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LAMPIRAN

LAMPIRAN A

ANALISIS MIKROSKOPIS

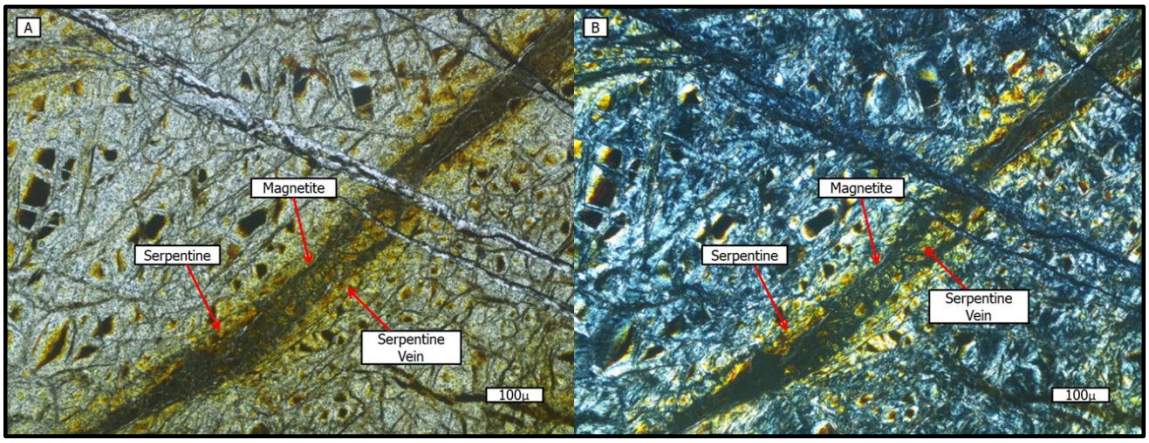
Lokasi	**:** Desa Latowu, Kecamatan Batuputih, Kabupaten Kolaka Utara, Provinsi Sulawesi Tenggara.
Tipe Mineralisasi	**: Tersebar**
Mineral Bijih	**: Serpentin, magnetit**
Referensi	**: Marshall *et al.* (2004), Kretz (1983)**
Perbesaran	**: 5 x**

Deskripsi Mineralogi Bijih

Kenampakan mikroskopis memperlihatkan mineral serpentin tersebar pada batuan, mineral magnetit terlihat di sekitar mineral serpentin dan terdapat urat/vein, dimana mineral serpentin menjadi pengisi rekahan urat tersebut dan berasosiasi dengan mineral magnetit

Komposisi Mineral	Keterangan optik mineral
Serpentin	Warna kuning, *anhedral-subhedral*, isotropic
Magnetit	Warna hitam kecoklatan bentuk *euhedral*, isotropic,

Foto



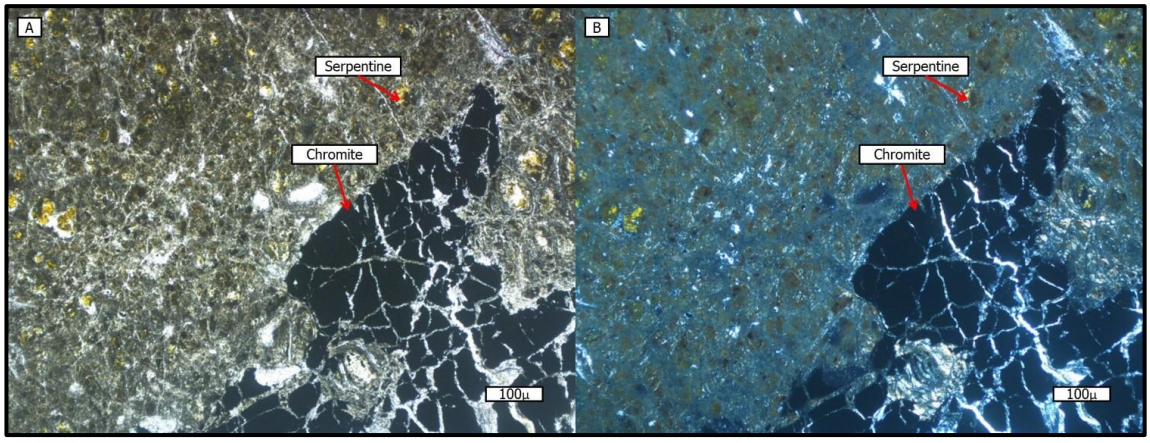
Lokasi	**:** Desa Latowu, Kecamatan Batuputih, Kabupaten Kolaka Utara, Provinsi Sulawesi Tenggara.
Tipe Mineralisasi	**: Tersebar**
Mineral Bijih	**: Serpentin, kromit**
Referensi	**: Marshall *et al.* (2004), Kretz (1983)**
Perbesaran	**: 5 x**

