed rock Bag 1 TGA – 1

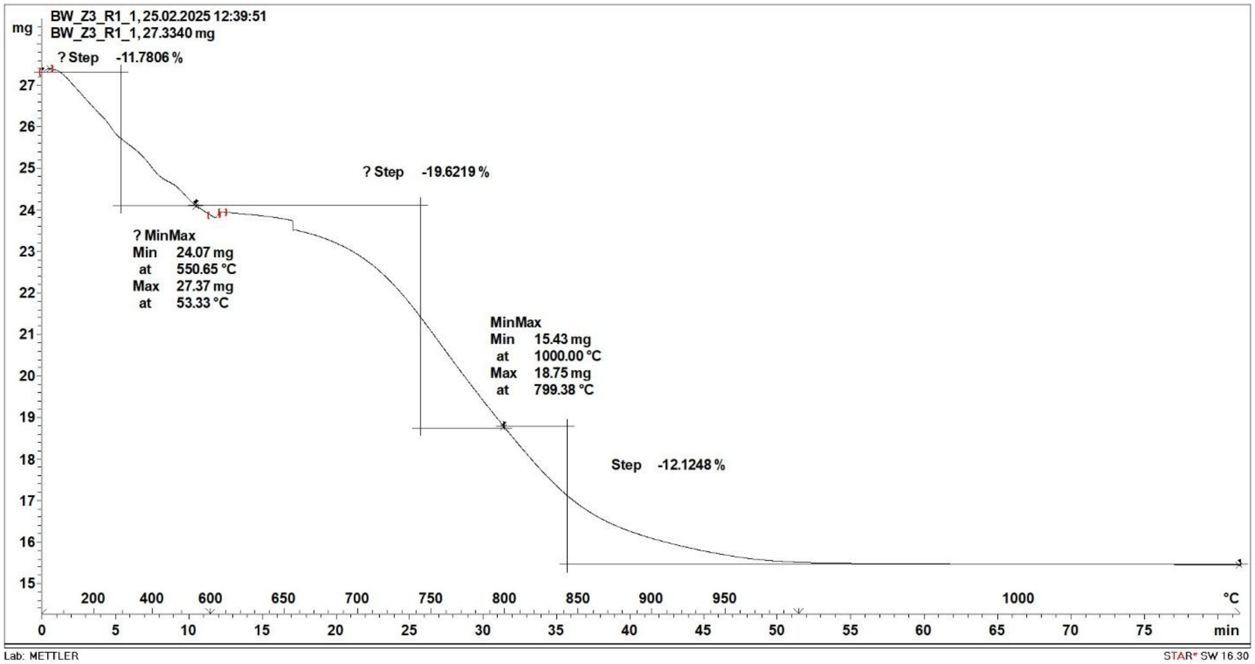


Figure 10. Crushed rock Bag 1 TGA – 2

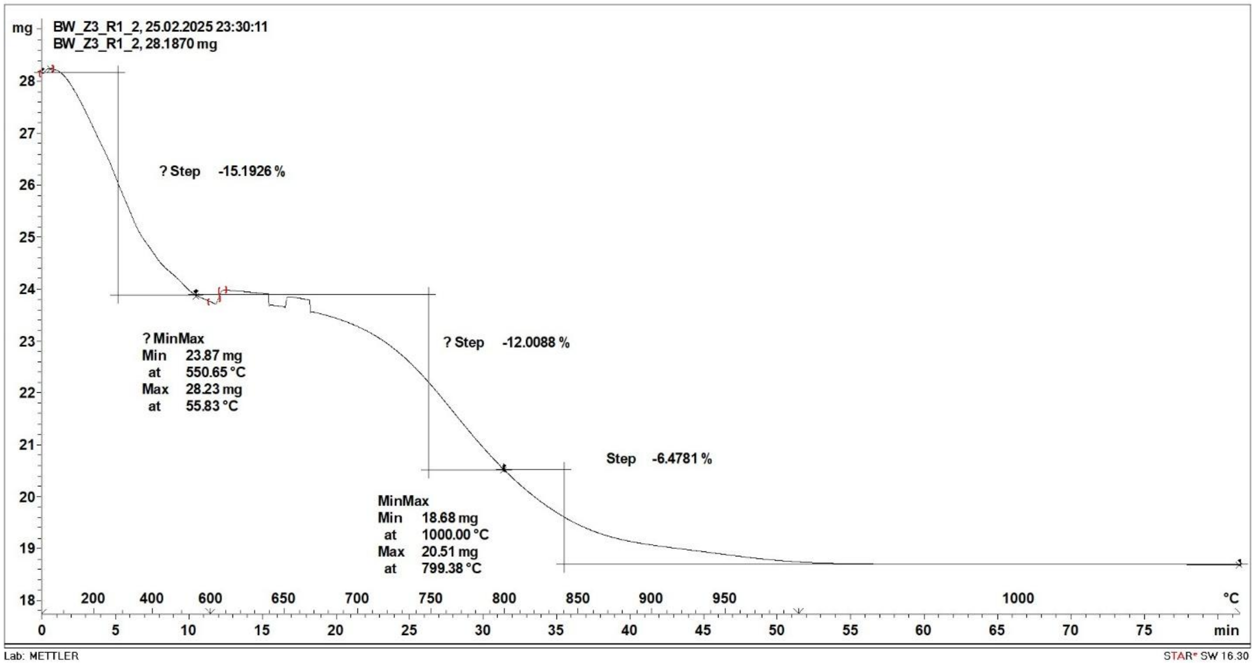


Figure 11. Crushed rock Bag 2 TGA – 1

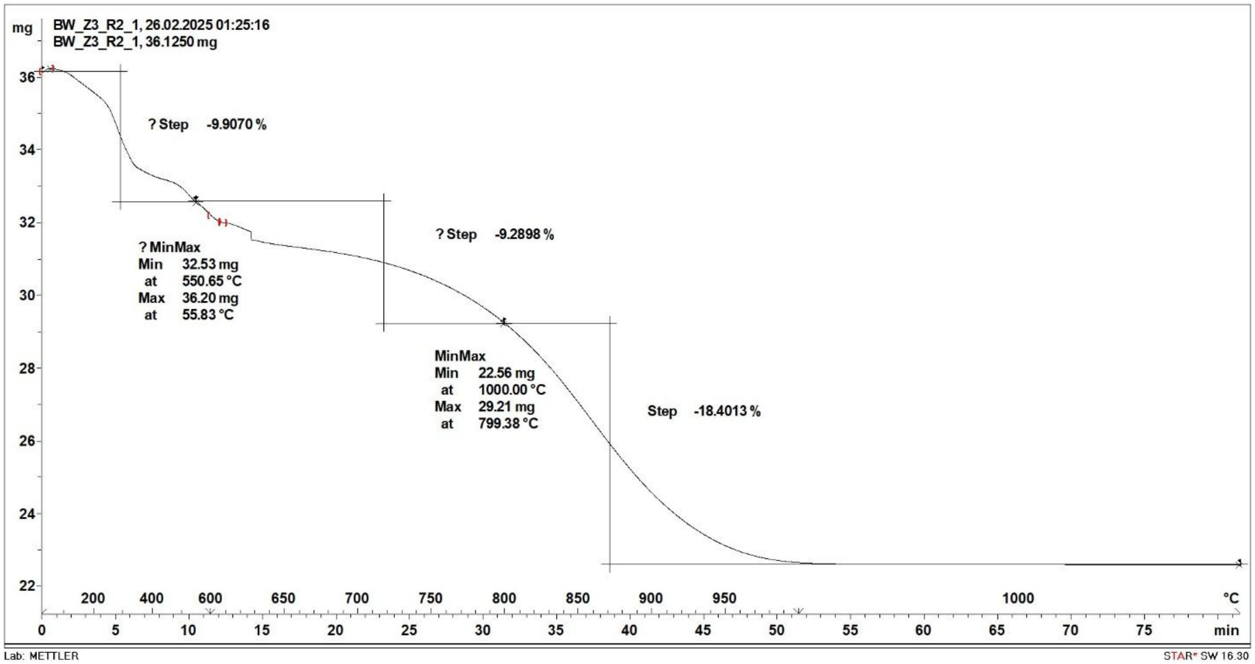


