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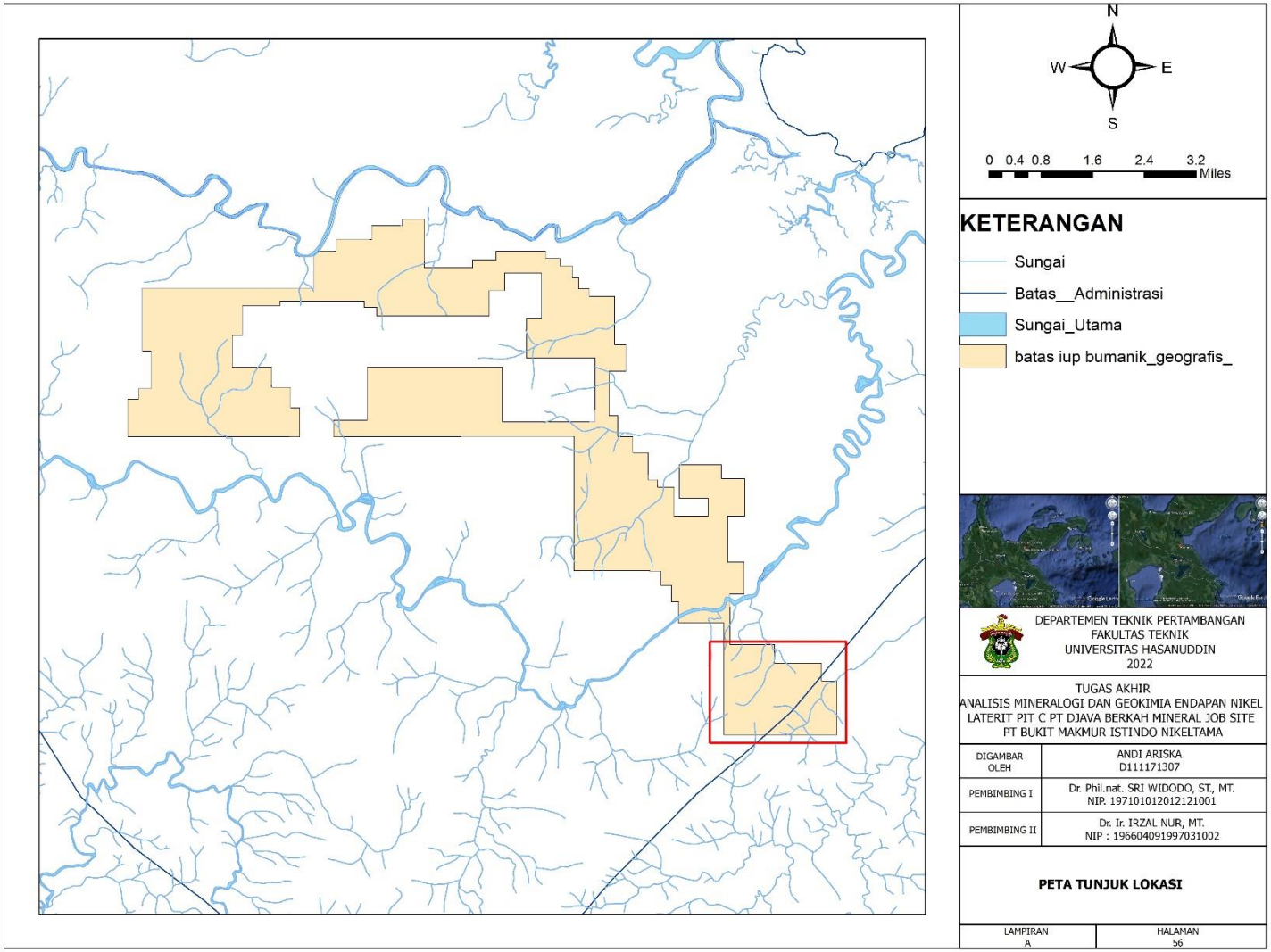
LAMPIRAN

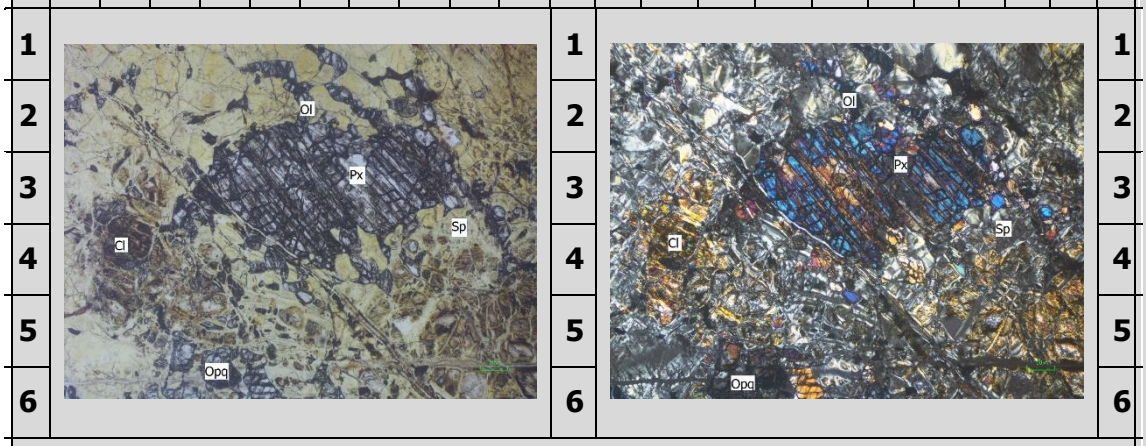
LAMPIRAN A
PETA TUNJUK LOKASI


N
W
E
S
0 0.4 0.8 1.6 2.4 3.2
Miles
KETERANGAN
Sungai
Batas__Administrasi
Sungai_Utama
batas iup bumanik_geografis_
DEPARTEMEN TEKNIK PERTAMBANGAN
FAKULTAS TEKNIK
UNIVERSITAS HASANUDDIN
2022
TUGAS AKHIR
ANALISIS MINERALOGI DAN GEOKIMIA ENDAPAN NIKEL LATERIT PIT C PT DJAVA BERKAH MINERAL JOB SITE PT BUKIT MAKMUR ISTINDO NIKELTAMA
DIGAMBAR OLEH
ANDI ARISKA
D111171307
PEMBIMBING I
Dr. Phil.nat. SRI WIDODO, ST, MT.
NIP. 19710101201212100 1
PEMBIMBING II
Dr. Ir. IRZAL NUR, MT.
NIP : 196604091997031002
PETA TUNJUK LOKASI
LAMPIRAN
A
HALAMAN
56

