

## REFERENCES

- Anonymous, 1997, *Guidelines for Drinking-Water Quality*, 2<sup>nd</sup> Ed., World Health Organization, Geneva.
- Anonymous, 2010, Peraturan Menteri Kesehatan Republik Indonesia Nomor 492/Menkes/Per/2010 Tentang Persyaratan Kualitas Air Minum.
- Anonymous, 2016, Mewujudkan Aksesibilitas Air Minum dan Sanitasi yang Aman dan Berkelanjutan bagi Semua: Hasil Survei Kualitas Air di Daerah Istimewa Yogyakarta Tahun 2015, Badan Pusat Statistik, Jakarta.
- Anonymous, 2017, *Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG Baselines*, World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), Geneva.
- Ali, I., AL-Othman, Z. A., and Alwarthan, A., 2016, Molecular Uptake of Congo Red Dye from Water on Iron Composite Nano Particles, *J. Mol. Liq.*, 224, 171–176.
- Anjana, R.R., Anjali Devi, J.S., Jayasree, M., Aparna, R.S., Aswathy, B., Praveen, G.L., Lekha, G. M., and Sony, G., 2017, S,N-Doped Carbon Dots as a Fluorescent Probe for Bilirubin, *Microchim. Acta*, 185(1), 11-21.
- Baker, S.N. and Baker G.A., 2010, Luminescent Carbon Nanodots: Emergent Nanolights, *Angew. Chem. Int. Ed.*, 49, 6726–6744.
- Barman, M.K., Jana, B., Bhattacharyya, S., and Patra, A., 2014, Photophysical Properties of Doped Carbon Dots (N, P, and B) and Their Influence on Electron/Hole Transfer in Carbon Dots–Nickel (II) Phthalocyanine Conjugates, *J. Phys. Chem. C*, 118(34), 20034–20041.
- Bhaisare, M.L., Gedda, G., Khan, M.S., and Wu, H.F., 2016, Fluorimetric Detection of Pathogenic Bacteria Using Magnetic Carbon Dots, *Anal. Chim. Acta*, 920, 63–71.
- Bhaisare, M.L., Talib, A., Khan, M.S., Pandey, S., and Wu, H.F., 2015, Synthesis of Fluorescent Carbon Dots via Microwave Carbonization of Citric Acid in Presence of Tetraoctylammonium Ion, and Their Application to Cellular Bioimaging, *Microchim. Acta*, 182, 2173–2181.
- Bialvaei, A.Z. and Kafil, H.S., 2015, Colistin, Mechanisms and Prevalence of Resistance, *Curr. Med. Res. Opin.*, 1–54
- Chan, K.K., Yang, C., Chien, Y.H., Panwar, N., and Yong, K.T., 2019, A Facile Synthesis of Label-Free Carbon Dots with Unique Selectivity-Tunable Characteristics for Ferric Ion Detection and Cellular Imaging Applications, *New J. Chem.*, 43, 4734–4744.

