

DAFTAR PUSTAKA

- Abou, Z, D, M., Müller, R, J., & Deckwer, W, D. 2001. Degradation of natural and synthetic polyesters under anaerobic conditions. *Journal of Biotechnology*. 86(2): 113–126.
- Ahmad, N, N, R., Fernando, W, J, N., & Uzir, M, H. 2015. Parametric evaluation using mechanistic model for release rate of phosphate ions from chitosancoated phosphorus fertiliser pellets. *Biosystems Engineering*. 129 : 78-86.
- Ansel, H, C., Allen, L, V. and Popovich, N, G. 1999. *Pharmaceutical Dosage Forms and Drug Delivery System (7thed)*. London: Lippincott Williams & Wilkins.
- Averous, L. 2013. *Synthesis, Properties, Enviromental and Biomedical Applications of Polylactic Acid (Chapter 9)*. Handbook of Biopolymers and Biodegradable Plastics. Elsevier Science.
- Balai Penelitian Tanah. 2005. *Analisis Kimia Tanah, Tanaman, Air dan Pupuk*. Bogor: Badan Penelitian dan Pengembangan Pertanian Departemen Pertanian.
- Barber, S, A., Robert, D, M., & Dancy, W, B., 1985. Produksi, Pemasaran, dan Penggunaan Pupuk Kalium. hal 567-611 O. P. Engeistad (edt). Teknologi dan Penggunaan Pupuk. UGM press. Jogjakarta.
- Bastioli, C., and Bettarini, F. 2014. *General Characteristics, Processability, Industrial Applications and Market Evolution of Biodegradable Polymers (Chapter 6)*. Handbook of Biodegradable Polymers, 2nd Edition. UK: Smithers Rapra Technology Ltd.
- Benedict, C, V., Cameron, J, A., & Huang, S, J. 1983. Polycaprolactone degradation by mixed and pure cultures of bacteria and a yeast. *Journal of Applied Polymer Science*. 28(1): 335–342.
- Bharadia and M. Vikram, P. 2014. A Review on Aqueous Film Coating Technology. *Indian Journal of Pharmacy and Pharmacology*. 1(1): 64-106.
- Bonartsev, A, P. 2007. *Biosynthesis, biodegradation, and application of poly(3-hydroxybutyrate) and its copolymers – natural polyesters produced by diazotrophic bacteria*. Communicating Current Research and Educational Topics and Trends in Applied Microbiology. A. Méndez-Vilas (Ed.).
- Bose, S and Bogner, R. H. 2007. Solventless Pharmaceutical Coating Processes : A Review. *Pharmaceutical Development and Technology*. 12: 115-131.

- Buckman, H.O and N.C Brady. 1982. *Ilmu Tanah*. Terjemahan. Bhrathara Karya Aksara. Jakarta
- Chatterjee, G., and Prasad, S. 2011. *Polystyrene: Properties and it's Application in Sensing Platforms*. J. Gray (Ed.) (119-141). Material Science and Technologies. New York: Nova Science Publishers Inc.
- Cong, Z., Yazhen, S., Changwen, D., Jianmin, Z., Huoyan, W., & Xiaoqin, C. 2010. Evaluation of Waterborne Coating for Controlled Release Fertilizer Using Wurster Fluidized Bed. *Industrial & Engineering Chemistry Research*. 49(20): 9644–9647.
- Costa, P., & Sousa Lobo, J, M. 2001. Modeling and comparison of dissolution profiles. *European Journal of Pharmaceutical Sciences*. 13(2): 123–133.
- Coulembier, O., Degee, P., Hedrick, J, L., & Dubois, P. 2006. From controlled ring-opening polymerization to biodegradable aliphatic polyester: Especially poly(β -malic acid) derivatives. *Progress in Polymer Science*. 31(8): 723–747.
- D. Akmal, R. Monica, R. Asiska, S. Muslim, E. Ben, & Z. Erizal. 2015. The use of biopolymer of poly(3-hydroxybutyrate) as matrix of urea slow release fertilizer. *Journal of Chemical and Pharmaceutical Research* 7(7): 558-563.
- Departemen Kesehatan Republik Indonesia. 1979. *Farmakope Indonesia. Edisi III*. Jakarta: Direktorat Jenderal Pengawasan Obat dan Makanan.
- Di Franco, C, R., *et al.* 2004. Degradation of polycaprolactone/starch blends and composites with sisal fibre. *Polymer Degradation and Stability*. 86: 95-103.
- Djamaan, A., Isa, M. A. M., & Azizan, M. M. N. 2003. Fermentasi *Fed-Batch* pada Produksi Plastik mudah Terurai Poli(3-Hidroksibutirat) dari Asam Oleat. *Majalah Farmasi Indonesia*. 14(1): 256-264.
- Djamaan, A., Ulfa, M., & Suharti, N. 2012. Penggunaan Biopolimer Polikaprolakton sebagai Matrik Herbisida Lepas Lambat Asam 2,4-diklorofenoksi asetat. *Jurnal Farmasi Higea*. 4(2): 133-146.
- Djamaan, A. 2015. *Konsep produksi biopolimer P(3HB) dan P(3HB-ko-3HV) secara fermentasi cetakan kedua*. Andalas University Press. Padang.
- Doi, Y. 1990. *Microorganism and Poly (3-Hydroxyalkanoates)*. In: Microbial Polyester. Chapter 3. VCH Publ. Inc. New York. 33-60.
- Ekwu, L. G., Utobo, E. B., & Nwokwu, G. N. Effect of NPK Fertilizer and Weeding Regime on the Growth and Yield of Eggplant (*Solanum*

