

DAFTAR PUSTAKA

- Abia, A.A., Horsfall, M.Jr., and Didi, O., 2003, The Use of Chemically Modified and Unmodified Cassava Waste for The Removal of Cd, Cu, and Zn Ion from Aqueous Solution, *Bioresource Tech.*, 90(3), 345-348.
- Agarwal, B., Sengupta, P., and Balomajumder, C., 2013, Equilibrium, Kinetic, and Thermodynamic Studies of Simultaneous Co-adsorptive Removal of Phenol and Cyanide Using Chitosan, *Int. J. Of. Chem. Mol. Nuc. Mat. And Met Eng.*, 7(11), 863-870.
- Ahmad, M., Ahmed, S., Swami, B.L., and Ikram, S., 2015, Adsorption of Heavy Metal Ions: Role of Chitosan and Cellulose for Water Treatment, *Int. J. Of. Pharm.*, 2(6), 280-289.
- Al-Ghouti, M.A., and Da'ana, D.A., 2020, Guidelines for the Use and Interpretation of Adsorption Isotherm Models: A Review, *J. Hazard. Mater.*, 393, 1-22.
- Al-Ghouti, M.A., and Razavi, M.M., 2020, Water Reuse: Brackish Water Desalination Using *Prosopis juliflora*, *Environ. Technol. Innov.*, 17, 1-16.
- Arabi, F., Imandar, M., Negahdary, M., Imandar, M., Noughabi, M.T., Akbari-dastjerdi, H., and Fazilati, M., 2012, Investigation Antibacterial Effect of Zinc Oxide Nanoparticles Upon Life of *Listeria monocytogenes*, *Annals of Biol Resc.*, 3(7), 3679-3685.
- Balouiri, M., Sadiki, M., and Ibensouda, S.K., 2016, Methods for In Vitro Evaluating Antimicrobial Activity: A Review, *J. Pharm. Anal.*, 6(2), 71-79.
- Barros, M.A.S.D., Zola, A.S., Arroyo, P.A., Sousa-Agular, E.F., dan Tavares, C.R.G., 2003, Binary Ion Exchange of Metal Ions in Y and X Zeolites, *Braz. J. Chem. Eng.*, 20(4), 413-421.
- Bhumkar, D.R., and Pokharkar, V., 2006, Studies on Effect of pH on Crosslinking of Chitosan with Sodium Tripolyphosphate, *AAPS PharmSciTech*, 7(2), 138-143.
- Bodnar, M., Hartmann, J.F., and Borbely, J., 2005, Preparation and Characterization of Chitosan-Based Nanoparticles, *J. of. Biomacro.*, 6(5), 2521-2527.
- Bonilla-Petriciolet, A., Mendoza-Castillo, D.I., and Reynel-Avia, H.E., 2017, *Adsorption Processes for Water Treatment and Purification*, Springer, Aguascalientes.
- Cahyaningrum, S.E., 2001, Karakterisasi Adsorpsi Ni(II) dan Cd(II) pada Kitosan dan Kitosan Sulfat dari Cangkang Udang Windu, *Tesis*, Universitas Gadjah Mada, Yogyakarta.
- Castellan, G.W., 1985, *Physical Chemistry*, 2th Ed., Addison Wesley Publishing Company, Massachusetts.
- Choi, C.H., Su, Y.W., and Chang, C., 2013, Effect of Fluid Flow on the Growth and Assembly of ZnO Nanocrystals in a Continuous Flow Microreactor, *CrystEngComm*, 15(7), 3326-3333.

- Covelo, E.F., Vega, F.A., and Andrade, M.L., 2007, Competitive Sorption and Desorption of Heavy Metals by Individual Soil Components, *J. Hazard. Mater.*, 140(1-2), 308-315.
- Darmawan, M., Syamdidi, Yennie, Y., dan Wibowo, S., 2016, Karakteristik Serat Nano Komposit Kitosan-Polivinil Alkohol (PVA) dari Cangkang Rajungan Melalui Proses Electrospinning, *JPBKP*, 11(2), 213-222.
- DeLeo, F.R., Otto, M., Kreiswirth, B.N., and Chambers, H.F., 2010, *Community-Associated Methicillin Resistant Staphylococcus aureus*, Laboratory of Human Bacterial Pathogenesis, Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases, National Institute of Health, Hamilton.
