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DAFTAR PUSTAKA

Abe, Y., dan Krimm, S., 1972, Normal vibrations of crystalline polyglycine I. *Biopolymers*, 11, 1817–1839.

Ahmad, M, dan Benjakul, S., 2011, Characteristics of gelatin from the skin of unicorn leatherjacket Aluterus monoceros, as influenced by acid pretreatment and extraction time, *Food Hydrocolloids*, 25, 3, 381–388.

Ahmaruzzaman, M, 2010, A review on the utilization of fly ash. *Progress in Energy and Combustion Science*, *36*(3), 327–363.

Aigueperse, J., Zhang, X., dan Hu, S., 2005, Fluorine Compounds, Inorganic, in *Ullmann's Encyclopedia of Industrial Chemistry*, Wiley-VCH, Weinheim,

Alleavitch, J, dan Turner, W,A., 1989, *Gelatin*, *Ullmann's Encyclopedia of Industrial Chemistry*, Vol, A, 12, Chapter 1, 310, VCH Publishers, Weinheim.

Anbia, M., dan Parvin, Z., 2011, Desulfurization of fuels by means of a nanoporous carbon adsorbent, *Chem. Eng. Res. Design*, *89*6, 641–647.

Andreuccetti, C., Carvalho, R. a., dan Grosso, C. R. F., 2009, Effect of hydrophobic plasticizers on functional properties of gelatin-based films. *Food. Res. Int.*, *42*8, 1113–1121.

Ania, C.O. Bandosz, T.J., An, T., 2005, Importance of structural and chemical heterogeneity of activated carbon surfaces for adsorption of dibenzothiophene, *Langmuir*, 21 7752–7759.

Anonim , 2012, *Gelatin Handbook*, Gelatin Manufacturers Institute of America, Inc., New York, www.GMIA.com [diakses 15 oktober 2013]

Anonim, 2010, EPA-Heavy-Duty Engine and Vehicle Standards and Highway Fuel Sulfur Control Requirements, Regulatory Announcement, EPA420-F-00-057, December 2000.

Anonim, 2012, *Standard Methods for the Sampling and Testing of Gelatins*, Gelatin Manufacturers Institute of America, Inc., New York, NY.

Aoki, H., Taguchi, T., Saito, H., Kobayashi, H., Kataoka, K., dan Tanaka, J., 2004, Rheological evaluation of gelatin gels prepared with a citric acid derivative as a novel cross-linker. *Mat. Sci. Eng., C*, *24*6-8, 787–790.

Arnesen, J, A., dan Gildberg, A., 2007, Extraction and characterisation of gelatine from Atlantic salmon Salmo salar, skin, *Biores. Tech.*, 98, 53–5.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Asgari, G., Seid, A., Bagher, S., dan Ramavandi, B., 2013, Investigation on the pyrolysis of cow bone as a catalyst for ozone aqueous decomposition : Kinetic approach. *J. Anal. Appl. Pyrolysis*, *99*, 149–154.

Asghar, A., dan Henrickson, R. L., 1982, Chemical, biochemical, functional, and nutritional characteristics o 187 :n food system, *Adv. Food. Res*, 28,1, 232–372.

Ayotte, P; Hébert, M; Marchand, P., 2005, "Why is hydrofluoric acid a weak acid?". *J. Chem. Phys.* 123 18: 184501.

Bai, S., Urabe, S., Okaue, Y., & Yokoyama, T., 2009, Acceleration effect of sulfate ion on the dissolution of amorphous silica. *Journal of colloid and interface science*, *331*(2), 551–4.

Barata-Rodrigues P.M., Mays, T.J., Moggridge, G.D., 2003, Structured carbon adsorbents from clay, zeolite and mesoporous aluminosilicate templates. *Carbon*, 41:2231–46.

Beck, J.C., Vartuli, J.S., Roth, W.J. Loenowicz, M.E., C,T, Kresge, K,D, Schimitt, C,T., 1992, A New Family of Mesoporous Molecular sieves Prepared with Liquid Crystal Templates, *J. Am. Chem. Soc.*, 114, 2,10834-1094.

Berreta, M., 2009, *Nanostructured mesoporous material obtained by template synthesis and controlled shape replica*, University of Milano, Biocca Department of Material Science, Ph,D Thesis, pp 23-56

Bo, K., Einicke, W., Klepel, O., 2005, Templated synthesis of mesoporous carbon from sucrose- the way from the silica pore filling to the carbon material. *Carbon*, 43,1918–1925.

Boehm, H,-P., 1994, Some aspects of the surface chemistry of carbon blacks, *Polymer*, 53, 4595–4603.

Boral, S., Gupta, A. N., dan Bohidar, H. B., 2006, Swelling and de-swelling kinetics of gelatin hydrogels in ethanol-water marginal solvent. *Int. J. Bio. Macromol.*, *39*4-5, 240–9.

Brodsky, B., Werkmeister, J. A., & Ramshaw, J. A. M., 2005, *Collagens and Gelatins* (III., pp. 119–128). Elsevier.

Bu, J., Loh, G., Gwie, C., Gunawan, Dewiyanti, S.,Tasrif, Michael, B. A., 2011, Desulfurization of diesel fuels by selective adsorption on activated carbons: Competitive adsorption of polycyclic aromatic sulfur heterocycles and polycyclic aromatic hydrocarbons, *Chem. Eng. J.*, 1661, 3, 207–217.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Bulteel D, Garcia-Diaz E, Vernet C, Zanni H, 2002, Alkali-silica reaction: a method to quantify the reaction degree. *Cem. Concrete. Res.*, 32, 199–206.

Cal, M. P., Strickler, B. W., Lizzio, A. A., dan Gangwal, S. K., 2000, High temperature hydrogen sulfide adsorption on activated carbon II . Effects of gas temperature , gas pressure and sorbent regeneration, *Carbon*, *38*, 1767–1774.

Cao, L., Strickler, B., Kruk, M., 2010, Synthesis of large-pore SBA-15 silica from tetramethyl orthosilicate using triisopropylbenzene as micelle expander. *Colloid. Surf. A: Physicochemical and Engineering Aspects*, *357*1-3, 91–96.

Carey, J, and Hanley, V., 1990, *Protein Structure*, Biophysical Society On-line Textbook, 609, 5, 23–33.

Casoli, A., Isca, C., De Iasio, S., Botti, L., Iannuccelli, S., Residori, L., Ruggiero, D., 2014, Analytical evaluation, by GC/MS, of gelatine removal from ancient papers induced by wet cleaning: A comparison between immersion treatment and application of rigid Gellan gum gel. *Micro.Chem. J.*, *117*, 61–67.

Cataldo F., 2007, On the action of ozone on gelatin, *Int. J. Biol. Macromol*. 41, 210–216.

Chaplin, M, 2006, Gelatin, Water structure and behavior, http://w/lsbu,ac,uk [Diakses 15 Oktober 2013].

Cho, S.-H., Jahncke, M. L., Chin, K.-B., dan Eun, J.-B., 2006, The effect of processing conditions on the properties of gelatin from skate Raja Kenojei skins. *Food Hydrocolloids*, *20*6, 810–816.

Chys, P., Gielens,C., Filip, M., 2011, FTIR 2D correlation spectroscopy of α1 and α2 fractions of an alkali-pretreated gelatin.pdf. *BBA - Proteins and Proteomics*, *1814*, 318–325.

Clarke, M.A., Edye, L.A., Eggleston, G., 1997, Sucrose decomposition in aqueous solution, and losses in sugar manufacture and refining. *Ad. Carbohyd. Chem. Biochem.*, 52, 441–70.

Coradin, T., Bah, S., Livage, J., 2004, Gelatine/silicate interactions : from nanoparticles to composite gels, *Polymer* , 35, 8, 53–58

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Corma, A., 1997, From Microporous to Mesoporous Molecular Sieve Materials and Their Use in Catalysis. *Chem. Rev.*, *97*6, 2373–2420

Croome, R.J., Clegg, E.G., 1965, *Photographic gelatin*. The Focal Press, New York.

