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LAMPIRAN

Sampel BT1

Sampel BT2

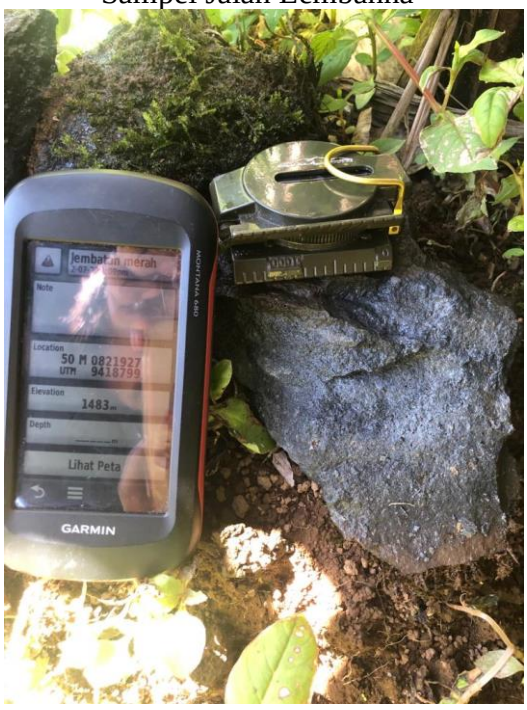
Sampel BT3

Sampel BT4

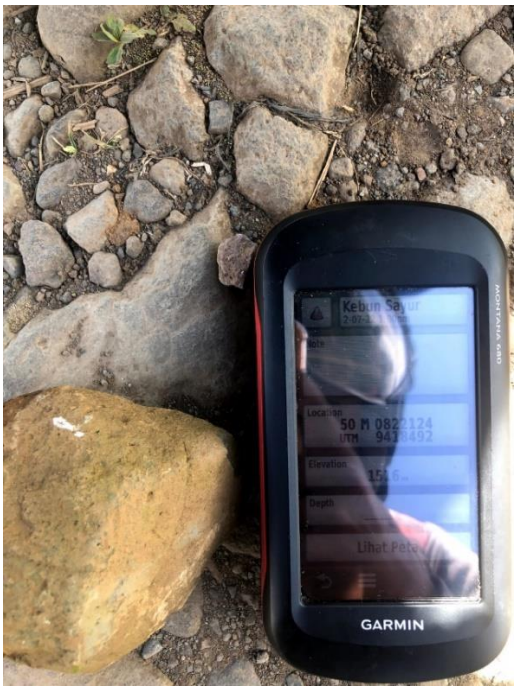
Sampel BT5

Sampel Jembatan Merah

Sampel Jalan Lembanna



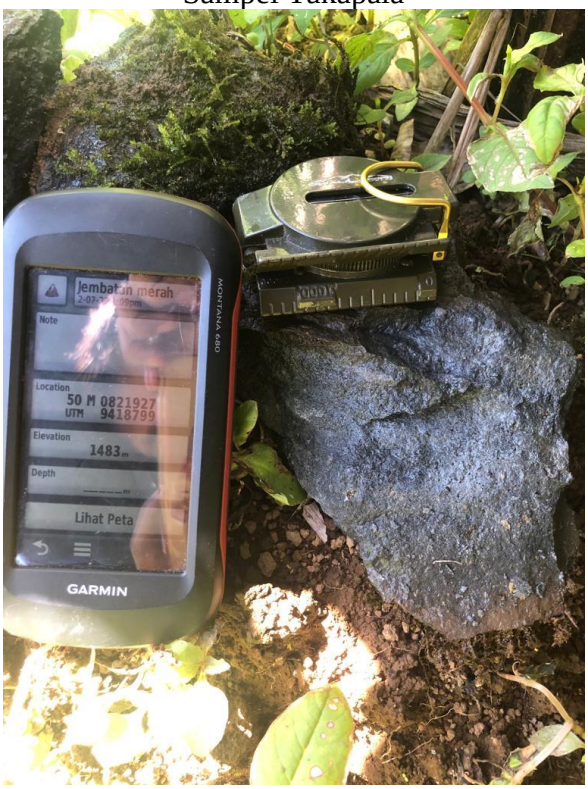
Sampel Kebun Lembanna



Sampel Pos 1.1 Bawakaraeng

Sampel Pos 1 Bawakaraeng

Sampel Takapala



HASIL XRD

Match! Phase Analysis Report

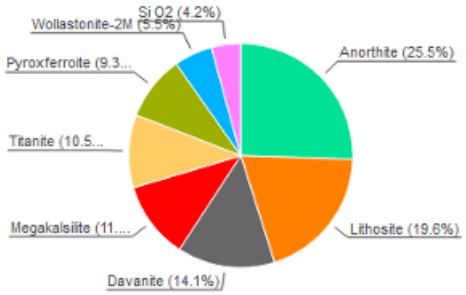
Sample: TEST SAMPLE

Sample Data

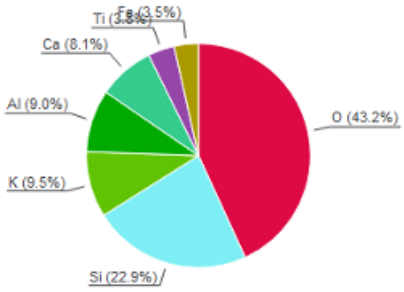
File name	BT_1 UNHAS.raw
File path	C:/Users/AGUNGP~1/AppData/Local/Temp/Rar$DRa11372.9016/Hasil XRD
Data collected	Agu 22, 2022 05:52:07
Data range	10.300° - 90.300°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	0.3°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	25.5	Anorthite	Al2 Ca O8 Si2
B	19.6	Lithosite	Al2 K3 O13 Si4
C	14.1	Davanite	K2 O15 Si6 Ti
D	11.2	Megakalsilite	Al K O4 Si
E	10.5	Titanite	Ca O5 Si Ti
F	9.3	Pyroxferroite	Ca0.94 Fe6.06 O21 Si7
G	5.5	Wollastonite-2M	Ca O3 Si
H	4.2	Si O2	O2 Si
	1.4	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*43.2%(*)*
Si	22.9%
K	9.5%
Al	9.0%
Ca	8.1%
Ti	3.8%
Fe	3.5%
**LE (sum)*	*43.2%*

Details of identified phases

A: Anorthite (25.5 %)*

Formula sum	Al2 Ca O8 Si2
Entry number	96-900-0363
Figure-of-Merit (FoM)	0.852919*
Total number of peaks	500
Peaks in range	500

Unit cell	a= 8.2230 A b= 12.9150 A c= 14.2040 A α= 92.750° β= 115.800 ° γ= 91.020 °
I/Ic	0.51
Calc. density	2.727 g/cm³
Reference	Foit F. F., Peacor D. R., "The anorthite crystal structure at 410 and 830 CT = 830 C", American Mineralogist **58**, 665-675 (1973)

B: Lithosite (19.6 %)*

Formula sum	Al2 K3 O13 Si4
Entry number	96-901-1908
Figure-of-Merit (FoM)	0.847830*
Total number of peaks	499
Peaks in range	499
Peaks matched	498
Intensity scale factor	0.31*
Space group	P 1 21 1
Crystal system	monoclinic
Unit cell	a= 15.1970 Å b= 10.2330 Å c= 8.4350 Å β= 90.310 °
I/Ic	0.60
Calc. density	2.489 g/cm³
Reference	Pudovkina Z. V., Solov'eva L. P., Pyatenko Y. A., "Crystal structure of lithosite K3[HAl2Si4O13]", Soviet Physics Doklady **31**, 941-942 (1986)

C: Davanite (14.1 %)*

Formula sum	K2 O15 Si6 Ti
Entry number	96-900-9617
Figure-of-Merit (FoM)	0.823978*
Total number of peaks	500
Peaks in range	500
Peaks matched	500
Intensity scale factor	0.27*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 7.2500 Å b= 7.4740 Å c= 6.9090 Å α= 105.590° β= 112.810 ° γ= 99.280 °
I/Ic	0.71
Calc. density	2.799 g/cm³
Reference	Gebert W., Medenbach O., Florke O. W., "Darstellung und kristallographie von K2TiSi6O15 - isotyp mit dalyitK2ZrSi6O15 Locality: synthetic", Tschermaks Mineralogische und Petrographische Mitteilungen **31**, 69-79 (1983)

D: Megakalsilite (11.2 %)*

Formula sum	Al K O4 Si
Entry number	96-900-4686
Figure-of-Merit (FoM)	0.858024*
Total number of peaks	290
Peaks in range	290
Peaks matched	288
Intensity scale factor	0.62*
Space group	P 63
Crystal system	hexagonal
Unit cell	a= 18.1111 Å c= 8.4619 Å
I/Ic	2.07
Calc. density	2.622 g/cm³
Reference	Khomyakov A. P., Nechelyustov G. N., Sokolova E. V., Bonaccorsi E., Merlino S., Pasero M., "Megakalsilite, a new polymorph of KAlSiO4 from the Khibina alkaline massif,Kola Peninsula, Russia: mineral description and crystal structure", The Canadian Mineralogist **40**, 961-970 (2002)

E: Titanite (10.5 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-2464
Figure-of-Merit (FoM)	0.786205*
Total number of peaks	286
Peaks in range	144
Peaks matched	144
Intensity scale factor	0.37*
Space group	A 1 2/a 1
Crystal system	monoclinic
Unit cell	a= 6.9409 Å b= 8.6532 Å c= 6.4551 Å β= 113.331 °
I/Ic	1.30
Calc. density	3.658 g/cm³
Reference	Kunz M., Arlt T., Stolz J., "In situ powder diffraction study of titanite (CaTiOSiO4) at high pressureand high temperatureSample", American Mineralogist **85**, 1465-1473 (2000)

F: Pyroxferroite (9.3 %)

Formula sum	Ca0.94 Fe6.06 O21 Si7
Entry number	96-901-2890
Figure-of-Merit (FoM)	0.820614
Total number of peaks	496
Peaks in range	496

Peaks matched	495
Intensity scale factor	0.22
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6213 Å b= 7.5506 Å c= 17.3806 Å α= 114.267° β= 82.684 ° γ= 94.576 °
I/Ic	0.89
Calc. density	3.843 g/cm³
Reference	Burnham C. W., "The crystal structure of pyroxferroite from Mare Tranquillitatis", Proceedings of the Second Lunar Science Conference **1**, 47-57 (1971)

G: Wollastonite-2M (5.5 %)*

Formula sum	Ca O3 Si
Entry number	96-901-1453
Figure-of-Merit (FoM)	0.834180*
Total number of peaks	498
Peaks in range	498
Peaks matched	498
Intensity scale factor	0.26*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.4090 Å b= 7.3220 Å c= 7.0630 Å β= 95.300 °
I/Ic	1.75
Calc. density	2.917 g/cm³
Reference	Hesse K.-F., "Refinement of the crystal structure of wollastonite-2M (parawollastonite)", Zeitschrift fur Kristallographie **168**, 93-98 (1984)

H: Si O2 (4.2 %)*

Formula sum	O2 Si
Entry number	96-412-4066
Figure-of-Merit (FoM)	0.814152*
Total number of peaks	491
Peaks in range	490
Peaks matched	490
Intensity scale factor	0.17*
Space group	P b c a
Crystal system	orthorhombic
Unit cell	a= 8.7724 Å b= 8.7833 Å c= 16.1865 Å
I/Ic	1.51
Calc. density	2.559 g/cm³
Reference	Foster M.D., Friedrichs O.D., Bell R.G., Paz F.A.A., Klinowski J., "Chemical evaluation of hypothetical uninodal zeolites", Journal of the American Chemical Society **126**, 9769-9775 (2004)

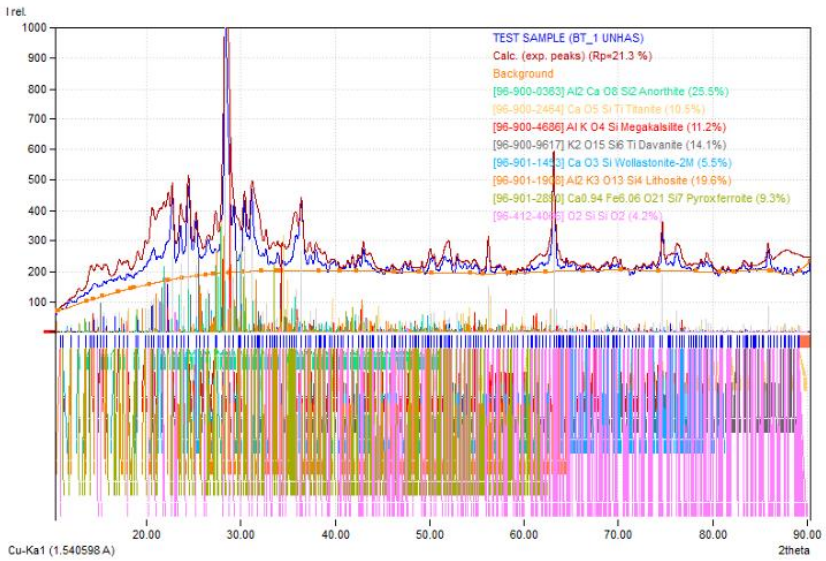
(*)2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.

