

## DAFTAR PUSTAKA

- Abdurrahim, M. B., Anggara, F., Handini, E., Fahrialam, A., & Patria, A. A. (2025). Microfacies and Paleomire Reconstruction of Korinci Formation Coal, Peranap, Central Sumatra Basin. *IOP Conference Series: Earth and Environmental Science*, 1517(1). <https://doi.org/10.1088/1755-1315/1517/1/012044>
- Aller, D., Bakshi, S., & Laird, D. A. (2017). Modified method for proximate analysis of biochars. *Journal of Analytical and Applied Pyrolysis*, 124, 335–342. <https://doi.org/10.1016/j.jaap.2017.01.012>
- Alvarez, R., Pis, J., Diez, M., Barriocanal, C., Menkndez, J., & Parra, J. (1996). Carbonization of wet and preheated coal. Effect on coke quality and its relation with textural properties. *Journal of Analytical and Applied Pyrolysis*, 38, 119–130. [https://doi.org/https://doi.org/10.1016/S0165-2370\(96\)00947-3](https://doi.org/https://doi.org/10.1016/S0165-2370(96)00947-3)
- Amijaya, H., & Littke, R. (2006). Properties of thermally metamorphosed coal from Tanjung Enim Area, South Sumatra Basin, Indonesia with special reference to the coalification path of macerals. *International Journal of Coal Geology*, 66(4), 271–295. <https://doi.org/10.1016/j.coal.2005.07.008>
- Andika, R., Astuti, W., Syafriadi, & Nurjaman, F. (2019). Effect of Flux Addition and Reductant Type in Smelting Process of Indonesian Limonite Ore in Electric Arc Furnace. *IOP Conference Series: Materials Science and Engineering*, 478(1), 1–7. <https://doi.org/10.1088/1757-899X/478/1/012007>
- Anggara, F., Patria, A. A., Rahmat, B., Wibisono, H., Putera, M. Z. J., Petrus, H. T. B. M., Erviana, F., Handini, E., & Amijaya, D. H. (2024). Signature characteristics of coal geochemistry from the Eocene Tanjung Formation and the Miocene Warukin Formation, Barito Basin: Insights into geological control on coal deposition and future critical element prospection. *International Journal of Coal Geology*, 282, 1–20. <https://doi.org/10.1016/j.coal.2023.104423>
- Antola, O., Holappa, L., & Paschen, P. (1995). Nickel Ore Reduction by Hydrogen and Carbon Monoxide Containing Gases. *Mineral Processing and Extractive*

*Metallurgy Review*, 15(1–4), 169–179.

<https://doi.org/10.1080/08827509508914195>

Avarmaa, K., Järvenpää, M., Klemettinen, L., Marjakoski, M., Taskinen, P., Lindberg, D., & Jokilaakso, A. (2020). Battery scrap and biochar utilization for improved metal recoveries in nickel slag cleaning conditions. *Batteries*, 6(4), 1–21. <https://doi.org/10.3390/batteries6040058>

Averitt, P. (1974). *Coal Resources of the United States*. <https://doi.org/https://doi.org/10.3133/b1412>

Bahfie, F., Manaf, A., Astuti, W., & Nurjaman, F. (2021). Studies on Reduction Characteristics of Limonite and Effect of Sodium Sulphate on The Selective Reduction to Nickel. *Journal of The Institution of Engineers*, 102(1), 149–157. <https://doi.org/10.1007/s40033-020-00240-3>

Barriocanal, C., Díez, M., Alvarez, R., & Canga, C. (2003). On the relationship between coal plasticity and thermogravimetric analysis. *Journal of Analytical and Applied Pyrolysis*, 67, 23–40. [https://doi.org/https://doi.org/10.1016/S0165-2370\(02\)00012-8](https://doi.org/https://doi.org/10.1016/S0165-2370(02)00012-8)

Bazaluk, O., Kieush, L., Koveria, A., Schenk, J., Pfeiffer, A., Zheng, H., & Lozynskiy, V. (2022). Metallurgical Coke Production with Biomass Additives: Study of Biocoke Properties for Blast Furnace and Submerged Arc Furnace Purposes. *Materials*, 15(3), 1–17. <https://doi.org/10.3390/ma15031147>

Born, S., Babich, A., van der Stel, J., Ho, H. T., Sert, D., Anseau, O., Plancq, C., Pierret, J. C., Geyer, R., Senk, D., & Pridhivi, V. (2020). Char Formation by Coal Injection and Its Behavior in the Blast Furnace. *Steel Research International*, 91(11). <https://doi.org/10.1002/srin.202000038>

Cavaliere, P., Sadeghi, B., Dijon, L., Laska, A., & Koszelow, D. (2024). Three-dimensional characterization of porosity in iron ore pellets: A comprehensive study. *Minerals Engineering*, 213. <https://doi.org/10.1016/j.mineng.2024.108746>

Choi, Y., Lee, I., & Moon, I. (2021). Geochemical and Mineralogical Characteristics of Garnierite From the Morowali Ni-Laterite Deposit in