Dai, S., Sheng, Wang, X., Xing, W., 2012, *Paten mesoporous carbon Material*, 12–51, US 8,114,510 B2

Dai, W. Y.P. Zhou, S.N. Li, W. Li, W. Su, Y. Sun, L. Zhou, 2006, Thiophene capture with complex adsorbent SBA-15/Cu I, *Ind. Eng. Chem.* Res. 45 7892–7896

Darmstadt, H, and Ryoo, R., 2008, *Adsorption by Carbons*, 2nd edn, Academic Press., 455–477.

Darmstadt, H. and Ryoo, R., 2002, Surface chemistry of ordered mesoporous carbons, *Micropor. Mesopor. Mat.*, 40, 2673–2683.

Darmstadt, H., Roy, C., Kaliaguine, S., Kim, T., dan Ryoo, R., 2003, Surface and pore structures of CMK-5 ordered mesoporous carbons studied by nitrogen adsorption and surface spectroscopic methods, *Carbon*, 335–338.

Deng, S., Chu, W., Xu, H., Shi, L., dan Huang, L., 2008, Effects of impregnation sequence on the microstructure and performances of Cu-Co based catalysts for the synthesis of higher alcohols. *J. Nat. Gas Chem.*, *17*(4), 369–373

Despetis, F., Bengourna, N., Lartigue, B., Spagnol, S., dan Olivi-tran, N, 2012, Three-dimensional reconstruction of aerogels from TEM images. *Journal of Non-Crystalline Solids*, *358*9, 1180–1184.

Djabourov, M., Lechaire, J., dan Gaill, F., 1993, Strucutre and rheology of gelatin and collagen gels. *Biorheology*, 30, 191–205

Do, D. D., Nguyen, C., dan Do, H. D., 2001, Characterization of micro-mesoporous carbon media, *Carbon, 188*, 51–71.

Eid, M., Abdel-Ghaffar, M. dan Dessouki, M, 2009, Effect of maleic acid content on the thermal stability, swelling behaviour and network structure of gelatin-based hydrogels prepared by gamma irradiation. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, *267*1, 91–98.

El-Bassyouni, G. T., Guirguis, O. W., dan Abdel-Fattah, W. I., 2013, Morphological and macrostructural studies of dog cranial bone

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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demineralized with different acids. *Current Applied Physics*, *13*5, 864–874.

Enterría, M, Suárez-García, F., Martínez-Alonso, A., Tascón, J,M,D., 2013, One-pot endo/exotemplating of hierarchical micro-mesoporous carbons, *Carbon*, 54, ,365–377.

Enterría, M., Suárez-García, F., Martínez-Alonso, a., dan Tascón, J. M. D. , 2012, Synthesis of ordered micro–mesoporous carbons by activation of SBA-15 carbon replicas. *Micropor. Mesopor. Mat.,151*, 390–396.

Ettelaie, R., Dickinson, E., Du, Z., dan Murray, B. S., 2003, Disproportionation of clustered protein-stabilized bubbles at planar air – water interfaces, *263 Biomaterials* , 47–58.

Fertani-Gmati, M., Brahim, K., Khattech, I., dan Jemal, M., 2014, Thermochemistry and kinetics of silica dissolution in NaOH solutions: Effect of the alkali concentration. *Thermochimica Acta, 594*, 58–67.

Finch, C.A., and Jobling, A., 1977, *The Science and Technology of Gelatin*, 3eds, 258-260, Academic Press, London.

Fischer, G., Cao, X., Cox, N., & Francis, M., 2005, The FTIR spectra of glycine and glycylglycine zwitterions isolated in alkali halide matrices. *J. Chem. Phys.*, 313, 39–49.

Friess, W., dan Lee, G, 1996, Basic thermoanalytical studies of insoluble collagen matrices. *Biomat.*, 17, 2289–2294.

Friischl, F., Marr, R., Universittit, T., dan Nussbaumer, M., 1991, Degreasing of Protein-Hydrolysate by SC-CO$. *The Journal of Supercritical Fluids*, *4*, 250–253

Fuertes AB, Nevskaia D., 2003, Template synthesis of mesoporous carbons from mesostructured silica by vapor deposition polymerisation. *J. Mater Chem;13:1843–6.*

Fuertes, A.B., Nevskaia D.M.,Latia, E.R., 2003, Control of mesoporous structure of carbons synthesised using a mesostructured silica as template. *Micropor. Mesopor. Mat.*,62:177–90.

Gangwal, S,K., 2011, *Desulfurization for Fuel Cells*, Elsevier, Available at: http://dx.doi.org/10.1016/B978-0-444-53563-4,10011-2.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Gao, X. X., Cyr, M., Multon, S., dan Sellier, 2013, A comparison of methods for chemical assessment of reactive silica in concrete aggregates by selective dissolution. *Cement and Concrete Composites*, *37*, 82–94.

Garcia, T. R., Murillo, D. Cazorla-Amoros, A.M. Mastral, A. Linares-Solano, 2004, Role of the activated carbon surface chemistry in the adsorption of phenanthrene, *Carbon* 42 1683.

Ge, J., Shi, J., Chen, L., 2008, Gelatin-based carbon microspheres with a foam-like core / solid shell structure. *Carbon*, 474, 1192–1195.

Giménez, B., Gómez-Guillén, M. C., dan Montero, P, 2005, The role of salt washing of fish skins in chemical and rheological properties of gelatin extracted. *Food Hydrocolloids*, *19*6, 951–957.

Giménez, B., Turnay, J., Lizarbe, M. A., Montero, P., dan Gómez-Guillén, M. C., 2005, Use of lactic acid for extraction of fish skin gelatin, *Food Hydrocolloids*, 196, 941-950.

Gómez, G.M.C., Giménez, B., López-Caballero, M,E., Montero, M,P., 2011, Functional and bioactive properties of collagen and gelatin from alternative sources: A review, *Food Hydrocolloids*, 258, 8 ,1813–1827.

Gomez, S, V, Selestina, G., and Vanja., Piriz-Almeida F, Duran-Valle C., Pastor, 2003, Collagen vs Gelatine-Based Biomaterials and Their Biocompatibility: Review and Perspectives, *Biomaterials Applications for Nanomedicine* 86 4, 211–263.

Gomez-Serrano V, Piriz-Almeida F, Duran-Valle C, Pastor- Villegas J. , 1999, Formation of oxygen structures by air activation. A study by FT-IR spectroscopy, *Carbon* ,37:1517–28.

Gordon, P. W., Brooker, A. D. M., Chew, Y. M. J., Wilson, D. I., dan York, D. W., 2010, Studies into the swelling of gelatine films using a scanning fluid dynamic gauge. *Food. Bio. Process.*, *88*4, 357–364.

Gorgieva, S, and Kokol, V., 2011, Collagen- vs, Gelatine-Based Biomaterials and Their Biocompatibility : Review and Perspectives, In R, Pignatello, ed, *Biomaterials Applications for Nanomedicine*, In Tech, 17–52

Govindasamy, C., Won-jin, S., dan Ahn, W., 2009, Synthesis of mesoporous materials SBA-15 and CMK-3 from fly ash and their application for CO 2 adsorption, *Micropor. Mesopor. Mat.*, 545–551.

Greenwood, Norman N., Earnshaw, Alan, 1984, *Chemistry of the Elements*. Oxford: Pergamon Press. p. 921. ISBN 0-08-022057-6.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Gregg, S. J. and Sing, K. S. W., 1982, *Adsorption, Surface Area, and Porosity* (2nd edn.). Academic Press.

Guilminot, E., Lemoine, G., Pelé, C., Poisson, L., Surbled, M., Louvet, I., Mevellec, J.-Y., 2014. Re-treatment of whale bones – How to extract degraded fats from weakened bones?, *Journal of Cultural Heritage, 152*, 128–135.

Guo, R., Guo, J., Yu, F., dan Dianchen, D., 2013, Microporous and Mesoporous Materials Synthesis and surface functional group modifications of ordered mesoporous carbons for resorcinol removal. *Micropor. Mesopor. Mat., 175*, 141–146.

Hampsey, J. E., Hu, Q., Wu, Z., Rice, L., Pang, J., dan Lu, Y., 2005, Templating synthesis of ordered mesoporous carbon particles, *Carbon*, *43*, 2977–2982.

