

## DAFTAR PUSTAKA

- Ahmed, H., Abolore, R.S., Jaiswal, S. and Jaiswal, A.K., 2024. Toward Circular Economy: Potentials of Spent Coffee Grounds in Bioproducts and Chemical Production. *Biomass*, 4(2), pp.286-312.
- Aji, M.P., Susanto, Wiguna, P.A. and Sulhadi, 2017. Facile synthesis of luminescent carbon dots from mangosteen peel by pyrolysis method. *Journal of Theoretical and Applied Physics*, 11, pp.119-126.
- Aji, M.P., Wati, A.L., Priyanto, A., Karunawan, J., Nuryadin, B.W., Wibowo, E. and Marwoto, P., 2018. Polymer carbon dots from plastics waste upcycling. *Environmental Nanotechnology, Monitoring & Management*, 9, pp.136-140.
- Akash, M.S.H., Rehman, K., Akash, M.S.H. and Rehman, K., 2020. Ultraviolet-visible (UV-VIS) spectroscopy. *Essentials of pharmaceutical analysis*, pp.29-56.
- Aouay, F., Attia, A., Dammak, L., Ben Amar, R. and Deratani, A., 2024. Activated carbon prepared from waste coffee grounds: Characterization and adsorption properties of dyes. *Materials*, 17(13), p.3078.
- Ballesteros, L.F., Teixeira, J.A. and Mussatto, S.I., 2014. Chemical, functional, and structural properties of spent coffee grounds and coffee silverskin. *Food and bioprocess technology*, 7, pp.3493-3503.
- Bhattacharjee, S., 2016. DLS and zeta potential—what they are and what they are not?. *Journal of controlled release*, 235, pp.337-351.
- Bose, A., Thomas, I. and Abraham, E., 2018. Fluorescence spectroscopy and its applications: A Review. *Int. J. Adv. Pharm. Res*, 8(1), pp.1-8.
- Brekalo, M., Rajs, B.B., Aladić, K., Jakobek, L., Šereš, Z., Krstović, S., Jokić, S., Budžaki, S. and Strelec, I., 2023. Multistep extraction transformation of spent coffee grounds to the cellulose-based enzyme immobilization carrier. *Sustainability*, 15(17), p.13142.
- Cong-Jie, P.A.N., Xin-Xin, D.E.N.G., Mei-Cheng, L.U. and Xue-Zhen, Q.I.N., 2023. Preparation of bright blue fluorescent carbon dots and their application in highly sensitive chlorogenic acid detection. *Chinese Journal of Analytical Chemistry*, 51(12), p.100334.
- Das, G.S., Shim, J.P., Bhatnagar, A., Tripathi, K.M. and Kim, T., 2019. Biomass-derived carbon quantum dots for visible-light-induced photocatalysis and label-free detection of Fe (III) and ascorbic acid. *Scientific reports*, 9(1), p.15084.
- Datta, R., Heaster, T.M., Sharick, J.T., Gillette, A.A. and Skala, M.C., 2020. Fluorescence lifetime imaging microscopy: fundamentals and advances in

- instrumentation, analysis, and applications. *Journal of biomedical optics*, 25(7), pp.071203-071203.
- Devin, B. and Richards, C., 2018. Food waste, power, and corporate social responsibility in the Australian food supply chain. *Journal of Business Ethics*, 150, pp.199-210.
- Dolez, P.I., 2015. Nanomaterials definitions, classifications, and applications. In *Nanoengineering* (pp. 3-40). Elsevier.
- Fang, M., Wang, B., Qu, X., Li, S., Huang, J., Li, J., Lu, S. and Zhou, N., 2024 . State- of-the-art of biomass-derived carbon dots: Preparation, properties, and applications. *Chinese Chemical Letters*, 35(1), p.108423.
- Fischer, H., Romano, N. and Sinha, A.K., 2021. Conversion of spent coffee and donuts by black soldier fly (*Hermetia illucens*) larvae into potential resources for animal and plant farming. *Insects*, 12(4), p.332.
- Freitas, V.V., Borges, L.L.R., Vidigal, M.C.T.R., dos Santos, M.H. and Stringheta, P.C., 2024. Coffee: A comprehensive overview of origin, market, and the quality process. *Trends in Food Science & Technology*, p.104411.
- Gan, J., Chen, L., Chen, Z., Zhang, J., Yu, W., Huang, C., Wu, Y. and Zhang, K., 2023. Lignocellulosic biomass-based carbon dots: synthesis processes, properties, and applications. *Small*, 19(48), p.2304066.
- Gao, P., Xie, Z. and Zheng, M., 2022. Small nanoparticles bring big prospect: The synthesis, modification, photoluminescence and sensing applications of carbon dots. *Chinese Chemical Letters*, 33(4), pp.1659-1672.
- Guirguis, A., Yang, W., Conlan, X.A., Kong, L., Cahill, D.M. and Wang, Y., 2023. Boosting plant photosynthesis with carbon dots: a critical review of performance and prospects. *Small*, 19(43), p.2300671.
- Jagdale, P., Ziegler, D., Rovere, M., Tulliani, J.M. and Tagliaferro, A., 2019. Waste coffee ground biochar: A material for humidity sensors. *Sensors*, 19(4), p.801.
- Jameson, D.M., 2014. *Introduction to fluorescence*. Taylor & Francis.
- Jeong, G., Park, C.H., Yi, D. and Yang, H., 2023. Green synthesis of carbon dots from spent coffee grounds via ball-milling: Application in fluorescent chemosensors. *Journal of Cleaner Production*, 392, p.136250.
- Jiang, M., Sun, Y., Chen, M., Ji, H., Liu, Y., Qin, R., Li, X., Gao, H., Zhang, R. and Zhang, L., 2024. Multicolor luminescence of carbon Dots: From mechanisms to applications. *Chemical Engineering Journal*, p.153761.
- John, B.K., John, N., Mathew, S., Korah, B.K., Punnoose, M.S. and Mathew, B.,

