

## DAFTAR PUSTAKA

- Abdu, M., Worku, A., Babaee, S., Diale, P., Msagati, T. A., & Nure, J. F. 2025. The development of TiO<sub>2</sub>-biochar composite material for photodegradation of basic blue 41 and erichrome black T azo dyes from water. *Surfaces and Interfaces*, 62, 1–13. <https://doi.org/10.1016/j.surfin.2025.106156>
- Aghababaei, E., Alizadeh, M., & Bahrami, A. 2025. Synthesis and characterization of Ce-doped TiO<sub>2</sub>/Cu-doped Fe<sub>3</sub>O<sub>4</sub> heterogeneous photocatalyst for antibacterial applications and visible-light photocatalytic degradation of methylene blue. *Ceramics International*, 1–19. <https://doi.org/10.1016/j.ceramint.2025.05.109>
- Ahmad, N., Wijaya, A., Arsyad, F. S., Royani, I., & Lesbani, A. 2024. Layered double hydroxide-functionalized humic acid and magnetite by hydrothermal synthesis for optimized adsorption of malachite green. *Kuwait Journal of Science*, 51(2), 1-8. <https://doi.org/10.1016/j.kjs.2024.100206>
- Ali, A. A., Ahmed, I. S., & Elfiky, E. M. 2021. Auto-combustion Synthesis and Characterization of Iron Oxide Nanoparticles ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>) for Removal of Lead Ions from Aqueous Solution. *Journal of Inorganic and Organometallic Polymers and Materials*, 31(1), 384–396. <https://doi.org/10.1007/s10904-020-01695-3>
- Ali, S., Li, Z., Chen, S., Zada, A., Khan, I., Khan, I., Ali, W., Shaheen, S., Qu, Y., & Jing, L. 2019. Synthesis of Activated Carbon-Supported TiO<sub>2</sub>-Based Nano-Photocatalysts With Well Recycling for Efficiently Degrading High-Concentration Pollutants. *Catalysis Today*, 335, 557–564. <https://doi.org/10.1016/j.cattod.2019.03.044>
- Almutairi, S. T. 2024. Fabrication and catalytic activity of TiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> and Fe<sub>3</sub>O<sub>4</sub>/ $\beta$ -cyclodextrin nanocatalysts for safe treatment of industrial wastewater. *Heliyon*, 10(15), 1–12. <https://doi.org/10.1016/j.heliyon.2024.e35400>
- Al-Oubidy, E. A., & Kadhim, F. J. 2019. Photocatalytic activity of anatase titanium dioxide nanostructures prepared by reactive magnetron sputtering technique. *Optical and Quantum Electronics*, 51(1), 1–23. <https://doi.org/10.1007/s11082-018-1738-z>
- Anbu, A., Dilipkumar, M., Jeyajothi, K., Rajasimman, M., & Manojkumar, M. S. 2025. Magnetically retrievable of Ag–ZrO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub>@TiO<sub>2</sub> quaternary nanocomposites (QNCs) towards fabric dye degradation. *Journal of the Indian Chemical Society*, 102(1), 1–10. <https://doi.org/10.1016/j.jics.2024.101528>
- Ao, W., Qu, J., Yu, H., Liu, Y., Liu, C., Fu, J., Dai, J., Bi, X., Yuan, Y., & Jin, Y. (2022). TiO<sub>2</sub>/activated carbon synthesized by microwave-assisted heating for tetracycline photodegradation. *Environmental Research*, 214, 1–16. <https://doi.org/10.1016/j.envres.2022.113837>
- Asses, N., Ayed, L., Hkiri, N., & Hamdi, M. 2018. Congo red decolorization and detoxification by *Aspergillus niger*: removal mechanisms and dye degradation pathway. *BioMed Research International*, 2018, 1–9. <https://doi.org/10.1155/2018/3049686>
- Azari, A., Rezaei, R., & Sanaeepur, H. 2018. Synthesis and characterization of TiO<sub>2</sub> nanoparticles loaded activated carbon for congo red removal from wastewater: kinetic and equilibrium studies. *Desalination and Water Treatment*, 124, 308–318. <https://doi.org/10.5004/dwt.2018.22728>



