

DAFTAR PUSTAKA

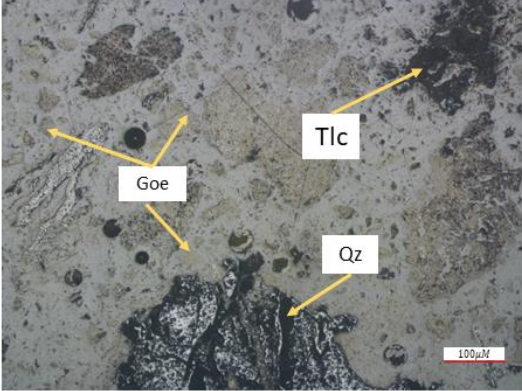
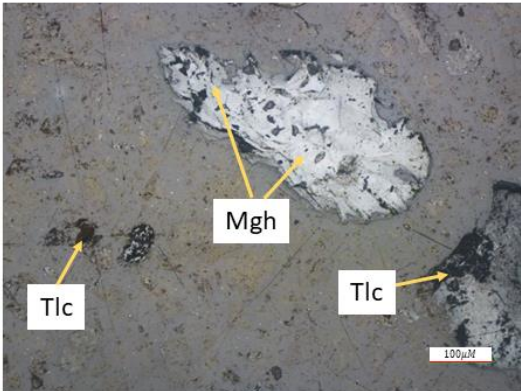
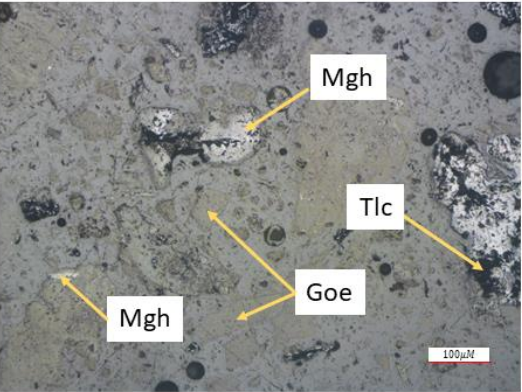
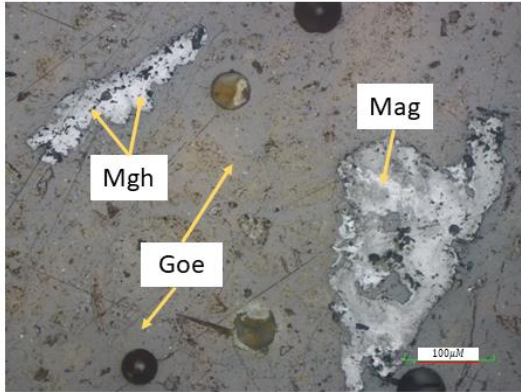
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LAMPIRAN

LAMPIRAN A
HASIL ANALISIS MIKROSKOPIS

Lokasi	: PT Ceria Nugraha Indotama	Kode Sampel	: SA
Tipe Mineralisasi	: Tersebar		
Mineral Bijih	: Goetit, Kuarsa, Talk, Maghemit		
Referensi	:(Kontak, 2005), Warr (2021)		
Deskripsi Mineralogi Bijih			
Kenampakan mikroskopis memperlihatkan mineral goetit, kuarsa, talk, dan maghemit			
Foto			
			
			

Komposisi Mineral	Jumlah (%)	Keterangan optik mineral
Goetit (Goe)		Sistem kristal ortorombik, berwarna hitam kecoklatan dengan bentuk (<i>subhedral</i>), ukuran mineral yang tampak yaitu 50 μm -100 μm .
Talk (Tlc)		Sistem kristal monoklin atau triklin, berwarna putih kecoklatan (<i>anhedral-subhedral</i>), ukuran mineral yang tampak yaitu 10 μm -100 μm
Kuarsa (Qz)		Sistem kristal trigonal, berwarna abu-abu terang dengan bentuk (<i>anhedral-subhedral</i>), ukuran mineral yang tampak yaitu 20 μm -50 μm
Maghemit (Mgh)		Sistem kristal isometrik, berwarna putih keabu-abuan dengan bentuk (<i>subhedral</i>), ukuran mineral yang tampak yaitu 20 μm -50 μm

Hasil analisis mikroskopis pada sampel awal bijih limonit menunjukkan bahwa terdapat mineral goetit, talk, kuarsa dan maghemit. Keberadaan mineral-mineral tersebut dapat dilihat pada pengamatan mikroskopis pada sampel bijih limonit yang diamati dibawah mikroskopis refleksi untuk mendapatkan kenampakan atau foto sampel limonit.

