

DAFTAR PUSTAKA

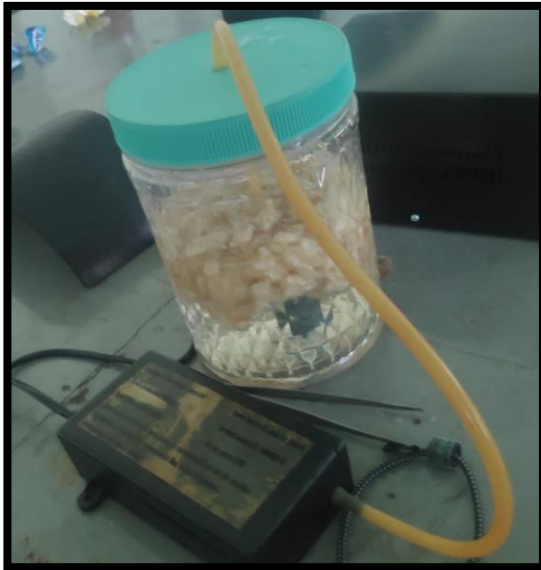
- Abdullah, M.A., Rahmah, A.U., Man, Z., 2010. Physicochemical and sorption characteristics of Malaysian *Ceiba pentandra* (L.) Gaertn. as a natural oil sorbent. *J. Hazard. Mater.* 177 (1–3), 683–691.
- Avinc, O., Eren, H. A., & Uysal, P. (2012). Ozone applications for after-clearing of disperse-dyed poly (lactic acid) fibres. *Coloration Technology*, 128(6), 479-487.
- Bradley, R., Clackson, I., & Sykes, D. 1993. UV ozone modification of wool fibre surfaces. *Applied surface science*, 72(2), 143-147.
- Brondani RPV, Gaiotto FA, Missiaggia AA, Kirst M, Gribel R, & Grattapaglia D. 2003. Microsatellite Markers for *Ceiba pentandra* (Bombacaceae), an Endangered Tree Species of the Amazon Forest. *Molecular Ecology Notes* 3(2).
- Chaiarekij, S., Apirakchaiskul, A., Suvarnakich, K., 867 Kiatkamjornwong, S., 2012. Kapok I: characteristics of kapok 868 fiber as a potential pulp source for papermaking. *Bioresources* 869 7 (1), 475–488.
- Chung, B.Y., Cho, J.Y., Lee, M.H., Wi, S.G., Kim, J.H., Kim, J.S., et al., 2008. Adsorption of heavy metal ions onto chemically oxidized *Ceiba pentandra* (L.) Gaertn. (kapok) fibers. *J. Appl. Biol. Chem.* 51 (1), 28–35.
- Chung, B.Y., Hyeong, M.H., An, B.C., Lee, E.M., Lee, S.S., Kim, J.-H., 880 et al., 2009. Flame-resistant kapok fiber manufactured using 881 gamma ray. *Radiat. Phys. Chem.* 78 (7–8), 513–515.
- Dick CW, Hardy OJ, Jones FA, & Petit RJ. 2008. Spatial Scales of Pollen and Seed Mediated Gene Flow in Tropical Rain Forests Trees. *Tropical Plant Biol* 1.
- Eren, H. A., Avinc, O., Erişmiş, B., & Eren, S. (2014). Ultrasound-assisted ozone bleaching of cotton. *Cellulose*, 21(6), 4643-4658.
- Fan, H.S., Yu, X.L., Long, Y.H., Zhang, X.Y., Xiang, H.F., Duan, C.T., et al., 2012. Preparation of kapok–polyacrylonitrile core–shell 895 composite microtube and its application as gold nanoparticles carrier. *Appl. Surf. Sci.* (7), 2876–2882.
- Fengel, D, & G. Wegener. 1995. *Kayu: Kimia, Ultrastruktur, Reaksi-reaksi* (Terjemahan). Yogyakarta: Gadjah Mada Univ. Peress.
- Fengel, D., Przyklenk, M., 1986. Studies on kapok. 2. Chemical investigation. *Holzforschung* 40 (6), 325–330.