Deskripsi Mineralogi Bijih

Kenampakan mikroskopis memperlihatkan mineral kromit terlihat berbentuk memanjang dengan bentuk kristal yang tidak jelas berada sekitar mineral serpentin yang terlihat tersebar di permukaan sampel.

Komposisi Mineral	Keterangan optik mineral
Serpentin	Warna kuning, *subhedral-anhedral*, isotropik.
Kromit	Warna hitam, bentuk *anhedral*, isotropik, dengan ukuran 1185,71 µm

Foto



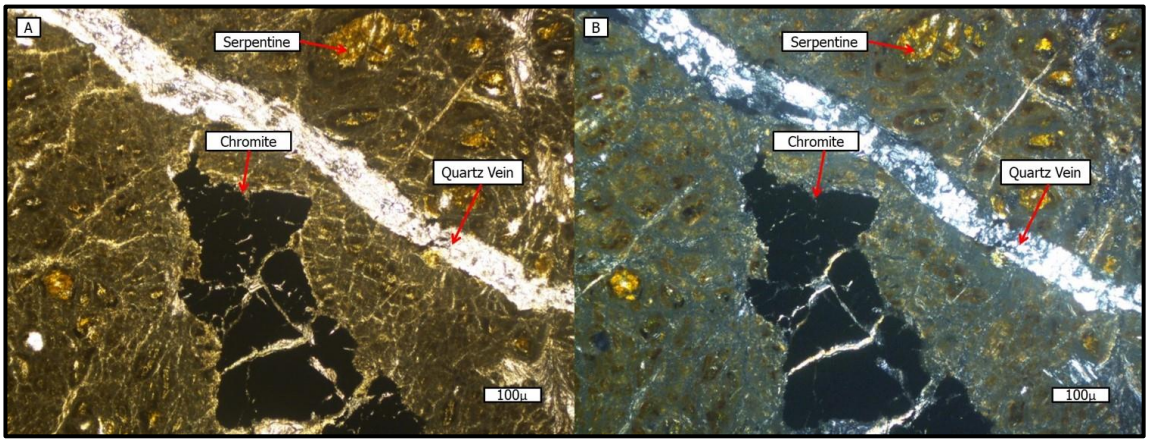
Lokasi	**:** Desa Latowu, Kecamatan Batuputih, Kabupaten Kolaka Utara, Provinsi Sulawesi Tenggara.
Tipe Mineralisasi	**: Tersebar**
Mineral Bijih	**: Serpentin, kromit, kuarsa**
Referensi	**: Marshall *et al.* (2004), Kretz (1983)**
Perbesaran	**: 5 x**

Deskripsi Mineralogi Bijih

Kenampakan mikroskopis memperlihatkan urat kuarsa, mineral serpentin terlihat tersebar di permukaan sampel. Mineral kromit terlihat di sekitar mineral serpentin berbentuk pipih memanjang.