- Chandra, S., Mahto, T.K., Chowdhuri, A.R., Das, B., and Sahu, S.K., 2017, One Step Synthesis of Functionalized Carbon Dots for the Ultrasensitive Detection of *Escherichia coli* and iron (III), *Sensors Actuat. B Chem*, 245, 835–844.
- Chen, X., Jin, Q., Wu, L., Tung, C., and Tang, X., 2014. Synthesis and Unique Photoluminescence Properties of Nitrogen-Rich Quantum Dots and Their Applications, *Angew. Chem. Int. Ed.*, 53, 1-7.
- Cui, X., Wang, Y., Liu, J., Yang, Q., Zhang, B., Gao, Y., Wang, Y., and Lu, G., 2017, Dual functional N- and S-co-Doped Carbon Dots as the Sensor for Temperature and Fe<sup>3+</sup> Ions, *Sensors Actuat. B Chem.*, 242, 1272–1280.
- Dey, S., Chithaiah, P., Belawadi, S., Biswas, K., Rao, C.N.R., 2014, New Methods of Synthesis and Varied Properties of Carbon Quantum Dots with High Nitrogen Content, *J. Mater. Res.*, 29, 383–391.
- Długosz, M. and Trylska, J., 2009, Aminoglycoside Association Pathways with the 30S Ribosomal Subunit, *J. Phys. Chem. B*, 113(20), 7322–7330.
- Dong, Y.Q., Pang, H.C., Yang, H.B., Guo, C.X., Shao, J.W., Chi, Y.W., Li, C.M., and Yu, T., 2013, Carbon-Based Dots-co-Doped with Nitrogen and Sulfur for High Quantum Yield and Excitation-Independent Emission, *Angew. Chem. Int.Ed.*, 52, 1–6.
- Dowhan, W., 1997, Molecular Basis for Membrane Phospholipid Diversity: Why are There so Many Lipids?, *Annu. Rev. Biochem.*, 66, 199–232.
- Edberg, S., 2000, *Escherichia Coli*: The Best Biological Drinking Water Indicator for Public Health Protection, *J. Appl. Microbiol.*, 88, 106–116.
- Epand, R.M., Walker, C., Epand, R.F., and Magarvey, N.A., 2016, Molecular Mechanisms of Membrane Targeting Antibiotics, *Biochim. Biophys. Acta. Biomembr.*, 1858(5), 980–987.
- Guo, L., Ge, J., Liu, W., Niu, G., Jia, Q., Wang, H., and Wang, P. 2016, Tunable Multicolor Carbon Dots Prepared from Well-Defined Polythiophene Derivatives and Their Emission Mechanism, *Nanoscale*, 8, 729–734.
- Guo, L., Li, L., Liu, M., Wan, Q., Tian, J., Huang, Q., Wen, Y., Liang, S., Zhang, X., and Wei, Y., 2018, Bottom-Up Preparation of Nitrogen Doped Carbon Quantum Dots with Green Emission under Microwave-Assisted Hydrothermal Treatment and Their Biological Imaging, *Mater. Sci. Eng. C*, 84, 60–66.
- Hancock, R.E.W., Farmer, S.W., Zusheng, L., and Poole, K., 1991, Interaction of Aminoglycoside with the Outer Membranes and Purified

Lipopolysaccharide and OmpF Porin of *Escherichia coli*, *Antimicrob. Agents Chemoter.*, 35(7), 1309–1314.

- He, G., Xu, M., Shu, M., Li, X., Yang, Z., Zhang, L., Su, Y., Hu, N., and Zhang, Y., 2016, Rapid Solid-Phase Microwave Synthesis of Highly Photoluminescent Nitrogen-Doped Carbon Dots for Fe<sup>3+</sup> Detection and Cellular Bioimaging, *Nanotechnology*, 27(39), 395706-396715.
- Hu, S. L., Niu, K. Y., Sun, J., Yang, J., Zhao, N. Q., and Du, X. W., 2009, One-step Synthesis of Fluorescent Carbon Nanoparticles by Laser Irradiation, *J. Mater. Chem.*, 19, 484–488.
- Hu, Q., Paaui, M.C., Zhang, Y., Gong, X., Zhang, L., Lu, D., Liu, Y., Liu, Q., Yao, J., and Choi, M.M.F., 2014, Green Synthesis of Fluorescent Nitrogen/Sulfur Doped Carbon Dots and Investigation of Their Properties by HPLC Coupled with Mass Spectrometry, *RSC Adv.*, 4(35), 18065–18073.
- Hu, Y., Yang, J., Tian, J., Jia, L., and Yu, J.S., 2014, Waste Frying Oil as a Precursor for One-Step Synthesis of Sulfur-Doped Carbon Dots with pH-Sensitive Photoluminescence, *Carbon*, 77, 775–782.
- Hu, Y., Yang, J., Tian, J., and Yu, J. S., 2015, How do Nitrogen-Doped Carbon Dots Generate from Molecular Precursors? An Investigation of the Formation Mechanism and a Solution-Based Large-Scale Synthesis, *J. Mater. Chem. B*, 3(27), 5608–5614.
- Ishii, S. and Sadowsky, M.J., 2008, *Escherichia coli* in the Environment: Implications for Water Quality and Human Health, *Microbes Environ.*, 23, 101–108.
- Ipekci, T., Seyman, D., Berk, H., and Celik, O., 2014, Clinical and Bacteriological Efficacy of Amikacin in the Treatment of Lower Urinary Tract Infection caused by Extended-Spectrum Beta-Lactamase-Producing *Escherichia coli* or *Klebsiella pneumoniae*, *J. Infect. Chemother.*, 20(12), 1–6.
- Jang, J., Hur, H.G., Sadowsky, M.J., Byappanahalli, M.N., Yan, T., and Ishii, S., 2017, Environmental *Escherichia coli*: Ecology and Public Health Implications-A Review, *J. Appl. Microbiol.*, 123(3), 570–581.
- Kandasamy, G., 2019, Recent Advancements in Doped/Co-Doped Carbon Quantum Dots for Multi-Potential Applications, *C*, 5(2), 24-63.
- Kasouni, A., Chatzimitakos, T., and Stalikas, C., 2019, Bioimaging Applications of Carbon Nanodots: A Review, *C*, 5(2), 19-37.
- Lai, I.P.J., Harroun, S.G., Chena, S.Y., Unnikrishnan, B., Li, Y.J., and Huang, C.C., 2016, Solid-State Synthesis of Self-Functional Carbon

