

DAFTAR PUSTAKA

- Aida, A. A., Hatamoto, M., Yamamoto, M., Ono, S., Nakamura, A., Takahashi, M., & Yamaguchi, T. (2014). Molecular characterization of anaerobic sulfur-oxidizing microbial communities in up- fl ow anaerobic sludge blanket reactor treating municipal sewage. *Journal of Bioscience and Bioengineering*, 118(5), 540–545.
<https://doi.org/10.1016/j.jbiosc.2014.04.011>
- Alkarimiah, R., Mahat, S. B., Yuzir, A., Din, M. F., & Chelliapan, S. (2011). Performance of an innovative multi-stage anaerobic reactor during start-up period. *African Journal of Biotechnology*, 10(54), 11294–11302.
<https://doi.org/10.5897/AJB11.1270>
- Amin, M. R., Sutarto, & Ikram, M. F. D. (2018). *Prarancangan Anaerobic Fluidized Bed Reactor (AFBR) untuk Produksi Biogas dari Palm Oil Mill Effluent (POME) dengan Kapasitas Pengolahan 15.642 Ton COD/Tahun*. Yogyakarta, Indonesia.
- Astiti, D. F. (2019). *Seleksi Inokulum dan Pengaturan pH untuk Pemisahan Asidogenesis dan Metanogenesis pada Proses Produksi Biogas dari Palm Oil Mill Effluent (POME)*. Universitas Gadjah Mada.
- Bayonita, S. (2019). *Uji Kinerja Reaktor Anaerobik dengan Media Imobilisasi Bakteri dan Penambahan Ion Ni untuk Pengolahan Palm Oil Mill Effluent*. Universitas Gadjah Mada.
- Bibra, M., Wang, J., Squillace, P., Pinkelman, R., Papendick, S., Schneiderman, S., ... Sani, R. K. (2015). Biofuels and Value-added Products from Extremophiles. In *Advances in Biotechnology* (pp. 17–51). New Delhi: I.K. International Publishing House.
- Botheju, D., & Bakke, R. (2011). Oxygen Effects in Anaerobic Digestion – A Review. *The Open Waste Management Journal*, 4(3901), 1–19.
- Brioukhanov, A. L., & Netrusov, A. I. (2007). Aerotolerance of Strictly Anaerobic Microorganisms and Factors of Defense against Oxidative Stress : A Review. *Applied Biochemistry and Microbiology*, 43(6), 567–568.
<https://doi.org/10.1134/S0003683807060014>

- Budhijanto, W., Cahyono, R. B., Azis, M. M., Damayanti, S. I., & Ginting, S. B. (2019). *Perancangan Anaerobic Fluidized Bed Reactor Kontinu dengan Imobilisasi Mikroorganisme dalam Modified Zeolite untuk Peningkatan Efisiensi Produksi Biogas dari Palm Oil Mill Effluent (POME)*. Yogyakarta, Indonesia.
- Ca, C., Martinez, M. A., Woodcroft, B. J., Ignacio, J. C., Zayed, A. A., Singleton, C. M., ... Rich, V. I. (2018). Discovery and ecogenomic context of a global Caldiserica-related phylum active in thawing permafrost , Candidatus Cryoserica class nov ., Ca . Cryoserica class nov ., Ca . Cryosericales ord . nov ., Ca . Cryoseriaceae fam . nov ., comprising the four. *Systematic and Applied Microbiology*, 42, 54–66. <https://doi.org/10.1016/j.syapm.2018.12.003>
- Chang, I., Kim, C., & Nam, B. (2005). The influence of poly-vinyl-alcohol (PVA) characteristics on the physical stability of encapsulated immobilization media for advanced wastewater treatment. *Process Biochemistry*, 40, 3050–3054. <https://doi.org/10.1016/j.procbio.2005.02.009>
- Chojnacka, A., Szczesny, P., Blaszczyk, M. K., Zielenkiewicz, U., Detman, A., Salamon, A., & Sikora, A. (2015). Noteworthy Facts about a Methane-Producing Microbial Community Processing Acidic Effluent from Sugar Beet Molasses Fermentation. *Plos One*, 1–23. <https://doi.org/10.1371/journal.pone.0128008>
- Choorit, W., & Wisarnwan, P. (2007). Effect of temperature on the anaerobic digestion of palm oil mill effluent. *Electronic Journal of Biotechnology*, 10(3). <https://doi.org/10.2225/vol10-issue3-fulltext-7>
- Chusna, F. M. A., Mellyanawaty, M., Cahyono, R. B., & Budhijanto, W. (2018). Cation Modification of Zeolite as Microbial Immobilization Media in Anaerobic Digestion Process of Palm Oil Mill Effluent (POME). In *SEATUC2018* (pp. 616–621).
- Cleseri, L. S., Greenberg, A. E., & Eaton, A. D. (2005). *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association (APHA). Washington D.C.
- Daas, P. J., Hagen, W. R., Keltjens, J. T., & Vogels, G. D. (1994).