LAMPIRAN B
HASIL DESKRIPSI MINERAL

No. Sayatan: 1
Lokasi : PIT C, PT Djava Berkah Mineral

Foto



//– Nikol *X – Nikol*

Lensa Okuler : 10x *Lensa Obyektif : 5x*
Perbesaran Total :50x

Tipe Batuan : Batuan Beku

Tipe Str uktur : Masif

Mikroskopis :

Warna absorbsi abu-abu kecoklatan, warna interferensi abu-abu kehitaman, tekstur kristalinitashipokristalin, granularitas Faneritik, bentuk anhedral-subhedral, relasi inequigranular, komposisi mineral terdiri dari kuarsa, plagioklas, ortoklas, biotit dan muskovit.

Deskripsi Mineral

Komposisi Mineral	Jumlah (%)	Keterangan Optik Mineral
Piroksen (Px)	**40**	Piroksin memiliki warna absorbsi transparan/*colourless*, warna interferensi abu-abu kecoklatan. Memiliki relief sedang,intensitas sedang, memiliki belahan 2 arah, bentuk mineral anhedral-subhedral, ukuran 0,01 mm-0,5 mm, tidak memiliki kembaran pecahan uneven, sudut gelapan 47.5^{o}, jenis gelapan miring.
Olivin (Ol)	**35**	Olivin memiliki warna absorbs transparan/*colourless* warna interferensi biru kehijauan, relief sedang intensitas sedang bentuk anhedral-subhedral ukuran 0,06 mm-0,2 mm pecahan uneven tidak memiliki belahan sudut gelapan 47^{o} gelapan miring.

Serpentin (Sp)	**15**	Serpentin memiliki warna absorbs transparan/*colourless*, warna interferensi putih keabuan relief sedang, intensitas sedang, tidak memiliki belahan tidak memiliki pecahan, bentuk anhedral-subhedral ukuran 0.02 – 0.5 mm sudut gelapan 40 ° jenis gelapan miring.
Klorit (Cl)	**10**	Memiliki warna absorbsi hijau, bentuk anhedral-subhedral, relief rendah, intensitas kuat, pleokroisme kuat, ukuran mineral 0,2 mm, warna interferensi hijau,tidak memiliki kembaran, jenis gelapan miring 25°.

LAMPIRAN C

HASIL ANALISIS *X-RAY DIFFRACTION* (XRD)

Match! Phase Analysis Report
Sample: LIM-PIT-C (5-70)

Sample Data

File name	LIM-PIT-C.RAW
File path	D:/ika/ika/XRD IKA TAMBANG/LIM-PIT-C/LIM-PIT-C
Data collected	Dec 13, 2022 13:34:25
Data range	5.020° - 70.020°
Original data range	5.000° - 70.000°
Number of points	3251
Step size	0.020
Rietveld refinement converged	No
Alpha2 substracted	No
Background subtr.	No
Data smoothed	Yes
2theta correction	0.02°
Radiation	X-rays
Wavelength	1.540600 Å

Matched Phases

Index	***Amount (%)***	***Name***	***Formula sum***
A	37.9	Goethite	Fe H O2
B	26.7	Talc	H2 Mg3 O12 Si4
C	26.4	Chlorite	H4 Mg3 O9 Si2
D	4.6	Magnetite	Fe3 O4
E	4.5	Maghemite	Fe2 O3
	7.9	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Elemental composition of sample (identified crystalline phases only)

Element Amount (weight %)

O	43.46%
Fe	30.28%
Si	13.24%
Mg	12.06%
H	0.96%
LE (sum)	*44.42%*

Matching entry details

*A: Goethite (37.9 %)**

Formula sum	Fe H O2
Entry number	96-900-2159
Figure-of-Merit (FoM)	0.707083*
Total number of peaks	182
Peaks in range	32
Peaks matched	13
Intensity scale factor	0.83*
Space group	P n m a
Crystal system	orthorhombic
Unit cell	a= 9.9134 Å b= 3.0128 Å c= 4.5800 Å
I/Ic	2.57
Calc. density	4.314 g/cm³

Reference	Gualtieri A., Venturelli P., "In situ study of the goethite-hematite phase transformation by real timesynchrotron powder diffractionSample at T = 25 C", American Mineralogist **84**, 895-904 (1999)

*B: Talc (26.7 %)**

Formula sum	H2 Mg3 O12 Si4
Entry number	96-900-8298
Figure-of-Merit (FoM)	0.625052*
Total number of peaks	251
Peaks in range	167
Peaks matched	38
Intensity scale factor	0.24*
Space group	C -1
Crystal system	triclinic (anorthic)
Unit cell	a= 5.2900 Å b= 9.1730 Å c= 9.4600 Å α= 90.460º β= 98.680 º γ= 90.090 º
I/Ic	1.03
Calc. density	2.776 g/cm³
Reference	Perdikatsis B., Burzlaff H., "Strukturverfeinerung am talk Mg3[(OH)2Si4O10]", Zeitschrift fur Kristallographie **156**, 177-186 (1981)

*C: Chlorite (26.4 %)**

Formula sum	H4 Mg3 O9
Entry number	96-900-0159
Figure-of-Merit (FoM)	0.659152*
Total number of peaks	91
Peaks in range	91
Peaks matched	23
Intensity scale factor	0.18*
Space group	C 1
Crystal system	triclinic (anorthic)
Unit cell	a= 5.3350 Å b= 9.2400 Å c= 28.7350 Å α= 90.000º β= 90.000 º γ= 90.000 º
I/Ic	0.81
Calc. density	2.599 g/cm³
Reference	Lister J. S., Bailey S. W., "Chlorite polytypism: IV. Regular two-layer structuresrefined structure", American Mineralogist **52**, 1614-1631 (1967