- S., Ezung, S. L., Jamir, L., Bora Sinha, U., & Sinha, D. 2024. Preparation of Co-activated carbon nanocomposite and its photocatalytic degradation of phenol. *Inorganic Chemistry Communications*, 166, 1–13. <https://doi.org/10.1016/j.inoche.2024.112644>

Bassim, S., Mageed, A. K., AbdulRazak, A. A., & Majdi, H. Sh. 2022. Green synthesis of Fe<sub>3</sub>O<sub>4</sub> nanoparticles and its applications in wastewater treatment. *Inorganics*, 10(12), 1–23. <https://doi.org/10.3390/inorganics10120260>

Bukhari, S. N. U. S., Shah, A. A., Liu, W., Channa, I. A., Chandio, A. D., Chandio, I. A., & Ibupoto, Z. H. 2024. Activated carbon based TiO<sub>2</sub> nanocomposites (TiO<sub>2</sub>@AC) used simultaneous adsorption and photocatalytic oxidation for the efficient removal of Rhodamine-B (Rh-B). *Ceramics International*, 50(21), 41285–41298. <https://doi.org/10.1016/j.ceramint.2024.07.440>

Bustamante-Torres, M., Romero-Fierro, D., Estrella-Nuñez, J., Arcentales-Vera, B., Chichande-Proañó, E., & Bucio, E. (2022). Polymeric Composite of Magnetite Iron Oxide Nanoparticles and Their Application in Biomedicine: A Review. *Polymers*, 14(4), 1–26. <https://doi.org/10.3390/polym14040752>

Byzynski, G., Volanti, D. P., Ribeiro, C., Mastelaro, V. R., & Longo, E. 2018. Direct photo-oxidation and superoxide radical as major responsible for dye photodegradation mechanism promoted by TiO<sub>2</sub>-rGO heterostructure. *Journal of Materials Science: Materials in Electronics*, 29(19), 17022–17037. <https://doi.org/10.1007/s10854-018-9799-0>

Charafi, S., Janani, F. Z., Elhalil, A., Abdennouri, M., Sadiq, M., & Barka, N. 2025. Optimization of photocatalytic degradation of amoxicillin by ZnO-TiO<sub>2</sub> heterojunction under UV-Visible irradiation. *Cleaner Chemical Engineering*, 11, 1–14. <https://doi.org/10.1016/j.clce.2025.100183>

Chekem, C. T., Goetz, V., Richardson, Y., Plantard, G., & Blin, J. 2019. Modelling of adsorption/photodegradation phenomena on AC-TiO<sub>2</sub> composite catalysts for water treatment detoxification. *Catalysis Today*, 328 (July 2018), 183–188. <https://doi.org/10.1016/j.cattod.2018.12.038>

Chen, W., Chang, L., Ren, S. Bin, He, Z. C., Huang, G. B., & Liu, X. H. 2020. Direct Z-scheme 1D/2D WO<sub>2</sub>.72/ZnIn<sub>2</sub>S<sub>4</sub> hybrid photocatalysts with highly-efficient visible-light-driven photodegradation towards tetracycline hydrochloride removal. *Journal of Hazardous Materials*, 384, 1–11. <https://doi.org/10.1016/j.jhazmat.2019.121308>

De Smedt, J., Arauzo, P. J., & Ronsse, F. 2025. Molten salts vs conventional activating agents for activated carbon production: A comprehensive review. *Journal of Analytical and Applied Pyrolysis*, 192, 1–23. <https://doi.org/10.1016/j.jaap.2025.107239>

Gebrezgiabher, M., Gebreslassie, G., Gebretsadik, T., Yeabyo, G., Elemo, F., Bayeh, Y., Thomas, M., & Linert, W. 2019. A c-doped TiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> nanocomposite for photocatalytic dye degradation under natural sunlight irradiation. *Journal of Composites Science*, 3(3), 1–11. <https://doi.org/10.3390/jcs3030075>

Guo, Q., Zhou, C., Ma, Z., & Yang, X. 2019. Fundamentals of TiO<sub>2</sub> photocatalysis: concepts, mechanisms, and challenges. *In Advanced Materials*, 31(50), 1–26. <https://doi.org/10.1002/adma.201901997>

Hanafi, M. F., & Sapawe, N. 2020. Effect of pH on the photocatalytic degradation of remazol brilliant blue dye using zirconia catalyst. *Materials Today: Proceedings*, 31, 260–262. <https://doi.org/10.1016/j.matpr.2020.05.746>