- Sulawesi, Indonesia. *Frontiers in Earth Science*, 9, 1–17.  
<https://doi.org/10.3389/feart.2021.761748>
- Cococcioni, M., Dal Corso, A., & de Gironcoli, S. (2003). Structural, Electronic, and Magnetic Properties of Fe<sub>2</sub>SiO<sub>4</sub> Fayalite: Comparison of LDA and GGA Results. *Physical Review B - Condensed Matter and Materials Physics*, 67(9), 941061–941067. <https://doi.org/10.1103/PhysRevB.67.094106>
- Corbari, R., & Fruehan, R. J. (2010). Reduction of iron oxide fines to wustite with CO/CO<sub>2</sub> gas of low reducing potential. *Metallurgical and Materials Transactions B: Process Metallurgy and Materials Processing Science*, 41(2), 318–329. <https://doi.org/10.1007/s11663-009-9315-2>
- Crelling, J. C. (2008). *Coal Carbonization* (I. S. Ruiz & J. C. Crelling, Ed.; 1 ed.). elsevier. <https://doi.org/DOI:10.1016/B978-0-08-045051-3.00007-5>
- Cui, B., Wu, B., Wang, M., Jin, X., Shen, Y., & Chang, L. (2024). A Preliminary Study on the Quality Evaluation of Coking Coal from its Structure Thermal Transformation: Applications of Fluidity and Swelling Indices. *Fuel*, 355, 1–11. <https://doi.org/10.1016/j.fuel.2023.129418>
- Cullity, B. D., & Graham, C. D. (2009). *Introduction to Magnetic Materials* (R. Abari, J. Anderson, S. Basu, A. Chatterjee, T. Chen, T. G. Croda, S. Farschi, B. M. Hammerli, O. Malik, S. Nahavandi, M. S. Newman, & W. Reeve, Ed.; 2 ed.). A John Wiley and Sons. <https://doi.org/DOI:10.1002/9780470386323>
- Dai, S., Bechtel, A., Eble, C. F., Flores, R. M., French, D., Graham, I. T., Hood, M. M., Hower, J. C., Korasidis, V. A., Moore, T. A., Püttmann, W., Wei, Q., Zhao, L., & O’Keefe, J. M. K. (2020). Recognition of peat depositional environments in coal: A review. *International Journal of Coal Geology*, 219, 1–67. <https://doi.org/10.1016/j.coal.2019.103383>
- Diez, M. A., Alvarez, R., & Barriocanal, C. (2002). Coal for Metallurgical Coke Production: Predictions of Coke Quality and Future Requirements for Cokemaking. *International Journal of Coal Geology*, 50, 389–412. [https://doi.org/https://doi.org/10.1016/S0166-5162\(02\)00123-4](https://doi.org/https://doi.org/10.1016/S0166-5162(02)00123-4)
- Direktorat Jenderal Mineral dan Batubara. (2021). *Road Map Pengembangan dan Pemanfaatan Batubara*.

<https://www.esdm.go.id/assets/media/content/content-buku-road-map-pengembangan-dan-pemanfaatan-batubara.pdf>

- Elias, M. (2002). *Nickel laterite deposits-geological overview, resources and exploitation*. 202–250. <https://www.researchgate.net/publication/281422746>
- Elliott, R., & Pickles, C. A. (2017). Thermodynamic Analysis of the Selective Reduction of a Nickeliferous Limonitic Laterite Ore by Hydrogen. *High Temperature Materials and Processes*, 36(8), 835–846. <https://doi.org/10.1515/htmp-2015-0208>
- Elliott, R., Pickles, C. A., & Forster, J. (2016). Thermodynamics of the Reduction Roasting of Nickeliferous Laterite Ores. *Journal of Minerals and Materials Characterization and Engineering*, 04(06), 320–346. <https://doi.org/10.4236/jmmce.2016.46028>
- Elliott, R., Rodrigues, F., Pickles, C. A., & Peacey, J. (2015). A Two-stage Thermal Upgrading Process for Nickeliferous Limonitic Laterite Ores. *Canadian Metallurgical Quarterly*, 54(4), 395–405. <https://doi.org/10.1179/1879139515Y.0000000009>
- Fikri, H. N., Sachsenhofer, R. F., Bechtel, A., & Gross, D. (2022). Coal deposition in the Barito Basin (Southeast Borneo): The Eocene Tanjung Formation compared to the Miocene Warukin Formation. *International Journal of Coal Geology*, 263, 1–22. <https://doi.org/10.1016/j.coal.2022.104117>
- Florentino-Madiedo, L., Díaz-Faes, E., & Barriocanal, C. (2020). Mechanical strength of bio-coke from briquettes. *Renewable Energy*, 146, 1717–1724. <https://doi.org/10.1016/j.renene.2019.07.139>
- Friederich, M. C., Moore, T. A., & Flores, R. M. (2016). A regional review and new insights into SE Asian Cenozoic coal-bearing sediments: Why does Indonesia have such extensive coal deposits? *International Journal of Coal Geology*, 166, 2–35. <https://doi.org/10.1016/j.coal.2016.06.013>
- Fuchigami, Y., Hara, K., Kita, T., Uwasu, M., & Kurimoto, S. (2016). Analysis of Effect on CO<sub>2</sub> Emission Reduction and Cost Estimation for the Use of Bio-coke: a Case Study of Osaka, Japan. *Journal of Wood Science*, 62(1), 93–100. <https://doi.org/10.1007/s10086-015-1515-6>

