

## DAFTAR PUSTAKA

- Arshad, M.N., Al-Dies, A.A.M., Asiri, A.M., Khalid, M., Birinji, A.S., Al-Amry, K.A., and Braga, A.A.C., 2017, Synthesis, crystal structures, spectroscopic and nonlinear optical properties of chalcone derivatives: A combined experimental and theoretical study, *J. Mol. Struct.*, 1141, 142–156.
- Asiri, A.M., Marwani, H.M., Alamry, K.A., Al-Amoudi, M.S., Khan, S.A., and El-Daly, S.A., 2014, Green synthesis, characterization, photophysical and electrochemical properties of bis-chalcones, *Int. J. Electrochem. Sci.*, 9, 799–809.
- D'silva, E.D., Podagatlapalli, G.K., Rao, S. V., Rao, D.N., and Dharmaprakash, S.M., 2011, New, high efficiency nonlinear optical chalcone co-crystal and structure–property relationship, *Cryst. Growth Des.*, 11, 5362–5369.
- Eryanti, Y., Hendra, R., Herlina, T., Zamri, A., and Supratman, U., 2018, Synthesis of N-methyl-4-piperidone curcumin analogues and their cytotoxicity activity against T47D cell lines, *Indones. J. Chem.*, 18, 362–366.
- Eryanti, Y., Herlina, T., Zamri, A., Abdul Halim, S.N., Shiono, Y., Syah, Y.M., Awang, K., and Supratman, U., 2015, 3,5-Bis(2-hydroxybenzylidene)piperidin-4-one, *Molbank*, 2015, 2–5.
- Eryanti, Y., Herlina, T., Zamri, A., Shiono, Y., Awang, K., Halim, S.N.A., and Supratman, U., 2015, N-benzyl-(3E,5E)-3,5-bis(2-hydroxybenzylidene)-4-piperidone, *Molbank*, 2015, 5–8.
- Evrano Aksöz, B. and Ertan, R., 2011, Chemical and structural properties of chalcones I, *Fabad J. Pharm. Sci.*, 36, 223–242.
- Girisun, T.S., Dhanuskodi, S., and Vinitha, G., 2011,  $\chi(3)$  measurement and optical limiting properties of metal complexes of thiourea using Z-scan, *Mater. Chem. Phys.*, 129, 9–14.
- Habibi, R., Herfindo, N., Hendra, R., Teruna, H.Y., and Zamri, A., 2020, Synthesis and Molecular Docking Study of 1-(3-chloropropyl)-3,5-bis((E)-4-methoxybenzylidene)piperidin-4-one as Dengue Virus Type 2 (DENV) NS2B/NS3 Protease Inhibitor Candidate, *Pharmacol. Clin. Pharm. Res.*, 5, 14.
- Hsieh, C.T., Hsieh, T.J., El-Shazly, M., Chuang, D.W., Tsai, Y.H., Yen, C.T., Wu, S.F., Wu, Y.C., and Chang, F.R., 2012, Synthesis of chalcone derivatives as potential anti-diabetic agents, *Bioorganic Med. Chem. Lett.*, 22, 3912–3915.
- Hutama, A.S., Huang, H., and Kurniawan, Y.S., 2019, Investigation of the chemical and optical properties of halogen-substituted N-methyl-4-piperidone curcumin analogs by density functional theory calculations, *Spectrochim. Acta - Part A Mol. Biomol. Spectrosc.*, 221, 117152.
- Jacquemin, D., Mennucci, B., and Adamo, C., 2011, Excited-state calculations