S., Said, M., & Farahdiba, R. 2023. Core-shell Fe<sub>3</sub>O<sub>4</sub>/SiO<sub>2</sub>/TiO<sub>2</sub> magnetic modified photocatalytic degradation of congo red dye and antibacterial activity. *Bulletin of Reaction Engineering & Catalysis*, 18(2), 315–330. <https://doi.org/10.9767/bcrec.19275>

ig, Y., Xiang, J., Li, Y., & He, D. 2017. Adsorption characteristic of congo red onto Fe<sub>2</sub>O<sub>4</sub> nanoparticles prepared via the solution combustion and gel calcination



process. *Journal of Nanoscience and Nanotechnology*, 17(6), 3967–3974.  
<https://doi.org/10.1166/jnn.2017.13091>

Helmiyati, H., Fitriana, N., Chaerani, M. L., & Dini, F. W. 2022. Green hybrid photocatalyst containing cellulose and  $\gamma\text{-Fe}_2\text{O}_3\text{-ZrO}_2$  heterojunction for improved visible-light driven degradation of Congo red. *Optical Materials*, 124, 1–10.  
<https://doi.org/10.1016/j.optmat.2022.111982>

Huang, C.-H., Tseng, Y.-H., Hsu, S.-H., Liu, Y.-H., & Hsu, C.-L. 2025. Enhancing UV sensing and photocatalytic degradation with Pt nanoparticles on carbon-modified electrospun  $\text{TiO}_2$  nanowires. *Materials Chemistry and Physics*, 347, 1–9.  
<https://doi.org/10.1016/j.matchemphys.2025.131458>

Kampouri, S., & Stylianou, K. C. 2019. Dual-functional photocatalysis for simultaneous hydrogen production and oxidation of organic substances. *ACS Catalysis*, 9(5), 4247–4270.  
<https://doi.org/10.1021/acscatal.9b00332>

Karunadasa, K. S. P., & Manoratne, C. H. 2022. Microstructural view of anatase to rutile phase transformation examined by in-situ high-temperature X-ray powder diffraction. *Journal of Solid State Chemistry*, 314, 1–10.  
<https://doi.org/10.1016/j.jssc.2022.123377>

Khera, N., & Jeevanandam, P. 2025. Core-shell composite nanoarchitectonics of  $\text{TiO}_2\text{@NiCO}_2\text{S}_4$  via thermal decomposition approach for photodegradation of congo red. *Environmental Research*, 274, 1–13.  
<https://doi.org/10.1016/j.envres.2025.121304>

Kousar, N., Rasheed, S., Yasmeen, K., Umar, A. R., Laiche, M. H., Masood, M., Muhammad, H., & Hanif, M. 2024. Efficient synergistic degradation of congo red and omeprazole in wastewater using  $\text{rGO/Ag@ZnO}$  nanocomposite. *Journal of Water Process Engineering*, 58, 1–14.  
<https://doi.org/10.1016/j.jwpe.2024.104775>

Kumaravel, S., Geetha, M., Niyitanga, T., Kumar, D. S., Al-Ansari, M. M., Mythili, R., Suganthi, S., Guganathan, L., Murugan, A., & Ragupathy, S. 2024. Preparation and characterization of activated carbon from corn cob by chemical activation and their adsorption of brilliant green dye from wastewater. *Process Safety and Environmental Protection*, 188, 1338–1345.  
<https://doi.org/10.1016/j.psep.2024.05.127>

Kumar, S., Baruah, S., & Puzari, A. 2020. Poly(p-phenylenediamine)-based nanocomposites with metal oxide nanoparticle for optoelectronic and magneto-optic application. *Polymer Bulletin*, 77(1), 441–457.  
<https://doi.org/10.1007/s00289-019-02760-9>

Kunusa, W. R., Iyabu, H., & Abdullah, R. 2021. FTIR, SEM and XRD analysis of activated carbon from sago wastes using acid modification. *Journal of Physics: Conference Series*, 1968(1), 1–12.  
<https://doi.org/10.1088/1742-6596/1968/1/012014>