Profile area	***Counts***	***Amount***
Overall diffraction profile	660132	100.00%
Background radiation	540878	81.93%
Diffraction peaks	119253	18.07%
Peak area belonging to selected phases	110336	16.71%
Peak area of phase A (Anorthite)	*23766*	*3.60%*
Peak area of phase B (Titanite)	*11565*	*1.75%*
Peak area of phase C (Megakalsilite)	*12012*	*1.82%*
Peak area of phase D (Davanite)	*18623*	*2.82%*
Peak area of phase E (Wollastonite-2M)	*7720*	*1.17%*
Peak area of phase F (Lithosite)	*19303*	*2.92%*
Peak area of phase G (Pyroxferroite)	*10506*	*1.59%*
Peak area of phase H (Si O2)	*6842*	*1.04%*
Unidentified peak area	8917	1.35%

Peak Residuals

Peak data	***Counts***	***Amount***
Overall peak intensity	4315	100.00%
Peak intensity belonging to selected phases	3992	92.51%
Unidentified peak intensity	323	7.49%

Diffraction Pattern Graphics



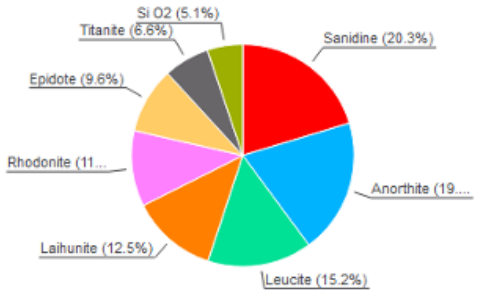
Sample: TEST SAMPLE

Sample Data

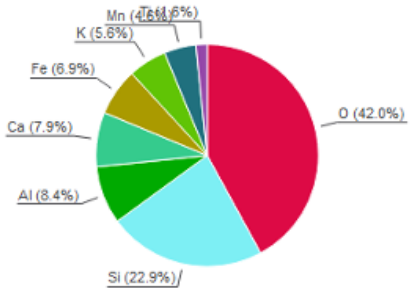
File name	BT_2 UNHAS.raw
File path	C:/Users/AGUNGP~1/AppData/Local/Temp/Rar$DRa11372.14993/Hasil XRD
Data collected	Agu 18, 2022 03:42:28
Data range	9.920° - 89.920°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	-0.08°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	20.3	Sanidine	Al K O8 Si3
B	19.6	Anorthite	Al Ca O4 Si
C	15.2	Leucite	Al K O6 Si2
D	12.5	Laihunite	Fe4.74 O12 Si3
E	11.0	Rhodonite	Mn5 O15 Si5
F	9.6	Epidote	Al2.32 Ca2 Fe0.68 O13 Si3
G	6.6	Titanite	Ca O5 Si Ti
H	5.1	Si O2	O2 Si
	2.8	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*42.0%(*)*
Si	22.9%
Al	8.4%
Ca	7.9%
Fe	6.9%
K	5.6%
Mn	4.6%
Ti	1.6%
**LE (sum)*	*42.0%*

Details of identified phases

A: Sanidine (20.3 %)*

Formula sum	Al K O8 Si3
Entry number	96-900-4247
Figure-of-Merit (FoM)	0.847292*
Total number of peaks	292
Peaks in range	292
Peaks matched	292
Intensity scale factor	0.37*
Space group	C 1 2/m 1
Crystal system	monoclinic

Unit cell	a= 8.6110 Å b= 13.0460 Å c= 7.1750 Å β= 116.010 °
I/Ic	0.73
Calc. density	2.552 g/cm³
Reference	Ferguson R. B., Ball N. A., Cerny P., "Structure refinement of an adularian end-member high sanidine from theBuck Claim Pegmatite, Bernic Lake, ManitobaSample: IIINote: variety adularia", The Canadian Mineralogist **29**, 543-552 (1991)

B: Anorthite (19.6 %)*

Formula sum	Al Ca O4 Si
Entry number	96-900-1262
Figure-of-Merit (FoM)	0.824217*
Total number of peaks	248
Peaks in range	248
Peaks matched	247
Intensity scale factor	0.29*
Space group	I -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.1780 Å b= 12.8700 Å c= 14.1750 Å α= 93.170° β= 115.970 ° γ= 91.150 °
I/Ic	0.59
Calc. density	3.161 g/cm³
Reference	Angel R. J., Carpenter M. A., Finger L. W., "Structural variation associated with compositional variation andorder-disorder behavior in anorthite-rich feldspars sample", American Mineralogist **75**, 150-162 (1990)

C: Leucite (15.2 %)*

Formula sum	Al K O6 Si2
Entry number	96-900-1796
Figure-of-Merit (FoM)	0.837608*
Total number of peaks	141
Peaks in range	141
Peaks matched	140
Intensity scale factor	0.52*
Space group	I 41/a
Crystal system	tetragonal
Unit cell	a= 13.0548 Å c= 13.7518 Å
I/Ic	1.38
Calc. density	2.474 g/cm³
Reference	Palmer D. C., Dove M. T., Ibberson R. M., Powell B. M., "Structural behavior, crystal chemistry and phase transitions in substitutedleucites: High-resolution neutron powder diffraction studiesSample: Natural, Expt. no. 3003, T = 298 K, KAlSi2O6", American Mineralogist **82**, 16-29 (1997)

D: Laihunite (12.5 %)*

Formula sum	Fe4.74 O12 Si3
Entry number	96-900-1036
Figure-of-Merit (FoM)	0.859302*
Total number of peaks	497
Peaks in range	497
Peaks matched	496
Intensity scale factor	0.43*
Space group	P 21/b 1 1
Crystal system	monoclinic
Unit cell	a= 4.8050 Å b= 10.1890 Å c= 17.4030 Å α= 91.000°
I/Ic	1.40
Calc. density	4.218 g/cm³
Reference	Shen B., Tamada O., Kitamura M., Morimoto N., "Superstructure of laihunite-3M (_.40Fe.80Fe.80SiO4)Sample: SuperstructureFe1B-y coordinate changed by Tamada (Aug, 2001)", American Mineralogist **71**, 1455-1460 (1986)

E: Rhodonite (11.0 %)*

Formula sum	Mn5 O15 Si5
Entry number	96-900-3679
Figure-of-Merit (FoM)	0.805724*
Total number of peaks	246
Peaks in range	246
Peaks matched	244
Intensity scale factor	0.26*
Space group	C -1
Crystal system	triclinic (anorthic)
Unit cell	a= 9.7999 Å b= 10.5176 Å c= 12.2365 Å α= 108.587° β= 103.185 ° γ= 82.320 °
I/Ic	0.96
Calc. density	3.747 g/cm³
Reference	Nelson W. R., Griffen D. T., "Crystal chemistry of Zn-rich rhodonite ("fowlerite")Sample: 15-4025Note: see samples 15-4029 and 15-4024 for plausible typical fowleriteand rhodonite cation distributions", American Mineralogist **90**, 969-983 (2005)

F: Epidote (9.6 %)*

Formula sum	Al2.32 Ca2 Fe0.68 O13 Si3
Entry number	96-900-2181
Figure-of-Merit (FoM)	

	0.795046*
Total number of peaks	499
Peaks in range	427
Peaks matched	421
Intensity scale factor	0.20*
Space group	P 1 21/m 1
Crystal system	monoclinic
Unit cell	a= 8.8910 Å b= 5.6240 Å c= 10.1640 Å β= 115.440 °
I/Ic	0.82
Calc. density	3.423 g/cm³
Reference	Giuli G., Bonazzi P., Menchetti S., "Al-Fe disorder in synthetic epidotes: A single-crystal X-ray diffractionstudy Sample: CC11c", American Mineralogist **84**, 933-936 (1999)

G: Titanite (6.6 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-0511
Figure-of-Merit (FoM)	0.815109*
Total number of peaks	500
Peaks in range	300
Peaks matched	295
Intensity scale factor	0.24*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 7.0670 Å b= 8.7260 Å c= 6.5680 Å β= 113.770 °
I/Ic	1.47
Calc. density	3.513 g/cm³
Reference	Taylor M., Brown G. E., "High-temperature structural study of the P2_1/a - A2/a phase transition insynthetic titanite, CaTiSiO5T = 165 deg C", American Mineralogist **61**, 435-447 (1976)

H: Si O2 (5.1 %)*

Formula sum	O2 Si
Entry number	96-412-4049
Figure-of-Merit (FoM)	0.808802*
Total number of peaks	130
Peaks in range	130
Peaks matched	130
Intensity scale factor	0.46*
Space group	F d d d
Crystal system	orthorhombic
Unit cell	a= 4.8424 Å b= 15.1161 Å c= 20.6075 Å
I/Ic	3.61
Calc. density	2.116 g/cm³
Reference	Foster M.D., Bell R.G., Friedrichs O.D., Paz F.A.A., Klinowski J., "Chemical evaluation of hypothetical uninodal zeolites", Journal of the American Chemical Society **126**, 9769-9775 (2004)

(*)2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.

Integrated Profile Areas

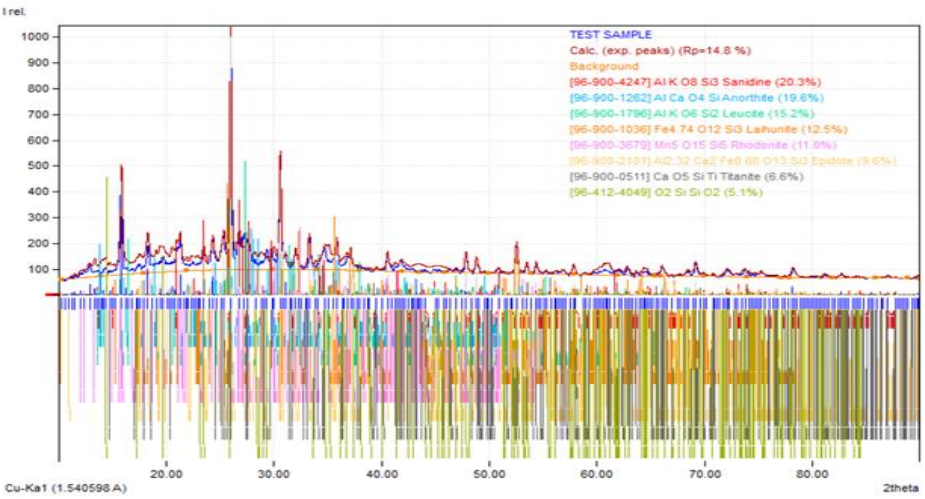
Based on calculated profile

Profile area	*Counts*	*Amount*
Overall diffraction profile	1059208	100.00%
Background radiation	816066	77.04%
Diffraction peaks	243142	22.96%
Peak area belonging to selected phases	213436	20.15%
Peak area of phase A (Sanidine)	*44976*	*4.25%*
Peak area of phase B (Anorthite)	*39433*	*3.72%*
Peak area of phase C (Leucite)	*28904*	*2.73%*
Peak area of phase D (Laihunite)	*32123*	*3.03%*
Peak area of phase E (Rhodonite)	*18823*	*1.78%*
Peak area of phase F (Epidote)	*20849*	*1.97%*
Peak area of phase G (Titanite)	*14061*	*1.33%*
Peak area of phase H (Si O2)	*14267*	*1.35%*
Unidentified peak area	29706	2.80%

Peak Residuals

Peak data	*Counts*	*Amount*
Overall peak intensity	6895	100.00%
Peak intensity belonging to selected phases	6571	95.30%
Unidentified peak intensity	324	4.70%

Diffraction Pattern Graphics



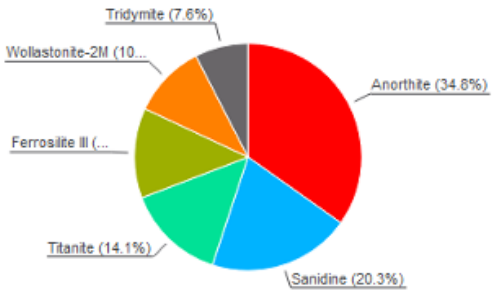
Sample: TEST SAMPLE

Sample Data

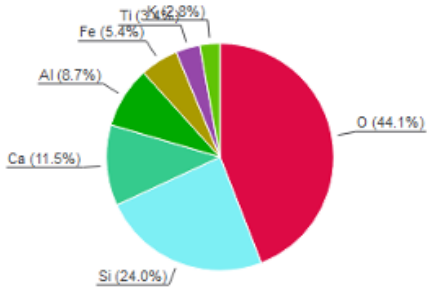
File name	BT_3 UNHAS.raw
File path	C:/Users/AGUNGP~1/AppData/Local/Temp/Rar$DRa11372.26093/Hasil XRD
Data collected	Agu 18, 2022 06:00:12
Data range	9.780° - 89.780°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	-0.22°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	34.8	Anorthite	Al2 Ca O8 Si2
B	20.3	Sanidine	Al K O8 Si3
C	14.1	Titanite	Ca O5 Si Ti
D	12.8	Ferrosilite III	Fe O3 Si
E	10.5	Wollastonite-2M	Ca O3 Si
F	7.6	Tridymite	O2 Si
	0.4	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*44.1%(*)*
Si	24.0%
Ca	11.5%
Al	8.7%
Fe	5.4%
Ti	3.4%
K	2.8%
**LE (sum)*	*44.1%*

Details of identified phases

A: Anorthite (34.8 %)*

Formula sum	Al2 Ca O8 Si2
Entry number	96-900-0363
Figure-of-Merit (FoM)	0.856940*
Total number of peaks	500
Peaks in range	500
Peaks matched	497
Intensity scale factor	0.41*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.2230 Å b= 12.9150 Å c= 14.2040 Å α= 92.750° β= 115.800 ° γ= 91.020 °
I/Ic	0.51
Calc. density	2.727 g/cm³

Reference	Foit F. F., Peacor D. R., "The anorthite crystal structure at 410 and 830 CT = 830 C", American Mineralogist **58**, 665-675 (1973)

B: Sanidine (20.3 %)*

Formula sum	Al K O8 Si3
Entry number	96-901-7291
Figure-of-Merit (FoM)	0.819263*
Total number of peaks	293
Peaks in range	293
Peaks matched	293
Intensity scale factor	0.35*
Space group	C 1 2/m 1
Crystal system	monoclinic
Unit cell	a= 8.4800 Å b= 12.9700 Å c= 7.1800 Å β= 115.980 °
I/Ic	0.74
Calc. density	2.604 g/cm³
Reference	Ribbe P. H., "A refinement of the crystal structure of sanidinised orthoclaseNote: Occupancies not provided, estimated using Kroll & Ribbe, 1983", Acta Crystallographica **16**, 426-427 (1963)

C: Titanite (14.1 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-0926
Figure-of-Merit (FoM)	0.833178*
Total number of peaks	500
Peaks in range	323
Peaks matched	319
Intensity scale factor	0.49*
Space group	P 1 21 1
Crystal system	monoclinic
Unit cell	a= 7.0500 Å b= 8.6810 Å c= 6.5390 Å β= 113.900 °
I/Ic	1.48
Calc. density	3.559 g/cm³
Reference	Hollabaugh C. L., Foit F. F., "The crystal structure of an Al-rich titanite from Grisons, Switzerland", American Mineralogist **69**, 725-732 (1984)

D: Ferrosilite III (12.8 %)*

Formula sum	Fe O3 Si
Entry number	96-901-5033
Figure-of-Merit (FoM)	0.798624*
Total number of peaks	499
Peaks in range	499
Peaks matched	497
Intensity scale factor	0.16*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6280 Å b= 7.4670 Å c= 22.6070 Å α= 115.320° β= 80.560 ° γ= 95.490 °
I/Ic	0.54
Calc. density	3.954 g/cm³
Reference	Weber H. P., "Ferrosilite III, the high-temperature polymorph of FeSiO3", Acta Crystallographica, Section C **39**, 1-3 (1983)

