

DAFTAR PUSTAKA

- Ahmad, S.I., Ahmad, R., Khan, M.S., Kant, R., Shahid, S., Gautam, L., Hasan, G.M., and Hassan, M.I., 2020, Chitin and its derivatives: Structural properties and biomedical applications, *Int J Biol Macromol*, 164, 526–539.
- de Alvarenga, E.S., de Oliveira, C.P., and Bellato, C.R., 2010, An approach to understanding the deacetylation degree of chitosan, *Carbohydr Polym*, 80, 1155–1160.
- Aminah, S. and Hersoelistyorini, W., 2021, Review Artikel: Enkapsulasi Meningkatkan Kualitas Komponen Bioaktif Minuman Instan,. In, *Prosiding Seminar Nasional Unimus*.
- Anderson, M.J. and Whitcomb, P.J., 2016, RSM simplified: optimizing processes using response surface methods for design of experiments, Productivity press.
- Andreasen, A., Rasmussen, K.R., and Mandø, M., 2018, Plant wide oil and gas separation plant optimisation using response surface methodology, *IFAC-PapersOnLine*, 51, 178–184.
- Anindya, A.L., 2018, Particle size analyser: beberapa penggunaan instrumen hamburan cahaya,. In, *Prosiding Seminar Nasional Instrumentasi, Kontrol dan Otomasi.*, pp. 59–62.
- Ansel, H.C., 1989, Pengantar bentuk sediaan farmasi,.
- Argo, B.D. and Amaliyah, F.A., 2020, Pengaruh gelombang mikro terhadap kualitas hasil minyak atsiri jahe (*Zingiber officinale*) dengan hidrodistilasi, *agriTECH*, 40, 332–339.
- Arianto, A. and Cindy, C., 2019, Preparation and evaluation of sunflower oil nanoemulsion as a sunscreen, *Open Access Maced J Med Sci*, 7, 3757.
- Ayuningtyas, V.K., Tahir, M., and Same, M., 2017, Pengaruh waktu perendaman dan konsentrasi giberelin (GA3) pada pertumbuhan benih cemara laut (*Casuarina equisetifolia* L.), *Jurnal Agro Industri Perkebunan*, 29–38.
- Bastaman, 1989, Studies on Degradation and Extraction of Chitin and Chitosan from Prawn Shells,.
- Bonnet, M., Cansell, M., Placin, F., David-Briand, E., Anton, M., and Leal-Calderon, F., 2010, Influence of ionic complexation on release rate profiles from multiple water-in-oil-in-water (W/O/W) emulsions, *J Agric Food Chem*, 58, 7762–7769.

- Cahyono, E., 2018, Karakteristik kitosan dari limbah cangkang udang windu (*Panaeus monodon*), *Akuatika Indonesia*, 3, 96–102.
- Chen, J., Sun, D.X., and Wu, C.F.J., 1993, A Catalogue of Two-Level and Three-Level Fractional Factorial Designs with Small Runs,.
- Cheng, M., Zeng, G., Huang, D., Yang, C., Lai, C., Zhang, C., and Liu, Y., 2017, Advantages and challenges of Tween 80 surfactant-enhanced technologies for the remediation of soils contaminated with hydrophobic organic compounds, *Chemical Engineering Journal*, 314, 98–113.
- Derringer, G. and Suich, R., 1980, Simultaneous optimization of several response variables, *Journal of quality technology*, 12, 214–219.
- Desbrianto, D., Ulfa, A.M., and Lestari, Y.E., 2024, Uji Stabilitas Formulasi Spray Nanoemulsi Variasi Polietilen Glikol 400 Ekstrak Bunga Telang (*Clitoria ternatea L.*) Sebagai Tabir Surya, *JFM (Jurnal Farmasi Malahayati)*, 7, 132–145.
- Dwiastuti, R. and Dewi, N.K.D.P.K., 2022, Aplikasi metode optimasi central composite design dalam formulasi sediaan gel nanopartikel lipid dengan bahan aktif 4-n-butilresorcinol, *Jurnal Ilmiah Manuntung: Sains Farmasi Dan Kesehatan*, 8, 71–81.
- Griffiths, D.J., 2023, Introduction to electrodynamics, Cambridge University Press.
- Hakim, A.R., Handoyo, W.T., and Prasetyo, A.W., 2020, A simulation study of parameters influencing microwave heating of seaweed (*Eucheuma cottonii*),. In, *Journal of Physics: Conference Series*. IOP Publishing, p. 012026.
- Hamed, I., Özogul, F., and Regenstein, J.M., 2016, Industrial applications of crustacean by-products (chitin, chitosan, and chitooligosaccharides): A review, *Trends Food Sci Technol*, 48, 40–50.
- Hapsari, R. B., Pranoto, Y., Murdiati, A., Supriyanto, S., 2022, Optimasi Proses Nanopresipitasi pada Nanoenkapsulasi Ekstrak Kasar Daun Kakao (*Theobroma cacao L.*) Menggunakan Response Surface Methodology (RSM), *agriTECH*, 1(42), 75-85.
- Hidayat, I.R., Zuhrotun, A., and Sopyan, I., 2021, Design-expert software sebagai alat optimasi formulasi sediaan farmasi, *Majalah Farmasetika*, 6, 99–120.
- Husni, P., Hisprastin, Y., and Januarti, M., 2019, Formulasi dan uji stabilitas fisik sediaan emulsi minyak ikan lemuru (*Sardinella lemuru*), *As-Syifaa Jurnal Farmasi*, 11, 137–146.