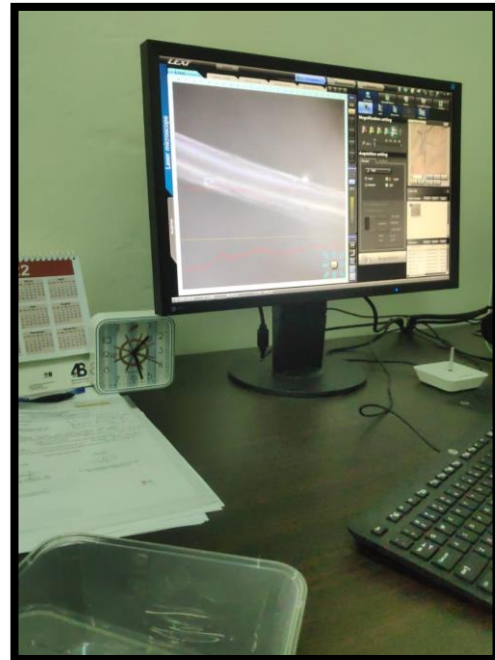
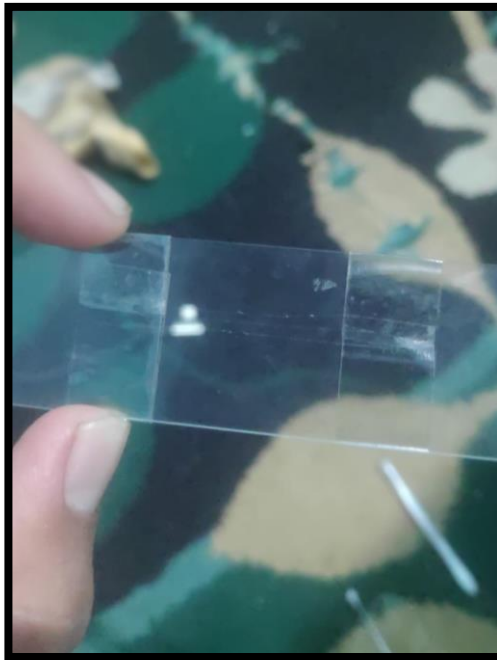
- Heru Suryanto, 2016. Review Serat Alam. Komposisi, Struktur, Dan Sifat Mekanis. Researchgate.
- Hoigne, J., & Bader, H. 1976. The role of hydroxyl radical reactions in ozonation processes in aqueous solutions. *Water Research*, 10, 377–386.
- Hong, J., Liu, M.C., , Mo, J.Y., Wu, P.Y., Chen, D., 2012. Wearability test and analysis of kapok-containing fabrics. *J. Text. Res.* 33 (8), 46–49.
- Huang, X.F., Lim, T.T., 2006. Performance and mechanism of a hydrophobic–oleophilic kapok filter for oil/water separation. *Desalination* (1–3), 295–307.
- Kang, P.H., Jeun, J.P., Chung, B.Y., Kim, J.S., Nho, Y.C., 2007. Preparation and characterization of glycidyl methacrylate (GNU) grafted kapok fiber by using radiation induced grafting technique. *J. Ind. Eng. Chem.* 13, 956–958.
- Kang, G., Zhang, Y., Ni, Y., & Van Heiningen, A. R. P. (1995). Influence of lignins on the degradation of cellulose during ozone treatment. *Journal of Wood Chemistry and Technology*, 15(4), 413–430.
- Krik, R. E, & Othmer, D. F. (1952). *Encyclopedia of chemical technology. 2nd ed, Jhon Wilery and Sons Inc*, New York.
- Kobayashi, Y., Matsuo, R., Nishiyama, M., 1977. Method for adsorption of oils. Japanese Patent, 52138081.
- Kollman, F. F. P., Cote, W. A., 1984. *Principle of Wood Science and Tehnology. Vol I: Solid wood.* 52-56.
- Liu, Y., Wang, J.T., Zheng, Y.A., Wang, A.Q., 2012. Adsorption of methylene blue by kapok fiber treated by sodium chlorite optimized with response surface methodology. *Chem. Eng. J.* 184, 248–255.
- Miller, F.A., C.L. Silva, T.R. Brandao. 2013. A review on ozone-based treatments for fruit and vegetables preservation. *Journal Food Engineering Reviews*. Vol. 5(2): 77-106.
- Mwaikambo, L., Y., 2006, Review Of The History, Properties And Application Of Plant Fibres, Department of Engineering Materials, College of Engineering and Technology, Dar es Salaam, Tanzania.
- Novia, Lubis, A.M. dan Jufianto, F. 2014. Pengaruh Konsentrasi Dan Waktu Perendaman Ammonia Terhadap Konversi Bioetanol Dari Jerami Dengan Metode Soaking In Aqueous Ammonia (SAA). Jurusan Teknik Kimia Universitas Sriwijaya: Inderalaya.