*D: Magnetite (4.6 %)**

Formula sum	Fe3 O4
Entry number	96-900-2331
Figure-of-Merit (FoM)	0.615835*
Total number of peaks	34
Peaks in range	9
Peaks matched	5
Intensity scale factor	0.22*
Space group	F d -3 m
Crystal system	cubic
Unit cell	a= 8.1177 Å
I/Ic	5.68
Calc. density	5.750 g/cm³
Reference	Haavik C., Stolen S., Fjellvag H., Hanfland M., Hausermann D., "Equation of state of magnetite and its high- pressure modification:Thermodynamics of the Fe-O system at high pressureSample at P = 26.9 GPa", American Mineralogist **85**, 514-523 (2000)

*E: Maghemite (4.5 %)**

Formula sum	Fe2 O3
Entry number	96-901-2693
Figure-of-Merit (FoM)	0.566507*
Total number of peaks	393
Peaks in range	77
Peaks matched	13
Intensity scale factor	0.14*
Space group	P 43 21 2
Crystal system	tetragonal
Unit cell	a= 8.3396 Å c= 8.3220 Å
I/Ic	3.62
Calc. density	4.887 g/cm³
Reference	Greaves C., "A powder neutron diffraction investigation of vacancy ordering and covalencein gamma-Fe2O3 Locality: synthetic Sample: T = 4 K", Journal of Solid State Chemistry **49**, 325-333 (1983)

(*)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'.

Candidates

Name	*Formula*	*Entry No.*	*FoM*
(Mo4 Pt)1.6	Mo6.4 Pt1.6	96-210-7217	0.7444
Ir2 (Nb V)3	Ir2 Nb3 V3	96-152-3138	0.7443
(Mo0.8 Pt0.2)	Mo0.8 Pt0.2	96-152-3629	0.7441
(Mo17 Pt3)0.4	Mo6.8 Pt1.2	96-153-9144	0.7419
	Sn V3	96-152-7072	0.7418
	Sn V3	96-154-0205	0.7355
Britvinite	C2 B3.468 F2 Mg9 O58 Pb14.144 Si10.532	96-901-2669	0.7262
	Ir Ti3	96-153-7944	0.7234
Barium	Ba	96-900-8529	0.7213
(Mo0.7 Re0.3)	Mo0.7 Re0.3	96-152-2723	0.7211
	Mo3 Os	96-152-2995	0.7198
	Mo3 Os	96-210-6125	0.7185
Gyrolite	Al Ca16 H28 Na O82 Si23	96-900-9473	0.7123
Dirubidium copper hexacyanoferrate(II)	C6 Cu Fe N6 Rb2	96-101-0365	0.7106
	Ir Ti3	96-153-7951	0.7098
Richetite	Fe0.47 H24 Mg0.83 O173 Pb8.74 U36	96-900-4468	0.7024
Okenite	Ca5 H23 O32 Si9	96-900-0884	0.7011
Okenite	Ca5 H18 O32 Si9	96-901-5623	0.7011
Ag3 S I	Ag3 I S	96-151-0009	0.6978
Na (Cl O4)	Cl Na O4	96-722-3700	0.6963
Litharge	O Pb	96-901-2697	0.6892
	Nb P2 S8	96-153-4699	0.6881
Charoite	Ba0.16 Ca12.82 F H4.18 K6.94 Mn0.18 Na3.18 O92.59 Si35 Sr0.5	96-901-6709	0.6847
Ca8 H2 (P O4)6 (H2 O)5	Ca8 H12 O29 P6	96-153-4328	0.6840
Calcium Catena-polyphosphat	Ca P6 O2	96-153-4328	0.6840
C18H36N4I10Pb3	C18 H36 I10 N4 Pb3	96-724-1117	0.6814
beryllium bis(hypophosphite)	Be H4 O4 P2	96-201-4099	0.6792
Copper diniobate	Cu Nb2 O6	96-100-6091	0.6787
Zn Se	Se Zn	96-153-8614	0.6784
	Ag Cr O2	96-720-9333	0.6776
	C49.05 Cl0.42 F21.89 O0.21	96-403-2118	0.6755
	C10 H10 F6 N O10 P	96-770-0269	0.6730
Dipotassium copper hexacyanoferrate(II)	C6 Cu Fe K2 N6	96-101-0360	0.6723
	C111 N5 O12 Se5 Sn4	96-722-3367	0.6711
	H7.5 I0.5 Lu2 O6.5	96-703-1395	0.6706
Silicon carbide (Moissanite 3C)	Si C	96-101-0996	0.6705
Dysprosium	Dy	96-900-8495	0.6705
	C Si	96-900-8857	0.6705
U30	Li Mg4 O239 U30	96-702-5955	0.6699
(((Mg Al) (Si4 O10 (H2 O)2 (O H))) (H2 O)1.46) (C16 N2 O2 H10)0.045	C0.72 H8.37 Al Mg N0.09 O14.55 Si4	96-153-3370	0.6693
	Cs4 Se4 Si	96-810-1314	0.6682
bismuth cadmium oxide phosphate	Bi15.32 Cd10 O58 P10	96-433-2414	0.6678
	C30 H61 N9 O26 Pt3	96-200-9381	0.6675
	C82.5 H10.5 F16	96-705-3323	0.6673
Ashcroftine-(Y)	C16 H14.8 K10.4 Na8.26 O202.96 Si54.16 Y24	96-900-1108	0.6673
Zn Mn3 O7 (H2 O)3	H6 Mn3 O10 Zn	96-231-0846	0.6671
propane-1,3-diammonium bis(zinc phosphate)	C1.875 H7.5 N1.25 O5 P1.25 Zn1.25	96-220-0281	0.6670
Nb N	N0.77 Nb	96-154-0243	0.6668
Pb O	O Pb	96-153-3610	0.6665
beta-Na3PS4	Na3 P S4	96-722-9734	0.6659
	C14 N6 O5 W	96-407-9201	0.6658
	Cu Fe K O8 P2	96-156-3290	0.6657

and 5344 others...

