DAFTAR PUSTAKA

Anggayana, K. (2002). Genesa Batubara. Departemen Teknik Pertambangan, FIKTM. Institut Teknologi Bandung.

Arif, I. (2014). Batubara Indonesia. Institut Teknologi Bandung: Bandung

American Standard and Testing Materials. (1979). ASTM D 3177-02: *Test Methods for Total Sulfur in the Analysis Sample of Coal and Coke*. ASTM Book of Standards; ASTM: West Conshohocken, PA, 2006; Vol. 05.06.

Brower, Peter. (2003).Theory of XFR. PANalytical BV.Edition 3rd.The Netherlands.

Cheney, Brandon. (2005). Introduction to Scanning Electron Microscopy.The Materials Engineering Department. San Jose.

Elliot, M.A dan YOHE, G.R. (1981). *The Coal Industry and Coal Research and Development in Prospective* Kentucky Geological Survey, University of Kentucky. 2012

Firth, Band Dale, L., (1998). Trace Element in Coal Preparation. CSIRO Division of Coal and Energy Technology. Vol 19, pp. 297-317.

Finkelman, R.B., Orem, W., Castranova, V., Tatu, C.A., Belkin, H.E., Zheng, B., Lerch, H.B., Maharaj, S.V., Bates, A.L., (2002). Health impacts of coal and coal use: possible solutions. Int. J. Coal Geol. 50, 425–443.

Gluskoter, H., (1975). Mineral Matter and Trace Elements in Coal. Environ Earth Sci, Vol 10, pp. 01-41

Loye,H. (2013). *X-ray Difraction How It Works.* University of South Carolina. Caroline.

*Mesh*ram, B.K., Sinha, M.K, Sahu, M.K., and Pandey B.D., (2014). Demineralization of low grade coal. Environ Earth Sci, Vol 41, pp. 745-756.

Nasir S, Kucerik J, Mahmood Z. A study on the washability of the Azad Kashmir(Pakistan) coalfield. Fuel Process Technol (2012). 99:75–81.

Pujobroto, A., (1997). Organic petrology and geochemistry of Bukit Asam coal, South Sumatra, Indonesia. Unpublished Ph.D. thesis, University of Wollongong, Australia, 397 hal.

Subba, V., and Gouricharan, T. (2016) *Coal Processing and Utilization*. RC Press, Taylor & Francis Group. London. p 160, 162, 171.

Sanwani, E., Ibrahim, A., Sule D., dan Handayani, I. (1998) *pencucian Batubara*, Ciloto: Diklat Pencucian Batubara, p. II-36-II-41, V-1- V-7.

Speight J. G, (2005), Handbook of Coal Analysis, A Series Monographs on Analytical Chemistry and Its Applications, Series Editor J.D. Winefordner, Volume 166 by John Wiley & Sons, Inc. All rights reserved, Published by John Wiley & Sons, Inc., Hoboken, New Jersey, Published simultaneously in Canada

Sukandarrumidi. (1995). Batubara dan Gambut. Universitas Gajah Mada: Yogyakarta

Sutardji. (2009). Buku Ajar Sumber Daya Alam. Semarang. Jurusan Geografi FIS: UNNES

Swaine, D.J. (1990). *Trace elements in coal.* Butterworth, London

Syarbaini, (2000). *Teknologi ICP-MS Aplikasinya untuk Studi Radiaktivitas Lingkungan*. Pusat Pengembangan dan Pengelolaan Limbah Radioaktif. Batan

Tambunan, D. (2012). *Pengaruh Penggunaan Float-Sink Process dan Roasting Reduction Terhadap Transformasi Fasa Bijih Nikel.* UI. Indonesia

Taylor, G.H., TeichmuellerM.., DavisA., Diessel, C, F. K., Littje, R., and Robert ,P. (1998). *Organic petrologi.* Gebrueder Borntraeger, Berlin, Stuttgart, 704 p.

Ward, R, C., (2016). Analysis origin and significance of mineral matter in coal:An update review. International Journal of Coal Geology, Vol 165, pp. 1-27

Warren, 8.E., (1969) . *X-Ray Diffraction*, Addittionwesley pub : Messach$ssetfs.

Wills Barry A, Napier-Munn Tim. Dense medium separation (DMS). 7thed. Wills' Mineral Processing Technology; (2005). p. 246–66.