Figure 12. Crushed rock Bag 2 TGA – 2

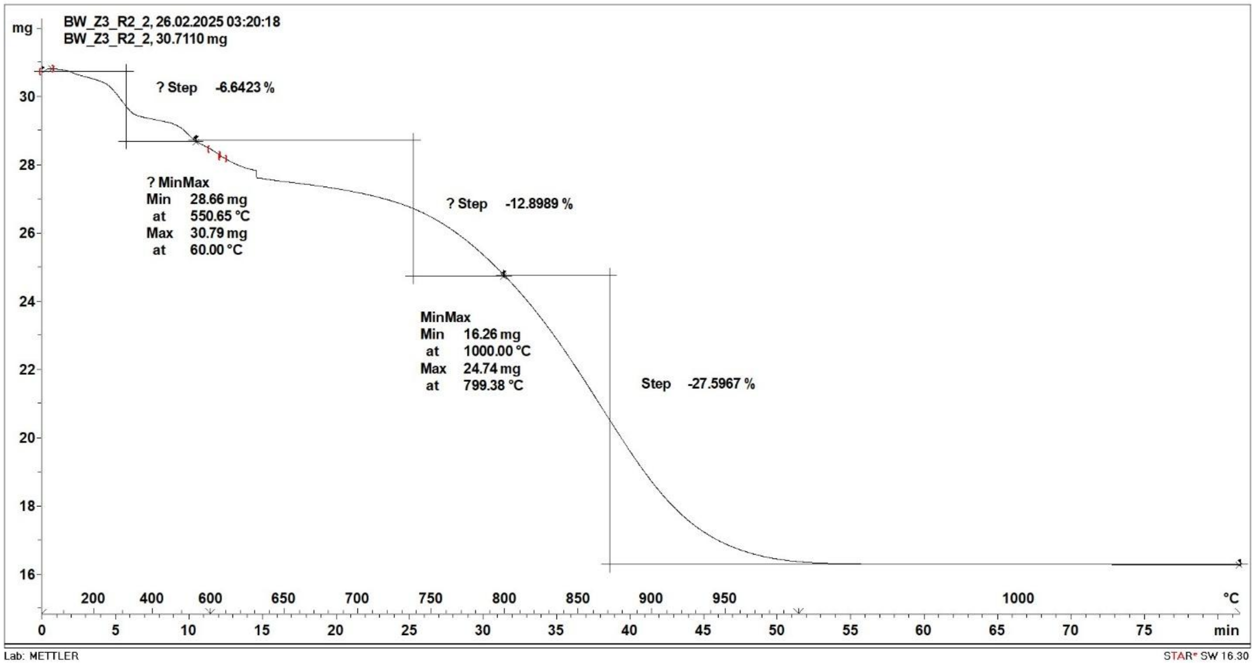


Figure 13. Crushed rock Bag 3 TGA – 1

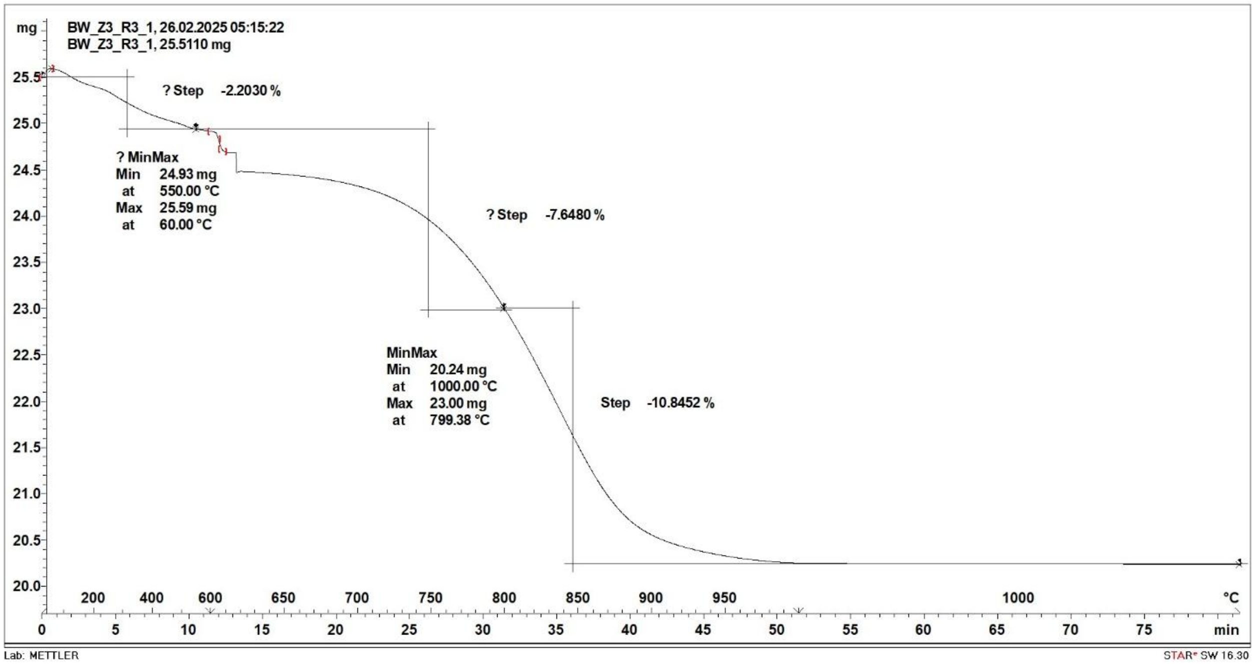


Figure 14. Crushed rock Bag 3 TGA – 2

