

DAFTAR PUSTAKA

- Abosadiya, H. M., Hasbullah, S. A., & Yamin, B. M. (2015). Synthesis, Crystal Structure, and Antioxidant Evaluation of C -4-acetamidophenylcalix[4]pyrogallolarene. *AIP Conference Proceedings*, 1678, 1–6.
- Amić, D., Davidović-Amić, D., Bešlo, D., & Trinajstić, N. (2003). Structure-Radical Scavenging Activity Relationships of Flavonoids. *Croatica Chemica Acta*, 76(1), 55–61.
- Ardianingsih, R. (2009). Penggunaan High Performance Liquid Chromatography (HPLC) dalam Proses Analisa Deteksi Ion. *Berita Dirgantara*, 10(4), 101–104.
- Asmal, A., Nurvianthi, R. Y., & Jehaman, T. (2023). Analisis Kandungan Vitamin C dalam Cabai Rawit (*Capsicum frutescens L.*) secara Iodimetri. *Jurnal Kesehatan Luwu Raya*, 9(2), 44–50.
- Badhani, B., Sharma, N., & Kakkar, R. (2015). Gallic Acid: A Versatile Antioxidant with Promising Therapeutic and Industrial Applications. *RSC Advances*, 5(35), 27540–27557. <https://doi.org/10.1039/c5ra01911g>
- Baldini, L., Casnati, A., & Sansone, F. (2017). Biomacromolecule Recognition by Calixarene Macrocycles. In *Comprehensive Supramolecular Chemistry II* (Second Edi, Vol. 4). Elsevier. <https://doi.org/10.1016/B978-0-12-409547-2.12545-4>
- Basilotta, R., Mannino, D., Filippone, A., Casili, G., Prestifilippo, A., Colarossi, L., Raciti, G., Esposito, E., & Campolo, M. (2021). Role of Calixarene in Chemotherapy Delivery Strategies. *Molecules*, 26(13), 1–14. <https://doi.org/10.3390/molecules26133963>
- Brand-Williams, W., Cuvelier, M. E., & Berset, C. (1995). Use of a Free Radical Method to Evaluate Antioxidant Activity. *LWT - Food Science and Technology*, 28(1), 25–30. [https://doi.org/10.1016/S0023-6438\(95\)80008-5](https://doi.org/10.1016/S0023-6438(95)80008-5)
- Buraen, Y. E., D., P. O., & Lerrick, R. I. (2019). Sintesis Senyawa C-2 8,14,20-Tetra- (2,4,5-Trimetoksi) Fenilkaliks[4]resorsinarena dari Senyawa 2,4,5 Trimetoksi Benzaldehid. *Jurnal Saintek Lahan Kering*, 2(2), 46–48.
- Dachriyanus. (2004). *Analisis Struktur Senyawa Organik Secara Spektrofotometri*. Andalas University Press.
- Diamond, D., & McKervey, M. A. (1994). Calixarene-based Sensing Agents. *Journal of Inclusion Phenomena and Molecular Recognition in Chemistry*, 19(1–4), 149–166. <https://doi.org/10.1007/BF00708980>
- Diniyah, N., & Lee, S.-H. (2020). Komposisi Senyawa Fenol dan Potensi Antioksidan dari Kacang-Kacangan: Review. *Jurnal Agroteknologi*, 14(1), 91–102.
- Elfariyanti, E., Zarwinda, I., Mardiana, M., & Rahmah, R. (2022). Analisis Kandungan Vitamin C dan Aktivitas Antioksidan Buah-Buahan Khas Dataran Tinggi Gayo Aceh. *Jurnal Kedokteran Dan Kesehatan : Publikasi Ilmiah*

- Fakultas Kedokteran Universitas Sriwijaya*, 9(2), 161–170.
<https://doi.org/10.32539/jkk.v9i2.16999>
- Firdaus, M. (2013). Indeks Aktivitas Antioksidan Ekstrak Rumput Laut Coklat (*Sargassum aquifolium*). *Jurnal Pengolahan Hasil Perikanan Indonesia*, 16(1), 42–47.
- Forestryana, D., & Arnida, A. (2020). Skrining Fitokimia dan Analisis Kromatografi Lapis Tipis Ekstrak Etanol Daun Jeruju (*Hydrolea Spinosa L.*). *Jurnal Ilmiah Farmako Bahari*, 11(2), 113.