- Dianati, T.R.A., and Mahmood, S., 2004, Study on Removal of Cadmium from Water by Adsorption on GAC, BAC, and Biofilter, *Pak. J. Biol. Sci.*, 7(5), 865-869.
- Diantariani, N.P., Sudiarta, I.W., and Elantiani, N.K., 2008, Proses Biosorpsi dan Desorpsi ion Cr(VI) pada Biosorben Rumput Laut *Eucheuma spinosum*, *J.Kim.*, 2(1), 45-52.
- Diantariani, N.P., 2010, Peningkatan Potensi Batu Padas Ladgestone Sebagai Adsorben Ion Logam Berat Cr(III) dalam Air Melalui Aktivitas Asam dan Basa, *J. Kim.*, 4(1), 91-100.
- Dubey, R., Bajpai, J., and Bajpai, A.K., 2016, Chitosan-Alginate Nanoparticles (CANPs) as Potential Nanosorbent for Removal of Hg(II) Ions, *Env. Nanotech. Mon. And. Manag.*, 6, 32-44.
- Eldin, M.S.M., Omer, A.M., Wassel, M.A., Tamer, T.M., A.B.D. Elmonem, M.S., and Ibrahim, S.A., 2015, Novel Smart pH Sensitive Chitosan Grafted Alginate Hydrogel Microcapsules for Oral Protein Delivery: Preparation and Characterization, *Int. J. Pharm. Pharm. Sci.*, 7(10), 320-326.
- Eriningsih, R., Marlina, R., Mutia, T., Sana, A.W., dan Titis, A., 2014, Eksplorasi Kandungan Pigmen dan Alginat dari Rumput Laut Coklat untuk Proses Pewarnaan Kain Sutera, *Arena Tekstil*, 29(2), 73-80.
- Fatha, A., 2007, Pemanfaatan Zeolit Aktif untuk Menurunkan BOD dan COD Limbah Tahu, *Skripsi*, Universitas Negeri Semarang, Malang.
- Fatimah, N., Prasetya, A.T., dan Sumarni, W., 2014, Penggunaan Silika Gel Terimobilisasi Biomassa *Aspergillus niger* untuk Adsorpsi Logam Fe(III), *Indones. J. Chem.*, 3(3), 183-187.
- Forster, U., and Wittman, T.W., 1983, *Metal Pollution In The Aquatic Environment*, Springer-Zerlag, Berlin.
- Fu, S., Thacker, A., Sperger, D.M., Boni, R.L., Buckner, I.S., Velankar, S., Munson, E.J., and Block, L.H., 2011, Relevance of Rheological Properties of Sodium Alginate in Solution to Calcium Alginate Gel Properties, *AAPS PharmSciTech*, 12(2), 453-460.
- Gazra, R.M., Olguin, M.T., Garcia, S., Alcantara, O., and Rodriguez, F.G., 2000, Silver Suported on Natural Mexican Zeolite As an Antibacterial, *J. Micro and Mesap. Mater.*, 39, 431-444.

- Gerhard, A., D. Ruiter., and Rudolph, B., 1997, Carrageenan Biotechnology, *Trend. In. Food. Sci. Tech.*, 8(12), 389-395.
- Guo, L., Sun, C.M., Li, G.Y., Liu, C.P., and Ji, C.N., 2009, Thermodynamics and Kinetics of Zn(II) Adsorption on Crosslinked Strach Phosphates, *J. Haz. Mat.*, 161(1), 510-515.
- Gyliene, O., Razmute, I., Tarozaitė, R., and Nivinskiene, O., 2003, Chemical Composition and Sorption Properties of Chitosan Produced from Fly Larva Shells, *Chemija*, 14(3), 121-127.
- Habibi, M., 2009, Studi Adsorpsi Ion Nikel(II) dalam Larutan Menggunakan Komposit Serbuk Cangkang Kupang-Khitosan Terikat Silang, *Skripsi*, FMIPA Institut Teknologi Sepuluh Nopember, Surabaya.
- Hamdaoui, O., and Chiha, M., 2007, Removal of Methylene Blue from Aqueous Solution by Wheat Bran, *Acta Chim. Slov.*, 54, 407-418.
