

DAFTAR PUSTAKA

- Alkian, I., Sutanto, H., dan Hadiyanto, 2022, Quantum yield optimization of carbon dots using response surface methodology and its application as control of Fe^{3+} ion levels in drinking water, *Mater. Res. Express*, 9 (1), 015702.
- Arkan, E., Barati, A., Rahmanpanah, M., Hosseinzadeh, L., Moradi, S., dan Hajialyani, M., 2018, Green Synthesis of Carbon Dots Derived from Walnut Oil and an Investigation of Their Cytotoxic and Apoptogenic Activities toward Cancer Cells, *Adv. Pharm. Bull.*, 8 (1), 149–155.
- Arul, V., Chandrasekaran, P., Sivaraman, G., dan Sethuraman, M.G., 2021, Efficient green synthesis of N,B co-doped bright fluorescent carbon nanodots and their electrocatalytic and bio-imaging applications, *Diam. Relat. Mater.*, 116, 108437.
- Assubaie, F.N., 2015, Assessment of the levels of some heavy metals in water in Alahsa Oasis farms, Saudi Arabia, with analysis by atomic absorption spectrophotometry, *Arab. J. Chem.*, 8 (2), 240–245.
- Atchudan, R., Edison, T.N.J.I., Perumal, S., Muthuchamy, N., dan Lee, Y.R., 2020, Hydrophilic nitrogen-doped carbon dots from biowaste using dwarf banana peel for environmental and biological applications, *Fuel*, 275, 117821.
- Ayiania, M., Weiss-Hortala, E., Smith, M., McEwen, J.S., dan Garcia-Perez, M., 2020, Microstructural analysis of nitrogen-doped char by Raman spectroscopy: Raman shift analysis from first principles, *Carbon N. Y.*, 167, 559–574.
- Balakrishnan, T., Ang, W.L., Mahmoudi, E., Mohammad, A.W., dan Sambudi, N.S., 2022, Formation mechanism and application potential of carbon dots synthesized from palm kernel shell via microwave assisted method, *Carbon Resour. Convers.*, 5 (2), 150–166.
- Batool, M., Junaid, H.M., Tabassum, S., Kanwal, F., Abid, K., Fatima, Z., dan Shah, A.T., 2022, Metal Ion Detection by Carbon Dots-A Review, *Crit. Rev. Anal. Chem.*, 52 (4), 756–767.
- Bayati, M., Dai, J., Zambrana, A., Rees, C., dan Fidalgo de Cortalezzi, M., 2018, Effect of water chemistry on the aggregation and photoluminescence behavior of carbon dots, *J. Environ. Sci. (China)*, 65, 223–235.
- Bloch, D.N., Ben Zichri, S., Kolusheva, S., dan Jelinek, R., 2020, Tyrosine carbon dots inhibit fibrillation and toxicity of the human islet amyloid polypeptide, *Nanoscale Adv.*, 2 (12), 5866–5873.
- Cattelan, M., Agnoli, S., Favaro, M., Garoli, D., Romanato, F., Meneghetti, M., Barinov, A., Dudin, P., dan Granozzi, G., 2013, Microscopic view on a chemical vapor deposition route to boron-doped graphene nanostructures, *Chem. Mater.*, 25 (9), 1490–1495.

- Chahal, S., Macairan, J.R., Yousefi, N., Tufenkji, N., dan Naccache, R., 2021, Green synthesis of carbon dots and their applications, *RSC Adv.*, 11 (41), 25354–25363.
- Chen, B. Bin, Liu, M.L., Li, C.M., dan Huang, C.Z., 2019, Fluorescent carbon dots functionalization, *Adv. Colloid Interface Sci.*, 270, 165–190.
- Chen, S., Hao, Y., Liu, S., Liu, Y., Zhang, Z., Fang, M., dan Geng, L., 2024, Boron and nitrogen co-doped carbon dots as the dual functional fluorescent probe for Fe^{3+} and pH detection, *J. Saudi Chem. Soc.*, 28 (1), 101775.
- Chen, Y., Sun, X., Pan, W., Yu, G., dan Wang, J., 2020, Fe^{3+} -Sensitive Carbon Dots for Detection of Fe^{3+} in Aqueous Solution and Intracellular Imaging of Fe^{3+} Inside Fungal Cells, *Front. Chem.*, 7 (January), 1–9.
- Choi, Y., Kang, B., Lee, J., Kim, S., Kim, G.T., Kang, H., Lee, B.R., Kim, H., Shim, S.H., Lee, G., Kwon, O.H., dan Kim, B.S., 2016, Integrative Approach toward Uncovering the Origin of Photoluminescence in Dual Heteroatom-Doped Carbon Nanodots, *Chem. Mater.*, 28 (19), 6840–6847.
- Choi, Yuri, Choi, Yeongkyu, Kwon, O.H., dan Kim, B.S., 2018, Carbon Dots: Bottom-Up Syntheses, Properties, and Light-Harvesting Applications, *Chem. – An Asian J.*, 13 (6), 586–598.
- Crista, D.M.A., da Silva, J.C.G.E., dan da Silva, L.P., 2020, Evaluation of Different Bottom-up Routes for the Fabrication of Carbon Dots, *Nanomater. (Basel, Switzerland)*, 10 (7), 1–15.
- Cronin, S.J.F., Woolf, C.J., Weiss, G., dan Penninger, J.M., 2019, The Role of Iron Regulation in Immunometabolism and Immune-Related Disease, *Front. Mol. Biosci.*, 6, 116.
- De, B. dan Karak, N., 2013, A green and facile approach for the synthesis of water soluble fluorescent carbon dots from banana juice, *RSC Adv.*, 3 (22), 8286–8290.
- Devi, P., Rajput, P., Thakur, A., Kim, K.H., dan Kumar, P., 2019, Recent advances in carbon quantum dot-based sensing of heavy metals in water, *TrAC - Trends Anal. Chem.*, 114, 171–195.
- Didukh-Shadrina, S.L., Losev, V.N., Samoilov, A., Trofimchuk, A., dan Nesterenko, P.N., 2019, Determination of metals in natural waters by inductively coupled plasma optical emission spectroscopy after preconcentration on silica sequentially coated with layers of polyhexamethylene guanidinium and sulphonated nitrosonaphthols, *Int. J. Anal. Chem.*, 2019 (3), 1–13.
- Ding, H., Li, X.H., Chen, X.B., Wei, J.S., Li, X.B., dan Xiong, H.M., 2020, Surface states of carbon dots and their influences on luminescence, *J. Appl. Phys.*, 127 (23), 231101.
- Dong, W., Zhou, S., Dong, Y., Wang, J., Ge, X., dan Sui, L., 2015, The preparation