Search-Match

Settings

Reference database used	COD-Inorg 2021.06.14
Automatic zeropoint adaptation	Yes
Downgrade entries with low scaling factors	Yes
Minimum figure-of-merit (FoM)	0.60
2theta window for peak corr.	0.30 deg.
Minimum rel. int. for peak corr.	1
Parameter/influence 2theta	0.50
Parameter/influence intensities	0.50
Parameter multiple/single phase(s)	0.50

Criteria for entries added by user

Reference:

Entry number: 96-201-4618;96-201-4619;96-201-4931;96-220-5377;96-220-7380;96-220-7381;96-900-0159;96-900-4189;96-901-0164;96-901-0165;96-901-0166;96-901-0167;96-901-0168;96-901-0169;96-901-0170;96-101-1153;96-300-0049;96-900-8041;96-900-8298;96-900-8732;96-901-4436;96-900-1115;96-900-6317;96-900-6318;96-900-6319;96-901-2693;96-100-8767;96-100-8768;96-100-8769;96-101-1088;96-221-1653;96-900-2159;96-900-2160;96-900-3077;96-900-3078;96-900-3079;96-900-3080;96-900-3081;96-901-0407;96-901-0408;96-901-0409;96-901-0410;96-901-0411;96-901-1413;96-901-5697;96-901-6060;96-901-6179;96-901-6407;96-101-1033;96-101-1085;96-722-8111;96-900-0927;96-900-0928;96-900-0929;96-900-0930;96-900-0931;96-900-0932;96-900-0933;96-900-0934;96-900-0935;96-900-2317;96-900-2318;96-900-2319;96-900-2320;96-900-2321;96-900-2322;96-900-2323;96-900-2324;96-900-2325;96-900-2326;96-900-2327;96-900-2328;96-900-2329;96-900-2330;96-900-2331;96-900-2332;96-900-2333;96-900-2674;96-900-2675;96-900-4088;96-900-4156;96-900-4157;96-900-5813;96-900-5814;96-900-5815;96-900-5816;96-900-5817;96-900-

5837;96-900-5838;96-900-5839;96-900-5840;96-900-5841;96-900-5842;96-900-5843;96-900-6185;96-900-6190;96-900-6195;96-900-6200;96-900-6243;96-900-6248;96-900-6253;96-900-6266;96-900-6921;96-900-6922;96-900-7645;96-900-7707;96-900-7708;96-900-9769;96-900-9770;96-901-0940;96-901-0941;96-901-0942;96-901-3530;96-901-3531;96-901-3532;96-901-3533;96-901-3534;96-901-3535;96-901-3536;96-101-1098;96-101-1160;96-101-1173;96-101-1177;96-101-1201;96-110-0020;96-500-0036;96-900-0776;96-900-0777;96-900-0778;96-900-0779;96-900-0780;96-900-0781;96-900-5018;96-900-5019;96-900-5020;96-900-5021;96-900-5022;96-900-5023;96-900-5024;96-900-5025;96-900-5026;96-900-5027;96-900-5028;96-900-5029;96-900-5030;96-900-5031;96-900-5032;96-900-5033;96-900-5034;96-900-7379;96-900-8093;96-900-8094;96-900-9667;96-901-0145;96-901-0146;96-901-0147;96-901-1494;96-901-1495;96-901-1496;96-901-1497;96-901-2601;96-901-2602;96-901-2603;96-901-2604;96-901-2605;96-901-2606;96-901-3322;96-901-5023;96-101-1241;96-101-1268;96-210-8028;96-210-8029;96-591-0083;96-900-0140;96-900-2161;96-900-2162;96-900-2163;96-900-9783;96-901-4881;96-901-5066;96-901-5504;96-901-5965;96-901-6458;96-101-1046;96-155-0599;96-900-9231;96-900-9235;96-901-5000;96-100-1742;96-100-1744;96-101-0918;96-101-0929;96-101-0963;96-210-0993;96-591-0096;96-721-4218;96-721-4219;96-900-0096;96-900-0575;96-900-0966;96-900-0967;96-900-0968;96-900-0969;96-900-0970;96-900-0971;96-900-1298;96-900-1299;96-900-7287;96-900-7688;96-900-7690;96-900-9668;96-900-9669;96-900-9866;96-901-2074;96-901-3466;96-901-4217;96-901-4345;96-901-4393;96-901-4416;96-901-4525;96-901-4612;96-901-4745;96-901-4773;96-901-

4878;96-901-4892;96-901-5067;96-901-5074;96-901-5391;96-901-5461;96-901-5482;96-901-5488;96-901-5692;96-901-5762;96-901-5836;96-901-6021;96-901-6023;96-901-6180;96-901-6201;96-901-6465;96-901-6706;96-901-6707;96-900-1591;96-150-5105;96-154-0680;96-101-1082;96-120-0017;96-154-4376;96-900-3875;96-900-8238;96-901-1748;96-901-5516;96-901-5977;96-900-0097;96-900-0381;96-900-0972;96-900-0973;96-900-0974;96-900-0975;96-900-0976;96-900-1850;96-900-1851;96-900-1852;96-900-1853;96-900-1854;96-900-1855;96-900-2811;96-900-2812;96-900-2813;96-900-2814;96-900-2815;96-900-2816;96-900-2817;96-900-2818;96-900-2819;96-900-2820;96-900-2821;96-900-7693;96-900-9130;96-901-0201;96-901-0202;96-901-0203;96-901-0209;96-901-0210;96-901-0211;96-901-0214;96-901-0215;96-901-0216;96-901-0217;96-901-0218;96-901-0224;96-901-0225;96-901-0226;96-901-0227;96-901-1208

Peak List

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	9.60	9.2055	340.29	13.98	0.4400	B
2	12.48	7.0869	522.40	21.46	0.4400	C
3	18.80	4.7163	498.00	22.32	0.4800	B,C,D
4	19.94	4.4492	206.65	20.84	1.0800	C
5	21.36	4.1565	1000.00	89.64	0.9600	A,B,C,E
6	25.12	3.5422	651.73	21.91	0.3600	B
7	26.72	3.3336	596.36	22.27	0.4000	A,C
8	28.72	3.1059	978.28	29.23	0.3200	B
9	31.54	2.8343	164.85	4.93	0.3200	C
10	33.26	2.6916	481.98	25.20	0.5600	A
11	34.86	2.5716	371.60	23.59	0.6800	A,B,C
12	35.86	2.5022	741.67	77.56	1.1200	A,B,C,E
13	36.84	2.4378	971.21	87.06	0.9600	A,B,C,D
14	40.32	2.2351	237.36	19.50	0.8800	A,B,C,E
15	41.34	2.1822	174.87	24.17	1.4800	A,B
16	44.34	2.0413	602.75	15.76	0.2800	B,C,D
17	53.66	1.7067	385.10	38.83	1.0800	A,B,E
18	59.12	1.5614	215.46	11.27	0.5600	A,B,D
19	60.22	1.5355	177.55	17.90	1.0800	B
20	61.96	1.4965	189.40	19.10	1.0800	A,B
21	63.20	1.4701	136.45	34.66	2.7200	A,B,E
22	65.06	1.4325	164.83	7.39	0.4800	B,D,E