Komposisi Mineral	Keterangan optik mineral
Serpentin	Warna kuning, *subhedral-anhedral*, isotropik,
Kromit	Warna hitam, bentuk *anhedral*, isotropik, dengan ukuran 1214,28 µm
Kuarsa	Warna putih, *euhedral*, isotropic

Foto



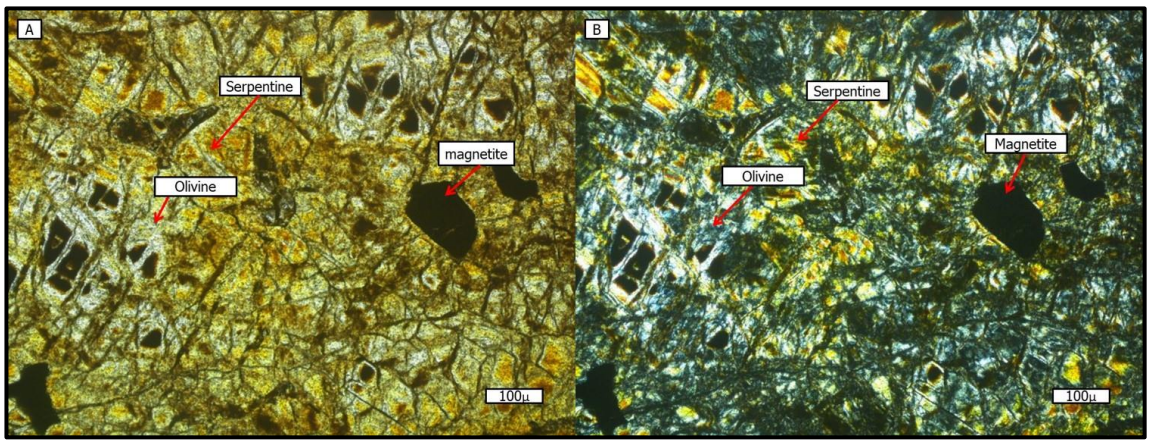
Lokasi	**:** Desa Latowu, Kecamatan Batuputih, Kabupaten Kolaka Utara, Provinsi Sulawesi Tenggara.
Tipe Mineralisasi	**: Tersebar**
Mineral Bijih	**: Serpentin, olivin, magnetit**
Referensi	**: Marshall *et al.* (2004), Kretz (1983)**
Perbesaran	**: 5 x**

Deskripsi Mineralogi Bijih

Kenampakan mikroskopis memperlihatkan mineral olivin dan serpentin tersebar pada permukaan sampel, mineral magnetit terlihat di sekitar mineral olivin dan serpentin berbentuk persegi dengan batas mineral yang jelas.

Komposisi Mineral	Keterangan optik mineral
Serpentin	Warna kuning, *subhedral- anhedral*, isotropic
Olivin	Warna coklat keputihan pada nikol sejajar, warna kehijauan pada nikol silang, bentuk *subhedral-anhedral*, anisotropic
Magnetit	Warna hitam, *euhedral*, isotropik, dengan ukuran 42,86 – 300 µm