of ethylenediamine-modified fluorescent carbon dots and their use in imaging of cells, *Luminescence*, 30 (6), 867–871.

Dua, S., Kumar, P., Pani, B., Kaur, A., Khanna, M., dan Bhatt, G., 2023, Stability of carbon quantum dots: a critical review, *RSC Adv.*, 13 (20), 13845–13861.

Dulama, I.D., Radulescu, C., Chelarescu, E.D., Stihi, C., Bucurica, I.A., Teodorescu, S., Stirbescu, R.M., Gurgu, I.V., Let, D.D., dan Stirbescu, N.M., 2017, Determination of heavy metal contents in surface water by inductively coupled plasma – Mass spectrometry: A case study of Ialomita River, Romania, *Rom. J. Phys.*, 62 (5–6),.

Eid, R., Arab, N.T.T., dan Greenwood, M.T., 2017, Iron mediated toxicity and programmed cell death: A review and a re-examination of existing paradigms, *Biochim. Biophys. Acta - Mol. Cell Res.*, 1864 (2), 399–430.

Fan, C., Ao, K., Lv, P., Dong, J., Wang, D., Cai, Y., Wei, Q., dan Xu, Y., 2018, Fluorescent Nitrogen-Doped Carbon Dots via Single-Step Synthesis Applied as Fluorescent Probe for the Detection of Fe³⁺ Ions and Anti-Counterfeiting Inks, *Nano*, 13 (8), 1–14.

Fan, R., Xiang, J., Zhou, P., Mei, H., Li, Y., Wang, H., Liu, X., dan Wang, X., 2022, Reuse of waste *Myrica rubra* for green synthesis of nitrogen-doped carbon dots as an “on-off-on” fluorescent probe for Fe³⁺ and ascorbic acid detection, *Ecotoxicol. Environ. Saf.*, 233, 113350.

Al Farsi, B., Sofin, R.G.S., Al Shidhani, H., El-Shafey, E.S.I., Al-Hosni, A.S., Al Marzouqi, F., Issac, A., Al Nabhani, A., dan Abou-Zied, O.K., 2022, The effect of microwave power level and post-synthesis annealing treatment on oxygen-based functional groups present on carbon quantum dots, *J. Lumin.*, 252, 119326.

Feng, H. dan Qian, Z., 2018, Functional Carbon Quantum Dots: A Versatile Platform for Chemosensing and Biosensing, *Chem. Rec.*, 18 (5), 491–505.

Feng, X., Xie, Y., Zhao, W., Green, M., Liu, L., dan Chen, X., 2021, Fe³⁺ ions quenching effects on carbon dots.pdf, *Spectroscopy*, 36 (7), 31–36.

Forootan, A., Sjöback, R., Björkman, J., Sjögreen, B., Linz, L., dan Kubista, M., 2017, Methods to determine limit of detection and limit of quantification in quantitative real-time PCR (qPCR), *Biomol. Detect. Quantif.*, 12, 1–6.

Ghanem, A., Al-Qassar Bani Al-Marjeh, R., dan Atassi, Y., 2020, Novel nitrogen-doped carbon dots prepared under microwave-irradiation for highly sensitive detection of mercury ions, *Heliyon*, 6 (4), e03750.

Goel, N., Sinha, N., dan Kumar, B., 2013, Growth and properties of sodium tetraborate decahydrate single crystals, *Mater. Res. Bull.*, 48 (4), 1632–1636.

Gu, X., Zhu, L., Shen, D., dan Li, C., 2022, Facile Synthesis of Multi-Emission Nitrogen/Boron Co-Doped Carbon Dots from Lignin for Anti-Counterfeiting

Printing, *Polymers (Basel)*, 14 (14), 1–12.