Hashim, D. M., Man, Y. B. C., Norakasha, R., Shuhaimi, M., Salmah, Y., & Syahariza, Z. A., 2010, Potential use of Fourier transform infrared spectroscopy for differentiation of bovine and porcine gelatins. *Food Chemistry*, *118*, 3, 856–860.

Han S, Lee KT, Oh SM, Hyeon T., 2003, The effect of silica template structure on the pore structure of mesoporous carbons. *Carbon*;41:1049–56.

Han, E., Wishart, Y., Zheng, A., 2014, Comparison of three methods to regenerate activated carbon saturated by diesel fuels, Can. *J. Chem. Eng.* 92, 884– 891

Han, X., Lin, H., dan Zheng, Y., 2014, Regeneration methods to restore carbon adsorptive capacity of dibenzothiophene and neutral nitrogen heteroaromatic compounds. *Chem. Eng. J.*, *243*, 315–325.

Harris, D. C., 2010, *Quantitative Chemical Analysis* 8th international ed.. New York: W. H. Freeman. pp. AP14. ISBN 1429263091.

Haug, I.J., Draget, K.I., Smidsrod, O., 2004, Physical and rheological properties of fish gelatin compared to mammalian gelatin. *Food Hydrocolloid*. 18, 203–213.

He, S., Yin, T., Zhen, J., & Xu, X., 2015, Food Hydrocolloids Cross-linking of gelatin by chlorine dioxide steam. *Food hydrocolloids*, *45*, 63–71.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Hensen, E, J,M., 2000, *Hydrodesulfurization Catalysis and Mechanism of Supported Transition Metal Sulfides door*, Technische Universiteit Eindhoven, Proefschrift, ISBN 90-386-2871-4.

Hernández-Maldonado A.J., and Yang R.T., 2003, Desulfurization of commercial liquid fuels by selective adsorption via complexation with Cu I-Y Zeolite, *Ind. Eng. Chem. Res*. 42 3103–3110.

Hernandez-Maldonado A.J., Yang, R.T., 2004, New sorbents for desulfurization of diesel fuels via complexation, *Carbon*, 50 791–801.

Ho, Y.-S, 2004, Citation review of Lagergren kinetic rate equation on adsorption reactions. *Akadémiai Kiadó, Budapest and Kluwer Academic Publishers, Dordrecht Scientometrics*, *5*91, 171–177.

Hodgkins, A. E., Sen, R. P., dan Anderson, T., 2004, HRTEM Imaging Of Mesoporous Phase Transition From Hexagonal P6mm To Cubic La3d Symmetry. *Studies in Surface Science and Catalysis*, *154*, 400–407.

Holzer, D., 1996, *Gelatin production*. US patent: 5,484,888.

Horikawa, T., Do, D. D., dan Nicholson, D., 2011, Capillary condensation of adsorbates in porous materials Amount adsorbed, *Carbon*, *169*, 40–58.

Hsieh, C.T. Yang., H.S. Teng, T., 2000, Influence of mesopore volume and adsorbate size on adsorption capacities of activated carbons in aqueous solutions, *Carbon* 38 863–869

Hsu, C,H., Lin., H,P., Tang, C,Y, Lin C,Y., 2007, Synthesis of mesoporous silica and mesoporous carbon using gelatin as organic template, *Mesostructured Materials* 32, 6, 385–388.

Hu, Z. M.P. Srinivasan, Y. Ni, 2000, Preparation of mesoporous high-surface-area acti- vated carbon, *Adv. Mater*. 12 62–65.

Huang, L., Kruk, M., Hou, Y., 2012, Journal of Colloid and Interface Science Synthesis of ultra-large-pore FDU-12 silica using ethylbenzene as micelle expander, *Journal of Colloid And Interface Science*, 3651,6, 137–142.

Hudec, P., Smieskova, A., Zidek, A., Schneider, B., S., 2002, Determination of Microporous Structure of Zeolites by t-Plot Method - State-of-the-Art. *Studies in Surface Science and Catalysis*, *23*, 1587–1594.

Huo, Q., 2011, Porous Materials. *Modern Inorganic Synthetic Chemistry* pp. 339–373.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Ignat, M, Van Oers, C,J., Vernimmen, J., Mertens, M., S, Potgieter-Vermaak, V., Meynen, E, Popovici P, Cool., 2010, Textural property tuning of ordered mesoporous carbon obtained by glycerol conversion using SBA-15 silica as template, *Carbon*, 48,2, 1609 –1618.

Irvine, R.L., 1998, *Process for desulfurizing gasoline and hydrocarbon feedstock*, US patent 5730860

Jackson, M., Choo, L., Watson, P. H., Halliday, W. C., dan Mantsch,H. H., 1995, Beware of connective tissue proteins: Assignment and implications of collagen absorptions in infrared spectra of human tissues. *Biochima et Biophysica Acta*, 1270, 1–6.

Jamilah, B., dan Harvinder, K. G., 2002, Properties of gelatins from skins of fish-black tilapia Oreochromis mossambicus and red tilapia Oreochromis nilotica. *Food Chemistry*, 77, 81-84.

Jaroniec, M., 2005, Synthesis and adsorption properties of FDU-1 silica with carbon deposited in mesopores, *Micropor. Mesopor. Mat.*, 21, 489–496.

Jiang, Z.X. Y. Liu, X.P. Sun, F.P. Tian, F.X. Sun, C.H. Liang, W.S. You, C.R. Han, C. Li,. 2003, Activated carbons chemically modified by concentrated H_2SO_4 for the adsorption of the pollutants from wastewater and dibenzothiophene from fuel oils, *Langmuir* 19 731–736.

Jiménez, V., Sánchez, P., Luís, J., Romero, A., 2010, Effect of the nature the carbon precursor on the physico-chemical characteristics of the resulting activated carbon materials. *Mat. Chem. Phys.*, 124, 223–233.

Johansson, E. M., Córdoba, J. M., dan Odén, M., 2009, Synthesis and characterization of large mesoporous silica SBA-15 sheets with ordered accessible 18 nm pores. *Materials Letters*, *6*324-25, 2129–2131.

Joo, S,H., Jun, S., Ryoo, R., 2001, Synthesis of ordered mesoporous carbon molecular sieves CMK-1, *Micro.and Meso. Mat.*, 44-45, 153–158.

Joo, S.H., Ryoo, R., Kruk, M., Jaroniec, M., 2002, Evidence for general nature of pore interconnectivity in 2-dimensional hexagonal mesoporous silicas prepared using block copolymer templates. *J .Phys. Chem* B .106:4640–6.

Jun, S., Joo, S,H., Ryoo, R., 2000, Synthesis of new, nanoporous carbon with hexagonally ordered mesostructure, *J. Am. Chern. Soc.*, 122, 10712-13.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Jun, S., Joo, S.H., Ryoo, R., 2000, Synthesis of ordered mesoporous carbon by hard template synthesis and controlled shape replica, *Micropor. Mesopor. Mat.*, 44-45, 4, 153–158.

Jun, S., Joo, S.H., Ryoo, R., Kruk, M., Jaroniec, M., Liu, Z., 2002, Synthesis of new, nanoporous carbon with hexagonally ordered mesostructure. *J. Am. Chem. Soc.*, 2000;122:10712–3.

Kamegawa, K., Masaya, K., Keiko, N., Hiroshi, Y., Yoshio, A., Hisayoshi, Y., 2005, Production of micro- and mesoporous carbons by pyrolysis of the lithium salts of aromatic acids, *Micro.and Meso. Mat.*, 872, 118–123.

Kaneda M.T., Tsubakiyama, A., Carlsson, Y., Sakamoto, T., Ohsuna, O., Terasaki, S. H. Joo and Ryoo, R., 2002, New Family of Ordered carbon prepared with partially disordered MCM-48 silica, *J. Phys. Chem., B*, 106 2002, 1256-1266.

Kang, S., Jian-chun, J., Dan-dan, C., 2011. Preparation of activated carbon with highly developed mesoporous structure from Camellia oleifera shell through water vapor gasification and phosphoric acid modification. *Biomass and Bioenergy*, 358, 3643–3647.

Khare, G.P. *Desulfurization and novel sorbents*, US patent 6346190 2002.

Khiari, Z, Khiari, Z., Rico, D., Martin, D., Ana, B., Catherine, B.R., 2013, Comparison between gelatines extracted from mackerel and blue whiting bones after different pre-treatments, *Food Chemistry*, 41 , 207–228.