Hasil analisis mikroskopis pada pembesaran 100 μm seperti yang terlihat pada foto tersebut menunjukkan beberapa mineral yang terdapat dalam sampel bijih limonit. Mineral-mineral yang terkandung dalam sampel bijih limonit berdasarkan pengamatan mikroskop yaitu kuarsa (Qz), maghemit (Mgh), goetit (Gth) dan talk (Tlc). Mineral goetit memiliki persentase paling tinggi pada sampel mempunyai komposisi kimia (FeO(OH),

sistem kristal ortorombik, berwarna hitam kecoklatan dengan bentuk (*subhedral*), ukuran mineral yang tampak yaitu 50 μm -100 μm . Mineral maghemit mempunyai komposisi kimia (Fe_2O_3), sistem kristal isometrik, berwarna putih keabu-abuan dengan bentuk (*subhedral*), ukuran mineral yang tampak yaitu 20 μm -50 μm . Mineral kuarsa memiliki komposisi kimia (SiO_2), sistem kristal trigonal, berwarna abu-abu terang dengan bentuk (*anhedral-subhedral*), ukuran mineral yang tampak yaitu 20 μm -50 μm . Mineral talk mempunyai komposisi kimia $\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$, sistem kristal trigonal, berwarna abu-abu terang dengan bentuk (*anhedral-subhedral*), ukuran mineral yang tampak yaitu 20 μm -50 μm .