<https://doi.org/10.52434/jfb.v11i2.859>
- Gubaidullin, A. T., Nikolaeva, I. L., Burilov, A. R., Litvinov, I. A., Pudovik, M. A., Habicher, W. D., & Konovalov, A. I. (2001). Crystal and Molecular Structure of Calix[4]arene Originating. *Russian Journal of General Chemistry*, 71(3), 396–402.
- Gunawan, R., Bayu, A., & Nandiyanto, D. (2021). How to Read and Interpret ¹H-NMR and ¹³C-NMR Spectrums. *Indonesian Journal of Science & Technology*, 6(2), 267–298.
- Gutsche, C. D. (1989). *Calixarenes*. Royals Society of Chemistry.
- Halliwell, B., & Gutteridge, J. M. C. (2015). *Free radicals in biology and medicine* (Fifth Edit). Oxford University Press.
<https://doi.org/10.1080/09553009014552071>
- Handayani, S. N. (2016). Perbandingan Aktivitas Antioksidan Buah Pepaya (*Carica papaya L.*) dan Buah Jambu Biji Merah (*Psidium guajava L.*). *Prosiding Seminar Nasional II, 1*, 1019–1028.
- Handayani, S. N., Ekowati, H., Irmanto, Aprilia, D. N. A., & Utami, S. (2020). Synthesis of Phenylcalix[4]resorcinarene Sulfonate and It's Aplication as an Antioxidant. *AIP Conference Proceedings*, 2237(June).
<https://doi.org/10.1063/5.0006139>
- Handayani, S. N., Irmanto, & Indriyani, N. N. (2020). Removal of Rhodamine B using 4-Hydroxy-3-Methoxyphenylcalix[4]resorcinarene. *Journal of Physics: Conference Series*, 1494(1).
- Handayani, S., Najib, A., & Wati, N. P. (2018). Uji Aktivitas Antioksidan Ekstrak Daun Daruju (*Acanthus Ilcifolius L.*) dengan Metode Peredaman Radikal Bebas 1,1-Diphenyl-2-Picrylhidrazil (DPPH). *Jurnal Fitofarmaka Indonesia*, 5(2), 299–308. <https://doi.org/10.33096/jffi.v5i2.414>
- Hariyanti, R., Pamela, V. Y., & Kusumasari, S (2021). Review Jurnal: Aktivitas Antioksidan pada Beberapa Produk Berbahan Dasar Kulit Buah Naga Merah. *Jitipari*, 6(1), 41–48.
- Harizal, Jumina, & D., W. T. (2018). Sintesis, Serapan Elektronik, dan Fotostabilitas Senyawa C-4-Benziloksifenilkaliks[4]pirogalolarena dodekabenzoat. *Forum Ilmiah*, 15(3), 405–415.
- Harizal, Jumina, & Wahyuningsih, T. D. (2022). C -4-metoksifenilkaliks[4]pirogalaril Dodekasinamat : Sintesis dan Uji Pendahuluan sebagai Bahan Aktif

- Tabir Surya. *Journal of Pharmaceutical and Health Research*, 3(3), 95–101.
- Hart, H., Craine, L. E., & Hart, D. J. (2003). *Kimia Organik, Suatu Kuliah Singkat Edisi Kesebelas*. Erlangga.
- Hilwatullisan, & Hamid, I. (2019). Pengaruh Kitosan dan Plasticizer Gliserol Dalam Pembuatan Plastik Biodegradable Dari Pati Talas. *Prosiding Seminar Nasional II Hasil Litbangyasa Industri*, 221–227.
- Hinestroza, J. L. C., Suazo, M. Á. V., & Villamil, M. M. (2020). Experimental Comparative Study of Dynamic Behavior in Solution Phase of C-Tetra(phenyl)resorcin[4]arene and C-Tetra(phenyl)pyrogallol[4]arene. *Molecules*, 25(10). <https://doi.org/10.3390/molecules25102275>
- Hossain, M. B., Brunton, N. P., Barry-Ryan, C., Martin-Diana, A. B., & Wilkinson, M. (2008). Antioxidant Activity of Spice Extracts and Phenolics in Comparison to Synthetic Antioxidants. *Rasayan Journal of Chemistry*, 1(4), 751–756.
