

DAFTAR PUSTAKA

- Ahmad, I., Ahmed, S., Anwar, Z., Sheraz, M.A., & Sikorski, M., 2016, Photostability and Photostabilization of Drugs and Drug Products, *International Journal of Photoenergy*, **2016**, 1–19.
- Al-Sakkaf, M.K. & Onaizi, S.A., 2024, Effects of emulsification factors on the characteristics of crude oil emulsions stabilized by chemical and Biosurfactants: A review, *Fuel*, **361** (December 2023), 130604.
- Arianto, A., Cella, G., & Bangun, H., 2019, Preparation and Evaluation of Sunscreen Nanoemulsions with Synergistic Efficacy on SPF by Combination of Soybean Oil, Avobenzone, and Octyl Methoxycinnamate, *Open Access Macedonian Journal of Medical Sciences*, **7** (17), 2751–2756.
- Ashara, K.C., Paun, J.S., Soniwala, M.M., Chavda, J.R., Mendapara, V.P., & Mori, N.M., 2016, Microemulgel: an overwhelming approach to improve therapeutic action of drug moiety, *Saudi Pharmaceutical Journal*, **24** (4), 452–457.
- Badan Pengawas Obat dan Makanan Republik Indonesia, 2022, *PERATURAN BADAN PENGAWAS OBAT DAN MAKANAN NOMOR 17 TAHUN 2022 TENTANG PERUBAHAN ATAS PERATURAN BADAN PENGAWAS OBAT DAN MAKANAN NOMOR 23 TAHUN 2019 TENTANG PERSYARATAN TEKNIS BAHAN KOSMETIKA*. Jakarta: : Badan Pengawas Obat dan Makanan Republik Indonesia.
- Belem, B.R., Carapeto, G.V., Issa, M.G., & Ferraz, H.G., 2023, Microemulsions: An Encapsulation Strategy to Increase the Thermal Stability of D-limonene, *Pharmaceutics*, **15** (11), 2564.
- Berkman, M. & Güleç, K., 2021, Pseudo ternary phase diagrams: a practical approach for the area and centroid calculation of stable microemulsion regions, *Istanbul Journal of Pharmacy*, **51** (1), 42–49.
- Donglikar, M.M. & Deore, S.L., 2016, Sunscreens: A review, *Pharmacognosy Journal*, **8** (3), 171–179.
- Ferlay, J., Colombet, M., Soerjomataram, I., Parkin, D.M., Piñeros, M., Znaor, A., & Bray, F., 2021, Cancer statistics for the year 2020: An overview, *International Journal of Cancer*, **149** (4), 778–789.
- Flores, M., Saravia, C., Vergara, C., Avila, F., Valdés, H., & Ortiz-Viedma, J., 2019, Avocado Oil: Characteristics, Properties, and Applications, *Molecules*, **24** (11), 2172.
- Forestryana, D. & Rahman, S.Y., 2020, Formulasi dan Uji Stabilitas Serbuk Perasan Jeruk Nipis (*Citrus aurantifolia* (Cristm.) Swingle) dengan Variasi Konsentrasi Carbopol 940, *JPSCR: Journal of Pharmaceutical Science and Clinical Research*, **5** (2), 165.
- Geoffrey, K., Mwangi, A.N., & Maru, S.M., 2019, Sunscreen products: Rationale for use, formulation development and regulatory considerations, *Saudi Pharmaceutical Journal*, **27** (7), 1009–1018.
- Gholap, A.D., Sayyad, S.F., Hatvate, N.T., Dhumal, V. V., Pardeshi, S.R., Chavda,

- V.P., & Vora, L.K., 2023, Drug Delivery Strategies for Avobenzone: A Case Study of Photostabilization, *Pharmaceutics*, **15** (3).
- Hanson, K.M., Cutuli, M., Rivas, T., Antuna, M., Saoub, J., Tierce, N.T., & Bardeen, C.J., 2020, Effects of solvent and micellar encapsulation on the photostability of avobenzone, *Photochemical & Photobiological Sciences*, **19** (3), 390–398.
- Hawilla, A., Karim Zulkarnain, A., Lukitaningsih, E., Ilmu Farmasi, M., Farmasi, F., Gadjah Mada, U., Farmasi, J., & Kimia Farmasi, J., 2023, Stabilitas dan Sifat Fisik Sediaan Mikroemulgel Resveratrol Sebagai Tabir Surya dan Antiaging Secara In Vitro, | *Majalah Farmaseutik*, **19** (2), 155–163.