Integrated Profile Areas

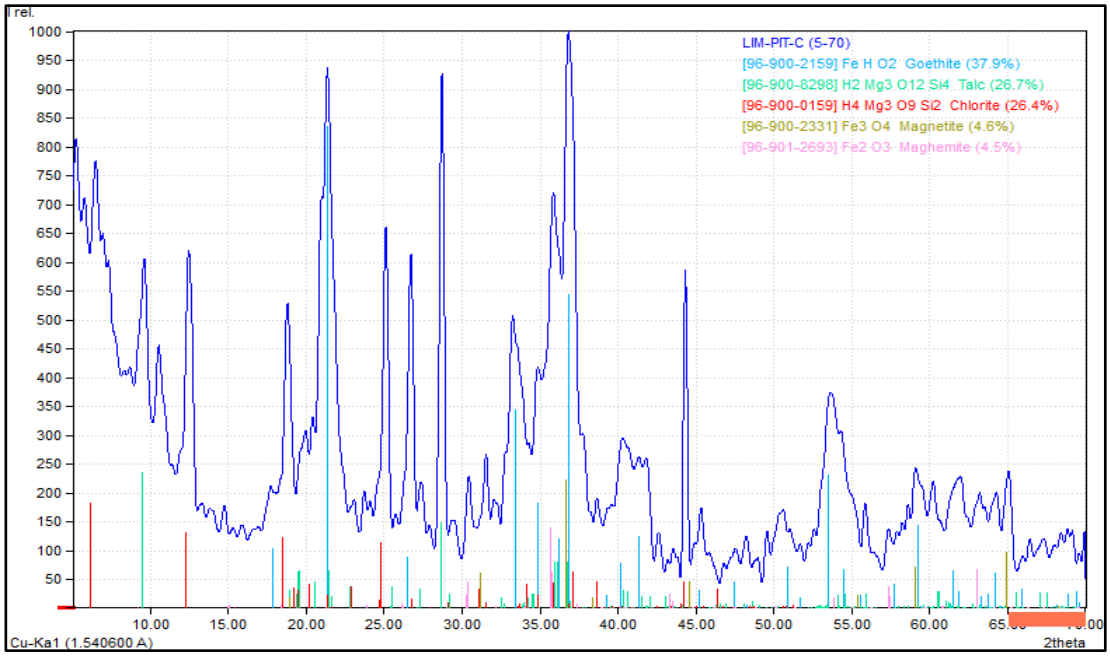
Based on calculated profile

Profile area	Counts	Amount
Overall diffraction profile	74859	100.00%
Background radiation	41559	55.52%
Diffraction peaks	33300	44.48%
Peak area belonging to selected phases	27365	36.56%
Peak area of phase A (Goethite)	*13051*	*17.43%*
Peak area of phase B (Talc)	*6225*	*8.32%*
Peak area of phase C (Chlorite)	*4317*	*5.77%*
Peak area of phase D (Magnetite)	*1830*	*2.44%*
Peak area of phase E (Maghemite)	*1942*	*2.59%*
Unidentified peak area	5935	7.93%

Peak Residuals

Peak data	Counts	Amount
Overall peak intensity	649	100.00%
Peak intensity belonging to selected phases	361	55.62%
Unidentified peak intensity	288	44.38%

Diffraction Pattern Graphics



Match! Phase Analysis Report

Sample: SAP-PIT-C (5-70)

Sample Data	
File name	SAP-PIT-C.RAW
File path	D:/ika/ika/XRD IKA TAMBANG/SAP-PIT-C/SAP-PIT-C
Data collected	Dec 13, 2022 13:34:26
Data range	5.000° - 70.000°
Original data range	5.000° - 70.000°
Number of points	3251
Rietveld refinement converged	No
Step size	0.020
Background subtr.	No
Data smoothed	Yes
Radiation	X-rays
Wavelength	1.540600 Å

Matched Phases

Index	*Amount (%)*	*Name*	*Formula sum*
A	36.2	Antigorite	H58 Mg45 O138 Si32
B	29.5	Goethite	Fe H O2
C	20.3	Lizardite	H4 Mg3 O9 Si2
D	10.8	Talc	H2 Mg3 O12 Si4
E	3.3	Enstatite	Fe0.41 Mg0.59 O3 Si
	13.9	*Unidentified peak area*	

Amounts calculated by RIR (Reference Intensity Ratio) method

Elemental composition of sample (identified crystalline phases only)

Element	Amount (weight %)
O	47.43%
Fe	18.56%
Mg	17.74%
Si	16.14%
H	1.18%
LE (sum)	*48.61%*

Matching entry details

*A: Antigorite (36.2 %)**

Formula sum	H58 Mg45 O138 Si32
Entry number	96-900-4000
Figure-of-Merit (FoM)	0.626451*
Total number of peaks	327
Peaks in range	327
Peaks matched	54
Intensity scale factor	0.24*
Space group	C 1 2/m 1
Crystal system	monoclinic
Unit cell	a= 81.6640 Å b= 9.2550 Å c= 7.2610 Å β= 91.409 º
I/Ic	0.70
Calc. density	2.578 g/cm³
Reference	Capitani G. C., Mellini M., "The crystal structure of a second antigorite polysome (m = 16),by single-crystal synchrotron diffraction", American Mineralogist **91**, 394-399 (2006)

B: Goethite (29.5 %)*

Formula sum	Fe H O2
Entry number	96-900-2159
Figure-of-Merit (FoM)	0.657432*
Total number of peaks	182
Peaks in range	182
Peaks matched	10
Intensity scale factor	0.72*
Space group	P n m a
Crystal system	orthorhombic
Unit cell	a= 9.9134 Å b= 3.0128 Å c= 4.5800 Å
I/Ic	2.57
Calc. density	4.314 g/cm³

Reference	Gualtieri A., Venturelli P., "In situ study of the goethite-hematite phase transformation by real timesynchrotron powder diffractionSample at T = 25 C", American Mineralogist **84**, 895-904 (1999)

