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DAFTAR PUSTAKA

Abdollahi, J., Alavi Moghaddam, M. R., & Habibzadeh, S. (2025). Uncovering the key determinants of electrode passivation and faradaic efficiency in electrocoagulation: Depassivation and sustainable performance via polarity reversal. *Environmental Research*, *279*, 121889. https://doi.org/10.1016/j.envres.2025.121889

Abfertiawan, M. S., Syafila, M., Handajani, M., Hasan, F., Oktaviani, H., Gunawan, F., & Djali, D. F. (2024). Batch Electrocoagulation Process for the Removal of High Colloidal Clay from Open-Cast Coal Mine Water Using Al and Fe Electrodes. *Mine Water and the Environment*, *43*(3), 516–528. https://doi.org/10.1007/s10230-024-01004-1

Acharya, B. S., & Kharel, G. (2020). Acid mine drainage from coal mining in the United States – An overview. *Journal of Hydrology*, *588*, 125061. https://doi.org/10.1016/j.jhydrol.2020.125061

Adjovu, G. E., Stephen, H., James, D., & Ahmad, S. (2023). Measurement of Total Dissolved Solids and Total Suspended Solids in Water Systems: A Review of the Issues, Conventional, and Remote Sensing Techniques. *Remote Sensing*, *15*(14), 3534. https://doi.org/10.3390/rs15143534

Afkarina, K. I. I., Wardana, S., & Damayanti, P. (2019). COAL MINING SECTOR CONTRIBUTION TO ENVIRONMENTAL CONDITIONS AND HUMAN DEVELOPMENT INDEX IN EAST KALIMANTAN PROVINCE. *Journal of Environmental Science and Sustainable Development*, *2*(2). https://doi.org/10.7454/jessd.v2i2.1025

Almendral, C. M., & Tayo, L. (2023). Performance of electrocoagulation process for copper removal in simulated artisanal and small-scale mining wastewater. *IOP Conference Series: Earth and Environmental Science*, *1146*(1), 012002. https://doi.org/10.1088/1755-1315/1146/1/012002

Al-Rubaiey, N. A. A.-R., & Al-Barazanjy, M. G. A.-B. (2021). Electrocoagulation Treatment of Oily Wastewater in the Oil Industry. *Journal of Petroleum Research and Studies*, *8*(3), 274–289. https://doi.org/10.52716/jprs.v8i3.285

Azwari, F., & Suprapto, D. (2016). Pengaruh Limbah Cair Tambang Batubara terhadap Komunitas Makrozoobenthos di Sungai Karang Mumus. *Jurnal Nusa Sylva*, *16*(1), 1–11.

Bazrafshan, E., Mohammadi, L., Ansari-Moghaddam, A., & Mahvi, A. H. (2015). Heavy metals removal from aqueous environments by electrocoagulation process– a systematic review. *Journal of Environmental Health Science and Engineering*, *13*(1), 74. https://doi.org/10.1186/s40201-015-0233-8

Bhadana, B., Ebrahimi, M., Krist, V. G., Shirkoohi, M. G., Estahbanati, M. R. K., Ali Khosravanipour, M., Khajvand, M., Kiendrebeogo, M., Kumari, A., Kumar, L. R., Kumar, S., Nayernia, Z., Ouarda, Y., Panidepu, H., Pilli, S., Ram, S. K., Ramin, P., Tiwari, B., & Vasavi, C. (2022). *Electro-Coagulation and Electro-Oxidation in Water and Wastewater Treatment* (P. Drogui, R. D. Tyagi, R. Y. Surampalli, T. C. Zhang, S.

UNIVERSITAS GADJAH MADA
PENGARUH WAKTU KONTAK DAN TEGANGAN PADA PROSES ELEKTROKOAGULASI TERHADAP KECEPATAN FILTRASI DAN
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Yan, & X. Zhang, Eds.). American Society of Civil Engineers. https://doi.org/10.1061/9780784416020

Bian, Z., Inyang, H. I., Daniels, J. L., Otto, F., & Struthers, S. (2010). Environmental issues from coal mining and their solutions. *Mining Science and Technology (China)*, *20*(2), 215–223. https://doi.org/10.1016/S1674-5264(09)60187-3