2022. Fluorescent carbon quantum dots as a novel solution and paper strip - based dual sensor for the selective detection of Cr (VI) ions. *Diamond and Related Materials*, 126, p.109138.
- Kang, C., Huang, Y., Yang, H., Yan, X.F. and Chen, Z.P., 2020. A review of carbon dots produced from biomass wastes. *Nanomaterials*, 10(11), p.2316.
- Kang, J.W., Kim, J.Y. and Kang, D.H., 2024. Synthesis of carbon quantum dot synthesized using spent coffee ground as a biomass exhibiting visible-light- driven antimicrobial activity against foodborne pathogens. *Journal of Food Engineering*, 365, p.111820.
- Karoui, R., 2018. Spectroscopic technique: fluorescence and ultraviolet - visible (UV- Vis) spectroscopies. In *Modern techniques for food authentication* (pp. 219- 252). Academic Press.
- Keerthana, A.K. and Ashraf, P.M., 2020. Carbon nanodots synthesized from chitosan and its application as a corrosion inhibitor in boat-building carbon steel BIS2062. *Applied Nanoscience*, 10(4), pp.1061-1071.
- Lagunay, R.A.E., Akhetova, B., O'Reilly, R.J. and Balanay, M.P., 2024. Tailoring the Optoelectronic Properties of Soybean-Derived Nitrogen Self-Doped Carbon Dots through Composite Formation with KCl and Zeolite, Synthesized Using Autogenic Atmosphere Pyrolysis. *Crystals*, 14(4), p.348.
- Lee, K., Park, E., Lee, H.A., Sugnaux, C., Shin, M., Jeong, C.J., Lee, J., Messersmith, P.B., Park, S.Y. and Lee, H., 2017. Phenolic condensation and facilitation of fluorescent carbon dot formation: a mechanism study. *Nanoscale*, 9(43), pp.16596-16601.
- Lee, Y.G., Cho, E.J., Maskey, S., Nguyen, D.T. and Bae, H.J., 2023. Value- added products from coffee waste: a review. *Molecules*, 28(8), p.3562.
- Li, S., Li, L., Tu, H., Zhang, H., Silvester, D.S., Banks, C.E., Zou, G., Hou, H. and Ji, X., 2021. The development of carbon dots: From the perspective of materials chemistry. *Materials Today*, 51, pp.188-207.
- Liu, H., Zhong, X., Pan, Q., Zhang, Y., Deng, W., Zou, G., Hou, H. and Ji, X., 2024. A review of carbon dots in synthesis strategy. *Coordination Chemistry Reviews*, 498, p.215468.
- Liu, J., Li, R., & Yang, B. (2020). Carbon Dots: A New Type of Carbon-Based Nanomaterial with Wide Applications. *ACS Central Science*, 6(12), 2179–2195. <https://doi.org/10.1021/acscentsci.0c01306>
- Liu, M., 2020. Optical properties of carbon dots: a review. *Nanoarchitectonics*, pp.1-12.
- Liu, W., Diao, H., Chang, H., Wang, H., Li, T. and Wei, W., 2017. Green synthesis of carbon dots from rose-heart radish and application for Fe<sup>3+</sup> detection and cell imaging. *Sensors and Actuators B: Chemical*, 241,

pp.190-198.

