

DAFTAR PUSTAKA

- Irfan. U.R, Maulana. A, Muhammad. F (2020), Role of bedrock serpentinization on the development of nikel laterite deposit in Sorowako, Sulawesi, Indonesia, pp. 1-10
- Irfan. U.R, Alimuddin. I, Pasalli. I.B (2015), The Influence of Topography to the distribution of Ni laterite deposits of Mangguruh Area, Sebuku Island, South Kalimantan, p.1
- Zuidam, Van, (20023), Terrain analysis and classification using aerial photographs, Integration of CiNii Dissertations and CiNii Books into CiNii Research.
- Rusmana. E, Sukido, Haryono, Simanjuntak (1993), Peta geologi lembar Lasusua – Kendari, Badan geologi Indonesia, Bandung.
- Sufriadin (1997), Mineralogi, Geokimia Dan Perilaku “Leaching” Pada Endapan Laterit Nikel Soroako, Sulawesi Selatan, Indonesia, disertasi, Universitas Gajah Mada, Yogyakarta, pp. 4-42
- Sufriadin, Widodo. S, Jaya. A (2002), The effect of heating on mineral and chemical Composition of saprolit ore from Latowu area, North Kolaka regency of Southeast Sulawesi Indonesia, pp. 1-10
- Tonggiroh. A, Jaya. et al. U.R (2016), Type of nikel laterization, lasolo fracture and mollase deposits of Southeast Sulawesi, pp. 1-8
- Aprilia. T, Awaluddin. R (2022), LiDAR (light detection and ranging), KHS survey and mapping management, Jakarta.



006), Fundamentals of chemistry, mineralogy, weathering processes and formation, chapter 3.1-3.48 and chapter 5.1-5.39

- Bustamante. M.O, Rúa, Gonzalez. S.D, Arias, Baena. P.B (2020), Nickel laterite concentration through a non-conventional method with surface sulfurization, pp. 9-26
- Elias. M (2002), Nickel laterite deposits – geological overview, resources and exploitation, pp. 1-22
- Fu. W., Y, Luo, et al. (2019), Weathering of Ophiolite Remnant and Formation of Ni Laterite in a Strong Uplifted Tectonic Region (Yuanjiang, Southwest China.
- Hall. R. (2002), Cenozoic geological and plate tectonic of SE Asia and the SW Pacific: computer- based reconstructions, model and animations, pp. 3-7
- Irzon. R, Baharuddin (2016), Geochemistry of ophiolite complex in north konawe, Southeast Sulawesi, pp. 2-12
- Kurniadi. A, Fatimah. M.R, Yuningsih, dkk (2017), "karakteristik batuan asal pembentukan endapan Nikel laterit di daerah madang dan serakaman Tengah.
- Kadarusman. A, Miyashita. et al , (2004), Petrology, geochemistry and paleogeographic construction of the East Sulawesi Ophiolite, Indonesia", pp. 2-3.
- Nasab. M.H, Noaparast. M, Abdollahi. H (2020), Dissolution of Nickel and Cobalt from Iron-Rich Laterite Ores Using Different Organic Acids.
- Panggabean. H, Surono (2011), Tekno-Stratigrafi Bagian Timur Sulawesi, pp. 239-246.
- PT AK Geosains Consulting (2021), JORC technical report PT Ceria Nugraha Indotama– Exploration, mineral resources update and ore reserves march period of Lapaopao nickel laterite project (unpublished).



Faulin. T, Mulyati. S.N (2011), Tectonic Evolution Of Sulawesi Area: tions For Proven And Prospective Petroleum Plays, pp. 1-30

Zhang.Y, Qie. J, Wang. X.F, Cui. K, Fu. T, Wang. J & Qi.Y (2020), Mineralogical Characteristics of the Nikel Laterite, Southeast Ophiolite Belt, Sulawesi Island, Indonesia.



LAMPIRAN



Lampiran 1 Stasiun Pengambilan Sampel

No Stasiun	L-01 – Sub Blok Lapaopao
ID Sampel	XRD L-01 SAP
Jenis Sampel	Saprolite
Koordinat Y	9575184
Koordinat X	308931
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Saprolite : warna coklat, kuning kehijauan, terdiri atas campuran material tanah (soil) dan fragment batuan yang berasal dari batuan ultrabasa yang sudah mengalami pelapukan. Komposisi mineral: utamanya geothite, olivine, mineral lain manganese, piroksin, serpentine.



No Stasiun	L-01 – Sub Blok Lapaopao
ID Sampel	XRD L-01 LIM
Jenis Sampel	Limonite
Koordinat Y	9575184
Koordinat X	308931
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Limonite : warna coklat, terdiri atas material tanah (soil), fragment ferricrete dalam ukuran yang kecil, memiliki kandungan Fe yang tinggi. Komposisi mineral: utamanya hematite, clay manganese, mineral lain berupa goethite.



No Stasiun	L-01 – Sub Blok Lapaopao
ID Sampel	TS-L 01
Jenis Sampel	Batuan
Koordinat Y	9575184
Koordinat X	308931
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Warna kehijauan, struktur massive, tingkat pelapukan rendah, mineral penyusun olivine, piroksin, serpentine. Batuan sudah mengalami proses serpentinisasi. Nama batuan : "Dunite"



No Stasiun	L-03 – Sub Blok Lapaopao
ID Sampel	XRD L-03 SAP
Jenis Sampel	Saprolite
Koordinat Y	9574332
Koordinat X	310362
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Saprolite : warna coklat, kuning kehijauan, terdiri atas campuran material tanah (soil) dan fragment batuan yang berasal dari batuan ultrabasa yang sudah mengalami pelapukan. Komposisi mineral: geothite, piroksin, olivine, manganese, serpentine.



No Stasiun	L-03 – Sub Blok Lapaopao
ID Sampel	XRD L-03 LIM
Jenis Sampel	Limonite
Koordinat Y	9574332
Koordinat X	310362
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Limonite : warna coklat-kekuningan, terdiri atas material tanah (soil), memiliki kandungan Fe yang tinggi. Komposisi mineral: utamanya hematite, clay manganese, mineral lain berupa goethite.



No Stasiun	L-03 – Sub Blok Lapaopao
ID Sampel	TS-L 03
Jenis Sampel	Batuan
Koordinat Y	9574332
Koordinat X	310362
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Warna abu-abu, struktur massive, tingkat pelapukan rendah, mineral penyusun , piroksin, serpentine. Batuan sudah mengalami proses serpentinisasi. Nama batuan : Peridotite



No Stasiun	L-04 – Sub Blok Lapaopao
ID Sampel	XRD L-04 SAP
Jenis Sampel	Saprolite
Koordinat Y	9572949
Koordinat X	311851
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Saprolite : warna coklat, kuning kehijauan, terdiri atas campuran material tanah (soil) dan fragment batuan yang berasal dari batuan ultrabasa yang sudah mengalami pelapukan. Komposisi mineral: geothite, piroksin, olivine, manganese, serpentine.



No Stasiun	L-04 – Sub Blok Lapaopao
ID Sampel	XRD L-04 LIM
Jenis Sampel	Limonite
Koordinat Y	9572949
Koordinat X	311851
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Limonite : warna coklat-kekuningan, terdiri atas material tanah (soil), memiliki kandungan Fe yang tinggi. Komposisi mineral: utamanya hematite, clay manganese, mineral lain berupa goethite.



No Stasiun	L-04 – Sub Blok Lapaopao
ID Sampel	TS-L 04
Jenis Sampel	Batuan
Koordinat Y	9572949
Koordinat X	311851
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Warna abu-kehitaman, struktur massive, tingkat pelapukan rendah, mineral penyusun , piroksin, serpentine. Batuan sudah mengalami proses serpentinisasi. Nama batuan : "Harzburgite:



No Stasiun	B-03 – Sub Blok Babarina
ID Sampel	XRD B-03 SAP
Jenis Sampel	Saprolite
Koordinat Y	9573948
Koordinat X	308643
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Saprolite : warna coklat, kuning kehijauan, terdiri atas campuran material tanah (soil) dan fragment batuan yang berasal dari batuan ultrabasa yang sudah mengalami pelapukan. Komposisi mineral: geothite, piroksin, olivine, manganese, serpentine.



