

DAFTAR PUSTAKA

- Alaqarbeh, M. (2021). Adsorption Phenomena: Definition, Mechanisms, and Adsorption Types: Short Review. *RHAZES: Green and Applied Chemistry*, 13(September), 43–51. <https://doi.org/10.48419/IMIST.PRSM/rhazes-v13.28283>
- Aldabib, J., & Edbeib, M. (2020). The effects of concentration based on the absorbance from the ultraviolet–visible (UV-VIS) spectroscopy analysis. *International Journal of Science Letters*, 2(1), 1–11. <https://doi.org/10.38058/ijsl.633876>
- Ali, H. A., Chughtai, A., & Sattar, A. (2009). Synthesis of quality silica gel ; Optimization of parameters Silica Sol Silica Gel. *Journal of Faculty of Engineering & Technology*, 23, 1–14.
- Andure, S. D., & Tiwari, N. (2022). A Complete Review on UV-Visible Spectroscopic Technique. *International Journal of Pharmaceutical Research and Applications*, 7(6), 2456–4494. <https://doi.org/10.35629/7781-070612881299>
- Azmiyawati, C., Sawitri, E., Siahaan, P., Darmawan, A., & Suyati, L. (2020). Preparation of magnetite-silica-cetyltrimethylammonium for phenol removal based on adsolubilization. *Open Chemistry*, 18(1), 369–376. <https://doi.org/10.1515/chem-2020-0040>
- Bokov, D., Turki Jalil, A., Chupradit, S., Suksatan, W., Javed Ansari, M., Shewael, I. H., Valiev, G. H., & Kianfar, E. (2021). Nanomaterial by Sol-Gel Method: Synthesis and Application. *Advances in Materials Science and Engineering*, 2021. <https://doi.org/10.1155/2021/5102014>
- Borlaf, M., & Moreno, R. (2021). Colloidal sol-gel: A powerful low-temperature aqueous synthesis route of nanosized powders and suspensions. *Open Ceramics*, 8(November), 100200. <https://doi.org/10.1016/j.oceram.2021.100200>
- Carvalho, G. C., Marena, G. D., Karnopp, J. C. F., Jorge, J., Sábio, R. M., Martines, M. A. U., Bauab, T. M., & Chorilli, M. (2022). Cetyltrimethylammonium bromide in the synthesis of mesoporous silica nanoparticles: General aspects and in vitro toxicity. *Advances in Colloid and Interface Science*, 307. <https://doi.org/10.1016/j.cis.2022.102746>
- Danks, A. E., Hall, S. R., & Schnepf, Z. (2016). The evolution of “sol-gel” chemistry as a technique for materials synthesis. *Materials Horizons*, 3(2), 91–112. <https://doi.org/10.1039/c5mh00260e>

- Du, L., Zhong, H., Guo, X., Li, H., Xia, J., & Chen, Q. (2024). Nitrogen fertilization and soil nitrogen cycling: Unraveling the links among multiple environmental factors, functional genes, and transformation rates. *Science of the Total Environment*, 951(August), 175561. <https://doi.org/10.1016/j.scitotenv.2024.175561>
- Faturachman, G. F., Ramanda, A. A., Maharani, S., Latif, L. A., Belo, G. A. G., & Ayubi, S. G. Al. (2025). Application of Fourier Transform Infrared Spectroscopy (FTIR) for Quantitative Analysis of Pharmaceutical Compounds. *Indonesian Journal of Pharmaceutical Education*, 5(1), 27–33. <https://doi.org/10.37311/ijpe.v5i1.23309>
- Fedorowicz, J., & Sączewski, J. (2024). Advances in the Synthesis of Biologically Active Quaternary Ammonium Compounds. In *International Journal of Molecular Sciences* (Vol. 25, Nomor 9). <https://doi.org/10.3390/ijms25094649>
- Grini, M. I., Benbayer, C., Saidi-Besbes, S., & Elaissari, A. (2025). Advances in mesoporous silica nanoparticles as carriers for drug delivery and other biomedical applications. *Microporous and Mesoporous Materials*, 391(March), 113603. <https://doi.org/10.1016/j.micromeso.2025.113603>
- Han, H. W., Joe, A., & Jang, E. S. (2021). Reduced cytotoxicity of CTAB-templated silica layer on gold nanorod using fluorescence dyes and its application in cancer theranostics. *Journal of Industrial and Engineering Chemistry*, 96, 202–212. <https://doi.org/10.1016/j.jiec.2021.01.020>
- Iriyama, M., Hagawa, H., Shimizu, S., Akiyama, H., Shimizu, K., & Honda, H. (2024). Separation and enrichment of multiple bile acid micelle-disrupting peptides by adsorption/desorption process with heat-treated porous silica gels. *Biochemical Engineering Journal*, 205(March), 109283. <https://doi.org/10.1016/j.bej.2024.109283>
- Janosevic-Lezaic, A., Paunovic, N., & Pejic, N. (2014). Thermodynamics of micellization of hexadecyltrimethylammonium bromide in propylene glycol-water mixture: A conductivity study. *Facta universitatis - series: Physics, Chemistry and Technology*, 12(1), 17–26. <https://doi.org/10.2298/fupct1401017j>
- Kim, M. K., Ki, D. H., Na, Y. G., Lee, H. S., Baek, J. S., Lee, J. Y., Lee, H. K., & Cho, C. W. (2021). Optimization of mesoporous silica nanoparticles through statistical design of experiment and the application for the anticancer drug. *Pharmaceutics*, 13(2). <https://doi.org/10.3390/pharmaceutics13020184>
- Kumar, S., Malik, M. M., & Purohit, R. (2017). Synthesis Methods of Mesoporous Silica Materials. *Materials Today: Proceedings*, 4(2), 350–357. <https://doi.org/10.1016/j.matpr.2017.01.032>