- Liu, X., Zhang, S., Xu, H., Wang, R., Dong, L., Gao, S., Tang, B., Fang, W., Hou, F., Zhong, L. and Aldalbahi, A., 2020. Nitrogen-doped carbon quantum dots from poly (ethyleneimine) for optical dual-mode determination of Cu<sup>2+</sup> and l-cysteine and their logic gate operation. *ACS applied materials & interfaces*, 12(42), pp.47245-47255.
- Liu, Z., Cui, M., Weng, R., Hengchao, E., Li, H., Hati, S., Hu, L. and Mo, H., 2024. Incorporation of carbon dots into polyvinyl alcohol/corn starch based film and its application on shiitake mushroom preservation. *International Journal of Biological Macromolecules*, p.135998.
- Luo, X., Han, Y., Chen, X., Tang, W., Yue, T. and Li, Z., 2020. Carbon dots derived fluorescent nanosensors as versatile tools for food quality and safety assessment: A review. *Trends in Food Science & Technology*, 95, pp.149-161.
- Ma, C.A., Yin, C., Fan, Y., Yang, X. and Zhou, X., 2019. Highly efficient synthesis of N-doped carbon dots with excellent stability through pyrolysis method. *Journal of Materials Science*, 54(13), pp.9372-9384.
- McNutt, Josiah, & Quan (Sophia) He. 2019. "Spent Coffee Grounds: A Review on Current Utilization." *Journal of Industrial and Engineering Chemistry* 71(May): 78–88. <https://doi.org/10.1016/j.jiec.2018.11.054>.
- Mourdikoudis, S., Pallares, R.M. and Thanh, N.T., 2018. Characterization techniques for nanoparticles: comparison and complementarity upon studying nanoparticle properties. *Nanoscale*, 10(27), pp.12871-12934.
- Nalwi, R., Maddu, A., Kurniati, M. and Jumardin, J., 2023. ANALISIS SIFAT OPTIK NANO PARTIKEL KARBON BERBAHAN DAUN PANDAN WANGI (PANDANUS AMARYLLIFOLIUS) DENGAN METODE SINTESIS HIDROTERMAL. *JOURNAL ONLINE OF PHYSICS*, 8(3), pp.58-69.
- Naresh, K., 2014. Applications of fluorescence spectroscopy. *J. Chem. Pharm. Sci*, 974, p.2115.
- Noureena, M.M., Puhazhendhi, A., Sivalingam, S., Anu, A.S., Nathan, V. and D Raj, R., 2024. Development of an Optical Fiber Sensor for Malachite Green Detection Using L-Tryptophan-Derived Carbon Dots. *Available at SSRN* 4820201.
- Ok, Y.S., Chang, S.X., Gao, B. and Chung, H.J., 2015. SMART biochar technology—a shifting paradigm towards advanced materials and healthcare research. *Environmental Technology & Innovation*, 4, pp.206-209.
- Ozyurt, D., Al Kobaisi, M., Hocking, R.K. and Fox, B., 2023. Properties, synthesis, and applications of carbon dots: A review. *Carbon Trends*, 12,

p.100276.

- Pandey, R.R. and Chusuei, C.C., 2021. Carbon nanotubes, graphene, and carbon dots as electrochemical biosensing composites. *Molecules*, 26(21), p.6674.
- Park, S.J. and Yang, H.K., 2022. Ultra-fast synthesis of carbon dots using the wasted coffee residues for environmental remediation. *Current Applied Physics*, 36, pp.9-15.
- Pei, X., Xiong, D., Fan, J., Li, Z., Wang, H. and Wang, J., 2017. Highly efficient fluorescence switching of carbon nanodots by CO<sub>2</sub>. *Carbon*, 117, pp.147-153.
- Piccolo, M., Aceto, M. and Vitorino, T., 2019. UV-Vis spectroscopy. *Physical sciences reviews*, 4(4), p.20180008.
- Pradana, P.W., Nurbaiti, E.A. and Dwandaru, W.S.B., 2023. Effect of carbon dots nanomaterial concentration on luminance spectral bandwidth via Kirchoff-Bunsen spectroscope. *Revista Mexicana de Física*, 69(6 Nov-Dec), pp.061003-1.
- Putri, M.S., 2023. Optimasi Karbon Aktif Berbasis Ampas Kopi Melalui Pencucian Heksana Yang Diaktivasi Secara Fisika Dan Kimia. *Skripsi S1*. Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Gadjah Mada, Yogyakarta.
- Ramalingam, G., Kathirgamanathan, P., Ravi, G., Elangovan, T., Manivannan, N. and Kasinathan, K., 2020. Quantum confinement effect of 2D nanomaterials. In *Quantum dots-fundamental and applications*. IntechOpen.
- Rocha, F.S., Gomes, A.J., Lunardi, C.N., Kaliaguine, S. and Patience, G.S., 2018. Experimental methods in chemical engineering: Ultraviolet visible spectroscopy—UV-Vis. *The Canadian Journal of Chemical Engineering*, 96(12), pp.2512-2517.
- Saleh, T.A., 2020. Nanomaterials: Classification, properties, and environmental toxicities. *Environmental Technology & Innovation*, 20, p.101067.
- Samoggia, A. and Riedel, B., 2018. Coffee consumption and purchasing behavior review: Insights for further research. *Appetite*, 129, pp.70-81.
- Sawalha, S., Assali, M., Nasasrah, A., Salman, M., Nasasrah, M., Jitan, M., Hilal, H.S. and Zyoud, A., 2022. Optical properties and photoactivity of carbon nanodots synthesized from olive solid wastes at different carbonization temperatures. *RSC advances*, 12(8), pp.4490-4500.
- Sjahriza, A., Herlambang, S., dan Wati, I.F., 2018. MODIFIKASI KARAKTERISTIK KUAT TARIK PADA KOMPOSIT FILM POLI(VINIL PIROLIDON) DAN KARAGENAN MELALUI PEMBENTUKAN KOMPOSIT KARBON NANO DOT. *Al-Kimiya*, Vol. 5, No. 2 (52-56).