- Han, X., Wang, W., and Ma, X., 2011, Adsorption Characteristics of Methylene Blue onto Low Cost Biomass Material Lotus Leaf, *J. Chem. Eng.*, 171, 1-8.
- Hashemian, S., Karimi, A.M., and Salehifar, H., 2013, Kinetics and Thermodynamics of Adsorption Methylene Blue onto Tea Waste/CuFe₂O₄ Composite, *Americ. J. Analy. Chem.*, 4, 1-7.
- Ho, Y., and MacKay, G., 1999, Pseudo-second Order Model for Sorption Processes, *Proc. Biochem.*, 34(5), 451-465.
- Hossain, M.A., Ngo, H., Hao, W.S., Guo, and Nguyen, T. V., 2012, Removal of Copper from Water by Adsorption onto Banana Peel as Bioadsorbent, *Int. J. Geomate*, 2(2), 227-234.
- Husniati dan Oktarina, E., 2014, Sintesis Nano Partikel Kitosan dan Pengaruhnya Terhadap Inhibisi Bakteri Pembusuk Jus Nenas, *JDPI*, 25(2), 89-95.
- Igwe, J.C., and Abia, A.A., 2007, Equilibrium Sorption Isotherm Studies of Cd(II), Pb(II), and Zn(II) Ions Detoxification from Waste Using Unmodified and EDTA-modified Maize Husk, *Electron. J. Biotechnol.*, 10(4), 536-548.
- Igwe, J.C., Ogunewe, D.N., and Abia, A.A., 2005, Competitive Adsorption of Zn(II), Cd(II), and Pb(II) Ions from Aqueous and Non-Aqueous Solution by Maize Cob and Husk, *Afr. J. Biotechnol*, 10(4), 1113-1116.
- Indrasti, N.S., Subroto, M.A., dan Funawan, G.G., 2005, Adsorpsi Logam Berat Seng (Zn) dengan Menggunakan Akar Rambut Solanum ningrum l Galur A₄ Kering Termobilisasi dalam Na-Alginat, *J. Tek. Ind. Pert.*, 15(1), 1-9.
- Irnawati, D., Agustiono, P., dan Wardhani, E.H., 2010, Pengaruh Konsentrasi Cu dalam Cu-Zeolit terhadap Daya Antibakteri pada *Streptococcus mutans*, *Jurnal Zeolit Indonesia*, 9(2), 47-53.
- Jain, V.K., Pillai, S.G., Pandya, R.A., Agrawal, Y.K., and Sharivastav, P.S., 2005, Selective Extraction, Preconcentration, and transport Studies of Thorium(IV) Using Octa-Functionalized Calix[4]resorcinarene-Hydroxamic Acid, *Anal. Sci.*, 21, 129-135.
- Jang, K.I., and Lee, H.G., 2008, Stability of Chitosan Nanopartivles for I-Ascorbic Acid during Heat Treatment in Aqueous Solution, *J. Agric. Food. Chem.*, 56(6), 1936-1941.
- Jawetz, E., Melnick, J.L., dan Adelberg, E.A., 2001, *Mikrobiologi Kedokteran*, EGC, Jakarta.

- Jin, T., Sun, D., Su, J.Y., Zhang, H., and Sue, H.J., 2009, Antimicrobial Efficacy of Zinc Oxide Quantum Dots Against *Listeria monocytogenes*, *Salmonella enteritidis*, and *Escheria coli*, *J. Food. Sci.*, 74, 46-52.
- Kim, S.K., 2011, *Chitin, Chitosan, Oligosaccharides and Their Derivatives: Biological Activities and Applications*, CRC Press, USA.
- Kulig, D., Korzycka, Z., Jarmoluk, A., and Marycz, K., 2016, Study on Alginate-Chitosan Complex Formed with Different Polymers Ratio, *Polymers*, 8(5), 167.
- Kusmayati, dan Agsutini, N.W.R., 2007, Uji Aktivitas Senyawa Antibakteri dari Mikroalga (*Porphyridium cruentum*), *J. Biod.*, 8(1), 48-53.
- Kusuma, S.A.F., 2010, *Escherichia coli*, *Makalah*, Fakultas Farmasi Universitas Padjajaran, Jatinangor.