Kusumah, H. P., Mahardhika, L. J., Zurnansyah, Jayanti, P. D., Ardiyanti, H., Istiqomah, N. I., Asri, N. S., Khoiri, H. Y., Sharma, A., Baqiya, M. A., Sunaryono, S., Ali, D., & Suharyadi, E. 2025. Eco-friendly  $\text{TiO}_2$ -doped  $\text{Fe}_3\text{O}_4/\text{rGO}$  nanocomposites synthesized using plant extracts for photodegradation of organic dye. 170, 1–15. <https://doi.org/10.1016/j.crcon.2025.100373>



ewewe, Z. O., Adeniyi, A. T., & Giwa, A. 2023. Maize cob-derived activated carbon as for the removal of nickel (II) cation from aqueous solution: optimization and kinetic *Journal of Basic and Applied Sciences*, 30(1), 573–582.  
<https://doi.org/10.1080/25765299.2023.2266230>

H. M., Lee, G. H., Jung, Y. W., Jo, S. G., & Kang, J. K. 2021. Agglomeration-Free red via nitrogen mediation of carbon nanotubes for high-performance arsenic

adsorption. *Journal of Environmental Chemical Engineering*, 9(3), 1–6. <https://doi.org/10.1016/j.jece.2020.104772>

Lee, S. Y., & Park, S. J. 2013. TiO<sub>2</sub> photocatalyst for water treatment applications. In *Journal of Industrial and Engineering Chemistry*, 19 (6), 1–9. <https://doi.org/10.1016/j.jiec.2013.07.012>

Lei, B., Xie, H., Chen, S., Liu, B., & Zhou, G. 2020. Control of pore structure and surface chemistry of activated carbon derived from waste Zanthoxylum bungeanum branches for toluene removal in air. *Environmental Science and Pollution Research*, 27(21), 27072–27092. <https://doi.org/10.1007/s11356-020-09115-2>

Lisjak, D., & Mertelj, A. 2018. Anisotropic magnetic nanoparticles: A review of their properties, syntheses and potential applications. *Progress in Materials Science*, 95, 286–328. <https://doi.org/10.1016/j.pmatsci.2018.03.003>

López, J., Rey, A., Viñuelas-Zahinos, E., & Álvarez, P. M. 2023. Preparation of a new green magnetic Fe<sub>3</sub>O<sub>4</sub>@TiO<sub>2</sub>-P25 photocatalyst for solar advanced oxidation processes in water. *Journal of Environmental Chemical Engineering*, 11(3).1-16. <https://doi.org/10.1016/j.jece.2023.109999>

Liu, M., Ye, Y., Ye, J., Gao, T., Wang, D., Chen, G., & Song, Z. 2023. Recent Advances of Magnetite (Fe<sub>3</sub>O<sub>4</sub>)-Based Magnetic Materials in Catalytic Applications. *Magnetochemistry*, 9(4), 1–32. <https://doi.org/10.3390/magnetochemistry9040110>

Liu, X., Liu, Y., Lu, S., Guo, W., & Xi, B. 2018. Performance and mechanism into TiO<sub>2</sub>/Zeolite composites for sulfadiazine adsorption and photodegradation. *Chemical Engineering Journal*, 350, 131–147. <https://doi.org/10.1016/j.cej.2018.05.141>

Li, Y., Chen, S., Wan, X., Jiang, N., Duan, W., Lei, W., Nan, Y., Ding, D., & Xiao, G. 2025. Powering efficient dye degradation based on nanostructured FeOOH/TiO<sub>2</sub> composite with hydrophilic surfaces and unparalleled photocatalytic performance. *Ceramics International*, 51(11), 14966–14973. <https://doi.org/10.1016/j.ceramint.2025.01.340>

Madima, N., Kefeni, K. K., Mishra, S. B., Mishra, A. K., & Kuvarega, A. T. 2022. Fabrication of magnetic recoverable Fe<sub>3</sub>O<sub>4</sub>/TiO<sub>2</sub> heterostructure for photocatalytic degradation of rhodamine B dye. *Inorganic Chemistry Communications*, 145, 1–13. <https://doi.org/10.1016/j.inoche.2022.109966>

Moosavi, S., Li, R. Y. M., Lai, C. W., Yusof, Y., Gan, S., Akbarzadeh, O., Chowhury, Z. Z., Yue, X. G., & Johan, M. R. 2020. Methylene blue dye photocatalytic degradation over synthesised Fe<sub>3</sub>O<sub>4</sub>/AC/TiO<sub>2</sub> nano-catalyst: Degradation and reusability studies. *Nanomaterials*, 10(12), 1–15. <https://doi.org/10.3390/nano10122360>