Bosak Pavlo, Stepova Kateryna, Marutyak Sofia, & Popovych Vasyl. (2020). FEATURES OF SEASONAL DYNAMICS OF HAZARDOUS CONSTITUENTS IN WASTEWATER FROM COLLIERY SPOIL HEAPS OF NOVOVOLYNSK MINING AREA. *NEWS of National Academy of Sciences of the Republic of Kazakhstan*, *5*(443), 39–46. https://doi.org/10.32014/2020.2518-170X.102

Cañizares, P., Carmona, M., Lobato, J., Martínez, F., & Rodrigo, M. A. (2005). Electrodissolution of Aluminum Electrodes in Electrocoagulation Processes. *Industrial & Engineering Chemistry Research*, *44*(12), 4178–4185. https://doi.org/10.1021/ie048858a

Chen, G. (2004). Electrochemical technologies in wastewater treatment. *Separation and Purification Technology*, *38*(1), 11–41. https://doi.org/10.1016/j.seppur.2003.10.006

Chen, X., Chen, G., & Yue, P. L. (2002). Investigation on the electrolysis voltage of electrocoagulation. *Chemical Engineering Science*, *57*(13), 2449–2455. https://doi.org/10.1016/S0009-2509(02)00147-1

Chow, H., & Pham, A. L.-T. (2021). Mitigating Electrode Fouling in Electrocoagulation by Means of Polarity Reversal: The Effects of Electrode Type, Current Density, and Polarity Reversal Frequency. *Water Research*, *197*, 117074. https://doi.org/10.1016/j.watres.2021.117074

Dewi, A. T., Alim, M. S., Khair, R. M., & Abdi, C. (2025). Pengaruh Variasi Jarak Elektroda pada Metode Elektrokoagulasi dalam Pengolahan Limbah Cair Batubara. *JTAM Teknik Lingkungan Universitas Lambung Mangkurat*, *8*(2), 6–9.

Du, S., Jin, W., Qiao, G., & Fang, H. (2021). *Study on the Relationship Between Suspended Solids Concentration and Tur-bidity in Coal Mine Water*. In Review. https://doi.org/10.21203/rs.3.rs-442907/v1

Ebba, M., Asaithambi, P., & Alemayehu, E. (2021). Investigation on operating parameters and cost using an electrocoagulation process for wastewater treatment. *Applied Water Science*, *11*(11), 175. https://doi.org/10.1007/s13201-021-01517-y

Emamjomeh, Mohammad. M., & Sivakumar, Muttucumaru. (2009). Review of pollutants removed by electrocoagulation and electrocoagulation/flotation processes. *Journal of Environmental Management*, *90*(5), 1663–1679. https://doi.org/10.1016/j.jenvman.2008.12.011

Fatimura, M., Agustina, T. E., Kurniawan, I., Masriatini, R., Nurlela, & Fitriyanti, R. (2025). Evaluation of Electrocoagulation Process Efficiency in Laboratory Wastewater Treatment with Various Current Densities. *Journal of Chemical Process Engineering*, *10*(1), 1–9. https://doi.org/10.33096/jcpe.v10i1.1533

PENGARUH WAKTU KONTAK DAN TEGANGAN PADA PROSES ELEKTROKOAGULASI TERHADAP KECEPATAN FILTRASI DAN
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Fernando, W. A. M., Ilankoon, I. M. S. K., Syed, T. H., & Yellishetty, M. (2018). Challenges and opportunities in the removal of sulphate ions in contaminated mine water: A review. *Minerals Engineering*, *117*, 74–90. https://doi.org/10.1016/j.mineng.2017.12.004

Fisher, R. S. (2002). *Groundwater Quality in Kentucky: pH*. https://doi.org/10.13023/KGS.IC06.12

Fitriyanti, R. (2016). Pertambangan Batubara: Dampak Lingkungan, Sosial dan Ekonomi. *Jurnal Redoks*, *1*(1), 34–40.