- Jafari, S.M., 2017, An overview of nanoencapsulation techniques and their classification, *Nanoencapsulation technologies for the food and nutraceutical industries*, 1–34.
- Jusnita, N. and Tridharma, W.S., 2019, Karakterisasi nanoemulsi ekstrak daun kelor (*Moringa oleifera* Lamk.), *Jurnal Sains Farmasi & Klinis*, 6, 16–24.
- Katouzian, I. and Jafari, S.M., 2016, Nano-encapsulation as a promising approach for targeted delivery and controlled release of vitamins, *Trends Food Sci Technol*, 53, 34–48.
- Kirkpatrick, A.T. and Kuo, K.K., 2024, *Principles of Combustion*, John Wiley & Sons.
- Kumar, Santosh, Singh, N., Devi, L.S., Kumar, Shrawan, Kamle, M., Kumar, P., and Mukherjee, A., 2022, Neem oil and its nanoemulsion in sustainable food preservation and packaging: Current status and future prospects, *J Agric Food Res*, 7, 100254.
- Kurniati, F., Hartini, E., and Solehudin, A., 2019, Effect of type of natural substances plant growth regulator on nutmeg (*Myristica Fragrans*) seedlings, *Agrotechnology Research Journal*, 3, 1–7.
- Kusmiati, A.R. and Hayati, N., 2020, Pemanfaatan kitosan dari cangkang udang sebagai adsorben logam berat pb pada limbah praktikum kimia farmasi, *Indonesian Journal of Laboratory*, 3, 6–14.
- Kusumo, S., 1990, Zat pengatur tumbuh tanaman, *Penerbit CV. Yasaguna. Jakarta*, 75, .
- Listyorini, N.M.D., Wijayanti, N., and Astuti, K.W., 2018, Optimasi pembuatan nanoemulsi virgin coconut oil, *Jurnal Kimia*, 12, 8–12.
- Mao, X., Guo, N., Sun, J., and Xue, C., 2017, Comprehensive utilization of shrimp waste based on biotechnological methods: A review, *J Clean Prod*, 143, 814–823.
- Martin, A., Swarbrick, J., and Cammarata, A., 1993, *Farmasi Fisik: Dasar-dasar Kimia Fisik dalam Ilmu Farmasetik 2*,.
- Mashuni, M., Natsir, M., Lestari, W.M., Hamid, F.H., and Jahiding, M., 2021, Pemanfaatan kitosan dari cangkang kepiting bakau (*Scylla serrata*) dengan metode microwave sebagai bahan dasar kapsul obat, *ALCHEMY Jurnal Penelitian Kimia*, 17, 74–82.
- Misra, S., Pandey, P., and Mishra, H.N., 2021, Novel approaches for co-encapsulation of probiotic bacteria with bioactive compounds, their health

benefits and functional food product development: A review, *Trends Food Sci Technol*, 109, 340–351.