Khodakov, A. Y., Zholobenko, V. L., Bechara, R., dan Durand, D., 2005, Impact of aqueous impregnation on the long-range ordering and mesoporous structure of cobalt containing MCM-41 and SBA-15 materials, *Micro.and Meso. Mat., 79*, 29–39.

Kim, J.H. X.L. Ma, A.N. Zhou, Song, C., 2006, Ultra-deep desulfurization and denitro- genation of diesel fuel by selective adsorption over three different adsorbents: a study on adsorptive selectivity and mechanism, *Catal. Today* 111 74–83.

Kim, S.S., Pinnavaia T.J., Han, C.D., 2001, A low cost route to hexagonal mesostructured carbon molecular sieves. *Chem. Commun.*, 23:2418–9.

Kim, X, Ma, A, Zhou, C., 2007, Synthesis of activated carbon and its application for adsorption of dibenzothiophene, *Fuel Processing Technology*, 106, 376–384.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Kirk, F., and Othmer, D, F., 1995, *Encyclopedia of Chemical Technology*, 3ed., John Willey and Sons, Inc., New York.

Kittiphattanabawon, P., Benjakul, S., Visessanguan, W., Nagai ., T., Tanaka, M., 2005, Characterisation of acid-soluble collagen from skin and bone of bigeye snapper Priacanthus tayenus, *Food Chemistry*, 893,8 , 363–372.

Kleitz F., S, H, Choi and R, Ryoo, 2003, Mesoporous Molecular carbon from KIT as silica template, *Chem. Commun*, 2136-2143.

Klepko, V. V, dan Yu.B.M., 1995, Kinetic and equilibrium swelling of gelatine gel. *Polymer*, *36*26, 5057–5059.

Klimova, T., Esquivel, A., Reyes, J., Rubio, M., dan Bokhimi, X., 2006, Factorial design for the evaluation of the influence of synthesis parameters upon the textural and structural properties of SBA-15 ordered materials, *Micro.and Meso. Mat., 93*, 331–343.

Kluson, P., dan Scaife, S. J., 2001, Pore Size Distribution Analysis of Structure Different Microporous Carbons – Theoretical Evaluation Based on Density Functional Theory and Nitrogen and Argon Experimental Adsorption Isotherms at 77 K, *Micropor. Mesopor. Mat., 15*(3), 117–125.

Koli, J.M., Subrata, B., Binay B.N., Surendra, B.P., Ashif U.P., Venkateshwarlu, G., 2012, Functional characteristics of gelatin extracted from skin and bone of Tiger-toothed croaker Otolithes ruber, and Pink perch Nemipterus japonicus, *Food and Bioproducts Processing*, 903, 555–562.

Kołodziejska, I., Skierka, E., Sadowska, M., Kołodziejski, W., dan Niecikowska, C., 2008, Effect of extracting time and temperature on yield of gelatin from different fish offal. *Food Chemistry*, *107*2, 700–706.

Kresge, C. T., Vartuli, J. C., Roth, W. J., dan Leonowicz, M. E., 2004, The Discovery of ExxonMobil ' s M41S Family of Mesoporous Molecular Sieves. *Studies in Surface Science and Catalysis*, *148*5, 53–63.

Kresge, J.S., Beck, J.C., Vartuli, W.J., Roth, M.E., Leonowicz, C.T., Kresge, K.D., Schmitt, C.T.W., Chu, D.H., Olson, E.W., Sheppard, S.B., McCullen, J.B., Higgins, J.L., Schlenker., 1992, Ordered Mesoporous Molecular Sieves Synthesized by a Liquid–Crystal Template Mechanisme, *Nature*, 359, 710-712.

Kruk, M., Jun, S.H., Joo, R., Ryoo, R, , M, Jaroniec, Z, Liu, T, Ohsuna, O, Terasaki., 2003a, Synthesis of ordered mesoporous carbon molecular sieves CMK-3, *Micro.and Meso. Mat.*, 4-15, 145–151.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Kruk, M., Jaroniec, M., Ryoo, R., and Joo, S,H., 2000, Characterization of ordered mesoporous carbons synthesized using MCM-48 silicas as templates, *J.Phys. Chem., B,* 104, 7960-8.

Kruk, M.,Jaroniec, M., Kim, T,W., and Ryoo, R., 2003b, Synthesis and characterization of hexagonally ordered carbon nanopipes, *Chem.Mater*. 15, 2815-23.

Kumagai, H., Ishizawa, Y., Toida., 2008, Synthesis of activated carbon and its application for adsorption of dibenzothiophene, *Fuel Processing Technology,* 106, ,376–384.

Kyotani, T., Nagai, T., Inoue, S., and Tomita, A., 1997, Preparation of mesoporous carbon from organic polymer/silica nanocomposite, *Chem, Mater*, 9,609-615.

Lagant, P., Vergoten, G., Loucheux-Lefebvre, M. H., & Fleury, G., 1983, Ramanspectra and normal vibrations of dipeptides I. Glycylglycine. Biopolymers, 22,1267-1273.

Ladavos, A. K., Katsoulidis, A. P., Iosifidis, A., Triantafyllidis, K. S., Pinnavaia, T. J., dan Pomonis, P. J., 2012, The BET equation, the inflection points of N_2 adsorption isotherms and the estimation of specific surface area of porous solids. *Micro.and Meso. Mat.,, 151,* 126–133.

Lagergren, S., 1898, About the theory of so-called adsorption of soluble substances. K. Sven. *Vetenskapsakad. Handlingar Band*, 24, 1-39.

Lander, S. L., Brits, D., dan Hosie, M., 2014, The effects of freezing, boiling and degreasing on the microstructure of bone. *Homo : internationale Zeitschrift für die vergleichende Forschung am Menschen*, *65*2, 131–42.

Lebeau, B., Parmentier, J., Soulard, M., Fowler, C., Zana, R., Vix-Guterl, C., dan Patarin, J., 2005, Organized mesoporous solids: mechanism of formation and use as host materials to prepare carbon and oxide replicas. *Comptes Rendus Chimie*, *8*(3-4), 597–607

Lee, J., Kim, J., Hyeon, T., 2003, A facile synthesis of bimodal mesoporous silica and its replication for bimodal mesoporous carbon. *Chem. Commun* 10:1138–9.

Lee, S. G., Fourcade, J., Latta, R., dan Solomon, A. A., 2008, Polymer impregnation and pyrolysis process development for improving thermal conductivity of SiCp / SiC – PIP matrix fabrication, *Carbon*, *83*, 713–719.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Lelieveld, H.L.M., Mostert, M.A., Holah, J., White, B., 2003, *Hygiene in Food Processing*, first ed. Woodhead Publishing, UK, p. 239.

Li, K., Jiangtian,Y., Guo, I., Limin, T., Shi, J., 2010, Stepwise in situ synthesis and characterization of metallophthalocyanines at mesoporous matrix SBA-15 composites, *Phys. Chem. Chemic. Phys : PCCP*, 1219, 5109–14.

Li, Q., Qi, Y., dan Gao, C., 2015, Chemical regeneration of spent powdered activated carbon used in decolorization of sodium salicylate for the pharmaceutical industry. *Journal of Cleaner Production*, *86*, 424–431.

Li, R., Bauerle, P., Schmelzer, M., dan Roth, S., 1993, Two-dimensional arrangement of thiophene: highly ordered structures prepared by the Langmuir-Blodgett technique. *Thin Solid Films*, *229*, 255–259.

Liang, F.Y., Lu, M. Eileen Birch, T.C., Keener, Z.F., 2006, Liu, Determination of poly- cyclic aromatic sulfur heterocycles in diesel particulate matter and diesel fuel by gas chromatography with atomic emission detection, *J. Chromat.* A 1114,145–153.

Lim, W. C., Srinivasakannan, C., dan Balasubramanian, N., 2010, Pyrolysis Activation of palm shells by phosphoric acid impregnation for high yielding activated carbon. *J. Anal. Appl. Pyrolysis*, *88*(2), 181–188

Lin, H., Chun-Yi, C.-C., dan Chih-Yuan, Tang, C.-Y. L., 2006, Synthesis of p6mm hexagonal mesoporous carbons and silicas using Pluronic F127 – PF resin polymer blends. *Micro.and Meso. Mat.*, *93*, 344–348.