E: Wollastonite-2M (10.5 %)*

Formula sum	Ca O3 Si
Entry number	96-901-1914
Figure-of-Merit (FoM)	0.829566*
Total number of peaks	404
Peaks in range	404
Peaks matched	404
Intensity scale factor	0.38*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.3600 Å b= 7.2850 Å c= 7.0840 Å β= 95.400 °
I/Ic	1.58
Calc. density	2.933 g/cm³
Reference	Mamedov K. S., Belov N. V., "The crystal structure of wollastonite", Doklady Akademii Nauk SSSR **107**, 463-466 (1956)

F: Tridymite (7.6 %)*

Formula sum	O2 Si
Entry number	96-901-7299
Figure-of-Merit (FoM)	0.808309*
Total number of peaks	287
Peaks in range	287
Peaks matched	286
Intensity scale factor	0.27*
Space group	C 1 c 1
Crystal system	monoclinic

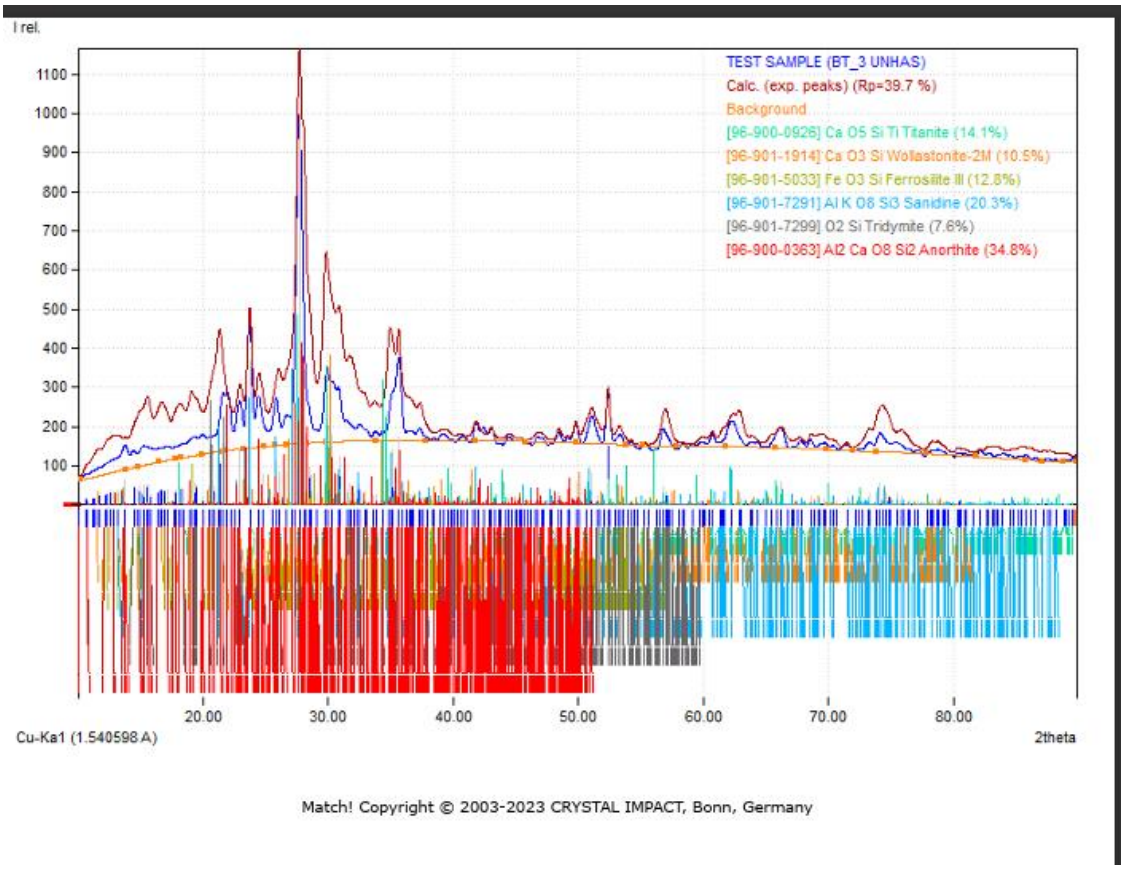
Unit cell	a= 18.4980 Å b= 4.9910 Å c= 25.8500 Å β= 117.750 °
V/e	1.62
Calc. density	2.270 g/cm³
Reference	Kato K., Nukui A., 'Die kristallstruktur des monoklinen tief-tridymits', Acta Crystallographica, Section B 32, 2486-2491 (1976)

(*) *2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due t the active search-match option 'Automatic zero point adaption'.*

Search-Match

Settings:

Reference database used	COD-Inorg 2023.05.06
Automatic zeropoint adaptation	Yes
Downgrade entries with low scaling factors	Yes
Minimum figure-of-merit (FoM)	0.60
2theta window for peak corr.	0.97 deg. (automatically determined)
Minimum rel. Int. for peak corr.	0
Parameter/influence 2theta	0.50
Parameter/influence intensities	0.50
Parameter multiple/single phase(s)	0.50



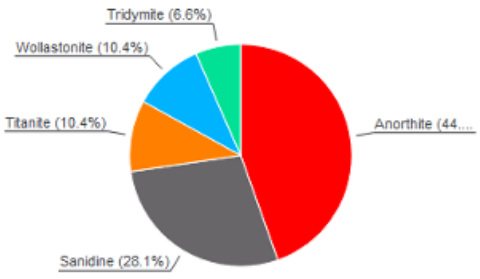
Sample: TEST SAMPLE

Sample Data

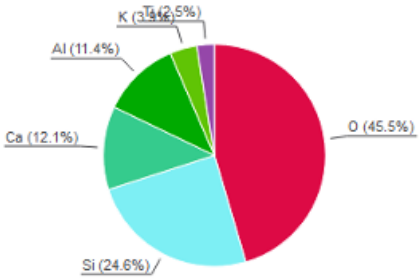
File name	BT_4 UNHAS.raw
File path	C:/Users/AGUNGP~1/AppData/Local/Temp/Rar$DRa11372.1557/Hasil XRD
Data collected	Agu 18, 2022 04:05:55
Data range	9.920° - 89.920°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	-0.08°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	44.6	Anorthite	Al2 Ca O8 Si2
B	28.1	Sanidine	Al K O8 Si3
C	10.4	Titanite	Ca O5 Si Ti
D	10.4	Wollastonite	Ca O3 Si
E	6.6	Tridymite	O2 Si
	1.6	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*45.5%(*)*
Si	24.6%
Ca	12.1%
Al	11.4%
K	3.9%
Ti	2.5%
**LE (sum)*	*45.5%*

Details of identified phases

A: Anorthite (44.6 %)*

Formula sum	Al2 Ca O8 Si2
Entry number	96-900-0362
Figure-of-Merit (FoM)	0.877793*
Total number of peaks	499
Peaks in range	499
Peaks matched	494
Intensity scale factor	0.32*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.1940 Å b= 12.8970 Å c= 14.1900 Å α= 92.980° β= 115.820 ° γ= 91.150 °
I/Ic	0.54
Calc. density	2.745 g/cm³
Reference	Foit F. F., Peacor D. R., "The anorthite crystal structure at 410 and 830 CT = 410 C", American Mineralogist **58**,

	665-675 (1973)

B: Sanidine (28.1 %)*

Formula sum	Al K O8 Si3
Entry number	96-900-4247
Figure-of-Merit (FoM)	0.794380*
Total number of peaks	292
Peaks in range	292
Peaks matched	292
Intensity scale factor	0.28*
Space group	C 1 2/m 1
Crystal system	monoclinic
Unit cell	a= 8.6110 Å b= 13.0460 Å c= 7.1750 Å β= 116.010 °
I/Ic	0.73
Calc. density	2.552 g/cm³
Reference	Ferguson R. B., Ball N. A., Cerny P., "Structure refinement of an adularian end-member high sanidine from theBuck Claim Pegmatite, Bernic Lake, ManitobaSample: IIINote: variety adularia", The Canadian Mineralogist **29**, 543-552 (1991)

C: Titanite (10.4 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-2452
Figure-of-Merit (FoM)	0.813410*
Total number of peaks	500
Peaks in range	295
Peaks matched	290
Intensity scale factor	0.17*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 6.9820 Å b= 8.6748 Å c= 6.4924 Å β= 113.498 °
I/Ic	1.21
Calc. density	3.611 g/cm³
Reference	Kunz M., Arlt T., Stolz J., "In situ powder diffraction study of titanite (CaTiOSiO4) at high pressureand high temperatureSample", American Mineralogist **85**, 1465-1473 (2000)

D: Wollastonite (10.4 %)*

Formula sum	Ca O3 Si
Entry number	96-900-5779
Figure-of-Merit (FoM)	0.803938*
Total number of peaks	487
Peaks in range	487
Peaks matched	487
Intensity scale factor	0.24*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.4240 Å b= 7.3240 Å c= 7.0692 Å β= 95.371 °
I/Ic	1.72
Calc. density	2.911 g/cm³
Reference	Ohashi Y., "Polysynthetically-twinned structures of enstatite and wollastoniteSample: WO2M", Physics and Chemistry of Minerals **10**, 217-229 (1984)

E: Tridymite (6.6 %)*

Formula sum	O2 Si
Entry number	96-900-6969
Figure-of-Merit (FoM)	0.815287*
Total number of peaks	499
Peaks in range	499
Peaks matched	497
Intensity scale factor	0.12*
Space group	P 21 21 21
Crystal system	orthorhombic
Unit cell	a= 26.1753 Å b= 4.9844 Å c= 8.2006 Å
I/Ic	1.38
Calc. density	2.238 g/cm³
Reference	Graetsch H., "X-ray powder diffraction study on the modulated high temperature formsof SiO2 tridymite between 110 and 220 CSample: superstructure, T = 115 C", Physics and Chemistry of Minerals **28**, 313-321 (2001)

(*)2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.

Integrated Profile Areas

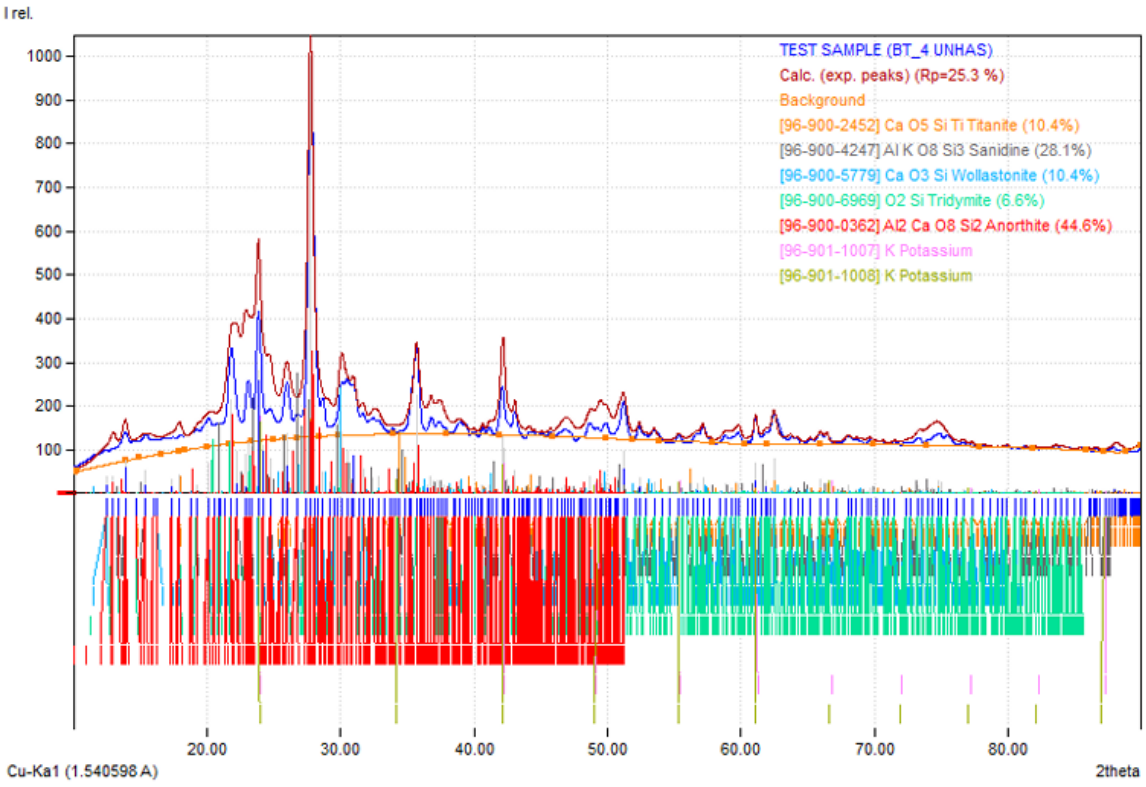
Based on calculated profile

Profile area	*Counts*	*Amount*
Overall diffraction profile	887049	100.00%
Background radiation	694387	78.28%
Diffraction peaks	192663	21.72%
Peak area belonging to selected phases	178324	20.10%
Peak area of phase A (Titanite)	*20702*	*2.33%*
Peak area of phase B (Sanidine)	*51185*	*5.77%*
Peak area of phase C (Wollastonite)	*18958*	*2.14%*
Peak area of phase D (Tridymite)	*15913*	*1.79%*
Peak area of phase E (Anorthite)	*71566*	*8.07%*
Unidentified peak area	14338	1.62%

Peak Residuals

Peak data	*Counts*	*Amount*
Overall peak intensity	6487	100.00%
Peak intensity belonging to selected phases	5667	87.36%
Unidentified peak intensity	820	12.64%

