

DAFTAR PUSTAKA

- Andini, V. M., Mutiara, I., & Witasari, Y. (2015). *Studi Persebaran Total Suspended Solid (TSS) Menggunakan Citra Aqua Modis Di Laut Senunu.* 204–2013.
- Anggarani, B. O. (2018). Peningkatan Efektifitas Proses Koagulasi-Flokulasi Dengan Coagulation-Flocculation Process Using Aluminium Sulphate and. *Institut Teknologi Sepuluh Nopember Surabaya*, 6.
- Aragaw, T. A., & Bogale, F. M. (2023). Role of coagulation/flocculation as a pretreatment option to reduce colloidal/bio-colloidal fouling in tertiary filtration of textile wastewater: A review and future outlooks. *Frontiers in Environmental Science*, 11(April). <https://doi.org/10.3389/fenvs.2023.1142227>
- At, A., & Shetty, R. (2024). Comparative study on natural and chemical coagulants for. 09, 2372–2380.
- AZIZAH. (2018). Bab I Studi Pengadukan Hidrolis Pada Proses Koagulasi Menggunakan Terjunan Dan Proses Flokulasi Menggunakan Vertical Baffle Channel. 1–4.
- Bahctiar, F. E., & Putro, R. K. H. (2022). Pemantauan dan Optimasi Instalasi Pengolahan Air Limbah Unit Lamella Clarifier dengan Penentuan Dosis Koagulan dan Flokulasi. *Indonesian Journal of Applied Science and Technology*, 3(1), 76–88. <https://journal.publication-center.com/index.php/ijast/article/view/1416>
- Barus, A., Tarigan, K., & Kemit, P. (2023). Effect of Al₂O₃ Levels On Poly Aluminium Chloride Added To The Water Purification Process At Tirtanadi Deli Tua. *Reprokimia*, 9211(27), 6–11.
- Bolto, B., & Gregory, J. (2015). Organic polyelectrolytes in water treatment. *Water Research*, 41(11), 2301–2324. <https://doi.org/10.1016/j.watres.2007.03.012>

Cahyo, A. D., Riyanto, A., Rukmana, M. D., Devi, S., & Putri, E. (2025). *Variasi Waktu Pengadukan dan Rasio Poly Aluminium Chloride (PAC) Terhadap Pengolahan Limbah Cair Industri Tahu.* 25(1), 899–903.
<https://doi.org/10.33087/jiubj.v25i1.6002>

Cholilalah, Arifin, R., & Hatneny, I. A. (2020). formulasi sediaan nanopartikel fraksi n-heksana dari ekstrak etanol daun jambu biji (psidium guajava linn.) dalam bentuk snedd dan uji aktivitasnya sebagai antikanker payudara. *Skripsi Fakultas Matematika Dan Ilmu Pengetahuan Alam Universitas Islam Indonesia Fakultas Matematika Dan Ilmu Pengetahuan Alam Universitas Islam Indonesia*, 82–95.

Euis Kusniawati, Rahma Nuryanti, A. S. W. (2023). *Utilization of papaya seeds (carica papaya l.) As biocoagulants to improve the quality of well water using parameters of ph, tss, tds, and turbidity.* 2(5), 2177–2184.

Fajar, U. (2023). Perbandingan efektivitas koagulan poly alluminium chloride (pac) dan aluminium sulfat (tawas) untuk menjernihkan air ridayanti program studi teknik kimia.

Fatoni, I., Subiantoro, R., & Maryanti, M. (2020). Pengaruh Penggunaan Berbagai Koagulan Kimia Pada Limbah Cair Kelapa Sawit Terhadap Penurunan Beban Pencemar. *JURNAL KESEHATAN LINGKUNGAN: Jurnal Dan Aplikasi Teknik Kesehatan Lingkungan*, 17(2), 63–72. <Https://doi.org/10.31964/jkl.v17i2.216>

Fitria, D., Fadila, M., Mustain, A., & Dandel, B. F. (2024). *Penyisihan parameter nilai tss dan turbidity pada proses pengolahan limbah cair industri krimen.* 10(9), 734–742.