Lin, L.-H., dan Chen, K.-M., 2006, Preparation and surface activity of gelatin derivative surfactants. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, *272*, 1-9

Liou, T. 2010. Development of mesoporous structure and high adsorption capacity of biomass-based activated carbon by phosphoric acid and zinc chloride activation. *Chemical Engineering Journal*, *158*2, 129–142.

Liu, D., Wei, G., Li, T., Hu, J., Lu, N., Regenstein, J. M., dan Zhou, P., 2015, Effects of alkaline pretreatments and acid extraction conditions on the acid-soluble collagen from grass carp Ctenopharyngodon idella skin. *Food chemistry*, *172*, 836–43.

Liu, H. Y., Han, J., dan Guo, S. D., 2009, Characteristics of the gelatin extracted from Channel Catfish Ictalurus Punctatus head bones. *LWT - Food Science and Technology*, *42*2, 540–544.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Liu, R., Meng, Y., Gu, D., Tu, B., dan Zhao, D., 2007, Ordered mesoporous polymers and polymer-silica anocomposites, *Micropor. Mesopor. Mat.*, 1721–1733.

Liu, X., dan Ma, P. X., 2009, Biomaterials Phase separation , pore structure , and properties of nanofibrous gelatin scaffolds. *Biomaterials*, *30*25, 4094–4103.

Liu, X., Khinast, J. G., dan Glasser, B. J., 2008, A parametric investigation of impregnation and drying of supported catalysts, *Journal of Analytical and Applied Pyrolysis*, 4517–4530.

Long, D, Górka,J., C,Fenning, M, Jaroniec, 2009, Effect of template and precursor chemistry on pore architectures of triblock copolymer-templated mesoporous carbons, *Micropor. Mesopor. Mat.*, 3, 58–66

Lu, A.-H. Wen-Cui, L., Wolfgang, S; Wolfgang, K., Schüth., 2004, Easy synthesis of an ordered mesoporous carbon with a hexagonally packed tubular structure, *Carbon*, 4214., ,2939–2948.

Lund, K., Muroyama, N., dan Terasaki, O., 2010, Accidental extinction in powder XRD intensity of porous crystals: Mesoporous carbon crystal CMK-5 and layered zeolite-nanosheets. *Micropor. Mesopor. Mat., 128*1-3, 71–77.

Ma, X. Velu, S., Kim, J.H., Song, C., 2005, Deep desulfurization of gasoline by selective adsorption over solid adsorbents and impact of analytical methods on ppm-level sulfur quantification for fuel cell applications, *Applied Catalysis B: Environmental*, 561-2,137–147.

Ma, X.L. K.Y. Sakanishi, I. Mochida, 1994, Hydrodesulfurization reactivities of various sulfur-compounds in diesel fuel, *Ind. Eng. Chem. Res*. 33 218–222.

Maiyalagan, T. M., Jaroniec, Z., Liu, T., Ohsuna, O., Terasaki, 2012, Three-dimensional cubic ordered mesoporous carbon CMK-8, as highly efficient stable Pd electro-catalyst support for formic acid oxidation, *Journal of Power Sources*, 211, 147–153.

Malaika, A. M. and Kozlowski, 2011, Modification of activated carbon with different agents and catalytic performance of products obtained in the process of ethylbenzene dehydrogenation coupled with nitrobenzene hydrogenation, *Chem. Eng. J.* 171, 1348–1355.

Marsh, H., And Rand, B., 1970, Adverse Criticism of the Use of the t-Plot to Characterize Microporosity. *Journal of Colloid And Interface Science*, *3*31, 478–479.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Martina, A., Tasco, J. M. D., dan Enterrıa, M., 2012, Avoiding structure degradation during activation of ordered mesoporous carbons, *Micro.and Meso. Mat.*, *4*, 1476–1483.

Mbileni, C. N., Prinsloo, F. F., dan Witcomb, M. J, 2006, Synthesis of mesoporous carbon supports via liquid impregnation of polystyrene onto a MCM-48 silica template. *Carbon*, *44*, 1476–1483.

McDonald R.S., 1990, Surface functionality of amorphous silica by infrared spectroscopy, *Journal of Physical Chemistry* 62 1168–1178.

Meador, M. A., Gaier, J. R., dan Sola, F, 2010, Reinforced Thermoplastic Polyimide with gelatin, *Polymer 2*3, 669–676.

Monavari, S., Galbe, M., dan Zacchi, G., 2009, Bioresource Technology Impact of impregnation time and chip size on sugar yield in pretreatment of softwood for ethanol production. *Bioresource Technology*, *100*24, 6312–6316.

Mondragon, G., Peña-rodriguez, C. dan González, A., Eceiza, A., Arbelaiz, A., 2015, Bionanocomposites based on gelatin matrix and nanocellulose. *European Polymer Journal*, 62, 1–9.

Moraes, M. C. D. and Cunha, R. L, 2013, Gelation property and water holding, *European Polymer Journal*, 3, 11–16.

Morrow B.A., A.J. McFarlan, 1991, Infrared and gravimetric study of an aerosil and a precipitated silica using chemical and H/D exchange probes, *Langmuir* 7, 1695–1701.

Mossner, S.G., Lopez, M. J., Alda, D., Sander, L.C., Lee, M.L.,Wise, S. A., 1999, Gas chromatographic retention behavior of polycyclic aromatic sulfur heterocyclic compounds , dibenzothiophene , naphtho [b] thiophenes , benzo [b] naphthothiophenes and alkyl- substituted derivatives, on stationary phases of different selectivity, *Fuel Processing Technology*, 841, 207–228.

Muyonga, J H., Cole, C.G.B; Doudu, K., 2007, Food Chemistry Fourier transform infrared FTIR spectroscopic study of acid soluble collagen and gelatin from skins and bones of young and adult Nile perch Lates niloticus . *Food Chemistry*, *86*, 325–332.

Muyonga, J.H., Cole, C.G., Duodu, K., 2004a, Extraction and physico-chemical characterisation of Nile perch Lates niloticus, skin and bone gelatin, *Food Hydrocolloids*, 184., ,581–592.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Muyonga, J.H., Cole, C.G., Duodu, K., 2004b, Food Chemistry Fourier transform infrared FTIR , spectroscopic study of acid soluble collagen and gelatin from skins and bones of young and adult Nile perch Lates niloticus, *Bioresource technology*, 86, 5 , 325–332.

Muzic, M., Sertic-bionda, K., Gomzi, Z., Podolski, S., dan Telen, S., 2009, Chemical Engineering Research and Design Study of diesel fuel desulfurization by adsorption. *Chemical Engineering Research and Design*, *88*4, 487–495.

Nagai, T., Suzuki, N., 2000, Isolation of collagen from fish waste material–skin, bone and fins. *Food. Chem*. 68 (3), 277–281.

Nagarajan, M., Benjakul, S., Prodpran, T., dan Songtipya, P., 2012, Food Hydrocolloids Characteristics and functional properties of gelatin from splendid squid Loligo formosana skin as affected by extraction temperatures. *Food hydrocolloids*, *29*2, 389–397.

Nejad, F., N., Shams, E., Amini, M. K., dan Bennett, J. C., 2013, Ordered mesoporous carbon CMK-5 as a potential sorbent for fuel desulfurization: Application to the removal of dibenzothiophene and comparison with CMK-3. *Micro.Meso. Mat.*, *168*, 239–246.

Nejad, F.N., Shams, E., Amini, M,K., 2013a, Synthesis of magnetic mesoporous carbon and its application for adsorption of dibenzothiophene, *Fuel Processing Technology*, 106, 376–384.

Nelson, D.L and Cox, M.M., 2010, *Principles of biochemistry*, 4ed., Available at: www,ehfreeman,com [di akses 10 oktober 2013]

Nguyen, T.H., H.H. Cho, D.L. Poster, W.P., 2007, Ball, Evidence for a pore-filling mechanism in the adsorption of aromatic hydrocarbons to a natural wood char, *Environ. Sci. Technol.* 41, 1212–1217.