Diffraction Pattern Graphics



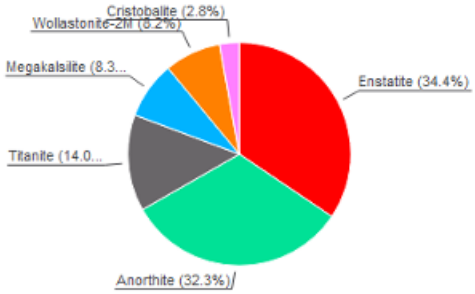
Sample: TEST SAMPLE

Sample Data

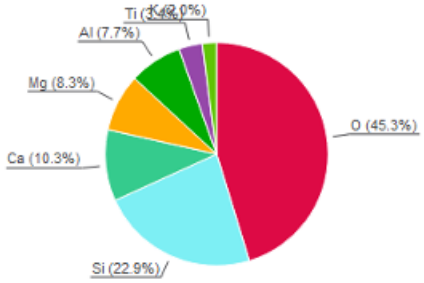
File name	BT_5 UNHAS.raw
File path	C:/Users/AGUNGP~1/AppData/Local/Temp/Rar$DRa11372.15346/Hasil XRD
Data collected	Agu 18, 2022 03:19:38
Data range	10.000° - 90.000°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	34.4	Enstatite	Mg O3 Si
B	32.3	Anorthite	Al2 Ca O8 Si2
C	14.0	Titanite	Ca O5 Si Ti
D	8.3	Megakalsilite	Al K O4 Si
E	8.2	Wollastonite-2M	Ca O3 Si
F	2.8	Cristobalite	O2 Si
	1.5	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*45.3%(*)*
Si	22.9%
Ca	10.3%
Mg	8.3%
Al	7.7%
Ti	3.4%
K	2.0%
**LE (sum)*	*45.3%*

Details of identified phases

A: Enstatite (34.4 %)*

Formula sum	Mg O3 Si
Entry number	96-900-6341
Figure-of-Merit (FoM)	0.843999*
Total number of peaks	499
Peaks in range	362
Peaks matched	355
Intensity scale factor	0.53*
Space group	P b c a
Crystal system	orthorhombic
Unit cell	a= 18.4560 Å b= 8.9600 Å c= 5.2700 Å
I/Ic	0.69
Calc. density	3.061 g/cm³
Reference	Yang H., Ghose S., "High temperature single crystal X-ray diffraction studiesof the ortho-proto phase transition

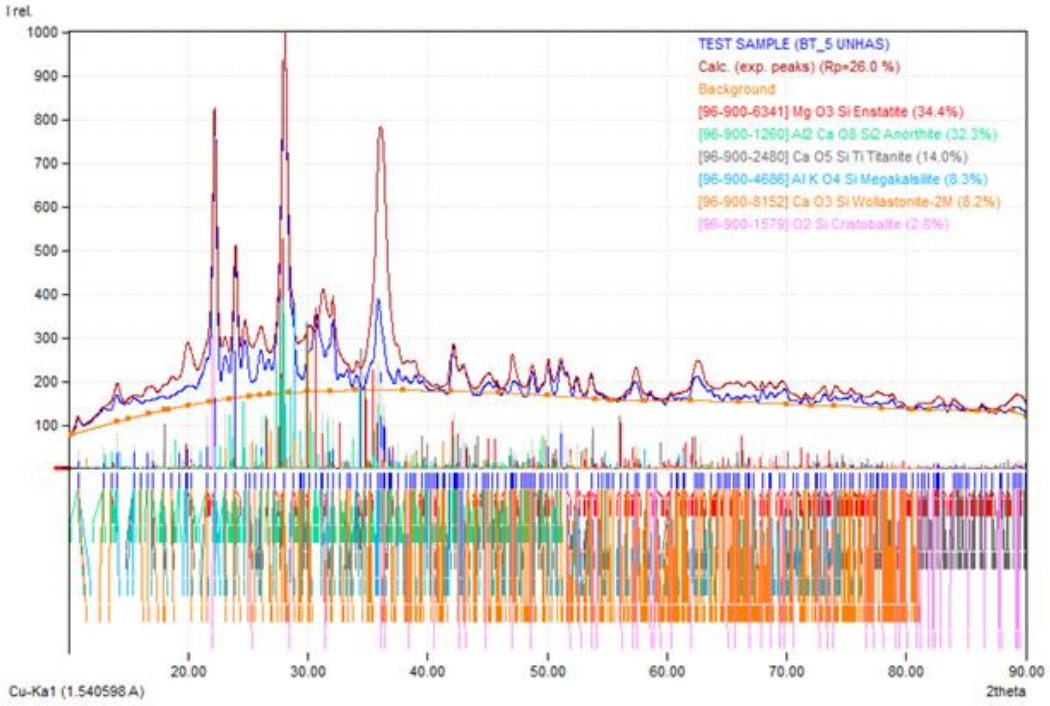
	in enstatite, Mg2Si2O6 at 1360 KSample: T = 1360 K", Physics and Chemistry of Minerals **22**, 300-310 (1995)
B: Anorthite (32.3 %)*	
Formula sum	Al2 Ca O8 Si2
Entry number	96-900-1260
Figure-of-Merit (FoM)	0.841315*
Total number of peaks	497
Peaks in range	497
Peaks matched	494
Intensity scale factor	0.39*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.1796 Å b= 12.8747 Å c= 14.1720 Å α= 93.134° β= 115.885 ° γ= 91.236 °
I/Ic	0.54
Calc. density	2.760 g/cm³
Reference	Angel R. J., Carpenter M. A., Finger L. W., "Structural variation associated with compositional variation andorder-disorder behavior in anorthite-rich feldspars sample from Monte Somma", American Mineralogist **75**, 150-162 (1990)
C: Titanite (14.0 %)*	
Formula sum	Ca O5 Si Ti
Entry number	96-900-2480
Figure-of-Merit (FoM)	0.822365*
Total number of peaks	500
Peaks in range	299
Peaks matched	292
Intensity scale factor	0.41*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 7.0014 Å b= 8.6869 Å c= 6.5081 Å β= 113.533 °
I/Ic	1.33
Calc. density	3.588 g/cm³
Reference	Kunz M., Arlt T., Stolz J., "In situ powder diffraction study of titanite (CaTiOSiO4) at high pressureand high temperatureSample", American Mineralogist **85**, 1465-1473 (2000)
D: Megakalsilite (8.3 %)*	
Formula sum	Al K O4 Si
Entry number	96-900-4686
Figure-of-Merit (FoM)	0.823587*
Total number of peaks	290
Peaks in range	290
Peaks matched	288
Intensity scale factor	0.38*
Space group	P 63
Crystal system	hexagonal
Unit cell	a= 18.1111 Å c= 8.4619 Å
I/Ic	2.07
Calc. density	2.622 g/cm³
Reference	Khomyakov A. P., Nechelyustov G. N., Sokolova E. V., Bonaccorsi E., Merlino S., Pasero M., "Megakalsilite, a new polymorph of KAlSiO4 from the Khibina alkaline massif,Kola Peninsula, Russia: mineral description and crystal structure", The Canadian Mineralogist **40**, 961-970 (2002)
E: Wollastonite-2M (8.2 %)	
Formula sum	Ca O3 Si
Entry number	96-900-8152
Figure-of-Merit (FoM)	0.825513
Total number of peaks	498
Peaks in range	498
Peaks matched	498
Intensity scale factor	0.32
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.4260 Å b= 7.3200 Å c= 7.0660 Å β= 95.404 °
I/Ic	1.75
Calc. density	2.914 g/cm³
Reference	Trojer F. J., "The crystal structure of parawollastonite", Zeitschrift fur Kristallographie **127**, 291-308 (1968)
F: Cristobalite (2.8 %)*	
Formula sum	O2 Si
Entry number	96-900-1579
Figure-of-Merit (FoM)	0.725240*
Total number of peaks	134
Peaks in range	57
Peaks matched	56
Intensity scale factor	0.31*
Space group	P 41 21 2
Crystal system	tetragonal
Unit cell	a= 4.9717 Å c= 6.9223 Å

Peak area of phase E (Wollastonite-2M)	*19104*	*2.11%*
Peak area of phase F (Cristobalite)	*11046*	*1.22%*
Unidentified peak area	13682	1.51%

Peak Residuals

Peak data	***Counts***	***Amount***
Overall peak intensity	6393	100.00%
Peak intensity belonging to selected phases	5135	80.32%
Unidentified peak intensity	1258	19.68%

Diffraction Pattern Graphics



Match! Phase Analysis Report

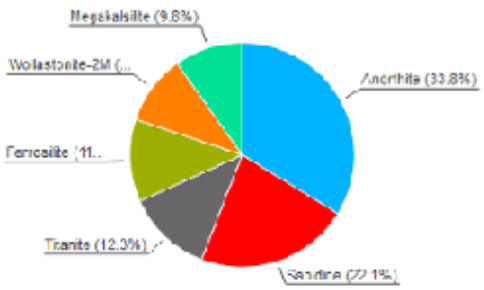
Sample: TEST SAMPLE

Sample Data

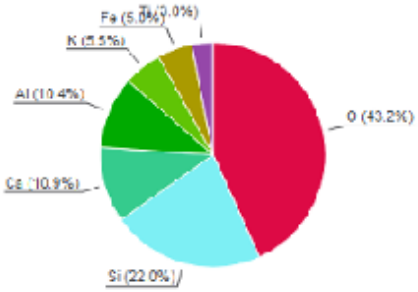
File name	BT_6 POS 1 Bawakaraeng.raw
File path	C:\Users\AGUNGT~1\AppData\Local\Temp\Rar$DRa11372.3712\Hasil XRD
Data collected	Agu 22, 2022 06:14:20
Data range	10.000° - 90.000°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 eliminated	No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	33.8	Anorthite	Al2 Ca O8 Si2
B	22.1	Sanidine	Al K O8 Si3
C	12.3	Titanite	Ca O5 Si Ti
D	11.9	Ferrosilite	Fe O3 Si
E	10.0	Wollastonite-2M	Ca O3 Si
F	9.8	Megakalsilite	Al K O4 Si
	0.9	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	43.2%(*)
Si	22.0%
Ca	10.9%
Al	10.4%
K	5.5%
Fe	5.0%
Ti	3.0%
%E (sum)	49.9%

Details of identified phases

A: Anorthite (33.8 %)

Formula sum	Al2 Ca O8 Si2
Entry number	00 900 1260
Figure-of-Merit (FoM)	0.829675
Total number of peaks	400
Peaks in range	400
Peaks matched	106
Intensity scale factor	0.43
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.1750 Å b= 12.8730 Å c= 14.1700 Å α= 93.110° β= 115.890° γ= 91.280°
I/Ic	0.53
Calc. density	2.763 g/cm³
Reference	Angel R. J., Carpenter M. A., Finger L. W., "Structural variation associated with compositional variation

B: Sanidine (22.1 %)*

Formula sum	Al K O8 Si3
Entry number	96-900-4245
Figure-of-Merit (FoM)	0.848291*
Total number of peaks	292
Peaks in range	292
Peaks matched	292
Intensity scale factor	0.39*
Space group	C 1 2/m 1
Crystal system	monoclinic
Unit cell	a= 8.6030 Å b= 13.0360 Å c= 7.1740 Å β= 116.030 °
I/Ic	0.73
Calc. density	2.557 g/cm³
Reference	Ferguson R. B., Ball N. A., Cerny P., "Structure refinement of an adularian end-member high sanidine from theBuck Claim Pegmatite, Bernic Lake, ManitobaSample: INote: variety adularia", The Canadian Mineralogist **29**, 543-552 (1991)

C: Titanite (12.3 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-2479
Figure-of-Merit (FoM)	0.821116*
Total number of peaks	500
Peaks in range	295
Peaks matched	292
Intensity scale factor	0.39*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 6.9984 Å b= 8.6846 Å c= 6.5063 Å β= 113.521 °
I/Ic	1.31
Calc. density	3.591 g/cm³
Reference	Kunz M., Arlt T., Stolz J., "In situ powder diffraction study of titanite (CaTiOSiO4) at high pressureand high temperatureSample", American Mineralogist **85**, 1465-1473 (2000)

D: Ferrosilite (11.9 %)*

Formula sum	Fe O3 Si
Entry number	96-900-6426
Figure-of-Merit (FoM)	0.799528*
Total number of peaks	490
Peaks in range	352
Peaks matched	341
Intensity scale factor	0.21*
Space group	P b c a
Crystal system	orthorhombic
Unit cell	a= 18.3410 Å b= 8.9660 Å c= 5.1925 Å
I/Ic	0.74
Calc. density	4.105 g/cm³
Reference	Hugh-Jones D A, Chopelas A., Angel R. J., "Tetrahedral compression in (Mg,Fe)SiO3 orthopyroxenesSample: P = 2.84 GPa", Physics and Chemistry of Minerals **24**, 301-310 (1997)

E: Wollastonite-2M (10.0 %)*

Formula sum	Ca O3 Si
Entry number	96-901-1914
Figure-of-Merit (FoM)	0.835177*
Total number of peaks	404
Peaks in range	404
Peaks matched	404
Intensity scale factor	0.38*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.3600 Å b= 7.2850 Å c= 7.0840 Å β= 95.400 °
I/Ic	1.58
Calc. density	2.933 g/cm³
Reference	Mamedov K. S., Belov N. V., "The crystal structure of wollastonite", Doklady Akademii Nauk SSSR **107**, 463-466 (1956)

F: Megakalsilite (9.8 %)*	
Formula sum	Al K O4 Si
Entry number	96-900-4686
Figure-of-Merit (FoM)	0.856462*
Total number of peaks	290
Peaks in range	290
Peaks matched	288
Intensity scale factor	0.49*
Space group	P 63

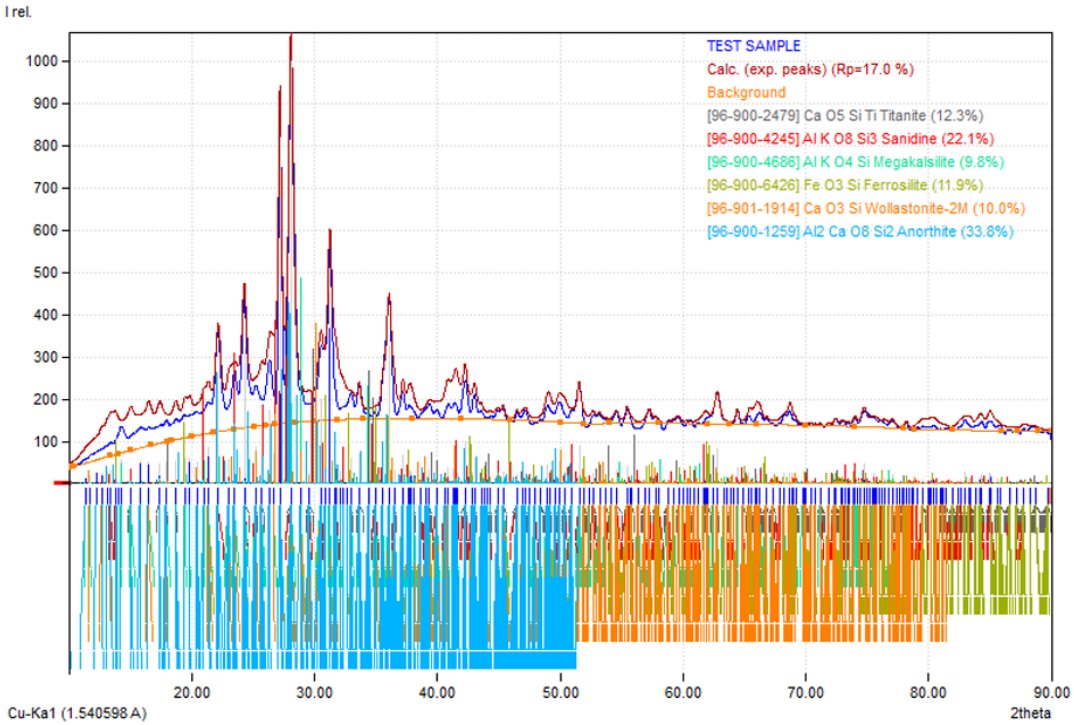
Crystal system	hexagonal
Unit cell	a= 18.1111 Å c= 8.4619 Å
I/Ic	2.07
Calc. density	2.622 g/cm³
Reference	Khomyakov A. P., Nechelyustov G. N., Sokolova E. V., Bonaccorsi E., Merlino S., Pasero M., "Megakalsilite, a new polymorph of KAlSiO4 from the Khibina alkaline massif,Kola Peninsula, Russia: mineral description and crystal structure", The Canadian Mineralogist **40**, 961-970 (2002)

(*)2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.