Moshari, M., Rabbani, M., & Rahimi, R. 2016. Synthesis of TCPP–Fe<sub>3</sub>O<sub>4</sub>@S/RGO and its application for purification of water. *Research on Chemical Intermediates*, 42(6), 5441–5455. <https://doi.org/10.1007/s11164-015-2378-6>

Napruszewska, B. D., Duraczyńska, D., Kryściak-Czerwenka, J., Nowak, P., & Serwicka, E. M. 2024. Clay Minerals/TiO<sub>2</sub> composites—characterization and application in photocatalytic degradation of water pollutants. *Molecules*, 29(20), 1–20. <https://doi.org/10.3390/molecules29204852>

Nasikhudin, Diantoro, M., Kusumaatmaja, A., & Triyana, K. 2018. Study on photocatalytic properties of TiO<sub>2</sub> nanoparticle in various pH condition. *Journal of Physics: Conference Series*, 1011, 1–8. <https://doi.org/10.1088/1742-6596/1011/1/012069>

ison, I., Gherendi, M., Culita, D. C., Baran, A., Petrescu, S., Trica, B., Pelinescu, D., Bratan, V., & Parvulescu, V. 2023. Brij 58–activated carbon assisted synthesis of TiO<sub>2</sub>-AC photocatalysts for efficient organic pollutants degradation. *Journal of Alloys and Compounds*, 931, 1-16. <https://doi.org/10.1016/j.jallcom.2022.167528>



Nguyen, M. D., Tran, H.-V., Xu, S., & Lee, T. R. 2021. Fe<sub>3</sub>O<sub>4</sub> Nanoparticles: Structures, Synthesis, Magnetic Properties, Surface Functionalization, and Emerging Applications. *Applied Sciences*, 11(23), 1–34.

<https://doi.org/10.3390/app112311301>

Nur, A. S. M., Sultana, M., Mondal, A., Islam, S., Robel, F. N., Islam, A., & Sumi, Mst. S. A. 2022. A review on the development of elemental and codoped TiO<sub>2</sub> photocatalysts for enhanced dye degradation under UV–vis irradiation. *Journal of Water Process Engineering*, 47(1), 1-17.

<https://doi.org/10.1016/j.jwpe.2022.102728>

Nurfatin, S., Mohd, N., Yusof, N., Fajrina, N., Hanis, N., Hairom, H., Aziz, F., Norharyati, W., & Salleh, W. 2023. Proceedings V<sub>2</sub>O<sub>5</sub> / Cds as nanocomposite catalyst for congo red dye photocatalytic degradation under visible light. *Materials Today: Proceedings*, June, 2–5.

<https://doi.org/10.1016/j.matpr.2023.10.152>

Ozpinar, P., Dogan, C., Demiral, H., Morali, U., Erol, S., Yildiz, D., Samdan, C., & Demiral, I. 2023. Effect of binder on the electrochemical performance of activated carbon electrodes obtained from waste hazelnut shells: Comparison of PTFE and PVDF. *Diamond and Related Materials*, 137(2023), 1-14.

<https://doi.org/10.1016/j.diamond.2023.110092>

Pang, Y. L., Lim, S., & Lee, R. K. L. 2019. Enhancement of sonocatalytic degradation of organic dye by using titanium dioxide (TiO<sub>2</sub>)/activated carbon (AC) derived from oil palm empty fruit bunch. *Environmental Science and Pollution Research*, 27(28), 1–15.

<https://doi.org/10.1007/s11356-019-05373-x>

Paryanto, Wibowo, W. A., Hantoko, D., & Saputro, M. E. 2019. Preparation of Activated Carbon from Mangrove Waste by KOH Chemical Activation. *IOP Conference Series: Materials Science and Engineering*, 543(1), 1–7.

<https://doi.org/10.1088/1757-899X/543/1/012087>

Parvizi, E., Tayebee, R., Koushki, E., Abdizadeh, M. F., Maleki, B., Audebert, P., & Galmiche, L. 2019. Photocatalytic efficacy of supported tetrazine on MgZnO nanoparticles for the heterogeneous photodegradation of methylene blue and ciprofloxacin. *RSC Advances*, 9(41), 23818–23831.