Foto



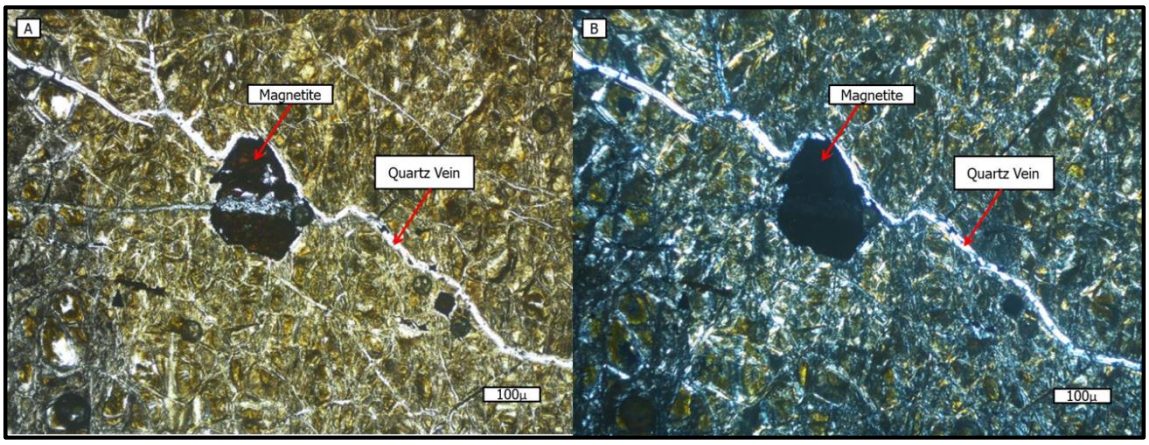
Lokasi	**:** Desa Latowu, Kecamatan Batuputih, Kabupaten Kolaka Utara, Provinsi Sulawesi Tenggara.
Tipe Mineralisasi	**: Tersebar**
Mineral Bijih	**: Magnetit, Kuarsa**
Referensi	**: Marshall *et al.* (2004), Kretz (1983)**
Perbesaran	**: 5 x**

Deskripsi Mineralogi Bijih

Kenampakan mikroskopis memperlihatkan mineral magnetit dan terdapat urat kuarsa pada sampel

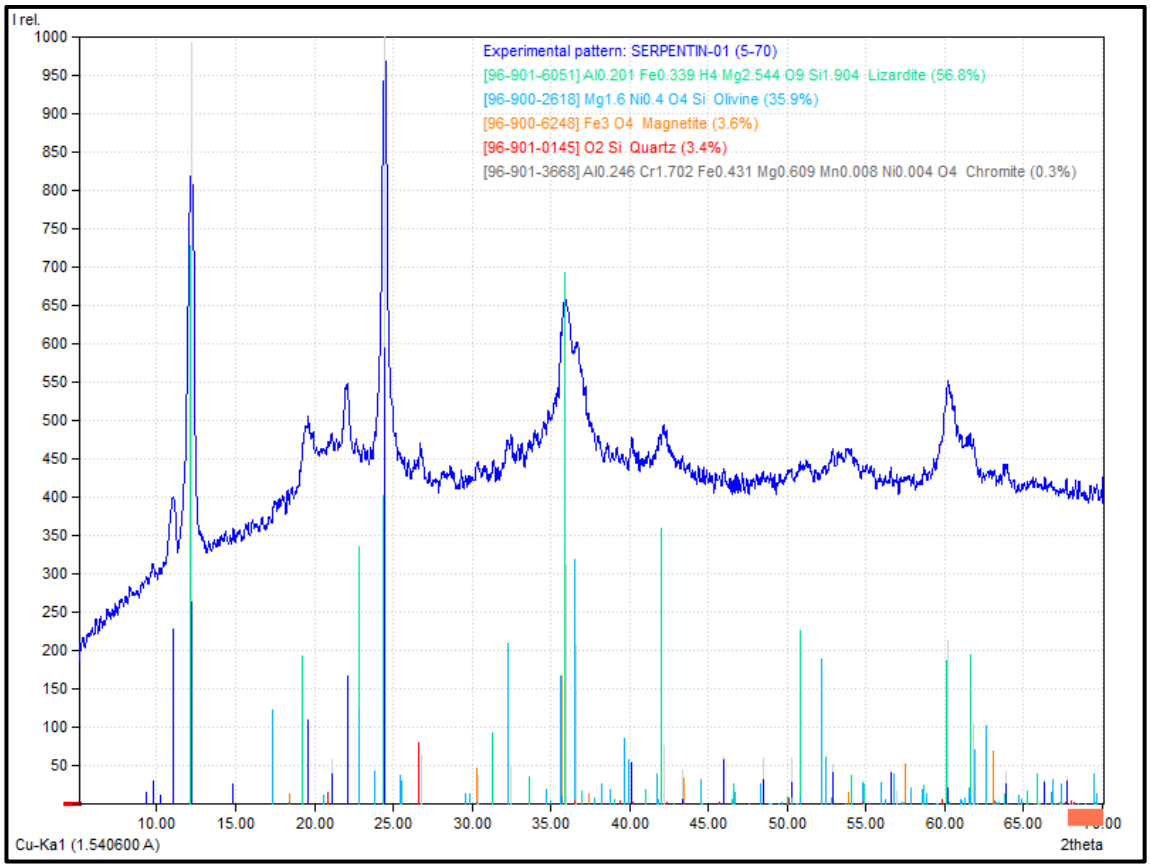
Komposisi Mineral	Keterangan optik mineral
Magnetit	Warna hitam, *euhedral*, isotropic
Kuarsa	Warna putih, *euhedral,* isotropic