Peak Residuals

Peak data	***Counts***	***Amount***
Overall peak intensity	5335	100.00%
Peak intensity belonging to selected phases	4847	90.86%
Unidentified peak intensity	488	9.14%

Diffraction Pattern Graphics



Sample: TEST SAMPLE

Sample Data

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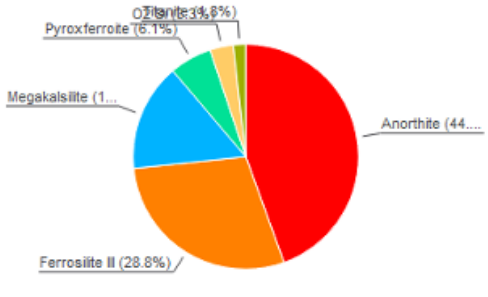
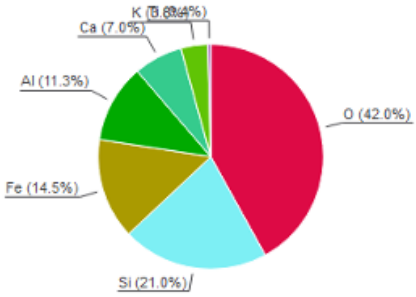
Data range	10.000° - 90.000°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	44.5	Anorthite	Al2 Ca O8 Si2
B	28.8	Ferrosilite III	Fe O3 Si
C	15.5	Megakalsilite	Al K O4 Si
D	6.1	Pyroxferroite	Ca0.94 Fe6.06 O21 Si7
E	3.3		O2 Si
F	1.8	Titanite	Ca O5 Si Ti
	6.5	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

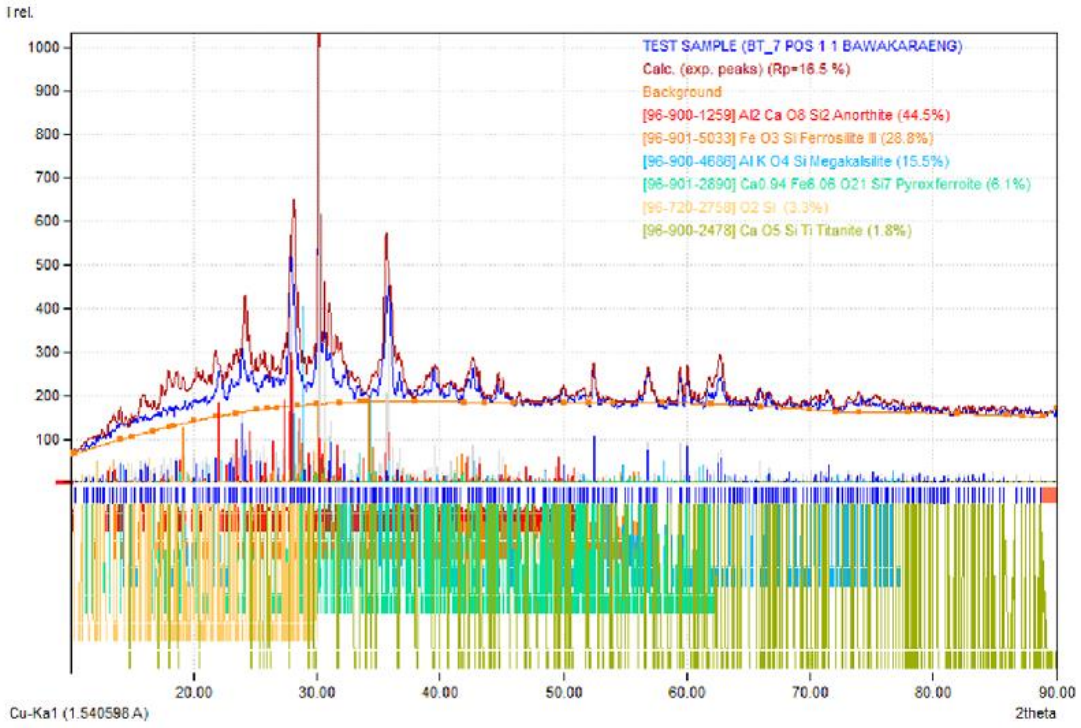
Element	*Amount (weight %)*
O	*42.0%(*)*
Si	21.0%
Fe	14.5%
Al	11.3%
Ca	7.0%
K	3.8%
Ti	0.4%
**LE (sum)*	*42.0%*

Details of identified phases

A: Anorthite (44.5 %)*

Formula sum	Al2 Ca O8 Si2
Entry number	96-900-1259
Figure-of-Merit (FoM)	0.894920*
Total number of peaks	499
Peaks in range	499
Peaks matched	496
Intensity scale factor	0.30*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.1750 Å b= 12.8730 Å c= 14.1700 Å α= 93.110° β= 115.890 ° γ= 91.280 °
I/Ic	0.53
Calc. density	2.763 g/cm³

Reference	Angel R. J., Carpenter M. A., Finger L. W., "Structural variation associated with compositional variation andorder-disorder behavior in anorthite-rich feldspars sample from Val Pasmeda", American Mineralogist **75**, 150-162 (1990)
B: Ferrosilite III (28.8 %)*	
Formula sum	Fe O3 Si
Entry number	96-901-5033
Figure-of-Merit (FoM)	0.857694*
Total number of peaks	499
Peaks in range	499
Peaks matched	497
Intensity scale factor	0.20*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6280 Å b= 7.4670 Å c= 22.6070 Å α= 115.320° β= 80.560 ° γ= 95.490 °
I/Ic	0.54
Calc. density	3.954 g/cm³
Reference	Weber H. P., "Ferrosilite III, the high-temperature polymorph of FeSiO3", Acta Crystallographica, Section C **39**, 1-3 (1983)
C: Megakalsilite (15.5 %)*	
Formula sum	Al K O4 Si
Entry number	96-900-4686
Figure-of-Merit (FoM)	0.857552*
Total number of peaks	290
Peaks in range	290
Peaks matched	288
Intensity scale factor	0.40*
Space group	P 63
Crystal system	hexagonal
Unit cell	a= 18.1111 Å c= 8.4619 Å
I/Ic	2.07
Calc. density	2.622 g/cm³
Reference	Khomyakov A. P., Nechelyustov G. N., Sokolova E. V., Bonaccorsi E., Merlino S., Pasero M., "Megakalsilite, a new polymorph of KAlSiO4 from the Khibina alkaline massif,Kola Peninsula, Russia: mineral description and crystal structure", The Canadian Mineralogist **40**, 961-970 (2002)
D: Pyroxferroite (6.1 %)*	
Formula sum	Ca0.94 Fe6.06 O21 Si7
Entry number	96-901-2890
Figure-of-Merit (FoM)	0.860753*
Total number of peaks	496
Peaks in range	496
Peaks matched	495
Intensity scale factor	0.07*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6213 Å b= 7.5506 Å c= 17.3806 Å α= 114.267° β= 82.684 ° γ= 94.576 °
I/Ic	0.89
Calc. density	3.843 g/cm³
Reference	Burnham C. W., "The crystal structure of pyroxferroite from Mare Tranquillitatis", Proceedings of the Second Lunar Science Conference **1**, 47-57 (1971)
E: O2 Si (3.3 %)*	
Formula sum	O2 Si
Entry number	96-720-2758
Figure-of-Merit (FoM)	0.787747*
Total number of peaks	183
Peaks in range	183
Peaks matched	172
Intensity scale factor	0.05*
Space group	P 1
Crystal system	triclinic (anorthic)
Unit cell	a= 14.4859 Å b= 10.0372 Å c= 43.0025 Å α= 90.000° β= 90.000 ° γ= 90.000 °
I/Ic	1.27
Calc. density	1.531 g/cm³
Reference	Bromley Stefan T., "A computational study into the viability of new molecular materialspolymorphs based on fully-coordinated inorganic nanoclusters", CrystEngComm **9(6)**, 463 (2007)
F: Titanite (1.8 %)*	
Formula sum	Ca O5 Si Ti
Entry number	96-900-2478
Figure-of-Merit (FoM)	0.835359*



Sample: TEST SAMPLE

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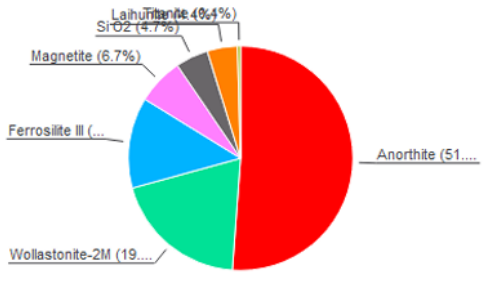
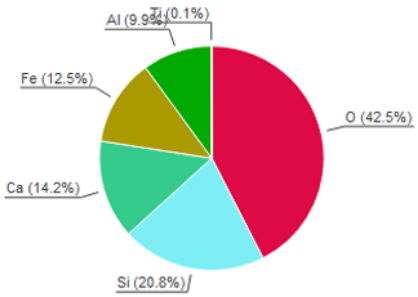
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	0.29°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	51.2	Anorthite	Al2 Ca O8 Si2
B	19.5	Wollastonite-2M	Ca O3 Si
C	13.1	Ferrosilite III	Fe O3 Si
D	6.7	Magnetite	Fe3 O4
E	4.7	Si O2	O2 Si
F	4.4	Laihunite	Fe4.74 O12 Si3
G	0.4	Titanite	Ca O5 Si Ti
	5.2	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*42.5%(*)*
Si	20.8%
Ca	14.2%
Fe	12.5%
Al	9.9%
Ti	0.1%
**LE (sum)*	*42.5%*

A: Anorthite (51.2 %)*	
Formula sum	Al2 Ca O8 Si2
Entry number	96-900-0363
Figure-of-Merit (FoM)	0.909709*
Total number of peaks	500
Peaks in range	500
Peaks matched	495
Intensity scale factor	0.39*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.2230 Å b= 12.9150 Å c= 14.2040 Å α= 92.750° β= 115.800 ° γ= 91.020 °
I/Ic	0.51
Calc. density	2.727 g/cm³
Reference	Foit F. F., Peacor D. R., "The anorthite crystal structure at 410 and 830 CT = 830 C", American Mineralogist **58**, 665-675 (1973)
B: Wollastonite-2M (19.5 %)*	
Formula sum	Ca O3 Si
Entry number	96-901-1914
Figure-of-Merit (FoM)	0.864853*
Total number of peaks	404
Peaks in range	404
Peaks matched	404
Intensity scale factor	0.46*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.3600 Å b= 7.2850 Å c= 7.0840 Å β= 95.400 °
I/Ic	1.58
Calc. density	2.933 g/cm³
Reference	Mamedov K. S., Belov N. V., "The crystal structure of wollastonite", Doklady Akademii Nauk SSSR **107**, 463-466 (1956)
C: Ferrosilite III (13.1 %)	
Formula sum	Fe O3 Si
Entry number	96-901-5033
Figure-of-Merit (FoM)	0.846203
Total number of peaks	499
Peaks in range	499
Peaks matched	497
Intensity scale factor	0.10
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6280 Å b= 7.4670 Å c= 22.6070 Å α= 115.320° β= 80.560 ° γ= 95.490 °
I/Ic	0.54
Calc. density	3.954 g/cm³
Reference	Weber H. P., "Ferrosilite III, the high-temperature polymorph of FeSiO3", Acta Crystallographica, Section C **39**, 1-3 (1983)
D: Magnetite (6.7 %)*	
Formula sum	Fe3 O4
Entry number	96-900-5814
Figure-of-Merit (FoM)	0.734912*
Total number of peaks	36
Peaks in range	17
Peaks matched	17
Intensity scale factor	0.58*
Space group	F d -3 m
Crystal system	cubic
Unit cell	a= 8.3578 Å
I/Ic	5.82
Calc. density	5.268 g/cm³
Reference	Finger L. W., Hazen R. M., Hofmeister A. M., "High-pressure crystal chemistry of spinel (MgAl2O4) and

E: Si O2 (4.7 %)*

Formula sum	O2 Si
Entry number	96-412-4066
Figure-of-Merit (FoM)	0.847387*
Total number of peaks	491
Peaks in range	470
Peaks matched	469
Intensity scale factor	0.11*
Space group	P b c a
Crystal system	orthorhombic
Unit cell	a= 8.7724 Å b= 8.7833 Å c= 16.1865 Å
I/Ic	1.51
Calc. density	2.559 g/cm³
Reference	Foster M.D., Friedrichs O.D., Bell R.G., Paz F.A.A., Klinowski J., "Chemical evaluation of hypothetical uninodal zeolites", Journal of the American Chemical Society **126**, 9769-9775 (2004)