- Kusuma, I.D.G.D.P., Wiratini, N.M., dan Wiratama, I.G.L., 2014, Isoterm Adsorpsi Cu^{2+} oleh Biomassa Rumput Laut *Eucheuma Spinosum*, *e-Journal Kimia Visvitalis*, 2(1), 1-10.
- Li, Z., Sun, X., Lou, J., and Hwang, J.Y., 2002, Unburned Carbon from Fly Ash for Mercury Adsorption: II Adsorption Isotherms and Mechanism, *J. Min. & Mat. Char. & Eng.*, 2(1), 79-96.
- Li P., Dai, Y.N., Zhang, J.P., Wang, A.Q., and Wei, Q., 2008, Chitosan-Alginate Nanoparticles as a Novel Drug Delivery System for Nifedipine, *IJBS*, 221-228.
- Madigan, M.T., Martinko, J.M., and Parker, J., 2000, *Brock Biology of Microorganism*, Prentice-Hall, New Jersey.
- Masruhin, Rasyid, R., dan Yani, S., 2018, Penjerapan Logam Berat Timbal (Pb) dengan Menggunakan Lignin Hasil Isolasi Jerami Padi, *J. of. Chem. Process. Eng.*, 3(1), 11-20.
- Mesayu, P., 2009, Limbah Arang Sekam Padi Sebagai Adsorben Ion Cr(III) dan Cr(IV), *Skripsi*, IPB, Bogor.
- Modrzejewska, Z., and Kaminski, W., 1999, Separation of Cr(VI) on Chitosan Membranes, *Ind. Eng. Chem. Res.*, 28, 4946-4950.
- Motsi, T., Rowson, N.A., and Simmons, M.J.H., 2009, Adsorption of Heavy Metals From Acid Mine Drainage by Natural Zeolite, *Int. J. Miner. Process.*, 92, 42-48.
- Moura, M.R., Aouada, F.A., Avena-Bustillos, R.J., McHufh, T.H., Krochta, J.M., and Mattoso, L.H.C., 2008, Improved Barrier and Mechanical Properties of Novel Hydrixypropyl-methylcellulose Edible Films with Chitosan/Triphosphosphate Nanoparticles, *J. Food. Eng.*, 92, 448-453.
- Muhammad, 2013, Adsorpsi Kinetik Ion Logam Zn^{2+} Menggunakan Karbon Aktif dari Tempurung Kelapa Sawit: Perbandingan Model Linear dan Nonlinear, *JTKU*, 1(2), 1-12.
- Ngah, W.S.W., and Fatinathan, S., 2010, Adsorption Characterization of Pb(II) and Cu(II) Ions Onto Chitosan-triphosphosphate Beads: Kinetic, Equilibrium and Thermodynamic Studies, *J. Enviro. Manag.*, 91(4), 958-969.
- Nurhayari, L.S., Yahdiyani, N., dan Hidayatulloh, A., 2020, Perbandingan Pengujian Aktivitas Antibakteri Stater Yogurt dengan Metode Difusi Sumuran dan Metode Difusi Cakram, *JTHP*, 1(2), 41-46.

- Novarini, E., dan Wahyudi, T., 2011, Sintesis Nanopartikel Seng Oksida (ZnO) Menggunakan Surfaktan Sebagai Stabilisator dan Aplikasinya pada Pembuatan Tekstil Antibakteri, *Arena Tekstil*, 26(2), 61-120.
- Oktarina, E., Adrianto, R., dan Setiawati, I., 2017, Imobilisasi Bakteri pada Kitosan-Alginat dan Kitin-Alginat, *Majalah teknologi Agro Industri*, 9(2), 1-8.
- Pasquet, J., Chevalier, Y., Pelletier, J., Couval, E., Bouvier, D., and Blozinger, M.A., 2014, The Contribution of Zinc Ions to The Antimicrobial Activity of Zinc Oxide, *Colloids and Surfaces A:Physicochemical and Engineering Aspect*, 457, 263-274.
- Pelczar, M.J., dan Chan, E.C.S., 2006, *Dasar-Dasar Mikrobiologi Jilid 2*, UI Press, Jakarta.