Frey, B. B. (2022). *The SAGE Encyclopedia of Research Design*. SAGE Publications, Inc. https://doi.org/10.4135/9781071812082

Fujioka, T., & Nghiem, L. D. (2015). Fouling control of a ceramic microfiltration membrane for direct sewer mining by backwashing with ozonated water. *Separation and Purification Technology*, *142*, 268–273. https://doi.org/10.1016/j.seppur.2014.12.049

Gafiullina, A., Mamelkina, M., Vehmaanperä, P., Kinnarinen, T., & Häkkinen, A. (2020). Pressure filtration properties of sludge generated in the electrochemical treatment of mining waters. *Water Research*, *181*, 115922. https://doi.org/10.1016/j.watres.2020.115922

Galvão, N., De Souza, J. B., & Vidal, C. M. D. S. (2020). Landfill leachate treatment by electrocoagulation: Effects of current density and electrolysis time. *Journal of Environmental Chemical Engineering*, *8*(5), 104368. https://doi.org/10.1016/j.jece.2020.104368

Garcia-Segura, S., Eiband, M. M. S. G., De Melo, J. V., & Martínez-Huitle, C. A. (2017). Electrocoagulation and advanced electrocoagulation processes: A general review about the fundamentals, emerging applications and its association with other technologies. *Journal of Electroanalytical Chemistry*, *801*, 267–299. https://doi.org/10.1016/j.jelechem.2017.07.047

Gómez Escobedo, F. W., Gómez Escobedo, J. E., Choton Cipriano, E. A., Castañeda Hilario, D. M., Arévalo Aranda, C. P., Portilla Rodriguez, H. R., Castillo Chung, A. R., & Vega Anticona, A. Y. (2021). Current density and residence time in the electrocoagulation process and its influence on Fe2+ reduction [Densidad de corriente y tiempo de residencia en el proceso de electrocoagulación y su influencia en la reducción de Fe+2]. *Journal of Sciences and Engineering*, *5*(1), 29. https://doi.org/10.32829/sej.v5i1.210

Gruiz, K., Meggyes, T., & Fenyvesi, É. (Eds.). (2019). *Engineering Tools for Environmental Risk Management: 4. Risk Reduction Technologies and Case Studies* (0 ed.). CRC Press. https://doi.org/10.1201/b20405

Hakizimana, J. N., Gourich, B., Chafi, M., Stiriba, Y., Vial, C., Drogui, P., & Naja, J. (2017). Electrocoagulation process in water treatment: A review of electrocoagulation modeling approaches. *Desalination*, *404*, 1–21. https://doi.org/10.1016/j.desal.2016.10.011

PENGARUH WAKTU KONTAK DAN TEGANGAN PADA PROSES ELEKTROKOAGULASI TERHADAP KECEPATAN FILTRASI DAN
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Harif, T., Khai, M., & Adin, A. (2012). Electrocoagulation versus chemical coagulation: Coagulation/flocculation mechanisms and resulting floc characteristics. *Water Research*, *46*(10), 3177–3188. https://doi.org/10.1016/j.watres.2012.03.034

Hassan, N., Lezy, J., Parmentier, D., & Van Hulle, S. W. H. (2023). Electrocoagulation flotation as a municipal wastewater (pre-)treatment technology: Effect of weather conditions and current density. *Journal of Environmental Management*, *345*, 118906. https://doi.org/10.1016/j.jenvman.2023.118906

Hidayati, S. Y., Alim, M. S., Prihatini, N. S., & Mahmud. (2025). Pengaruh Variasi Waktu Kontak pada Metode Elektrokoagulasi dalam Pengolahan Limbah Cair Batubara. *JTAM Teknik Lingkungan Universitas Lambung Mangkurat*, *8*(1), 62–70.

Holt, P. K., Barton, G. W., & Mitchell, C. A. (2005). The future for electrocoagulation as a localised water treatment technology. *Chemosphere*, *59*(3), 355–367. https://doi.org/10.1016/j.chemosphere.2004.10.023

Ilhan, F., Kurt, U., Apaydin, O., & Gonullu, M. T. (2008). Treatment of leachate by electrocoagulation using aluminum and iron electrodes. *Journal of Hazardous Materials*, *154*(1–3), 381–389. https://doi.org/10.1016/j.jhazmat.2007.10.035

Ingelsson, M., Yasri, N., & Roberts, E. P. L. (2020). Electrode passivation, faradaic efficiency, and performance enhancement strategies in electrocoagulation—A review. *Water Research*, *187*, 116433. https://doi.org/10.1016/j.watres.2020.116433

Johnson, D. B., & Hallberg, K. B. (2005). Acid mine drainage remediation options: A review. *Science of The Total Environment*, *338*(1–2), 3–14. https://doi.org/10.1016/j.scitotenv.2004.09.002