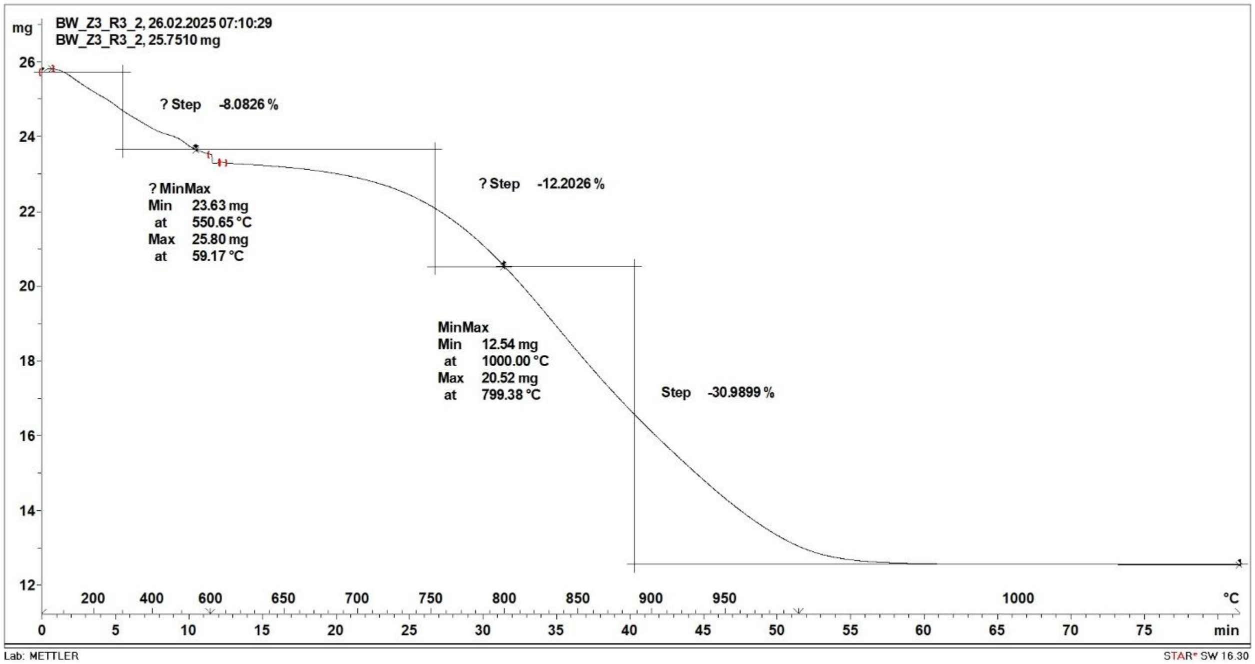


Figure 15. Crushed rock Bag 4 TGA – 1

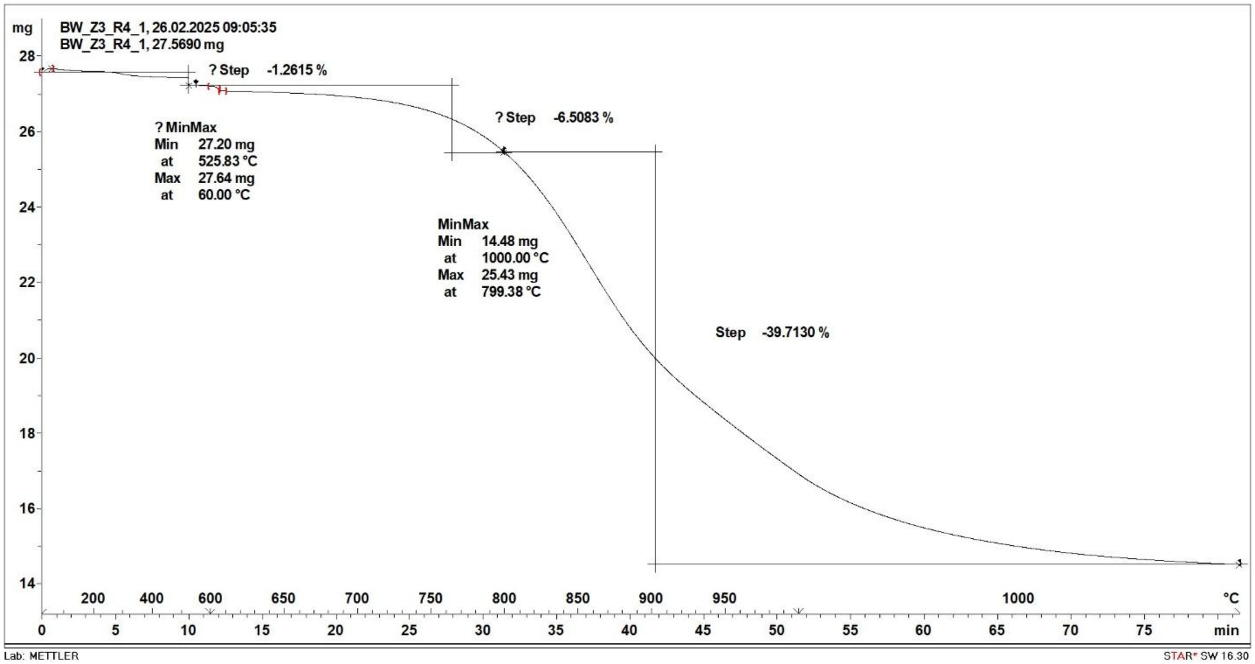


Figure 16. Crushed rock Bag 4 TGA – 2

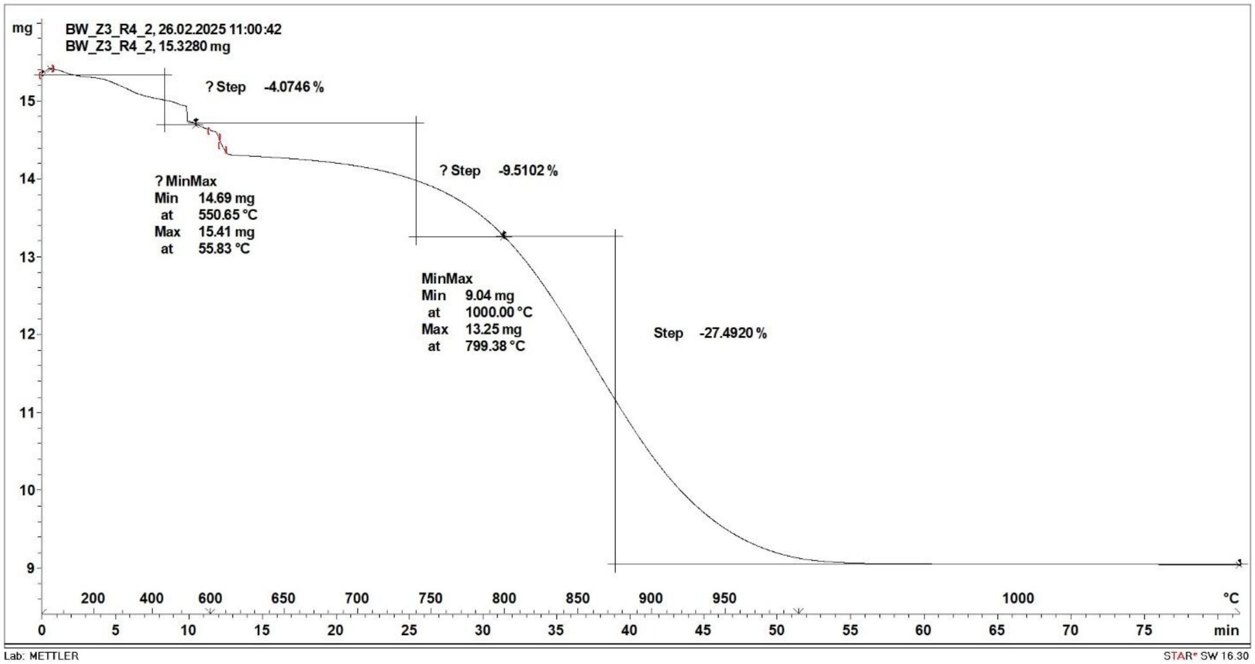