No Stasiun	B-04 – Sub Blok Babarina
ID Sampel	XRD B-03 LIM
Jenis Sampel	Limonite
Koordinat Y	9573948
Koordinat X	308643
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Limonite : warna coklat-kekuningan, terdiri atas material tanah (soil), memiliki kandungan Fe yang tinggi. Komposisi mineral: utamanya hematite, clay manganese, mineral lain berupa goethite.



No Stasiun	B-03 – Sub Blok Babarina
ID Sampel	TS B-03
Jenis Sampel	Batuan
Koordinat Y	9573948
Koordinat X	308643
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Warna abu-kehijauan, struktur massive, tingkat pelapukan rendah, mineral penyusun , piroksin, serpentine. Batuan sudah mengalami proses serpentinisasi. Nama batuan : "peridotite"



No Stasiun	B-06 – Sub Blok Babarina
ID Sampel	XRD B-06 SAP
Jenis Sampel	Saprolite
Koordinat Y	9573300
Koordinat X	308626
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Saprolite : warna kuning kehijauan, terdiri atas campuran material tanah (soil) dan fragment batuan yang berasal dari batuan ultrabasa yang sudah mengalami pelapukan. Ukuran butir pasir – kerikil. Komposisi mineral: geothite, piroksin, olivine, manganese, serpentine.



No Stasiun	B-06 – Sub Blok Babarina
ID Sampel	XRD B-06 LIM
Jenis Sampel	Limonite
Koordinat Y	9573300
Koordinat X	308626
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Limonite : warna coklat-kekuningan, terdiri atas material tanah (soil), memiliki kandungan Fe yang tinggi. Komposisi mineral: utamanya hematite, clay manganese, mineral lain berupa goethite.



No Stasiun	B-06 – Sub Blok Babarina
ID Sampel	TS B-06
Jenis Sampel	Batuan
Koordinat Y	9573300
Koordinat X	308626
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Warna abu-kehijauan, struktur massive, tingkat pelapukan rendah pada bagian tengah, pelapukan bagian luar cukup tinggi, mineral penyusun , piroksin, serpentine. Batuan sudah mengalami proses serpentinisasi. Nama batuan : "peridotite"



No Stasiun	B-07 – Sub Blok Babarina
ID Sampel	XRD B-07 SAP
Jenis Sampel	Saprolite
Koordinat Y	9572506
Koordinat X	308869
Sistem Koordinat	WGS 1984 UTM Zona 51S



Deskripsi

Material Saprolite : warna kuning kehijauan, terdiri atas campuran material tanah (soil) dan fragment batuan yang berasal dari batuan ultrabasa yang sudah mengalami pelapukan.

Ukuran butir pasir – kerikil.

Komposisi mineral: geothite, piroksin, olivine, manganese, serpentine.



No Stasiun	B-07 – Sub Blok Babarina
ID Sampel	XRD B-07 LIM
Jenis Sampel	Limonite
Koordinat Y	9572506
Koordinat X	308869
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Material Limonite : warna coklat gelap, terdiri atas material tanah (soil), memiliki kandungan Fe yang tinggi. Komposisi mineral: utamanya hematite, clay manganese, mineral lain berupa goethite.



No Stasiun	B-07 – Sub Blok Babarina
ID Sampel	TS B-07
Jenis Sampel	Batuan
Koordinat Y	9572506
Koordinat X	308869
Sistem Koordinat	WGS 1984 UTM Zona 51S
	
Deskripsi	Warna abu-abu, struktur massive, tingkat pelapukan rendah, mineral penyusun , piroksin, serpentine. Batuan sudah mengalami proses serpentinisasi. Nama batuan : "harzburgite"



Lampiran 2. Hasil Analisa Geokima

LABORATORIUM INTERNAL PT CERIA NUGRAHA INDOTAMA

No. Lab : SAMPEL STUDY
 Dispatch Client no. :
 Batch Client No. :
 Jumlah Conto : 12

Tanggal Masuk 02/08/2020
 Tanggal Selesai 04/08/2020

No	Element Dimension	Kadar Unsur/ Senyawaan yang dianalisa sesuai dengan komoditi (%)									
		Ni	Fe	Co	MgO	SiO ₂	CaO	Al ₂ O ₃	MnO	Cr	LOI
		EDXRF	EDXRF	EDXRF	EDXRF	EDXRF	EDXRF	EDXRF	EDXRF	EDXRF	TGA
		%	%	%	%	%	%	%	%	%	%
1	XRD-L.01/SAP	1.87	11.77	0.02	17.34	43.88	0.43	1.41	0.25	0.50	7.20
2	XRD-L.01/LIM	1.32	38.36	0.11	2.28	11.92	0.05	10.96	1.34	1.97	12.69
3	XRD-B.06/LIM	0.83	28.82	0.15	2.12	35.32	0.04	3.23	1.07	1.28	8.61
4	XRD-L.03/SAP	1.76	17.17	0.04	16.47	33.37	0.33	5.32	0.41	0.79	8.64
5	XRD-L.03/LIM	0.88	39.95	0.15	1.76	3.82	0.03	11.24	1.50	2.53	15.59
6	XRD-L.04/SAP	2.01	20.25	0.05	10.43	33.81	0.75	5.59	0.57	1.13	8.33
7	XRD-L.04/LIM	1.73	46.29	0.10	1.55	4.68	0.04	6.21	1.09	2.25	13.52
8	XRD-B.07/SAP	2.08	15.67	0.08	12.73	44.13	0.18	1.66	0.37	0.85	7.31
9	XRD-B.07/LIM	1.10	48.18	0.17	1.27	6.83	0.03	5.77	1.13	1.38	12.86
10	XRD-B.06/SAP	2.98	12.12	0.03	16.24	44.96	0.16	1.60	0.30	0.64	8.03
11	XRD-B.03/LIM	1.12	42.80	0.10	5.96	12.48	0.07	4.06	0.89	1.91	12.50
12	XRD-B.03/SAP	3.03	20.67	0.04	7.45	31.27	0.62	3.62	0.47	1.13	11.02

OREAS 194	2.11	11.43	0.03	23.11	42.68	0.23	2.24	0.26	0.55
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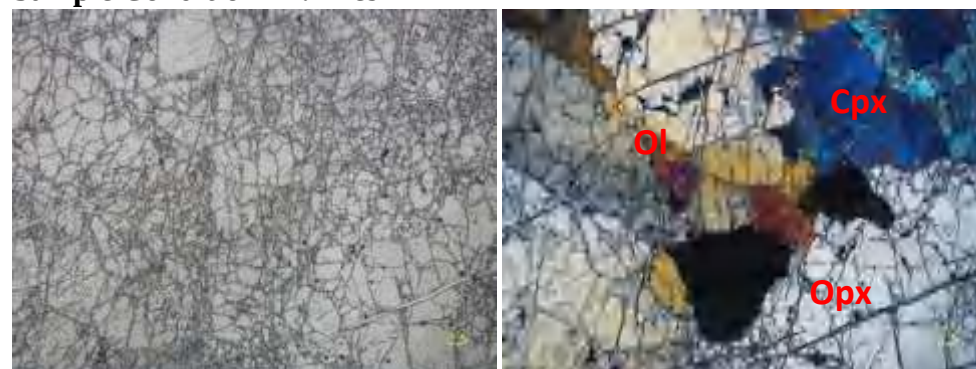


Lampiran 3. Hasil Analisa Petrogafi

Lithology : Harzburgite
Classification : Streckeisen, 1976

Location : 1
Sample Code : TS.B.03
Sample Condition : Fresh

PRIMARY MINERALS			SECONDARY MINERALS	
Orthopyroxene	63 %		Serpentine	3 %
Clinopyroxene	20 %		Opaque	6 %
Olivine	10 %			
GROUND MASS			VISIBLE POROSITY	
-			-	
TEXTURE				
Mineral Size (mm)			Crystallinity	Holocrystalline
Minimum	Mode	Maximum	Crystal shape	Subhedral - Anhedral
0.06		0.9	Fabric	Equigranular
			Texture	Phaneritic



PPL

XPL

Texture & Composition

The rock is clinopyroxene-rich harzburgite with minor olivine. Absorption colour is white, grey or colourless and interference colour is blackish grey. Crystalinity is holocrystalline showing phaneritic texture. Crystal shape is subhedral to anhedral. Mineral composition in this section identified as orthopyroxene, clinopyroxene, olivine, serpentine, and opaque, having size

– 0,9 mm. Some pseudomorph texture show in olivine, forming mesh and bastite texture. Serpentinite (as confirmed by XRD) found as veinlet either in



Crystallization & Recrystallization

Based on the microscopic analysis of the minerals, orthopyroxene and clinopyroxene in this rock is replaced by serpentinite due to serpentinization process, as evidence by bastite texture in orthopyroxene and clinopyroxene replacing the primary mineral. Opaque mineral found as both goethite and hematite replacing olivine.