melongena L.) in Abakaliki. 2012. *Int'l Journal of Agric. And Rural Dev.* 15(2): 9-16.

- El Diwani, G., *et al.* 2013. Nitrogen Slow Release Biodegradable Polymer Based on Oxidized Starch Prepared via Electrogenated Mixed Oxidants. *Journal of Applied Sciences Research.* 9(3): 1931-1939.
- Elzubair, A., Elias, C, N., Suarez, J, C, M., Lopes, H, P., &Vieira, M, V, B. 2006. The physical characterization of a thermoplastic polymer for endodontic obturation. *Journal of Dentistry.* 34(10): 784–789.
- Federle, T, W., Barlaz, M, A., Pettigrew, C, A., Kerr, K, M., Kemper, J, J., Nuck, B, A., & Schechtman, L, A. 2002. Anaerobic Biodegradation of Aliphatic Polyesters: Poly(3-hydroxybutyrate-co-3-hydroxyoctanoate) and Poly(ϵ -caprolactone). *Biomacromolecules.* 3(4): 813–822.
- Fernandez-Perez, M., Garrido-Herrera, F, J., Gonzalez-Pradas, E., Villafranca-Sánchez, M., & Flores-Cespedes, F. 2008. Lignin and ethylcellulose as polymers in controlled release formulations of urea. *Journal of Applied Polymer Science.* 108(6): 3796–3803.
- Forsell, P., Lahtinen, R., Lahelin, M., & Myllarinen, P. 2002. Oxygen permeability of amylose and amylopectin films. *Carbohydrate Polymers.* 47(2): 125–129.
- Garcia, Y. G., Nungaray, J., Cordova, J., Reynoso, O. G., Koller, M., Atlic, A., and Braunegg, G. 2008. Biosynthesis and Characterization of Polyhydroxyalkanoates in the Polysaccharide-Degrading Marine Bacterium *Saccharophagus degradans* ATCC 43961. *J Ind Microbial Biotechnol.* 35: 629-633.
- Gerard, T., Budtova, T., Podshivalov, A., & Bronnikov, S. 2014. Polylactide / Poly(hydroxybutyrate-co-hydroxyvalerate) Blends: Morphology and Mechanical Properties. *eXPRESS Polymer Letters.* 8(8): 609-617.
- Gray, J. 2011. *Polystyrene: Properties, Performance and applications.* New York: Nova Science Publishers Inc.
- Godbillot, L., Dole, P., Joly, C., Roge, B., & Mathlouthi, M. 2006. Analysis of water binding in starch plasticized films. *Food Chemistry.* 96(3): 380–386.
- Gomes, D, B., Mauricio, W, P., Dalmolin, C., & Augusto, J, M, A. 2014. Natural Additives for Poly (Hydroxybutyrate-co-Hydroxyvalerate)-PHBV: Effect on Mechanical Properties and Biodegradation. *Materials Research.* 17(5): 1145-1156.