- Piccin, J.S., Dotto, G.L., and Pinto, L.A.A., 2011, Adsorption Isotherms and Thermochemical Data of FDandC RED N° 40 Binding by CHitosan, *Brazilian J. Chem. Eng.*, 28(2), 295-304.
- Pratiwi, R., 2008, Perbedaan Daya Hambat terhadap *Streptococcus mutans* dari Beberapa Pasta Gigi yang Mengandung Herbal, *Maj. Kedokt. Gigi.*, 38(2), 64-67.
- Prihandani, S.S., Poeloengan, M., Noor, S.M., dan Andriani, 2015, Uji Daya Antibakteri Bawang Putih (*Allium sativum L.*) terhadap Bakteri *Staphylococcus aureus*, *Escherichia coli*, *Salmonella typhimurium* dan *Pseudomonas aeruginosa* dalam Meningkatkan Keamanan Pangan, *Informatika Pertanian*, 24(1), 53-58.
- Puspawati, N.M., dan Simpen, I.N., 2010, Optimasi Deasetilasi Khitin dari Kulit Udang dan Cangkang Kepiting Limbah Restoran Seafood Menjadi Khitosan Melalui Variasi Konsentrasi NaOH, *J. Kim.*, 4(1), 79-90.
- Qiu, H., Lv, L., and Pan, B.C., Zhang, Q.J., Zhang, W.M., and Zhang, Q.X., 2009, Critical Review in Adsorption Kinetic Models, *J. Zhej. Univ. Sci. A.*, 10, 716-724.
- Radwan, A.A., Alanazi, F.K., and Alsarra, I.A., 2010, Microwave Irradiation-Assisted Synthesis of a Novel Crown Ether Crosslinked Chitosan as a Chelating Agent for a Heavy Metal Ions (M^{+n}), *Molecules*, 15(9), 6257-6268.
- Rahayu, H.S., Elystia, S., dan Azis, Y., 2016, Adsorpsi Logam Seng (Zn) Menggunakan *Precipitated Calcium Carbonate* (PCC) dari Limbah Cangkang Kerang Lokan (*Geloina expansa*), *Jom FTEKNIK*, 3(2), 1-8.
- Ramli, R.H., Soon, C.F., and Mohd Rus, A.Z., Synthesis of Chitosan/Alginate/Silver Nanoparticles Hydrogel Scaffold, *MATEC Web Conf.*, 78, 1-8.
- Reynold, T.D., 1982, *Unit Operation and Process in Evironmental Engineering*, Woods Worths Inc., Texas.
- Rezaei, H., Haghshenasfard, M., and Moheb, A., 2016, Optimization of Dye Adsorption Using Fe_3O_4 Nanoparticles Encapsulated with Alginate Beads by Taguchi Method, *Adsorpt. Sci. Tech.*, 35(1), 55-71.
- Rifandi, R.A., Santosan, G.W., dan Ridlo, A., 2014, Pengaruh Konsentrasi Asam Klorida (HCl) terhadap Mutu Alginat Rumput Laut Coklat *Sargassum sp.*

- dari Perairan Teluk Awur Kab. Jepara dan Poktunggal Kab. Gunungkidul, *J. Maret. Res.*, 3(4), 676-684.
- Rochmah, V., Prasetya, A.T., dan Sulistyaningsih, T., 2017, Adsorpsi Ion Logam Pb^{2+} Menggunakan Limbah Serbuk Gergaji Kayu Mahoni, *Ind. J. Chem. Sci.*, 6(2), 168-172.
- Rohmah, W.M., Salim, M.A., dan Hasby, R.M., 2018, Imobilisasi Biomassa *Haematococcus pluvialis* pada Alginat Sebagai Biosorben Logam Berat Seng (Zn), *Pros. Sem. Nas. Hayati.*, 6(1), 258-267.
- Rodrigues, J.R., and Lagoa, R., 2006, Copper Ions Binding in Cu-Alginate Gelation, *J. Carbohydr. Chem.*, 25, 219-232.
- Romadhan, M.F., Suyatma, N.E., dan Taqi, F.M., 2016, Synthesis of ZnO Nanoparticles by Precipitation Method With Their Antibacterial Effect, *Ind. J. Chem.*, 6(2), 168-172.