- Gupta, R., Singh, A., dan Pal, A.K., 2024, Azaindole based fluorescent chemosensors for detecting Fe(II/III) ions and molecular logic gate implementation, *J. Photochem. Photobiol. A Chem.*, 449, 115425.
- Hallaji, Z., Bagheri, Z., Oroujlo, M., Nemati, M., Tavassoli, Z., dan Ranjbar, B., 2022, An insight into the potentials of carbon dots for in vitro live-cell imaging: recent progress, challenges, and prospects, *Microchim. Acta*, 189 (5), 190.
- Han, B., Hu, X., Zhang, X., Huang, X., An, M., Chen, X., Zhao, D., dan Li, J., 2022, The fluorescence mechanism of carbon dots based on the separation and identification of small molecular fluorophores, *RSC Adv.*, 12 (19), 11640–11648.
- He, G., Xu, M., Shu, M., Li, X., Yang, Z., Zhang, L., Su, Y., Hu, N., dan Zhang, Y., 2016, Rapid solid-phase microwave synthesis of highly photoluminescent nitrogen-doped carbon dots for Fe³⁺ detection and cellular bioimaging, *Nanotechnology*, 27 (39), 1–10.
- Hu, J., Sun, Y., Aryee, A.A., Qu, L., Zhang, K., dan Li, Z., 2022, Mechanisms for carbon dots-based chemosensing, biosensing, and bioimaging: A review, *Anal. Chim. Acta*, 1209, 338885.
- Islam, M.S. dan Mostafa, M.G., 2023, Occurrence, Source, and Mobilization of Iron, Manganese, and Arsenic Pollution in Shallow Aquifer, *Geofluids*, 2023 (5), 1–19.
- Issa, M.A., Abidin, Z.Z., Sobri, S., Rashid, S., Mahdi, M.A., Ibrahim, N.A., dan Pudza, M.Y., 2019, Facile synthesis of nitrogen-doped carbon dots from lignocellulosic waste, *Nanomaterials*, 9 (10), 1500.
- Jana, J., Ganguly, M., Chandrakumar, K.R.S., Rao, G.M., dan Pal, T., 2017, Boron precursor-dependent evolution of differently emitting carbon dots, *Langmuir*, 33 (2), 573–584.
- Jorns, M. dan Pappas, D., 2021, A Review of Fluorescent Carbon Dots, Their Synthesis, Physical and Chemical Characteristics, and Applications, *Nanomaterials*, 11 (6), 1448.
- Kashani, H.M., Madrakian, T., Afkhami, A., Mahjoubi, F., dan Moosavi, M.A., 2019, Bottom-up and green-synthesis route of amino functionalized graphene quantum dot as a novel biocompatible and label-free fluorescence probe for in vitro cellular imaging of human ACHN cell lines, *Mater. Sci. Eng. B*, 251, 114452.
- Kemenkes-RI, 2023, Peraturan Menteri Kesehatan Republik Indonesia No. 2 tentang Peraturan Pelaksanaan Peraturan Pemerintah Nomor 66 Tahun 2014 tentang Kesehatan Lingkungan, 27.

- Khan, Z.G. dan Patil, P.O., 2023, Fabrication of polyaspartic acid surface-modified highly fluorescent carbon quantum dot nanoprobe for sensing of reduced glutathione in real sample, *Appl. Nanosci.*, 13 (6), 4437–4453.
- Khayal, A., Dawane, V., Amin, M.A., Tirth, V., Yadav, V.K., Algahtani, A., Khan, S.H., Islam, S., Yadav, K.K., dan Jeon, B.H., 2021, Advances in the Methods for the Synthesis of Carbon Dots and Their Emerging Applications, *Polymers (Basel)*, 13 (18), 3190.
- Kilic, M., 2023, Validation and measurement uncertainty of the determination of 24 elements in drinking water using ICP-MS, *Water Pract. Technol.*, 18 (12), 3299–3314.
- Korram, J., Koyande, P., Mehetre, S., dan Sawant, S.N., 2023, Biomass-Derived Carbon Dots as Nanoprobes for Smartphone-Paper-Based Assay of Iron and Bioimaging Application, *ACS Omega*, 8 (34), 31410–31418.
- Kung, J.C., Tseng, I.T., Chien, C.S., Lin, S.H., Wang, C.C., dan Shih, C.J., 2020, Microwave assisted synthesis of negative-charge carbon dots with potential antibacterial activity against multi-drug resistant bacteria, *RSC Adv.*, 10 (67), 41202–41208.
- Latief, U., ul Islam, S., Khan, Z.M.S.H., dan Khan, M.S., 2021, A facile green synthesis of functionalized carbon quantum dots as fluorescent probes for a highly selective and sensitive detection of Fe³⁺ ions, *Spectrochim. Acta - Part A Mol. Biomol. Spectrosc.*, 262, 120132.
- Lecroy, G.E., Messina, F., Sciortino, A., Bunker, C.E., Wang, P., Fernando, K.A.S., dan Sun, Y.P., 2017, Characteristic Excitation Wavelength Dependence of Fluorescence Emissions in Carbon “quantum” Dots, *J. Phys. Chem. C*, 121 (50), 28180–28186.
- Lei, M., Xie, Y., Chen, L., Liu, X., Yang, Y., Zheng, J., dan Li, Q., 2022, Surface state modulation of blue-emitting carbon dots with high quantum yield and high product yield, *RSC Adv.*, 12 (42), 27431–27441.
- Li, G., Lv, N., Bi, W., Zhang, J., dan Ni, J., 2016, Nitrogen-doped carbon dots as a fluorescence probe suitable for sensing Fe³⁺ under acidic conditions, *New J. Chem.*, 40 (12), 10213–10218.
- Li, L., Wang, J., Xu, S., Li, C., dan Dong, B., 2022a, Recent Progress in Fluorescent Probes For Metal Ion Detection, *Front. Chem.*, 10, 398.
- Li, P. dan Li, S.F.Y., 2021, Recent advances in fluorescence probes based on carbon dots for sensing and speciation of heavy metals, *Nanophotonics*, 10 (2), 877–908.
- Li, X., Zhao, L., Wu, Y., Zhou, A., Jiang, X., Zhan, Y., dan Sun, Z., 2022b, Nitrogen and boron co-doped carbon dots as a novel fluorescent probe for fluorogenic sensing of Ce⁴⁺ and ratiometric detection of Al³⁺, *Spectrochim. Acta Part A Mol. Biomol. Spectrosc.*, 282, 121638.