- Characterization and Determination of The Redox Properties of The 2[4Fe-4S] Ferredoxin from Methanosarcina Barkeri Strain MS. *FEBS Letters*.
[https://doi.org/10.1016/0014-5793\(94\)01313-6](https://doi.org/10.1016/0014-5793(94)01313-6)
- Damayanti, S. I., Bayonita, S., Budhijanto, W., Sarto, Mustika, I. W., & Purnomo, C. W. (2019). The Study of Immobilized Media and Ni Ion Addition Effects on COD Removal of POME Using Anaerobic Filter Reactor. *Waste and Biomass Valorization*.
- Damayanti, S. I., Ginting, S. B., Sofyan, A. V., Putri, A. T., & Budhijanto, W. (2018). Utilization of Lampung Natural Zeolite as Immobilization Media on Biogas Production from Palm Oil Mill Effluent (POME). *Material Science Forum*, 929, 18–26. <https://doi.org/10.4028/www.scientific.net/MSF.929.18>
- Damayanti, S. I., Sarto, S., Astiti, D. F., & Budhijanto, W. (2019). The Effectiveness of pH Adjustment and Controlled Oxygen Injection to Enhance Acidogenic Performance in Two Stage Anaerobic Digestion. In T. Ariyanto, Rochmadi, I. Prasetyo, & N. R. E. Putri (Eds.), *AIP Conference Proceeding : The 11th Regional Conference on Chemical Engineering (RCCChE 2018)* (Vol. 2085). Yogyakarta, Indonesia.
[https://doi.org/https://doi.org/10.1063/1.5094978](https://doi.org/10.1063/1.5094978)
- Demirer, G. N., & Chen, S. (2005). Two-phase anaerobic digestion of unscreened dairy manure. *Bioprocess Chemistry*, 40, 3542–3549.
<https://doi.org/10.1016/j.procbio.2005.03.062>
- Deublein, D., & Steinhauser, A. (2008). *Biogas from Waste and Renewable Resources*. (D. Deublein & A. Steinhauser, Eds.). Weinheim: WILEY-VCH.
- Díaz, I., Donoso-bravo, A., & Fdz-polanco, M. (2011). Effect of microaerobic conditions on the degradation kinetics of cellulose. *Bioresource Technology*, 102, 10139–10142. <https://doi.org/10.1016/j.biortech.2011.07.096>
- Duarte, M. S., Oliveira, J. V, Magalhães, C. P., Salvador, A. F., Castro, A. R., & Stams, A. J. M. (2019). Aerobic and facultative bacteria : working horses at the service of Anaerobic Digestion. In *16th IWA World Conference on Anaerobic Digestion* (pp. 9–11). Netherlands.
- Dworkin, M., Falkow, S., Rosenberg, E., Schleifer, K.-H., & Stackebrandt, E. (2006). *The Prokaryotes : Volume 3. Archea. Bacteria : Firmicutes*,

Actinomycetes (Vol. 3). Springer New York.