Nishihara H., Y. Fukura, K. Inde, K. Tsuji, M. Takeuchi, T. Kyotani, 2008, Carbon-coated mesoporous silica with hydrophobicity and electrical conductivity, *Carbon* 46 48–53

Niu, L., Zhou, X., Yuan, C., Bai, Y., Lai, K., Yang, F., dan Huang, Y., 2013, Characterization of tilapia Oreochromis niloticus skin gelatin extracted with alkaline and different acid pretreatments, *Food Hydrocolloids*, *33*2, 336–341.

Norizah, M., Badii, F., dan Howell, N. K., 2015, Food Hydrocolloids The effect of chicken skin gelatin and whey protein interactions on rheological and thermal properties, *Food hydrocolloids*, *45*, 1–16.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Núñez-Flores, R. B., Giménez,. F. Fernández-Martín, M.E. López-Caballero, M.P. Montero, M.C. Gómez- Montero, M. C. G.-G., Giménez, B., dan Montero, M. P., 2013, Food Hydrocolloids Physical and functional characterization of active fish gelatin films incorporated with lignin, *Food hydrocolloids*, *57*, 23–29.

Ockermann, H. W., dan Hansen, C. L, 1988, *Glue and gelatin. In Animal by-product processing* pp. 132-157. England, Chichester: Elli Horwood Ltd.

Olivier J.P., 1995, Modeling physical adsorption on porous and nonpo- rous solids using density functional theory. *J.Porous. Mater.*, 2, 9–17.

Olivier JP, Conklin WB, von Szombathely M., 1995, Determination of pore-size distribution from density-functional theory—a compar- ison of nitrogen and argon results. *Stud. Surf. Sci. Catal.*, 87, 81–9.

Ormerod, S. J., dan Rundle, S. D., 1998, Effects of experimental acidification and liming on terrestrial.pdf. *Environmental Pollution*, *103*, 183–191.

Panday, K. K., Prasad, G., Singh, V. N., 1985, Copper II removal from aqueous solution by fly ash, *Water Research*, 19 : 869–873.

Pandey, P.K., Sharma, S.K., Sambi, S.S., 2010, Kinetics and equilibrium study of chromium adsorption on zeoliteNaX, *International Journal of Environmental Science dan Technology*, 7, 2, 395-404

Pang, J., Ford, C. dan Tan, G. Mcpherson, G., John, G., Vijay T., Yungfeng, L., 2005, Synthesis of mesoporous carbon using enzymatically polymerized polyphenolic precursor and simultaneously assembled silica template. *Micro.Meso.Mat.*, 85, 293–296.

Papadopoulou, V., Eckersley, R. J., Balestra, C., Karapantsios, T. D., dan Tang, M., 2013, A critical review of physiological bubble formation in hyperbaric decompression. *Advances in Colloid and Interface Science*, *191-192*, 22–30.

Papon, P., 1983, *Influence of thermal treatments on the structure and stability of gelatin gels*, 537–542. England, Chichester: Elli Horwood Ltd.

Park, S.J., Jung, W.Y. Yang, E.T., 2002, Effect of KOH activation on the formation of oxygen structure in activated carbons synthesized from polymeric precursor. *J. Colloid. Interf. Sci.*, 250:93–8.

Parmentier J, Vix-Guterl C, Gibot P, Reda M, Ilescu M, Werckmann J,, 2003, Study of the structural evolution of mesoporous MCM-48 silica

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

infiltrated with carbon by different techniques. *Micropor. Mesopor. Mat*, 62:87–96.

Porter, D., dan Vollrath, F., 2012, Biochimica et Biophysica Acta Water mobility , denaturation and the glass transition in proteins. *BBA - Proteins and Proteomics*, *1824*6, 785–791.

Pradhan BK, Sandle N.K.,1999, Effect of different oxidizing agent treatments on the surface properties of activated carbons. *Carbon*, 37, 1323–32.

Renugopalakrishnan, V., Chandarakasan, G., Moore, S., Hutson, T. B., Berney, C. V., dan Ravejendra, S. B., 1989, Bound water in collagen. Evidence from fourier transform infrared and Fourier transform infrared photoacoustic spectroscopic study. *Macromolecules*, 22, 4124–4124.

Riennoso F and Marsh, H., 1998, *Activated carbon*, 2ed , Academic Press, New York

Roggenbuck, J., Waitz, T., dan Tiemann, M., 2008, Synthesis of mesoporous metal oxides by structure replication : Strategies of impregnating porous matrices with metal salts, *Micropor. Mesopor. Mat.*, *113*, 575–582.

Ryoo, R., Joo, S.H, Jun S, Tsubakiyama T, Terasaki O., 2001, Ordered mesoporous carbon molecular sieves by templated synthesis: the structural varieties. Stud *Surf. Sci. Catal.*, 135:150–8.

Ryoo, R., Joo, S.H., Jun, S., 1999, Synthesis of highly ordered carbon molecular sieves via template-mediated structural transformation. *J. Phys. Chem. B* 10337:7743–6.

Ryoo, R., Joo, S.H., Kruk, M., Jaroniec., 1999a, Ordered mesoporous carbons, *Adv. Mater*, 367, 31–40.

Saddler, J.M., Horsey, P.J., 1987, The new generation gelatins. A review of their history, manufacture and properties. *Anesthesia*, 42, 998–1004.

Said, P. K., dan Babu, M., 2001, Studies on Rana tigerina skin collagen. Comparative Biochemistry and Physiology, *Food Hydrocolloid*, 128B, 81–90.

Saini, V,K, Bindez, K., Fuentes, J,K., 2010, How the adsorption properties get changed when going from SBA-15 to its CMK-3 carbon replica, *Separation and Purification Technology*, 753, 366–376.

Saito, H., Taguchi, T., Kobayashi, H., Kataoka, K., Tanaka, J., Murabayashi, S., dan Mitamura, Y., 2004, Physicochemical properties of gelatin gels prepared using citric acid derivative. *Mat. Sci. Eng., C*, *24*6-8, 781–785.

UNIVERSITAS GADJAH MADA
SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Sakintuna, B. and Yu, Y., 2006, Preparation and characterization of mesoporous carbons using a Turkish natural zeolitic template / furfuryl alcohol system. *Micropor. Mesopor. Mat.*, 304–312

Sampanthar, J.T. H. Xiao, J. Dou, T.Y. Nah, R. Xu, P.K. Wong, 2006, A novel oxidative desulfurization process to remove refractory sulfur compounds from diesel fuel, *Appl. Catal. B: Environ*. 63 85–93.

Sanchez. S.A., Suarez-Garcıa, F.A. Martı´nez-Alonso, J. M. D. T. , 2013, Surface modification of nanocast ordered mesoporous carbons through a wet oxidation method, *Carbon*, 13, 106-111

Sano Y. K.H. Choi, Y. Korai, I. Mochida, 2004, Adsorptive removal of sulfur and nitro- gen species from a straight run gas oil over activated carbons for its deep hydrodesulfurization, *Appl. Catal. B: Environ.* 49 219–225.

Santosa, S.J., Narsito, dan Ratna., 2007, Adsorption kinetics of Cu(II) species on silica gel in the presence of humic acid, *J.Ion Exchange*.,7,1, 25-31

Saxena, A., Sachin, K., Bohidar, H. B., dan Verma, A. K. 2005. Effect of molecular weight heterogeneity on drug encapsulation efficiency of gelatin nano-particles. *Colloids and Surfaces B: Biointerfaces*, 45, 42–48.

Schrieber, R., Gareis, H., 2007. *Gelatine Handbook*. Wiley-VCH, GmbH and Co, Weinheim.

Schüth, F., 2003, Endo- and exotemplating to create high-surface-area inorganic materials, *Angew. Chem. Int, Edit.*, 42, 3604-22.

Sciences, A., 2000, The dissolution kinetics of amorphous silica into sodium chloride solutions : Effects of temperature and ionic strength, *Angew. Chem. Int, Edit.*, *64*24, 4193–4203.

Seredych, M. J., Rawlins, T.J. Bandosz, 2011, Investigation of the thermal regeneration efficiency of activated carbons used in the desulfurization of model diesel fuel, *Ind. Eng. Chem. Res.* 50

Seredych, T.J., Bandosz, Fuentesiy, J.K., 2007, Easy synthesis of an ordered mesoporous carbon with a hexagonally packed tubular structure, *Carbon*, 4214, 2939–2948.