Lithology : Harzburgite
Classification : Streckeisen, 1976

PRIMARY MINERALS			SECONDARY MINERALS	
Orthopyroxene		54%	Serpentine	5 %
Clinopyroxene		10%	Opaque	3 %
Olivine		25%		
GROUND MASS			VISIBLE POROSITY	
-			-	
TEXTURE				
Mineral Size (mm)			Crystallinity	Holocrystalline
Minimum	Mode	Maximum	Crystal shape	Subhedral - Anhedral
0.05		0.7	Fabric	Equigranular
			Texture	Phaneritic

Texture & Composition

The rock is harzburgite rich in olivine. The absorption colour is white, grey or colourless and interference colour is blackish grey. Crystallinity is holocrystalline and showing granular to porphyroclastic texture. Crystal shape is subhedral to anhedral. Mineral composition in this section identified are dominated by orthopyroxene, clinopyroxene, olivine, serpentine, and opaque, having size as of 0.05 mm – 0.7 mm. Mesh and bastite texture in orthopyroxene. Goethite is regularly found in mesh

usually after olivine breakdown or in vein associated with ().

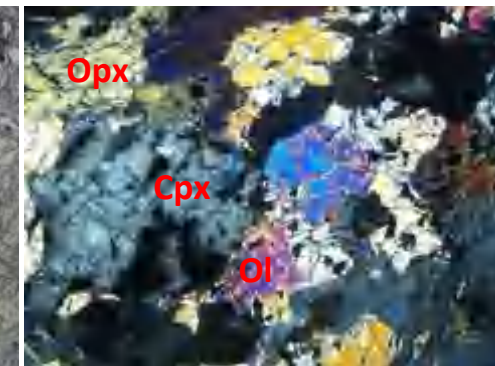


Recrystallization

Location : 2
Sample Code : TS.B.06
Sample Condition : Fresh



PPL



XPL

Olivine, clinopyroxene and orthopyroxene in this rock has been low to moderately serpentinized as showing by mainly mesh and lesser ribbon and bastitic texture in orthopyroxene and other main minerals. Goethite and spinel occur as secondary opaque mineral included in olivine and pyroxene. XRD analyses also confirmed the occurrence of hematite in minor volume replacing some rock forming minerals.

Classification : Modified Streckeisen, 1976
Location : 3
Sample Code : TS.B.07
Sample Condition : Moderately serpentinized

Lithology : Serpentinized Peridotite

Primary Minerals			Secondary Minerals	
Orthopyroxene	35 %		Serpentine	10 %
Clinopyroxene	30 %		Opaque	4 %
Olivine	23 %			
GROUND MASS			VISIBLE POROSITY	
-			-	
TEXTURE				
Mineral Size (mm)			Crystallinity	Holocrystalline
Minimum	Mode	Maximum	Crystal shape	Subhedral - Anhedral
0.05		0.5	Fabric	Equigranular
			Texture	Phaneritic

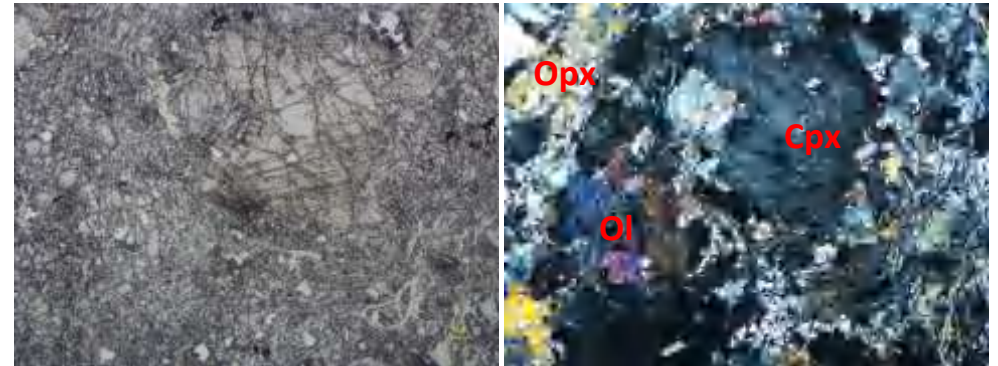
Texture & Composition

This rock is moderately serpentinized peridotite characterized by the occurrence of serpentinite in the form of ribbon, mesh, bastire and other distinctive texture. The absorption colour is grey or colourless and interference colour is blackish grey. Crystallinity is holocrystalline and texture is phaneritic. Crystal shape is subhedral to anhedral. Mineral composition in this section identified are orthopyroxene, clinopyroxene,

and opaque, having size as of 0.05 mm – 0,5 mm. flaky texture in serpentine evidence through all thin



Recrystallization



PPL

XPL

Most minerals have been moderately altered by serpentinization process as showing by the occurrence of bastite, mesh and flaky texture replacing orthopyroxene and clinopyroxene. In addition, olivine shows an intensive mesh texture due to moderate degree of serpentinization. Goethite occur in the core of mesh texture along with serpentinite (lizardite) as confirmed by XRD. Anhedral olivine maybe partly corroded and replaced by olivine neoblast.

Lithology : Dunite

Primary Minerals			Secondary Minerals	
Olivine	90 %		Opaque	1%
Clinopyroxene	5 %			
Orthopyroxene	4 %			
GROUND MASS			VISIBLE POROSITY	
-			-	
TEXTURE				
Mineral Size (mm)			Crystallinity	Holocrystalline
Minimum	Mode	Maximum	Crystal shape	Subhedral - Anhedral
0.05		0.5	Fabric	Equigranular
			Texture	Phaneritic

Texture & Composition

The rock is dunite with absorption colour white to colourless and interference color is blackish to grey. Crystallinity is holocrystalline and showing typical of porphyroclastic texture and cumulate. Crystal shape is subhedral to anhedral. Mineral composition in this section identified are mainly olivine with orthopyroxene, clinopyroxene. Serpentine occur especially in mesh and bastitic texture along with opaque (goethite). Grain



5 mm – 0,5 mm. Mesh and flaky texture in olivine and rained olivine usually elongated and display undulatory. Serpentinized olivine show porphyroclastic to cataclastic

Classification : Modified Streckeisen, 1976

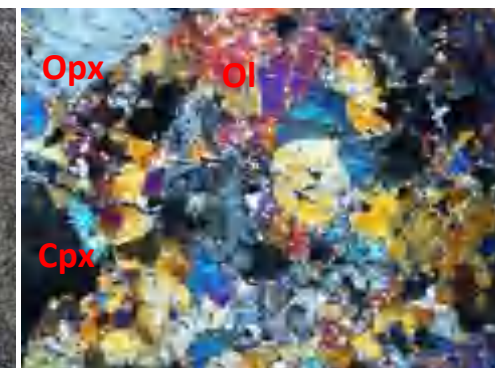
Location : 4

Sample Code : TS.L.01

Sample Condition : Fresh



PPL



XPL

Crystallization & Recrystallization

Based on the microscopic analysis of the minerals, dunite found as cumulate and sometime deformed displaying undulose extinction and kink band. Alteration of olivine has resulted in the development of serpentine (lizardite as confirmed by XRD) within the cracks. Small amount of clay mineral (montmorillonite) found filling the crack of deformed minerals.