- with TD-DFT: From benchmarks to simulations in complex environments, *Phys. Chem. Chem. Phys.*, 13, 16987–16998.
- Jensen, F., 2007, *Introduction to Computational Chemistry*, Wiley and Sons Inc., New York, USA.
- Kamath, L., Manjunatha, K.B., Shettigar, S., Umesh, G., Narayana, B., Samshuddin, S., and Sarojini, B.K., 2014, Investigation of third-order nonlinear and optical power limiting properties of terphenyl derivatives, *Opt. Laser Technol.*, 56, 425–429.
- Kumar, A., Srivastava, A.K., Gangwar, S., Misra, N., Mondal, A., and Brahmachari, G., 2015, Combined experimental (FT-IR, UV-visible spectra, NMR) and theoretical studies on the molecular structure, vibrational spectra, HOMO, LUMO, MESP surfaces, reactivity descriptor and molecular docking of Phomarin, *J. Mol. Struct.*, 1096, 94–101.
- Lakshmi, C.S.N., Balachandran, S., Arul, D.D., Ronaldo, A.A., and Hubert, J.I., 2019, DFT analysis on spectral and NLO properties of (2E)-3-[4-(dimethylamino) phenyl]-1-(naphthalen-2-yl) prop-2-en-1-one; a D- $\pi$ -A chalcone derivative and its docking studies as a potent hepatoprotective agent, *Chem. Data Collect.*, 20, 100205.
- Leach, A.R., 1996, *Molecular Modeling: Principles and Applications*, Longman, Singapore.
- Li, X., Liu, R., Xie, H., Zhang, Y., Lyu, B., Wang, P., Wang, J., Fan, Q., Ma, Y., Tao, S., Xiao, S., Yu, X., Gao, Y., and He, J., 2017, Tri-phase all-optical switching and broadband nonlinear optical response in Bi<sub>2</sub>Se<sub>3</sub> nanosheets, *Opt. Express*, 25, 18346.
- Maidur, S.R., Patil, P.S., Ekbote, A., Chia, T.S., and Quah, C.K., 2017, Molecular structure, second- and third-order nonlinear optical properties and DFT studies of a novel non-centrosymmetric chalcone derivative: (2E)-3-(4-fluorophenyl)-1-(4-([(1E)-(4-fluorophenyl)methylene]amino)phenyl)prop-2-en-1-one, *Spectrochim. Acta - Part A Mol. Biomol. Spectrosc.*, 184, 342–354.
- Maidur, S.R., Patil, P.S., Rao, S.V., Shkir, M., and Dharmaprakash, S.M., 2017, Experimental and computational studies on second-and third-order nonlinear optical properties of a novel D- $\pi$ -A type chalcone derivative: 3-(4-methoxyphenyl)-1-(4-nitrophenyl) prop-2-en-1-one, *Opt. Laser Technol.*, 97, 219–228.
- Motiei, H., Jafari, A., and Naderali, R., 2017, Third-order nonlinear optical properties of organic azo dyes by using strength of nonlinearity parameter and Z-scan technique, *Opt. Laser Technol.*, 88, 68–74.
- Nesterov, V.N., 2004, 3,5-Bis(4-methoxybenzylidene)-1-methyl-4-piperidone and 3,5-bis(4-methoxybenzylidene)-1-methyl-4-oxopiperidinium chloride: Potential biophotonic materials, *Acta Crystallogr. Sect. C Cryst. Struct. Commun.*, 60, 806–809.