LAMPIRAN B
HASIL ANALISIS XRF

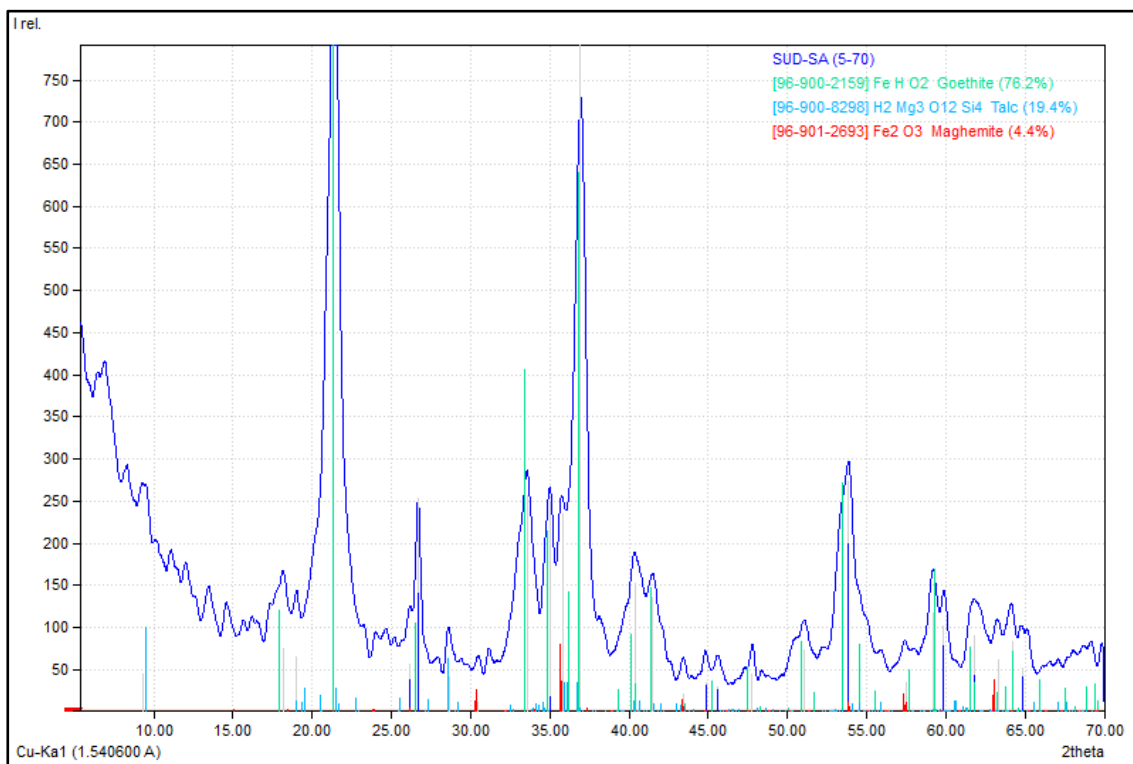


LABORATORIUM PT. BEHUM KARYAJUTAMA

Project PT. Bososi Pratama Site Bososi, Konawe Utara, Sulawesi Tenggara

Nb	Id_Sample	Assay By X-ray Epsilon 4											SMRasio
		N (%)	Fe (%)	Co (%)	MgO (%)	SiO ₂ (%)	CaO (%)	Al ₂ O ₃ (%)	P (%)	O ₂ O ₃ (%)			
1	XRF-FLS	1.311	27.810	0.092	10.400	35.940	6.420	0.660	0.001	2.770	3.456		
2	K-212-15	1.282	31.320	0.083	11.900	39.710	5.240	0.940	0.001	2.520	3.337		
3	K-150-15	1.335	26.960	0.084	8.900	34.112	4.780	0.980	0.001	2.590	3.833		
4	K-106-15	1.390	26.101	0.084	4.650	30.270	4.950	0.900	0.001	2.680	6.510		
5	K-106-5	1.274	32.860	0.083	10.240	35.690	6.680	1.050	0.001	2.480	3.485		
6	K-106-10	1.339	26.570	0.079	7.750	31.100	5.470	1.170	0.001	2.060	4.013		
7	K-106-15	1.393	26.301	0.084	4.650	30.270	4.950	0.900	0.001	2.680	6.510		
8	K-6M : 3M	1.399	26.010	0.084	4.650	30.270	4.950	0.900	0.001	2.680	6.510		
9	K-9M : 3M	1.302	27.410	0.099	6.610	30.820	3.110	0.640	0.000	2.920	4.663		
10	K-12M : 3M	1.289	31.210	0.089	9.020	33.920	2.970	1.010	0.002	2.970	3.761		
11	T-212-15	1.196	34.130	0.097	7.320	39.850	2.630	0.760	0.001	3.110	5.444		
12	T-150-15	1.187	34.680	0.092	6.790	40.120	2.940	0.670	0.001	3.030	5.909		
13	T-106-5	1.175	34.240	0.086	5.940	38.710	3.470	0.470	0.001	2.860	3.830		
14	T-106-10	1.164	35.340	0.103	5.790	41.990	2.380	0.290	0.001	2.630	3.280		
15	T-6M : 3M	1.171	35.800	0.064	7.440	42.930	3.540	1.260	0.002	1.950	4.020		
16	T-9M : 3M	1.132	34.230	0.065	6.540	39.360	3.510	1.110	0.001	2.050	4.030		
17	T-12 : 3M	1.113	35.490	0.071	7.920	38.480	2.750	1.210	0.001	2.300	3.470		

LAMPIRAN C
HASIL ANALISIS XRD



Peak list

Index	Amount (%)	Name	Formula sum
A	76.2	Goethite	Fe H O2
B	19.4	Talc	H2 Mg3 O12 Si4
C	4.4	Maghemite	Fe2 O3
	11.5	Unidentified peak area	

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	9.28	9.5222	44.70	2.87	0.3715	B
2	18.14	4.8864	74.65	22.88	1.7736	A,C
3	19.02	4.6623	64.58	14.94	1.3388	B
4	21.30	4.1681	1000.00	156.24	0.9040	A,B,C
5	26.16	3.4037	55.68	3.24	0.3362	C
6	26.70	3.3361	253.10	15.75	0.3600	A
7	28.62	3.1165	41.85	2.60	0.3600	B
8	30.48	2.9304	10.62	0.66	0.3600	C
9	33.58	2.6666	256.65	55.26	1.2457	A
10	35.02	2.5602	249.52	45.36	1.0518	A,B
11	35.84	2.5035	233.83	38.59	0.9548	A,B,C
12	36.94	2.4314	790.60	117.23	0.8579	A,B
13	40.40	2.2308	152.53	43.98	1.6683	A,B,C
14	41.48	2.1752	135.51	39.08	1.6683	A,B
15	43.40	2.0833	21.63	6.07	1.6236	A,B,C
16	44.86	2.0188	33.92	9.26	1.5789	C
17	45.60	1.9878	29.34	7.78	1.5342	B
18	47.76	1.9028	44.28	11.57	1.5118	A,C
19	51.06	1.7873	73.52	18.93	1.4894	A
20	53.86	1.7008	274.01	62.07	1.3106	B,C
21	57.50	1.6015	33.96	7.52	1.2809	A,B,C
22	59.24	1.5585	117.37	25.38	1.2513	A,B
23	59.84	1.5443	101.94	22.05	1.2513	B,C
24	61.84	1.4991	90.40	19.55	1.2513	A,B
25	63.32	1.4676	60.95	13.18	1.2513	A,B,C
26	64.18	1.4500	82.84	17.92	1.2513	A,B,C
27	64.86	1.4364	51.49	11.14	1.2513	A,B

LAMPIRAN C
PERHITUNGAN *RECOVERY*

Recovery limonit dapat dihitung dengan rumus sebagai berikut:

$$Recovery = \frac{C \times c}{F \times f} \times 100\%$$

Dimana:

C: Massa Konsentrat (gram)

c: Kadar Konsentrat (%)