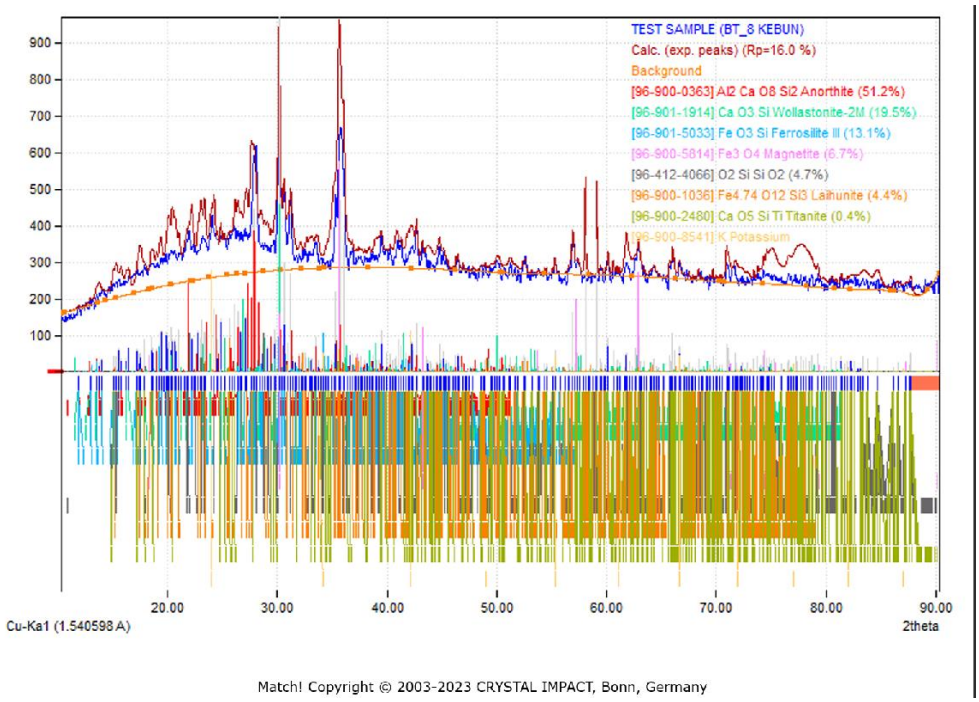
F: Laihunite (4.4 %)

Formula sum	Fe4.74 O12 Si3
Entry number	96-900-1036
Figure-of-Merit (FoM)	0.848808
Total number of peaks	497
Peaks in range	497
Peaks matched	495
Intensity scale factor	0.09
Space group	P 21/b 1 1
Crystal system	monoclinic
Unit cell	a= 4.8050 Å b= 10.1890 Å c= 17.4030 Å α= 91.000°
I/Ic	1.40
Calc. density	4.218 g/cm³
Reference	Shen B., Tamada O., Kitamura M., Morimoto N., "Superstructure of laihunite-3M (_.40Fe.80Fe.80SiO4)Sample: SuperstructureFe1B-y coordinate changed by Tamada (Aug, 2001)", American Mineralogist **71**, 1455-1460 (1986)

G: Titanite (0.4 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-2480
Figure-of-Merit (FoM)	0.829837*
Total number of peaks	500
Peaks in range	280
Peaks matched	280
Intensity scale factor	0.01*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 7.0014 Å b= 8.6869 Å c= 6.5081 Å β= 113.533 °
I/Ic	1.33
Calc. density	3.588 g/cm³
Reference	Kunz M., Arlt T., Stolz J., "In situ powder diffraction study of titanite (CaTiOSiO4) at high pressureand high temperatureSample", American Mineralogist **85**, 1465-1473 (2000)

(*)2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.



Sample: TEST SAMPLE

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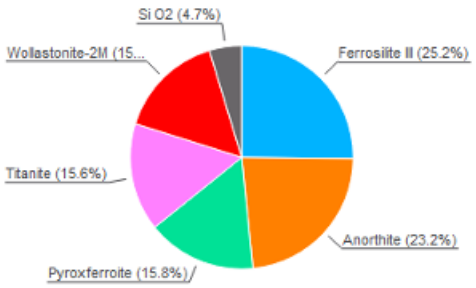
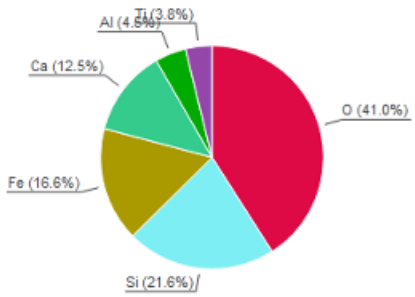
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	-0.27°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	25.2	Ferrosilite III	Fe O3 Si
B	23.2	Anorthite	Al2 Ca O8 Si2
C	15.8	Pyroxferroite	Ca0.94 Fe6.06 O21 Si7
D	15.6	Titanite	Ca O5 Si Ti
E	15.5	Wollastonite-2M	Ca O3 Si
F	4.7	Si O2	O2 Si
	0.3	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*41.0%(*)*
Si	21.6%
Fe	16.6%
Ca	12.5%
Al	4.5%
Ti	3.8%
**LE (sum)*	*41.0%*

Details of identified phases

A: Ferrosilite III (25.2 %)*

Formula sum	Fe O3 Si
Entry number	96-901-5033
Figure-of-Merit (FoM)	0.846372*
Total number of peaks	499
Peaks in range	499
Peaks matched	497
Intensity scale factor	0.41*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6280 Å b= 7.4670 Å c= 22.6070 Å α= 115.320° β= 80.560 ° γ= 95.490 °
I/Ic	0.54

Calc. density	3.954 g/cm³
Reference	Weber H. P., "Ferrosilite III, the high-temperature polymorph of FeSiO3", Acta Crystallographica, Section C **39**, 1-3 (1983)

B: Anorthite (23.2 %)*

Formula sum	Al2 Ca O8 Si2
Entry number	96-900-0363
Figure-of-Merit (FoM)	0.848268*
Total number of peaks	500
Peaks in range	500
Peaks matched	497
Intensity scale factor	0.36*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.2230 Å b= 12.9150 Å c= 14.2040 Å α= 92.750° β= 115.800 ° γ= 91.020 °
I/Ic	0.51
Calc. density	2.727 g/cm³
Reference	Foit F. F., Peacor D. R., "The anorthite crystal structure at 410 and 830 CT = 830 C", American Mineralogist **58**, 665-675 (1973)

C: Pyroxferroite (15.8 %)*

Formula sum	Ca0.94 Fe6.06 O21 Si7
Entry number	96-901-2890
Figure-of-Merit (FoM)	0.851702*
Total number of peaks	496
Peaks in range	496
Peaks matched	495
Intensity scale factor	0.43*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6213 Å b= 7.5506 Å c= 17.3806 Å α= 114.267° β= 82.684 ° γ= 94.576 °
I/Ic	0.89
Calc. density	3.843 g/cm³
Reference	Burnham C. W., "The crystal structure of pyroxferroite from Mare Tranquillitatis", Proceedings of the Second Lunar Science Conference **1**, 47-57 (1971)

D: Titanite (15.6 %)*

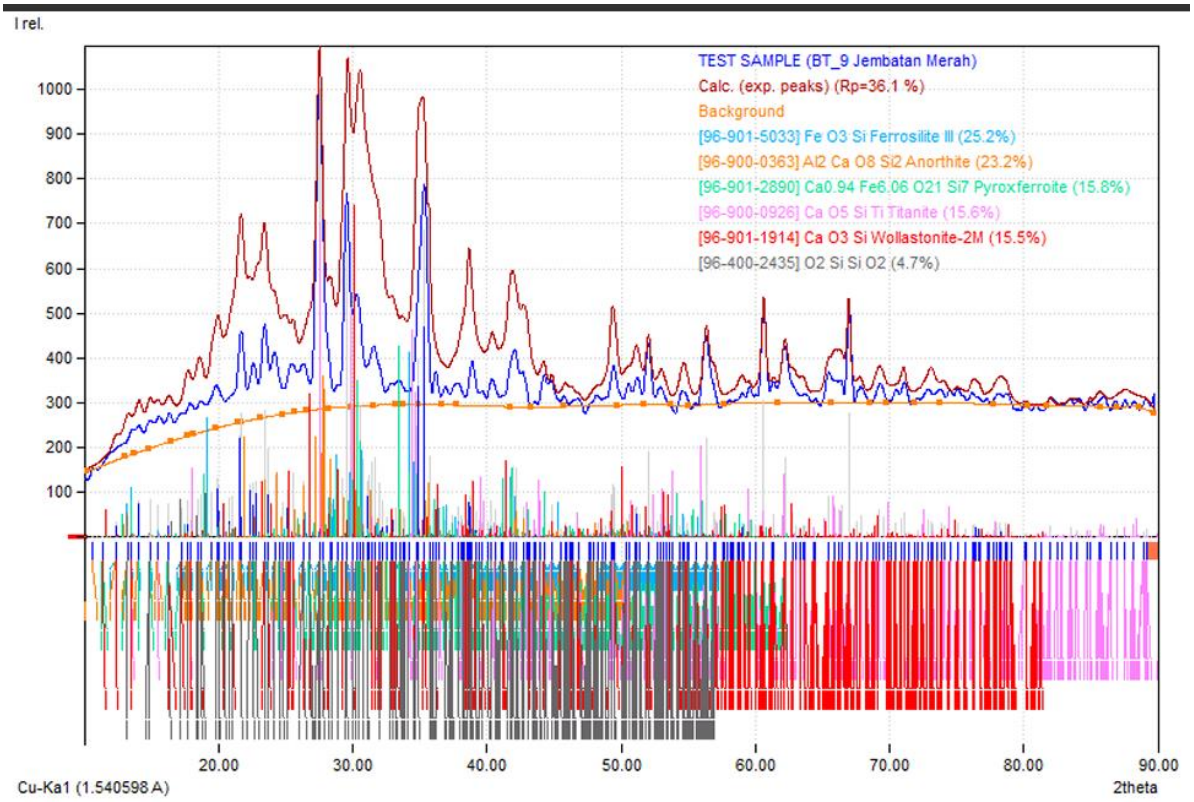
Formula sum	Ca O5 Si Ti
Entry number	96-900-0926
Figure-of-Merit (FoM)	0.838971*
Total number of peaks	500
Peaks in range	324
Peaks matched	319
Intensity scale factor	0.70*
Space group	P 1 21 1
Crystal system	monoclinic
Unit cell	a= 7.0500 Å b= 8.6810 Å c= 6.5390 Å β= 113.900 °
I/Ic	1.48
Calc. density	3.559 g/cm³
Reference	Hollabaugh C. L., Foit F. F., "The crystal structure of an Al-rich titanite from Grisons, Switzerland", American Mineralogist **69**, 725-732 (1984)

E: Wollastonite-2M (15.5 %)*

Formula sum	Ca O3 Si
Entry number	96-901-1914
Figure-of-Merit (FoM)	0.858844*
Total number of peaks	404
Peaks in range	404
Peaks matched	404
Intensity scale factor	0.74*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.3600 Å b= 7.2850 Å c= 7.0840 Å β= 95.400 °
I/Ic	1.58
Calc. density	2.933 g/cm³
Reference	Mamedov K. S., Belov N. V., "The crystal structure of wollastonite", Doklady Akademii Nauk SSSR **107**, 463-466 (1956)

F: Si O2 (4.7 %)*

Formula sum	O2 Si
Entry number	96-400-2435
Figure-of-Merit (FoM)	0.840034*
Total number of peaks	486
Peaks in range	486



Sample: TEST SAMPLE

Sample Data

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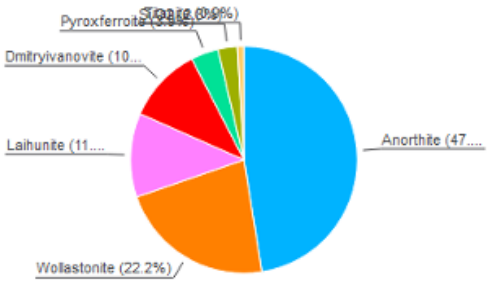
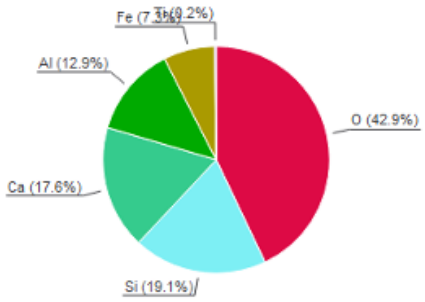
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	-0.13°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	47.5	Anorthite	Al2 Ca O8 Si2
B	22.2	Wollastonite	Ca O3 Si
C	11.9	Laihunite	Fe4.74 O12 Si3
D	10.8	Dmitryivanovite	Al2 Ca O4
E	3.9	Pyroxferroite	Ca0.94 Fe6.06 O21 Si7
F	2.8	Si O2	O2 Si
G	0.9	Titanite	Ca O5 Si Ti
	6.7	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	*42.9%(*)*
Si	19.1%
Ca	17.6%
Al	12.9%
Fe	7.3%
Ti	0.2%
**LE (sum)*	*42.9%*

Details of identified phases

A: Anorthite (47.5 %)*

Formula sum	Al2 Ca O8 Si2
Entry number	96-900-1260
Figure-of-Merit (FoM)	0.866934*
Total number of peaks	497
Peaks in range	497
Peaks matched	494
Intensity scale factor	0.42*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.1796 Å b= 12.8747 Å c= 14.1720 Å α= 93.134° β= 115.885 ° γ= 91.236 °

I/Ic	0.54
Calc. density	2.760 g/cm³
Reference	Angel R. J., Carpenter M. A., Finger L. W., "Structural variation associated with compositional variation andorder-disorder behavior in anorthite-rich feldspars sample from Monte Somma", American Mineralogist **75**, 150-162 (1990)

B: Wollastonite (22.2 %)*

Formula sum	Ca O3 Si
Entry number	96-900-5779
Figure-of-Merit (FoM)	0.867757*
Total number of peaks	487
Peaks in range	487
Peaks matched	487
Intensity scale factor	0.63*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 15.4240 Å b= 7.3240 Å c= 7.0692 Å β= 95.371 °
I/Ic	1.72
Calc. density	2.911 g/cm³
Reference	Ohashi Y., "Polysynthetically-twinned structures of enstatite and wollastoniteSample: WO2M", Physics and Chemistry of Minerals **10**, 217-229 (1984)

C: Laihunite (11.9 %)*

Formula sum	Fe4.74 O12 Si3
Entry number	96-900-1036
Figure-of-Merit (FoM)	0.846087*
Total number of peaks	497
Peaks in range	497
Peaks matched	496
Intensity scale factor	0.27*
Space group	P 21/b 1 1
Crystal system	monoclinic
Unit cell	a= 4.8050 Å b= 10.1890 Å c= 17.4030 Å α= 91.000°
I/Ic	1.40
Calc. density	4.218 g/cm³
Reference	Shen B., Tamada O., Kitamura M., Morimoto N., "Superstructure of laihunite-3M (_.40Fe.80Fe.80SiO4)Sample: SuperstructureFe1B-y coordinate changed by Tamada (Aug, 2001)", American Mineralogist **71**, 1455-1460 (1986)