Foto



LAMPIRAN B

ANALISIS XRD



No.	2theta [º]	d [Å]	I/I0	FWHM	Matched
1	9,33	9,4713	15,86	0,1408	
2	9,79	9,0273	30,59	0,2724	
3	10,21	8,6569	11,60	0,0851	
4	11,01	8,0296	229,19	0,9275	
5	12,19	7,2548	994,34	0,4265	A
6	14,85	5,9608	27,01	0,0692	
7	19,61	4,5233	109,57	0,8802	
8	21,09	4,2091	57,98	0,2400	D
9	22,07	4,0244	166,94	0,4476	
10	24,49	3,6319	1000,00	0,3942	A
11	26,79	3,3251	63,53	0,3930	D

12	30,35	2,9427	37,90	0,2134	C,E
13	32,47	2,7552	48,29	0,5727	B
14	35,99	2,4934	311,88	0,8800	A,C,E
15	36,63	2,4513	208,47	0,8800	B,D
16	40,15	2,2441	55,42	0,1558	B,D
17	40,15	2,2441	55,42	0,1558	
18	42,15	2,1422	76,25	0,8777	A,D
19	43,37	2,0847	45,29	0,3967	C,E
20	45,95	1,9735	62,31	0,4107	D
21	48,47	1,8766	61,09	0,4382	B
22	50,27	1,8135	59,66	0,4258	A,B,D
23	52,91	1,7291	53,32	0,4037	B
24	56,59	1,6251	41,19	0,1003	
25	56,95	1,6156	17,62	0,1394	B,D
26	60,23	1,5353	213,74	0,6400	A,B
27	61,83	1,4993	105,44	0,4664	A,B
28	63,89	1,4559	43,41	0,4235	A,D
29	66,35	1,4077	32,68	0,0855	C,E
30	67,71	1,3827	35,96	0,1285	B,D

Index	***Amount (%)***	***Name***	***Formula sum***
A	56.8	Lizardite	$Fe_4SiO_5(OH)_4$.
B	35.9	Olivine	Mg_2SiO_4
C	3.6	Magnetite	Fe_3O_4
D	3.4	Quartz	SiO_2
E	0.3	Chromite	$FeCr_2O_4$

LAMPIRAN C

ANALISIS XRF

Analyzed Result (Multi – Land)