Figure 17. Dry Separated Sample Bag 1 TGA – 1

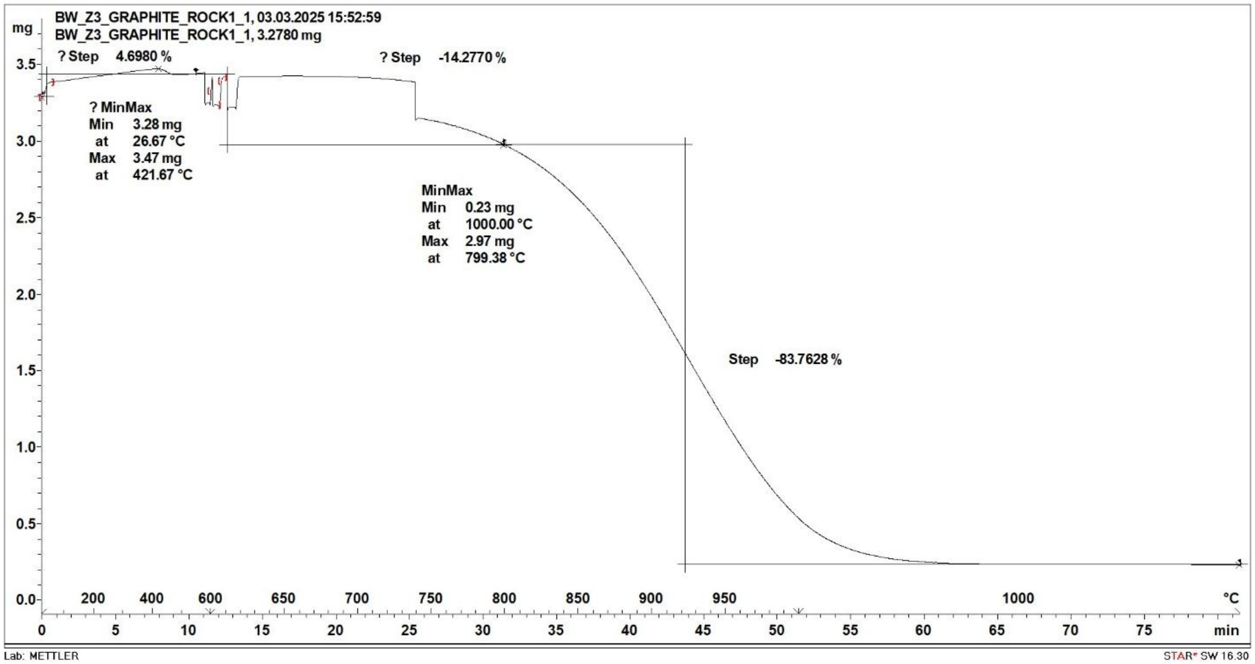


Figure 18. Dry Separated Sample Bag 1 TGA – 2

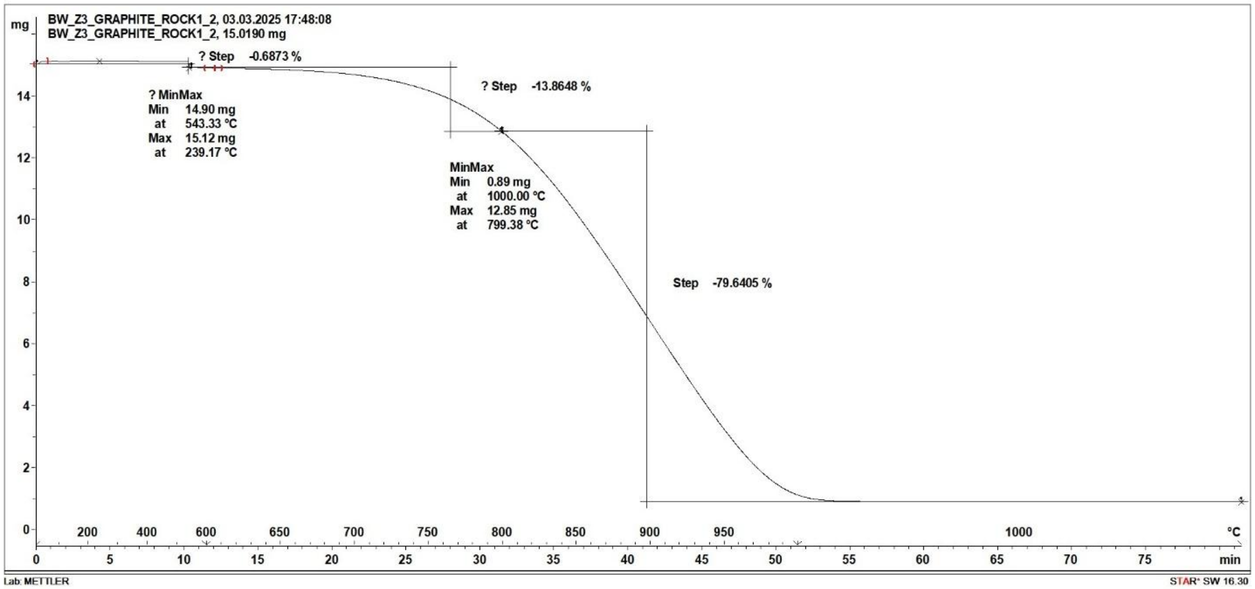


Figure 19. Dry Separated Sample Bag 2 TGA – 1