- Li, X., Zhao, S., Li, B., Yang, K., Lan, M., dan Zeng, L., 2021, Advances and perspectives in carbon dot-based fluorescent probes: Mechanism, and application, *Coord. Chem. Rev.*, 431, 213686.
- Li, Y., Huang, X., Wang, J., Huang, R., Wan, D., dan Yang, G., 2020, Regulation of Iron Homeostasis and Related Diseases, *Mediators Inflamm.*, 2020 (6062094), 1–11.
- Li, Y., Liu, Y., Shang, X., Chao, D., Zhou, L., dan Zhang, H., 2018, Highly sensitive and selective detection of Fe^{3+} by utilizing carbon quantum dots as fluorescent probes, *Chem. Phys. Lett.*, 705, 1–6.
- Li, Yueqin, Li, Yun, Yang, Z., Meng, F., Wang, N., Zhou, M., Xia, Z., Gong, Q., dan Gao, Q., 2019, Distinct supramolecular assemblies of Fe(iii) and Ni(ii) complexes constructed from the: O -vanillin salicylhydrazone ligand: Syntheses, crystal structures, DNA/protein interaction, and antioxidant and cytotoxic activity, *New J. Chem.*, 43 (21), 8024–8043.
- Liang, Y., Xu, L., Tang, K., Guan, Y., Wang, T., Wang, H., dan Yu, W.W., 2020, Nitrogen-doped carbon dots used as an “on–off–on” fluorescent sensor for Fe^{3+} and glutathione detection, *Dye. Pigment.*, 178, 108358.
- Lin, H., Huang, J., dan Ding, L., 2019, Preparation of Carbon Dots with High-Fluorescence Quantum Yield and Their Application in Dopamine Fluorescence Probe and Cellular Imaging, *J. Nanomater.*, 1–9.
- Liu, C., Zhang, F., Hu, J., Gao, W., dan Zhang, M., 2021, A Mini Review on pH-Sensitive Photoluminescence in Carbon Nanodots, *Front. Chem.*, 8, 1–9.
- Liu, H., He, Z., Jiang, L.P., dan Zhu, J.J., 2015, Microwave-assisted synthesis of wavelength-tunable photoluminescent carbon nanodots and their potential applications, *ACS Appl. Mater. Interfaces*, 7 (8), 4913–4920.
- Liu, Y., Duan, W., Song, W., Liu, J., Ren, C., Wu, J., Liu, D., dan Chen, H., 2017, Red Emission B, N, S-co-Doped Carbon Dots for Colorimetric and Fluorescent Dual Mode Detection of Fe^{3+} Ions in Complex Biological Fluids and Living Cells, *ACS Appl. Mater. Interfaces*, 9 (14), 12663–12672.
- Lu, H., Li, C., Wang, H., Wang, X., dan Xu, S., 2019, Biomass-Derived Sulfur, Nitrogen Co-Doped Carbon Dots for Colorimetric and Fluorescent Dual Mode Detection of Silver (I) and Cell Imaging, *ACS omega*, 4 (25), 21500–21508.
- Ludmerczki, R., Mura, S., Carbonaro, C.M., Mandity, I.M., Carraro, M., Senes, N., Garroni, S., Granozzi, G., Calvillo, L., Marras, S., Malfatti, L., dan Innocenzi, P., 2019, Carbon Dots from Citric Acid and its Intermediates Formed by Thermal Decomposition, *Chem. - A Eur. J.*, 25 (51), 11963–11974.
- Mathew, S., John, B.K., Thara, C.R., Korah, B.K., dan Mathew, B., 2023, One-pot synthesis of sustainable carbon dots for analytical and cytotoxicity studies, *Biomass Convers. Biorefinery*.