- Gafoer, S., Cobrie, T., & Purnomo, J. (1986). Peta Geologi Lembar Lahat, Sumatera Selatan. Dalam *Pusat Penelitian dan Pengembangan Geologi*.
- Gani, A., Erdiwansyah, Munawar, E., Mahidin, Mamat, R., & Rosdi, S. M. (2023). Investigation of the potential biomass waste source for biocoke production in Indonesia: A review. *Energy Reports*, *10*, 2417–2438. <https://doi.org/10.1016/j.egy.2023.09.065>
- Gialanella, S., Girardi, F., Ischia, G., Lonardelli, I., Mattarelli, M., & Montagna, M. (2010). On the goethite to hematite phase transformation. *Journal of Thermal Analysis and Calorimetry*, *102*(3), 867–873. <https://doi.org/10.1007/s10973-010-0756-2>
- Gray, R. J. (1989). Coal to Coke Conversion. Dalam *Introduction to Carbon Science* (hlm. 285–321). Elsevier. <https://doi.org/10.1016/b978-0-408-03837-9.50014-2>
- Grigore, M., Sakurovs, R., French, D., & Sahajwalla, V. (2007). Effect of Carbonisation Conditions on Mineral Matter in Coke. *ISIJ International*, *47*(1), 62–66. <https://doi.org/10.2355/isijinternational.47.62>
- Harjanto, S., & Rhamdhani, M. A. (2019). Sulfides formation in carbothermic reduction of saprolitic nickel laterite ore using low-rank coals and additives: A thermodynamic simulation analysis. *Minerals*, *9*(10). <https://doi.org/10.3390/min9100631>
- Harrison, R. J., Dunin-Borkowski, R. E., Kasama, T., Simpson, E. T., & Feinberg, J. M. (2007). Properties of Rocks and Minerals-Magnetic Properties of Rocks and Minerals. Dalam *Treatise on Geophysics* (Vol. 2, hlm. 579–630).
- Hasegawa, M. (2013). Ellingham Diagram. Dalam *Treatise on Process Metallurgy* (Vol. 1, hlm. 507–516). Elsevier Ltd. <https://doi.org/10.1016/B978-0-08-096986-2.00032-1>
- Heryanto, R., & Sanyoto, P. (1994). Peta Geologi Lembar Amuntai, Kalimantan. Dalam *Pusat Penelitian dan Pengembangan Geologi*.
- Heryanto, R., Supriatna, S., Rustandi, E., & Baharuddin. (1994). Peta Geologi Lembar Sampanahan, Kalimantan. Dalam *Pusat Penelitian dan Pengembangan Geologi*.

- Heydari, M., Rahman, M., & Gupta, R. (2015). Kinetic Study and Thermal Decomposition Behavior of Lignite Coal. *International Journal of Chemical Engineering, 1*. <https://doi.org/10.1155/2015/481739>
- Hidayat, W., Riniarti, M., Prasetya, H., Niswati, A., Hasanudin, U., Banuwa, I. S., Yoo, J., Kim, S., & Lee, S. (2021). Characteristics of biochar produced from the harvesting wastes of meranti (*Shorea sp.*) and oil palm (*Elaeis guineensis*) empty fruit bunches. *IOP Conference Series: Earth and Environmental Science, 749*(1), 1–7. <https://doi.org/10.1088/1755-1315/749/1/012040>
- Hui, S., Li, B., Zhou, S., & Wei, Y. (2023). Extraction of Ferronickel Concentrate from Laterite Nickel Ore by Reduction Roasting-Magnetic Separation using Spent Cathode Carbon. *Minerals Engineering, 201*. <https://doi.org/10.1016/j.mineng.2023.108194>
- Jiang, M., Sun, T., Liu, Z., Kou, J., Liu, N., & Zhang, S. (2013). Mechanism of sodium sulfate in promoting selective reduction of nickel laterite ore during reduction roasting process. *International Journal of Mineral Processing, 123*, 32–38. <https://doi.org/10.1016/j.minpro.2013.04.005>
- Keboletse, K. P., Ntuli, F., & Oladijo, O. P. (2021). Influence of coal properties on coal conversion processes-coal carbonization, carbon fiber production, gasification and liquefaction technologies: a review. *International Journal of Coal Science and Technology, 8*(5), 817–843. <https://doi.org/10.1007/s40789-020-00401-5>
- Kementerian Energi dan Sumber Daya Mineral. (2024). *Minerba One Data Indonesia Tahun 2023*. <https://modi.esdm.go.id/filter?tahun=2023>
- Keputusan Menteri Energi dan Sumber Daya Mineral Republik Indonesia Nomor 132.K/GL.01/MEM.G/2024 tentang Neraca Sumber Daya dan Cadangan Mineral dan Batubara Nasional pada Tahun 2023, Pub. L. No. 132.K/GL.01/MEM.G/2024 (2024). <https://geologi.esdm.go.id/publikasi/laporan-dan-buku/keputusan-menteri-energi-dan-sumber-daya-mineral-nomor-132-k-gl-01-mem-g-2024-tentang-neraca-sumber-daya-dan-cadangan-mineral-dan-batubara-nasional-pada-tahun-2023>