Lithology : Harzburgite

PRIMARY MINERALS			SECONDARY MINERALS	
Orthopyroxene	61 %		Serpentine	5 %
Clinopyroxene	5 %		Opaque	8 %
Olivine	35 %			
GROUND MASS			VISIBLE POROSITY	
-			-	
TEXTURE				
Mineral Size (mm)			Crystallinity	Holocrystalline
Minimum	Mode	Maximum	Crystal shape	Subhedral - Anhedral
0.05		0.9	Fabric	Equigranular
			Texture	Phaneritic

Texture & Composition

The rock showing transition of harzburgite and olivine orthopyroxenite composition. The absorption colour is white to grey and colourless and interference colour is blackish to grey. Crystallinity is holocrystalline and texture is phaneritic. Crystal shape is subhedral to anhedral. Mineral composition in this section identified as essentially orthopyroxene (enstatite), olivine, and minor clinopyroxene, with serpentine, and opaque (goethite) occur as dominant accessory minerals. Grain size vary from 0.05

mesh and bastite texture in orthopyroxene and olivine



Recrystallization

Classification : Streckeisen, 1976

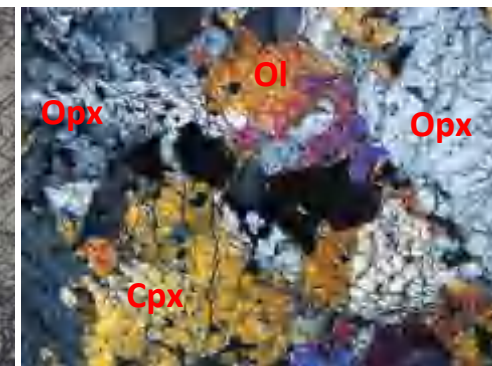
Location 5

Sample Code : TS.L.03

Sample Condition : Fresh



PPL



XPL

Most of clinopyroxene and olivine in this rock has been fractured and filled by serpentinite, showing bastite in orthopyroxene and mesh texture in olivine. Talc and gibbsite (as confirmed by XRD) occur as secondary alteration minerals during serpentinization process.

Lithology : Serpentinized Pyroxenite

PRIMARY MINERALS			SECONDARY MINERALS	
Clinopyroxene		15 %	Serpentine	20 %
Orthopyroxene		57 %	Opaque	2 %
Olivine		4 %		
GROUND MASS			VISIBLE POROSITY	
-			-	
TEXTURE				
Mineral Size (mm)			Crystallinity	Holocrystalline
Minimum	Mode	Maximum	Crystal shape	Subhedral - Anhedral
0.05		0.5	Fabric	Equigranular
			Texture	Phaneritic

Texture & Composition

The rock shows moderately serpentinized peridotite with absorption colour is white, grey to colourless and interference colour is blackish grey. Holocrystalline and phaneritic texture, equigranular and tend to show prophyroclastic texture. Subhedral to anhedral crystals shape. Mineral composition was essentially consists of orthopyroxene and clinopyroxene with small amount of olivine serpentine, olivine, chlorite and opaque (mainly goethite as confirmed by XRD) with its size between as of 0.05



sh and flaky texture in serpentine and view veinlets of chlore.

Recrystallization

Classification : Modified Streckeisen, 1976

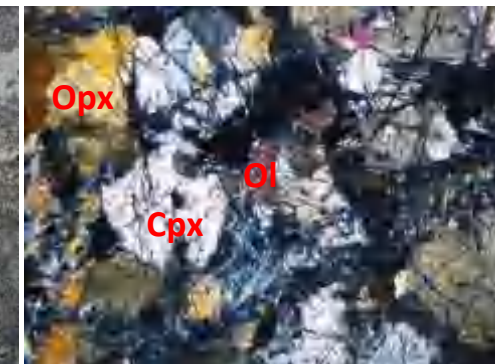
Location : 6

Sample Code : TS.L.04

Sample Condition : Fresh



PPL



XPL

The rock has been highly serpentinized as shown by serpentine mineral replacing both pyroxenes. Relict orthopyroxene suggests once coarse grained texture. Bastite occur as evident of replacement process by serpentine. The serpentine also grew as rim or veinlets and replaced the main minerals. Local interlocking found in the groundmass whereas interpenetrating and houghlass texture occur as replacement of older serpentine (recrystallization).

Lampiran 4. Hasil Analisa XRD

Results of XRD Analysis for Ni Laterite Samples

Date: August, 17/2020

Analyzed by
Dr. Ir. Sufriadin AS, MT

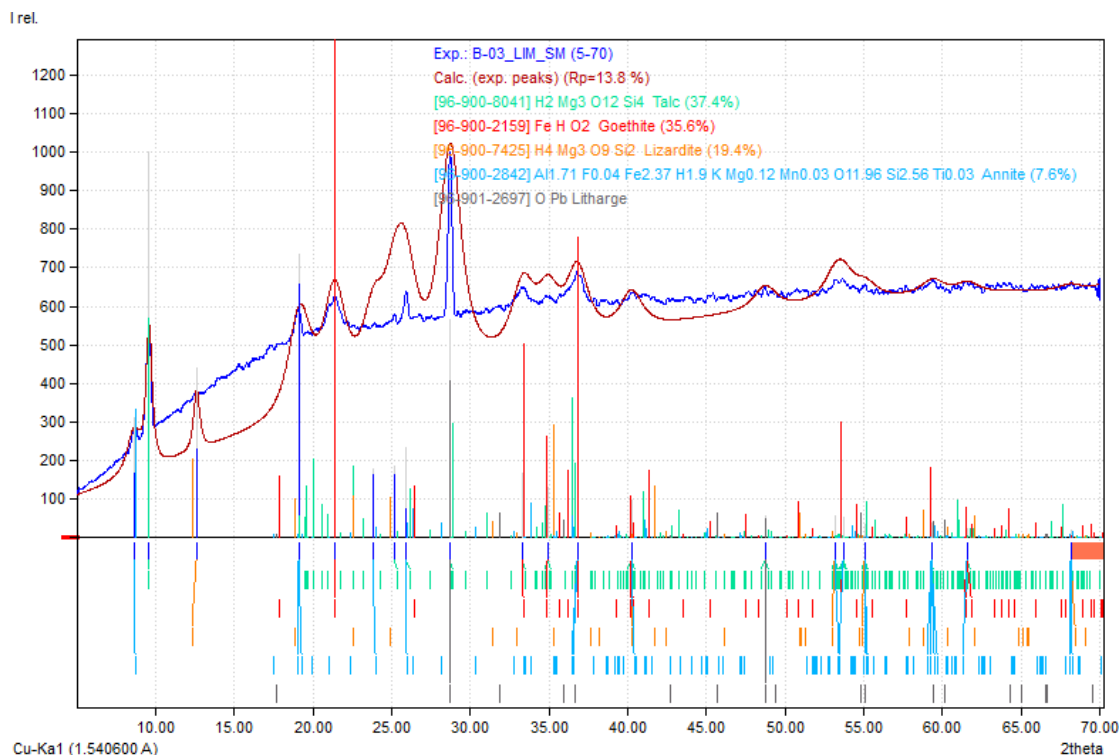
Nickel Laterite Samples were supplied by PT.CNI, Wolo-Kolaka. As received samples were further analyzed using X-ray diffractometer (Shimadzu Maxima, X-7000). The operational conditions were: voltage 40kV, current: 30 mA, scan range 5 to 70° 2 θ , scanning step 0.02° and scanning time 2°/minute. Diffractograms were further interpreted using Match! 3 software (trial version). The results of XRD analysis for 12 samples are presented below:

No	Sample ID	Mineral ID	QME (wt.%)	Remark
01	B03/LIM-SM	Talc	37.4	Unidentified peak ~8.9 %
		Goethite	35.6	
		Lizardite (serpentine group)	19.4	
		Annite (Mica Group)	7.6	
02	B03/SAP-SP	Quartz (low)	42.0	Unidentified peak ~6.5 %
		Lizardite	35.9	
		Goethite	17.1	
		Hematite	5.0	
03	B06/LIM-LM	Quartz	40.4	Unidentified peak ~7.6 %
		Talc	37.4	
		Goethite	21.0	
		Maghemite	1.2	
04	B06/SAP-SP	Lizardite	50.3	Unidentified peak ~6.7 %
		Quartz	31.3	
		Goethite	16.0	
		Spinel	2.4	
05	B07/LIM-LM	Goethite	64.2	Unidentified peak ~2.8 %
		Quartz	35.8	
06	B07/SAP-SP	Lizardite	41.0	Unidentified peak ~6.1 %
		Quartz	31.6	
		Olivine	13.9	
		Goethite	13.5	
07	L-01/LIM-LM	Goethite	61.6	-
		Maghemite	26.8	
		Braunite	11.7	
08	P-SP	Olivine	57.8	Unidentified peak ~4.8 %
		Lizardite	23.3	
		Quartz	18.1	
		Montmorillonite	0.8	