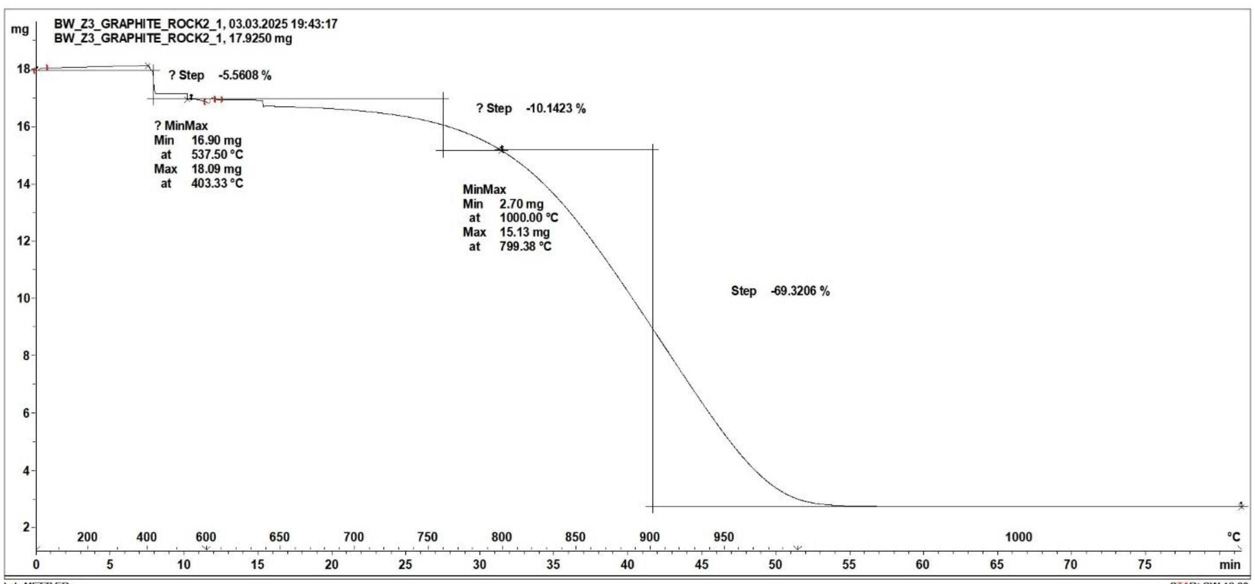


Figure 20. Dry Separated Sample Bag 2 TGA – 2

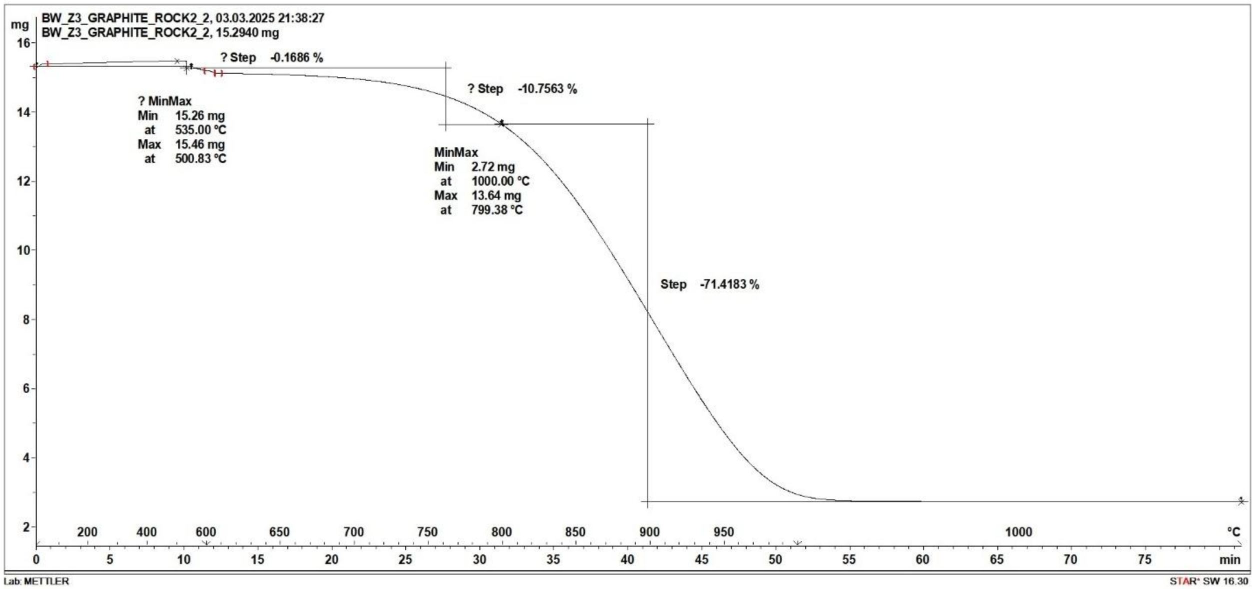


Figure 21. Dry Separated Sample Bag 3 TGA – 1

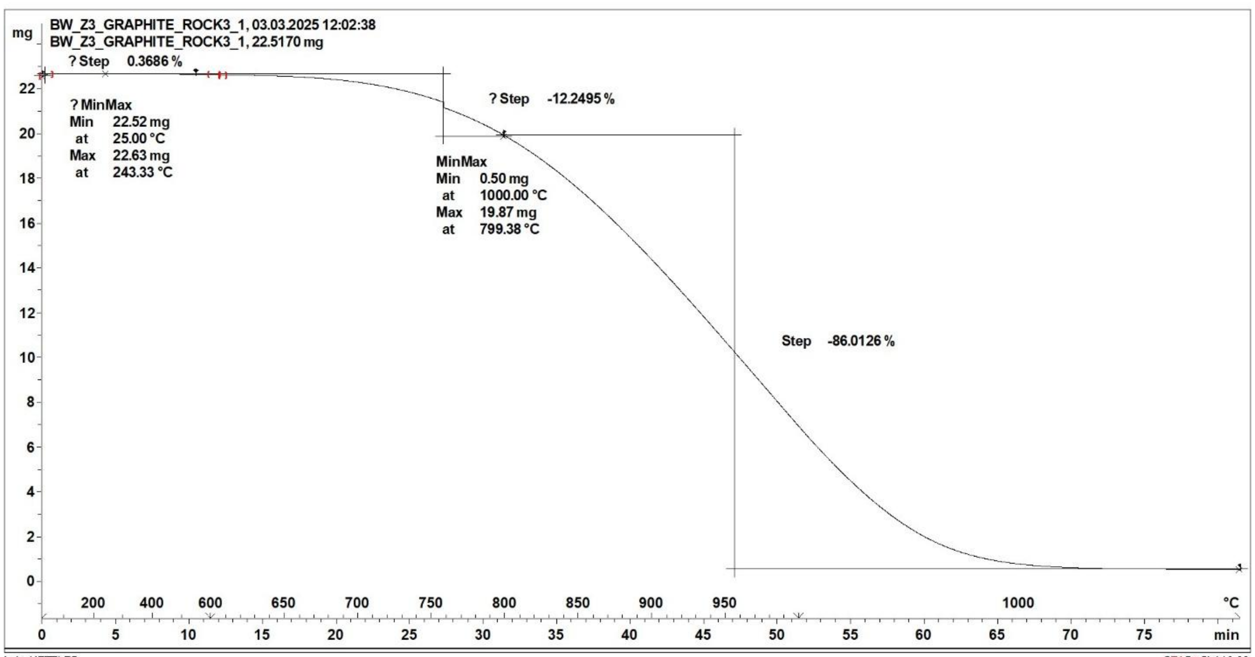