Analysis type : Quant analysis Analysis date : 2020- 9- 1 09:36

Analysis code : Nikel Ore 2019 5

No.	Sample name	Ni	Co	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	$Li_2B_4O_7$
		mass %	mass %	mass%	mass%	mass%	mass%	mass%	
1	C-75-10	1.084	0.020	40.103	0.415	7.858	0.207	32.555	20.000
2	C-75-15	1.128	0.017	40.168	0.358	8.176	0.171	32.619	20.000
3	C-75-20	1.226	0.020	39.717	0.259	9.199	0.183	31.847	20.000
4	C-75-25	1.244	0.022	40.427	0.358	9.205	0.176	31.868	20.000
5	C-106-15	1.243	0.016	39.852	0.381	9.003	0.175	32.605	20.000
6	C-150-15	1.210	0.018	38.287	0.515	9.142	0.296	30.549	20.000
7	C-212-5	1.235	0.014	39.340	0.438	9.228	0.213	31.105	20.000
8	T-75-10	0.993	0.016	40.938	0.550	7.808	0.264	32.773	20.000
9	T-75-15	0.998	0.017	40.853	0.499	8.135	0.257	33.039	20.000
10	T-75-20	1.184	0.019	39.568	0.370	9.325	0.262	31.900	20.000
11	T-75-25	1.164	0.019	39.831	0.475	9.385	0.233	32.421	20.000
12	T-106-15	1.162	0.023	41.097	0.514	8.848	0.192	31.993	20.000
13	T-150-15	1.152	0.015	40.565	0.485	8.592	0.188	32.029	20.000
14	T-212-15	1.074	0.017	40.588	0.491	8.147	0.133	32.436	20.000
15	SA	1.212	0.018	39.327	0.400	9.326	0.080	32.374	20.000
	Number	15	15	15	15	15	15	15	15
	Average	1.154	0.018	40.044	0.434	8.759	0.202	32.141	20.000
	Range	0.251	0.009	2.810	0.291	1.577	0.215	2.491	0.000
	RSD(%)	7.23	14.07	1.86	18.34	6.62	27.42	2.02	0.00

LAMPIRAN D

PERHITUNGAN LOI

LOI Table

sample weight (g):

(No.)

samp No	measurement date	cru.No	cru.Wt (g)	cru+samp	after oven	after burning	samp.Wt	※wt error
C-212-15			11.0500	12.0500	12.0200	11.8700	1.0000	
C-150-15			10.7000	11.7000	11.6800	11.5100	1.0000	
C-106-15			11.8900	12.8900	12.8600	12.7200	1.0000	
C-75-15			11.2900	12.2900	12.2700	12.1300	1.0000	
C-75-10			11.2000	12.2000	12.1700	12.0400	1.0000	
C-75-20			10.9400	11.9400	11.9100	11.7700	1.0000	
C-75-25			29.5600	30.5600	30.5400	30.3900	1.0000	
T-212-15			11.0900	12.0900	12.0600	11.9400	1.0000	
T-150-15			10.5700	11.5700	11.5400	11.4200	1.0000	
T-106-15			10.6600	11.6600	11.6300	11.5000	1.0000	
T-75-15			11.1100	12.1100	12.0900	11.9600	1.0000	
T-75-10			10.1700	11.1700	11.1500	11.0200	1.0000	
T-75-20			11.4800	12.4800	12.4500	12.3300	1.0000	
T-75-25			24.9800	25.9800	25.9500	25.8200	1.0000	
SA			26.7400	27.7400	27.6900	27.5600	1.0000	

samp No	measurement date	cru.No	AO samp.Wt	Loss of water in AO	AB samp.Wt	Loss of water in AB	H2O-(%)	H2O+(%)
C-212-15			0.9700	0.0300	0.8200	0.1800	3.0000	15.0000
C-150-15			0.9800	0.0200	0.8100	0.1900	2.0000	17.0000
C-106-15			0.9700	0.0300	0.8300	0.1700	3.0000	14.0000
C-75-15			0.9800	0.0300	0.8400	0.1600	2.0000	13.0000
C-75-10			0.9700	0.0200	0.8400	0.1600	3.0000	14.0000
C-75-20			0.9700	0.0300	0.8300	0.1700	3.0000	14.0000
C-75-25			0.9800	0.0200	0.8300	0.1700	2.0000	15.0000
T-212-15			0.9700	0.0300	0.8500	0.1500	3.0000	12.0000
T-150-15			0.9700	0.0300	0.8500	0.1500	3.0000	12.0000
T-106-15			0.9700	0.0300	0.8400	0.1600	3.0000	13.0000
T-75-15			0.9800	0.0200	0.8500	0.1500	2.0000	13.0000
T-75-10			0.9800	0.0200	0.8500	0.1500	2.0000	13.0000
T-75-20			0.9700	0.0300	0.8500	0.1500	3.0000	12.0000
T-75-25			0.9700	0.0300	0.8400	0.1600	3.0000	13.0000
SA			0.9500	0.0500	0.8200	0.1800	5.0000	13.0000