C: Lizardite (20.3 %)*

Formula sum	H4 Mg3 O9 Si2
Entry number	96-900-0849
Figure-of-Merit (FoM)	0.551063*
Total number of peaks	112
Peaks in range	112
Peaks matched	7
Intensity scale factor	0.26*
Space group	P 3 1 m
Crystal system	trigonal (hexagonal axes)
Unit cell	a= 5.3320 Å c= 7.2330 Å
I/Ic	1.35
Calc. density	2.584 g/cm³
Reference	Mellini M., "The crystal structure of lizardite 1T: hydrogen bonds and polytypism", American Mineralogist **67**, 587-598 (1982)

D: Talc (10.8 %)*

Formula sum	H2 Mg3 O12 Si4
Entry number	96-900-8041
Figure-of-Merit (FoM)	0.589295*
Total number of peaks	298
Peaks in range	298
Peaks matched	32
Intensity scale factor	0.11*
Space group	C 1 2/c 1
Crystal system	monoclinic

Unit cell	a= 5.2600 Å b= 9.1000 Å c= 18.8100 Å β= 100.000 º
I/Ic	1.05
Calc. density	2.841 g/cm³
Reference	Gruner J. W., "The crystal structures of talc and pyrophylliteLocality: Harford County, Maryland, USA", Zeitschrift fur Kristallographie **88**, 412-419 (1934)

E: Enstatite (3.3 %)*

Formula sum	Fe0.41 Mg0.59 O3 Si
Entry number	96-900-6428
Figure-of-Merit (FoM)	0.576745*
Total number of peaks	500
Peaks in range	500
Peaks matched	22
Intensity scale factor	0.02*
Space group	P b c a
Crystal system	orthorhombic
Unit cell	a= 18.2974 Å b= 8.9040 Å c= 5.2092 Å
I/Ic	0.63
Calc. density	3.548 g/cm³
Reference	Hugh-Jones D A, Chopelas A., Angel R. J., "Tetrahedral compression in (Mg,Fe)SiO3 orthopyroxenesSample: P = 0.00 GPa, synthetic En60 orthopyroxene", Physics and Chemistry of Minerals **24**, 301-310 (1997)

(*)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'.

Candidates

Name	Formula	Entry No.	FoM
Ba3 (P Mo12 O40)2 (D2 O)55.3	Mo24 O113.6 P2	96-153-3530	0.7382
H3 (P Mo12 O40) (H2 O)6	H15 Mo12 O46 P	96-210-6186	0.6823
	C7 F N O7 P2 Zr	96-723-8536	0.6688
	O69 P W12	96-901-5518	0.6645
Trihydrogen dodecatungstophosphate hydrate(29)	H61 O69 P W12	96-101-0634	0.6627
Pd21 Tl50 Si100 Al92 O384	Al92 O384 Pd21 Si100 Tl50	96-152-7030	0.6606
	Cs11.5 K1.5 Na1.5 O134 Si3 Ti10 W27	96-430-6277	0.6605
Pd18 Tl56 (Si100 Al92 O384)	Al92 O384 Pd18 Si100 Tl56	96-152-7029	0.6523
(Cs45.3 Na46.7) (Al92 Si100 O384)	Al92 Cs45.3 Na46.7 O384 Si100	96-153-3075	0.6496
Cs27.49 Na60.88 (Al88 Si104 O384) (H2 O)18.72	Al88 Cs27.49 H37.44 Na60.88 O402.72 Si104	96-152-1411	0.6486
	C4 N Nd O11 P2 S	96-400-3143	0.6483
Ag23 Tl69 (Al92 Si100 O384)	Ag23 Al92 O384 Si100 Tl69	96-150-9758	0.6435
	Ni2 Sc Si2	96-153-9239	0.6404
Rhomboclase	Fe H9 O12 S2	96-901-3792	0.6397
Cs44.8 Na54.4 (Al96 Si96 O384)	Al96 Cs44.8 Na54.4 O384 Si96	96-154-0967	0.6390
(Ag0.76 Mg0.24)2 Ca	Ag1.48 Ca Mg0.52	96-150-9597	0.6389
Fencooperite	C2 H1.38 Ba6 Cl1.62 Fe3 O31.38 Si8	96-900-4632	0.6317
	B Cl2 H4 N O3 Zn2	96-400-3328	0.6313
Okenite	Ca5 H23 O32 Si9	96-900-0884	0.6312
Okenite	Ca5 H18 O32 Si9	96-901-5623	0.6312
In2.42 Al22 O34.8	Al22 In2.42 O34.8	96-153-6597	0.6304
Cd3 Al2 Si3 O12	Al2 Cd3 O12 Si3	96-153-8398	0.6296
beryllium bis(hypophosphite)	Be H4 O4 P2	96-201-4099	0.6290
	C6 H11 S Tl	96-403-0499	0.6286
Diaoyudaoite	Al11 Cd0.105 Na1.008 O17.111	96-901-1272	0.6279
Ca Br2	Br2 Ca	96-403-1228	0.6278
catena-(octakis(2-Methylpiperidinium) 96-410-2795 0.6278 tritriaconta-selenido- tetradeca-gallium-tetra-zinc-di-tin)	C48 H112 Ga14 N8 Se33 Sn2 Zn4	96-900-0736	0.6275
	Fe2 O4 Si	96-900-6926	0.6274
Nd Ga3 (B O3)4	B4 Ga3 Nd O12	96-151-1742	0.6273
Fayalite	Fe2.001 O4 Si0.999	96-900-0396	0.6272
	Fe2 O4 Si	96-900-5823	0.6270
	C5 H13 N O44 Si22	96-154-6305	0.6263
Picropharmacolite	As4 Ca4 H24 Mg O27	96-900-0812	0.6263
Lithium Manganese(III) Manganese(IV) Oxide	Li Mn2 O4	96-151-3968	0.6258
diammonium tetrabromocuprate dihydrate	Br4 Cu H12 N2 O2	96-721-4573	0.6257
Tm0.524 Al0.58 B14	Al0.58 B14 Tm0.524	96-154-0307	0.6254
(Zn4 In16 S33) ((N2 C4 H8) ((N H2) C3 H6)2)	In16 S33 Zn4	96-412-3978	0.6250
	Ge4 K4 Li2 O13 Ti	96-400-3457	0.6249
	Eu2 O7 Ta2	96-901-5256	0.6246
Richelsdorfite	As4 Ca2 Cl Cu5 H18 O28 Sb	96-901-1487	0.6245
	C102 B2 N2	96-413-5311	0.6244
Ho.63 Al.74 B14	Al0.74 B14 Ho0.63	96-153-8906	0.6243
	Ce4 O4 Se3	96-430-5045	0.6243
Zn13 Tl66 Si100 Al92 O384 (Zn O)2	Al92 O386 Si100 Tl66 Zn15	96-152-1493	0.6231
Mg4.76Fe0.22Ti0.2Si1.99O8((H)1.26F0.74)(Natural chondrodite at 7.3 GPa)	F0.74 Fe0.22 H1.26 Mg4.76 09.26 Si1.99 Ti0.02	96-154-4884	0.6230
Spinel	Al0.988 Cr0.883 Fe0.469 Mg0.684 Mn0.005 Ni0.001 O4 Si0.003 Ti0.015	96-900-4938	0.6227
	C4 H12 A15 F17 N10	96-450-6127	0.6224
Catena-bis(tris(2-Amineoethy)amine-cadmium(ii)hexacyano-iron(ii)trihydrate	C99 Cd11 Fe10.5 N77 033	96-700-9718	0.6216
Manesiochromite	Al0.973 Cr0.973 Fe0.449 Mg0.684 Mn0.006 Ni0.001 O4 Si0.001 Ti0.003 Zn0.006	96-900-4939	0.6213
Na2 Pt (O D)6	D6 Na2 O6 Pt	96-152-4014	0.6195
Chromite	Al0.546 Cr0.422 Fe0.562 Mg0.457 Ni0.002 O4 Si0.002 Ti0.044 Zn0.007	96-900-4950	0.6191