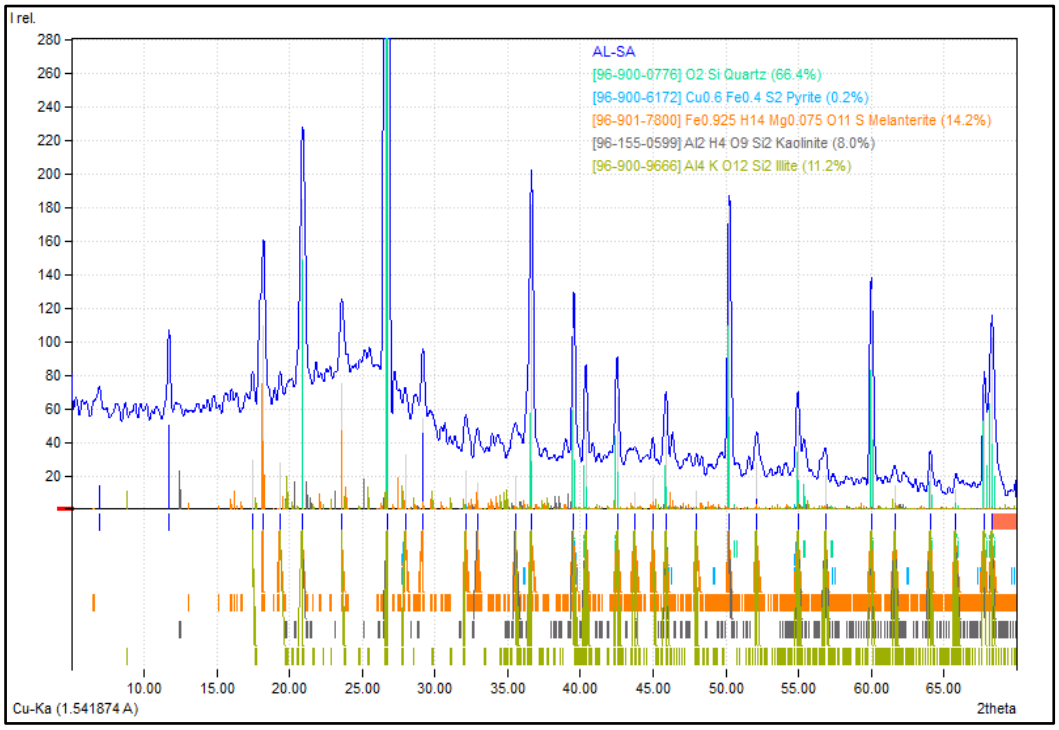
Wood, G. H., Kehn, T. M., Carter, M. D., & Culbertson, W. C. (1983). Coal Resource Classification System of the U.S. Geological Survey. U.S. Geological Survey.

Xiu-xiang T, Yi-jun C, Jing L, Kai-yi S, Jin-yan L, Fan M. Studies oncharacteristics and flotation of a hard-to-float high-ash fine coal. ProcediaEarth Planet Sci (2009).:799–806.

LAMPIRAN

Lampiran 1

Data peak dari analisis XRD



Peak list

No.	2theta [°]	d [Å]	I/I0 (peak height)	Counts (peak area)	FWHM	Matched
1	6.93	12.7557	13.74	3.79	0.2699	
2	11.71	7.5574	50.15	4.10	0.0800	
3	17.45	5.0822	29.01	9.49	0.3200	E
4	18.21	4.8718	109.47	26.86	0.2400	C
5	19.35	4.5873	28.03	15.16	0.5292	C,E
6	20.87	4.2565	184.87	60.48	0.3200	A,C,D,E
7	23.55	3.7778	74.64	21.37	0.2800	C,D,E
8	26.71	3.3376	1000.00	245.38	0.2400	A,D,E
9	27.95	3.1923	32.78	20.11	0.6000	B,C,E
10	29.15	3.0636	54.18	11.08	0.2000	C
11	32.13	2.7859	23.21	7.60	0.3205	B,C,E
12	32.95	2.7184	15.44	3.94	0.2494	C,D
13	35.55	2.5253	19.50	11.96	0.6000	C,D,E
14	36.65	2.4520	182.06	14.89	0.0800	A,C,E
15	39.55	2.2787	107.97	22.08	0.2000	A,B,C,D,E
16	40.37	2.2343	58.53	7.18	0.1200	A,C,D,E
17	42.53	2.1257	66.89	16.41	0.2400	A,C,D,E
18	43.75	2.0692	9.76	8.97	0.8993	C,D,E
19	44.97	2.0158	18.59	4.73	0.2490	C,E
20	45.87	1.9784	46.63	9.53	0.2000	A,B,C,D,E
21	47.99	1.8958	10.81	3.87	0.3498	C,D,E
22	50.23	1.8164	180.79	22.18	0.1200	A,C,D
23	52.13	1.7546	27.81	11.32	0.3982	C,E
24	54.95	1.6710	49.77	12.21	0.2400	A,B,C,D,E
	56.85	1.6196	20.51	8.56	0.4081	C,D,E
	59.99	1.5421	131.49	21.51	0.1600	A,B,C,D,E
	61.63	1.5049	13.64	6.00	0.4304	C,D,E
	64.07	1.4534	26.70	7.08	0.2595	A,C,D,E
	65.83	1.4187	11.32	3.22	0.2782	A,C,D,E
	67.77	1.3828	68.74	11.24	0.1600	A,C,D,E
	68.31	1.3732	102.47	16.76	0.1600	A,C,D,E