Kamajaya, G. Y., Putra, I. D. N. N., & Putra, I. N. G. (2021). Analisis Sebaran Total Suspended Solid (TSS) Berdasarkan Citra Landsat 8 Menggunakan Tiga Algoritma Berbeda Di Perairan Teluk Benoa, Bali. *Journal of Marine and Aquatic Sciences*, *7*(1), 18. https://doi.org/10.24843/jmas.2021.v07.i01.p03

KEBLC. (2025). *Narasi Kinerja Triwulan II Tahun 2025* [Laporan Kinerja Triwulan]. KEBLC.

Kobya, M., Can, O. T., & Bayramoglu, M. (2003). Treatment of textile wastewaters by electrocoagulation using iron and aluminum electrodes. *Journal of Hazardous Materials*, *100*(1–3), 163–178. https://doi.org/10.1016/S0304-3894(03)00102-X

Kobya, M., Ulu, F., Gebologlu, U., Demirbas, E., & Oncel, M. S. (2011). Treatment of potable water containing low concentration of arsenic with electrocoagulation: Different connection modes and Fe–Al electrodes. *Separation and Purification Technology*, *77*(3), 283–293. https://doi.org/10.1016/j.seppur.2010.12.018

Kori, D. N. & Rajashekarappa. (2022). Measuring Water Quality using Arduino and Turbidity Sensor. *International Journal of Computer Applications*, *184*(36), 1–4.

Kumar, A., Nidheesh, P. V., & Suresh Kumar, M. (2018). Composite wastewater treatment by aerated electrocoagulation and modified peroxi-coagulation processes. *Chemosphere*, *205*, 587–593. https://doi.org/10.1016/j.chemosphere.2018.04.141

PENGARUH WAKTU KONTAK DAN TEGANGAN PADA PROSES ELEKTROKOAGULASI TERHADAP KECEPATAN FILTRASI DAN
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Kumar, A., Sankalp, S., & Remesan, R. (2023). Chapter 1—Spatiotemporal rainfall variability and trend analysis over all the districts of West Bengal during 1980–2021. In K. S. Kasiviswanathan, B. Soundharajan, S. Patidar, J. He, & C. S. P. Ojha (Eds.), *Modeling and Mitigation Measures for Managing Extreme Hydrometeorological Events Under a Warming Climate* (Vol. 14, pp. 1–15). Elsevier. https://doi.org/https://doi.org/10.1016/B978-0-443-18640-0.00004-3

Larue, O., & Vorobiev, E. (2003). Floc size estimation in iron induced electrocoagulation and coagulation using sedimentation data. *International Journal of Mineral Processing*, *71*(1–4), 1–15. https://doi.org/10.1016/S0301-7516(03)00026-7

Lee, S. Y., & Gagnon, G. A. (2016). Growth and structure of flocs following electrocoagulation. *Separation and Purification Technology*, *163*, 162–168. https://doi.org/10.1016/j.seppur.2016.02.049

Lousada-Ferreira, M., van Lier, J. B., & van der Graaf, J. H. J. M. (2010). Sludge Filterability and Suspended Solids Concentration in Full-Scale Membrane Bioreactors. *Proceedings of the International Water Association (IWA)*.

Mansilha, C., Melo, A., Flores, D., Ribeiro, J., Rocha, J. R., Martins, V., Santos, P., & Espinha Marques, J. (2021). Irrigation with Coal Mining Effluents: Sustainability and Water Quality Considerations (São Pedro da Cova, North Portugal). *Water*, *13*(16), 2157. https://doi.org/10.3390/w13162157

Moosavirad, S. M. (2017). Treatment and operation cost analysis of greywater by electrocoagulation and comparison with coagulation process in mining areas. *Separation Science and Technology*, *52*(10), 1742–1750. https://doi.org/10.1080/01496395.2016.1274761

Mukimin, A. (2006). *Pengolahan Limbah Industri Berbasis Logam dengan Teknologi Elektrokoagulasi-Flotasi* [Tesis Magister]. Program Pascasarjana Universitas Diponegoro.