Mohadi, R., Nurlisa, H., and Miranda, R., 2009, Synthesis and Characterization of Composite Fe-chitosan and Its Application for Wastewater Treatment,. In, *Proceeding of 1st International Conference on Advances in Wastewater Treatment and Reuse, Tehran*.

Munawiroh, S.Z., Handayani, F.S., and Nugroh, B.H., 2020, Optimasi formulasi nanoemulsi minyak biji anggur energi tinggi dengan Box Behnken Design (BBD), *Majalah Farmasetika*, 4, 93–99.

Mursal, I.L.P., Warsito, A.M.P., Ariyanti, D.K., Susanti, E.I., and Irma, R., 2023, Penggunaan Nanopartikel Kitosan sebagai Penghantar Obat Baru, *Journal of Pharmaceutical and Sciences*, 804–809.

Mursida, M., Tasir, T., and Sahriawati, S., 2018, Efektifitas larutan alkali pada proses deasetilasi dari berbagai bahan baku kitosan, *J Pengolah Has Perikan Indones*, 21, 356–366.

Myers, R.D.M. and C.A.-C., 2016, Response Surface Methodology, 4th ed.

Nadia, L.M.H., Suptijah, P., and Ibrahim, B., 2014, Produksi dan karakterisasi nano kitosan dari cangkang udang windu dengan metode gelasi ionik, *J Pengolah Has Perikan Indones*, 17, 119–126.

Nainggolan, K.N., 2023, Ekstraksi Enzimatik Kitin dan Kitosan dari Limbah Udang, *Manfish Journal*, 4, 50–71.

Nuri, W., 2013, Pengaruh Daya Listrik Oven Gelombang Mikro terhadap Pemecahan Emulsi Minyak Mentah Cepu, *Eksergi*, 1(11), 50-56.

Nurmala, N.A., Susatyo, E.B., and Mahatmanti, F.W., 2018, Sintesis Kitosan dari Cangkang Rajungan Terkomposit Lilin Lebah dan Aplikasinya sebagai Edible Coating pada Buah Stroberi, *Indonesian Journal of Chemical Science*, 7, 278–284.

de Oca-Ávalos, J.M.M., Candal, R.J., and Herrera, M.L., 2017, Nanoemulsions: stability and physical properties, *Curr Opin Food Sci*, 16, 1–6.

Pakizeh, M., Moradi, A., and Ghassemi, T., 2021, Chemical extraction and modification of chitin and chitosan from shrimp shells, *Eur Polym J*, 159, 110709.

Pertiwi, N.M., Tahir, M., and Same, M., 2016, Respons pertumbuhan benih kopi robusta terhadap waktu perendaman dan konsentrasi giberelin (GA3), *Jurnal Agro Industri Perkebunan*, 1–11.