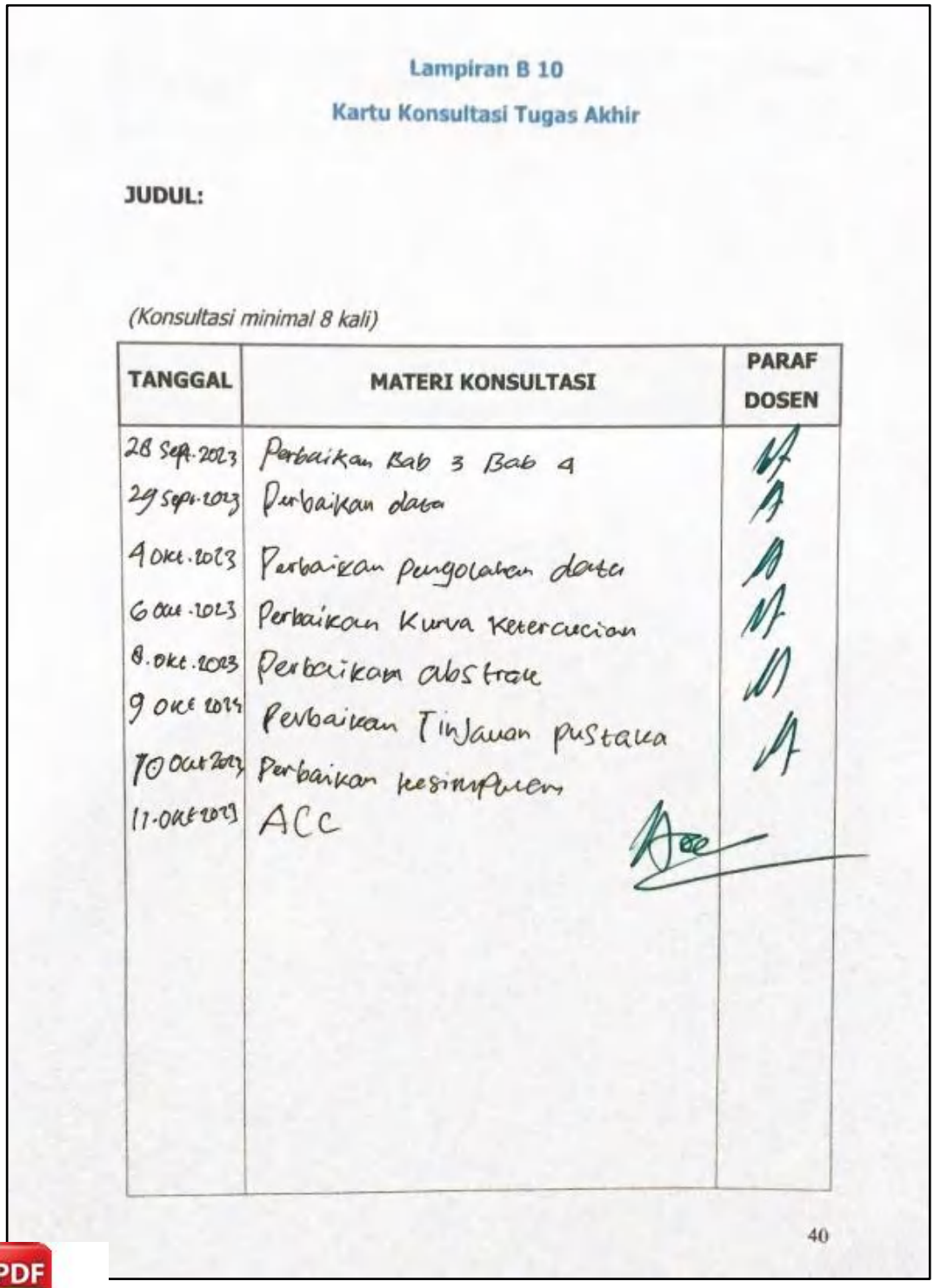
Lampiran 2

Perhitungan volume larutan

a. Untuk densitas 1,3 ➢ $C_{V1} \times \rho_1 + (1 - C_{V1}) \times \rho_2 = \rho_{12}$ ➢ $C_{V1} \times 0,7 + (1 - C_{V1}) \times 1,6 = 1,3$ ➢ $(0,7 - 1,6)C_{V1} + 1,6 = 1,3$ ➢ $1,6 - 0,9C_{V1} = 1,3$ ➢ $0,9\ C_{V1} = 1,6 - 1,3$ ➢ $C_{V1} = 0,3/0,9$ ➢ $C_{V1} = 0,333$	Maka volume yang diperlukan adalah: ➢ $1 - C_{V1} = C_{V2} \longrightarrow 1 - 0,333 = 0,667$ ➢ *V* larutan 1 = 0,333 × 400 = 133 ml ➢ *V* larutan 2 = 0,667 × 400 = 267 ml
b. Untuk densitas 1,4 ➢ $C_{V1} \times \rho_1 + (1 - C_{V1}) \times \rho_2 = \rho_{12}$ ➢ $C_{V1} \times 0,7 + (1 - C_{V1}) \times 1,6 = 1,4$ ➢ $(0,7 - 1,6)C_{V1} + 1,6 = 1,4$ ➢ $1,6 - 0,9C_{V1} = 1,4$ ➢ $0,9\ C_{V1} = 1,6 - 1,4$ ➢ $C_{V1} = 0,2/0,9$ ➢ $C_{V1} = 0,222$	Maka volume yang diperlukan adalah: ➢ $1 - C_{V1} = C_{V2} \longrightarrow 1 - 0,222 = 0,778$ ➢ *V* larutan 1 = 0,222 × 400 = 89 ml ➢ *V* larutan 2 = 0,778 × 400 = 311 ml