- Gunatillake, P. A., and Adhikari, R. 2003. Biodegradable Synthetic Polymers For Tissue Engineering. *European Cells and Materials*. 5: 1-16.
- Gupper, A., & Kazarian, S, G. 2005. Study of solvent diffusion and solvent-induced crystallization in syndiotactic polystyrene using FT-IR spectroscopy and imaging. *Macromolecules*. 38(6): 2327–2332.
- Hachemi, R., Belhaneche-Bensemra, N., & Massardier, V. 2014. Elaboration and characterization of bioblends based on PVC/PLA. *Journal of Applied Polymer Science*. 131(7).
- Haq, M., Burgueño, R., Mohanty, A, K., & Misra, M. 2008. Hybrid bio-based composites from blends of unsaturated polyester and soybean oil reinforced with nanoclay and natural fibers. *Composites Science and Technology*. 68(15–16): 3344–3351.
- Han, X., Chen, S., Hu, X. 2009. Controlled-release fertilizer encapsulated by starch/polyvinyl alcohol coating. *Desalination*, 240: 21-26.
- Harmaen, A, S., Khalina, A., Mohd, H, A., & Nor, I, A. 2016. Thermal, Morphological, and Biodegradability Properties of Bioplastic Fertilizer Composites Made of Oil Palm Biomass, Fertilizer, and Poly(hydroxybutyrate-co valerate). *International Journal of Polymer Science*. 2016 (8).
- Jarosiewicz, A and Tomaszewska, M. 2003. Controlled-Release NPK Fertilizer Encapsulated by Polymeric Membranes. *Journal of Agricultural and Food Chemistry*. 51(2): 413-417.
- Jiang, L and Zhang, J. 2013. *Biodegradable Polymers and Polymers Blends (Chapter 6)*. Handbook of Biopolymers and Biodegradable Plastics. Elsevier Science.
- Kan, A., & Demirboga, R. 2009. A new technique of processing for waste-expanded polystyrene foams as aggregates. *Journal of Materials Processing Technology*, 209(6): 2994–3000.
- Kiatkamjornwong, S., Sonsuk, M., Wittayapichet, S., Prasassarakich, P., & Vejjanukroh, P, C. 1999. Degradation of styrene-g-cassava starch filled polystyrene plastics. *Polymer Degradation and Stability*. 66(3): 323–335.
- Lachman, L., Lieberman, H, A., & Kanig, J, L. 1986. *The Theory and Practice of Industrial Pharmacy* (3 Sub edition). Philadelphia: Lea & Febiger.
- Lee, S, Y. 1996. Bacteria polyhydroxyalkanoates, *Biotechnology and Bioengineering*. 49: 1-14.
- Lingga, P., & Marsono. 2008. *Petunjuk Penggunaan Pupuk*. Penebar Swadaya.

- Lubkowski, K. 2014. Coating Fertilizer Granules with Biodegradable Materials for Controlled Fertilizer Release. *Environmental Engineering and Management Journal*. 13(10): 2573-2581.
- Luckachan, G, E., Pillai, C, K, S. 2011. Biodegradable Polymers- A Review on Recent Trends and Emerging Perspectives. *Journal Polymer Enviromental*. 19: 637-676.
- Martínez-Abad, A., Sánchez, G., Fuster, V., Lagaron, J, M., & Ocio, M, J. 2013. Antibacterial performance of solvent cast polycaprolactone (PCL) films containing essential oils. *Food Control*. 34(1): 214-220.
- Meenakshi, P., Noorjahan, S., Rajini, R., Venkateswarlu, U., Rose, C., & Sastry, T. 2002. Mechanical and Microstructure Studies on the Modification of CA Film by Blending with PS. *Bulletin of Materials Science*. 25(1): 25-29.
- Mohamed, A., Finkenstadt, V, L., Gordon, S, H., & Palmquist, D, E. 2010. Thermal and mechanical properties of compression-molded pMDI-reinforced PCL/gluten composites. *Journal of Applied Polymer Science*. 118(5): 2778-2790.
- Mohamed, A., Gordon, S, H., & Biresaw, G. 2007. Polycaprolactone/ polystyrene bioblends characterized by thermogravimetry, modulated differential scanning calorimetry and infrared photoacoustic spectroscopy. *Polymer Degradation and Stability*. 92(7): 1177-1185.
- Mohanty, A, K., Misra, M., & Hinrichsen, G. 2000. Biofibres, biodegradable polymers and biocomposites: An overview. *Macromolecular Materials and Engineering*. 276-277(1): 1-24. S.
- Muslim, Salman, L. Fitriani, Suharti, N., Z. Erizal, Febriyenti, Y. Aldi, & D. Akmal. 2015. Use of bioblend polystyrene/starch for coating urea granules as slow release fertilizer. *Journal of Chemical and Pharmaceutical Research*. 7(11): 478-484.
- Nafiu, A. K., Togun, A. O., Abiodun, M. O., & Chude, V. O. Effects of NPL Fertilizer on Growth, Drymatter Production and Yield of Eggplant in Southwestern Nigeria. 2011. *Agriculture and Biology Journal of North America*. 2(7): 1117-1125.
- Permatadewi, A., Erizal, Rustini, Djamaan, A. 2013. Kajian Biodegradasi Filem Plastik Campuran Polistiren dengan Poli(3-hidroksibutirat-ko-3-hidroksivalerat) dalam Tanah Secara *in-vitro*. 2013. *Jurnal Farmasi Andalas*. 1(1).