And 516 others...

Search-Match

Settings

Reference database used	COD-Inorg 2021.06.14
Automatic zeropoint adaptation	Yes
Downgrade entries with low scaling factors	Yes
Minimum figure-of-merit (FoM)	0.60
	0.60
2theta window for peak corr.	0.30 deg.
Minimum rel. int. for peak corr.	1
Parameter/influence 2theta	0.50
Parameter/influence intensities	0.50
Parameter multiple/single phase(s)	0.50

Criteria for entries added by user

Reference:

Entry number: 96-154-4616;96-154-4617;96-900-0167;96-900-0168;96-900-
Entry number: 96-154-4616;96-154-4617;96-900-0167;96-900-0168;96-900-0268;96-900-0315;96-900-0316;96-900-0317;96-900-0318;96-900-0319;96-900-0320;96-900-0321;96-900-0322;96-900-0323;96-900-0324;96-900-0325;96-900-0326;96-900-0327;96-900-0535;96-900-0536;96-900-0537;96-900-0538;96-900-0539;96-900-0540;96-900-0541;96-900-0542;96-900-0788;96-900-1667;96-900-1668;96-900-1669;96-900-1670;96-900-1671;96-900-4323;96-900-4324;96-900-4325;96-900-4326;96-900-4327;96-900-4328;96-900-4329;96-900-4330;96-900-4331;96-900-4332;96-900-4333;96-900-7378;96-901-0755;96-901-0756;96-901-0757;96-901-0758;96-901-0759;96-901-0760;96-901-0761;96-901-0762;96-901-0763;96-901-0764;96-901-0765;96-901-0766;96-901-0776;96-901-0777;96-901-0778;96-901-0779;96-901-0780;96-901-0781;96-901-1462;96-901-1463;96-901-1464;96-901-1465;96-901-1466;96-901-1467;96-901-1468;96-901-3094;96-901-3095;96-901-3096;96-901-3097;96-901-3098;96-901-3099;96-901-3100;96-901-3101;96-901-3102;96-901-3640;96-901-3641;96-901-3642;96-901-4298;96-901-5075;96-901-

5346;96-901-5659;96-901-6386;96-100-0048;96-101-1019;96-154-5543;96-154-8550;96-154-8551;96-154-8552;96-900-1179;96-900-1221;96-900-1594;96-900-1595;96-900-1596;96-900-1597;96-900-1598;96-900-1599;96-900-1600;96-900-1601;96-900-1602;96-900-1642;96-900-1643;96-900-1644;96-900-1645;96-900-1646;96-900-1700;96-900-1701;96-900-2711;96-900-2712;96-900-2713;96-900-2714;96-900-2715;96-900-2716;96-900-2717;96-900-4030;96-900-4031;96-900-4032;96-900-4033;96-900-4034;96-900-4118;96-900-4119;96-900-4957;96-900-4958;96-900-5542;96-900-5543;96-900-5544;96-900-5545;96-900-5589;96-900-5590;96-900-5776;96-900-5777;96-900-6338;96-900-6339;96-900-6340;96-900-6341;96-900-6342;96-900-6343;96-900-6428;96-900-6429;96-900-6430;96-900-6431;96-900-6432;96-900-6433;96-900-6434;96-900-6435;96-900-6436;96-900-6437;96-900-6438;96-900-6439;96-900-6440;96-900-6441;96-900-6442;96-900-6443;96-900-8078;96-900-8165;96-901-0242;96-901-0872;96-901-0873;96-901-0874;96-901-0888;96-901-0889;96-901-0890;96-901-0891;96-901-0892;96-901-0893;96-901-0894;96-901-0895;96-901-0896;96-901-0897;96-901-0898;96-901-0899;96-901-1582;96-901-3659;96-901-4118;96-901-4448;96-901-4536;96-901-4861;96-901-4978;96-901-4984;96-901-5810;96-901-6053;96-901-6154;96-901-6258;96-901-6266;96-901-6573;96-900-0849;96-900-1092;96-900-1093;96-900-1639;96-900-1640;96-900-1779;96-900-1883;96-900-4509;96-900-4510;96-900-4511;96-900-4512;96-900-4513;96-900-4514;96-900-4994;96-900-4995;96-900-7425;96-901-4665;96-901-5164;96-901-5487;96-901-5581;96-901-6051;96-901-6148;96-900-3104;96-900-4000;96-900-4515;96-901-4626;96-901-5975;96-901-6234;96-101-1153;96-300-0049;96-900-8041;96-900-8298;96-900-8732;96-901-4436;96-900-0097;96-900-0381;96-900-0972;96-900-0973;96-900-0974;96-900-0975;96-900-0976;96-900-1850;96-900-1851;96-900-1852;96-900-1853;96-900-1854;96-900-1855;96-900-2811;96-900-2812;96-900-2813;96-900-2814;96-900-2815;96-900-2816;96-900-2817;96-900-2818;96-900-2819;96-900-2820;96-900-2821;96-900-7693;96-900-9130;96-901-0201;96-901-0202;96-901-0203;96-901-0209;96-901-0210;96-901-0211;96-901-0214;96-901-0215;96-901-0216;96-901-0217;96-901-0218;96-901-0224;96-901-0225;96-901-0226;96-901-0227;96-901-1208;96-101-1098;96-101-1160;96-101-1173;96-101-1177;96-101-1201;96-110-0020;96-500-0036;96-900-0776;96-900-0777;96-900-0778;96-900-0779;96-900-