- Koesoemadinata, R. P. (2002). Outline of Tertiary Coal Basins of Indonesia. *Berita Sedimentologi*, 17(1), 2–27.
- König, U. (2021). Nickel laterites—mineralogical monitoring for grade definition and process optimization. *Minerals*, 11(11), 1–16. <https://doi.org/10.3390/min11111178>
- Li, Z., Lührs, L., & Weissmüller, J. (2024). Bicontinuous microstructure formation through partial melting. *Scripta Materialia*, 250. <https://doi.org/10.1016/j.scriptamat.2024.116192>
- Liang, D. (2020). Measurement of coal pyrolysis reaction heat by empirical baseline method. *Energy Sources, Part A: Recovery, Utilization and Environmental Effects*, 1–1. <https://doi.org/10.1080/15567036.2020.1764149>
- Lindsley, D. H., Andreasen, G. E., & Balsley, J. R. (1966). Magnetic Properties of Rocks and Minerals. Dalam *Handbook of Physical Constant*. The Geological Society of America.
- Liu, C., Zhang, Y., Zhao, K., Xing, H., & Kang, Y. (2019). Effect of Biomass on Reaction Performance of Sintering Fuel. *Journal of Materials Science*, 54(4), 3262–3272. <https://doi.org/10.1007/s10853-018-3061-2>
- Liu, P., Li, B., Cheung, S. C. P., & Wu, W. (2016). Material and energy flows in rotary kiln-electric furnace smelting of ferronickel alloy with energy saving. *Applied Thermal Engineering*, 109, 542–559. <https://doi.org/10.1016/j.applthermaleng.2016.08.095>
- Liu, W. R., Li, X. H., Hu, Q. Y., Wang, Z. X., Gu, K. Z., Li, J. H., & Zhang, L. X. (2010). Pretreatment study on chloridizing segregation and magnetic separation of low-grade nickel laterites. *Transactions of Nonferrous Metals Society of China (English Edition)*, 20(SUPPL.1), 82–86. [https://doi.org/10.1016/S1003-6326\(10\)60017-9](https://doi.org/10.1016/S1003-6326(10)60017-9)
- Lopez-Peinado, A. J., Tromp, P. J. J., & Moulijn, J. A. (1989). Quantitative heat effects associated with pyrolysis of coals, ranging from anthracite to lignite. *Fuel*, 68. [https://doi.org/https://doi.org/10.1016/0016-2361\(89\)90065-3](https://doi.org/https://doi.org/10.1016/0016-2361(89)90065-3)
- Lowenhaupt, D. E., & Gray, R. J. (1980). The Alkali-Extraction Test as a Reliable Method of Detecting Oxidized Metallurgical Coal. *International Journal of*

*Coal Geology*, 1, 63–73. [https://doi.org/https://doi.org/10.1016/0166-5162\(80\)90006-3](https://doi.org/https://doi.org/10.1016/0166-5162(80)90006-3)

- Lu, L., Devasahayam, S., & Sahajwalla, V. (2013). Evaluation of coal for metallurgical applications. Dalam *The Coal Handbook: Towards Cleaner Production* (Vol. 2, hlm. 352–386). Elsevier Inc. <https://doi.org/10.1533/9781782421177.3.352>
- Lv, W., Makuza, B., Wang, F., Marcuson, S., & Barati, M. (2024). A Review of Direct Reduction–Magnetic Separation Process for Ferronickel Production from Nickel Laterite. *Journal of Sustainable Metallurgy*. <https://doi.org/10.1007/s40831-024-00950-y>
- Mahajan, O. P., Tomita, A., & Walker, P. L. (1976). Differential scanning calorimetry studies on coal. 1. Pyrolysis in an inert atmosphere. *Fuel*, 55, 63–69. [https://doi.org/https://doi.org/10.1016/0016-2361\(76\)90072-7](https://doi.org/https://doi.org/10.1016/0016-2361(76)90072-7)
- Malini, K., Selvakumar, D., & Kumar, N. S. (2023). Activated carbon from biomass: Preparation, factors improving basicity and surface properties for enhanced CO<sub>2</sub> capture capacity - A review. Dalam *Journal of CO<sub>2</sub> Utilization* (Vol. 67). Elsevier Ltd. <https://doi.org/10.1016/j.jcou.2022.102318>
- Manyuchi, M. M., Mbohwa, C., & Muzenda, E. (2018). Value addition of coal fines and sawdust to briquettes using molasses as a binder. *South African Journal of Chemical Engineering*, 26, 70–73. <https://doi.org/10.1016/j.sajce.2018.09.004>
- Matkovic, V., Vuckovic, N., Sokic, M., Stojanovic, J., & Markovic, B. (2003). Investigation of Selective Leaching Process of Nickel Silicate Ore from the Deposit “Rudinci.” *Proceedings of 3rd BMC-2003-Ohrid, R. Macedonia*, 49–53.
- Maulana, A., & Anggara, F. (2020). Karakteristik Batubara Terpengaruh Intrusi di Tambang Air Laya, Sumatera Selatan dan Potensinya sebagai Material untuk Pembuatan Grafit sintesis. *Buletin Sumber Daya Geologi*, 15(3), 184–200. <https://doi.org/https://doi.org/10.47599/bsdg.v15i3.310>
- Meng, X., Sun, J., Chu, R., Fan, L., Jiang, X., Tang, L., & Zheng, D. (2023). Effect of active functional groups in coal on the release behavior of small molecule