- Hu, Z., Lei, Y., Zhang, J., Tong, W., Zhang, Y., & Du, L. (2023). Physiological Characterization, Antioxidant Potential, and Bacterial Survival of Soybean Sprouts Subjected to Pre- and Post-Harvest Low Intensity Ultrasound and Exogenous Ascorbic Acid Application. *Postharvest Biology and Technology*, 198. <https://doi.org/https://doi.org/10.1016/j.postharvbio.2023.112258>
- Irawan, A. (2019). Kalibrasi Spektrofotometer sebagai Penjaminan Mutu Hasil Pengukuran dalam Kegiatan Penelitian dan Pengujian. *Indonesian Journal of Laboratory*, 1(2), 1. <https://doi.org/10.22146/ijl.v1i2.44750>
- Jain, V. K., & Kanaiya, P. H. (2011). Chemistry of calix[4]resorcinarenes. *Russian Chemical Reviews*, 80(1), 75–102.
- Jawa La, E. O., Sawiji, R. T., & Yuliawati, A. N. (2020). Skrining Fitokimia dan Analisis Kromatografi Lapis Tipis Ekstrak Etanol Kulit Buah Naga Merah (*Hylocereus polyrhizus*). *Indonesian Journal of Pharmacy and Natural Product*, 3(1), 45–58. <https://doi.org/10.35473/ijpnp.v3i1.503>
- Jumina, J., Kurniawan, Y. S., Sari, R., Purba, S. N. H. B., Radean, H., Priatmoko, P., & Sholikhah, E. N. (2022). Synthesis and High Antioxidant Activity of C-Alkyl Calix[4]resorcinarene and C-Alkyl Calix[4]pyrogallolarene Derivatives. *Indonesian Journal of Pharmacy*, 32.
- Jumina, Setiawan, H. R., Triono, S., Kurniawan, Y. S., Priastomo, Y., Siswanta, D., Zulkarnain, A. K., & Kumar, N. (2020). C-Arylcalix[4]pyrogallolarene Sulfonic Acid: A Novel and Efficient Organocatalyst Material for Biodiesel Production. *Bulletin of the Chemical Society of Japan*, 93(2), 252–259. <https://doi.org/10.1246/BCSJ.20190275>
- Jumina, Siswanta, D., Zulkarnain, A. K., Triono, S., Priatmoko, Yuanita, E., Imawan, A. C., Fatmasari, N., & Nursalim, I. (2019). Development of C-Arylcalix[4]resorcinarenes and C-Arylcalix[4]pyrogallolarenes as Antioxidant and UV-B protector. *Indonesian Journal of Chemistry*, 19(2), 273–284. <https://doi.org/10.22146/ijc.26868>
- Jun, M., Fu, H. Y., Hong, J., Wan, X., Yang, C. S., & Ho, C. T. (2003). Comparison

- of Antioxidant Activities of Isoflavones from Kudzu root (*Pueraria lobata* Ohwi). *Journal of Food Science*, 68(6), 2117–2122.
- Keeler, J. (2006). *Understanding NMR spectroscopy* (Vol. 43, Issue 10). University of Cambridge. <https://doi.org/10.5860/choice.43-5896>
- Liu, X. (2021). IR Spectrum and Characteristic Absorption Bands. In *Organic Chemistry I* (pp. 197–200).
- Mamay, M., Wardani, D., & Hakim, F. (2022). Aktivitas Antioksidan Total pada Ekstrak Etanol Daun Bambu Surat (*Gigantochloa pseudoarundinaceae*). *Jurnal Kesehatan Perintis*, 9(1), 47–52.
- McMahon, G., O'Malley, S., Nolan, K., & Diamond, D. (2003). Important Calixarene Derivatives - Their Synthesis and Applications. *Arkivoc*, 2003(7), 23–31. <https://doi.org/10.3998/ark.5550190.0004.704>
- Molyneux, P. (2004). The Use of the Stable Free Radical Diphenylpicryl-Hydrazyl (DPPH) for Estimating Antioxidant Activity. *Songklanakarinn Journal of Science and Technology*, 26(2), 211–219.
- Mulangsri, D. A. K., Budiarti, A., & Saputri, E. N. (2017). Aktivitas Antioksidan Fraksi Dietiler Buah Mangga Arumanis (*Mangifera indica* L.) dengan Metode DPPH. *Jurnal Pharmascience*, 4(1), 85–93. <https://doi.org/10.20527/jps.v4i1.5760>
- NCBI. (2022). 4-methylbenzaldehyde. <https://pubchem.ncbi.nlm.nih.gov/compound/4-methylbenzaldehyde>
- Naufal, M., Maharani, R., & Wiani, I. (2018). Sintesis Senyawa 5-(4'-klorobenzilidena)imidazolina-2,4-dion. *Chimica et Natura Acta*, 6(3), 127–135.