- Lagalante, A. F. (2004). Atomic absorption spectroscopy: A tutorial review. *Applied Spectroscopy Reviews*, 34(3), 173–189. <https://doi.org/10.1081/asr-100100844>
- Lam, C. N., Do, C., Wang, Y., Huang, G. R., & Chen, W. R. (2019). Structural properties of the evolution of CTAB/NaSal micelles investigated by SANS and rheometry. *Physical Chemistry Chemical Physics*, 21(33), 18346–18351. <https://doi.org/10.1039/c9cp02868d>
- Lawrencia, D., Wong, S. K., Low, D. Y. S., Goh, B. H., Goh, J. K., Ruktanonchai, U. R., Soottitantawat, A., Lee, L. H., & Tang, S. Y. (2021). Controlled release fertilizers: A review on coating materials and mechanism of release. *Plants*, 10(2), 1–26. <https://doi.org/10.3390/plants10020238>
- Lester, E., Hilal, N., & Henderson, J. (2004). Porosity in ancient glass from Syria (c. 800 AD) using gas adsorption and atomic force microscopy. *Surface and Interface Analysis*, 36(9), 1323–1329. <https://doi.org/10.1002/sia.1911>
- Li, X., & Li, Z. (2024). Global Trends and Current Advances in Slow/Controlled-Release Fertilizers: A Bibliometric Analysis from 1990 to 2023. *Agriculture (Switzerland)*, 14(9). <https://doi.org/10.3390/agriculture14091502>
- Lin, H., Qu, F., Wu, X., Xue, M., Zhu, G., & Qiu, S. (2011). Mixed surfactants-directed the mesoporous silica materials with various morphologies and structures. *Journal of Solid State Chemistry*, 184(6), 1415–1420. <https://doi.org/10.1016/j.jssc.2011.03.043>
- Maniar, V., Kalsara, K., & Upadhyay, U. (2023). A Review of Ftir-An Useful Instrument. *International Journal of Pharmaceutical Research and Applications*, 8(1), 2486. <https://doi.org/10.35629/7781-080124862490>
- Mehmood, A., Ghafar, H., Yaqoob, S., Gohar, U. F., & Ahmad, B. (2017). Mesoporous Silica Nanoparticles: A Review. *Journal of Developing Drugs*, 06(02). <https://doi.org/10.4172/2329-6631.1000174>
- Migneault, I., Dartiguenave, C., Bertrand, M. J., & Waldron, K. C. (2004). Glutaraldehyde: Behavior in aqueous solution, reaction with proteins, and application to enzyme crosslinking. *BioTechniques*, 37(5), 790–802. <https://doi.org/10.2144/04375rv01>
- Ni'mah, Y. L., Suprpto, S., Subandi, A. P. K., Yuningsih, N. E., & Pertiwi, A. C. (2022). The optimization of silica gel synthesis from chemical bottle waste using response surface methodology. *Arabian Journal of Chemistry*, 15(12), 104329. <https://doi.org/10.1016/j.arabjc.2022.104329>
- Othman, N. (2023). IR Spectroscopy in Qualitative and Quantitative Analysis. *Infrared Spectroscopy - Perspectives and Applications*, 1–16.