D: Dmitryivanovite (10.8 %)*

Formula sum	Al2 Ca O4
Entry number	96-901-3918
Figure-of-Merit (FoM)	0.871266*
Total number of peaks	498
Peaks in range	498
Peaks matched	498
Intensity scale factor	0.15*
Space group	P 1 21/c 1
Crystal system	monoclinic
Unit cell	a= 7.9719 Å b= 8.6284 Å c= 10.2628 Å β= 94.801 °
I/Ic	0.84
Calc. density	2.985 g/cm³
Reference	Lazic B., Kahlenberg V., Konzett J., "Structural studies on a stuffed framework high pressure polymorph of CaAl2O4", Zeitschrift fur Kristallographie **222**, 690-695 (2007)

E: Pyroxferroite (3.9 %)*

Formula sum	Ca0.94 Fe6.06 O21 Si7
Entry number	96-901-2890
Figure-of-Merit (FoM)	0.870906*
Total number of peaks	496
Peaks in range	496
Peaks matched	495
Intensity scale factor	0.06*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6213 Å b= 7.5506 Å c= 17.3806 Å α= 114.267° β= 82.684 ° γ= 94.576 °
I/Ic	0.89
Calc. density	3.843 g/cm³
Reference	Burnham C. W., "The crystal structure of pyroxferroite from Mare Tranquillitatis", Proceedings of the Second Lunar Science Conference **1**, 47-57 (1971)

F: Si O2 (2.8 %)*

Formula sum	O2 Si
Entry number	96-412-4032

Figure-of-Merit (FoM)	0.846665*
Total number of peaks	212
Peaks in range	212
Peaks matched	211
Intensity scale factor	0.37*
Space group	I 41/a m d
Crystal system	tetragonal
Unit cell	a= 10.0340 Å c= 20.6038 Å
I/Ic	8.22
Calc. density	1.539 g/cm³
Reference	Foster M.D., Friedrichs O.D., Bell R.G., Paz F.A.A., Klinowski J., "Chemical evaluation of hypothetical uninodal zeolites", Journal of the American Chemical Society **126**, 9769-9775 (2004)

G: Titanite (0.9 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-2439
Figure-of-Merit (FoM)	0.823440*
Total number of peaks	499
Peaks in range	293
Peaks matched	293
Intensity scale factor	0.02*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 7.0442 Å b= 8.7132 Å c= 6.5476 Å β= 113.705 °
I/Ic	1.47
Calc. density	3.539 g/cm³
Reference	Kunz M., Arlt T., Stolz J., "In situ powder diffraction study of titanite (CaTiOSiO4) at high pressureand high temperatureSample", American Mineralogist **85**, 1465-1473 (2000)

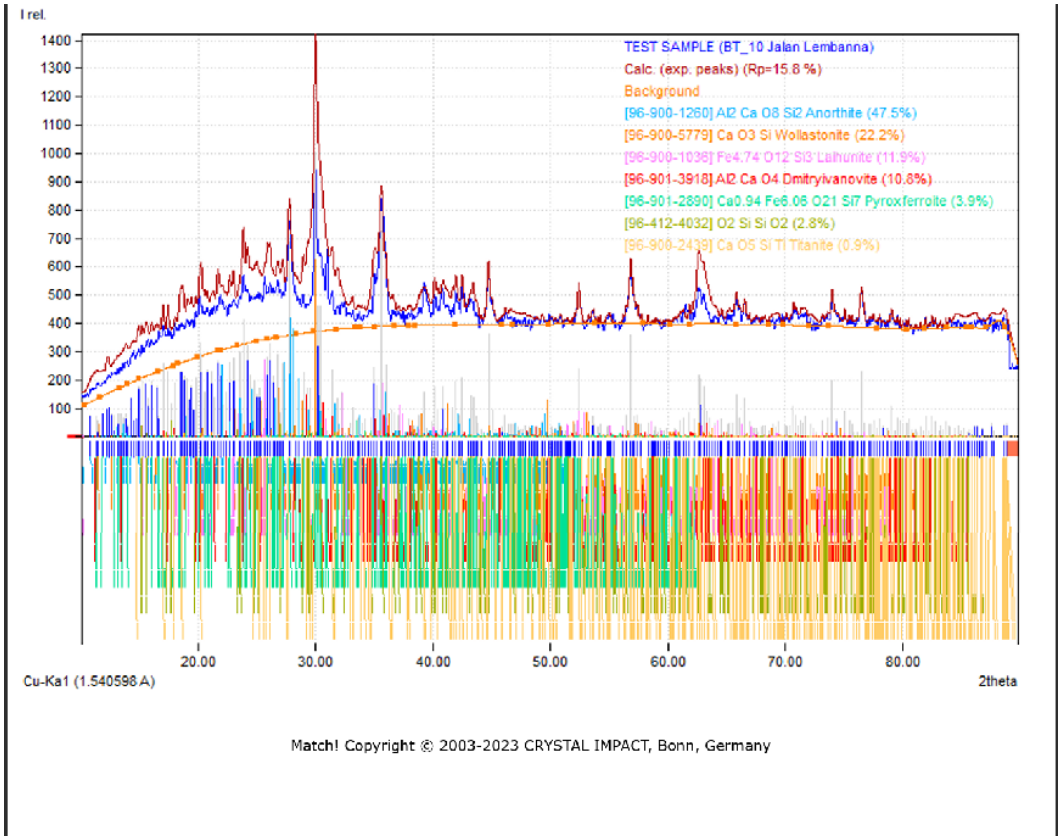
(*)2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.

Profile area	***Counts***	***Amount***
Overall diffraction profile	921597	100.00%
Background radiation	783119	84.97%
Diffraction peaks	138478	15.03%
Peak area belonging to selected phases	76392	8.29%
Peak area of phase A (Anorthite)	*28891*	*3.13%*
Peak area of phase B (Wollastonite)	*18037*	*1.96%*
Peak area of phase C (Laihunite)	*12951*	*1.41%*
Peak area of phase D (Dmitryivanovite)	*9170*	*0.99%*
Peak area of phase E (Pyroxferroite)	*3530*	*0.38%*
Peak area of phase F (Si O2)	*2970*	*0.32%*
Peak area of phase G (Titanite)	*842*	*0.09%*
Unidentified peak area	62086	6.74%

Peak Residuals

Peak data	***Counts***	***Amount***
Overall peak intensity	4481	100.00%
Peak intensity belonging to selected phases	3934	87.79%
Unidentified peak intensity	547	12.21%

Diffraction Pattern Graphics



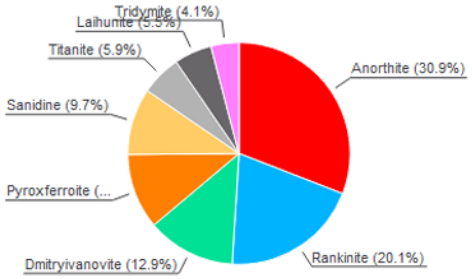
Sample: TEST SAMPLE

Sample Data

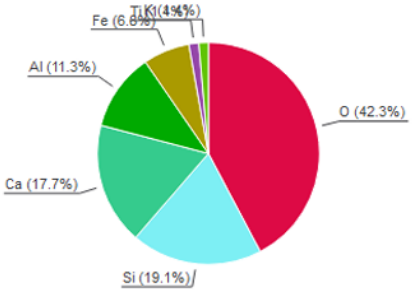
File name	BT_11 Takapala.raw
File path	C:/Users/AGUNGP~1/AppData/Local/Temp/Rar$DRa11372.20897/Hasil XRD
Data collected	Agu 18, 2022 05:37:48
Data range	10.080° - 90.080°
Original data range	10.000° - 90.000°
Number of points	4001
Step size	0.020
Rietveld refinement converged	No
Alpha2 subtracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	0.08°
Radiation	X-rays
Wavelength	1.540598 Å

Analysis Results

Phase composition (Weight %)



Elemental composition (Weight %)



Index	*Amount (%)*	*Name*	*Formula sum*
A	30.9	Anorthite	Al2 Ca O8 Si2
B	20.1	Rankinite	Ca3 O7 Si2
C	12.9	Dmitryivanovite	Al2 Ca O4
D	11.0	Pyroxferroite	Ca0.94 Fe6.06 O21 Si7
E	9.7	Sanidine	Al K O8 Si3
F	5.9	Titanite	Ca O5 Si Ti
G	5.5	Laihunite	Fe4.74 O12 Si3
H	4.1	Tridymite	O2 Si
	2.7	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Element	*Amount (weight %)*
O	42.3%(*)
Si	19.1%
Ca	17.7%
Al	11.3%
Fe	6.8%
Ti	1.4%
K	1.4%
**LE (sum)*	42.3%

Details of identified phases

A: Anorthite (30.9 %)*

Formula sum	Al2 Ca O8 Si2
Entry number	96-900-1260
Figure-of-Merit (FoM)	0.882923*
Total number of peaks	497
Peaks in range	497
Peaks matched	494
Intensity scale factor	0.60*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 8.1796 Å b= 12.8747 Å c= 14.1720 Å α= 93.134° β= 115.885 ° γ= 91.236 °
I/Ic	0.54
Calc. density	2.760 g/cm³
Reference	Angel R. J., Carpenter M. A., Finger L. W., "Structural variation associated with compositional variation andorder-disorder behavior in anorthite-rich feldspars sample from Monte Somma", American Mineralogist **75**, 150-162 (1990)

B: Rankinite (20.1 %)

Formula sum	Ca3 O7 Si2
Entry number	96-901-2094
Figure-of-Merit (FoM)	0.865150
Total number of peaks	498
Peaks in range	498
Peaks matched	498
Intensity scale factor	0.36
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 10.6000 Å b= 8.9200 Å c= 7.8900 Å β= 119.600 °
I/Ic	0.50
Calc. density	2.953 g/cm³
Reference	Kusachi I., Henmi C., Kawahara A., Henmi K., "The structure of rankinite", Mineralogical Journal **8**, 38-47 (1975)

C: Dmitryivanovite (12.9 %)*

Formula sum	Al2 Ca O4
Entry number	96-901-3918
Figure-of-Merit (FoM)	0.868973*
Total number of peaks	498
Peaks in range	498
Peaks matched	498
Intensity scale factor	0.39*
Space group	P 1 21/c 1
Crystal system	monoclinic
Unit cell	a= 7.9719 Å b= 8.6284 Å c= 10.2628 Å β= 94.801 °
I/Ic	0.84
Calc. density	2.985 g/cm³
Reference	Lazic B., Kahlenberg V., Konzett J., "Structural studies on a stuffed framework high pressure polymorph of CaAl2O4", Zeitschrift fur Kristallographie **222**, 690-695 (2007)

D: Pyroxferroite (11.0 %)*

Formula sum	Ca0.94 Fe6.06 O21 Si7
Entry number	96-901-2890
Figure-of-Merit (FoM)	0.863306*
Total number of peaks	496
Peaks in range	496
Peaks matched	495

Intensity scale factor	0.35*
Space group	P -1
Crystal system	triclinic (anorthic)
Unit cell	a= 6.6213 Å b= 7.5506 Å c= 17.3806 Å α= 114.267° β= 82.684 ° γ= 94.576 °
I/Ic	0.89
Calc. density	3.843 g/cm³
Reference	Burnham C. W., "The crystal structure of pyroxferroite from Mare Tranquillitatis", Proceedings of the Second Lunar Science Conference **1**, 47-57 (1971)

E: Sanidine (9.7 %)*

Formula sum	Al K O8 Si3
Entry number	96-901-7455
Figure-of-Merit (FoM)	0.819768*
Total number of peaks	293
Peaks in range	293
Peaks matched	293
Intensity scale factor	0.26*
Space group	C 1 2/m 1
Crystal system	monoclinic
Unit cell	a= 8.5460 Å b= 13.0330 Å c= 7.1760 Å β= 115.970 °
I/Ic	0.73
Calc. density	2.573 g/cm³
Reference	Gering E., "Silizium/Aluminium-Ordnung und Kristallperfektion von SanidinenNote: Sample SANN, T = 1050 C, X-ray diffraction", Dissertation Kernforshungszentrum Karlsruhe **1**, 1-97 (1985)

F: Titanite (5.9 %)*

Formula sum	Ca O5 Si Ti
Entry number	96-900-2443
Figure-of-Merit (FoM)	0.834370*
Total number of peaks	500
Peaks in range	296
Peaks matched	293
Intensity scale factor	0.34*
Space group	P 1 21/a 1
Crystal system	monoclinic
Unit cell	a= 7.0187 Å b= 8.6965 Å c= 6.5243 Å β= 113.594 °
I/Ic	1.58
Calc. density	3.568 g/cm³
Reference	Kunz M., Arlt T., Stolz J., "In situ powder diffraction study of titanite (CaTiOSiO4) at high pressureand high temperatureSample", American Mineralogist **85**, 1465-1473 (2000)

G: Laihunite (5.5 %)*

Formula sum	Fe4.74 O12 Si3
Entry number	96-900-1036
Figure-of-Merit (FoM)	0.856798*
Total number of peaks	497
Peaks in range	497
Peaks matched	496
Intensity scale factor	0.28*
Space group	P 21/b 1 1
Crystal system	monoclinic
Unit cell	a= 4.8050 Å b= 10.1890 Å c= 17.4030 Å α= 91.000°
I/Ic	1.40
Calc. density	4.218 g/cm³
Reference	Shen B., Tamada O., Kitamura M., Morimoto N., "Superstructure of laihunite-3M (_.40Fe.80Fe.80SiO4)Sample: SuperstructureFe1B-y coordinate changed by Tamada (Aug, 2001)", American Mineralogist **71**, 1455-1460 (1986)

H: Tridymite (4.1 %)*

Formula sum	O2 Si
Entry number	96-901-3494
Figure-of-Merit (FoM)	0.840580*
Total number of peaks	500
Peaks in range	500
Peaks matched	499
Intensity scale factor	0.22*
Space group	P 21 21 21
Crystal system	orthorhombic
Unit cell	a= 26.1630 Å b= 4.9870 Å c= 8.1990 Å
I/Ic	1.51
Calc. density	2.238 g/cm³
Reference	Hirose T., Kihara K., Okuno M., Fujinami S., Shinoda K., "X-ray, DTA and Raman studies of monoclinic tridymite and its highertemperature orthorhombic modification with varying temperature.Note: T = 413 K", Journal of Mineralogical and Petrological Sciences **100**, 55-69 (2005)