- Octavia, S. (2008) Efektivitas kombinasi proses perendaman dengan amoniak dan asam pada pengolahan awal biomassa sebagai bahan baku pembuatan bioetanol, Thesis, Institut Teknologi Bandung, Bandung.
- P. M. Pinazzi and F. Foucher, "Potential of Ozone to Enable Low Load Operations of a Gasoline Compression Ignition (GCI) Engine," 2017, doi: 10.4271/2017-01-0746.
- Prachayawarakorn, J., Chaiwatyothin, S., Mueangta, S., Hanchana, A., 2013. Effect of jute and kapok fibers on properties of thermoplastic cassava starch composites. *Mater. Des.* 47, 309–315.
- Prahady, S., Linda. S., Intan, R. U., Muhammad, R., 2020. Pengaruh Penambahan Selulosa Dari Serat Kapuk Dan Crosslink Agent Terhadap Sifat Absorpsi Dan Rasio Swelling Biopolimer Superabsorben. *Jurnal Integritas Proses.* 9(2): 9-14.
- Reddy, G.V., Naidu, S.V., Rani, T.S., 2009. A study on hardness and flexural properties of kapok/sisal composites. *J. Reinf. Plast. Comp.* 28 (16), 2035–2044.
- Rengasamy, R.S., Das, D., Karan, C.P., 2011. Study of oil sorption behavior of filled and structured fiber assemblies made from polypropylene, kapok and milkweed fibers. *J. Hazard. Mater.* 186 (1), 526–532.
- Sukadarti, S., Kholisoh, S., Prasetyo, H., Santoso, W., & Mursini, T. (2010). Produksi Gula Dari Sabut Kelapa Menggunakan Jamur *Trichoderma reesei*. *Prosiding Seminar Nasional Teknik Kimia, Universitas Veteran*, ISSN1693-4393.
- Syamsul, A. S., Tarkono, Sugiyanto. 2013. Analisa Perilaku Mekanik Kompositserat Kapuk Randu Menggunakanmatrik *Polyester*. *Jurnal FEMA.* 1(2): 65-72.
- Tang, A.M., Hu, T.T., Su, X., 2012. The influence of pretreatment on kapok fiber/CdS nanocomposites morphology structure by AFM. *Funct. Mater.* 43 (24), 3437–3441.
- Tehranibagha, A. R., Mahmoodi, N. M., & Menger, F. M. (2010). Degradation of a persistent organic dye from colored textile wastewater by ozonation. *Desalination*, 260(1), 34-38.
- Tillman, A. D., H. Hartadi, S. Reksohardiprodjo, S. Prawirokusumo dan S. Lebdoesoekojo. 1989. *Ilmu Makanan Ternak Dasar*. Gadjah Mada University Press. Yogyakarta.
- Tye, Y.Y., Lee, K.T., Abdullah, W.N.W., Leh, C.P., 2012. Potential of *Ceiba pentandra* (L.) Gaertn. (kapok fiber) as a resource for second generation

- bioethanol: Effect of various simple pretreatment methods on sugar production. *Bioresour. Technol.* 116, 536–539.
- Wang, J.T., Zheng, Y.A., Wang, A.Q., 2012. Effect of kapok fiber treated with various solvents on oil absorbency. *Ind. Crop. Prod.* 40, 178–184.
- Xiang, H.F., Wang, D., Liu, H.C., Zhao, N., Xu, J., 2013. Investigation on sound absorption properties of kapok fibers. *Chin. J. Polym. Sci.* 31 (3), 521–529.
- Xiao, H., Yu, W.D., Shi, M.W., 2005. Structures and performances of the kapok fiber. *J. Text. Res.* 26 (4), 4–6.
- Zhang, X.Y., Duan, C.T., Zhao, N., Xiao, H., Shi, M.W., Zhang, X.L., et al., 2010. Facile fabrication of large scale microtubes with a natural template-kapok fiber. *Chin. J. Polym. Sci.* 28 (5), 841–847.
- Zhang, X.Y., Fu, W.Y., Duan, C.T., Xiao, H., Shi, M.W., Zhao, N., et al., 2013. Superhydrophobicity determines the buoyancy performance of kapok fiber aggregates. *Appl. Surf. Sci.* 266, 225–229.
- Zhou, 2011. Antioxidant Activity of Papaya Seed Extract. *J. Molecules* 16, 6179–6192.

