

DAFTAR PUSTAKA

- Amalia, D. dan Aziz, M. (2011). Percobaan Pendahuluan Pembuatan Alumina Kualitas Metalurgi dari Bauksit Kalimantan Barat. *Jurnal Teknologi Mineral dan Batubara*, 7(4), 183-191.
- Arif, S. dan Refai, A. (2021). Potensi Pasir Besi Pada Material Gunung Merapi di Sungai Krasak. *Jurnal Teknominerale*, 3(2), 63-68.
- Bartier, P. M. dan Keller, C. P. (1996). *Multivariate Interpolation to Incorporate Thematic Surface Data Using Inverse Distance Weighting (IDW)*. *Computers dan Geosciences*, 22(7), 795-799.
- Ceyda, B. dan Safak, B. (2019). Application of Fourier Transform Infrared (FTIR) Spectroscopy to Analysis of Clays. *Nevşehir Bilim ve Teknoloji Dergisi*, Nevşehir Bilim ve Teknoloji Dergisi, (8)1, 37-46.
- Chang, R. (2010). *Chemistry*. New York: The McGraw-Hill Companies.
- Dahaan, S. A. (2019). *Igneous Rocks*. Iraq: Ministry of Higher Education and Scientific Research.
- Earle, S. (2015). *Physical Geology*. Canada: BCcampus Victoria, B.C.
- Fitri, D. B., Hidayat, B., Subandrio, A. S. (2017). Klasifikasi Jenis Batuan Sedimen berdasarkan Tekstur dengan Metode *Gray Level Co-Occurrence Matrix* Dan K-NN. *Jurnal Engineering*, 4(2), 1638.
- Hahn, A., Vogel, H., Ando, S., Garzanti, E., Kuhn, G., Lantzsche, H., Schuurman, J., Vogt, C., Zabel, M. (2018). *Using Fourier Transform Infrared Spectroscopy to Determine Mineral Phases in Sediments*. Belanda: Elsevier.
- Jamaluddin dan Umar, E. P. (2018). Identifikasi Kandungan Unsur Logam Batuan Menggunakan Metode XRF (*X-Ray Fluorescence*) Studi Kasus: Kabupaten Buton. *Jurnal Geoelebes*, 2(2), 47-52.
- Jamaludin, A. dan Adiantoro, D. (2012). Analisis Kerusakan *X-Ray Fluorescence* (XRF). *Pusat Teknologi Bahan Bakar Nuklir*, 5(9), 19-28.
- Johannes, F. T., Hidayat, B., Subandrio, A. S. (2018). Identifikasi Tekstur dan Warna Mineral untuk Klasifikasi Batuan Beku dengan Menggunakan Metode *Histogram of Oriented Gradient* dan *Linear Discriminant Analysis*. *Jurnal Engineering*, 5(3), 4909.