No	Sample ID	Mineral ID	QME (wt.%)	Remark
09	L-03/LIM-SM	Gibbsite	40.4	-
		Goethite	33.2	
		Talc	26.4	
10	L-03/SAP-SP	Enstatite	35.1	Unidentified peak ~5.8 %
		Talc	29.2	
		Goethite	20.7	
		Quartz	15.1	
11	L-04/LIM-LM	Goethite	100	-
12	L-04/SAP-SP	Quartz	35.3	Unidentified peak ~7.1 %
		Talc	29.3	
		Lizardite	19.2	
		Clinocllore	15.3	
		Magnetite	0.8	

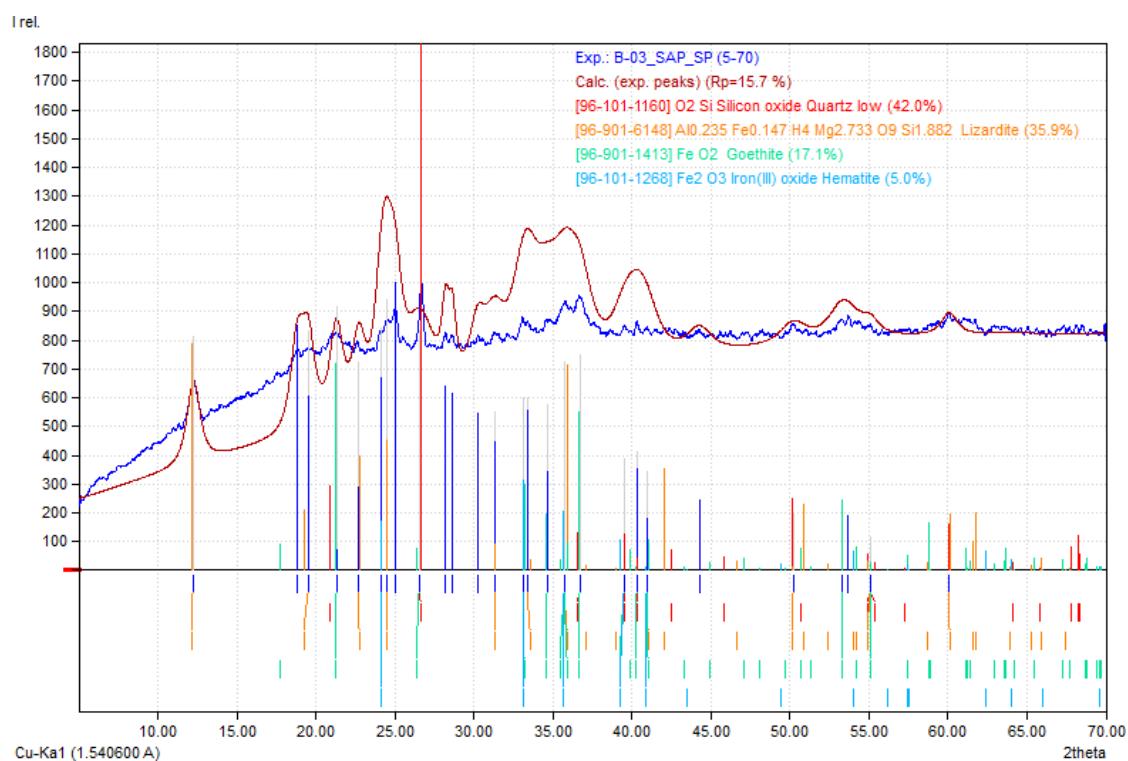
DIFFRACTOGRAMS



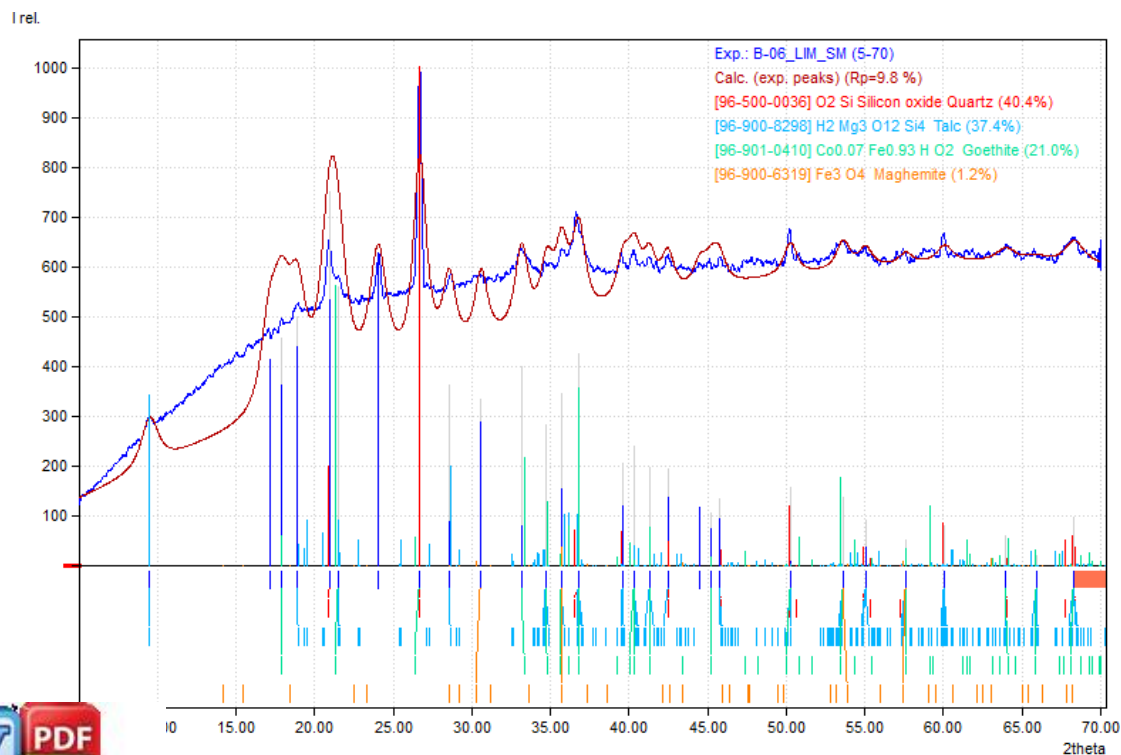
Sample ID. B03/LIM-LM



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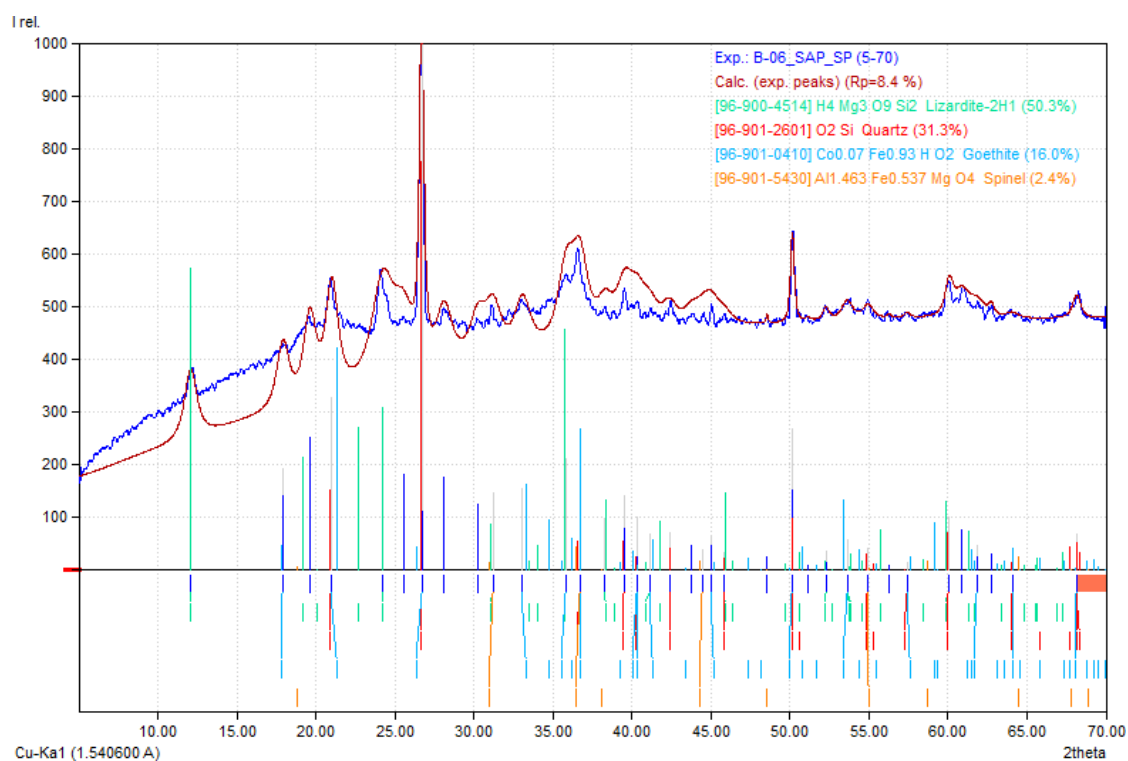