- Purwanto, H., Hartati, I., and Kurniasari, L., 2010, Pengembangan microwave assisted extractor (MAE) pada produksi minyak jahe dengan kadar zingiberene tinggi, *Jurnal Ilmiah Momentum*, 6, .
- Qin, T., Huang, Q., Li, J., Ayyaz, A., Farooq, M.A., Chen, W., Zhou, Y., Wu, X., Ali, B., and Zhou, W., 2024, Comprehensive characterization of gibberellin oxidase gene family in *Brassica napus* reveals BnGA2ox15 involved in hormone signaling and response to drought stress, *Int J Biol Macromol*, 282, 136822.
- Ratnawati, S.E., Ekantari, N., Pradipta, R.W., and Paramita, B.L., 2018, Aplikasi response surface methodology (RSM) pada optimasi ekstraksi kalsium tulang lele, *Jurnal Perikanan Universitas Gadjah Mada*, 20, 41–48.
- Raviadaran, R., Muthoosamy, K., and Manickam, S., 2018, Simple and multiple emulsions emphasizing on industrial applications and stability assessment,. In, *Food process engineering and quality assurance*. Apple Academic Press, pp. 179–230.
- Rowe, R.C., S.P.J. and Q.M.E., 2009, Handbook of Pharmaceutical Excipients, 6th ed.
- Safaya, M. and Rotliwala, Y.C., 2020, Nanoemulsions: A review on low energy formulation methods, characterization, applications and optimization technique, *Mater Today Proc*, 27, 454–459.
- Saifullah, M., Ahsan, A., and Shishir, M.R.I., 2016, Production, stability and application of micro-and nanoemulsion in food production and the food processing industry,. In, *emulsions*. Elsevier, pp. 405–442.
- Sarjono, P.R., Ismiyanto, Ngadiwiyan, Adiwibawa Prasetya, N.B., Rosydhaulfa, Ariestiani, B., Kusuma, A.B., Darmastuti, N.E., dan Rohman, J.H.F., 2019, Antioxidant Activity from Limonene Encapsulated by Chitosan, IOP Conf. Ser. Mater. Sci. Eng., 509, .
- Sarmah, S., Gogoi, S.B., Xianfeng, F., and Baruah, A.A., 2020, Characterization and identification of the most appropriate nonionic surfactant for enhanced oil recovery, *J Pet Explor Prod Technol*, 10, 115–123.
- Setha, B., Rumata, F., and Silaban, B.B., 2019, Karakteristik kitosan dari kulit udang vaname dengan menggunakan suhu dan waktu yang berbeda dalam proses deasetilasi, *J Pengolah Has Perikan Indones*, 22, 498–507.
- Shabrina, A. and Khansa, I.S.M., 2022, Physical Stability of Sea Buckthorn Oil Nanoemulsion with Tween 80 Variations, *Indonesian Journal of Pharmaceutical Science and Technology*, 1, 14–21.

- Shabrina, A., Pratiwi, A.R., and Muurukmihadi, M., 2020, Stabilitas fisik dan antioksidan mikroemulsi minyak nilam dengan variasi Tween 80 dan PEG 400, *Media Farmasi*, 16, 185–192.
- Shah, S.H., Islam, S., Mohammad, F., and Siddiqui, M.H., 2023, Gibberellic acid: a versatile regulator of plant growth, development and stress responses, *J Plant Growth Regul*, 42, 7352–7373.
- Shahzad, K., Hussain, Sadam, Arfan, M., Hussain, Saddam, Waraich, E.A., Zamir, S., Saddique, M., Rauf, A., Kamal, K.Y., and Hano, C., 2021, Exogenously applied gibberellic acid enhances growth and salinity stress tolerance of maize through modulating the morpho-physiological, biochemical and molecular attributes, *Biomolecules*, 11, 1005.
- Silva, H.D., Cerqueira, M.Â., and Vicente, A.A., 2012, Nanoemulsions for Food Applications: Development and Characterization, *Food Bioproc Tech*, 5, 854–867.
- Solikah, W.Y., Nuryanti, S.D., Nabila, L., Ananda, D.S., Sati, E.L., Sondak, F.K., Inas, H., and Musyaffangatul, I., 2023, Skrining Fitokimia dan Standarisasi Ekstrak Etanol Biji Pala (*Myristica fragrans* Houtt),.
- Soni, M., Yadav, A., Maurya, A., Das, S., Dubey, N.K., and Dwivedy, A.K., 2023, Advances in designing essential oil nanoformulations: An integrative approach to mathematical modeling with potential application in food preservation, *Foods*, 12, 4017.
- Suciati, T., Prihantini, M., and Fidrianny, I., 2019, Optimasi nanoemulsi A/M/A ekstrak etanol daun binahong dan konjugat AG-kitosan menggunakan desain Box-Behnken, *Jurnal Ilmu Kefarmasian Indonesia*, 17, 150–159.
- Sudjana, 2002, *Metoda Statistika*, Tarsito (ed) Bandung.
- Susilawati, E. and Soewondo, B.P., 2022, Pengaruh Nanoenkapsulasi pada Aktivitas Senyawa yang Berpotensi sebagai Antioksidan, *Jurnal Riset Farmasi*, 1–8.
- Taurina, W., Sari, R., Hafinur, U.C., and Isnindar, S.W., 2017, Optimasi kecepatan dan lama pengadukan terhadap ukuran nanopartikel kitosan-ekstrak etanol 70% kulit jeruk siam (*Citrus nobilis* L. var *Microcarpa*), *Traditional Medicine Journal*, 22, 16–20.
- Tiandho, Y., Jonuarti, R., and Yuliarto, B., 2024, Investigation of silver@ gold nanorod for waterborne pathogen detection: An integration of finite difference time domain method and response surface methodology, *Opt Laser Technol*, 176, 110942.