Gadekar, M. R., & Ahammed, M. M. (2016). Coagulation/flocculation process for dye removal using water treatment residuals: modelling through artificial neural networks. *Desalination and Water Treatment*, 57(55), 26392–26400.
<https://doi.org/10.1080/19443994.2016.1165150>

Hani, M., & Ratni, N. (2020). *Rizky, M. H. (Maulidya), & Juliardi AR, N. R.*

- (2020). *Penurunan Total Suspended Solid dan Kekeruhan Air Baku Menggunakan Pipa Circular dan Gravel Bed Flocculator dengan Koagulan Poly Aluminium Chl.* 1(1), 16–21.
- Hariani, P. L., Hidayati, N., & Oktaria, M. (2015). Penurunan Konsentrasi Cr(VI) Dalam Air Dengan Koagulan FeSO 4. *Jurnal Penelitian Sains*, 12(C), 12208.
- Hasan, R. (2024). *Efektivitas Koagulan Aluminium Sulfat dan Poly Aluminium Chloride (PAC) pada Pengolahan Limbah Cair B3 PT X.* 5–14.
- Himayati, Q. (2019). Tinjauan kualitas Air Permukaan. *Jurnal Kesehatan Masyarakat*, 1(2), 105–112.
- Hinkelmann, K. (2016). Design and Analysis of Experiments. In *Design and Analysis of Experiments* (Vol. 3, Issue June).
- <https://doi.org/10.1002/9781118147634>
- Hua, Z., Kong, X., Hou, S., Zou, S., Xu, X., Huang, H., & Fang, J. (2019). DBP alteration from NOM and model compounds after UV/persulfate treatment with post chlorination. *Water Research*, 158, 237–245.
- <https://doi.org/10.1016/j.watres.2019.04.030>
- Hun, H. (2024). *Karakterisasi Material Nano Particle Size Analyzer.* June.
- <https://doi.org/10.13140/RG.2.2.36203.35365>
- Izzah, A., Isuluqi, C., & Nabil, E. (2025). *Pengolahan limbah cair pada coal stockpile dengan metode koagulasi.* 11(9), 131–140.
- Johnson, P. D., Girinathannair, P., Ohlinger, K. N., Ritchie, S., Teuber, L., & Kirby, J. (2015). Enhanced Removal of Heavy Metals in Primary Treatment Using Coagulation and Flocculation. *Water Environment Research*, 80(5), 472–479.
- <https://doi.org/10.2175/106143007x221490>
- Joodi, A. (2013). Effect of baffles geometry of the flocculation basin on the turbulence behavior using Comsol multiphysics technique. *Journal of Environmental Studies*, 10(1), 71–77.

<https://doi.org/10.21608/jesj.2013.190295>

- Juliani, A., Rahmawati, S., & Yoneda, M. (2021). *Heavy metal characteristics of wastewater from batik industry in yogyakarta area , indonesia.* 20(80), 59–67.
- Kim, Y. Il, & Bae, B. U. (2015). Design and evaluation of hydraulic baffled-channel PAC contactor for taste and odor removal from drinking water supplies. *Water Research*, 41(10), 2256–2264. <https://doi.org/10.1016/j.watres.2007.02.005>
- Kocamemi, Bilge Alpaslan, A. P. (2015). *ENVE 301, Environmental Engineering Unit Operations, Chapter 12 : Filtration.*
- Kocamemi, B. a. (2015). Design of rapid mixing (coagulation) and slow mixing (flocculation) units. *Marmara University. Department of Environmental Engineering*, 1–18.
http://mimoza.marmara.edu.tr/~bilge.alpaslan/enve301/Lectures/Chp_9.pdf
- Kusuma, D. P. A. (2021). *Pengolahan Air Limbah Industri Tekstil.* 5, 99–103.
- Laboratorium Karakterisasi Universitas Indonesia. (2020). Particle Size Analyzer (PSA). *Direktorat Riset & Pengembangan, Universitas Indonesia.* <https://research.ui.ac.id/research/lab-karakterisasi/>
- Liu, Q., Wang, Y., Wu, L., Jing, B., Tong, S., Wang, W., & Ge, M. (2017). Temperature dependence of the heterogeneous uptake of acrylic acid on Arizona test dust. *Journal of Environmental Sciences (China)*, 53, 107–112. <https://doi.org/10.1016/j.jes.2016.03.027>
- Maliga, I., Rafi'ah, R., Lestari, A., Pratama, D. B., & Febriansyah, D. (2022). Penyuluhan Pengelolaan Air Limbah Greywater Rumah Tangga dalam Upaya Meningkatkan Derajat Kesehatan Masyarakat. *ABDIKAN: Jurnal Pengabdian Masyarakat Bidang Sains Dan Teknologi*, 1(2), 259–263. <https://doi.org/10.55123/abdiikan.v1i2.308>
- Mardeansyah, Y. D., & Ma'arief, M. S. (2022). Tinjauan Pengelolahan Sarana Air Bersih Desa Permu Kecamatan Kepahiang Kabupaten Kepahiang melalui