<https://doi.org/10.1039/C9RA04702F>

Pereira, L. de O., Sales, I. M., Zampiere, L. P., Vieira, S. S., Guimarães, I. do R., & Magalhães, F. (2019). Preparation of magnetic photocatalysts from TiO<sub>2</sub>, activated carbon and iron nitrate for environmental remediation. *Journal of Photochemistry and Photobiology A: Chemistry*, 382, 1–9.

<https://doi.org/10.1016/j.jphotochem.2019.111907>

Pham, T. T., & Thuy Le, T. T. 2025. Tertiary heterojunction TiO<sub>2</sub>-Fe<sub>3</sub>O<sub>4</sub>/rGO composites for visible light-enhanced degradation of organic dyes in wastewater. *Physica B: Condensed Matter*, 714, 1–12.

<https://doi.org/10.1016/j.physb.2025.417465>

Pishrafti, H., Kamani, H., Mansouri, N., Hassani, A. H., & Ahmadpanahi, H. 2022. Photocatalytic removal of the erythromycin antibiotic using Fe-doped TiO<sub>2</sub>@Fe<sub>3</sub>O<sub>4</sub> magnetic nanoparticles: investigation of effective parameters, process kinetics and degradation end products. *Desalination and Water Treatment*, 262, 323–337.

<https://doi.org/10.5004/dwt.2022.28542>

Pradipta, A. R., Enriyani, R., Rahmatia, L., & Utami, A. 2021. Sintesis nanokomposit Fe<sub>3</sub>O<sub>4</sub>/TiO<sub>2</sub> sebagai fotokatalis yang dapat diambil kembali dalam fotoreduksi limbah ion perak(I). *Warta Akab*, 44(2), 32–39.

<https://doi.org/10.55075/wa.v45i1.6>



20. Synthesis of magnetite nanoparticles using the reverse CO-precipitation method as precipitating agent and its stability test at various pH. *Natural Science: Journal of Technology*, 9(3), <https://doi.org/10.22487/25411969.2020.v9.i3.15298>