LAMPIRAN





	Berat Awal	Durasi	Berat Akhir	Selisih		Berat Awal	Durasi	Berat Akhir	Selisih
	10,544	30 menit	9,826	0,718		30,744	30 menit	29,524	1,22
	10,541		9,833	0,708		30,747		29,528	1,219
	10,546		9,834	0,712		30,746		29,531	1,215
Average	10,5436667		9,831	0,713		30,7456667		29,528	1,218
STD	0,0020548		0,00355903	0,0041		0,001247219		0,0028674	0,00216
	10,212	60 menit	9,49	0,722		30,335	60 menit	28,945	1,39
	10,214		9,494	0,72		30,336		28,947	1,389
	10,217		9,489	0,728		30,338		28,951	1,387
Average	10,214		9,491	0,7233		30,33633333		28,948	1,389
STD	0,0020548		0,00216025	0,0034		0,001247219		0,0024944	0,001247
	10,68	90 menit	9,948	0,732		30,848	90 menit	29,407	1,441
	10,691		9,946	0,745		30,851		29,409	1,442
	10,688		9,945	0,743		30,843		29,41	1,433
Average	10,686		9,946	0,74		30,84733333		29,409	1,439
STD	0,0046428		0,00124722	0,0057		0,003299832		0,0012472	0,004028

Durasi	Peak (cm⁻¹)	Intensitas (%)	Jenis Ikatan	Senyawa
Non Treatment	3341,62	76,19	O-H <i>stretching</i>	Kelompok O-H
	2909,28	90,36	C-H <i>stretching</i>	selulosa
	1735,08	81,79	C=O <i>stretching</i>	hemiselulosa
	1646,75	83,41	C=C <i>stretching</i>	lignin
	1240,27	75,40	C-O <i>stretching</i>	hemiselulosa dan lignin
	1039,90	46,21	C-O <i>stretching</i>	hemiselulosa
30 menit (10 gram)	3339,46	74,55	O-H <i>stretching</i>	Kelompok O-H
	2911,44	88,81	C-H <i>stretching</i>	selulosa
	1732,93	84,00	C=O <i>stretching</i>	hemiselulosa
	1638,13	86,31	C=C <i>stretching</i>	lignin
	1240,27	73,15	C-O <i>stretching</i>	hemiselulosa dan lignin
	1038,46	43,01	C-O <i>stretching</i>	hemiselulosa
60 menit (10 gram)	3341,62	77,66	O-H <i>stretching</i>	Kelompok O-H
	2910,00	90,10	C-H <i>stretching</i>	selulosa
	1734,37	83,36	C=O <i>stretching</i>	hemiselulosa
	1646,03	84,68	C=C <i>stretching</i>	lignin
	1239,55	76,24	C-O <i>stretching</i>	hemiselulosa dan lignin
	1039,90	48,54	C-O <i>stretching</i>	hemiselulosa
90 menit (10 gram)	3340,18	73,91	O-H <i>stretching</i>	Kelompok O-H
	2914,31	88,91	C-H <i>stretching</i>	selulosa
	1735,80	78,38	C=O <i>stretching</i>	hemiselulosa
	1648,90	77,74	C=C <i>stretching</i>	lignin
	1240,99	72,54	C-O <i>stretching</i>	hemiselulosa dan lignin
	1039,18	40,56	C-O <i>stretching</i>	hemiselulosa
30 menit (30 gram)	3341,62	87,84	O-H <i>stretching</i>	Kelompok O-H
	2911,44	94,90	C-H <i>stretching</i>	selulosa
	1735,08	88,63	C=O <i>stretching</i>	hemiselulosa
	1648,90	87,01	C=C <i>stretching</i>	lignin
	1241,71	88,81	C-O <i>stretching</i>	hemiselulosa dan lignin
	1039,90	70,77	C-O <i>stretching</i>	hemiselulosa



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Tanggal terima sampel : 4 April 2023
Jumlah sampel : 2
Jenis sampel : Kapuk
Asal sampel : Lab. Metalurgi Fisik FTUH
Jenis Kegiatan : Penelitian S1

DATA HASIL PENGUJIAN

No	Kode Sampel	Parameter Uji		
		Kadar Lignin (%)	Kadar Selulosa (%)	Kadar Hemiselulosa (%)
1	30	9,970	47,01	29,59
2	60	8,910	47,85	30,21

Makassar, 8 Mei 2022
Pranata Lab. Pendidikan (PLP)

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No : 05.UM.Sub/Lab.Air/V/2023
Pemilik sampel : Nur Muhammad Brilliant (Teknik UNHAS)
Tanggal terima sampel : 10 Mei 2023
Jumlah sampel : 2
Jenis sampel : Kapuk
Asal sampel : Lab. Metalurgi Fisik FTUH
Jenis Kegiatan : Penelitian S1

DATA HASIL PENGUJIAN

No	Kode Sampel	Parameter Uji		
		Kadar Lignin (%)	Kadar Selulosa (%)	Kadar Hemiselulosa (%)
1	30/30	10,7	46,15	29,71
2	90	7,02	51,69	31,19

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Makassar, 19 Mei 2023
Kepala Lab.



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