- Program PDAM. *STATIKA: Jurnal Teknik Sipil*, 8(1), 25–37.
<http://ejournal.polraf.ac.id/index.php/JTS/article/view/205><https://ejournal.polraf.ac.id/index.php/JTS/article/download/205/219>
- Matilainen, A., Gjessing, E. T., Lahtinen, T., Hed, L., Bhatnagar, A., & Sillanpää, M. (2015). An overview of the methods used in the characterisation of natural organic matter (NOM) in relation to drinking water treatment. *Chemosphere*, 83(11), 1431–1442. <https://doi.org/10.1016/j.chemosphere.2011.01.018>
- Mazloomi, S., Ghodsei, S., Amraei, P., & Bonyadi, Z. (2018). Data on the removal of turbidity from aqueous solutions using polyaluminum chloride. *Data in Brief*, 20, 371–374. <https://doi.org/10.1016/j.dib.2018.08.024>
- McConnachie, G. L., & Liu, J. (2015). Design of baffled hydraulic channels for turbulence-induced flocculation. *Water Research*, 34(6), 1886–1896. [https://doi.org/10.1016/S0043-1354\(99\)00329-2](https://doi.org/10.1016/S0043-1354(99)00329-2)
- Meicahyanti, I., Marwah, & Setiawan, Y. (2018). Effectiveness Chitosan of Shrimp Waste and Alum As Coagulant In Textile Wastewater for TSS Degradation. *Jurnal Chemurgy*, 02(1), 1–5.
- Mursitaningrum, A. P., Fricilia, D. K., & Adhani, L. (2024). *Efektivitas Koagulan PAC dan Aluminium Sulfat dengan Kombinasi Flokulasi pada Limbah Cair Pabrik Sepeda Motor*. 7(2), 90–95.
- Nelly Rofiatul Umah , Tri Joko, H. L. D. (2018). Efektivitas dosis ferri klorida (fecl3) dalam menurunkan kadar chemical oxygen demand (cod) pada limbah pabrik tahu di tempelsari kalikajar wonosobo. *Jurnal kesehatan masyarakat*, 6, 279–289.
- Pasciucco, F., Pasciucco, E., Castagnoli, A., Iannelli, R., & Pecorini, I. (2024). Comparing the effects of Al-based coagulants in waste activated sludge anaerobic digestion: Methane yield, kinetics and sludge implications. *Heliyon*, 10(7), e29282. <https://doi.org/10.1016/j.heliyon.2024.e29282>
- Prakoso, H. (2018). *Uji Kinerja Unit Pengaduk Lambat Tipe Hidraulis*.