- Rajendran, R., Rojviroon, O., Arumugam, P., Ramasamy, G., Paramasivam, S., & Rojviroon, T. 2025. Synergistic effects of activated Carbon-Supported TiO<sub>2</sub>/ZnO nanocomposites for photocatalytic dye degradation and antibacterial activity. *Journal of Molecular Liquids*, 433, 1–11. <https://doi.org/10.1016/j.molliq.2025.127792>
- Ramalingam s. 2019. Synthesis of Nanosized Titanium Dioxide (TiO<sub>2</sub>) by Sol-Gel Method. *International Journal of Innovative Technology and Exploring Engineering*, 9, 732–735. <https://doi.org/10.35940/ijitee.b1174.1292s219>
- Rashid, M., Ikram, M., Haider, A., Naz, S., Haider, J., Ul-Hamid, A., Shahzadi, A., & Aqeel, M. 2020. Photocatalytic, dye degradation, and bactericidal behavior of Cu-doped ZnO nanorods and their molecular docking analysis. *Dalton Transactions*, 49(24), 1–38. <https://doi.org/10.1039/D0DT01397H>
- Rashid, R., Shafiq, I., Gilani, M. R. H. S., Maaz, M., Akhter, P., Hussain, M., Jeong, K. E., Kwon, E. E., Bae, S., & Park, Y. K. 2024. Advancements in TiO<sub>2</sub>-based photocatalysis for environmental remediation: Strategies for enhancing visible-light-driven activity. *In Chemosphere*, 349, 1–19. <https://doi.org/10.1016/j.chemosphere.2023.140703>
- Ren, H., Li, H., Barry, P., Wang, Z., Campos, A. R., Takeuchi, E. S., Marschilok, A. C., Yan, S., Takeuchi, K. J., & Reichmanis, E. 2024. Recent advances in the application of magnetite (Fe<sub>3</sub>O<sub>4</sub>) in Lithium-Ion Batteries: Synthesis, Electrochemical Performance, and Characterization Techniques. *Chemistry of Materials*, 36(19), 9299–9319. <https://doi.org/10.1021/acs.chemmater.4c02013>
- Riyanti, F., Hasanudin, H., Rachmat, A., Purwaningrum, W., & Hariani, P. L. 2023. Photocatalytic degradation of methylene blue and Congo red dyes from aqueous solutions by bentonite-Fe<sub>3</sub>O<sub>4</sub> magnetic. *Communications in Science and Technology*, 8(1), 1–9. <https://doi.org/10.21924/cst.8.1.2023.1007>
- Sadek, O., Touhtouh, S., Rkhis, M., Anoua, R., El Jouad, M., Belhora, F., & Hajjaji, A. 2022. Synthesis by sol-gel method and characterization of nano-TiO<sub>2</sub> powders. *Materials Today: Proceedings*, 66, 456–458. <https://doi.org/10.1016/j.matpr.2022.06.385>
- Sadikin, S. N., Ridwan, J., Umar, M. I. A., Raub, A. A. M., Yunas, J., Hamzah, A. A., Dahlan, D., Rahman, M. Y. A., & Umar, A. A. 2023. Photocatalytic activity and stability properties of porous TiO<sub>2</sub> film as photocatalyst for methylene blue and methylene orange degradation. *International Journal of Electrochemical Science*, 18(9), 1–8. <https://doi.org/10.1016/j.ijoes.2023.100246>
- Saefumillah, A., Mahadika, B. S., Saepurahman, Kurnia, K. A., Wellia, D. V., & Apriandanu, D. O. B. 2025. Adsorption and photodegradation of various organic dyes in batch and flow systems over TiO<sub>2</sub>-chitosan immobilized on glass beads. *Results in Surfaces and Interfaces*, 18, 1–11. <https://doi.org/10.1016/j.rsurfi.2025.100418>
- Sanadi, P. D., Chougale, R. K., Malavekar, D. B., Kim, J. H., Masimukku, S., Chang-Chien, G. P., Lee, Y. Y., Ghaware, R. C., Kolekar, S. S., & Kamble, G. S. 2025. Controllable synthesis of semiconducting anatase TiO<sub>2</sub> nanostructures for visible light driven photocatalytic degradation of crystal violet and methylene blue dye. *Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy*, 341, 1–11. <https://doi.org/10.1016/j.saa.2025.126404>
- Setiawan, A., Kusumawati, T. A., Ramadani, T. A., Wang, Y.-F., Kusumawardani, A., & Dermawan, D. 2024. Composite of activated carbon-hydroxyapatite from corn (*Zea mays L.*) cob and catfish (*Pangasius sp.*) bones with H<sub>3</sub>PO<sub>4</sub> activation for methylene blue dye adsorption. *Inorganic Chemistry Communications*, 167, 1–12. <https://doi.org/10.1016/j.inoche.2024.112744>



ad, W., Anwar, M., Shah, R., Khan, J. A., Shah, N. S., Al-Anazi, A., & Han, C. 2025. Properties, and applications of Fe<sub>3</sub>O<sub>4</sub> and Fe<sub>3</sub>O<sub>4</sub>-based nanocomposites: A review. *Analysis O: Open*, 203, 1–29. <https://doi.org/10.1016/j.apcato.2025.207049>

., Dolete, G., Croitoru, A. M., Surdu, V. A., Truşcă, R. D., Motelica, L., Oprea, O. C., Sai, A., Andronesco, E., & Diţu, L. M. 2022. Preparation and characterization of

Chitosan/TiO<sub>2</sub> composite membranes as adsorbent materials for water purification. *Membranes*, 12(8), 1–25.

<https://doi.org/10.3390/membranes12080804>

Tahsin, M., Shahinuzzaman, M., Akter, T., Abdur, R., Bashar, M. S., Kadir, Md. R., Hoque, S., Jamal, M. S., & Hossain, M. 2025. Improved CO<sub>2</sub> adsorption and desorption using chemically derived activated carbon from corn cob hard shell. *Carbon Trends*, 19, 1–10.

<https://doi.org/10.1016/j.cartre.2025.100495>

Thanh, N. D., Hai, D. S., Huyen, L. T., Thuy, V. T. T., Tung, D. T., Van, H. T. K., Toan, V. N., Giang, N. T. K., & Tri, N. M. 2023. Fe<sub>3</sub>O<sub>4</sub>-MNPs@MMT-K10: a reusable catalyst for synthesis of propargyl 4-aryl-4H-pyran-3-carboxyles via one pot three-component reaction under microwave-assisted solvent-free conditions. *Research on Chemical Intermediates*, 49(2), 525–555.