- Effebi, K. R., Baya, T., Jupsin, H., & Vasel, J. L. (2011). Acidogenic and Methanogenic activities in Anaerobic Ponds. *International Journal of Scientific & Engineering*, 2(12), 1–4.
- Facchin, V., Cavinato, C., Fatone, F., Pavan, P., Cecchi, F., & Bolzonella, D. (2013). Effect of trace element supplementation on the mesophilic anaerobic digestion of foodwaste in batch trials : The influence of inoculum origin. *Biochemical Engineering Journal*, 70, 71–77.
- Fernandez, N., Montalvo, S., Borja, R., Guerrero, L., Sanchez, E., Cortes, I., ... Raposo, F. (2008). Performance evaluation of an anaerobic fluidized bed reactor with natural zeolite as support material when treating high-strength distillery wastewater. *Renewable Energy*, 33, 2458–2466. <https://doi.org/10.1016/j.renene.2008.02.002>
- Fitzgerald, J. A., Allen, E., Wall, D. M., Jackson, S. A., Murphy, D., & Dobson, A. D. W. (2015). Methanosarcina Play an Important Role in Anaerobic Co-Digestion of the Seaweed *Ulva lactuca*: Taxonomy and Predicted Metabolism of Functional Microbial Communities. *Plos One*, 1–21. <https://doi.org/10.1371/journal.pone.0142603>
- Fogler, H. S. (1999). *Essentials of Chemical Reaction Engineering*. (N. R. Amundson, Ed.) (3rd editio). New Jersey: Prentice Hall PTR.
- Fu, S., Wang, F., Shi, X., & Guo, R. (2016). Impacts of microaeration on the anaerobic digestion of corn straw and the microbial community structure. *Chemical Engineering Journal*, 287, 523–528. <https://doi.org/10.1016/j.cej.2015.11.070>
- Glass, J. B., & Orphan, V. J. (2012). Trace Metal Requirements for Microbial Enzymes Involved in the Production and Consumption of Methane and Nitrous Oxide. *Frontiers in Microbiology*, (February). <https://doi.org/10.3389/fmicb.2012.00061>
- Halim, L., Mellyanawaty, M., Cahyono, R. B., Sudibyo, H., & Budhijanto, W. (2017). Anaerobic Digestion of Palm Oil Mill Effluent with Lampung Natural Zeolite as Microbe Immobilization Medium and Digested Cow Manure as Starter. In *AIP Conference Proceeding* (Vol. 1840).

- Hidalgo, D., Gomez, M., Martin-Marroquin, J. M., Aguado, A., & Sastre, E. (2015). Two-phase anaerobic co-digestion of used vegetable oils ' wastes and pig manure. *International Journal of Environmental Science and Technology*, 1727–1736. <https://doi.org/10.1007/s13762-014-0560-9>
- Jagadabhi, P. S., Kaparaju, P., & Rintala, J. (2010). Effect of micro-aeration and leachate replacement on COD solubilization and VFA production during mono-digestion of grass-silage in one-stage leach-bed reactors. *Bioresource Technology*, 101(8), 2818–2824. <https://doi.org/10.1016/j.biortech.2009.10.083>
- Jenicek, P., Celis, C. A., Krayzelova, L., Anferova, N., & Pokorna, D. (2014). Improving Products of Anaerobic Sludge Digestion by Microaeration. *Water Science and Technology*, 803–809. <https://doi.org/10.2166/wst.2013.779>
- Ji, C. M., Eong, P. P., Ti, T. B., Seng, C. E., & Ling, C. K. (2013). Biogas from palm oil mill effluent (POME): Opportunities and challenges from Malaysia's perspective. *Renewable and Sustainable Energy Reviews*, 26, 717–726.
- Jneid, J., Khalil, J. Y. B., Aherfi, S., Blanc-Tailleur, C., Raoult, D., Scola, B. La, & Pagnier, I. (2018). “ Massilibacteroides vaginae ” gen . nov ., sp . nov ., a new genus within the family of Bacteroidaceae isolated from a patient with vaginosis. *New Microbe and New Infect*, 1–8. <https://doi.org/10.1016/j.nmni.2017.08.002>
- Johansen, J., & Bakke, R. (2006). Enhancing hydrolysis with microaeration. *Water Science and Technology*, 53(1), 43–50. <https://doi.org/10.2166/wst.2006.234>
- Kementerian Pertanian, R. I. (2016). *Outlook Kelapa Sawit, Pusat Data dan Sistem Informasi Pertanian Sekretariat Jenderal - Kementerian Pertanian 2016 PA SAWIT ISSN 1907-1507*. Jakarta: Pusat Data dan Sistem Informasi Pertanian Sekretariat Jenderal - Kementerian Pertanian.
- Krzmarzick, M. J., Crary, B. B., Harding, J. J., Oyerinde, O. O., Leri, A. C., Myneni, S. C. B., & Novak, P. J. (2012). Natural Niche for Organohalide-Respiring Chloroflexi. *Applied and Environmental Microbiology*, 393–401. <https://doi.org/10.1128/AEM.06510-11>

