



DAFTAR PUSTAKA

- Aggarwal, B.B., Kumar, A. dan Bharti, A.C., 2003, Anticancer Potential of Curcumin: Preclinical and Clinical Studies, *Anticancer Res.*, 23, 363-398.
- Albersheim, P., Darvill, M.A. dan Schols, H.A., Voragen, A.G.J., 1996, An Hypothesis: The Same Six Polysaccharides are Components of The Primary Cell Walls of All Higher Plants, *Prog. Biotechnol.*, 14, 47–55.
- Anand, P., Kunnumakkara, A.B., Newman, R.A. dan Aggarwal, B.B., 2008, Bioavailability of Curcumin: Problems and Promises, *Mol. Pharm.*, 4 (6), 807–818.
- Anarjan, N. dan Tan, C.P., 2013, Effects of Selected Polysorbate and Sucrose Ester Emulsifiers on The Physicochemical Properties of Astaxanthin Nanodispersions, *Molecules*, 18, 768-777.
- Anitha, A., Deepagan, V.G., Rani, V.V.D., Menon, D., Nair, S.V. dan Jayakumar, R., 2011, Preparation, Characterization, In Vitro Drug Release and Biological Studies of Curcumin Loaded Dextran Sulphate-Chitosan Nanoparticles, *Carbohydr. Polym.*, 84, 1158-1164.
- Anonim, 2013, Curcumin, <http://www.sigmaldrich.com/catalog/product/sigma/c7727?lang=en®ion-ID>, diakses tanggal 13 Desember 2014.
- Arouri, A. dan Mouritsen, O.G., 2012, Review: Membrane-Pertubing Effect of Fatty Acids and Lysolipids, *Progress in Lipid Research*, 52, 130–140.
- Arwidsson, H., 1991, Properties of Ethylcellulose Films for Extended Release.1. Influence of Process Factors When Using Organic Solution, *Acta Pharm. Nord*, 3, 25-30.
- Basnet, P., dan Basnet, N.S., 2011, Review Curcumin: An Anti-Inflammatory Molecule from a Curry Spice on the Path to Cancer Treatment, *Molecules*, 16,4567-4598.
- Berger, J., Reist, M., Mayer, J.M., Felt, O., Peppas, N.A. dan Gurny, R., 2004, Structure and Interactions in Covalently and Ionically Crosslinked Chitosan Hydrogels for Biomedical Applications, *Eur. J. Phar. Bio.*, 57, 19-34.
- Bisht, S., Feldmann, G., Soni, S., Ravi, R., Karikar, C. dan Maitra, A., 2007, Polymeric Nanoparticle-Encapsulated Curcumin (“Nanocurcumin”): A Novel Strategy for Human Cancer Therapy. *J. Nanobiotechnol.*, 5, 38.
- Boli, N., Liu, M.Z., Xie, L.H. dan Wang, Y.F., 2011, Environmentally Friendly Slow-Release Nitrogen Fertilizer: *J. Agric. Food Chem.*, 59, 10169-10175.
- Brady, J.E., 1999, *Kimia Universitas Asas dan Struktur*, Binarupa Aksara Pub., Tangerang



- Champagne, L.M., 2002, The Synthesis of Water Soluble N-Acyl Chitosan Derivatives for Characterization As Antibacterial Agent, *Dissertation*, B.S., Xavier University of Louisiana.
- Chandur, V.K., Badiger, A.M. dan Rao, K.R.S.S., 2011, Characterizing Formulations Containing Derivatized Chitosan with Polymer Blending, *IJRP*, 4, 1, 1-18.
- Chang, K.L.B dan Lin, J., 2000, Swelling Behaviour and The Release of Protein from Chitosan-Pectin Composite Particles, *Carbohydr. Polym.*, 43, 163-169.
- Chen, P.H., Kuo, T.Y., Kuo, J.Y., Tseng, Y.P., Wang, D.M., Lai, J.Y. dan Hsieh, H.J., 2010, Novel Chitosan–Pectin Composite Membranes with Enhanced Strength, Hydrophilicity and Controllable Disintegration, *Carbohydr. Polym.*, 82,4, 1236–1242.
- Coenen, G.J., Bakx, E.J., Verhoef, R.P., Schols, H.A. dan Voragen, A.G.J., 2007, Identification of The Connecting Linkage Between Homo- or Xylogalacturonan and Rhamnoga- LacturonanType I, *Carbohydr. Polym.*, 70, 224–235.