<https://doi.org/10.1007/s11164-022-04911-6>

Thuy, V. T. T., Tan, D. N., Khai, N. L. P., Thuy, N. T., Tien, N. T. C., Hien, L. P. T., Van Thanh, D., & Huy, N. N. 2023. Degradation of enrofloxacin in water by Fe<sub>3</sub>O<sub>4</sub>@TiO<sub>2</sub> magnetic photocatalyst: optimization of environmental factors. *Desalination and Water Treatment*, 287, 124–138.

<https://doi.org/10.5004/dwt.2023.29351>

Toubal, B., Bensaha, R., & Yakuphanoglu, F. 2017. The influence of copper-cobalt co-doping on optical and electrical properties of nanostructures TiO<sub>2</sub> thin films prepared by sol-gel. *Journal of Sol-Gel Science and Technology*, 82(2), 478–489.

<https://doi.org/10.1007/s10971-017-4337-8>

Utami, M., Zahra', H. A., Khoirunisa, & Dewi, T. A. 2022. Green synthesis of magnetic activated carbon from peanut shells functionalized with TiO<sub>2</sub> photocatalyst for Batik liquid waste treatment. *Open Chemistry*, 20(1), 1229–1238.

<https://doi.org/10.1515/chem-2022-0231>

Wenbin, L., Zhou, Z., Chen, Z., Chen, L., Tang, J., & Zhang, L. 2024. Adsorption and degradation of tetracycline hydrochloride in aqueous solutions using activated carbon with Fe/Ag nanoparticles. *Materials Today Communications*, 39, 1–15.

<https://doi.org/10.1016/j.mtcomm.2024.108504>

Yahya, S. N., Istiqomah, N. I., Sari, E. K., Asri, N. S., Darmawan, M. Y., Tumbelaka, R. M., Adrianto, N., & Suharyadi, E. 2025. Photodegradation of organic water pollutants using magnetically separable and reusable novel Ag-doped Fe<sub>3</sub>O<sub>4</sub>/TiO<sub>2</sub> nanocomposites synthesized by green route. *Inorganic Chemistry Communications*, 172, 1–15.

<https://doi.org/10.1016/j.inoche.2024.113749>

You, J., Liu, C., Feng, X., Lu, B., Xia, L., & Zhuang, X. 2022. In situ synthesis of ZnS nanoparticles onto cellulose/chitosan sponge for adsorption–photocatalytic removal of congo red. *Carbohydrate Polymers*, 288, 1–19.

<https://doi.org/10.1016/j.carbpol.2022.119332>

Yue, Y., Yue, X., Tang, X., Han, L., Wang, J., Wang, S., & Du, C. 2024. Synergistic adsorption and photocatalysis study of TiO<sub>2</sub> and activated carbon composite. *Heliyon*, 10(10), 1–13.

<https://doi.org/10.1016/j.heliyon.2024.e30817>

Yunarti, R. T., Emanuel, E., Buhori, A., Apriandanu, D. O. B., Dahnum, D., & Ha, J.-M. 2025. Fe/TiO<sub>2</sub>-GO nanosheets as two-dimensional photocatalyst in the application of rhodamine B photodegradation. *Optical Materials*, 159, 1–11.

<https://doi.org/10.1016/j.optmat.2025.116682>

Žerjav, G., Žižek, K., Zavašnik, J., & Pintar, A. 2022. Brookite vs. rutile vs. anatase: What's behind their various photocatalytic activities. *Journal of Environmental Chemical Engineering*, 10(3), 1–18.

<https://doi.org/10.1016/j.jece.2022.107722>



L., & Liu, Z. 2018. Removal of toluene from waste gas by adsorption-desorption using corn cob-based activated carbons as adsorbents. *Ecotoxicology and Environmental Safety*, 165, 115–125.

<https://doi.org/10.1016/j.ecoenv.2018.08.105>

Zia, A., Akhter, P., Nazir, A., Hussain, M., & Park, Y. K. 2025. Synergistic effect of metal-doped TiO<sub>2</sub>/AC for efficient visible light driven cationic dye degradation. *Separation and Purification Technology*, 361, 1-12. <https://doi.org/10.1016/j.seppur.2024.131402>



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