- gases during low-temperature oxidation. *Energy*, 273, 1–11.  
<https://doi.org/10.1016/j.energy.2023.127290>
- Meshram, P., Abhilash, & Pandey, B. D. (2019). Advanced Review on Extraction of Nickel from Primary and Secondary Sources. *Mineral Processing and Extractive Metallurgy Review*, 40(3), 157–193.  
<https://doi.org/10.1080/08827508.2018.1514300>
- Mitchell, P. J., Dalley, T. S. L., & Helleur, R. J. (2013). Preliminary laboratory production and characterization of biochars from lignocellulosic municipal waste. *Journal of Analytical and Applied Pyrolysis*, 99, 71–78.  
<https://doi.org/10.1016/j.jaap.2012.10.025>
- Mousa, E., Wang, C., Riesbeck, J., & Larsson, M. (2016). Biomass applications in iron and steel industry: An overview of challenges and opportunities. *Renewable and Sustainable Energy Reviews*, 65, 1247–1266.  
<https://doi.org/10.1016/j.rser.2016.07.061>
- Muharam, S. R. (2021). *Pengaruh Penambahan Limbah Biomassa terhadap Struktur Karbon Biokokas Menggunakan Batubara Non Coking* [Thesis, Institut Teknologi Bandung].  
[https://digilib.itb.ac.id/gdl/view/54279/biokokas?rows=3&per\\_page=4](https://digilib.itb.ac.id/gdl/view/54279/biokokas?rows=3&per_page=4)
- Ninduangdee, P., Kuprianov, V. I., Cha, E. Y., Kaewrath, R., Youngyuen, P., & Athawethworawuth, W. (2015). Thermogravimetric Studies of Oil Palm Empty Fruit Bunch and Palm Kernel Shell: TG/DTG Analysis and Modeling. *Energy Procedia*, 79, 453–458. <https://doi.org/10.1016/j.egypro.2015.11.518>
- Novita, D., & Kusumah, K. D. (2016). Karakteristik dan Lingkungan Pengendapan Batubara Formasi Warukin di Desa Kalumpang, Binuang, Kalimantan Selatan. *Jurnal Geologi dan Sumberdaya Mineral*, 17(3), 139–152.  
<https://doi.org/https://doi.org/10.33332/jgsm.geologi.v17i3.12>
- Nurjaman, F. (2022). *Pengaruh Basisitas Slag pada Proses Reduksi Selektif Bijih Nikel Laterit (Limonit dan Saprolit)*. Universitas Indonesia.
- Nurjaman, F., Astuti, W., Bahfie, F., & Suharno, B. (2021). Study of Selective Reduction in Lateritic Nickel Ore: Saprolite versus Limonite. *Materials*

Today: Proceedings, 44, 1488–1494.

<https://doi.org/10.1016/j.matpr.2020.11.687>

Nurjaman, F., Bahfie, F., Herlina, U., Astuti, W., & Suharno, B. (2020). Kajian Literatur Parameter Proses Reduksi Selektif Bijih Nikel Laterit. *MetalIndonesia*, 42(2), 63–71. <https://doi.org/10.32423/jmi.2020.v42.63-71>

Nurjaman, F., Sa'adah, A., Shofi, A., Apriyana, W., & Suharno, B. (2018). The Effect of Additives and Reductors in Selective Reduction Process of Laterite Nickel Ore. *Jurnal Sains Materi Indonesia*, 20(1), 8–14. <https://doi.org/10.17146/jsmi.2018.20.1.5404>

Nurjaman, F., Sari, Y., Manurung, P., Handoko, A. S., Bahfie, F., Astuti, W., & Suharno, B. (2021). Study of Binary, Ternary, and Quaternary Basicity in Reduction of Saprolitic Nickel Ore. *Transactions of the Indian Institute of Metals*, 74(12), 3249–3263. <https://doi.org/10.1007/s12666-021-02391-7>