LAMPIRAN E

PERHITUNGAN *RECOVERY*

1. *Recovery* berdasarkan variabel fraksi ukuran butir

   a. *Recovery* Ni

Recovery Ni C-212-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{26{,}5\ x1{,}312}{200\ x\ 1{,}318}\ x100\%$

= 13,19 %

Recovery Ni C-150-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{36{,}4\ x1{,}255}{200\ x\ 1{,}318}\ x100\%$

= 17,33%

Recovery Ni C-106-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{52{,}5\ x1{,}336}{200\ x\ 1{,}318}\ x100\%$

= 26,61%

Recovery Ni C-75-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{98{,}6\ x1{,}226}{200\ x\ 1{,}318}\ x100\%$

= 45,88%

b. *Recovery* Fe_2O_3

Recovery Fe_2O_3 C-212-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{26,5\ x9,804}{200\ x\ 10,142}\ x100\%$

=12,80%

Recovery Fe_2O_3 C-150-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{36,4\ x9,484}{200\ x\ 10,142}\ x100\%$

= 17,02%

Recovery Fe_2O_3 C-106-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{52,5\ x9,678}{200\ x\ 10,142}\ x100\%$

= 25,04%

Recovery Fe_2O_3 C-75-15 $= \frac{C.c}{F.f} x100\%$

$= \frac{98,6\ x8,891}{200\ x10,142}\ x100\%$

= 43,22%

2. *Recovery* berdasarkan variabel waktu flotasi

a. *Recovery* Ni

Recovery Ni C-75-10 $= \frac{C.c}{F.f} x100\%$

$= \frac{79,3\ x1,178}{200\ x\ 1,318}\ 100\%$

= 35,46%

Recovery Ni C-75-15 = $\frac{C.c}{F.f} x100\%$

= $\frac{98{,}6\ x1{,}226}{200\ x\ 1{,}318}\ x100\%$

= 45,88%

Recovery Ni C-75-20 = $\frac{C.c}{F.f} x100\%$

= $\frac{95{,}1\ x1{,}317}{200\ x\ 1{,}318}\ x100\%$

= 47,54%

Recovery Ni C-75-25 = $\frac{C.c}{F.f} x100\%$

= $\frac{81{,}5\ x1{,}321}{200\ x\ 1{,}318}\ x100\%$

= 40,86%

b. *Recovery* Fe_2O_3

Recovery Fe_2O_3 C-75-10 = $\frac{C.c}{F.f} x100\%$

= $\frac{79{,}3\ x7{,}858}{200\ x\ 10{,}142}\ x100\%$

= 33,40%

Recovery Fe_2O_3 C-75-15 = $\frac{C.c}{F.f} x100\%$

= $\frac{98{,}6\ x8{,}891}{200\ x\ 10{,}142}\ x100\%$

= 43,22%

Recovery Fe_2O_3 C-75-20 $= \frac{C.c}{F.f} x100\%$

$= \frac{95{,}1\ x9{,}888}{200\ x\ 10{,}142}\ x100\%$

$= 46{,}36\%$

Recovery Fe_2O_3 C-75-25 $= \frac{C.c}{F.f} x100\%$

$= \frac{81{,}5\ x\ 9{,}780}{200\ x\ 10{,}142}\ x100\%$

$= 39{,}29\%$