- De Medeiros, T. V., Manioudakis, J., Noun, F., Macairan, J.R., Victoria, F., dan Naccache, R., 2019, Microwave-assisted synthesis of carbon dots and their applications, *J. Mater. Chem. C*, 7 (24), 7175–7195.
- Meng, A., Zhang, Y., Wang, X., Xu, Q., Li, Z., Sheng, L., dan Yan, L., 2022, Fluorescence probe based on boron-doped carbon quantum dots for high selectivity “on-off-on” mercury ion sensing and cell imaging, *Colloids Surfaces A Physicochem. Eng. Asp.*, 648, 129150.
- Minervini, G., Panniello, A., Madonia, A., Carbonaro, C.M., Mocci, F., Sibillano, T., Giannini, C., Comparelli, R., Ingrosso, C., Depalo, N., Fanizza, E., Curri, M.L., dan Striccoli, M., 2022, Photostable carbon dots with intense green emission in an open reactor synthesis, *Carbon N. Y.*, 198, 230–243.
- Moriom, K., Biswas, B., Neger, T., Sharmin, N., dan Rahman, L., 2020, Method validation on iron determination by spectrophotometric method in aqueous medium, *Indian J. Chem. -Section A*, 59 (6), 790–796.
- Mousa, M.A., Abdelrahman, H.H., Fahmy, M.A., Ebrahim, D.G., dan Moustafa, A.H.E., 2023, Pure and doped carbon quantum dots as fluorescent probes for the detection of phenol compounds and antibiotics in aquariums, *Sci. Rep.*, 13 (1), 1–19.
- Ng, S.W., Norwitz, S.G., dan Norwitz, E.R., 2019, The impact of iron overload and ferroptosis on reproductive disorders in humans: Implications for preeclampsia, *Int. J. Mol. Sci.*, 20 (13), 3283.
- Nguyen, K.G., Baragau, I.A., Gromicova, R., Nicolaev, A., Thomson, S.A.J., Rennie, A., Power, N.P., Sajjad, M.T., dan Kellici, S., 2022, Investigating the effect of N-doping on carbon quantum dots structure, optical properties and metal ion screening, *Sci. Rep.*, 12 (1), 1–12.
- Noun, F., Jury, E.A., dan Naccache, R., 2021, Elucidating the Quenching Mechanism in Carbon Dot-Metal Interactions–Designing Sensitive and Selective Optical Probes, *Sensors*, 21 (4), 1391.
- Omer, K.M. dan Sartin, M., 2019, Dual-mode colorimetric and fluorometric probe for ferric ion detection using N-doped carbon dots prepared via hydrothermal synthesis followed by microwave irradiation, *Opt. Mater. (Amst.)*, 94, 330–336.
- Pal, A., Sk, M.P., dan Chattopadhyay, A., 2020, Recent advances in crystalline carbon dots for superior application potential, *Mater. Adv.*, 1 (4), 525–553.
- Pang, L.F., Wu, H., Fu, M.J., Guo, X.F., dan Wang, H., 2019, Red emissive boron and nitrogen co-doped “on-off-on” carbon dots for detecting and imaging of mercury(II) and biothiols, *Microchim. Acta*, 186 (11), 708.
- Pang, S. dan Liu, S., 2020, Dual-emission carbon dots for ratiometric detection of Fe³⁺ ions and acid phosphatase, *Anal. Chim. Acta*, 1105, 155–161.

- Papaioannou, N., Titirici, M.M., dan Sapelkin, A., 2019, Investigating the Effect of Reaction Time on Carbon Dot Formation, Structure, and Optical Properties, *ACS Omega*, 4 (26), 21658–21665.
- Peng, Z., Zhou, Y., Ji, C., Pardo, J., Mintz, K.J., Pandey, R.R., Chusuei, C.C., Graham, R.M., Yan, G., dan Leblanc, R.M., 2020, Facile Synthesis of “Boron-Doped” Carbon Dots and Their Application in Visible-Light-Driven Photocatalytic Degradation of Organic Dyes, *Nanomaterials*, 10 (8), 1–17.
- Piskin, E., Cinciosi, D., Gulec, S., Tomas, M., dan Capanoglu, E., 2022, Iron Absorption: Factors, Limitations, and Improvement Methods, *ACS Omega*, 7 (24), 20441–20456.
- Pschunder, F., Huergo, M.A., Ramallo-López, J.M., Kommula, B., Requejo, F.G., dan Bhattacharyya, S., 2020, Role of Intrinsic Atomic Features and Bonding Motifs from the Surface to the Deep Core on Multistate Emissive Properties of N,B-Codoped Carbon Dots, *J. Phys. Chem. C*, 124 (1), 1121–1128.
- Pu, Z.F., Wen, Q.L., Yang, Y.J., Cui, X.M., Ling, J., Liu, P., dan Cao, Q.E., 2020, Fluorescent carbon quantum dots synthesized using phenylalanine and citric acid for selective detection of Fe³⁺ ions, *Spectrochim. Acta - Part A Mol. Biomol. Spectrosc.*, 229, 117944.
- Qin, J., Gao, X., Chen, Q., Liu, H., Liu, S., Hou, J., dan Sun, T., 2021, PH sensing and bioimaging using green synthesized carbon dots from black fungus, *RSC Adv.*, 11 (50), 31791–31794.
- Qiu, J., Zeng, D., Lin, Y., Ye, W., Chen, C., Xu, Z., Hu, G., dan Liu, Y., 2023, Carbon-polymer dot-based UV absorption and fluorescence performances for heavy metal ion detection, *Spectrochim. Acta Part A Mol. Biomol. Spectrosc.*, 285, 121913.
- Rabajczyk, A. dan Namieśnik, J., 2014, Speciation of Iron in the Aquatic Environment, *Water Environ. Res.*, 86 (8), 741–758.
- Ramjam, N.J. dan Mohamed, K.N., 2021, Optimization of Dissolved Fe(III) Determination in Coastal Water by Using Electrochemistry Approach and 2, 3-Dihydroxynaphthalene as the Binding Ligand, *Int. J. Electrochem. Sci.*, 16, 1–18.
- Ren, J., Malfatti, L., dan Innocenzi, P., 2020, Citric Acid Derived Carbon Dots, the Challenge of Understanding the Synthesis-Structure Relationship, *C - J. Carbon Res.*, 7 (1), 2–16.
- Rigodanza, F., Burian, M., Arcudi, F., Đorđević, L., Amenitsch, H., dan Prato, M., 2021, Snapshots into carbon dots formation through a combined spectroscopic approach, *Nat. Commun.* 2021 121, 12 (1), 1–9.
- Romero, M.P., Alves, F., Stringasci, M.D., Buzzá, H.H., Ciol, H., Inada, N.M., dan Bagnato, V.S., 2021, One-Pot Microwave-Assisted Synthesis of Carbon Dots and in vivo and in vitro Antimicrobial Photodynamic Applications, *Front.*