- https://repository.its.ac.id/53213/1/03211440000021-Undergraduate_Thesis.pdf
- Pramesti, D. S., & Puspikawati, S. I. (2020). Analysis of Turbidity Test Bottled Drinking Water In Banyuwangi District. *Preventif: Jurnal Kesehatan Masyarakat*, 11(2), 75–85. <https://doi.org/10.22487/preventif.v11i2.59>
- Rafif Permata Dwidewitra, M. Miftahul Huda, & Tuhu Agung Rachmanto. (2024). Pengaruh Konsentrasi Koagulan Terhadap Proses Pengolahan Air Di PDAM Surya Sembada Kota Surabaya. *Globe: Publikasi Ilmu Teknik, Teknologi Kebumian, Ilmu Perkapalan*, 2(2), 145–153. <https://doi.org/10.61132/globe.v2i2.313>
- Ramadhani, S., Sutanhaji, A. T., & Widiatmono, R. (2015). *Perbandingan Efektivitas Tepung Biji Kelor (Moringa oleifera Lamk), Poly Aluminium Chloride (PAC), dan Tawas sebagai Koagulan untuk Air Jernih Effectiveness Comparison of Moringa Seed Flour (Moringa oleifera lamk), Poly Aluminium Chloride (PAC)*, a. 1(3), 186–193.
- Ridwan, R., Afrianita, R., & Kurniawan, Y. (2021). Modification of the Sedimentation Unit with Continuous Discharges Flow (CDF) as a New Method to Increase Turbidity Removal in Raw Water. *Andalasian International Journal of Applied Science, Engineering and Technology*, 1(1), 1–9. <https://doi.org/10.25077/aijaset.v1i1.6>
- Rocha Vianna, M., Vassalle, L., & Oliveira, C. (2015). Perforated tray-type hydraulic flocculator for potable water treatment: concept and state of the art in Brazil. *Certified Journal*, 9001(3), 1. www.ijetae.com
- Rosariawari, F., & Rahayu, S. R. E. (2021). Efektifitas kombinasi koagulasi-flokulasi pipa circular dan baffle channel terhadap air Ssungai. *Prosiding ESEC*, 2(1), 75–80. <http://esec.upnvjt.com/index.php/prosiding/article/view/75%0Ahttps://esec.upnvjt.com/index.php/prosiding/article/download/75/84>

- Rouf, N. A., Arseto, D., & Bagastyo, Y. (2020). Kajian Pemanfaatan Koagulan Recovery Aluminium Dan Besi Dari Abu Terbang Study of Coagulant Recovery Utilization of Aluminum and Iron From Fly Ash. *Jurnal Purifikasi*, 20(1), 28–39.
- Ryanita, P. K. Y., Arsana, I. N., & Juliasih, N. K. A. (2020). Fitoremediasi Dengan Tanaman Air Untuk Mengolah Air Limbah Domestik. *Jurnal Widya Biologi*, 11(2), 76–89.
- S.W., R., Iswanto, B., & . W. (2009). pengaruh ph pada proses koagulasi dengan koagulan aluminum sulfat dan ferri klorida. *Indonesian Journal of Urban and Environmental Technology*, 5(2), 40. <https://doi.org/10.25105/urbanenvirotech.v5i2.676>
- Sari, P. S., & Sa'diyah, K. (2024). Pengaruh Rasio Penambahan Koagulan Pac Pada Pengolahan Limbah Cair Pusat Perbelanjaan Secara Koagulasi-Flokulasi. *DISTILAT: Jurnal Teknologi Separasi*, 10(1), 205–218. <https://doi.org/10.33795/distilat.v10i1.4212>
- Septianto, F., Masrida, R., & Nuraliyah, A. (2024). *Analisis pembuatan dan penggunaan koagulan poly aluminium chloride (PAC) pada proses penjernihan air*. 1(1), 58–71.
- Srivastava, S., Brighu, U., & Gupta, A. B. (2021). Characterization of particles and their relation with residual aluminum in water treated with pulsating floc blanket clarifiers and conventional clariflocculators using PACl. *Water Supply*, 21(8), 4548–4562. <https://doi.org/10.2166/ws.2021.200>
- Sururi, M. R., & Hardika. (2024). Penyisihan Kekeruhan Dan Natural Organic Matter (Nom) Pada Unit Koagulasi-Flokulasi Instalasi Pengolahan Air Minum Di Asia Tenggara : Studi. *Jurnal Reka Lingkungan*, 12(1), 63–79.
- Susanti, E. (2016). *Limbah pencelupan benang using pac as coagulant to remove color from textile wastewater*. 37–42.
- Tabatabaei, F., Mafigholami, R., Moghimi, H., & Khoramipoor, S. (2023). Effect

of Fe and Al based coagulants and disinfectants on polyethylene microplastics removal in coagulation process through response surface methodology. *Water Science and Technology : A Journal of the International Association on Water Pollution Research*, 87(1), 99–114. <https://doi.org/10.2166/wst.2022.393>