- Saadi, R., Saadi, Z., Fazaeli, R., and Fard, N.E., 2015, Monolayer and Multilayer Adsorption Isotherm Models for Sorption from Aqueous Media, *Korean J. Chem. Eng.*, 32, 787-799.
- Sahoo, T.R., and Prelot, B., 2020, Adsorption Processes for the Removal of Contaminants from Wastewater, In *Nanomaterials for the Detection and Removal Wastewater Pollutants*, Elsevier, 161-222.
- Sardjono, R.E., 2007, Sintesis dan Penggunaan Tetramer Siklis Seri Kaliksresorsinarena., Alkoksikaliksarena, dan Alkenilikaliksarena untuk Adsorpsi Kation Logam Berat, *Disertasi*, Universitas Gajah Mada, Yogyakarta.
- Sari, D.P., dan Abdiani, I.M., 2015, Pemanfaatan Kulit Udang dan cangkang Kepiting sebagai Bahan Baku Kitosan, *J.Hard. Bor.*, 6(1), 142-147.
- Savage, N., and Diallo, M.S., 2005, Nanomaterials and Water Purification: Opportunities and Challenges, *J. Nano. Res.*, 7(4), 331-342.
- Seetharaj, R., Vandana, P.V., Arya, P., dan Mathew, S., 2019, Dependence of solvents, pH, molar ratio and temperature in Tuning Metal Organic Framework Architecture, *Arb. J. Chem.*, 2(3), 295-315.
- Sejdini, M., Begzati, A., Salihu, S., Krasniqi, S., Barisha, N., and Aliu, N., 2018, The Role and Impact of Salivary Zn Levels on Dental Caries, *Int. J. Dent.*, 1-6.
- Silalahi, I.H., Zahara, T.A., dan Tampubolon, H.M., 2012, Kapasitas Adsorpsi Merkuri Menggunakan Adsorben Teraktivasi, *Bio. Ind.*, 3(1), 28-38.
- Sivaiah, M.V., Venkatesan, K.A., and Sasidhar, P., Ion Exchange Studies of Cerium(III) on Uranium Antimonate, *J. Nucl. Radiochem. Sci.*, 5(1), 7-10.
- Sivakami, M.S., Thandapani, G., Jayachandran, V., Hee, S.J., Se, K.K., and Sudha, P.N., 2013, Preparation and Characterization of Nano Chitosan for Treatment Watewaters, *Int. J. Biol. Macromol.*, 57, 204-211.
- Smetana, A.B., Klabunde, K.J., Marchin, G.R., and Sorensen, C.M., 2008, Biocidal Activity of Nanocrystalline Silver Powders and Particles, *Langmuir*, 24, 7457-7464.
- Soelama, H.J.J., Kepel, B.J., dan Siagian, K.V., 2015, Uji *Minimum Inhibitory Concentration* (MIC) Ekstrak Rumput Laut (*Eucheuma cottonii*) sebagai Antibakteri terhadap *Streptococcus mutans*, *J. Eg.*, 3(2), 374-379.

- Song, C., Yu, H., Zhang, M., Yang, Y., and Zhang, G., 2013, Physicochemical Properties and Antioxidant Activity of Chitosan from The Blowfly *Chrysomya megacephala* Larvae, *Int. J. Biol. Macromol.*, 60, 347-354.
- Strahl, E.D., Dobson, W.E., and Jr. Lundie, L.L., 2002, Isolation and Screening of Brittlestar-Associated Bacteria for Antibacterial Activity, *Curr. Microbiol.*, 44, 450-459.
- Sugita, P., Wkirsari, T., Sjahriza, A., dan Wahyono, D., 2009, *Kitosan Sumber Biomaterial Masa Depan*, IPB Press, Bogor.
- Sukma, D.H., Riani, E., dan Pakpahan, E.N., 2018, Pemanfaatan Kitosan Sebagai Adsorben Sianida pada Limbah Pengolahan Bijih Emas, *JPHPI*, 21(3), 460-470.
- Syahputri, F.N., dan Patricia, V.M., 2019, Pengaruh Penambahan Emulgator Tween dan Span Terhadap Stabilitas Krim, *JSTE*, 1(2), 140-146.