Microbiol., 12, 662149.

Ross, S., Wu, R.S., Wei, S.C., Ross, G.M., dan Chang, H.T., 2020, The analytical and biomedical applications of carbon dots and their future theranostic potential: A review, *J. Food Drug Anal.*, 28 (4), 677–695.

Rusydi, A.F., Onodera, S.I., Saito, M., Ioka, S., Maria, R., Ridwansyah, I., dan Delinom, R.M., 2021, Vulnerability of groundwater to iron and manganese contamination in the coastal alluvial plain of a developing Indonesian city, *SN Appl. Sci.*, 3 (4), 1–12.

Sarkar, A. dan Shekhar, S., 2018, Iron contamination in the waters of Upper Yamuna basin, *Groundw. Sustain. Dev.*, 7, 421–429.

Semeniuk, M., Yi, Z., Poursorkhabi, V., Tjong, J., Jaffer, S., Lu, Z.H., dan Sain, M., 2019, Future Perspectives and Review on Organic Carbon Dots in Electronic Applications., *ACS Nano*, 13 (6), 6224–6255.

Sendão, R., Yuso, M. del V.M. de, Algarra, M., Esteves da Silva, J.C.G., dan Pinto da Silva, L., 2020, Comparative life cycle assessment of bottom-up synthesis routes for carbon dots derived from citric acid and urea, *J. Clean. Prod.*, 254, 120080.

Sharma, N., Sharma, I., dan Bera, M.K., 2022, Microwave-Assisted Green Synthesis of Carbon Quantum Dots Derived from *Calotropis Gigantea* as a Fluorescent Probe for Bioimaging, *J. Fluoresc.*, 32 (3), 1039–1049.

Siahcheshm, P. dan Heiden, P., 2023, High quantum yield carbon quantum dots as selective fluorescent turn-off probes for dual detection of $\text{Fe}^{2+}/\text{Fe}^{3+}$ ions, *J. Photochem. Photobiol. A Chem.*, 435, 114284.

Simões, E.F.C., Leitão, J.M.M., dan da Silva, J.C.G.E., 2016, Carbon dots prepared from citric acid and urea as fluorescent probes for hypochlorite and peroxynitrite, *Microchim. Acta*, 183 (5), 1769–1777.

Singh, H., Bamrah, A., Bhardwaj, S.K., Deep, A., Khatri, M., Kim, K.H., dan Bhardwaj, N., 2021, Nanomaterial-based fluorescent sensors for the detection of lead ions, *J. Hazard. Mater.*, 407, 124379.

Solati, N., Mobassem, S., Kahraman, A., Ogasawara, H., dan Kaya, S., 2019, A comprehensive study on the characteristic spectroscopic features of nitrogen doped graphene, *Appl. Surf. Sci.*, 495, 143518.

Sonaimuthu, M., Ganesan, S., Anand, S., Kumar, A.J., Palanisamy, S., You, S.G., Velsankar, K., Sudhakar, S., Lo, H.M., dan Lee, Y.R., 2023, Multiple heteroatom dopant carbon dots as a novel photoluminescent probe for the sensitive detection of Cu^{2+} and Fe^{3+} ions in living cells and environmental sample analysis, *Environ. Res.*, 219, 115106.