Figure 22. Dry Separated Sample Bag 3 TGA – 2

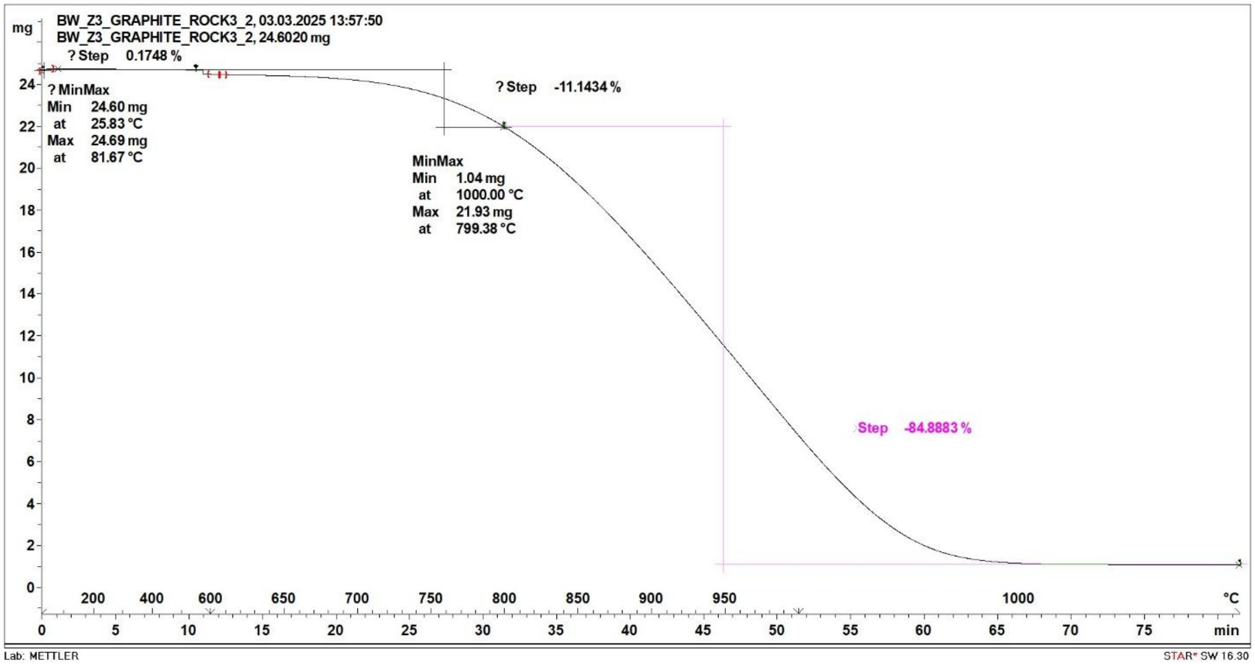


Figure 23. Dry Separated Sample Bag 4 TGA – 1

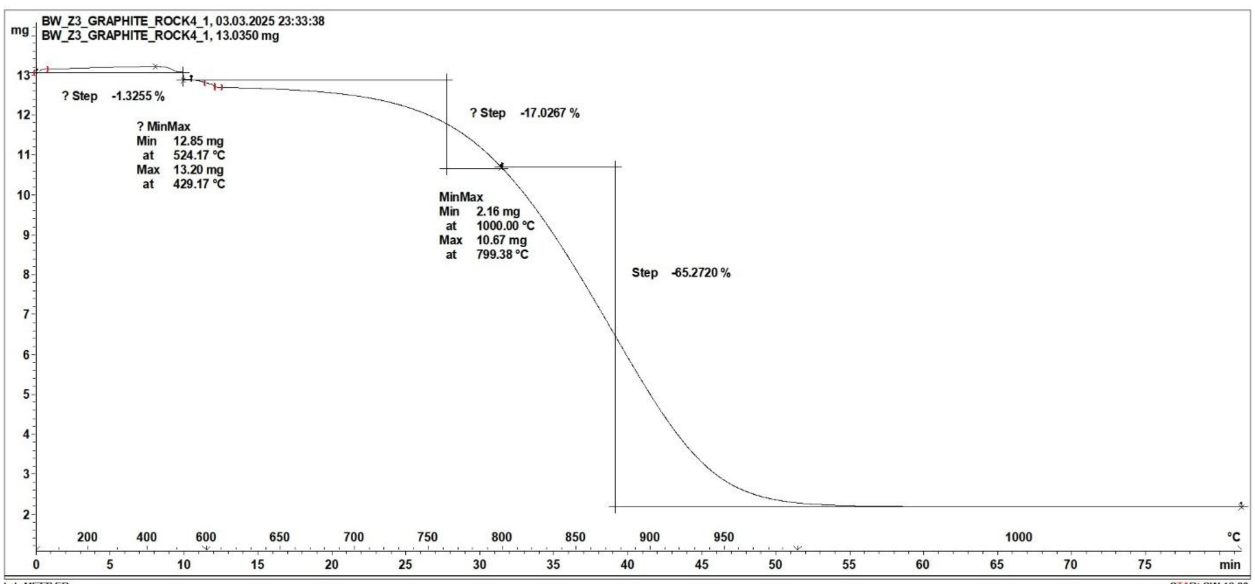
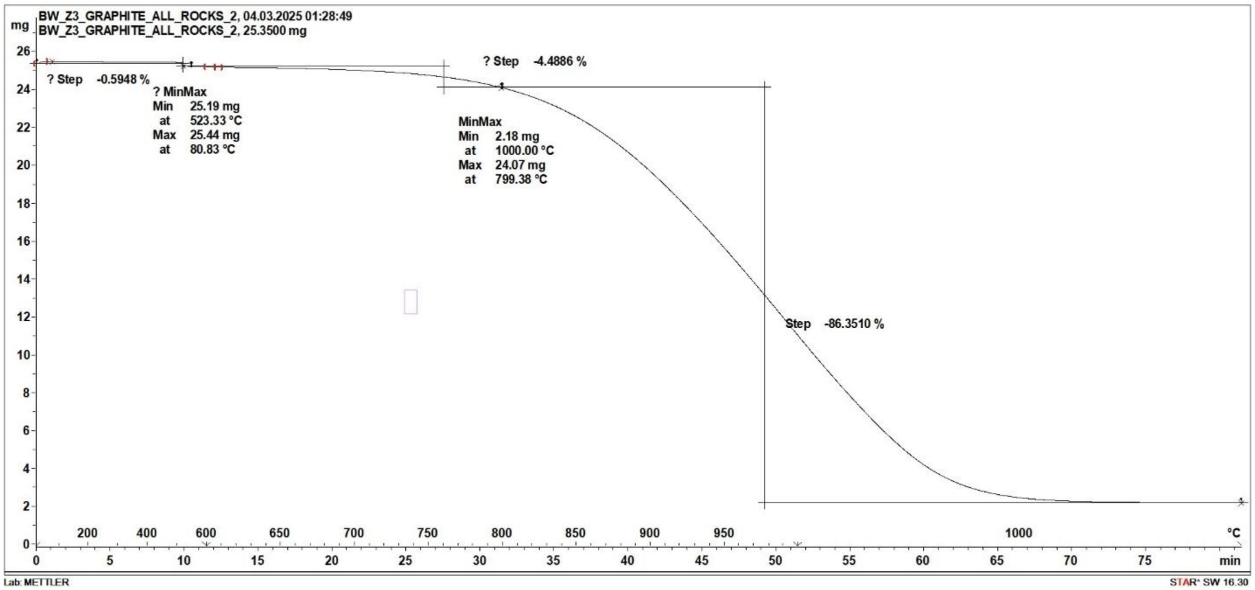


