

- Alexander, S. R., & Winnick, J. (1994). Removal of hydrogen sulfide from natural gas through an electrochemical membrane separator. *AIChE Journal*, 40(4), 613–620. <https://doi.org/10.1002/aic.690400406>
- Bagreev, A., Rahman, H., & Bandoz, T. J. (2000). Study of H₂S adsorption and water regeneration of spent coconut-based activated carbon. *Environmental Science and Technology*, 34(21), 4587–4592. <https://doi.org/10.1021/es001150c>
- Balsamo, M., Cimino, S., de Falco, G., Erto, A., & Lisi, L. (2016). ZnO-CuO supported on activated carbon for H₂S removal at room temperature. *Chemical Engineering Journal*, 304, 399–407. <https://doi.org/10.1016/j.cej.2016.06.085>
- Barrett, E. P., Joyner, L. G., & Halenda, P. P. (1951). The Determination of Pore Volume and Area Distributions in Porous Substances. I. Computations from Nitrogen Isotherms. *Journal of the American Chemical Society*, 73(1), 373–380. <https://doi.org/10.1021/ja01145a126>
- Baur, G. B., Yuranov, I., & Kiwi-Minsker, L. (2015). Activated carbon fibers modified by metal oxide as effective structured adsorbents for acetaldehyde. *Catalysis Today*, 249, 252–258. <https://doi.org/10.1016/j.cattod.2014.11.021>
- Boutillara, Y., Tombeur, J. L., De Weireld, G., & Lodewyckx, P. (2019). In-situ copper impregnation by chemical activation with CuCl₂ and its application to SO₂ and H₂S capture by activated carbons. *Chemical Engineering Journal*, 372(April), 631–637. <https://doi.org/10.1016/j.cej.2019.04.183>
- Chung Lau, L. (2016). Adsorption Isotherm, Kinetic, Thermodynamic and Breakthrough Curve Models of H₂S Removal Using CeO₂/NaOH/PSAC. *International Journal of*

<https://doi.org/10.15406/ipcse.2016.01.00009>

Cimino, S., Lisi, L., Erto, A., Deorsola, F. A., de Falco, G., Montagnaro, F., & Balsamo, M. (2020). Role of H₂O and O₂ during the reactive adsorption of H₂S on CuO-ZnO/activated carbon at low temperature. *Microporous and Mesoporous Materials*, 295(October 2019), 109949. <https://doi.org/10.1016/j.micromeso.2019.109949>

Ding, L. P., & Bhatia, S. K. (2003). Analysis of multicomponent adsorption kinetics on activated carbon. *AIChE Journal*, 49(4), 883–895. <https://doi.org/10.1002/aic.690490408>

Do, D. D. (1998). Adsorption Analysis: Equilibria and Kinetics. In *Chemical Engineering* (Vol. 2, Issue Imperial College Press). <http://ebooks.worldscinet.com/ISBN/9781860943829/9781860943829.html>

Duong, T. H. Y., Nguyen, T. N., Oanh, H. T., Dang Thi, T. A., Giang, L. N. T., Phuong, H. T., Anh, N. T., Nguyen, B. M., Quang, V. T., Le, G. T., & Nguyen, T. Van. (2019). Synthesis of Magnesium Oxide Nanoplates and Their Application in Nitrogen Dioxide and Sulfur Dioxide Adsorption. *Journal of Chemistry*, 2019(2). <https://doi.org/10.1155/2019/4376429>

Feng, W., Kwon, S., Borguet, E., & Vidic, R. (2005). Adsorption of Hydrogen Sulfide onto Activated Carbon Fibers: Effect of Pore Structure and Surface Chemistry. *Environmental Science & Technology*, 39(24), 9744–9749. <https://doi.org/10.1021/es0507158>

Feng, Y., Dou, J., Tahmasebi, A., Xu, J., Li, X., Yu, J., & Yin, F. (2015). Regeneration of Fe-Zn-Cu Sorbents Supported on Activated Lignite Char for the Desulfurization

<https://doi.org/10.1021/acs.energyfuels.5b01909>

Feng, Y., Wen, J., Hu, Y., Wu, B., Wu, M., & Mi, J. (2017). Evaluation of the cycling performance of a sorbent for H₂S removal and simulation of desulfurization-regeneration processes. *Chemical Engineering Journal*, 326, 1255–1265.
<https://doi.org/10.1016/j.cej.2017.05.098>