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Peak List

No.	*2theta [º]*	*d [Å]*	*I/I0 (peak height)*	*Counts (peak area)*	*FWHM*	*Matched*
1	6.40	13.7993	512.34	59.72	1.0000	A
2	9.46	9.3415	148.93	5.55	0.3200	A,D,E
3	12.36	7.1554	1000.00	60.61	0.5200	A,C
4	18.66	4.7514	491.12	27.48	0.4800	A

5	19.48	4.5532	337.43	20.45	0.5200	A,C,D,E
6	19.86	4.4669	270.40	40.34	1.2800	A,D,E
7	21.16	4.1953	548.16	66.45	1.0400	A,B,D
8	24.98	3.5618	844.37	47.24	0.4800	A
9	26.76	3.3287	570.29	21.27	0.3200	A,B,E
10	28.66	3.1122	409.24	13.36	0.2800	A,D
11	30.60	2.9192	177.62	7.45	0.3600	A
12	33.38	2.6822	227.19	27.54	1.0400	A,B,C,D
13	34.76	2.5788	362.48	27.04	0.6400	A,B,D,E
14	35.84	2.5035	654.70	85.47	1.1200	A,B,C,E
15	36.88	2.4353	631.90	55.97	0.7600	A,B,D
16	37.84	2.3757	148.39	6.92	0.4000	A,D
17	39.94	2.2555	170.85	50.98	2.5600	A,B,D,E
18	53.40	1.7144	248.69	31.31	1.0800	B,D,E
19	58.90	1.5667	179.38	10.04	0.4800	C,D,E
20	60.18	1.5364	304.64	22.72	0.6400	C,D,E
21	61.50	1.5066	222.98	27.03	1.0400	B,C,D,E

Integrated Profile Areas

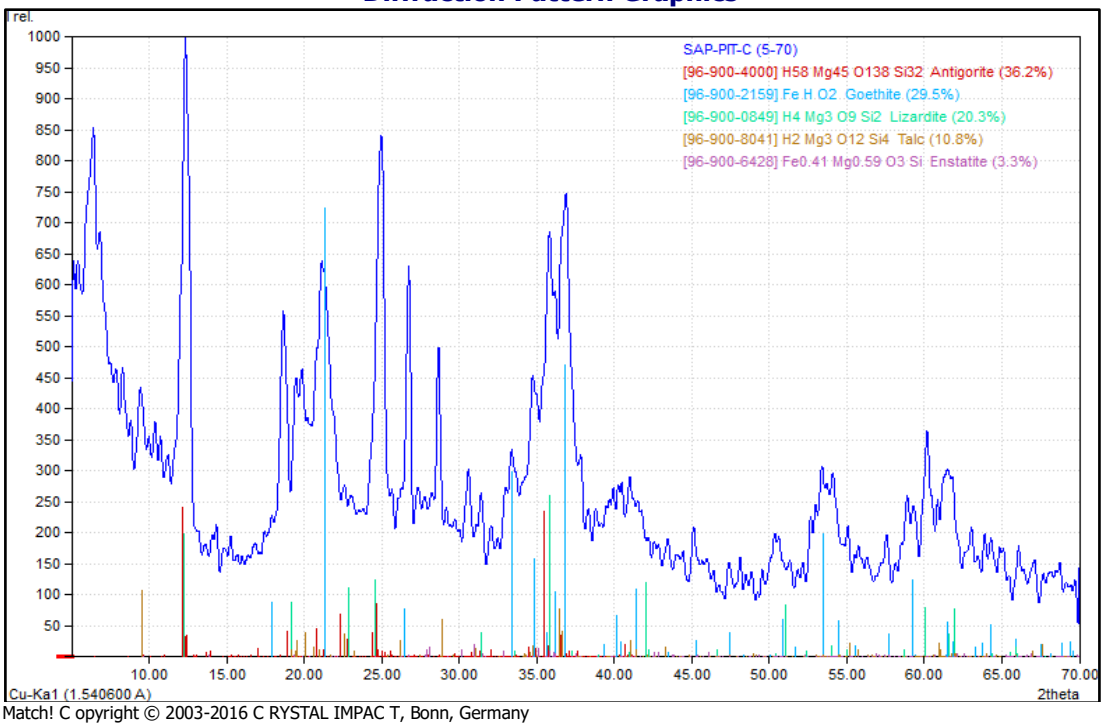
Based on calculated profile

Profile area	***Counts***	***Amount***
Overall diffraction profile	98147	100.00%
Background radiation	59775	60.90%
Diffraction peaks	38372	39.10%
Peak area belonging to selected phases	24706	25.17%
Peak area of phase A (Antigorite)	*5623*	*5.73%*
Peak area of phase B (Goethite)	*10923*	*11.13%*
Peak area of phase C (Lizardite)	*4459*	*4.54%*
Peak area of phase D (Talc)	*2841*	*2.89%*
Peak area of phase E (Enstatite)	*859*	*0.88%*
Unidentified peak area	13666	13.92%

Peak Residuals

Peak data	***Counts***	***Amount***
Overall peak intensity	715	100.00%
Peak intensity belonging to selected phases	558	78.09%
Unidentified peak intensity	157	21.91%

Diffraction Pattern Graphics



LAMPIRAN D

HASIL ANALISIS *X-RAY FLOURESCENCE* (XRF)

Identifikasi	Sequence	Time	Pos	Persentase Kadar (%)							
				Ni	Fe	Si	Mg	Al	Ca	Cr	Co
QS AA/ LIM PITC	1 of 1	6/19/2021 11:30	2	0,95	35,76	33,51	10,28	10,34	0,06	2	0,07
QS AA/ SAP PITC	1 of 1	6/19/2021 11:30	3	1,59	32,94	36,03	8,22	8,85	0,09	2,12	0,06