Figure 24. Dry Separated Sample Bag 4 TGA – 2



APPENDIX C

C. MICROSCOPIC IMAGING

Figure 25. Selected Rocks

Figure 26. Bag 1 Crushed Rock

Figure 27. Bag 2 Crushed Rock

Figure 28. Bag 3 Crushed Rock

Figure 29. Bag 4 Crushed Rock

Figure 30. Bag 1 Graphite 20M 40M

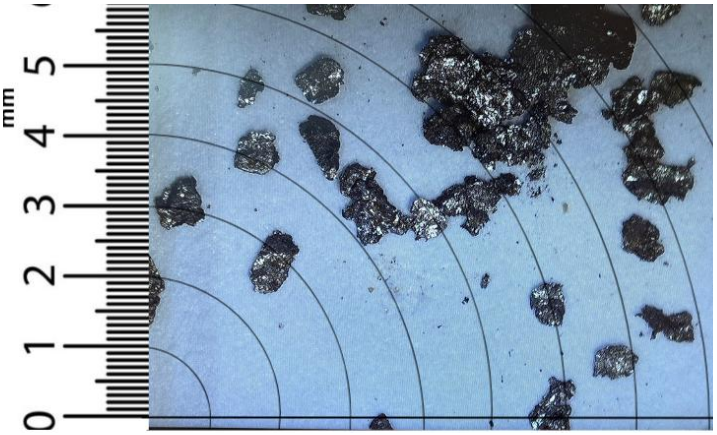


Figure 31. Bag 1 Graphite 10M 20M

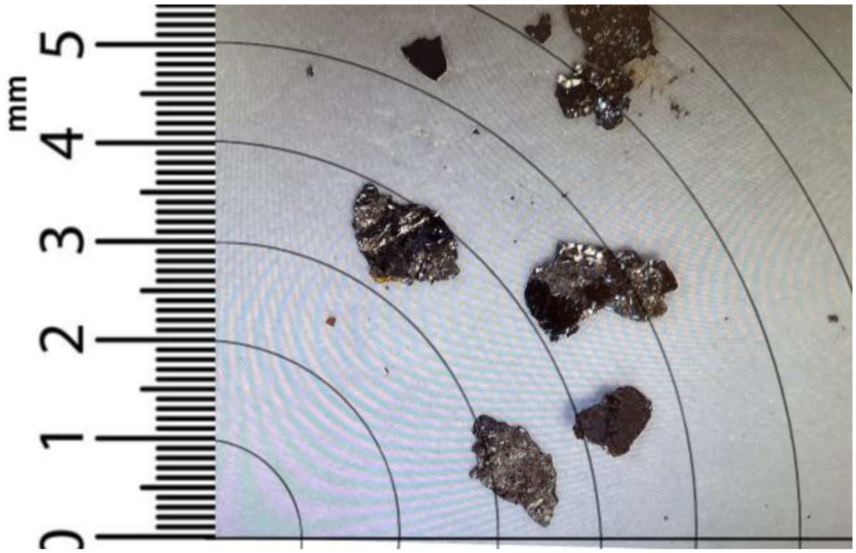


Figure 32. Bag 2 Graphite 20M 40M Image 1

Figure 33. Bag 2 Graphite 20M 40M Image 2

Figure 34. Bag 2 Graphite 40M 60M Image 1