Quantum Dots for Detection of Bacteria and Tumor Cells, *Sens. Actuators B Chem.*, 228, 465–470.

Li, H., Xu, Y., Ding, J., Zhao, L., Zhou, T., Ding, H., Chen, Y., and Ding, L., 2018, Microwave-Assisted Synthesis of Highly Luminescent N- And S-co-Doped Carbon Dots as a Ratiometric Fluorescent Probe for Levofloxacin, *Microchim. Acta*, 185(2), 104–110.

Li, X.Y., Wang, H.Q., Shimizu, Y., Pyatenko, A., Kawaguchi, K., Koshizaki, N., 2011, Preparation of Carbon Quantum Dots with Tunable Photoluminescence by Rapid Laser Passivation in Ordinary Organic Solvents, *Chem. Comm.*, 47, 932–934.

Li, Z., Wang, Y., Ni, Y., Kokot, S., 2015, A Rapid and Label-Free Dual Detection of Hg (II) and Cysteine with the Use of Fluorescence Switching of Graphene Quantum Dots, *Sens. Actuators B Chem.*, 207, 490–497.

Liao, J., Cheng, Z., and Zhou, L., 2016, Nitrogen-Doping Enhanced Fluorescent Carbon Dots: Green Synthesis and Their Applications for Bioimaging and Label-Free Detection of Au<sup>3+</sup> Ions, *ACS Sustain. Chem. Eng.*, 4(6), 3053–3061.

Liu, L.Q., Li, Y.F., Zhan, L., Liu, Y., and Huang, C.Z., 2011, One Step Synthesis of Fluorescent Hydroxyls-Coated Carbon Dots with Hydrothermal Reaction and Its Application to Optical Sensing of Metal Ions, *Sci. China Chem.*, 54(8), 1342–1347.

Liu, M.L., Chen, B.B., Li, C.M., and Huang, C.Z., 2019, Carbon Dots: Synthesis, Formation Mechanism, Fluorescence Origin and Sensing Applications, *Green Chem.*, 21, 449–471.

Liu, Z.X., Li, R.S., Zou, H.Y., Lin, M., Liu, H., and Huang, C.Z., 2016, Synthesis of Nitrogen-Doping Carbon Dots with Different Photoluminescence Properties by Controlling the Surface States, *Nanoscale*, 8, 6770–6776.

Loukanov, A., Mladenova, P., Udono, H., Miskolczy, Z., Angelov, A., Biczók, L., and Nakabayashi, S., 2018, Sulfur Doped Fluorescent Carbon Dots as Nanosensors for Rapid and Sensitive Monitoring of Calcium in Hard Water, *J. Chem. Technol. Metall.*, 53, 473–479.

Lu, F., Song, Y., Huang, H., Liu, Y., Fu, Y., Huang, J., Hao, L., Qu, H., and Kang, Z., 2017, Fluorescent Carbon Dots with Tunable Negative Charges for Bio-Imaging in Bacterial Viability Assessment, *Carbon*, 120, 95–102.

Lu, W., Gong, X., Nan, M., Liu, Y., Shuang, S., and Dong, C., 2015, Comparative study for N and S Doped Carbon Dots: Synthesis, Characterization and

Applications for Fe<sup>3+</sup> Probe and Cellular imaging, *Anal. Chim. Acta*, 898, 116–127.

Mitra, S., Chandra, S., Kundu, T., Banerjee, R., Pramanik, P., and Goswami, A., 2012, Rapid Microwave Synthesis of Fluorescent Hydrophobic Carbon Dots, *RSC Adv.*, 2(32), 12129–12131.