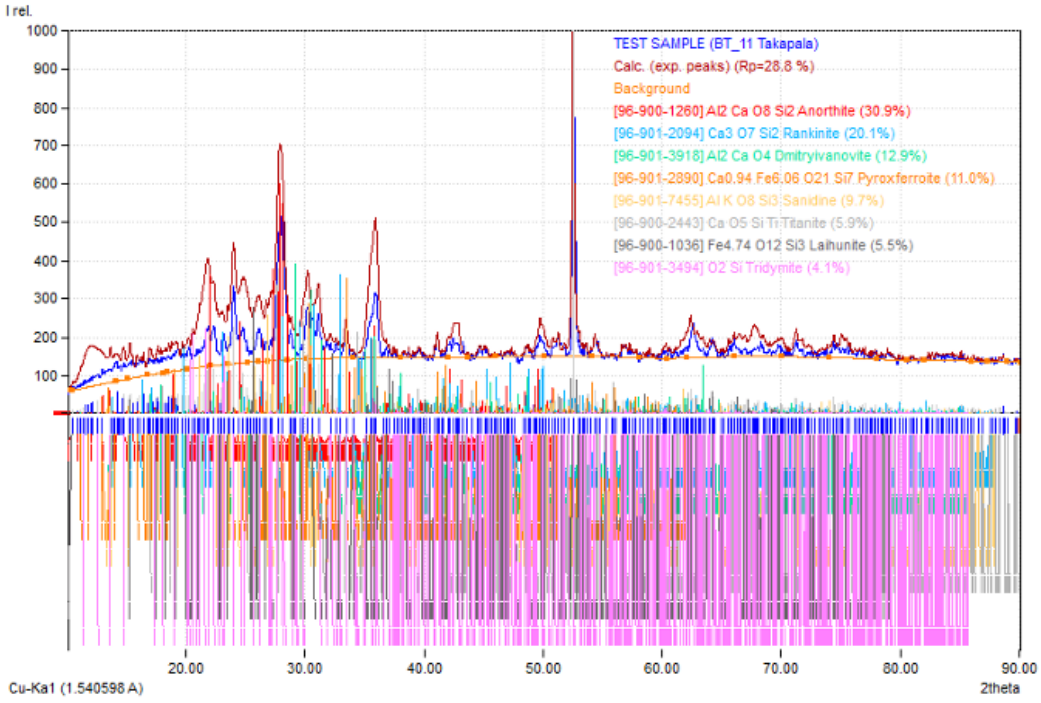
(*)2theta values have been shifted internally for the calculation of the amounts, the intensity scaling factors as well as the figure-of-merit (FoM), due to the active search-match option 'Automatic zero point adaption'.

Profile area	*Counts*	*Amount*
Overall diffraction profile	700228	100.00%
Background radiation	576699	82.36%
Diffraction peaks	123529	17.64%
Peak area belonging to selected phases	104771	14.96%
Peak area of phase A (Anorthite)	*27380*	*3.91%*
Peak area of phase B (Rankinite)	*23321*	*3.33%*
Peak area of phase C (Dmitryivanovite)	*12788*	*1.83%*
Peak area of phase D (Pyroxferroite)	*11077*	*1.58%*
Peak area of phase E (Sanidine)	*9497*	*1.36%*
Peak area of phase F (Titanite)	*6079*	*0.87%*
Peak area of phase G (Laihunite)	*8732*	*1.25%*
Peak area of phase H (Tridymite)	*5898*	*0.84%*
Unidentified peak area	18758	2.68%

Peak Residuals

Peak data	*Counts*	*Amount*
Overall peak intensity	4894	100.00%
Peak intensity belonging to selected phases	4814	98.36%
Unidentified peak intensity	80	1.64%

Diffraction Pattern Graphics



HASIL XRF

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SAMPLE ANALYSIS REPORT                                    THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER                          UNIQUANT(TM) STANDARDLESS METHOD
_____________________________________________________________________________

C:\UQed\USER\Quant'X\Job\JOB.323    2022-08-12
BT1

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as :  Elements     Matrix (Shape & ImpFc) :  1|Teflon
X-ray path    =     Air       Film type     = No supporting film
Case number   =  0  All known
Eff.Diam.     = 13.0 mm       Eff.Area      = 132.7 mm2
KnownConc     =  0    %
Rest          =  0    %                     Viewed Mass   = 1000.00 mg
Dil/Sample    =  0                          Sample Height = 5.00 mm

         El     m/m%     StdErr
         --     -------- -------
         Si      47.39    0.60
         Fe      22.33    0.28
         Ca      15.23    0.27
         Al       5.25    1.02
         K        4.81    0.23

         Ti       2.58    0.10
         Sr      0.926   0.046
         Px       0.49    0.12
         Mn      0.359   0.058
         Zr      0.214   0.056

         Ba      0.185   0.040
         Nb     0.0686  0.0055
         Zn      0.048   0.016
         Mo     0.0419  0.0083
         In     0.0229  0.0012

         Sn     0.0180  0.0021
         Ru     0.0164  0.0041
         Sb     0.0133  0.0032
         Rh     0.0106  0.0040
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ARL QUANT'X EDXRF ANALYZER                          UNIQUANT(TM) STANDARDLESS METHOD
_____________________________________________________________________________

C:\UQed\USER\Quant'X\Job\JOB.322    2022-08-12
BT2

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as :  Elements     Matrix (Shape & ImpFc) :  1|Teflon
X-ray path    =     Air       Film type     = No supporting film
Case number   =  0  All known
Eff.Diam.     = 13.0 mm       Eff.Area      = 132.7 mm2
KnownConc     =  0    %
Rest          =  0    %                     Viewed Mass   = 18000.00 mg
Dil/Sample    =  0                          Sample Height = 5.00 mm

          El     m/m%     StdErr
          --     -------- -------
          Si      52.94    0.63
          Fe      17.90    0.22
          K        8.99    0.24
          Ca       7.82    0.33
          Al       7.27    0.97

          Ti       1.62    0.20
          Mn       1.05    0.06
          Sr      0.766   0.038
          Px       0.58    0.10
          Ba      0.508   0.042

          Zr      0.189   0.050
          Rb      0.127   0.019
          Zn      0.064   0.017
          Nb     0.0595  0.0053
          Mo     0.0396  0.0075

          In     0.0183  0.0012
          Sn     0.0177  0.0021
          Ru     0.0161  0.0038
          Sb     0.0124  0.0033
          Rh     0.0093  0.0037
```

SAMPLE ANALYSIS REPORT — THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER — UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.319 2022-08-12
BT3

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements | Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air | Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm | Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % | Viewed Mass = 1000.00 mg
Dil/Sample = 0 | Sample Height = 5.00 mm

El	m/m%	StdErr
Si	48.74	0.56
Fe	19.79	0.23
Ca	15.34	0.32
K	6.52	0.27
Al	4.97	0.94
Ti	1.94	0.16
Sr	0.800	0.040
Px	0.67	0.10
Mn	0.464	0.054
Ba	0.274	0.048
Zr	0.200	0.050
Nb	0.0802	0.0054
Rb	0.056	0.016
Mo	0.0518	0.0081
In	0.0268	0.0014
Sn	0.0224	0.0024
Ru	0.0222	0.0043
Sb	0.0168	0.0038
Rh	0.0124	0.0042

SAMPLE ANALYSIS REPORT — THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER — UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.320 2022-08-12
BT4

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements | Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air | Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm | Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % | Viewed Mass = 1000.00 mg
Dil/Sample = 0 | Sample Height = 5.00 mm

El	m/m%	StdErr
Si	49.94	0.57
Fe	18.18	0.21
Ca	13.14	0.32
K	7.75	0.26
Al	6.02	0.92
Ti	1.95	0.10
Sr	0.972	0.048
Px	0.78	0.11
Mn	0.500	0.051
Ba	0.278	0.045
Zr	0.223	0.057
Rb	0.079	0.016
Nb	0.0747	0.0050
Mo	0.0449	0.0081
In	0.0241	0.0012
Sn	0.0188	0.0022
Ru	0.0175	0.0039
Sb	0.0128	0.0034
Rh	0.0111	0.0038

SAMPLE ANALYSIS REPORT — THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER — UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.327 2022-08-12
BT5

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % Viewed Mass = 1000.00 mg
Dil/Sample = 0 Sample Height = 5.00 mm

El	m/m%	StdErr
Si	52.28	1.58
Fe	16.32	0.50
Ca	12.13	0.37
Mg	5.52	2.49
K	5.32	0.22
Al	4.25	0.92
Ti	2.13	0.07
Sr	0.907	0.048
Mn	0.405	0.051
Px	0.35	0.11
Ba	0.122	0.036
Zr	0.112	0.056
Nb	0.0501	0.0043
Mo	0.0331	0.0055
In	0.0150	0.0009
Sn	0.0138	0.0017
Ru	0.0138	0.0032
Sb	0.0102	0.0026
Rh	0.0084	0.0031

SAMPLE ANALYSIS REPORT — THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER — UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.341 2022-08-29
JLN#Lembanna

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % Viewed Mass = 1000.00 mg
Dil/Sample = 0 Sample Height = 5.00 mm

El	m/m%	StdErr
Si	34.26	0.51
Fe	32.22	0.40
Al	15.90	0.94
Ca	11.05	0.16
Ti	3.19	0.18
Px	1.47	0.11
Mn	0.706	0.079
K	0.55	0.17
Sr	0.224	0.011
Zr	0.188	0.022
Ni	0.081	0.023
Nb	0.0601	0.0040
Mo	0.0328	0.0066
Sn	0.0166	0.0017
In	0.0147	0.0009
Ru	0.0129	0.0031
Sb	0.0114	0.0026
Rh	0.0088	0.0029

SAMPLE ANALYSIS REPORT THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.325 2022-08-12
KebUn

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % Viewed Mass = 18000.00 mg
Dil/Sample = 0 Sample Height = 5.00 mm

El	m/m%	StdErr
Fe	33.88	0.46
Si	32.57	0.54
Al	15.60	1.05
Ca	9.74	0.17
Ti	3.69	0.10
Px	1.80	0.12
K	1.22	0.17
Mn	0.753	0.085
Zr	0.254	0.025
Sr	0.203	0.013
Nb	0.0922	0.0046
Mo	0.0510	0.0080
Zn	0.051	0.017
Sn	0.0228	0.0022
In	0.0226	0.0013
Ru	0.0226	0.0033
Sb	0.0172	0.0034
Rh	0.0170	0.0031

SAMPLE ANALYSIS REPORT THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.321 2022-08-12
Pos#1b1#Bawakaraeng

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % Viewed Mass = 1000.00 mg
Dil/Sample = 0 Sample Height = 5.00 mm

El	m/m%	StdErr
Si	41.66	0.52
Fe	25.99	0.30
Ca	13.62	0.18
Al	11.61	0.89
Ti	2.90	0.10
K	1.48	0.18
Px	0.990	0.100
Mn	0.642	0.066
Sr	0.532	0.026
Ba	0.221	0.040
Zr	0.159	0.036
Nb	0.0726	0.0050
Mo	0.0450	0.0069
In	0.0237	0.0013
Sn	0.0196	0.0023
Ru	0.0162	0.0039
Sb	0.0133	0.0035
Rh	0.0112	0.0038

SAMPLE ANALYSIS REPORT THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.328 2022-08-12
Pos1#Bawakaraeng

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % Viewed Mass = 1000.00 mg
Dil/Sample = 0 Sample Height = 5.00 mm

El	m/m%	StdErr
Si	47.91	0.65
Fe	20.37	0.27
Al	9.95	1.05
K	9.10	0.24
Ca	7.23	0.32
Ti	2.53	0.11
Px	0.97	0.13
Sr	0.655	0.033
Mn	0.463	0.056
Ba	0.276	0.044
Zr	0.230	0.044
Nb	0.0917	0.0046
Rb	0.067	0.019
Mo	0.0482	0.0074
Ru	0.0235	0.0032
In	0.0226	0.0014
Sn	0.0206	0.0024
Sb	0.0176	0.0036
Rh	0.0174	0.0030

SAMPLE ANALYSIS REPORT THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.326 2022-08-12
Takapala

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % Viewed Mass = 1000.00 mg
Dil/Sample = 0 Sample Height = 5.00 mm

El	m/m%	StdErr
Si	44.53	0.51
Fe	23.34	0.26
Ca	17.25	0.26
K	4.91	0.23
Al	4.87	0.91
Ti	2.45	0.10
Sr	0.853	0.042
Mn	0.649	0.058
Px	0.501	0.094
Ba	0.296	0.048
Zr	0.148	0.051
Nb	0.0691	0.0052
Mo	0.0449	0.0069
In	0.0239	0.0013
Sn	0.0210	0.0024
Ru	0.0177	0.0041
Sb	0.0170	0.0036
Rh	0.0106	0.0040

SAMPLE ANALYSIS REPORT THERMO FISHER SCIENTIFIC
ARL QUANT'X EDXRF ANALYZER UNIQUANT(TM) STANDARDLESS METHOD

C:\UQed\USER\Quant'X\Job\JOB.324 2022-08-12
JembatanMerah

Quant'X Rh end window 50kV
C:\UQed\USER\Quant'X\Appl\AnySampleAir.kap 2008-06-13
Calculated as : Elements Matrix (Shape & ImpFc) : 1|Teflon
X-ray path = Air Film type = No supporting film
Case number = 0 All known
Eff.Diam. = 13.0 mm Eff.Area = 132.7 mm2
KnownConc = 0 %
Rest = 0 % Viewed Mass = 1000.00 mg
Dil/Sample = 0 Sample Height = 5.00 mm

El	m/m%	StdErr
Si	42.07	0.51
Fe	25.97	0.29
Ca	17.20	0.20
Al	7.74	0.92
Ti	2.19	0.18
K	1.37	0.20
Px	1.09	0.10
Sr	0.847	0.042
Mn	0.646	0.067
Ba	0.210	0.039
Cr	0.156	0.068
Zr	0.145	0.050
Nb	0.0715	0.0037
Ni	0.068	0.022
Mo	0.0466	0.0055
Rb	0.046	0.018
Zn	0.036	0.013
Ru	0.0211	0.0028
In	0.0201	0.0012