Sample ID. B03/SAP-SP

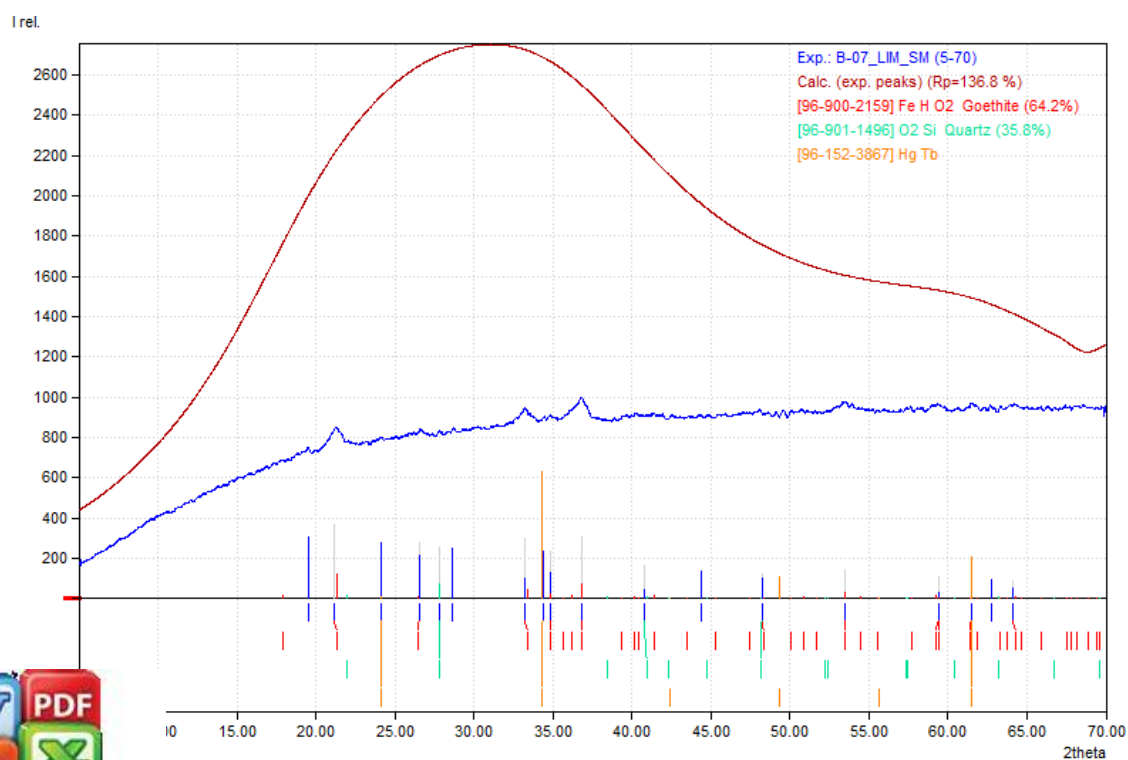


Sample ID. B06/LIM-LM





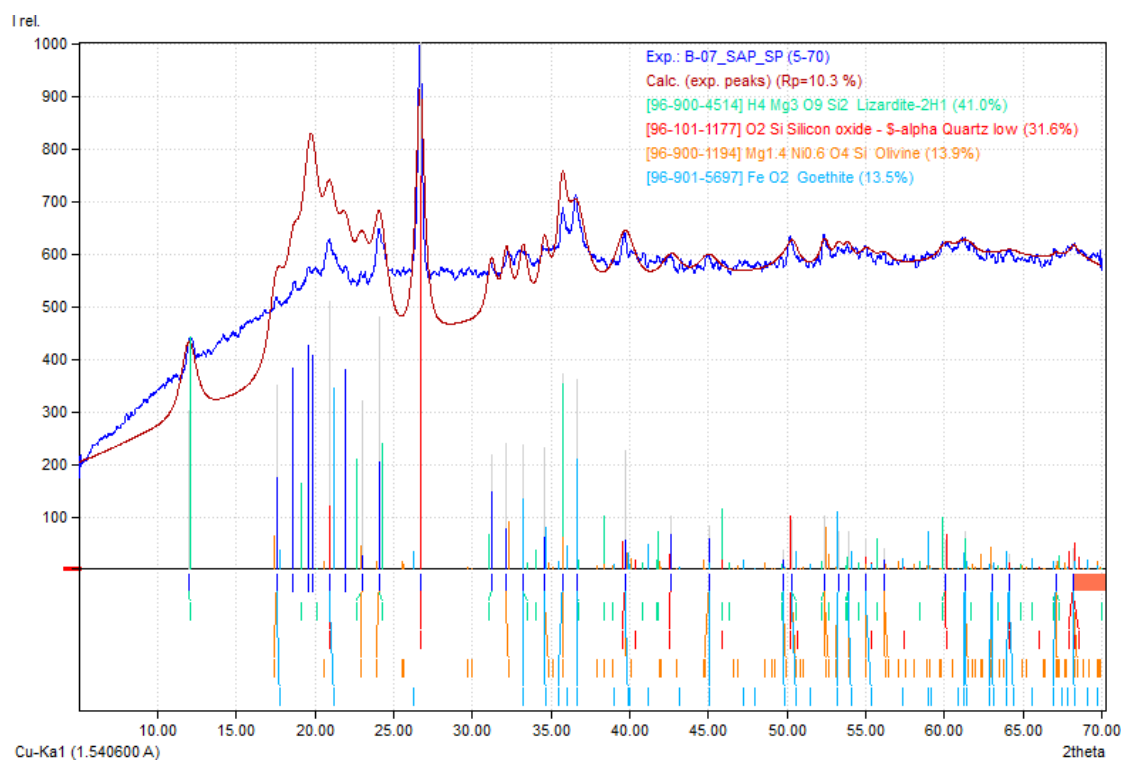
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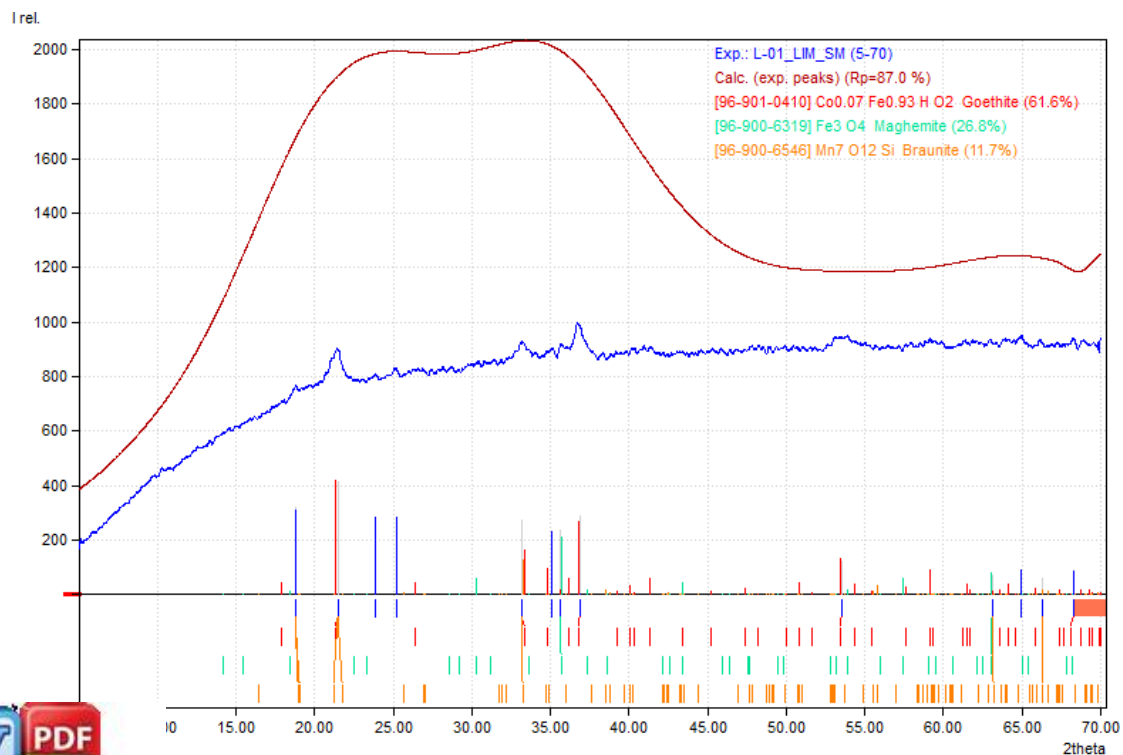
B07/LIM-LM