Fogler, H. S. (2004). Chemical reaction engineering. In *The Engineering Handbook, Second Edition*. <https://doi.org/10.1201/9781420087567-13>

Gardner, T. J., & Messing, G. L. (1984). Magnesium salt decomposition and morphological development during evaporative decomposition of solutions. *Thermochimica Acta*, 78(1–3), 17–27. [https://doi.org/10.1016/0040-6031\(84\)87128-2](https://doi.org/10.1016/0040-6031(84)87128-2)

Gasquet, V., Kim, B., Sigot, L., & Benbelkacem, H. (2020). H₂S Adsorption from Biogas with Thermal Treatment Residues. *Waste and Biomass Valorization*, 11(10), 5363–5373. <https://doi.org/10.1007/s12649-020-00998-3>

Georgiadis, A. G., Charisiou, N. D., & Goula, M. A. (2020). Removal of hydrogen sulfide from various industrial gases: A review of the most promising adsorbing materials. *Catalysts*, 10(5). <https://doi.org/10.3390/catal10050521>

GilPavas, E., Dobrosz-Gómez, I., & Gómez-García, M.-Á. (2019). Optimization and toxicity assessment of a combined electrocoagulation, H₂O₂/Fe²⁺/UV and activated carbon adsorption for textile wastewater treatment. *Science of The Total Environment*, 651, 551–560. <https://doi.org/10.1016/j.scitotenv.2018.09.125>

Goldnik, E., & Turek, T. (2016). Removal of hydrogen sulfide by permanganate based

Science, 151, 51–63. <https://doi.org/10.1016/j.ces.2016.04.059>

Hasdi, N. D. (2020). Reviewing Methods To Prepare Activated Carbon From Various Sources. *Nanoscale Research Letters*, 14(341), 1–17.

Heo, Y. J., & Park, S. J. (2017). Facile Synthesis of MgO-Modified Carbon Adsorbents with Microwave-Assisted Methods: Effect of MgO Particles and Porosities on CO₂ Capture. *Scientific Reports*, 7(1), 1–9. <https://doi.org/10.1038/s41598-017-06091-5>

Huang, C. C., Chen, C. H., & Chu, S. M. (2006). Effect of moisture on H₂S adsorption by copper impregnated activated carbon. *Journal of Hazardous Materials*, 136(3), 866–873. <https://doi.org/10.1016/j.jhazmat.2006.01.025>

Huang, G., He, E., Wang, Z., Fan, H., Shangguan, J., Croiset, E., & Chen, Z. (2015). Synthesis and Characterization of γ -Fe₂O₃ for H₂S Removal at Low Temperature. *Industrial and Engineering Chemistry Research*, 54(34), 8469–8478. <https://doi.org/10.1021/acs.iecr.5b01398>

Huang, Q. Z., Lu, G. M., Wang, J., & Yu, J. G. (2010). Mechanism and kinetics of thermal decomposition of MgCl₂ × 6H₂O. *Metallurgical and Materials Transactions B: Process Metallurgy and Materials Processing Science*, 41(5), 1059–1066. <https://doi.org/10.1007/s11663-010-9390-4>

Khabazipour, M., & Anbia, M. (2019). Removal of Hydrogen Sulfide from Gas Streams Using Porous Materials: A Review. *Industrial and Engineering Chemistry Research*, 58(49), 22133–22164. <https://doi.org/10.1021/acs.iecr.9b03800>

Kulkarni, M. B., & Ghanegaonkar, P. M. (2019). Hydrogen sulfide removal from biogas using chemical absorption technique in packed column reactors. *Global Journal of*

<https://doi.org/10.22034/gjesm.2019.02.02>

Kumeria, T., Parkinson, L., & Losic, D. (2011). A nanoporous interferometric micro-sensor for biomedical detection of volatile sulphur compounds. *Nanoscale Research Letters*, 6, 1–7. <https://doi.org/10.1186/1556-276X-6-634>

Li, Q., & Lancaster, J. R. (2013). Chemical foundations of hydrogen sulfide biology. *Nitric Oxide - Biology and Chemistry*, 35, 21–34. <https://doi.org/10.1016/j.niox.2013.07.001>