c. Untuk densitas 1,5 ➢ $C_{V1} \times \rho_1 + (1 - C_{V1}) \times \rho_2 = \rho_{12}$ ➢ $C_{V1} \times 0,7 + (1 - C_{V1}) \times 1,6 = 1,5$ ➢ $(0,7 - 1,6)C_{V1} + 1,6 = 1,5$ ➢ $1,6 - 0,9C_{V1} = 1,5$ ➢ $0,9\ C_{V1} = 1,6 - 1,5$ ➢ $C_{V1} = 0,1/0,9$ ➢ $C_{V1} = 0,111$	Maka volume yang diperlukan adalah: ➢ $1 - C_{V1} = C_{V2} \longrightarrow 1 - 0,111 = 0,889$ ➢ *V* larutan 1 = 0,111 × 400 = 44 ml ➢ *V* larutan 2 = 0,889 × 400 = 356 ml
d. Untuk densitas 1,6	➢ *V* larutan 1 = 0 ml ➢ *V* larutan 2 = 400 ml

Lampiran 3

Lembar asistensi



Lampiran B 10

Kartu Konsultasi Tugas Akhir

JUDUL:

(Konsultasi minimal 8 kali)

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
28 Sept. 2023	Perbaikan Bab 3 Bab 4	
29 Sept. 2023	Perbaikan data	
4 Okt. 2023	Perbaikan pengolahan data	
6 Okt. 2023	Perbaikan Kurva Kelengkungan	
8. Okt. 2023	Perbaikan abstrak	
9 Okt 2023	Perbaikan Tinjauan pustaka	
10 Okt 2023	Perbaikan kesimpulan	
11 Okt 2023	ACC	

40