- Stylianou, M., Agapiou, A., Omirou, M., Vyrides, I., Ioannides, I.M., Maratheftis, G. and Fasoula, D., 2018. Converting environmental risks to benefits by using spent coffee grounds (SCG) as a valuable resource. *Environmental Science and Pollution Research*, 25, pp.35776-35790.
- Sun, L., Wei, W., Zhang, H., Xu, J. and Zhao, X., 2022. A simple colorimetric and fluorescent “on-off-on” dual-mode sensor based on cyan fluorescent carbon dots/AuNPs for the detection of L-cysteine and Zinc thiazole. *Microchemical Journal*, 174, p.107079.
- Sun, X. and Lei, Y., 2017. Fluorescent carbon dots and their sensing applications. *TrAC Trends in Analytical Chemistry*, 89, pp.163-180.
- Tan, X.W., Romainor, A.N.B., Chin, S.F. and Ng, S.M., 2014. Carbon dots production via pyrolysis of sago waste as potential probe for metal ions sensing. *Journal of analytical and applied pyrolysis*, 105, pp.157-165.
- Triwardiati, D. and Ermawati, I.R., 2018. Analisis Bandgap Karbon Nanodots (C-Dots) Kulit Bawang Merah Menggunakan Teknik Microwave. In *Prosiding Seminar Nasional Teknoka* (Vol. 3, No. 2502, p. 25).
- Tuerhong, M., Yang, X.U. and Xue-Bo, Y.I.N., 2017. Review on carbon dots and their applications. *Chinese Journal of Analytical Chemistry*, 45(1), pp.139-150.
- Usevičiūtė, L. and Baltrėnaitė-Gedienė, E., 2021. Dependence of pyrolysis temperature and lignocellulosic physical-chemical properties of biochar on its wettability. *Biomass Conversion and Biorefinery*, 11(6), pp.2775-2793.
- Virk, H.S 2014, *Luminescence: Basic Concepts, Applications and Instrumentation*, Churerstrasse 20 CH-8808 Pfaffikon Switzerland, Trans Tech Publications Ltd.
- Wang, Q., Wang, R., Sun, X., Aslam, R., Zhou, X., Zhang, Q., Zhao, C., Sun, Y., Yan, Z. and Li, X., 2024. Protein-derived carbon dots as green corrosion inhibitors for carbon steel in sulfuric acid solution. *Diamond and Related Materials*, 145, p.111135.
- Waychunas, G.A., 2014. Luminescence spectroscopy. *Reviews in Mineralogy and Geochemistry*, 78(1), pp.175-217.
- Yang, C., Liu, J. and Lu, S., 2021. Pyrolysis temperature affects pore characteristics of rice straw and canola stalk biochars and biochar-amended soils. *Geoderma*, 397, p.115097.
- Yurdakal, S., Garlisi, C., Özcan, L., Bellardita, M. and Palmisano, G., 2019. (Photo) catalyst characterization techniques: adsorption isotherms and BET, SEM, FTIR, UV-Vis, photoluminescence, and electrochemical characterizations. In *Heterogeneous photocatalysis* (pp. 87-152). Elsevier.
- Yusufoğlu, B., Kezer, G., Wang, Y., Ziora, Z.M. and Esatbeyoglu, T., 2024. Bio-

recycling of spent coffee grounds: Recent advances and potential applications. *Current Opinion in Food Science*, 55, p.101111.

Zhang, Y., Fan, X., Sun, X., Yang, X., Li, Z., Yang, Z. and Dong, C., 2024. Synthesis of oil-soluble carbon dots via pyrolysis and their diverse applications in doxycycline detection, fluorescent ink and film. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 304, p.123406.

Zhao, S., Chan, K., Sheng, N., Song, Q. and Li, J., 2024. Reducing carbon footprint of typical coffee consumption from the whole lifecycle viewpoint. *Environmental Impact Assessment Review*, 106, p.107476.