Song, Y., Zhu, S., Zhang, S., Fu, Y., Wang, L., Zhao, X., dan Yang, B., 2015, Investigation from chemical structure to photoluminescent mechanism: a type

- of carbon dots from the pyrolysis of citric acid and an amine, *J. Mater. Chem. C*, 3 (23), 5976–5984.
- Sun, N., Zhang, Y., Yin, L., Xiong, G., You, L., He, Y., dan Sun, Y., 2023, A water-stable Tb-MOF as a multifunctional luminescent sensor for Fe^{3+} and $\text{Cr}_2\text{O}_7^{2-}$ in water, *Inorganica Chim. Acta*, 555, 121581.
- Tabaraki, R. dan Abdi, O., 2020, Fluorescent sensing of Pb^{2+} by microwave-assisted synthesized N-doped carbon dots: application of response surface methodology and Doehlert design, *J. Iran. Chem. Soc.*, 17 (4), 839–846.
- Tan, D., Zhou, S., Shimotsuna, Y., Miura, K., dan Qiu, J., 2014, Effect of UV irradiation on photoluminescence of carbon dots, *Opt. Mater. Express*, 4 (2), 213–219.
- Thulasi, S., Kathiravan, A., dan Asha Jhonsi, M., 2020, Fluorescent Carbon Dots Derived from Vehicle Exhaust Soot and Sensing of Tartrazine in Soft Drinks, *ACS Omega*, 5 (12), 7025–7031.
- Tian, B., Fu, T., Wan, Y., Ma, Y., Wang, Y., Feng, Z., dan Jiang, Z., 2021, B- and N-doped carbon dots by one-step microwave hydrothermal synthesis: tracking yeast status and imaging mechanism, *J. Nanobiotechnology*, 19 (1), 1–12.
- Ustun, O., Karadag, S.N., Mazlumoglu, H., dan Yilmaz, A., 2023, pH-Sensitive Fluorescence Emission of Boron / Nitrogen, *Coatings*, 13 (456), 1–9.
- Wang, F., Hao, Q., Zhang, Y., Xu, Y., dan Lei, W., 2016, Fluorescence quenchometric method for determination of ferric ion using boron-doped carbon dots, *Microchim. Acta*, 183 (1), 273–279.
- Wang, H., Su, W., dan Tan, M., 2020a, Endogenous Fluorescence Carbon Dots Derived from Food Items, *Innovation*, 1 (1), 100009.
- Wang, L., Cao, H.X., Pan, C.G., He, Y.S., Liu, H.F., Zhou, L.H., Li, C.Q., dan Liang, G.X., 2019a, A fluorometric aptasensor for bisphenol a based on the inner filter effect of gold nanoparticles on the fluorescence of nitrogen-doped carbon dots, *Microchim. Acta*, 186 (28), 1–9.
- Wang, L., Chung, J.S., dan Hur, S.H., 2019b, Nitrogen and boron-incorporated carbon dots for the sequential sensing of ferric ions and ascorbic acid sensitively and selectively, *Dye. Pigment.*, 171, 107752.
- Wang, L., Zhang, Q., Su, P., Yu, L., Bu, Y., Yuan, C., dan Wang, S., 2022, Excitation-dependent ratiometric fluorescence response to mercury ion based on single hexagonal boron nitride quantum dots, *Anal. Chim. Acta*, 1236, 340585.
- Wang, R., Xue, L., Dong, X., Yan, W., dan Li, Y., 2024, Chitosan-initiated gold nanoparticles with enhanced fluorescence for unique Fe^{3+} /PPi sensing and photothermal therapy, *Talanta*, 271, 125719.
- Wang, Y., Hu, X., Li, W., Huang, X., Li, Z., Zhang, W., Zhang, X., Zou, X., dan

- Shi, J., 2020b, Preparation of boron nitrogen co-doped carbon quantum dots for rapid detection of Cr(VI), *Spectrochim. Acta - Part A Mol. Biomol. Spectrosc.*, 243, 118807.
- Wei, Y., Chen, L., Wang, J., Liu, X., Yang, Y., dan Yu, S., 2020, Rapid synthesis of B-N co-doped yellow emissive carbon quantum dots for cellular imaging, *Opt. Mater. (Amst.)*, 100, 109647.
- Welham, N.J., Malatt, K.A., dan Vukcevic, S., 2000, The effect of solution speciation on iron-sulphur-arsenic-chloride systems at 298 K, *Hydrometallurgy*, 57 (3), 209–223.
- Wibrianto, A., Khairunisa, S.Q., Sakti, S.C.W., Ni'Mah, Y.L., Purwanto, B., dan Fahmi, M.Z., 2021, Comparison of the effects of synthesis methods of B, N, S, and P-doped carbon dots with high photoluminescence properties on HeLa tumor cells, *RSC Adv.*, 11 (2), 1098–1108.
- World Health Organization, 2003, Iron in drinking-water, *WHO Guidel. Drink. Qual.*, 1–4.
- Wu, Y., Torabi, S.F., Lake, R.J., Hong, S., Yu, Z., Wu, P., Yang, Z., Nelson, K., Guo, W., Pawel, G.T., Van Stappen, J., Shao, X., Mirica, L.M., dan Lu, Y., 2023, Simultaneous Fe²⁺/Fe³⁺ imaging shows Fe³⁺ over Fe²⁺ enrichment in Alzheimer's disease mouse brain, *Sci. Adv.*, 9 (16), 1–14.
- Wu, Y.N., Li, Y., Cao, M.J., Dai, C.L., He, L., dan Yang, Y.P., 2020, Preparation and stabilization mechanism of carbon dots nanofluids for drag reduction, *Pet. Sci.*, 17 (6), 1717–1725.
- Xiang, Z., Jiang, Y., Cui, C., Luo, Y., dan Peng, Z., 2022, Sensitive, Selective and Reliable Detection of Fe³⁺ in Lake Water via Carbon Dots-Based Fluorescence Assay, *Molecules*, 27 (19), 6749.
- Xu, J., Guo, Y., Qin, L., Yue, X., Zhang, Q., dan Wang, L., 2023, Green one-step synthesis of boron and nitrogen co-doped carbon dots based on inner filter effect as fluorescent nanosensors for determination of Fe³⁺, *Ceram. Int.*, 49 (5), 7546–7555.
- Xu, X.J., Ge, S., Li, D.Q., Xu, Z.Q., Wang, E.J., dan Wang, S.M., 2022, Fluorescent carbon dots for sensing metal ions and small molecules, *Chinese J. Anal. Chem.*, 50 (2), 103–111.
- Xu, Y., Liu, J., Gao, C., dan Wang, E., 2014, Applications of carbon quantum dots in electrochemiluminescence: A mini review, *Electrochem. commun.*, 48, 151–154.
- Yan, Z., Cai, Y., Zhang, J., dan Zhao, Y., 2022, Fluorescent sensor arrays for metal ions detection: A review, *Meas. J. Int. Meas. Confed.*, 187, 110355.
- Yang, G. dan Park, S.J., 2019, Conventional and Microwave Hydrothermal Synthesis and Application of Functional Materials: A Review, *Materials*