- Combo, A.M.M., Aguedo, M.N., Quiévy, S., Danthine, D., Goffin, N., Jacquet, C., Blecker, J., Devaux, M. dan Paquot, 2013, Characterization of Sugar Beet Pectin-Derived Oligosaccharides Obtained by Enzymatic Hydrolysis, *Int. J. Biol. Macromol.*, 52, 148–156.
- Dash, S., Murthy, P.N., Nath, L. dan Chowdhury, P., 2010, Kinetic Modeling on Drug Release from Controlled Drug Delivery Systems, *Acta Poloniae Pharmaceutica-Drug Research*, 3,67, 217-223.
- Ferreira, L.A.M., Seiller, M., Grossiord, J.L., Marty, J.P. dan Wepierre, J., 1995, Vehicle Influence on In Vitro Release of Glucose: W/O. W/O/W and O/W System Compared, *J. Controlled Release*, 33, 349-356.
- Firdaus, D., 2008, Proses Pemurnian Air dengan Modifikasi Filtrasi Kitosan, *skripsi*, Institut Pertanian Bogor, Bogor
- George, M dan Abraham, T.E., 2006, Polyionik Hydrocolloids for The Intestinal Delivery of Protein Drugs: Alginate and Chitosan, *J. Controlled Release*, 114, 1-14.
- Giri, T.K., Thakur, A., Alexdaner, A., Ajazuddin, Badwaik, H. dan Tripathi, D.K., 2012, Modified Chitosan Hydrogels as Drug Delivery and Tissue Enginerring Systems: Present Status and Applications, *Acta Pharm. Sin. B.*, 1-11.
- Goel, A., Kunnumakkara, A.B. dan Aggarwal, B.B., 2008, Curcumin as “Curecumin”: from Kitchen to Clinic, *Biochem. Pharmacol.*, 75, 787-809.
- Goel, A dan Aggarwal, B.B., 2010, Curcumin The Golden Spice from Indian Saffron, is A Chemosensitizer and Radiosensitizer for Tumors and



- Chemoprotector and Radioprotector for Normal Organs, *Nutr. Cancer*, 62, 919–930.
- Griffin, W.C., 1949, Classification of Surface-Active Agents by HLB, *J. Soc. Cosmet. Chem.*, 1, 311-326.
- Hagesaether, E., Hiorth, M. dan Sande, S.A., 2009, Mucoadhesion and Drug Permeability of Free Mixed Films of Pectin and Chitosan: An In Vitro and Ex Vivo Study, *Eur. J. Phar. Bio.*, 71, 325–331.
- Hatcher, H., Planalp, R., Cho, J., Torti, F.M. dan Torti, S.V., 2008, Curcumin: From Ancient Medicine to Current Clinical Trials, *Cell. Mol. Life Sci.*, 65, 1631–1652.
- Higuchi, T., 1963, Mechanism of Sustained Action Medication, Theoretical Analysis of Rate of Release of Solid Drugs Dispersed in Solid Matrices, *J. Pharm. Sci.*, 52 (12), 1145-1149.
- Hiorth, M., Kjønksen, A.L., Knudsen, K.D., Sande, S.A. dan Nyström, B., 2005, Structural and Dynamical Properties of Aqueous Mixtures of Pectin and Chitosan, *Eur. Polym. J.*, 41, 1718–1728.
- Islam, A., Riaz, M. dan Yasin, T., 2013, Structural and Viscoelastic Properties of Chitosan-Based Hydrogel and Its Drug Delivery Application, *Int. J. Biol. Macromol.*, 59, 119-124.
- Jayakumar, R., Prabaharan, M., Nair, S.V., Tokura, S., Tamura, H. dan Selvamurugan, N., 2010, Novel Carboxymethyl Derivatives of Chitin and Chitosan Materials and Their Biomedical Applications, *Progress in Materials Science*, 55, 675–709.
- Jones, A.J., 1987, *Membrane and Separation Technology: The Australian Perspective*, Australian Publishing Service, Canberra.
- Jovanovic, S.V., Steenken, S., dan Boone, C.W., 1999, H-Atom Transfer is a Preferred Antioxidant Mechanism of Curcumin, *J. Am. Chem. Soc.*, 21, 677-681.
- Jurenka, J.S., 2009, Anti-inflammatory Properties of Curcumin, A Major Constituent of Curcuma longa: A Review of Preclinical and Clinical Research, *Altern. Med. Rev.*, 14, 141–153.
- Khattak, S.F., Chin, K.S., Bhatia, S.R. dan Roberts, S.C., 2007, Enhancing Oxygen Tension and Cellular Function in Alginate Cell Encapsulation Devices Through The Use of Perfluorocarbons, *Biotechnol. Bioeng.*, 96, 156-166.