- Novrianto, M.A., Wibowo, M.A., & Ardiningsih, P. (2016). Karakterisasi Senyawa Fitosterol dari Ekstrak Daun Soma (*Ploiarium alternifolium* Melch) dengan Metode ¹H-NMR. *Jurnal Kimia Khatulistiwa*, 6(4), 69–74.
- Nurhaliza, S., Ibrahim, I., Astuti, I., & Paerah, P. (2021). Formulasi Kapsul Daun dan Biji Jamblang (*Syzygium cumini* L.) sebagai Antioksidan Alami dari Desa Pallantikang Kabupaten Maros. *Jurnal Medika Utama*, 2(2), 711–720.
- Pratiwi, A., & Ersam, T. (2013). Uji Kemurnian Dua Senyawa dari Ekstrak Metanol Kayu Batang *Garcinia cylindrocarpa*. *Sains Dan Seni Pomits*, 2(2), 1–4.
- Pratiwi, A. R. (2017). *Sintesis C-Aralkaliks [4] Pirogalolarena dan Uji Aktivitasnya sebagai Senyawa Antioksidan*. Skripsi. Universitas Gajah Mada.
- Purnomo, T. A. B., & Yuliati, L. (2020). High Antioxidant Activity of Pucuk Merah (*Syzygium oleina*) Leaf and Zinnia (*Zinnia elegans*) Flower Extracts. *Indonesian Journal of Natural Pigments*, 2(2), 54. <https://doi.org/10.33479/ijnp.2020.02.02.54>
- Puspitasari, A. D., & Sumantri. (2019). Aktivitas Antioksidan Perasan Jeruk Manis (*Citrus sinensis*) dan Jeruk Purut (*Citrus hystrix*) Menggunakan Metode ABTS. *Majalah Farmasi Dan Farmakologi*, 23(2), 48–51.
- Rahayu, S. (2022). *Sintesis C-Fenilkaliks[4]Pirogalolarena dan Aplikasinya*

- Sebagai Adsorben Ion Logam Cd(II)*. Skripsi. Universitas Jenderal Soedirman.
- Rahmawati, I., Rosyidah, A., & Ediati, R. (2015). Sintesis Ni-UiO-66 secara Solvotermal. *Jurnal Sains Dan Seni ITS*, 4(1), 17–20.
- Rani, V., & Singh Yadav, U. C. (2015). *Free Radicals in Human Health and Disease*. Springer. <https://doi.org/10.1007/978-81-322-2035-0>
- Saputro, A., & Sudarsono. (2014). Arrest Potential for Radical 2, 2-diphenyl-1-pikrilhidrazil (DPPH) by Pisang Ssusu (*Musa paradisiaca L . " Susu "*) and Pisang Ambon (*Musa paradisiaca L . " Ambon "*). *Trad. Med. J*, 7–13.
- Sardjono, R. E., Dwiyantri, G., Aisyah, S., & Khoerunnisa, F. (2009). The Synthesis of Calix[4]Resorcinarene from Cassia Oil and Its Application for Solid Phase Extraction of Heavy Metals Hg(II) and Pb(II). *Prosiding Seminar Kimia Bersama UKM-ITB VIII*, 110–117.
- Sari, A. K., & Ayati, R. (2018). Penentuan Aktivitas Antioksidan Ekstrak Etanol Daun Jeruk Purut (*Citrus Hystrix D.C*) dengan Metode DPPH (1,1-diphenyl-2-picrylhydrazyl). *Journal of Current Pharmaceutical Sciences*, 1(2), 69–74.
- Sarikaya, S. B. O. (2015). Acetylcholinesterase Inhibitory Potential and Antioxidant Properties of Pyrogallol. *Journal of Enzyme Inhibition and Medicinal Chemistry*, 30(5), 761–766.
- Scherer, R., & Godoy, H. T. (2009). Antioxidant Activity Index (AAI) by the 2,2-diphenyl-1-picrylhydrazyl Method. *Food Chemistry*, 112(3), 654–658.
- Setiawan, F., Yunita, O., & Kurniawan, A. (2018). Uji Aktivitas Antioksidan Ekstrak Etanol Kayu Secang (*Caesalpinia Sappan*) Menggunakan Metode DPPH, ABTS, dan FRAP. *Media Pharmaceutica Indonesiana*, 2(2), 82–89.