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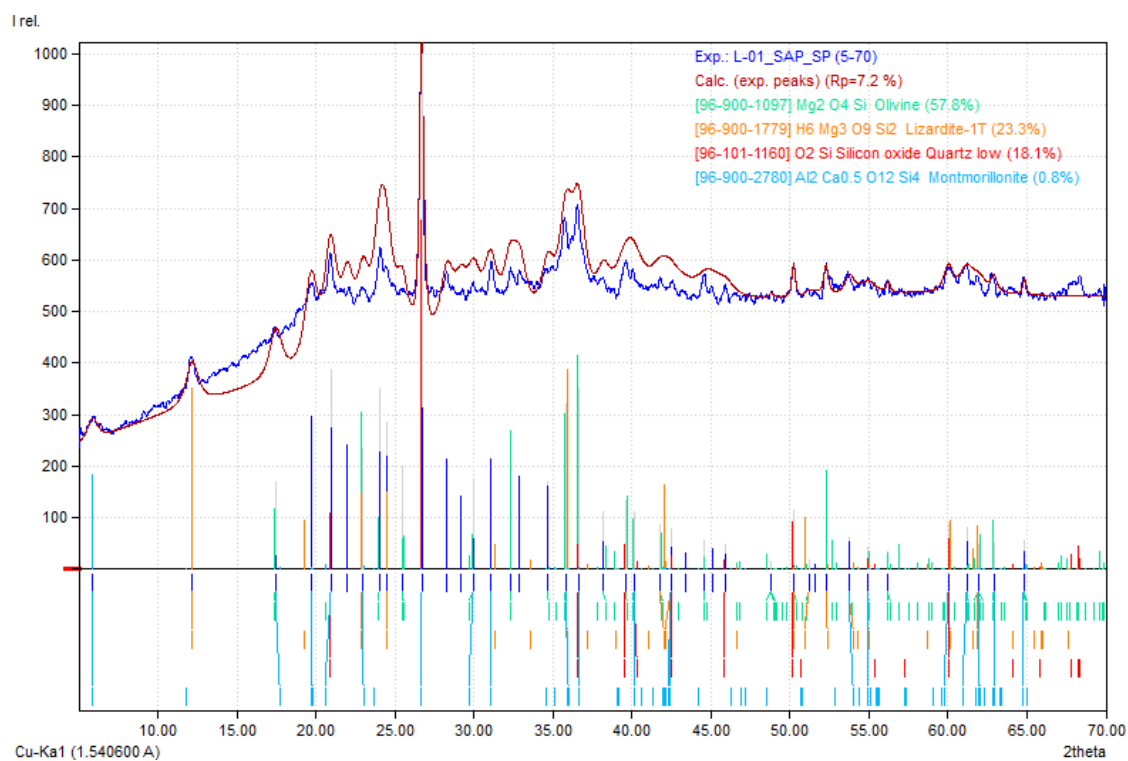