- Pitt, C, G. 1990. Poly (ϵ -caprolactone) and Its Copolymers. *In Biodegradable Polymers as Drug Delivery Systems* (pp. 71–119). New York: Marcel Dekker.
- Pitt, C, G., Chasalow, F, I., Hibionada, Y, M., Klimas, D, M., & Schindler, A. 1981. Aliphatic polyesters. I. The degradation of poly(ϵ -caprolactone) in vivo. *Journal of Applied Polymer Science*. 26(11): 3779–3787.
- Pitt, C, G., Gratzl, M, M., Jeffcoat, A, R., Zweidinger, R., & Schindler, A. 1979. Sustained drug delivery systems II: Factors affecting release rates from poly(ϵ -caprolactone) and related biodegradable polyesters. *Journal of Pharmaceutical Sciences*. 68(12): 1534–1538.
- Reetz, H, F. 2016. *Fertiizers and their Efficient Use*. Paris, France: International Fertilizers Industry Association.
- Rezwan, K., Chen, Q.Z., Blacker, J. J and Boccaccini, A. R. 2006. Biodegradable and Bioactive Porous Polymer/Inorganic Composite scaffolds for Bone Tissue Engineering. *Biomaterials*. 27: 3413-3431.
- Rosmarkam, A. dan N.W. Yuwono. 2002. *Ilmu Kesuburan Tanah*. Kanisius. Yogyakarta.
- Rudnik, E. 2013. *Compostable Polymer Materials: Definitions, Structure, and Methods of Preparation (Chapter 10)*. Handbook of Biopolymers and Biodegradable Plastics. USA: Elsevier Inc.
- Saitoh, A., Amutharani, D., Yamamoto, Y., Tsujita, Y., Yoshimizu, H., & Okamoto, S. 2003. Structure and Properties of the Mesophase of Syndiotactic Polystyrene IV. Release of Guest Molecules from δ Form of Syndiotactic Polystyrene by Time Resolved FT-IR and WAXD Measurement. *Polymer Journal*. 35(11): 868–871.
- Salman, Febriyenti & D. Akmal. 2015. Pengaruh Penggunaan Penyalut Bioblend PS/PCL terhadap Pelepasan Zat Aktif Urea Granul. *J. Ris. Kim.* 8(2): 158-164.
- Salman, O, A. 1988. Polymer coating on urea prills to reduce dissolution rate. *Journal of Agricultural and Food Chemistry*. 36(3): 616–621.
- Shargel, L., Wu-Pong, S., and Yu, A. B. 2012. *Biofarmasetika dan Farmakokinetika Terapan*. Edisi 5 Alih Bahasa: Fasich, Siti Sjamsiah. Surabaya: Airlangga University Press.
- Sravanthi, R. 2009. *Preparation and characterization of poly (ϵ -caprolactone) PCL scaffolds for tissue engineering applications* (Thesis). Rourkela: National Institute of Technology Rourkela.