- Shin, M., Park, E., & Lee, H. (2019). Plant-Inspired Pyrogallol-Containing Functional Materials. *Advanced Functional Materials*, 29(43), 1–26. <https://doi.org/10.1002/adfm.201903022>
- Skoog, A. D., West, M. D., Holler, F. J., & Crouch, S. R. (2013). *Fundamentals of Analytical Chemistry 9th Edition*. Brooks/Cole.
- Subhani, N. I. (2022). *Aplikasi Senyawa C-4-Hidroksi-3-Metoksifenilkaliks[4] Pirogalolarena sebagai Adsorben Ion Pb(II)*. Skripsi. Universitas Jenderal Soedirman.
- Sulistiyani, M., & Huda, N. (2017). Optimasi Pengukuran Spektrum Vibrasi Sampel Protein Menggunakan Spektrofotometer Fourier Transform Infra Red (FTIR). *Indonesian Journal of Chemical Science*, 6(2), 173–180.
- Syahmani, S., Leny, L., Iriani, R., & Elfa, N. (2017). Penggunaan Kitin Sebagai Alternatif Fase Diam Kromatografi Lapis Tipis dalam Praktikum Kimia Organik. *Jurnal Vidya Karya*, 32(1), 1–11.
- Tristantini, D., Ismawati, A., Pradana, B. T., & Gabriel, J. (2016). Pengujian Aktivitas Antioksidan Menggunakan Metode DPPH pada Daun Tanjung (*Mimusops elengi L*). *Prosiding Seminar Nasional Teknik Kimia "Kejuangan" Pengembangan Teknologi Kimia Untuk Pengolahan Sumber Daya Alam Indonesia*, 1–5.

- Umaru, I. J. (2020). Pyrogallol Isolation, Characterization, Cytotoxicity, Antioxidant and Bioactive Potentials on Selected Bacterial and Fungi. *International Journal of Pharmacy & Biomedical Research*, 7(2), 1–11. <https://doi.org/10.18782/2394-3726.1088>
- Utomo, S. B., Fujiyanti, M., Lestari, W. P., & Mulyani, S. (2018). Uji Aktivitas Antibakteri Senyawa C-4 Metoksifenilkaliks (4) Resorsinarena Termodifikasi Hexadecyltrimethylammonium-Bromide Terhadap Bakteri *Staphylococcus aureus* dan *Escherichia coli*. *Jurnal Kimia Dan Pendidikan Kimia*, 3(3), 201.
- Utomo, S. B., & Sari, A. Y. (2019). Sintesis C-4-Karboksifenil-Kaliks[4] Resorsinarena dan Studi Adsorpsinya terhadap Ion Logam Ag [I]. *Seminar Nasional Kimia Dan Pendidikan Kimia XII*, 198–207.
- Vaya, J., & Aviram, M. (2005). Nutritional Antioxidants Mechanisms of Action, Analyses of Activities and Medical Applications. *Current Medicinal Chemistry-Immunology, Endocrine & Metabolic Agents*, 1(1), 99–117. <https://doi.org/10.2174/1568013013359168>
- Velázquez, E., Tournier, H. A., Mordujovich De Buschiazso, P., Saavedra, G., & Schinella, G. R. (2003). Antioxidant Activity of Paraguayan Plant Extracts. *Fitoterapia*, 74(1–2), 91–97. [https://doi.org/10.1016/S0367-326X\(02\)00293-9](https://doi.org/10.1016/S0367-326X(02)00293-9)
- Warono, D., & Syamsudin. (2013). Analisis Kimia Kuantitatif. Ed ke-5. *Konversi*, 2(2), 57–65.
- Watson, D. (2005). *Analisis Farmasi*. Buku Kedokteran EGC.
- Werdhasari, A. (2014). Peran Antioksidan Bagi Kesehatan. *Jurnal Biomedik Medisiana Indonesia*, 3(2), 59–68.
- WHO. (2020). Menaikkan Harga Cukai dan Harga Produk Tembakau untuk Indonesia Sehat dan Sejahtera. In *WHO South-East Asia*.
- Wulandari, L. (2011). *Kromatografi Lapis Tipis*. Taman Kampus Presindo.
- Yoga, W. K., & Komalasari, H. (2022). Potensi Alga Hijau (*Caulerpa racemosa*) sebagai Sumber Antioksidan Alami. *Jurnal Teknologi Dan Mutu Pangan*, 1(1), 15–18.
- Zackiyah. (2016). Spektrometri Ultra Violet atau Sinar Tampak (UV-Vis). In *Kimia Analitik Instrumen* (pp. 1–46). Universitas Terbuka.