Tu, J., Zhang, Y., Chen, L., Chen, X., Li, Y., Min, X., Chen, Q., Chen, T., Wang, K., & Luo, Y. (2025). Optimization of FeSO₄-Al₂(SO₄)₃ Composite Flocculant for Enhanced Phosphorus Removal in Wastewater Treatment: A Response Surface Methodology Study. *Processes*, 13(3), 80–90. <https://doi.org/10.3390/pr13030882>

Tzoupanos, N. D., & Zouboulis, a I. (2015). Coagulation-Flocculation Processes in Water / Wastewater Treatment : the Application of New Generation of Chemical Reagents. *6th IASME/WSEAS International Conference on HEAT TRANSFER, THERMAL ENGINEERING and ENVIRONMENT, April*, 309–317.

Udin, Hamrul, H., & Mansyur, M. F. (2021). Prototype Sistem Monitoring Kekeruhan Sumber Mata Air Berbasis Internet of Things. *Journal of Applied Computer Science and Technology*, 2(2), 66–72. <https://doi.org/10.52158/jacost.v2i2.219>

Verma, S., Prasad, B., & Mishra, I. M. (2011). Thermochemical treatment (thermolysis) of petrochemical wastewater: COD removal mechanism and floc formation. *Industrial and Engineering Chemistry Research*, 50(9), 5352–5359. <https://doi.org/10.1021/ie102576w>

Wang, Y., Gao, B. Y., Xu, X. M., Xu, W. Y., & Xu, G. Y. (2015). Characterization of floc size, strength and structure in various aluminum coagulants treatment. *Journal of Colloid and Interface Science*, 332(2), 354–359. <https://doi.org/10.1016/j.jcis.2009.01.002>

Wang, Z., Nan, J., Yao, M., Ren, P., & Yang, Y. (2016). Evaluation of kaolin floc characteristics during coagulation process: A case study with a continuous flow device. *RSC Advances*, 6(54), 48745–48752.

<https://doi.org/10.1039/c6ra06046c>

Wartiono, T., & Rosyida, A. (2018). Pemilihan tawas, ferri khlorida dan ferro sulfat sebagai zat koagulan yang paling efektif dalam pengolahan limbah cair tekstil. *Teknika ATW*, 1(6), 1–10.

Widyaningsih, T. (2023). Pengolahan Limbah Cair Laundry Dengan Menggunakan Bahan Koagulan Tawas Menjadi Air Bersih Dengan Biaya Rendah. *Jurnal Pendidikan Indonesia : Teori, Penelitian, Dan Inovasi*, 3(3). <https://doi.org/10.59818/jpi.v3i3.495>

Xiao, F., Yi, P., Pan, X. R., Zhang, B. J., & Lee, C. (2015). Comparative study of the effects of experimental variables on growth rates of aluminum and iron hydroxide flocs during coagulation and their structural characteristics. *Desalination*, 250(3), 902–907. <https://doi.org/10.1016/j.desal.2008.12.050>

Zhang, X., Zhu, J., Li, Z., Li, J., & Ren, P. (2022). Effect of hydrodynamic breakage on floc evolution and turbidity reduction in flocculation and sedimentation processes. *Water Supply*, 22(2), 1409–1420. <https://doi.org/10.2166/ws.2021.345>

Zouboulis, A., Traskas, G., & Samaras, P. (2016). Comparison of efficiency between poly-aluminium chloride and aluminium sulphate coagulants during full-scale experiments in a drinking water treatment plant. *Separation Science and Technology*, 43(6), 1507–1519. <https://doi.org/10.1080/01496390801940903>