Shah, I. K., Pre, P., dan Alappat, B. J., 2014, Effect of thermal regeneration of spent activated carbon on volatile organic compound adsorption performances. *Journal of the Taiwan Institute of Chemical Engineers*, *45*4, 1733–1738.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Shakila, J.R, Jeevithan, E, Varatharajakumar, A, Jeyasekaran, G., Sukumar, D., 2012, Functional characterization of gelatin extracted from bones of red snapper and grouper in comparison with mammalian gelatin, *LWT - Food Science and Technology*, 481, 30–36.

Shinn, J.H., 1984, From carbon to single-stage and two-stage products: a reactive model of carbon structure. *Fuel*, 63, 9, 1187-1196.

Skurtys, O. Ã., Bouchon, P., dan Aguilera, J. M, 2008, Formation of bubbles and foams in gelatine solutions within a vertical glass tube. *Food Hydrocolloids*, *22*, 706–714.

Song C., 2000, *Chemistry of Diesel Fuels*, 1st Ed., CRC, New York

Song C., and Ma, X.L., 2003, New Design approaches to ultra-clean diesel fuels by deep desulfurization and deep dearomatization, *Appl. Catal. B: Environ*. 41 207–238.

Soscun, H., Y. Alvarado, J. Hernandez, P. Hernandez, R. Atencio, A. Hinchliffe, 2001, Experimental and theoretical determination of the dipole polarizability of dibenzothiophene, *J. Phys. Org. Chem.* 14 709–715.

Sperling, L.H., 1985, *Introduction of Physical Polymer Science*. John Wiley, New York.

Srivastav, A, dan Srivastava, V,C., 2009, Adsorptive desulfurization by activated alumina, *Journal of hazardous materials*, 1702-3, 1133–40.

Stainsby, G., 1987, *Gelatin gels*. In: Pearson, A.M., Dutson, T.R., Baily, A.J. (Eds.), Collagen as Food: Advances in Meat Research, vol. 4. Van Nostrand Reinhold, New York, pp. 209–222.

Stainsby. G., 1997, In: *The science and technology of gelatin* A. G. Ward and A. Courts, eds.. London: Academic Press, p. 179.

Surewicz, W. K., & Mantsch, H. H. (1988). New insight into protein secondary structure from resolution enhanced infrared spectra. Biochimica et Biophysica Acta (BBA) - Protein Structure and Molecular Enzymology, 952, 115–130.

Suzuki-Muresan, T., Vandenborre, J., Abdelouas, A., Grambow, B., 2011, Solution control for dissolved silica at 25, 50 and 90 C for quartz, Callovo-Oxfordian claystone, ilite and MX80 bentonite, *Physics and Chemistry of Earth*, 36, 1648-1660

UNIVERSITAS GADJAH MADA
SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Takahashi A., Yang, R.T. Yang, F.H., 2002, New sorbents for desulfurization by complexation: thiophene/benzene adsorption, *Ind. Eng. Chem. Res.* 41, 2487–2496.

Tanford, C., 1968, Protein Denaturation. *Advances in Protein Chemistry*, *23*6, 121–182.

Tang, L., Zhan. L., Guang-Zhi, Y., Yang, J.H., Wang, L. Qiao Wen-ming, L. L. , 2011, Preparation of mesoporous carbon microsphere / activated carbon composite for electric double-layer capacitors. *New Carbon Materials*, *26*(3), 237–240.

Tang, Z., Yan, S., Yongming, T., Lang, L., Quangui, G., 2008, Effect of surfactant on the pore structure of mesoporous carbon, *Micro. Meso.Mat.,* 3 ,48–54.

Tasco, J. M. D., dan Sai, A., 2013, Surface modification of nanocast ordered mesoporous carbons through a wet oxidation method, *Micropor. Mesopor. Mat., 2*, 6-11

Tesson, D. A. H. M. O. M., dan Wielen, L. A. M.,Van Der., 2002, Improving Gelatin Plant Productivity By Modelling The Demineralization Process Of Animal Bones. *European Symposium on Computer Aided Process Engineering -12*, 10, 691–696

Ting, C., Hao-yiang, W., Shanmugam, V., Diganta, S., Yu-chi, P., George, T, K, F., Hsien-ming, K., 2010, A one-pot route to synthesize highly ordered mesoporous carbons and silicas through organic – inorganic self-assembly of triblock copolymer, sucrose and silica, *Micro. Meso.Mat.*, 1281-3, 1–11.

Tongnuanchan, P., Benjakul, S., dan Prodpran, T., 2014, Food Hydrocolloids Structural , morphological and thermal behaviour characterisations of fish gelatin film incorporated with basil and citronella essential oils as affected by surfactants. *Food hydrocolloids*, *41*, 33–43.

Townsend, A.A., Nakai, S., 1983, Relationships between hydrophobicity and foaming characteristics of food proteins. *J. Food Sci.* 48, 588–594.

Tucker, K., Carole, C., Perry, 1998, Crystalline silica prepared at room temperature from aqueous solution in the presence of intrasilica bioaxtract, *Chem. Commun*, 38, 2587-2588

Tungate, F.L. D., Hopkins, D.C., Huang, J., Fletcher, E., Kohler, 1999, Advanced distillate hydroprocessing Annual Meeting, San Antonio, *Texas Paper* AM-99-38.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Ulfa, M., Trisunaryanti, W., Falah, I. I., dan Kartini, I. , 2014c, Studies of kinetic on thermal decomposition of mesoporous carbon of gelatin by thermogravimetric technique. *Inter. J. Innov. Appl. Stud.*, *7*(3), 849–856.

Ulfa, M., Trisunaryanti, W., Falah, I. I., dan Kartini, I., 2014a, Synthesis of mesoporous carbon using gelatin as source of carbon by hard template technique and its characterizations. *J.Appl. Chem.*, *4*, 1–7.

Ulfa, M., Trisunaryanti, W., Falah, I. I., dan Kartini, I., 2014b, Nitrogen Sorption Evaluation of the Porous Carbon. *J. Chem. Eng. Chem. Res*, 1, 1–5.

Van den Bosch, E, and Gielens, C., 2003, Gelatin degradation at elevated temperature, *Inter. J. Bio. Macromol.*323-5, 129–138.

Vigón V.P., Sevilla, M., Fuertes, A.B., 2012, Sulfonated mesoporous silica–carbon composites and their use as solid acid catalysts, *Applied Surface Science*, 261, 574–583.

Vinu, A., Hou, Y., Guo, L., 2007, Controlling the textural parameters of mesoporous carbon materials, *Micropor. Mesopor. Mat.*, 201-4, 10–16.

Wainewright, F.W., 1977, *Physical tests for gelatin and gelatin products*. In: Ward, A.G., Courts, A. (Eds.), The Science and Technology of Gelatins. Academic Press Inc., London, pp. 508–531.

Wang, X., Liu, P., dan Tian, Y., 2011, Microporous and Mesoporous Materials Ordered mesoporous carbons for ibuprofen drug loading and release behavior. *Micropor. Mesopor. Mat.*, *142*1, 334–340.

Wang, X., Zhang, Y., Zhou, J., Zhang, T., dan Chen, M., 2015, Regeneration of elemental sulfur in a simultaneous sulfide and nitrate removal reactor under different dissolved oxygen conditions. *Bioresource technology*, *182*x, 75–81.

Wang, Y., Yang, H., dan Regenstein, J, M, 2008, Characterization of fish gelatin at nanoscale using atomic force microscopy, *Food Biophysics*, 3, 269-272.

Wei-Lin, X. U., 2010, Interaction Of A Cavitation Bubble And An Air Bubble With A Rigid Boundary , *Journal Of Hydrodynamics*, *22*4, 503–512.

Wen, J., Han, X., Lin, H., Zheng, Y., dan Chu, W., 2010, A critical study on the adsorption of heterocyclic sulfur and nitrogen compounds by activated carbon : Equilibrium , kinetics and thermodynamics. *Chemical Engineering Journal*, *164*1, 29–36.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Weng, W., Zheng, H., dan Su, W., 2014, Food Hydrocolloids Characterization of edible films based on tilapia Tilapia zillii scale gelatin with different extraction pH. *Food hydrocolloids*, *41*, 19–26.