Nandi, S., Ritenberga, M., and Jelinek, R., 2015, Bacterial Detection with Amphiphilic Carbon Dots, *Analyst*, 140, 4232–4237.

Outlaw, V.K., Zhou, J., Bragg, A.E., and Townsend, C.A., 2016, Unusual BlueShifted Acid-Responsive Photoluminescence Behavior in 6-Amino-8-cyanobenzo[1,2-*b*]indolizines, *RSC Adv.*, 6, 61249–61253.

Park, Y., Yoo, J., Lim, B., Kwon, W., and Rhee, S.W., 2016, Improving the Functionality of Carbon Nanodots: Doping and Surface Functionalization, *J. Mater. Chem. A*, 4(30), 11582–11603.

Peng, J., Gao, W., Gupta, B. K., Liu, Z., Romero-Aburto, R., Ge, L. H., Song, L., Alemany, L. B., Zhan, X. B., Gao, G. H., Vithayathil, S. A., Kaiparettu, B. A., Marti, A. A., Hayashi, T., Zhu, J. J., and P. M. Ajayan, 2012, Graphene Quantum Dots Derived from Carbon Fibers, *Nano Lett.*, 12, 844–849.

Ramirez, M.S. and Tolmasky, M.E., 2017, Amikacin; Uses, Resistance, and Prospects for Inhibition, *Molecules*, 22, 2267–2290.

Sader, H.S., Farrell, D.J., Flamm, R.K., and Jones, R.N., 2014, Antimicrobial Susceptibility of Gram-Negative Organisms Isolated from Patients Hospitalised with Pneumonia in U.S. and European Hospitals: Results from the SENTRY Antimicrobial Surveillance Program, 2009–2012, *Int. J. Antimicrob. Agents*, 43, 328–334.

Sevilla, M. and Fuertes, A.B., 2009, The Production of Carbon Materials by Hydrothermal Carbonization of Cellulose, *Carbon*, 47, 2281–2289.

Shen, J., Zhang, T., Cai, Y., Chen, X., Shang, S., and Li, J., 2017, Highly Fluorescent N,S-co-Doped Carbon Dots: Synthesis and Multiple Applications, *New J. Chem.*, 41(19), 11125–11137.

Song, Z., Quan, F., Xu, Y., Liu, M., Cui, L., and Liu, J., 2016, Multifunctional N,S co-Doped Carbon Quantum Dots with pH- and Thermo-Dependent Switchable Fluorescent Properties and Highly Selective Detection of Glutathione, *Carbon*, 104, 169–178.

Sun, X. and Lei, Y., 2017, Fluorescent Carbon Dots and Their Sensing Applications, *Trends Anal. Chem.*, 89, 163–180.

- Tong, G., Wang, J., Wang, R., Guo, X., He, L., Qiu, F., Wang, G., Zhu, B., Zhu, X., and Liu, T., 2015, Amorphous Carbon Dots with High Two-Photon Fluorescence for Cellular Imaging Passivated by Hyperbranched Poly(Amino Amine), *J. Mater. Chem. B*, 3, 700–706.
- Tsubery, H., Ofek, I., Cohen, S. and Fridkin, M., 2000, Structure-Function Studies of Polymyxin B Nonapeptide: Implications to Sensitization of Gram Negative Bacteria, *J. Med. Chem.*, 43, 3085–3092.
- Vakulenko, S. B. and Mobashery, S., 2003, Versatility of Aminoglycosides and Prospects for Their Future, *Clin. Microbiol. Rev.*, 16(3), 430–450.
- Wang, N., Wang, Y.T., Guo, T.T., Yang, T., Chen M.L., and Wang, J.H., 2016, Green Preparation of Carbon Dots with Papaya as Carbon Source for Effective Fluorescent Sensing of Iron (III) and *Escherichia coli*, *Biosens. Bioelectron.*, 85, 68–75.
- Wang, W., Li, Y., Cheng, L., Cao, Z., and Liu, W., 2014, Water-soluble and Phosphorus-Containing Carbon Dots with Strong Green Fluorescence for Cell Labeling, *J. Mater. Chem. B*, 2(1), 46–48.
- Wang, X.H., Zhang, M., Huo, X., Zhao, W., Kang, B., Xu, J.J., and Chen, H.Y., 2019, Modulating Electronic Structure of Semiconductor to Optimize Its Electrochemiluminescence Performance, *Nanoscale Adv.*, 1, 1965–1969.
- Wang, X., Qu, K., Xu, B., Ren, J., and Qu, X., 2011, Microwave Assisted One-Step Green Synthesis of Cell-Permeable Multicolor Photoluminescent Carbon Dots without Surface Passivation Reagents, *J. Mater. Chem.*, 21(8), 2445–2450.
- Weng, C.I., Chang, H.T., Lin, C.H., Shen, Y.W., Unnikrishnan, B., Li, Y.J., and Huang, C.C., 2015, One-Step Synthesis of Biofunctional Carbon Quantum Dots for Bacterial Labeling, *Biosens. Bioelectron.*, 68, 1–6.
- White, B. P., Lomaestro, B., and Paib, P., 2015, Optimizing the Initial Amikacin Dosage in Adults, *Antimicrob. Agents Chemother.*, 59(11), 7094–7096.
- Xu, Q., Pu, P., Zhao, J., Dong, C., Gao, C., Chen, Y., and Zhou, H., 2015, Preparation of Highly Photoluminescent Sulfur-Doped Carbon Dots for Fe(III) Detection, *J. Mat. Chem. A*, 3(2), 542–546.
- Xu, X., Ray, R., Gu, Y., Ploehn, H.J., Gearheart, L., Raker, K., and Scrivens, W.A., 2004, Electrophoretic Analysis And Purification Of Fluorescent Single-Walled Carbon Nanotube Fragments, *J. Am. Chem. Soc.*, 126, 12736–12737.