Omar, R., Idris, A., Yunus, R., Khalid, K., & Aida Isma, M. I. (2011). Characterization of empty fruit bunch for microwave-assisted pyrolysis. *Fuel*, 90(4), 1536–1544. <https://doi.org/10.1016/j.fuel.2011.01.023>

Overmann, S., Vollpracht, A., & Matschei, T. (2024). Reactivity of Calcined Clays as SCM—A Review. Dalam *Materials* (Vol. 17, Nomor 2). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/ma17020312>

Patrick, J. W., & Stacey, A. E. (1972a). The Strength of Industrial Cokes: Part 3. Tensile Strength of Blast-Furnace Cokes. *Fuel*, 51, 206–210. [https://doi.org/10.1016/0016-2361\(72\)90082-8](https://doi.org/10.1016/0016-2361(72)90082-8)

Patrick, J. W., & Stacey, A. E. (1972b). The Strength of Industrial Cokes: Part I. Variability of Tensile Strength in Relation to Fissure Formation. *Fuel*, 51, 81–87. [https://doi.org/10.1016/0016-2361\(72\)90044-0](https://doi.org/10.1016/0016-2361(72)90044-0)

Patricx, F. (2021). *Pengaruh Penambahan Binder terhadap Kualitas dan Struktur Karbon Kokas menggunakan Batubara Non-Coking* [Thesis, Institut Teknologi Bandung]. [https://digilib.itb.ac.id/gdl/view/54436/kokas?rows=18&per\\_page=3](https://digilib.itb.ac.id/gdl/view/54436/kokas?rows=18&per_page=3)

Petrus, H. T. B. M., Putera, A. D. P., Sugiarto, E., Perdana, I., Warmada, I. W., Nurjaman, F., Astuti, W., & Mursito, A. T. (2019). Kinetics on Roasting

- Reduction of Limonitic Laterite Ore using Coconut-Charcoal and Anthracite Reductants. *Minerals Engineering*, 132, 126–133. <https://doi.org/10.1016/j.mineng.2018.11.043>
- Phounglamcheik, A., Wang, L., Romar, H., Kienzl, N., Broström, M., Ramser, K., Skreiberg, Ø., & Umeki, K. (2020). Effects of Pyrolysis Conditions and Feedstocks on the Properties and Gasification Reactivity of Charcoal from Woodchips. *Energy and Fuels*, 34(7), 8353–8365. <https://doi.org/10.1021/acs.energyfuels.0c00592>
- Pintowantoro, S., & Abdul, F. (2019). Selective reduction of laterite nickel ore. *Materials Transactions*, 60(11), 2245–2254. <https://doi.org/10.2320/matertrans.MT-M2019101>
- Pratama, A., Ananda, R., Nurjaman, F., Ferdian, D., & Suharno, B. (2021). Effect of Addition Elemental Sulfur as Additive in the Selective Reduction Process of Limonite Nickel Ore with the Presents of Sodium Sulfate. *IOP Conference Series: Materials Science and Engineering*, 1034(1), 1–10. <https://doi.org/10.1088/1757-899x/1034/1/012171>
- Putera, A. D. P., Warmada, I. W., Amijaya, D. H., Astuti, W., Sukadana, I. G., & Petrus, H. T. B. M. (2023). A Comparison Study of Nickel Laterite Reduction using Coal and Coconut Shell Charcoal: A FactSage Simulation. *International Journal of Technology*, 14(2), 267–275. <https://doi.org/10.14716/ijtech.v14i2.5808>
- Rasyid, M. H. Al, Rizky, A., Diga, A. P., & Petrus, H. T. B. M. (2016). Study on Biomass Performance in Reduction of Nickel Laterite from Pomalaa, Sulawesi Tenggara. *AIP Conference Proceedings*, 1755, 1–8. <https://doi.org/10.1063/1.4958490>
- Rizky, M. A., Sukamto, U., & Setiawan, A. (2022). Literature Review: Comparison of Caron Process and RKEF on the Processing of Nickel Laterite Ore For Battery. 6(2), 47–56. <https://doi.org/https://doi.org/10.31315/jmel.v6i2.6900>
- Sakurovs, R., French, D., & Grigore, M. (2007). Quantification of mineral matter in commercial cokes and their parent coals. *International Journal of Coal Geology*, 72(2), 81–88. <https://doi.org/10.1016/j.coal.2006.12.009>