- Trinh, T.K. and Kang, L.S., 2011, Response surface methodological approach to optimize the coagulation–flocculation process in drinking water treatment, *Chemical engineering research and design*, 89, 1126–1135.
- Vallejo-Domínguez, D., Rubio-Rosas, E., Aguila-Almanza, E., Hernández-Cocoletzi, H., Ramos-Cassellis, M.E., Luna-Guevara, M.L., Rambabu, K., Manickam, S., Munawaroh, H.S.H., and Show, P.L., 2021, Ultrasound in the deproteinization process for chitin and chitosan production, *Ultrason Sonochem*, 72, 105417.
- Vivek, P.C., 2019, Nanotherapeutics and Nanobiotechnology In: Shyam S, M, Shivendu R., Nandita, D., Raghvendra, KM, Sabu, T.(ed.) *Micro and Nano Technologies, Applications of Targeted Nano Drugs and Delivery Systems*, 1–13.
- Wahyuningsih, I. and Putranti, W., 2015, Optimasi perbandingan tween 80 dan polietilenglikol 400 pada formula self nanoemulsifying drug delivery system (SNEDDS) minyak biji jinten hitam, *PHARMACY: Jurnal Farmasi Indonesia (Pharmaceutical Journal of Indonesia)*, 12, 223–241.
- Wardana, D., Ramadhan, A., Amne, F., Prihatini, D., and Eddiyanto, E., 2019, Utilization of glycerol from used oil as an ester glycerol surfactant, *Indonesian Journal of Chemical Science and Technology*, 2, 111–120.
- Widyastuti, A.I. and Saryanti, D., 2023, Formulasi dan Evaluasi Sediaan Nanoemulsi Ekstrak Umbi Bawang Putih (*Allium sativum* L.): Formulation and Evaluation of Nanoemulsion of Garlic (*Allium sativum* L.) Extract, *Jurnal Sains dan Kesehatan*, 5, 178–185.
- Winarti, L., Martien, R., Suwaldi, S., and Hakim, L., 2016, An experimental design of SNEDDS template loaded with bovine serum albumin and optimization using D-optimal,.
- Wulansari, S.A., Sumiyani, R., and Aryani, N.L.D., 2019, Pengaruh Konsentrasi Surfaktan Terhadap Karakteristik Fisik Nanoemulsi Dan Nanoemulsi Gel Koenzim Q10, *Jurnal Kimia Riset*, 4, 143–151.
- Yan, N. and Chen, X., 2015, Sustainability: Don't waste seafood waste, *Nature*, 524, 155–157.
- Younes, I. and Rinaudo, M., 2015, Chitin and chitosan preparation from marine sources. Structure, properties and applications, *Mar Drugs*, 13, 1133–1174.
- Yuan, D., Long, Y., Liu, D., Zhou, F., Chen, L., and Pan, Y., 2024, Ecological impact of surfactant Tween-80 on plankton: High-scale analyses reveal deeper hazards, *Science of The Total Environment*, 912, 169176.
- Zein, 2016, Dasar-Dasar Fisiologi Tumbuhan,.

Zhang, Z., Ma, Z., Song, L., and Farag, M.A., 2024, Maximizing crustaceans (shrimp, crab, and lobster) by-products value for optimum valorization practices: A comparative review of their active ingredients, extraction, bioprocesses and applications, *J Adv Res*, 57, 59–76.

Zulfa, E., Novianto, D., and Setiawan, D., 2019, Formulasi nanoemulsi natrium diklofenak dengan variasi kombinasi tween 80 dan span 80: kajian karakteristik fisik sediaan, *Media Farmasi Indonesia*, 14, 1471–1477.