- Labatut, R. A., Angenent, L. T., & Scott, N. R. (2014). Conventional mesophilic vs . thermophilic anaerobic digestion : A trade-off between performance and stability? *Water Research*, 53, 249–258.
<https://doi.org/10.1016/j.watres.2014.01.035>
- Leven, L., Eriksson, A. R. B., & Schnurer, A. (2007). Effect of process temperature on bacterial and archaeal communities in two methanogenic bioreactors treating organic household waste. *FEMS Microbiol Ecol*, 683–693. <https://doi.org/10.1111/j.1574-6941.2006.00263.x>
- Lim, J. W., Chiam, J. A., & Wang, J.-Y. (2014). Microbial community structure reveals how microaeration improves fermentation during anaerobic co-digestion of brown water and food waste. *Bioresource Technology*, 171, 132–138. <https://doi.org/10.1016/j.biortech.2014.08.050>
- Lim, J. W., & Wang, J.-Y. (2013). Enhanced hydrolysis and methane yield by applying microaeration pretreatment to the anaerobic co-digestion of brown water and food waste. *Waste Management*, 33(4), 813–819. <https://doi.org/10.1016/j.wasman.2012.11.013>
- Marin, I. (2014). Proteobacteria. In *In: Amils R. et al. (eds) Encyclopedia of Astrobiology*. Springer, Berlin, Heidelberg.
- Milán, Z., Montalvo, S., Ilangovan, K., Monroy, O., Chamy, R., Weiland, P., ... Borja, R. (2010). The Impact of Ammonia Nitrogen Concentration and Zeolite Addition on The Spesific Methanogenic Activity of Granular and Flocculent Anaerobic Sludges. *Journal of Environmental Science and Health*, 45(7), 883–889.
- Montalvo, S., Ferna, F., Guerrero, L., Corte, I., & Echeverri, A. (2007). Real evidence about zeolite as microorganisms immobilizer in anaerobic fluidized bed reactors. *Process Biochemistry*, 42, 721–728. <https://doi.org/10.1016/j.procbio.2006.12.004>
- Montalvo, S., Guerrero, L., Borja, R., Sánchez, E., Milán, Z., Cortés, I., & De, M. A. (2012). Application of natural zeolites in anaerobic digestion processes : A review. *Applied Clay Science*, 58, 125–133. <https://doi.org/10.1016/j.clay.2012.01.013>
- Mott, J., & Smith, A. (2011). Library Dependent Source Tracking Methods. In C.

- Hagedorn, A. R. Blanch, & V. J. Harwood (Eds.), *Microbial Source Tracking: Methods, Applications, and Case Studies*. New York: Springer Science & Business.
- Nealson, K. H., & Finkel, S. E. (2011). Electron flow and biofilms. *Materials Research Society*, 36, 380–384. <https://doi.org/10.1557/mrs.2011.69>
- Nelson, M. J., Nakhla, G., & Zhu, J. (2017). Fluidized-Bed Bioreactor Applications for Biological Wastewater Treatment : A Review of Research and Developments. *Engineering*, 3, 330–342.
- Nguyen, D., & Khanal, S. K. (2018). A little breath of fresh air into an anaerobic system : How microaeration facilitates anaerobic digestion process. *Biotechnology Advances*, 36(7), 1971–1983. <https://doi.org/10.1016/j.biotechadv.2018.08.007>
- Nguyen, V., Karunakaran, E., Collins, G., & Biggs, C. A. (2016). Physicochemical analysis of initial adhesion and biofilm formation of *Methanosarcina barkeri* on polymer support material. *Colloids and Surfaces B : Biointerfaces*, 143, 518–525.
- Parinduri, L. (2018). Analisa Pemanfaatan POME Untuk Sumber Pembangkit Listrik Tenaga Biogas Di Pabrik Kelapa Sawit. *Journal of Electrical Technology*, 3(3), 180–183.
- Phukoetphim, N., Salakkam, A., Laopaiboon, P., & Laopaiboon, L. (2017). Kinetic models for batch ethanol production from sweet sorghum juice under normal and high gravity fermentations : Logistic and modified Gompertz models. *Journal of Biotechnology*, 243, 69–75. <https://doi.org/10.1016/j.jbiotec.2016.12.012>
- Poh, P. E., & Chong, M. F. (2009). Development of anaerobic digestion methods for palm oil mill effluent (POME) treatment. *Bioresource Technology*, 100, 1–9. <https://doi.org/10.1016/j.biortech.2008.06.022>
- Prasetyo, E., Sudibyo, H., & Budhijanto, W. (2017). Determination of the Optimum Hydraulic Retention Time in Two-Stage Anaerobic Fluidized Bed Bioreactor for Landfill Leachate Treatment. *J. Eng. Technol. Sci.*, 49(3), 388–399. <https://doi.org/10.5614/j.eng.technol.sci.2017.49.3.7>
- Purnomo, C. W., Mellyanawati, M., & Budhijanto, W. (2017). Simulation and