- Sari, Y., Manaf, A., Astuti, W., Nurjaman, F., Susanti, D., Sipahutar, W. S., & Bahfie, F. (2024). Nickel recovery in ferronickel concentrate by green selective reduction of nickel laterite. *Engineering Science and Technology, an International Journal*, 57. <https://doi.org/10.1016/j.jestch.2024.101798>
- Seo, M. W., Jeong, H. M., Lee, W. J., Yoon, S. J., Ra, H. W., Kim, Y. K., Lee, D., Han, S. W., Kim, S. D., Lee, J. G., & Jeong, S. M. (2020). Carbonization characteristics of biomass/coking coal blends for the application of bio-coke. *Chemical Engineering Journal*, 394, 1–10. <https://doi.org/10.1016/j.cej.2020.124943>
- Sharma, A., Sakimoto, N., & Takanohashi, T. (2018). Effect of binder amount on the development of coal-binder interface and its relationship with the strength of the carbonized coal-binder composite. *Carbon Resources Conversion*, 1(2), 139–146. <https://doi.org/10.1016/j.crcon.2018.05.002>
- Silitonga, P. R., & Kastowo. (1995). Peta Geologi Lembar Solok, Sumatera. Dalam *Pusat Penelitian dan Pengembangan Geologi*.
- Singh, A. K., Singh, P. K., Singh, M. P., & Banerjee, P. K. (2015). Utilization of the Permian Coal Deposits of West Bokaro, India: A Petrochemical Evaluation. *Energy Sources, Part A: Recovery, Utilization and Environmental Effects*, 37(10), 1081–1088. <https://doi.org/10.1080/15567036.2011.603029>
- Speight, J. G. (2015). *Handbook of Coal Analysis* (M. F. Vitha, Ed.; 2 ed., Vol. 182). John Wiley & Sons. <https://doi.org/DOI:10.1002/9781119037699>
- Stanković, S., Stopić, S., Sokić, M., Marković, B., & Friedrich, B. (2020). Review of the past, present, and future of the hydrometallurgical production of nickel and cobalt from lateritic ores. *Metallurgical and Materials Engineering*, 26(2), 199–208. <https://doi.org/10.30544/513>
- Strangway, D. W. (1989). Magnetic properties of rocks and minerals. *Physical properties of rocks and minerals. CINDAS data series on material properties, volume II(2)*, 331–360. <https://doi.org/10.1029/rf003p0189>
- Susanto, J. P., Santoso, A. D., & Suwedi, N. (2017). Perhitungan Potensi Limbah Padat Kelapa Sawit untuk Sumber Energi Terbaharukan dengan Metode LCA Palm Solid Wastes Potential Calculation for Renewable Energy with LCA

- Method. *Jurnal Teknologi Lingkungan*, 18(2), 165–172.  
<https://doi.org/10.29122/jtl.v18i2.2046>
- Sutarwan, A. H. (1995). *Petrographical and chemical properties of coals from the Southern Petrographical and chemical properties of coals from the Southern Peranap deposit Central Sumatra Basin, Indonesia* [Thesis, University of Wollongong]. <https://ro.uow.edu.au/theses>
- Suwarna, N., Budhitrisona, T., Santosa, S., & Mangga, S. A. (1994). Peta Geologi Lembar Rengat, Sumatera. Dalam *Pusat Penelitian dan Pengembangan Geologi*.
- Tamehe, L. S., Zhao, Y., Xu, W., & Gao, J. (2024). Ni(Co) Laterite Deposits of Southeast Asia: A Review and Perspective. *Minerals*, 14(2), 1–22.  
<https://doi.org/10.3390/min14020134>
- Tang, X. hui, Liu, R. zao, Yao, L., Ji, Z. jun, Zhang, Y. ting, & Li, S. qi. (2014). Ferronickel enrichment by fine particle reduction and magnetic separation from nickel laterite ore. *International Journal of Minerals, Metallurgy and Materials*, 21(10), 955–961. <https://doi.org/10.1007/s12613-014-0995-5>
- Thomas, L. (2020). *Coal Geology* (3 ed.). John Wiley & Sons.
- Trindade, M. J., Dias, M. I., Coroado, J., & Rocha, F. (2010). Firing tests on clay-rich raw materials from the algarve basin (Southern Portugal): Study of mineral transformations with temperature. *Clays and Clay Minerals*, 58(2), 188–204. <https://doi.org/10.1346/CCMN.2010.0580205>
- Undang-Undang Nomor 3 Tahun 2020 tentang Perubahan Atas Undang-Undang Nomor 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara, Pub. L. No. 3, [peraturan.bpk.go.id](http://peraturan.bpk.go.id) (2020).  
<https://peraturan.bpk.go.id/Details/138909/uu-no-3-tahun-2020>
- Usino, D. O., Ylittervo, P., & Richards, T. (2023). Primary Products from Fast Co-Pyrolysis of Palm Kernel Shell and Sawdust. *Molecules*, 28(19).  
<https://doi.org/10.3390/molecules28196809>
- Wada, T., Geslin, P. A., Wei, D., & Kato, H. (2023). Partial liquid Metal Dealloying to Synthesize Nickel-containing Porous and Composite Ferrous and High-