- Yan, Y., Sun, X., Ma, F., Li, J., Shen, J., Han, W., Liu, X., and Wang, L., 2014, Removal of Phosphate from Wastewater using Alkaline Residue, *J. Environ. Sci.*, 26(5), 970–980.
- Yang, S., Sun, J., Li, S., Zhou, W., Wang, Z., He, P., Ding, G., Xie, X., Kang, Z., Jiang, M., 2014, Large-Scale Fabrication of Heavy Doped Carbon Quantum Dots with Tunable-Photoluminescence and Sensitive Fluorescence Detection, *J. Mater. Chem. A.*, 2, 8660–8667.
- Zhang, J., Wang, J., Fu, J., Fu, X., Gan, W., and Hao, H., 2018, Rapid Synthesis of N,S co-Doped Carbon Dots and Their Application for Fe<sup>3+</sup> Ion Detection, *J. Nanopart. Res.*, 20(2), 41–49.
- Zhang, R. and Chen, W., 2014, Nitrogen-Doped Carbon Quantum Dots: Facile Synthesis and Application as a “Turn-Off” Fluorescent Probe for Detection of Hg<sup>2+</sup> Ions, *Biosens. Bioelectron.*, 55, 83–90.
- Zhang, Y., Cui, P., Zhang, F., Feng, X.T., Wang, Y., Yang, Y.Z., and Liu, X. G., 2016, Fluorescent Probes for “off-on” Highly Sensitive Detection of Hg<sup>2+</sup> and L-Cysteine based on Nitrogen-Doped Carbon Dots, *Talanta*, 152, 288–300.
- Zhang, Y., He, Y.H., Cui, P.P., Feng, X.T., Chen, L., Yang, Y.Z., Liu, X.G., 2015, Water-Soluble, Nitrogen-Doped Fluorescent Carbon Dots for Highly Sensitive and Selective Detection of Hg<sup>2+</sup> in Aqueous Solution, *RSC Adv.*, 5, 40393–40401.
- Zhao, W., Róg, T., Gurtovenko, A.A., Vattulainen, I., and Karttunen, M., 2008, Role of Phosphatidylglycerols in the Stability of Bacterial Membranes, *Biochimie*, 90(6), 930–938.
- Zhu, S., Meng, Q., Wang, L., Zhang, J., Song, Y., Jin, H., Zhang, K., Sun, H., Wang, H., and Yang, B., 2013, Highly Photoluminescent Carbon Dots for Multicolor Patterning, Sensors, and Bioimaging, *Angew. Chem. Int. Ed.*, 2013, 52(14), 3953–3957.
- Zhu, S.J., Song, Y.B., Zhao, X.H., Shao, J.R., Zhang, J.H, and Yang, B., 2015, The Photoluminescence Mechanism in Carbon Dots (Graphene Quantum Dots, Carbon Nanodots, and Polymer Dots): Current State and Future Perspective, *Nano Res.*, 8, 355–381.