- Kunnumakkara, A.B., Anand, P. dan Aggarwal, B.B., 2008, Curcumin Inhibits Proliferation, Invasion, Angiogenesis and Metastasis of Different Cancers Through Interaction With Multiple Cell Signaling Proteins, *Cancer Letters.*, 269, 199225.



- Kuvamat, S.D., Chaudhari, Y.S., Borole, P., Mishra, P., Shenghani, K., dan Duvvuri, P., 2013, Degradation Studies of Curcumin, *IJPDR*, 3, 2, 50-55.
- Langer, R.S. dan Wise, D.L., 1984, *Medical Applications of Controlled Release, Applications and Evaluation*, Eds., Vol. I and II, CRC Press, Boca Raton.
- Lantz, R.C., Chen, G.J., Solyom, A.M., Jolad, S.D. dan Timmermann, B.N., 2005, The Effect of Tumeric Extract on Inflamatory Mediator Production, *Phytomedicine*, 12, 445-452.
- Leung, M.H.M., Colangelo, H. dan Kee, T.W., 2008, Encapsulation of Curcumin in Cationic Micelles Suppresses Alkaline Hydrolysis, *Langmuir*, 24, 5672-5675.
- Lin, J.K., Pan, M.H., dan Shiau, S.Y.L., 2000, Recent Studies on the Biofunctions and Biotransformations of Curcumin, *Biofactors*, 13, 153-158.
- Lindman, B. dan Stilbs, P., 1984, *Surfactants in Solution*, vol.III, ed. K.L. Mittal and B. Lidman, Plenum Press, New York.
- Ma, Z., Haddadi, A., Molavi, O., Lavasanifar, A., Lai, R. dan Samuel, J., 2008, Micelles of Poly(ethylene oxide)- β -poly(ϵ -aprolactone) as Vehicles for The Solubilization, Stabilization, and Controlled Delivery of Curcumin, *J. Biomed. Mater. Res.*, Part A, 86A, 300-310.
- Macleod, G.S., Collett, J.H. dan Fell, J.T., 1999, The Potential Use of Mixed Films of Pectin, Chitosan and HPMC for Bimodal Drug Release, *J. Control. Release*, 58, 303–310.
- Madhavi, B.B., Vennela, K.S., Masan, P. dan Madipoju, B., 2013, Enhanced Transdermal Drug Penetration of Curcumin Via Ethosomes, *Mal. J. Pram. Sci.*, 1 (11), 49-58.
- Maheshwari, R.K., Singh, A.K., Gaddipati, J. dan Srimal, R.C., 2006, Multiple Biological Activities of Curcumin: A Short Review, *Life Sci.*, 78, 2081–2087.
- Martin, A., Bustamante, P. dan Chun, A.H.C., 1993, *Physical Pharmacy*, 4th Ed., 324-361, Lea and Febiger, Philadelphia, London.
- Meshali, M.M. dan Gabr, K.E., 1993, Effect of Interpolymer Complex Formation of Chitosan with Pectin or Acacia on The Release Behaviour of Chlorpromazine HCl, *Int. J. of Pharm.*, 89, 177–181.
- Minpeng, Z. dan Suhong, L., 2012, The Stability of Curcumin and Drug-Loading Property of Starch Microspheres for It, *ICBBS*, 9, 44-48.
- Nofianty, T., 2008, Pengaruh Formulasi Sediaan Losio Terhadap Efektifitas Minyak Buah Merah Sebagai Tabir Surya Dibandingkan Terhadap Sediaan Tabir Surya yang Mengandung Oktinoksat, *Skripsi*, Program Studi Ilmu Farmasi Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Indonesia, Depok.



- Nordby, M.H., Kjoniksen, A.L., Nystrom, B. dan Roots, J., 2003, Thermoreversible Gelation of Aqueous Mixtures of Pectin and Chitosan, *Rheology, Biomacromolecules*, 4, 337–343.
- Ofori-Kwakye, K. dan Fell, J.T., 2001, Biphasic Drug Release: The Permeability of Films Containing Pectin, Chitosan and HPMC, *Int. J. Pharm.*, 226, 139–145.
- Ofori-Kwakye, K. dan Fell, J.T., 2003, Leaching of Pectin from Mixed Films Containing Pectin, Chitosan and HPMC Intended for Biphasic Drug Delivery, *Int. J. Pharm.*, 250, pp. 251-257.