Naldi, N., Hazmi, A., Desmiarti, R., & Emeraldi, P. (2025). Electrocoagulation in Wastewater Treatment: A Comprehensive Review on Parameters and Applications. *Andalas Journal of Electrical and Electronic Engineering Technology*, *5*(2), 37–46. https://doi.org/10.25077/ajeeet.v5i2.163

Nugraha, A., Amri, I., & Hs, I. (2018). Pengaruh pola dan jarak elektroda pada proses elektrokoagulasi limbah cair industri tahu. *Jom FTEKNIK*, *5*(2), 1–5.

Oncel, M. S., Muhcu, A., Demirbas, E., & Kobya, M. (2013). A comparative study of chemical precipitation and electrocoagulation for treatment of coal acid drainage wastewater. *Journal of Environmental Chemical Engineering*, *1*(4), 989–995. https://doi.org/10.1016/j.jece.2013.08.008

Perly, R., Cahyono, Y. D. G., & Sari, A. S. (2024). Evaluasi Pengelolaan Buangan Air Asam Tambang Berdasarkan pH dan TSS pada Settling Pond 04 Pit AJE Blok Central PT. Angsana Jaya Energi Kabupaten Tanah Bumbu Kalimantan Selatan. *Jurnal Pertambangan Dan Lingkungan*, *5*(2), 72. https://doi.org/10.31764/jpl.v5i2.25908

PENGARUH WAKTU KONTAK DAN TEGANGAN PADA PROSES ELEKTROKOAGULASI TERHADAP KECEPATAN FILTRASI DAN
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Putra, N. M., Mukiart, & Handayani, Rr. H. E. (2017). Evaluasi Pengelolaan Limbah Cair Batubara di Stockpile PT Bukit Asam (Persero) Tbk Unit Dermaga Kertapati. *Jurnal Pertambangan*, *1*(3).

Putri, F. A. R. (2018). *Kajian Hidrologi Lingkungan Hidup Strategis sebagai Penyempurnaan Kebijakan, Rencana, dan/atau Program Kawasan Pertambangan Gunung Lawu* [Tesis Magister]. Universitas Pembangunan Nasional "Veteran" Yogyakarta.

Qian, G., Ye, L., Li, L., & Hu, X. (2018). Impact of electrocoagulation on membrane filtration resistance under different proportions of industrial wastewater. *Journal of Chemical Technology & Biotechnology*, *93*(11), 3160–3170. https://doi.org/10.1002/jctb.5670

Ramadhan, M. R., Nizam, M. K., & Mesran. (2021). Penerapan Metode SAW (Simple Additive Weighting) Dalam Pemilihan Siswa-Siswi Berprestasi Pada Sekolah SMK Swasta Mustafa. *TIN: Terapan Informatika Nusantara*, *1*(9), 459–471.

Ramadhani, A. A., & Rachmanto, T. A. (2026). Pengaruh Variasi Elektroda untuk Penurunan Kadar TSS dan Kekeruhan Limbah Tekstil Batik Dalam Metode Elektrokoagulasi. *Jurnal Serambi Engineering*, *11*(1), 16500–16505.

Ray, S., & Dey, K. (2020). Coal Mine Water Drainage: The Current Status and Challenges. *Journal of The Institution of Engineers (India): Series D*, *101*(2), 165–172. https://doi.org/10.1007/s40033-020-00222-5

Redanto Putri, F. A. (2020). Kajian Teknis Sistem Penyaliran Tambang Batubara pada Tambang Terbuka di PT. X. *Jurnal IPTEK*, *24*(1), 59–66. https://doi.org/10.31284/j.iptek.2020.v24i1.902

Rosada, N. A., Rusli, F. D. S., Ardiansyah, A., & Amir, Muh. K. (2024). Mine Dewatering Model dalam Inovasi Sistem Penyaliran Tambang dengan Pendekatan Matematis untuk Mencegah Flooding Akibat Bukaan Tambang. *MINETECH Journal: Mining Science and Technology Journal*, *3*(2), 127–139.

Rusdianasari. (2017). *Pengolahan Limbah Cair Stockpile Batubara untuk Mengurangi Pencemaran Lingkungan* [Laporan Akhir Penelitian Hibah Bersaing]. Politeknik Negeri Sriwijaya.