<https://doi.org/10.5772/intechopen.106625>

- Pal, N., Lee, J., & Cho, E. (2020). *Recent Trends in Morphology-Controlled Synthesis and Application of Mesoporous Silica Nanoparticles*. 2. <https://doi.org/https://doi.org/10.3390/nano10112122>
- Saleh, T. A. (2022). Adsorption technology and surface science. In T. A. Saleh (Ed.), *Interface Science and Technology* (Vol. 34, hal. 39–64). Elsevier. <https://doi.org/https://doi.org/10.1016/B978-0-12-849876-7.00006-3>
- Sathiparan, N., & Subramaniam, D. N. (2024). Potential use of crushed waste glass and glass powder in sustainable pervious concrete: A review. *Cleaner Waste Systems*, 9(October), 100191. <https://doi.org/10.1016/j.clwas.2024.100191>
- Sathish Kumar, M., Vijaya Sree, V., Begum, M., Kavyanjali, D., & Harshitha Chowdary, K. (2025). A Novel Review on Atomic Absorption Spectroscopy and Atomic Emission Spectroscopy. *International Journal of Research Publication and Reviews Journal homepage: www.ijrpr.com*, 6(3), 3988–3996. www.ijrpr.com
- Schrader, A. M., Monroe, J. I., Sheil, R., Dobbs, H. A., Keller, T. J., Li, Y., Jain, S., Shell, M. S., Israelachvili, J. N., & Han, S. (2018). Surface chemical heterogeneity modulates silica surface hydration. *Proceedings of the National Academy of Sciences of the United States of America*, 115(12), 2890–2895. <https://doi.org/10.1073/pnas.1722263115>
- Sehmi, S. K., Allan, E., MacRobert, A. J., & Parkin, I. (2016). The bactericidal activity of glutaraldehyde-impregnated polyurethane. *MicrobiologyOpen*, 5(5), 891–897. <https://doi.org/10.1002/mbo3.378>
- Sunkara, N., Anvitha, G., Yamini, G., Deepika, G., Indupriya, G., & Srikanth, G. (2022). Review Article on FTIR Spectroscopy. *International Journal of Creative Research Thoughts (IJCRT)*, 10(2), 835–840. www.ijcrt.org
- Tanko, N. L., & Tijjani, A. S. (2018). Gas Sorption Analysis of Pore Size Distribution and Pore Anisotropy of Mesoporous Materials. *IOSR Journal of Applied Geology and Geophysics*, 6(2), 28–36. <https://doi.org/10.9790/0990-0602012836>
- Thommes, M., Kaneko, K., Neimark, A. V., Olivier, J. P., Rodriguez-Reinoso, F., Rouquerol, J., & Sing, K. S. W. (2015). Physisorption of gases, with special reference to the evaluation of surface area and pore size distribution (IUPAC Technical Report). *Pure and Applied Chemistry*, 87(9–10), 1051–1069. <https://doi.org/10.1515/pac-2014-1117>
- Tu, P., Zhang, G., Cen, Y., Huang, B., Li, J., Li, Y., Deng, L., & Yuan, H. (2023). Enhanced phosphate adsorption and desorption characteristics of MgO-

- modified biochars prepared via direct co-pyrolysis of MgO and raw materials. *Bioresources and Bioprocessing*, 10(1). <https://doi.org/10.1186/s40643-023-00670-3>
- Verma, G., & Mishra, M. (2018). Development and Optimization Of UV-Vis Spectroscopy - A Review. *World Journal of Pharmaceutical Research*, 7(11), 1170–1180. <https://doi.org/10.20959/wjpr201811-12333>
- Vo, P. T., Nguyen, H. T., Trinh, H. T., Nguyen, V. M., Le, A. T., Tran, H. Q., & Nguyen, T. T. T. (2021). The nitrogen slow-release fertilizer based on urea incorporating chitosan and poly(vinyl alcohol) blend. *Environmental Technology and Innovation*, 22, 101528. <https://doi.org/10.1016/j.eti.2021.101528>
- Wanyika, H., Gatebe, E., Kioni, P., Tang, Z., & Gao, Y. (2012). Mesoporous silica nanoparticles carrier for urea: Potential applications in agrochemical delivery systems. *Journal of Nanoscience and Nanotechnology*, 12(3), 2221–2228. <https://doi.org/10.1166/jnn.2012.5801>
- Władyczyn, A., & John, Ł. (2024). Silsesquioxane Cages under Solvent Regimen: The Influence of the Solvent on the Hydrolysis and Condensation of Alkoxysilane. *Inorganic Chemistry*, 63(20), 9145–9155. <https://doi.org/10.1021/acs.inorgchem.4c00460>
- Wulandari, N. M., Efiyanti, L., Trisunaryanti, W., Oktaviano, H. S., Bahri, S., Lailun Ni'mah, Y., & Larasati, S. (2021). Effect of CTAB ratio to the characters of mesoporous silica prepared from rice husk ash in the pyrolysis of α -cellulose. *Bulletin of Chemical Reaction Engineering and Catalysis*, 16(3), 632–640. <https://doi.org/10.9767/BCREC.16.3.10828.632-640>