- Hojerová, J., Medovčíková, A., & Mikula, M., 2011, Photoprotective efficacy and photostability of fifteen sunscreen products having the same label SPF subjected to natural sunlight, *International Journal of Pharmaceutics*, **408** (1–2), 27–38.
- Holt, E.L., Rodrigues, N. d. N., Cebrián, J., & Stavros, V.G., 2021, Determining the photostability of avobenzone in sunscreen formulation models using ultrafast spectroscopy, *Physical Chemistry Chemical Physics*, **23** (42), 24439–24448.
- ICH, 1996, *STABILITY TESTING: PHOTOSTABILITY TESTING OF NEW DRUG SUBSTANCES AND PRODUCTS Q1B*. Geneva: International Conference On Harmonisation Of Technical Requirements For Registration Of Pharmaceuticals For Human Use.
- Irianto, I.D.K., Purwanto, P., & Mardan, M.T., 2020, Aktivitas Antibakteri dan Uji Sifat Fisik Sediaan Gel Dekokta Sirih Hijau (Piper betle L.) Sebagai Alternatif Pengobatan Mastitis Sapi, *Majalah Farmaseutik*, **16** (2), 202.
- JCIA, 2022, *JCIA Standards and Related Notifications for Sun Protection Factor (SPF), UVA protection Grade (PA) and Water Resistance for UV Protection*. Tokyo: Japan Cosmetic Industry Association.
- Kolarsick, P.A.J., Kolarsick, M.A., & Goodwin, C., 2011, Anatomy and Physiology of the Skin, *Journal of the Dermatology Nurses' Association*, **3** (4), 203–213.
- Kresnawati, Y., Shantiningsih, R.R., & Martien, R., 2020, Optimization of soybean oil, tween 80, PEG 400 in formulation of beta carotene nanoemulsion, *RESEARCH JOURNAL OF PHARMACY AND TECHNOLOGY*, **13** (12), 5692–5698.
- Kushwah, P., Kumar Sharma, P., S Koka, S., Gupta, A., Sharma, R., & Darwhekar, G.N., 2021, Microemulgel: a novel approach for topical drug delivery, *Journal of Applied Pharmaceutical Research*, **9** (3), 14–20.
- Liang, H., Yang, Q., Deng, L., Lu, J., & Chen, J., 2011, Phospholipid–Tween 80 mixed micelles as an intravenous delivery carrier for paclitaxel, *Drug Development and Industrial Pharmacy*, **37** (5), 597–605.
- Lv, X., Cong, Z., Liu, Z., Ma, X., Xu, M., Tian, Y., Zhang, X., Xu, B., Zhang, J., & Tang, Z., 2018, Improvement of the solubility, photostability, antioxidant activity and UVB photoprotection of trans-resveratrol by essential oil based microemulsions for topical application, *Journal of Drug Delivery Science and*

- Technology*, **48** (October), 346–354.
- Malavi, S., Kumbhar, P., Manjappa, A., Chopade, S., Patil, O., Kataria, U., Dwivedi, J., & Disouza, J., 2022, Topical Emulgel: Basic Considerations in Development and Advanced Research, *Indian Journal of Pharmaceutical Sciences*, **84** (5).
- Mandar, S., Wulandari, P., Savitri, V.F., Aziz, H., Refilda, & Rahmawati, Y., 2023, Photostability of avobenzone in a commercial sunscreen SPF 50 with the addition of quencher upon sun exposure, *International Journal of Scientific Reports*, **9** (7), 202–209.
- Moi, S., Hosamani, B., Kumar, K., Gunaga, S., Raghothama, S., & Gowd, K.H., 2021, Photochemical studies of new synthetic derivatives of avobenzone under sunlight using UV-spectroscopy, *Journal of Photochemistry and Photobiology A: Chemistry*, **420**, 113488.
- Musakhanian, J. & Osborne, D.W., 2025, Understanding Microemulsions and Nanoemulsions in (Trans)Dermal Delivery, *AAPS PharmSciTech*, **26** (1), 31.
- Nasri, C., Halabi, Y., Hajib, A., Choukri, H., Harhar, H., Lee, L.-H., Mani, V., Ming, L.C., Goh, K.W., Bouyahya, A., & Tabyaoui, M., 2023, Proximate composition, lipid and elemental profiling of eight varieties of avocado (*Persea americana*), *Scientific Reports*, **13** (1), 22767.