Safira, R., Coudert, L., Neculita, C. M., & Rosa, E. (2024). Efficiency of electrocoagulation for simultaneous treatment of As and Mn in neutral mine water. *Minerals Engineering*, *207*, 108546. https://doi.org/10.1016/j.mineng.2023.108546

Sanchis-Perucho, P., Aguado, D., Ferrer, J., Seco, A., & Robles, A. (2022). Direct Membrane Filtration of Municipal Wastewater: Studying the Most Suitable Conditions for Minimizing Fouling Growth Rate in Porous Membranes. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4191277

Sanchis-Perucho, P., Torres, K. M. M., Ferrer, J., & Robles, Á. (2023). Evaluating the potential of off-line methodologies to determine sludge filterability from different municipal wastewater treatment systems. *Chemical Engineering Journal*, *468*, 143537. https://doi.org/10.1016/j.cej.2023.143537

Shahedi, A., Darban, A. K., Jamshidi-Zanjani, A., & Homaee, M. (2023). An overview of the application of electrocoagulation for mine wastewater treatment. *Environmental*

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PENGARUH WAKTU KONTAK DAN TEGANGAN PADA PROSES ELEKTROKOAGULASI TERHADAP KECEPATAN FILTRASI DAN
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Monitoring and Assessment, *195*(4), 522. https://doi.org/10.1007/s10661-023-11044-9

Shahedi, A., Darban, A. K., Taghipour, F., & Jamshidi-Zanjani, A. (2020). A review on industrial wastewater treatment via electrocoagulation processes. *Current Opinion in Electrochemistry*, *22*, 154–169. https://doi.org/10.1016/j.coelec.2020.05.009

Sharma, A. K., & Chopra, A. K. (2017). Removal of nitrate and sulphate from biologically treated municipal wastewater by electrocoagulation. *Applied Water Science*, *7*(3), 1239–1246. https://doi.org/10.1007/s13201-015-0320-0

Stylianou, M., Montel, E., Zissimos, A., Christoforou, I., Dermentzis, K., & Agapiou, A. (2022). Removal of toxic metals and anions from acid mine drainage (AMD) by electrocoagulation: The case of North Mathiatis open cast mine. *Sustainable Chemistry and Pharmacy*, *29*, 100737. https://doi.org/10.1016/j.scp.2022.100737

Sun, J., Huo, J., Li, B., Gu, Z., Hu, C., & Qu, J. (2022). Anode passivation mitigation by homogenizing current density distribution in electrocoagulation. *Water Research*, *223*, 118966. https://doi.org/10.1016/j.watres.2022.118966

Sutanto, & Rohadi, N. (2020). Pengaruh Penambahan Garam Dapur (NaCl) Terhadap Perubahan Arus Listrik dan Kandungan Logam Pada Pengolahan Air Limbah Industri Secara Elektrokoagulasi. *Prosiding Seminar Nasional Teknik Elektro*, *5*, 119–126.

Tegladza, I. D., Xu, Q., Xu, K., Lv, G., & Lu, J. (2021). Electrocoagulation processes: A general review about role of electro-generated flocs in pollutant removal. *Process Safety and Environmental Protection*, *146*, 169–189. https://doi.org/10.1016/j.psep.2020.08.048

Tiwary, R. K. (2001). Environmental Impact of Coal Mining on Water Regime and Its Management. *Water, Air, and Soil Pollution*, *132*(1–2), 185–199. https://doi.org/10.1023/A:1012083519667

Touahria, S., Hazourli, S., Touahria, K., Eulmi, A., & Aitbara, A. (2016). Clarification of Industrial Mining Wastewater Using Electrocoagulation. *International Journal of Electrochemical Science*, *11*(7), 5710–5723. https://doi.org/10.20964/2016.07.51

Wang, X., Gao, Y., Jiang, X., Zhang, Q., & Liu, W. (2021). Analysis on the Characteristics of Water Pollution Caused by Underground Mining and Research Progress of Treatment Technology. *Advances in Civil Engineering*, *2021*(1), 9984147. https://doi.org/10.1155/2021/9984147

Yasri, N. G., Ingelsson, M., Nightingale, M., Jaggi, A., Dejak, M., Kryst, K., Oldenburg, T. B. P., & Roberts, E. P. L. (2022). Investigation of electrode passivation during electrocoagulation treatment with aluminum electrodes for high silica content produced water. *Water Science and Technology*, *85*(3), 925–942. https://doi.org/10.2166/wst.2022.012