F: Massa *feed* (gram)

f: Kadar *feed* (%)

1. *Recovery* berdasarkan variabel fraksi ukuran butir

a. *Recovery* Ni

Kode Sampel K-212-15

$$Recovery = \frac{C \times c}{F \times f} \times 100\%$$

$$Recovery = \frac{51,4 \times 1.282}{150 \times 1.311} \times 100\%$$

$$Recovery = \frac{65,8948}{196,65} \times 100\%$$

$$Recovery = 33,51\%$$

Kode Sampel K-150-15

$$Recovery = \frac{C \times c}{F \times f} \times 100\%$$

$$Recovery = \frac{72,3 \times 1.335}{150 \times 1.311} \times 100\%$$

$$Recovery = \frac{96,5205}{196,65} \times 100\%$$

$$Recovery = 49,08\%$$

Kode Sampel K-106-15

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{86,5 \times 1.390}{150 \times 1.311} \times 100\%$$

$$\text{Recovery} = \frac{121,0135}{196,65} \times 100\%$$

$$\text{Recovery} = 61,54\%$$

b. *Recovery* Fe

Kode Sampel K-212-15

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{51,4 \times 31,320}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{1609,848}{4171,5} \times 100\%$$

$$\text{Recovery} = 38,59\%$$

Kode Sampel K-150-15

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{72,3 \times 26,960}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{1949,2}{4171,5} \times 100\%$$

$$\text{Recovery} = 46,73\%$$

Kode Sampel K-106-15

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{86,5 \times 26,110}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{2249,865}{4171,5} \times 100\%$$

$$\text{Recovery} = 53,93\%$$

2. *Recovery* berdasarkan variabel waktu flotasi

a. *Recovery* Ni

Kode Sampel K-106-5

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{38,1 \times 1.274}{150 \times 1.311} \times 100\%$$

$$\text{Recovery} = \frac{48,5394}{196,65} \times 100\%$$

$$\text{Recovery} = 24,68\%$$

Kode Sampel K-106-10

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{71,2 \times 1.339}{150 \times 1.311} \times 100\%$$

$$\text{Recovery} = \frac{95,3368}{196,65} \times 100\%$$

$$\text{Recovery} = 48,48\%$$

Kode Sampel K-106-15

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{96,2 \times 1.393}{150 \times 1.311} \times 100\%$$

$$\text{Recovery} = \frac{134,5838}{196,65} \times 100\%$$

$$\text{Recovery} = 68,44\%$$

b. *Recovery* Fe

Kode Sampel K-106-5

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{38,1 \times 32,680}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{1245,108}{4171,5} \times 100\%$$

$$\text{Recovery} = 29,85\%$$

Kode Sampel K-106-10

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{71,2 \times 26,570}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{1891,784}{4171,5} \times 100\%$$

$$\text{Recovery} = 45,35\%$$

Kode Sampel K-106-15

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{96,2 \times 26,310}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{2424,132}{4171,5} \times 100\%$$

$$\text{Recovery} = 60,00\%$$

3. *Recovery* berdasarkan variabel dosis reagen flotasi

c. *Recovery* Ni

Kode Sampel K-6ml : 3 ml

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{93,2 \times 1,399}{150 \times 1.311} \times 100\%$$

$$\text{Recovery} = \frac{65,8948}{196,65} \times 100\%$$

$$\text{Recovery} = 66,30\%$$

Kode Sampel K-9ml : 3ml

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{60,1 \times 1.302}{150 \times 1.311} \times 100\%$$

$$\text{Recovery} = \frac{78,2505}{196,65} \times 100\%$$

$$\text{Recovery} = 39,79\%$$

Kode Sampel K-12ml : 3ml

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{25,2 \times 1.289}{150 \times 1.311} \times 100\%$$

$$\text{Recovery} = \frac{32,4828}{196,65} \times 100\%$$

$$\text{Recovery} = 16,52\%$$

d. *Recovery* Fe

Kode Sampel K-6ml : 3ml

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{93,2 \times 26,010}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{2424,132}{4171,5} \times 100\%$$

$$\text{Recovery} = 58,54\%$$

Kode Sampel K-9ml : 3ml

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{60,1 \times 27,410}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{1647,341}{4171,5} \times 100\%$$

$$\text{Recovery} = 39,49\%$$

Kode Sampel K-12ml : 3ml

$$\text{Recovery} = \frac{C \times c}{F \times f} \times 100\%$$

$$\text{Recovery} = \frac{25,2 \times 31,210}{150 \times 27,810} \times 100\%$$

$$\text{Recovery} = \frac{786,492}{4171,5} \times 100\%$$

$$\text{Recovery} = 18,85\%$$