- National Center for Biotechnology Information, 2024, PubChem Compound Summary for CID 51040, Avobenzone. [online]. Available from: <https://pubchem.ncbi.nlm.nih.gov/compound/Avobenzone>.
- Nitulescu, G., Lupuliasa, D., Adam-Dima, I., & Nitulescu, G.M., 2023, Ultraviolet Filters for Cosmetic Applications, *Cosmetics*, **10** (4), 101.
- Parwaiz, S. & Khan, M.M., 2023, Recent developments in tuning the efficacy of different types of sunscreens, *Bioprocess and Biosystems Engineering*, **46** (12), 1711–1727.
- Pratiwi, R., Maladjili, N., Sulastri, E., Yusriadi, Y., Aanisah, N., & Syamsidi, A., 2023, Development and Evaluation of Microemulsion-Based Sunscreen Cream Containing Lycopene from Tomato (*Solanum lycopersicum* L.), *Journal of Pharmaceutical Sciences and Community*, **20** (1), 52–59.
- Ramli, S., K.T., C., N., Z., W.N.A.W., M., & I., A.R., 2019, The Influence of Surfactant/Co-Surfactant Hydrophilic-Lipophilic Balance on the Formation of Limonene-Based Microemulsion as Vitamin C Carrier, *Sains Malaysiana*, **48** (5), 1035–1042.
- Rowe, R.C., Sheskey, P.J., & Quinn, M.E., 2009, *Handbook of Pharmaceutical Excipients-Sixth Edition*. London: RPS Publishing.
- Sanap, D. & Ghuge, P., 2024, Microemulsions as a potential carrier for improved drug delivery, *Journal of Research in Pharmacy*, **28**(6) (28(6)), 2202–2214.
- Sander, M., Sander, M., Burbidge, T., & Beecker, J., 2020, The efficacy and safety of sunscreen use for the prevention of skin cancer, *Canadian Medical Association Journal*, **192** (50), E1802–E1808.
- Sari, F.M., 2014, EFEK PERBANDINGAN SURFAKTAN DAN

- KOSURFAKTAN PADA MIKROEMULSI OVALBUMIN TIPE W/O DENGAN MINYAK KEDELAI TERHADAP KARAKTERISTIK FISIK DAN KIMIA (Mikroemulsi W/O dengan Surfaktan Span 80 –Tween 80 : Kosurfaktan Etanol 96%= 5:1; 6:1 dan 7:1). Universitas Airlangga, Surabaya.
- Schalka, S., Steiner, D., Ravelli, F.N., Steiner, T., Terena, A.C., Marçon, C.R., Ayres, E.L., Addor, F.A.S., Miot, H.A., Ponzio, H., Duarte, I., Neffá, J., Cunha, J.A.J. da, Boza, J.C., Samorano, L. de P., Corrêa, M. de P., Maia, M., Nasser, N., Leite, O.M.R.R., Lopes, O.S., Oliveira, P.D., Meyer, R.L.B., Cestari, T., Reis, V.M.S. dos, & Rego, V.R.P. de A., 2014, Brazilian Consensus on Photoprotection, *Anais Brasileiros de Dermatologia*, **89** (6 suppl 1), 1–74.
- Scomoroscenco, C., Teodorescu, M., Raducan, A., Stan, M., Voicu, S.N., Trica, B., Ninciuleanu, C.M., Nistor, C.L., Mihaescu, C.I., Petcu, C., & Cinteza, L.O., 2021, Novel Gel Microemulsion as Topical Drug Delivery System for Curcumin in Dermatocosmetics, *Pharmaceutics*, **13** (4), 505.
- Sewell, M.J., Burkhart, C.N., & Morrell, D.S., 2017, Dermatological Pharmacology, *In: L.L. Brunton, R. Hilal-Dandan, dan B.C. Knollmann, ed. Goodman & Gilman's: The Pharmacological Basis of Therapeutics*, 13e. New York, NY: McGraw-Hill Education.
- Shabrina, A., Firdausi, Z.M., Poerba, A.T., Setyani, D.A., & Heroweti, J., 2024, Sunscreen effectivity and physical characterization of avocado oil in nanoemulsion using isopropyl myristate variations, *Pharmaciana*, **14** (1), 69.