- Entropy Alloys. *Communications Materials*, 4(1).  
<https://doi.org/10.1038/s43246-023-00374-3>
- Wang, A., Huang, J., Zhao, M., Liu, Y., Cao, D., Wei, Y., & Wei, L. (2023). Effects of Functional Groups in Coal with Different Vitrinite/Inertinite Ratios on Pyrolysis Products. *ACS Omega*, 8(20), 18202–18211.  
<https://doi.org/10.1021/acsomega.3c01635>
- Wang, T., Li, C., Zhou, B., Zhang, Y., Zhang, M., Yang, H., & Wang, Z. (2020). Experimental investigation of thermal effect in coal pyrolysis process. *Fuel Processing Technology*, 200, 1–9.  
<https://doi.org/10.1016/j.fuproc.2019.106269>
- Wang, Y. (2024). Experimental and molecular dynamics study on combustion characteristics of non-stick coal. *Scientific Reports*, 14(1).  
<https://doi.org/10.1038/s41598-024-77128-9>
- Wicaksono, M. D. S. W. (2024). *Reduksi Selektif Bijih Nikel Laterit Menggunakan Reduktor Berbahan Batubara dan Biomassa Tandan Kosong Kelapa Sawit* [Thesis, Universitas Gadjah Mada].  
<https://doi.org/https://etd.repository.ugm.ac.id/penelitian/detail/243092>
- Worasuwanarak, N., Nakagawa, H., & Miura, K. (2002). Effect of pre-oxidation at low temperature on the carbonization behavior of coal. *fuel*, 81(11–12), 1477–1484. [https://doi.org/https://doi.org/10.1016/S0016-2361\(02\)00083-2](https://doi.org/https://doi.org/10.1016/S0016-2361(02)00083-2)
- Wutti, R., Petek, J., & Staudinger, G. (1996). *Transport limitations in pyrolysing coal particles*. 75(7), 843–850. [https://doi.org/https://doi.org/10.1016/0016-2361\(96\)00021-X](https://doi.org/https://doi.org/10.1016/0016-2361(96)00021-X)
- Yang, H., Yan, R., Chen, H., Lee, D. H., & Zheng, C. (2007). Characteristics of hemicellulose, cellulose and lignin pyrolysis. *Fuel*, 86(12–13), 1781–1788.  
<https://doi.org/10.1016/j.fuel.2006.12.013>
- Yang, Y.-H. (1990). *Fundamental study of pore formation in iron ore sinter and pellets* [University of Wollongong]. <http://ro.uow.edu.au/theses/1498>
- Yano, S., Louca, D., Yang, J., Chatterjee, U., Bugaris, D. E., Chung, D. Y., Peng, L., Grayson, M., & Kanatzidis, M. G. (2016). Magnetic structure of NiS<sub>2-x</sub>Sex. *Physical Review B*, 93(2). <https://doi.org/10.1103/PhysRevB.93.024409>

- Yu, D., Zhu, M., Utigard, T. A., & Barati, M. (2014). TG/DTA study on the carbon monoxide and graphite thermal reduction of a high-grade iron nickel oxide residue with the presence of siliceous gangue. *Thermochimica Acta*, *575*, 1–11. <https://doi.org/10.1016/j.tca.2013.10.015>
- Yunus, N. A., Ani, M. H., Salleh, H. M., Abd Rashid, R. Z., Akiyama, T., & Purwanto, H. (2013). Reduction of iron ore/empty fruit bunch char briquette composite. *ISIJ International*, *53*(10), 1749–1755. <https://doi.org/10.2355/isijinternational.53.1749>
- Yustanti, E., Wardhono, E. Y., Mursito, A. T., & Alhamidi, A. (2021). Types and composition of biomass in biocoke synthesis with the coal blending method. *Energies*, *14*(20), 1–18. <https://doi.org/10.3390/en14206570>
- Zailani, R., Ghafar, H., & So'aib, M. S. (2013). The influence of oxygen in the carbonization of oil palm shell on bio- char yield and properties. *Applied Mechanics and Materials*, *393*, 499–504. <https://doi.org/10.4028/www.scientific.net/AMM.393.499>
- Zappala, L., McDonald, R., & Pownceby, M. I. (2024). Nickel Laterite Beneficiation and Potential for Upgrading Using High Temperature Methods: A Review. Dalam *Mineral Processing and Extractive Metallurgy Review* (Vol. 45, Nomor 7, hlm. 767–789). Taylor and Francis Ltd. <https://doi.org/10.1080/08827508.2023.2265533>
- Zhang, L., Wang, G., Xue, Q., Zuo, H., She, X., & Wang, J. (2021). Effect of Preheating on Coking Coal and Metallurgical Coke Properties: A Review. *Fuel Processing Technology*, *221*, 1–14. <https://doi.org/10.1016/j.fuproc.2021.106942>
- Zhong, Q., Yang, Y., Li, Q., Xu, B., & Jiang, T. (2017). Coal tar pitch and molasses blended binder for production of formed coal briquettes from high volatile coal. *Fuel Processing Technology*, *157*, 12–19. <https://doi.org/10.1016/j.fuproc.2016.11.005>
- Zhu, D. Q., Cui, Y., Vining, K., Hapugoda, S., Douglas, J., Pan, J., & Zheng, G. L. (2012). Upgrading low nickel content laterite ores using selective reduction

followed by magnetic separation. *International Journal of Mineral Processing*, 106–109, 1–7. <https://doi.org/10.1016/j.minpro.2012.01.003>