- Pasquali, R.C., Sacco, N. dan Bregni, C., 2009, The Studies on Hydrophilic-Lipophilic Balance (HLB), *Lat. Am. J. Pharm.*, 28(2): 313-317.
- Patel, R., Singh, S., Sheth, N.R. dan Gendle, R., 2009, Development and Characterization of Curcumin Loaded Transfersome for Transdermal Delivery, *J. Pharm. Sci. & Res.*, 4, 71-80.
- Patra, D., dan Sleem, F., 2013, A New Methods for pH triggered curcumin release by Applying Poly(l-lysine) Mediated Nanoparticle-Congregation, *Analytica Chimica Acta*, 795, 60– 68.
- Peppas, N.A., 1986, *Hydrogels in Medicine and Pharmacy: Fundamentals*, CRC Press.
- Pfeiffer, E., Hohle, S., Solyom, A. dan Metzler, M., 2003, Study of Turmeric Constituents, *J. Food Eng.*, 56, 257–259.
- Perrone, P., Hewage, C.M., Thomson, A.R., Bailey, K., Salder, I.H. dan Fry, S.C., 2002, Patterns of Methyl and O-acetyl Esterification in Spinach PectinsNew Complexity, *Phytochemistry*, 60, 67–77.
- Raini, M., Mutiatikum, D. dan Lestari, P., 2010, Uji Disolusi dan Penetapan Kadar Tablet Loratadin Inovator dan Generik Bermerek, *Media Litbang Kesehatan*, 2,20, 59-64.
- Ratanajiajaroen P. dan Oshima, M., 2012, Synthesis, Release Ability and Bioactivity Evaluation of Chitin Beads Incorporated with Curcumin for Drug Delivery Applications, *J. Microencapsul.*, 29,6, 549-558.
- Reddy, R.C., Vatsala, P.G., Keshamouni, V.G., Padmanaban, G. dan Rangarajan, P.N., 2005, Curcumin for Malaria Therapy, *Biochem. Biophys. Res. Commun.*, 326, 472–474.
- Reeves, L.R. dan Harkaway, S.A., 1977, *Micellization, Solubilition and Microemulsion*, Vol. 2, editor K. L. Mital, Plenum Press, New York.
- Rege, P.R., dan Lawrence, H.B., 1999, Chitosan Processing: Influence of Process Parameters During Acidic and Alkaline Hydrolysis and Effect of The Processing Sequence on The Resultant Chitosan's Properties, *Carbohydr. Res.*, 321, 235-245.



- Ribeiro, L.N.M., Alcântara, A.C.S., Darder, M., Aranda, P., Araújo-Moreira, F.M. dan Ruiz-Hitzky, E., 2014, Pectin-Coated Chitosan-LDH Bionanocomposite Beads as Potential Systems for Colon-Targeted Drug Delivery, *Int. J. Pharm.*, 463, 1-9.
- Ritger, R.L. dan Peppas, N.A., 1987, A Simple Equation for Disposition of Salute Release-II, *J. Controlled Release*, 5, 37-42.
- Roberts, G.A.F., 1992, *Chitin Chemistry*, London: Macmillan.
- Robinson, J.R., Lee, V.H.L. dan Dekker, M., 1987, *Controlled Drug Delivery*, Basel Inc, New York.
- Rohman, A., 2012, Mini Review Analysis of Curcuminoids in Food and Pharmaceutical Products, *Int. Food Res. J.*, 19, 1, 19-27.
- Ron, E., Langer, R. dan Kydonieus, A., 1992, *Treatise on Controlled Drug Delivery: Fundamentals, Optimization, Applications*, Marcel Dekker, New York., 199-212.
- Ruby, A.J., Kuttan, G., Babu, K.D., Rajasekharan, K.N. dan Kuttan, R., 1995, Antitumor and Antioxidant Activity of Natural Curcuminoids, *Cancer Lett.*, 94, 79-83.
- Sahu, A., Kasoju, N. dan Bora, B., 2008, Fluorescence Study of The Curcumin-Casein Micelle Complexation and Its Application as a Drug Nanocarrier to Cancer Cells, *Biomacromolecules*, 9, 2905-2912.
- Shen, L. dan Hong-Fang, J., 2012, The Pharmacology of Curcumin: Is It The Degradation Products?, *Mol. Med.*, 3, 18, 138-144.
- Singh, R., 2015, *Membrane Technology and Engineering for Water Purification (Second Edition) Chapter 1-Introduction to Membrane Technology-Application, Systems Design and Operation*, 1-80, Butterworth-Heinemann.