- Shabrina, A., Heroweti, J., Yumni, G.G., Poerba, A.T., & Diana, A., 2024, Physical Stability and Effectivity Comparison of Nanoemulsion and Nano- emulgel of Avocado Oil with Carbopol 940 Variation Perbandingan Stabilitas Fisik dan Efektivitas Nanoemulsi dan Nano- emulgel Minyak Alpukat dengan Variasi Carbopol 940, *Indonesian Journal of Pharmaceutical Science and Technology*, **6** (1), 8–17.
- Shabrina, A., Pratiwi, A.R., & Muurukmihadi, M., 2020, Stabilitas Fisik Dan Antioksidan Mikroemulsi Minyak Nilam Dengan Variasi Tween 80 Dan PEG 400, *Media Farmasi*, **16** (2), 185.
- Souto, E.B., Cano, A., Martins-Gomes, C., Coutinho, T.E., Zielińska, A., & Silva, A.M., 2022, Microemulsions and Nanoemulsions in Skin Drug Delivery, *Bioengineering*, **9** (4), 158.
- Stryjecka, M., Kiełtyka-Dadasiewicz, A., Michalak, M., Rachoń, L., & Głowacka, A., 2019, Chemical Composition and Antioxidant Properties of Oils from the Seeds of Five Apricot (*Prunus armeniaca* L.) Cultivars, *Journal of Oleo Science*, **68** (8), 729–738.
- Su, J., Luo, H., Zheng, J., Xu, Z., & Fu, X., 2024, Novel stable and high-loaded natural UV filter microemulsion based on optimized emulsifiers system, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **699**, 134612.
- Sunarto, Wisnu, N., & Ngestiningrum, A.H., 2019, *Modul ajar anatomi dan fisiologi*, Prodi Kebidanan Magetan Poltekkes Kemenkes Surabaya.



- Tartaro, G., Mateos, H., Schirone, D., Angelico, R., & Palazzo, G., 2020, Microemulsion Microstructure(s): A Tutorial Review, *Nanomaterials*, **10** (9), 1657.
- Taurina, W., Sari, R., Hafinur, U.C., Wahdaningsih, S., & Isnindar, I., 2017, OPTIMIZATION OF STIRRING SPEED AND STIRRING TIME TOWARD NANOPARTICLE SIZE OF CHITOSAN-SIAM CITRUS PEEL (*Citrus nobilis* L.var *Microcarpa*) 70% ETHANOL EXTRACT, *Majalah Obat Tradisional*, **22** (1), 16.
- Thombre, N.A., Niphade, P.S., D. Ahire, E., & J. Kshirsagar, S., 2022, Formulation Development and Evaluation of Microemulsion Based Lornoxicam Gel, *Biosciences Biotechnology Research Asia*, **19** (1), 69–80.
- World Health Organization, 2017, Radiation: Ultraviolet (UV) radiation and skin cancer [online]. Available from: [https://www.who.int/news-room/questions-and-answers/item/radiation-ultraviolet-\(uv\)-radiation-and-skin-cancer?gad_source=1&gclid=CjwKCAjwlbU2BhA3EiwA3yXyu7ZkKalFmwKS2QV9aQFIy5MO9JnQtoM4ssEKdgrb-aC2JOQTGiSOOxoCbIIQAvD_BwE#](https://www.who.int/news-room/questions-and-answers/item/radiation-ultraviolet-(uv)-radiation-and-skin-cancer?gad_source=1&gclid=CjwKCAjwlbU2BhA3EiwA3yXyu7ZkKalFmwKS2QV9aQFIy5MO9JnQtoM4ssEKdgrb-aC2JOQTGiSOOxoCbIIQAvD_BwE#).
- Yonei, Y., Yagi, M., Takabe, W., & Kon, M., 2019, Skin Aging: Oxidative Stress and Glycative Stress, *Journal of Society of Cosmetic Chemists of Japan*, **53** (2), 83–90.
- Zam, A.N.Z. & Musdalifah, M., 2022, Formulasi dan Evaluasi Kestabilan Fisik Krim Ekstrak Biji Lada Hitam (*Piper nigrum* L.) Menggunakan Variasi Emulgator, *Journal Syifa Sciences and Clinical Research*, **4** (2), 304–313.
- Zarkogianni, M. & Nikolaos, N., 2016, Determination of Sun Protection Factor (SPF) and Stability of Oil-in-Water Emulsions Containing Greek Red Saffron (*Crocus Sativus* L.) as a Main Antisolar Agent, *International Journal of Advanced Research in Chemical Science*, **3** (7).