- Experimental Study on Iron Impregnated Microbial Immobilization in Zeolite for Production of Biogas. *Waste Biomass Valor*, 2413–2421. <https://doi.org/10.1007/s12649-017-9879-z>
- Rahayu, A. S., Karsiwulan, D., Yuwono, H., Trisnawati, I., Mulyasari, S., Raharjo, S., ... Paramita, V. (2015). *POME-to-Biogas (Project Development in Indonesia)*. (B. Castermans, H. Yuwono, R. Hardison, & V. Paramita, Eds.) (Second edi). Winrock International.
- Ramadhani, L. I. (2018). *Evaluasi Kinerja Double Stage Anaerobic Fluidized Bed Reactor dalam Mengolah Palm Oil Mill Effluent (POME) Menggunakan Zeolit Alam sebagai Media Imobilisasi Bakteri*. Universitas Gajah Mada.
- Ramos, I., & Fdz-Polanco, M. (2013). The potential of oxygen to improve the stability of anaerobic reactors during unbalanced conditions : Results from a pilot-scale digester treating sewage sludge. *Bioresource Technology*, 140, 80–85. <https://doi.org/10.1016/j.biortech.2013.04.066>
- Saelor, S., Kongjan, P., & O-Thong, S. (2017). Biogas Production from Anaerobic of Palm Effluent and Empty Fruit Bunches. *Energy Procedia*, 138, 717–722. <https://doi.org/10.1016/j.egypro.2017.10.206>
- Seadi, T. Al, Rutz, D., Prassl, H., Kottner, M., Finsterwalder, T., Volk, S., & Janssen, R. (2008). *Biogas Handbook*. (T. Al Saedi, Ed.). DK-6700 Esbjerg, Denmark: University of Southern Denmark Esbjerg, Niels Bohrs Vej 9-10, DK-6700 Esbjerg, Denmark.
- Setyowati, P. A. H., Halim, L., Mellyanawaty, M., Sudibyo, H., & Budhijanto, W. (2017). Anaerobic treatment of palm oil mill effluent in batch reactor with digested biodiesel waste as starter and natural zeolite for microbial immobilization. In *AIP Conference Proceeding*. <https://doi.org/10.1063/1.4982334>
- Shuler, M. L., & Kargi, F. (2014). *Bioprocess Engineering Basic Concepts* (2nd ed.). New York: Pearson.
- Soto, M., Mendez, R., & Lema, J. M. (1993). Methanogenic and non-methanogenic activity tests: theoretical basis and experimental setup. *Water Research*, 27(8), 1361–1376.
- Tatar, A. (2018). Microbial Enhance Oil Recovery: Microbiology and

- Fundamentals. In A. Bahadori (Ed.), *Fundamentals of Enhanced Oil and Gas Recovery from Conventional and Unconventional Reservoirs* (pp. 298–411). Oxford: Gulf Professional Publishing.
- Thauer, R. K., Kaster, A., & Hiromoto, T. (2010). Hydrogenases from Methanogenic Archaea, Nickel, a Novel Cofactor, and H₂ Storage. *Annual Review of Biochemistry*, (March).
<https://doi.org/10.1146/annurev.biochem.030508.152103>
- Thiel, V., Fukushima, S.-I., Kanno, N., & Hanada, S. (2019). Chloroflexi. In T. M. Schmidt (Ed.), *Encyclopedia of Microbiology* (4th editi, p. 651). Academic Press.
- Tuson, H. H., & Weibel, D. B. (2013). Bacteria-surface interaction. *Soft Matter*, 9, 4368–4380. <https://doi.org/10.1039/c3sm27705d>
- Wikipedia. (2019). Bacteroidetes. Retrieved February 26, 2020, from <https://en.wikipedia.org/wiki/Bacteroidetes>
- Wikipedia. (2020). Rhodobacteraceae. Retrieved February 26, 2020, from <https://en.wikipedia.org/wiki/Rhodobacteraceae>
- Yi, J., Dong, B., Jin, J., & Dai, X. (2015). Effect of Increasing Total Solid Contents on Anaerobic Digestion of Food Waste under Mesophilic Condition: Performance and Microbial Characteristic Analysis. In E. C. Rada (Ed.), *Biological Treatment of Solid Waste: Enhancing Sustainability* (pp. 33–36). Canada: Apple Academic Press.
- Yin, J., Yu, X., Zhang, Y., Shen, D., Wang, M., Long, Y., & Chen, T. (2016). Enhancement of acidogenic fermentation for volatile fatty acid production from food waste: Effect of redox potential and inoculum. *Bioresource Technology*, 216, 996–1003. <https://doi.org/10.1016/j.biortech.2016.06.053>
- Zahan, K. A., & Kano, M. (2018). Biodiesel Production from Palm Oil, Its By-Products, and Mill Effluent: A Review. *Energies*, 1–25. <https://doi.org/10.3390/en11082132>