Widodo, A., Sujatnika, Y., Awali, D., Prakoso, T., Adhi, T. P., Soerawidjaja, T. H., dan Indarto, A., 2015, Thermal heat-free regeneration process using antisolvent for amine recovery. *Chemical Engineering and Processing: Process Intensification*, *89*, 75–79.

Wiistneck . R. and J. Kriigel., 1998, Characterisation Of Gelatin/Surfactant Interaction And Its Relevance To Liquid Film Coating. *Protein at liquid interfaces*, 433–443.

Wolf, F. A. D., 2003, Collagen and gelatin. *Progress in Biotecnology*, *23*, 135–220.

Wolff-Boenisch, D., Gislason, S. R., dan Oelkers, E. H., 2004, The effect of fluoride on the dissolution rates of natural glasses at pH 4 and 25°C. *Geochimica et Cosmochimica Acta*, *68*22, 4571–4582.

Wu,C., 2012, The effects of surfactant template concentration on the supercapacitive behaviors of hierarchically porous carbons, *Journal of Power Sources* 399- 402.

Xue, Y., Liu, H., Chen, S., Dichtl, N., Dai, X., dan Li, N., 2015, Effects of thermal hydrolysis on organic matter solubilization and anaerobic digestion of high solid sludge. *Chem. Eng. J.*,, *264*, 174–180.

Yang R.T., A.J. Hernandez-Maldonado, F.H.,Yang, D., 2003, Desulfurization of transporta- tion fuels with zeolites under ambient conditions, Science 301, 79–81.

Yang, H., Wang, Y., Zhou, P., dan Regenstein, J. M., 2008, Effects of alkaline and acid pretreatment on the physical properties and nanostructures of the gelatin from channel catfish skins. *Food Hydrocolloids*, 228, 1541-1550.

Yang, L., Evilla, M., Fuo.T., Zee., 2007, One step non-hydrodesulfurization of fuel oil: Catalyzed oxidation adsorption desulfurization over HPWA-SBA-15, *Journal of Molecular Catalysis A: Chemical*, 2621-2,114–118.

Yang, X., Liao, S.-J., Liang, Z.-X., Li, Y.-X., dan Du, L. 2011. Gelatin-assisted templating route to synthesize sponge-like mesoporous silica with bimodal porosity and lysozyme adsorption behavior, *Micro. Meso.Mat.*, *3*, 263–269.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

Yang, Y.X., Liu, H.Y., Ying, P.L. Z.X. Jiang, C. Li, 2007, Selective dibenzothiophene adsorption on modified activated carbons, *Carbon* 45 3042–3044.

Yang, Z, and Mokaya, R., 2008, Probing the effect of the carbonization process on the textural properties and morphology of mesoporous carbons, *Micro. Meso.Mat.*, 1131-3., ,378–384.

Ying, L. I., Jian, Z., Xia-zhen, Y., Guo-jun, L. A. N., Hao-dong, T., dan Hua-zhang, L. I. U. 2011. Simple synthesis of semi-graphitized ordered mesoporous carbons with tunable pore sizes. *New Carbon Materials*, *26*2, 123–129.

Ying, L.I.U., Liang, Z., Rui, Z., Qiao, W.M., Liang, X.Y., Ling, L.C., 2007. Preparation of mesophase pitch based mesoporous carbons using an imprinting method. *New Carbon Materials*, 223, 20–23.

Yoon, S.B., Kim J.Y., Yu, J.S., 2001, Synthesis of highly ordered nanoporous carbon molecular sieves from silylated MCM-48 using divinyl- benzene as precursor. *Chem. Commun*., 6, 559–60.

Yoon, S.B., Kim, J.Y., Yu, J.S., 2002, A direct template synthesis of nanoporous carbons with high mechanical stability using as- synthesized MCM-48 hosts. *Chem. Commun.*, 14:1536–7.

Yu, C.J.S., Qiu, Y.F., Sun, X.H., Li, G., Chen, Z., 2008, Adsorption removal of thiophene and dibenzothiophene from oils with activated carbon as adsorbent: effect of surface chemistry, *J. Porous Mater*. 15, 151–157.

Yu, G.X., S.X. Lu, H. Chen, Z.N. Zhu, 2005. Diesel fuel desulfurization with hydrogen peroxide promoted by formic acid and catalyzed by activated carbon, *Carbon*, 43, 2285–2294.

Yu, J.S, Yoon S.B, Chai, G.S., 2001, Ordered uniform porous carbon by carbonization of sugars. *Carbon* 2001;39:1421–46.

Zarai, Z., Balti, R., Mejdoub, H., Gargouri, Y., dan Sayari, A, 2012, Process for extracting gelatin from marine snail Hexaplex trunculus : Chemical composition and functional properties. *Process Biochemistry*, *47*12, 1779–1784.

Zecchina A., S. Bordiga, G. Spoto, L. Marchese, G. Petrini, G. Leofanti, M. Padovan, Silicalite characterization. 2. IR spectroscopy of the interaction of carbon monoxide with internal and external hydroxyl groups, *The Journal of Physical Chemistry* 96 1992 4991–4997.

SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI
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Zeng, S., Yan, X., Cao, W., Hong, P., Zhang, C., dan Li, L. 2010. Optimisation of extraction conditions and characteristics of skin gelatin from Nile tilapia Oreochromis niloticus. *International Journal of Food Science and Technology*, 459, 1807-1813.

Zhang, R., Zhang, X., dan Hu, S, 2015, Dissolution Kinetics of Quartz in Water at high temperatures across the critical state of water. *The Journal of Supercritical Fluids*.

Zhang, W., Shan, Y., dan Seidel-Morgenstern, A. ,2006, Breakthrough curves and elution profiles of single solutes in case of adsorption isotherms with two inflection points. *J.Chroma., A, 1107*(1-2), 216–25.

Zhang, W., Wang, H., Han, J., dan Song, Z. 2012. Applied Surface Science Multifunctional mesoporous materials with acid – base frameworks and ordered channels filled with ionic liquid : Synthesis , characterization and catalytic performance of Ti – Zr-SBA-15-IL. *Applied Surface Science*, *258*16, 6158–6168.

Zhao D., Q, Huo, J, Feng, B, F, Chmelka and G, D, Stucky., 1999, Three-dimensional ordered mesoporous carbon with hexagonally mesostructure *J. Am. Chem. Soc*, 120, 6021-6029.

Zhi-hong, T., Xing, H., Song, Y., Liu, L., Guo, Q., 2010, Properties of mesoporous carbons prepared from differ- ent carbon precursors using nanosize silica as a template, *New Carbon Materials*, 256, 465–469.

Zhou, A., Ma, X., dan Song, C. 2009. Applied Catalysis B : Environmental Effects of oxidative modification of carbon surface on the adsorption of sulfur compounds in diesel fuel. *Applied Catalysis B: Environmental, 87*, 190–199.

Zhou, A.N., Ma, X.L. C.S. Song, 2006 Liquid-phase adsorption of multi-ring thiophenic sulfur compounds on carbon materials with different surface properties, *J. Phys. Chem. B.*, 110 4699–4707

Zhou, P., dan Regenstein, J. M. 2005. Effects of alkaline and acid pretreatments on Alaska pollock skin gelatin extraction. *Journal of Food Science,* 706, 392-396

Zhu, H., Wu, Y., Zhao, X., Wan, H., Yang, L., dan Hong, J. 2006. Influence of impregnation times on the dispersion of CuO on anatase, *Materials science dan engineering 243*, 24–30.

Zhu, W., Zhao, Q., Sun, C., Zhang, Z., Jiang, T., Sun, J., Li, Y., et al. 2014. Mesoporous carbon with spherical pores as a carrier for celecoxib with

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SINTESIS DAN KARAKTERISASI KARBON MESOPORI DARI GELATIN TULANG SAPI SERTA APLIKASINYA SEBAGAI ADSORBEN DIBENZOTIOFEN
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Universitas Gadjah Mada, 2015 | Diunduh dari http://etd.repository.ugm.ac.id/

needle-like crystallinity: improve dissolution rate and bioavailability. *Materials for biological applications*, *39*, 13–20.