- Pantazis, P., Maloney, J., Wu, D., and Fraser, S.E., 2010, Second harmonic generating ( SHG ) nanoprobe for in vivo imaging, *Proc. Natl. Acad. Sci.*, 107, 14535–14540.
- Patil, P.S., Maidur, S.R., Jahagirdar, J.R., Chia, T.S., Quah, C.K., and Shkir, M., 2019, Crystal structure, spectroscopic analyses, linear and third-order nonlinear optical properties of anthracene-based chalcone derivative for visible laser protection, *Appl. Phys. B Lasers Opt.*, 125, 1–13.
- Pérez, J.L.J., Gutiérrez-Fuentes, R., Ramírez, J.F.S., Vidal, O.U.G., Téllez-Sánchez, D.E., and Pacheco, Z.N.C., 2013, Nonlinear coefficient determination of Au/Pd bimetallic nanoparticles using Z-scan, *Adv. Nanoparticles*, 2, 223–228.
- Perundevi, T.S., Jonathan, D.R., and Kothai, S., 2017, Synthesis and Studies on Non-Linear Optical Property of New Chalcone Based Polymers, *Chem. Sci. Trans.*, 6, 199–208.
- Pongajow, N.T., Juliandri, and Hastiawan, I., 2013, Density Functional Theory untuk Penentuan Geometri dan Karakteristik Ikatan dari Kompleks Ni ( II ) - Dibutilditiokarbamat dan Co ( II ) -Dibutilditiokarbamat, *Saintek*, 4, 197–202.
- Poornesh, P., Shettigar, S., Umesh, G., Manjunatha, K. B., Kamath, K.P., Sarojini, B.K., and Narayana, B., 2010, Nonlinear optical studies on 1,3-disubstituent chalcones doped polymer films, *Opt. Mater. (Amst.)*, 31, 854–859.
- Prabhu, A.N., Upadhyaya, V., Jayarama, A., and Subrahmanya Bhat, K., 2013, Synthesis, growth and characterization of  $\pi$  conjugated organic nonlinear optical chalcone derivative, *Mater. Chem. Phys.*, 138, 179–185.
- Pranowo, H.D. and Hetadi, A.K.R., 2011, *Pengantar Kimia Komputasi*, Penerbit Lubuk Agung, Bandung.
- Prasad, P.N. and Williams, D., 1991, *Introduction to Nonlinear Optical Effects in Molecules and Polymers*, Wiley and Sons Inc., New York, USA.
- Romanelli, G., Pasquale, G., Sathicq, Á., Thomas, H., Autino, J., and Vázquez, P., 2011, Synthesis of chalcones catalyzed by aminopropylated silica sol-gel under solvent-free conditions, *J. Mol. Catal. A Chem.*, 340, 24–32.
- Shen, L., Li, Z., Wu, X., Zhou, W., Yang, J., and Song, Y., 2020, Ultrafast broadband nonlinear optical properties and excited-state dynamics of two bis-chalcone derivatives, *RSC Adv.*, 10, 15199–15205.
- Singh, A.K., Saxena, G., Dixit, S., Singh, S.K., Singh, S.K., Arshad, M., and Konwar, R., 2016, Synthesis, characterization and biological activities of some Ru (II) complexes with substituted chalcones and their applications as chemotherapeutics against breast cancer, *J. Mol. Struct.*, 1111, 90–99.

- Song, Y., Chen, Y., Jiang, X., Liang, W., Wang, Liang, Z., Ge, Y., Zhang, F., and Wu, L., 2018, Nonlinear few-layer antimonene-based all-optical signal processing: ultrafast optical switching and high-speed wavelength conversion, *Adv. Opt. Mater.*, 6, 1701287.
- Tan, J., Zhang, Y., Zhang, M., Tian, X., Wang, Y., Li, S., Wang, C., Zhou, H., and Yang, J., 2016, Small molecules of chalcone derivatives with high two-photon absorption activities in the near-IR region, *J. Mater. Chem. C*, 4, 3256–3267.
- Teng, M.Y., Zhang, J., Huang, G.L., Liu, B., Li, X.M., Rong, M.Z., Shen, T.H., and Song, Q.B., 2015, Synthesis and nonlinear optical properties of novel chalcone analogues of ferrocenyl biaryl derivatives, *J. Organomet. Chem.*, 791, 298–302.
- Verma, A.K., Bishnoi, A., and Fatma, S., 2016, Synthesis, spectral analysis and quantum chemical studies on molecular geometry of (2E,6E)-2,6-bis(2-chlorobenzylidene)cyclohexanone: Experimental and theoretical approaches, *J. Mol. Struct.*, 1116, 9–21.
- Yin, B.T., Yan, C.Y., Peng, X.M., Zhang, S.L., Rasheed, S., Geng, R.X., and Zhou, C.H., 2014, Synthesis and biological evaluation of  $\alpha$ -triazolyl chalcones as a new type of potential antimicrobial agents and their interaction with calf thymus DNA and human serum albumin, *Uropean J. Med. Chem.*, 71, 148–159.
- Zainuri, D.A., Abdullah, M., Arshad, S., Aziz, M.S.A., Krishnan, G., Bakhtiar, H., and Razak, I.A., 2018, Crystal structure, spectroscopic and third-order nonlinear optical susceptibility of linear fused ring dichloro-substituent chalcone isomers, *Opt. Mater. (Amst)*, 86, 32–45.