Liu, C., Zhang, R., Wei, S., Wang, J., Liu, Y., Li, M., & Liu, R. (2015). Selective removal of H₂S from biogas using a regenerable hybrid TiO₂/zeolite composite. *Fuel*, 157, 183–190. <https://doi.org/10.1016/j.fuel.2015.05.003>

Liu, D., Wang, Q., Wu, J., & Liu, Y. (2019). A review of sorbents for high-temperature hydrogen sulfide removal from hot coal gas. *Environmental Chemistry Letters*, 17(1), 259–276. <https://doi.org/10.1007/s10311-018-0792-x>

Liu, R., Chi, L., Wang, X., Sui, Y., Wang, Y., & Arandiyan, H. (2018). Review of metal (hydr)oxide and other adsorptive materials for phosphate removal from water. *Journal of Environmental Chemical Engineering*, 6(4), 5269–5286. <https://doi.org/10.1016/j.jece.2018.08.008>

Mastuli, M. S., Ansari, N. S., Nawawi, M. A., & Mahat, A. M. (2012). Effects of Cationic Surfactant in Sol-gel Synthesis of Nano Sized Magnesium Oxide. *APCBEE Procedia*, 3(May), 93–98. <https://doi.org/10.1016/j.apcbee.2012.06.052>

Noreen, S., Khalid, U., Ibrahim, S. M., Javed, T., Ghani, A., Naz, S., & Iqbal, M. (2020). ZnO, MgO and FeO adsorption efficiencies for direct sky Blue dye: Equilibrium,

Northrop, P. S., & Valencia, J. A. (2009). The CFZTM process: A cryogenic method for handling high- CO₂ and H₂S gas reserves and facilitating geosequestration of CO₂ and acid gases. *Energy Procedia*, 1(1), 171–177. <https://doi.org/10.1016/j.egypro.2009.01.025>

Ozekmekci, M., Salkic, G., & Fellah, M. F. (2015). Use of zeolites for the removal of H₂S: A mini-review. *Fuel Processing Technology*, 139, 49–60. <https://doi.org/10.1016/j.fuproc.2015.08.015>

Paryanto, P., Wibowo, W. A., Saputra, N. A., & Setyawati, R. B. (2019). Adsorption of Sulphur in Biogas by Activated Carbon Derived From Mangrove Fruits (*Rhizophora stylosa*) as Solid Residue of Natural Dyes Extraction. *Metana*, 15(2), 37–42. <https://doi.org/10.14710/metana.v15i2.24424>

Peluso, A., Gargiulo, N., Aprea, P., Pepe, F., & Caputo, D. (2019). Nanoporous Materials as H₂S Adsorbents for Biogas Purification: a Review. *Separation and Purification Reviews*, 48(1), 78–89. <https://doi.org/10.1080/15422119.2018.1476978>

Pradita, T., Shih, S. J., Aji, B. B., & Sudibyo. (2017). Synthesis of MgO powder from magnesium nitrate using spray pyrolysis. *AIP Conference Proceedings*, 1823(December). <https://doi.org/10.1063/1.4978089>

Pranolo, S. H., Paryanto, P., Margono, M., Rizaldy, B., & Yansah, H. (2018). Hydrogen Sulfide Removal from Biogas Using Digester Effluent Absorbent in a Continuous Vertical Column. *Reaktor*, 18(03), 160. <https://doi.org/10.14710/reaktor.18.03.160-165>

Prasetyo, I., Mukti, N. I. F., Fahrurrozi, M., & Ariyanto, T. (2018). Removing Ethylene

by Adsorption using Cobalt Oxide-Loaded Nanoporous Carbon. *ASEAN Journal of Chemical Engineering*, 18(1), 9. <https://doi.org/10.22146/ajche.49542>

Rongwong, W., Boributh, S., Assabumrungrat, S., Laosiripojana, N., & Jiraratnanon, R. (2012). Simultaneous absorption of CO₂ and H₂S from biogas by capillary membrane contactor. *Journal of Membrane Science*, 392–393, 38–47. <https://doi.org/10.1016/j.memsci.2011.11.050>

Sawada, Y., Yamaguchi, J., Sakurai, O., Uematsu, K., Mizutani, N., & Kato, M. (1979). Thermal decomposition of basic magnesium carbonates under high-pressure gas atmospheres. *Thermochimica Acta*, 32(1–2), 277–291. [https://doi.org/10.1016/0040-6031\(79\)85115-1](https://doi.org/10.1016/0040-6031(79)85115-1)