- Tania, D., Marchaban, dan Kuswahyuning, R., 2020, Formulasi Emulsi Ganda Air dalam Minyak dalam Air (A/M/A) dengan Variasi Konsentrasi *Carboxymethyl Cellulose Sodium*, *J. Food Pharm. Sci.*, 8(2), 284-293.
- Tantowidjojo, V.R., Roosdiana, A., dan Prasetyawan, S., 2013, Optimasi Amobilisasi Pektinase dari *Bacillus Subtilis* Menggunakan Kitosan-Natrium Tripolifosfat, *J. Il. Kim. Universitas.Brawijaya.*, 1(1), 91-97.
- Tarigan, Z., Edward, dan Rozak, A., 2003, Kandungan Logam Berat Pb, Cd, Cu, Zn, dan Ni dalam Air Laut dan Sedimen di Muara Sungai Membramo Papua dalam Kaitannya dengan Kepentingan Budidaya Perikanan, *Jurnal Sains*, 7(2), 119-127.
- Trisnawati, A.R., dan Cahyaningrum, S.E., 2014, Enkapsulasi Pirazinamid Menggunakan Alginat-Kitosan dengan Variasi Konsentrasi Penambahan Surfaktan Tween 80, *J. Chem.*, 3(3), 27-33.
- Wan, Y., A.M. Katherine, Creber, Peppley, B., and Tam, B.V., 2003, Synthesis, Characterication and Ionic Conductive Properties of Phosphorylated Chitosan Membranes, *Mac. Chem. Phy.*, 204, 850-858.
- Wardiyanti, S., Fisli, A., dan Ridwan, 2011, Penyerapan Logam Ini dalam Larutan Oleh Nanokomposit Fe₃O₄-Karbon Aktif, *JUSAMI*, 12(3), 224-228.
- Wijayanti, I.E., dan Kurniawati, E.A., Studi Kinetika Adsorpsi Isoterm Persamaan Langmuir dan Freundlich pada Abu Gosok Sebagai Adsorben, *J. Kim. dan. Pend.*, 4(2), 175-184.
- Yao, Y., Xu, F., Chen, M., Xu, Z., and Zhu, Z., 2010, Adsorption Behavior of Methylene Blue on Carbon Nanotubes, *Bio. Tech.*, 101, 3040-3046.
- Yasim, N.S.E.M., Ismail, Z.S., Zaki, S.M., and Azis, M.F.A., 2016, Adsorption of Cu, As, Pb, and Zn by Banana Trunk, *Malaysian. J. Anal. Sci.*, 20(1), 187-196.
- Yoncheva, K., Merino, M., Shenol, A., Daskalov, N.T., Petkov, P.S., Vayssilov, G.N., and Garrido, M.J., 2018, Optimazation and In-Vitro/In-Vivo Evaluation of Doxorubicin-loaded Chitosan-Alginate Nanoparticles Using a Melanoma Mouse Model, *Int. J. Pharm.*, 1-32.
- Yustinah, Hudzaifah, Aprilia, M., dan Syamsudin, A.B., 2019, Kesetimbangan Adsorpsi Logam Berat (Pb) dengan Adsorben Tanah Diatomit Secara Batch, *Konv*, 9(1), 17-27.

- Yu-Shin, L., Kiran, S., Kurt, M.L., Jyuhn, H.J., Long, F., Hn, Y., and Hsing, W.S., 2008, Multi-ion-crosslinked Nanoparticles with pH-responsive Characteristic for Oral Delivery of Protein Drugs, *J. Cont. Rel.*, 132, 141-149.
- Zhao, X., Wang, H., Peng, H., Wang, L., Lu, X.H., Huang, Y.J., Chen, J., and Chao, T.K., 2017, Buoyant ALG/HA/HGMs Composite Adsorbents for Highly Efficient Removal of Copper from Aqueous Solution and Contaminated Kaolin Soil, *Chem. Eng. J.*, 327, 244-256.
- Zhou, L., Wang, Y., Liu, Z., and Huang, Q., 2009, Characteristics of Equilibrium, Kinetics Studies for Adsorption of Hg(II), Cu(II), and Ni(II) Ions by Thiourea-Modified Magnetic Chitosan Microspheres, *J. Haz. Mat.*, 161, 995-1002.