- Srivastava, S., & Mishra, G. 2010. Fluid bed technology: Overview and parameters for process selection. *International Journal of Pharmaceutical Sciences and Drug Research*. 2(4): 236–246.
- Stading, M., Rindlav-Westling, Å., & Gatenholm, P. 2001. Humidity-induced structural transitions in amylose and amylopectin films. *Carbohydrate Polymers*. 45(3): 209–217.
- Suharti, N., Sulaiman, S., Febriyenti, Zaini, E., Suardi, M., Sahlan, E. B., & Djamaan, A. 2016. Effect of Bioblend Polystyrene/Polycaprolactone and Polystyrene/Starch Utilization toward Coating Thickness and Release of Active Substance from Urea Ganule. *Der Pharma Chemica*. 8(11): 83-87.
- Susan, X, S. 2013. *Overview of Plant Polymers : Resources, Demands, and Sustainability (Chapter 1)*. Handbook of Biopolymers and Biodegradable Plastics. USA: Elsevier Inc.
- Sutejo, M, M. 2002. *Pupuk dan Cara Pemupukan*. Rienekacipta. Jakarta.
- Swarbrick, J. 2006. *Encyclopedia of Pharmaceutical Technology, Third Edition*. London: Informa Healthcare.
- Syukri, Y. 2009. *Potensi Amilum Lokal Sebagai Eksipien Dalam Formulasi Sediaan Tablet*. Prosiding Seminar Nasional Farmasi. Yogyakarta: Universitas Islam Indonesia.
- Tin, L, S., et al. 2013. *Overview of Poly(lactic Acid) (Chapter 2)*. Handbook of Biopolymers and Biodegradable Plastics. Elsevier Science.
- Tomaszewska, M., & Jarosiewicz, A. 2004. Polysulfone coating with starch addition in CRF formulation. *Desalination*. 163(1–3): 247–252.
- Tomaszewska, M. 2003. Controlled Release NPK Fertilizer Formulation Using Polyacrylonitrile. *XVIIIth ARS Separatoria* : 186-189.
- Tomaszewska, M and Jarosiewicz, A. 2002. Use of Polysulfone in Controlled-Release NPK Fertilizer Formulations. *Journal of Agriculture Food and Chemistry*. 50(16): 4634-4639.
- Trenkel, M, E. 2010. *Slow and Controlled Release and Stabilized Fertilizer : An Option for Enhancing Nutrient Use Efficiency in Agriculture*. International Fertilizer Industry Association : Paris.
- Turton, R., & Cheng, X, X. 2005. The scale-up of spray coating processes for granular solids and tablets. *Powder Technology*. 150(2): 78–85.

- Ulery, B. D., Nair, L. S., & Laurencin, C. T. 2011. Biomedical Applications of Biodegradable Polymers. *Journal of Polymer Science. Part B, Polymer Physics*. 49(12) : 832–864.
- Van der Schueren, L., De Schoenmaker, B., Kalaoglu, Ö. I., & De Clerck, K. 2011. An alternative solvent system for the steady state electrospinning of polycaprolactone. *European Polymer Journal*. 47(6) : 1256–1263.
- Venugopal, J., Zhang, Y, Z, Ramakrishna, S. 2005. Fabrication of modified and functionalized polycaprolactone nanofibre scaffolds for vascular tissue engineering. *Nanotechnology*. 16 (10) : 2138–2142.
- Vert, M. 2009. Degradable and bioresorbable polymers in surgery and in pharmacology: beliefs and facts. *Journal of Materials Science: Materials in Medicine*. 20 (2) : 437–446.
- Vitosh, M, L. 1996. *NPK Fertilizers: Types, Uses and Characteristics*. Michigan State University Extension. Extension Bulletin : E-896.
- Voigt, R. 1994. *Buku Pelajaran Teknologi Farmasi*. Edisi 5. Penerjemah Soendani, N. Yogyakarta: Gadjah Mada University Press.
- Wang, Y., Rodriquez-Perez, M, A., Reis, R, L., & Mano, J, F. 2005. Thermal and Thermomechanical Behaviour of Polycaprolactone and Starch / Polycaprolactone Blends for Biomedical Applications. *Macromolecular Materials and Engineering*. 290 : 792-801.
- Woodruff, M, A., & Hutmacher, D, W. 2010. The return of a forgotten polymer Polycaprolactone in the 21st century. *Progress in Polymer Science*, 35(10), 1217–1256.
- Woodward, S, C., Brewer, P, S., Moatamed, F., Schindler, A., & Pitt, C, G. 1985. The intracellular degradation of a poly(ϵ -caprolactone). *Journal of Biomedical Materials Research*. 19(4): 437–444.
- Yang, Y., *et al.* 2012. Improving the Quality of Polymer Coated Urea with Recycled Plastic, Proper Additives, and Large Tablets. *Journal of Agriculture Food and Chemistry*. 60: 11229–11237.