- Singhvi, G. dan Singh, M., 2011, Review: In-Vitro Drug Release Characterization Models, *Int. J. Pharm. Res.*, 2, 77-84.
- Song, S., Wang, Z., Qian, Y., Zhang, L. dan Luo, E., 2012, The Release Rate of Curcumin from Calcium Alginate Beads Regulated by Food Emulsifiers, *J. Agric. Food. Chem.*, 60, 4388-4395.
- Stankovic, I., 2004, Curcumin Chemical and Technical Assessment (CTA), *Joint FAO/WHO Expert Committee on Food Additives (JECFA)*, Roma.
- Sun, M., Gao, Y., Guo, C., Cao, F., Song, Z., Xi, Y., Yu, A., Li, A. dan Zhai, G., 2010, Enhancement of Transport of Curcumin to Brain in Mice by Poly(n-Butylcyanoacrylate) Nanoparticle, *J. Nanopart. Res.*, 12, 3111-3122.
- Sutriyo, Joshita, D. dan Indah, R., 2005, Perbandingan Pelepasan Propranolol Hidroklorida dari Matriks Kitosan, Etil Selulosa (EC) dan Hidroksi Propil Metil Selulosa (HPMC), *Majalah Ilmu Kefarmasian*, 2 (3), 145-153.



- Sriamornsak, P., 2011, Application of Pectin in Oral Drug Delivery, *Expert Opinion on Drug Delivery*, 8,8, 1009–1023.
- Tolaimatea, A., Desbrieresb, J., Rhazia, M., dan Alaguic, A., 2003, Contribution to The Preparation of Chitins and Chitosans with Controlled Physico-Chemical Properties, *Polym. J.*, 44, 7939-7952.
- Tønnesen, H.H. dan Karlsen, J., 1985, Studies of Curcumin and Curcuminoids: V. Alkaline Degradation of Curcumin, *Z. Lebensm. Unters. Forsch.*, 180, 132-134.
- Tønnesen, H.H. dan Karlsen, J., 1985, Studies on Curcumin and Curcuminoids: VI. Kinetics of Curcumin Degradation in Aqueous Solution, *Z. Lebensm. Unters. Forsch.*, 180, 402-404.
- Tønnesen, H.H., M_asson, M. dan Loftsson, T., 2002, Studies of Curcumin and Curcuminoids. XXVII. Cyclodextrincomplexation: solubility, chemical and photochemical stability". *Int. J. Pharm.*, 244, 127135.
- Wang, D., Williams, C.G., Li, Q., Sharma, B. dan Elisseeff, J.H., 2003, *Biomaterials*, 24, 3969–3980.
- Wang, Q., Dong, Z., Du, Y. dan Kennedy, J.F., 2007, Controlled Release of Ciprofloaxacin Hydrochloride from Chitosan/Polyethylene glycol Blend Films, *Carbohydrate Polymers*, 69, 336–343.
- Wang, Q., Zhang, N., Hu, X., Yang, D. dan Du, Y., 2007, Chitosan/Starch Fibers and Their Properties for Drug Controlled Release, *J. Pharm. Biopharm.*, 66, 398-404.
- Wang, Y.J., Pan, M.H., Cheng, A.L., Lin, L.I., Ho, Y.S., Hsieh, C.Y. dan Lin, J.K., 1997, Stability of Curcumin in Buffer Solutions and Characterization of Its Degradation Products, *J. Pharm. Biomed. Anal.*, 15, 1867–1876.
- Wenten, I.G., 2002, Recent Development in Membrane Science and Its Industrial Applications, *Songklanakarin J. Sci. Technol.*, 24, 1009-1024.
- Wolf, B., Lam, S., Kirkland, M. dan Frith, W.J., 2007, Shear Thickening of An Emulsion Stabilized with Hydrophilic Silica Particles, *J. Rheol.*, 51, 465-478.
- Wu, X., Xu, J., Huang, X. dan Wen, C., 2011, Self-Microemulsifying Drug Delivery System Improves Curcumin Dissolution and Bioavailability, *Drug Dev. Ind. Pharm.*, 37, 1, 15-23.
- Yao, K.D., Liu, J., Cheng, G.X., Lu, X.D., Tu, H.L. dan Silva, J.A.L.D., 1996, Swelling Behavior of Pectin/Chitosan Complex Films, *J. Appl. Polym. Sci.*, 60, 279–283.
- Zheng, X.F.,Lian, Q. dan Song, S.T., 2013, Chitosan–Gelatin–Pectin Composite Films from Polyion-Complex Hydrogels, *Asian J. Chem.*, 24, 5363–5366.