Figure 35. Bag 2 Graphite 40M 60M Image 2

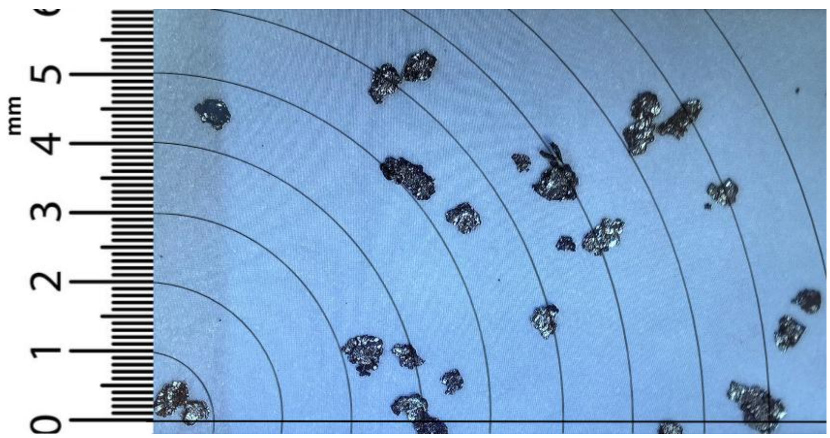


Figure 36. Bag 3 Graphite 10M 20M Image 1

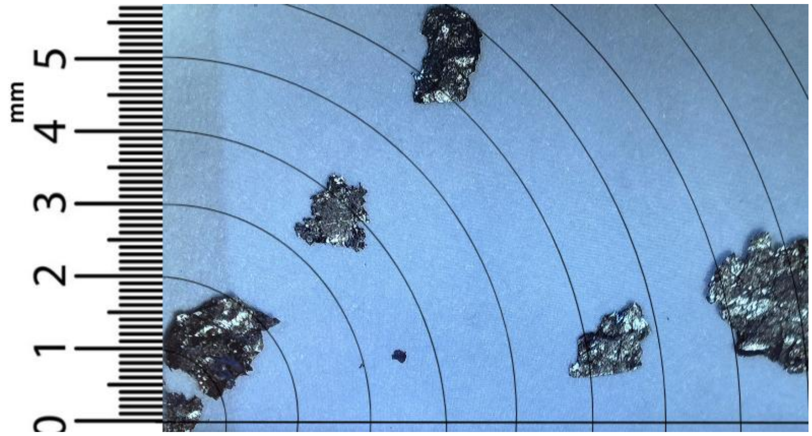


Figure 37. Bag 3 Graphite 10M 20M Image 2

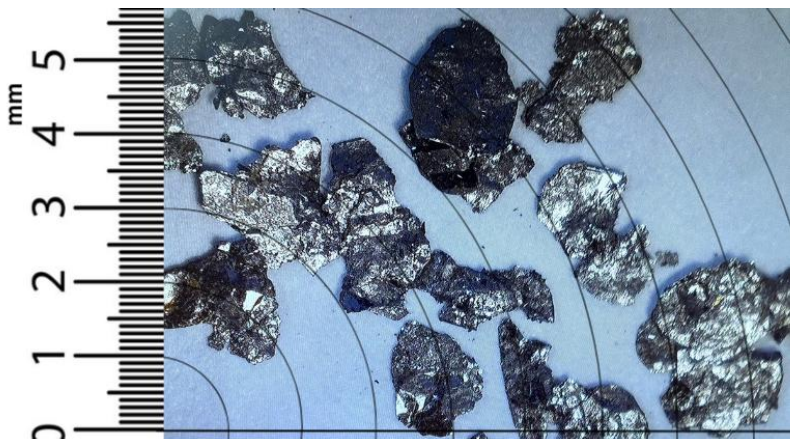


Figure 38. Bag 3 Graphite 20M 30M Image 1

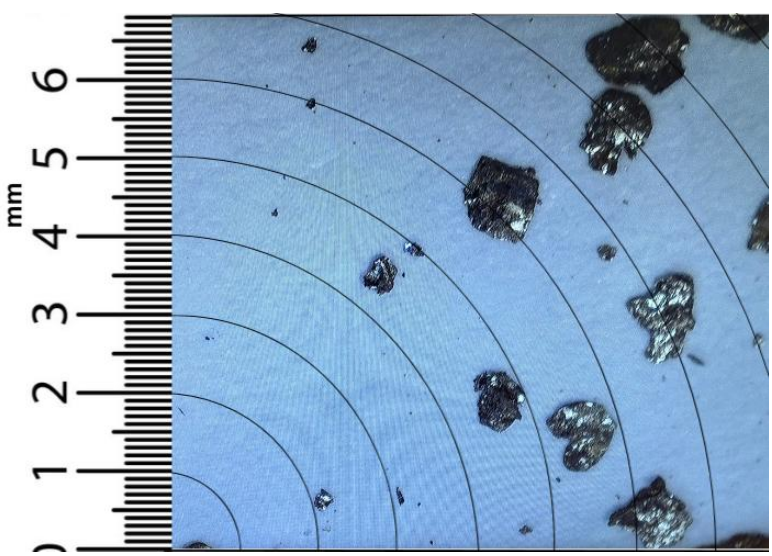


Figure 39. Bag 3 Graphite 20M 30M Image 2

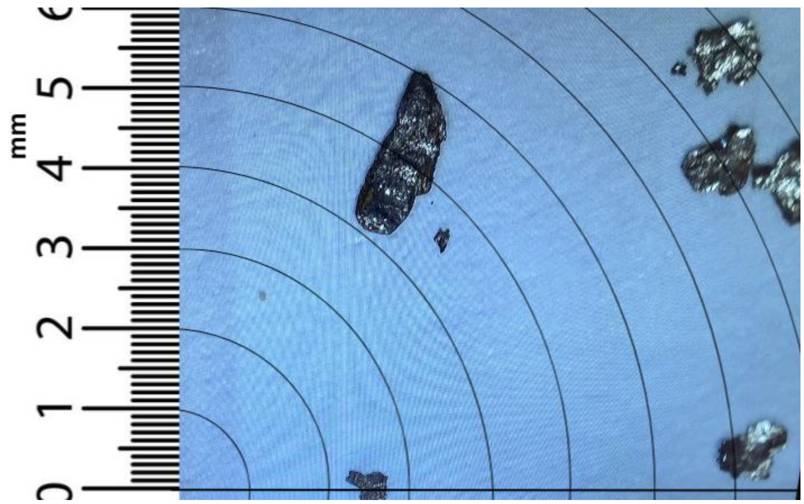


Figure 40. Bag 3 Graphite 40M 60M

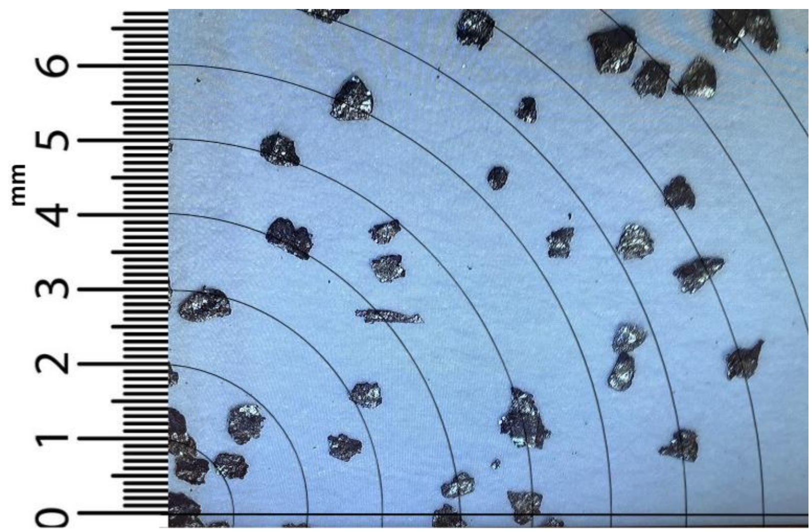


Figure 41. Bag 4 Graphite 30M 40M