(*Basel*)., 12 (7), 1177.

- Yang, R., Guo, X., Jia, L., Zhang, Y., Zhao, Z., dan Lonshakov, F., 2017, Green preparation of carbon dots with mangosteen pulp for the selective detection of Fe³⁺ ions and cell imaging, *Appl. Surf. Sci.*, 423, 426–432.
- Yao, B., Huang, H., Liu, Y., dan Kang, Z., 2019, Carbon Dots: A Small Conundrum, *Trends Chem.*, 1 (2), 235–246.
- Ye, Q., Yan, F., Shi, D., Zheng, T., Wang, Y., Zhou, X., dan Chen, L., 2016, N, B-doped carbon dots as a sensitive fluorescence probe for Hg²⁺ ions and 2,4,6-trinitrophenol detection for bioimaging, *J. Photochem. Photobiol. B Biol.*, 162, 1–13.
- Yu, T., Wang, H., Guo, C., Zhai, Y., Yang, J., dan Yuan, J., 2018, A rapid microwave synthesis of green-emissive carbon dots with solid-state fluorescence and pH-sensitive properties, *R. Soc. Open Sci.*, 5 (7), 1–11.
- Zhang, J., Yang, H., Pan, S., Liu, H., dan Hu, X., 2021a, A novel “off-on-off” fluorescent-nanoprobe based on B, N co-doped carbon dots and MnO₂ nanosheets for sensitive detection of GSH and Ag⁺, *Spectrochim. Acta - Part A Mol. Biomol. Spectrosc.*, 244, 118831.
- Zhang, Q., He, S., Zheng, K., Zhang, L., Lin, L., Chen, F., Du, X., dan Li, B., 2022, Green synthesis of mustard seeds carbon dots and study on fluorescence quenching mechanism of Fe³⁺ ions, *Inorg. Chem. Commun.*, 146, 110034.
- Zhang, Q., Wang, R., Feng, B., Zhong, X., dan Ostrikov, K. (Ken), 2021b, Photoluminescence mechanism of carbon dots: triggering high-color-purity red fluorescence emission through edge amino protonation, *Nat. Commun.*, 12 (1), 1–13.
- Zhang, Y., Wang, Y., Feng, X., Zhang, F., Yang, Y., dan Liu, X., 2016, Effect of reaction temperature on structure and fluorescence properties of nitrogen-doped carbon dots, *Appl. Surf. Sci.*, 387, 1236–1246.
- Zhao, L., Wang, Y., Zhao, X., Deng, Y., dan Xia, Y., 2019, Facile synthesis of nitrogen-doped carbon quantum dots with chitosan for fluorescent detection of Fe³⁺, *Polymers (Basel)*, 11 (11), 1–12.
- Zheng, Yong, Zheng, Yulian, Zhang, Y., Meng, H., dan Tan, C., 2024, An Ultra-low Detection Limit Fe³⁺ Optical Fiber Fluorescent Sensor Based on a Anti-B₁₈H₂₂ Derivative with Aggregation-induced Emission Enhancement, *J. Fluoresc.*
- Zhou, Y., Zahran, E.M., Quiroga, B.A., Perez, J., Mintz, K.J., Peng, Z., Liyanage, P.Y., Pandey, R.R., Chusuei, C.C., dan Leblanc, R.M., 2019, Size-dependent photocatalytic activity of carbon dots with surface-state determined photoluminescence, *Appl. Catal. B Environ.*, 248, 157–166.
- Zu, F., Yan, F., Bai, Z., Xu, J., Wang, Y., Huang, Y., dan Zhou, X., 2017, The

quenching of the fluorescence of carbon dots: A review on mechanisms and applications, *Microchim. Acta*, 184 (7), 1899–1914.

Zulfajri, M., Liu, K.C., Pu, Y.H., Rasool, A., Dayalan, S., dan Huang, G.G., 2020, Utilization of carbon dots derived from *Volvariella volvacea* mushroom for a highly sensitive detection of Fe³⁺ and Pb²⁺ ions in aqueous solutions, *Chemosensors*, 8 (3), 1–14.