- Lawton, D. C. dan Hochstein, M. P. (1993). *Geophysical study of the Taharoa ironsand deposit, west coast, North Island, New Zealand*. New Zealand Journal of Geology and Geophysics, 36(1), 141-160.
- Masrukan dan Rosika, K. (2008). Perbandingan Hasil Analisis Bahan Bakar U-Zr dengan Menggunakan Teknik XRF Dan SSA. *Pusat Teknologi Bahan Bakar Nuklir*, 14(1), 1-48.
- Massinai, M. A. (2012). Morfotektonik dalam Mengontrol Geomorfologi DAS Lengkesse-Jenelata di Sulawesi Selatan. *IJAS*, 2(1), 6-9.
- Massinai, M. A. (2015). *Geomorfologi Tektonik*. Yogyakarta: Pustaka Ilmu.
- Massinai, M. A., Syam, M. R., Massinai, M. F. I. (2022). Characteristics of Rock Minerals of the Camba Formation. *Atlantis Press*, 5(1), 95-103.
- Panjaitan, S. (2009). Penelitian Paleomagnetik dan Gaya Berat Kaitannya dengan Pembentukan Formasi Batuan Sulawesi Selatan serta Hubungannya dengan Selat Makassar dan Kalimantan. *JSDG*, 19(5), 297-312.
- Patel, C. M., Patel, C. D., Rami, J. M., Patel, K. R. (2020). *Optical Spectroscopic Study of Natural Rock's Minerals*. Belanda: Elsevier.
- Pinto, A. H. (2018). *Portable X-Ray Fluorescence Spectrometry: Principles and Applications for Analysis of Mineralogical and Environmental Materials*. *Crimson Publisher*, 1(2), 1-6.
- Prinz, M., Harlow, G., Peters, J. (1988). *Rocks and Minerals*. New York: Simon & Schuster Inc.
- Setianto, A. dan Triandini, T. (2013). *Comparison Of Kriging And Inverse Distance Weighted (IDW) Interpolation Methods In Lineament Extraction And Analysis*. *Jurnal SE Asian Appl*, 5(1), 21-29.
- Sukamdarruni, Purnamawati, D. I., Miftahussalam, Rakhman, A. N., Maulana, F. W. (2017). *Geologi Umum Bagian Kedua*. Yogyakarta: Gadjah Mada University Press.
- Sukamdarruni. (2016). *Geologi Mineral Logam*. Yogyakarta: Gadjah Mada University Press.
- Sukamto, R dan Supriatna, S. (1982). Peta Geologi Lembar Ujungpandang, Benteng dan Sinjai, Sulawesi. Bandung: Pusat Penelitian dan Pengembangan.
- Sultoni, M. I., Hidayat, B., Subandrio, A. S. (2019). Klasifikasi Jenis Batuan Beku Melalui Citra Berwarna dengan Menggunakan Metode *Local Binary Pattern* dan *K-Nearest Neighbor*. *Jurnal Teknika*, 4(1), 10-15.

- Sumaryono dan Triyana, Y. D. (2011). Simulasi Aliran Bahan Rombakan di Gunung Bawakaraeng, Sulawesi Selatan. *Jurnal Lingkungan dan Bencana Geologi*, 2(3), 191-202.
- Suminta, S. (2003). Simulasi Pola Difraksi Sinar-X Berbagai Jenis Mineral Zeolit Alam dengan Program Rietan. *Jurnal Zeolit Indonesia*, 2(1), 46-54.
- Suseno, J. E. dan Firdausi, K. S. (2008). Rancang Bangun Spektroskopi FTIR (*Fourier Transform Infrared*) untuk Penentuan Kualitas Susu Sapi. *Jurnal Berkala Fisika*, 11(1), 23-28.
- Tantowi, A. A., Hidayat, B., Subandrio, A. S. (2018). Identifikasi Tekstur Untuk Klasifikasi Batuan Beku Dengan Metode Discrete Wavelet Transform (DWT) Dan Support Vector Machine (SVM). *Jurnal Teknika*, 3(1), 37-42.
- Tomczak, M. (1998). *Spatial Interpolation and its Uncertainty Using Automated Anisotropic Inverse Distance Weighting (IDW) - Cross-Validation/Jackknife Approach*. *Journal of Geographic Information and Decision Analysis*, 2(2), 18-30.
- Yin, Y., Yin, J., Zhang, W., Tian, H., Hu, Z., Ruan, M., Xu, H., Liu, L., Yan, X., Chen, D. (2018). *FT-IR and micro-Raman spectroscopic characterization of minerals in high-calcium coal ashes*, *Journal of The Energi Institute*, (91)1, 389-396.
- Yoo, H. E., Oh, H. J., Lee, S. Y. (2008). *Gallstone Analysis Using Fourier Transform Infrared Spectroscopy (FTIR)*. *Clin Chem Lab Med*, 46(3), 376-381.
- Yulianto, A., Bijaksana, S., Loeksmanto, W. (2003). *Comparative Study on Magnetic Characterization of Iron Sand from Several Locations in Central Java*, *Indonesian Journal of Physics*, 14(2), 63-66.
- Zhang, Y., Wan, J., Zhang, C., Cao, X. (2022). *Mos₂ And Fe₂O₃ Co-Modify G-C₃N₄ To Improve The Performance Of Photocatalytic Hydrogen Production*. *Scientific Reports*, (12)1, 3261.