B07/SAP/SP

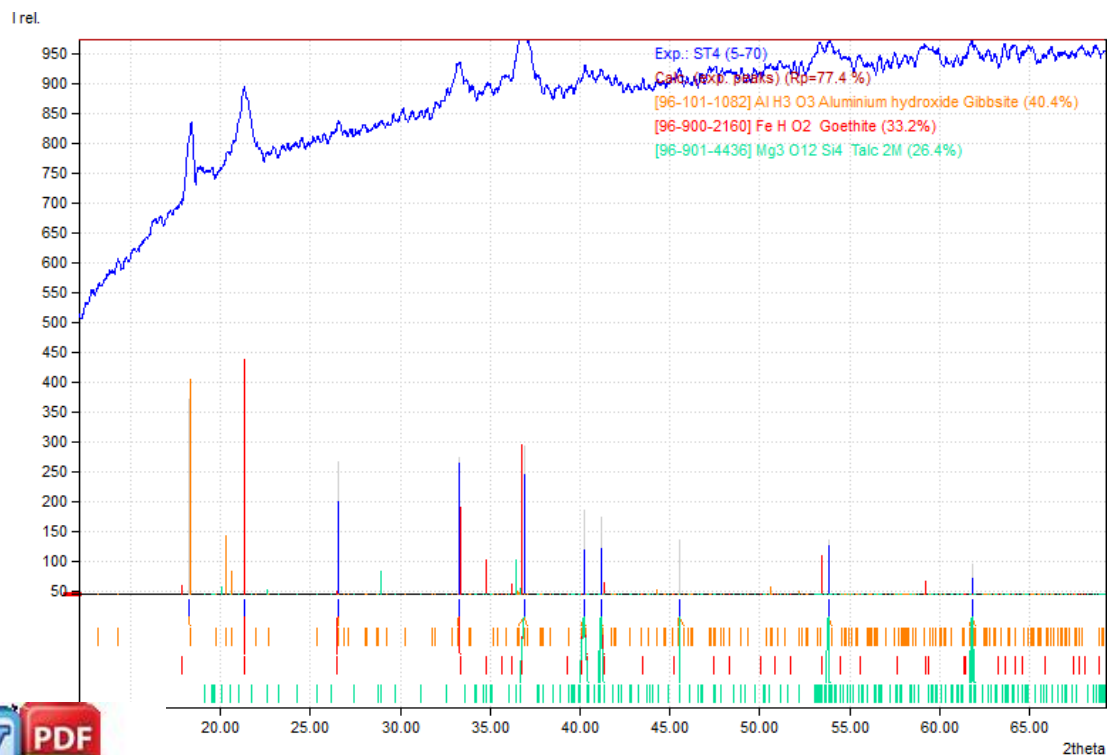


L01/LIM-LM



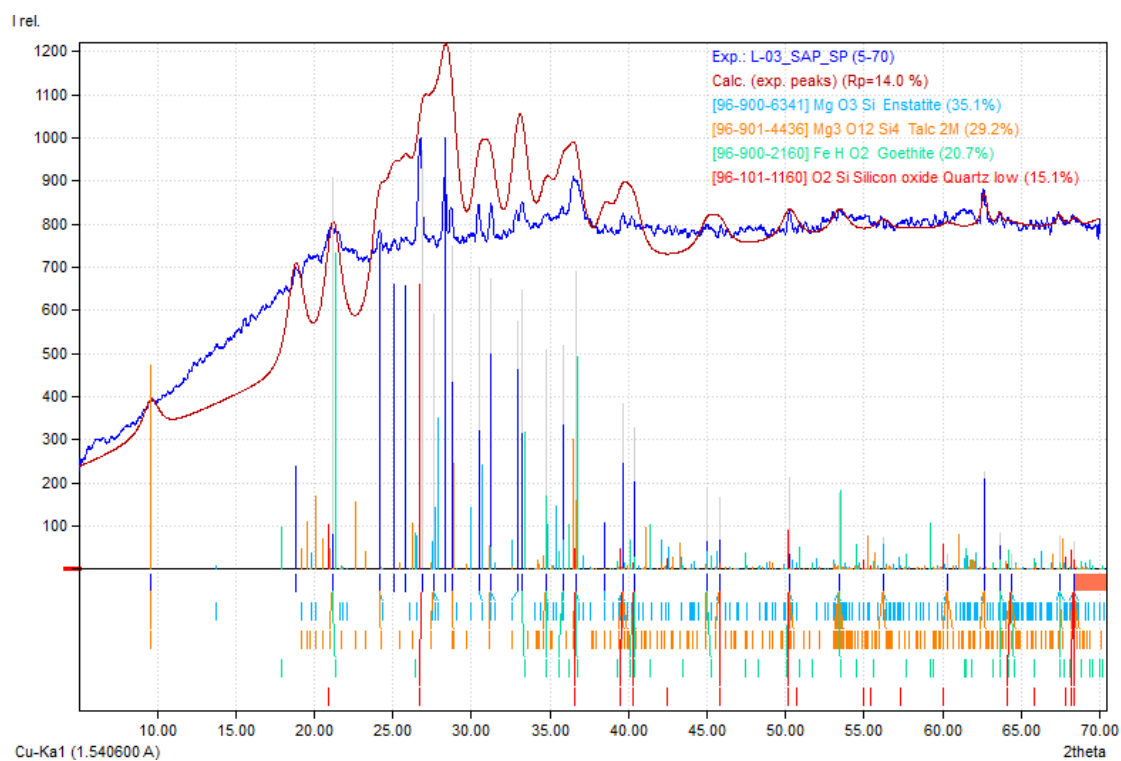


L01/SAP/SP

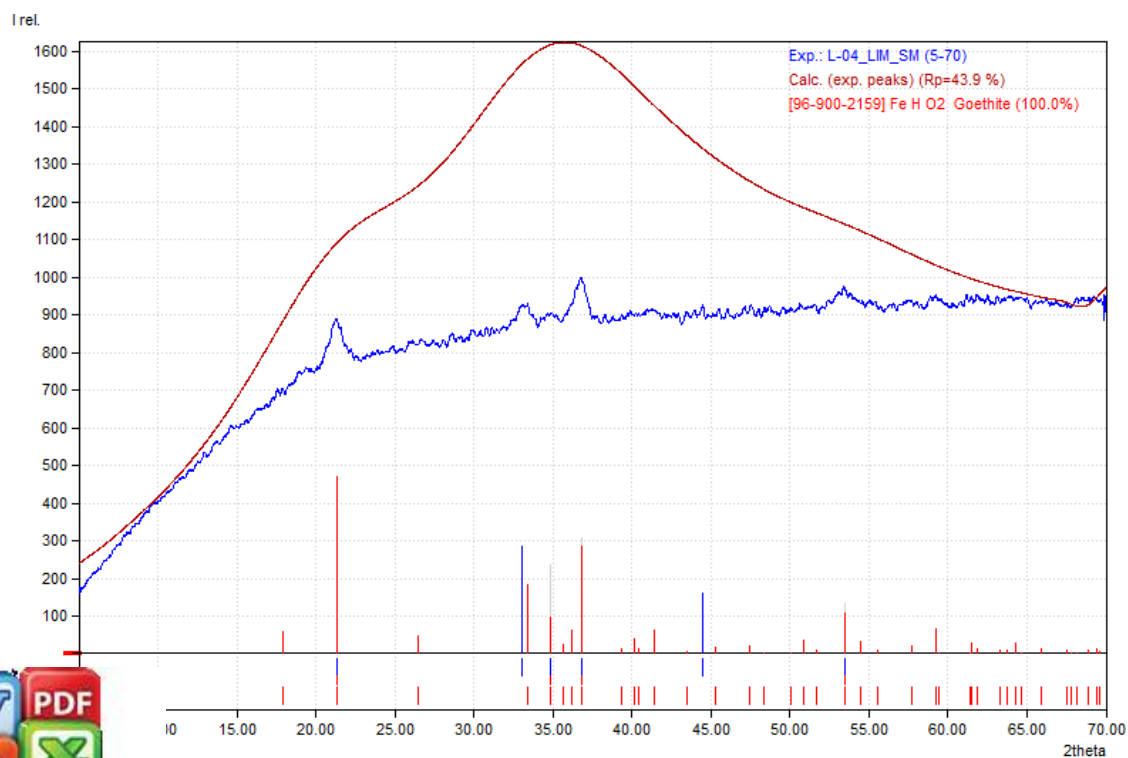


L03/LIM-LM



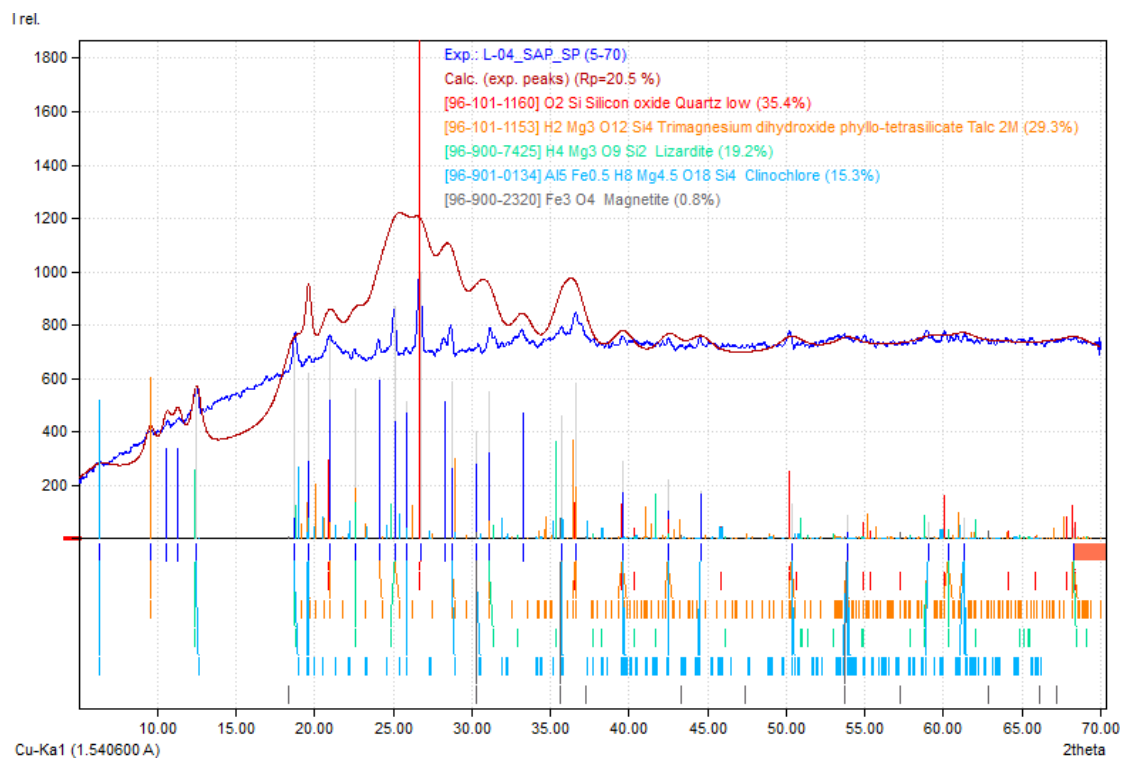


L03/SAP-SP



L04/LIM-LM





L04/SAP-SP



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Lampiran 5. Curriculum Vitae

A. Data Pribadi

1. Nama : Iwan Dermawan
2. Tempat, tanggal lahir : Lombok Timur, 13 Februari 1980
3. Alamat : Perumahan kalisade Praya, Lombok Tengah, NTB.
4. Kewarganegaraan : Indonesia

B. Riwayat Pendidikan

1. Tamat SLTA tahun 1998 di SMAN 1 Selong, Lombok Timur, NTB (IPA)
2. Sarjana (S1) tahun 2005 di Universitas Hasanuddin (Teknik Geologi)
3. Magister (S2) tahun 2024 di Universitas Hasanuddin (Teknik Geologi)

4. Pekerjaan dan Riwayat Pekerjaan

- Jenis pekerjaan : Kegiatan Eksplorasi
- Jabatan pekerjaan : Geologist

5. Karya ilmiah yang sudah di publikasikan

Dermawan, Iwan, et all. “Weathered ultrabasic rocks in the Lapaopao, an implication for development of nickel laterite”, IOP Conference Series: Earth and Environmental Science, Volume 1272, 5th International Conference on Global Issues for Infrastructure, Environment and Socio-Economic Development 23/11/2023 - 24/11/2023 Makassar, Indonesia.