LAMPIRAN

Sampel BT1



Sampel BT2



Sampel BT3



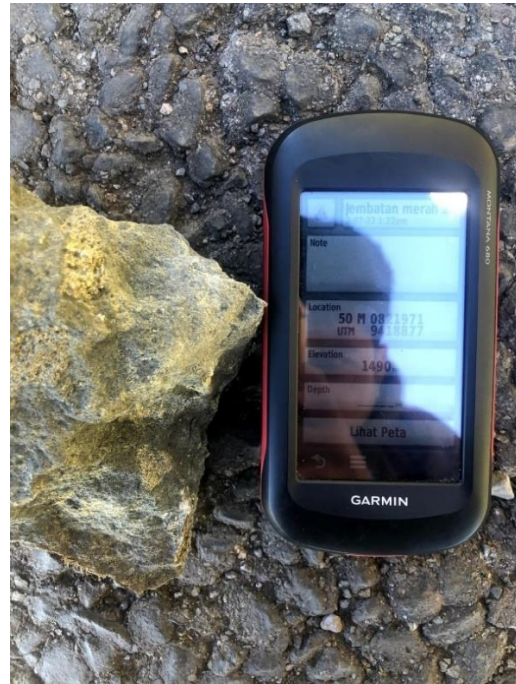
Sampel BT4



Sampel BT5



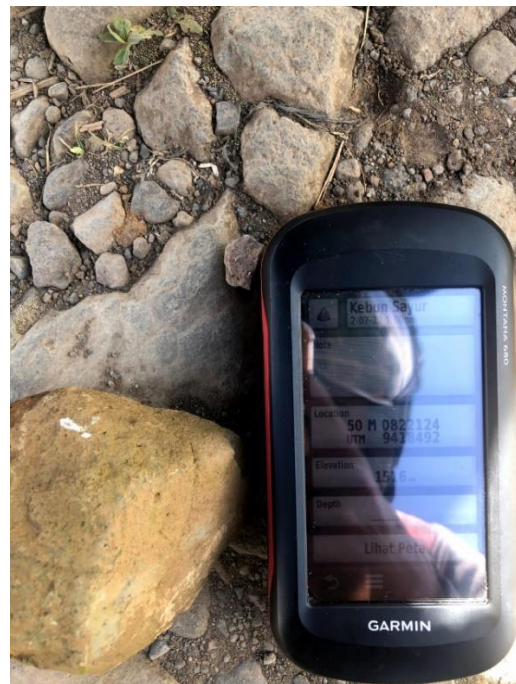
Sampel Jembatan Merah



Sampel Jalan Lembanna



Sampel Kebun Lembanna



Sampel Pos 1.1 Bawakaraeng



Sampel Pos 1 Bawakaraeng



Sampel Takapala



1. Hasil Metode XRF untuk sampel BT 1

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

KnownConc= 0 REST= 0 D/S= 0
 Sum Conc's before normalisation to 100% : 34.3 %

2. Hasil metode XRF untuk sampel BT 5

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

3. Hasil Metode XRF untuk sampel BT 3

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

KnownConc= 0

REST= 0

D/S= 0

Sum Conc's before normalisation to 100% : 39.4 %

4. Hasil XRF untuk sampel BT 4

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 m

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

KnownConc= 0

REST= 0

D/S= 0

Sum Conc's before normalisation to 100% : 39.1 %

5. Hasil metode XRF untuk sampel BT 5

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

KnownConc= 0

REST= 0

D/S= 0

Sum Conc's before normalisation to 100% : 37.7 %

6. Hasil metode XRF untuk sampel Jembatan Merah

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 %

Dil/Sample = 0

Viewed Mass = 1000.00 mg

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
Sn	0.0187	0.0019
Rh	0.0139	0.0027

7. Hasil metode XRF untuk sampel Kebun 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 = 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

KnownConc= 0

REST= 0

D/S= 0

Sum Conc's before normalisation to 100% : 38.1 %

8. Hasil metode XRF untuk sampel POS 1.1 BWK

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

KnownConc= 0 REST= 0 D/S= 0
 Sum Conc's before normalisation to 100% : 42.6 %

9. Hasil metode XRF untuk sampel POS 1 BWK

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

KnownConc= 0 REST= 0 D/S= 0
 Sum Conc's before normalisation to 100% : 32.5 %

10. Hasil metode XRF untuk sampel 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

KnownConc= 0

REST= 0

D/S= 0

Sum Conc's before normalisation to 100% : 42.9 %

11. Hasil metode XRF untuk sampel Jalan 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

KnownConc= 0 REST= 0 D/S= 0
 Sum Conc's before normalisation to 100% : 41.7 %