Seo, D.-C., Guo, R., & Lee, D.-H. (2020). Performance of alkaline impregnated biochar derived from rice hull for hydrogen sulfide removal from gas. *Environmental Engineering Research*, 26(6), 200452–0. <https://doi.org/10.4491/eer.2020.452>

Shah, M. S., Tsapatsis, M., & Siepmann, J. I. (2017). Hydrogen Sulfide Capture: From Absorption in Polar Liquids to Oxide, Zeolite, and Metal-Organic Framework Adsorbents and Membranes. *Chemical Reviews*, 117(14), 9755–9803. <https://doi.org/10.1021/acs.chemrev.7b00095>

Siriwardane, I. W., Udangawa, R., de Silva, R. M., Kumarasinghe, A. R., Acres, R. G., Hettiarachchi, A., Amaratunga, G. A. J., & de Silva, K. M. N. (2017a). Synthesis and characterization of nano magnesium oxide impregnated granular activated carbon composite for H₂S removal applications. *Materials and Design*, 136, 127–136. <https://doi.org/10.1016/j.matdes.2017.09.034>

Hettiarachchi, A., Amaratunga, G. A. J., & de Silva, K. M. N. (2017b). Synthesis and characterization of nano magnesium oxide impregnated granular activated carbon composite for H₂S removal applications. *Materials and Design*, 136, 127–136. <https://doi.org/10.1016/j.matdes.2017.09.034>

Sitthikhankaew, R., Predapitakkun, S., Kiattikomol, R., Pumhiran, S., Assabumrungrat, S., & Laosiripojana, N. (2011). Comparative study of hydrogen sulfide adsorption by using alkaline impregnated activated carbons for hot fuel gas purification. *Energy Procedia*, 9, 15–24. <https://doi.org/10.1016/j.egypro.2011.09.003>

Sneddon, G., Greenaway, A., & Yiu, H. H. P. (2014). The potential applications of nanoporous materials for the adsorption, separation, and catalytic conversion of carbon dioxide. *Advanced Energy Materials*, 4(10), 1–19. <https://doi.org/10.1002/aenm.201301873>

Suhrman, S., Ariyanto, T., & Prasetyo, I. (2021). Preparation of Potassium Permanganate Confined in Porous Carbon Synthesized from Palm Kernel Shell and its Application for Hydrogen Sulfide Removal. *Key Engineering Materials*, 884(Ibasc), 77–82. <https://doi.org/10.4028/www.scientific.net/kem.884.77>

Tan, P., Jiang, Y., Sun, L. B., Liu, X. Q., Albahily, K., Ravon, U., & Vinu, A. (2018). Design and fabrication of nanoporous adsorbents for the removal of aromatic sulfur compounds. *Journal of Materials Chemistry A*, 6(47), 23978–24012. <https://doi.org/10.1039/c8ta09184f>

Wan Isahak, W. N. R., Ramli, Z. A. C., Mohamed Hisham, M. W., & Yarmo, M. A. (2013). Magnesium oxide nanoparticles on green activated carbon as efficient CO₂ adsorbent. *AIP Conference Proceedings*, 1571(December 2013), 882–889.

- Wang, L., Shi, C., Pan, L., Zhang, X., & Zou, J. J. (2020). Rational design, synthesis, adsorption principles and applications of metal oxide adsorbents: A review. *Nanoscale*, 12(8), 4790–4815. <https://doi.org/10.1039/c9nr09274a>
- Wasajja, H., Lindeboom, R. E. F., van Lier, J. B., & Aravind, P. V. (2020). Techno-economic review of biogas cleaning technologies for small scale off-grid solid oxide fuel cell applications. *Fuel Processing Technology*, 197(May 2019), 106215. <https://doi.org/10.1016/j.fuproc.2019.106215>
- Xue, B., Zhang, J., Tang, X., Yang, C., Chen, Q., Man, X., & Dang, W. (2016). Micro-pore Structure and Gas Accumulation Characteristics of Shale in the Longmaxi Formation, Northwest Guizhou. *Petroleum Research*, 1(2), 191–204. [https://doi.org/10.1016/S2096-2495\(17\)30042-X](https://doi.org/10.1016/S2096-2495(17)30042-X)
- Yang, C., Wang, Y., Fan, H., de Falco, G., Yang, S., Shangguan, J., & Bandosz, T. J. (2020a). Bifunctional ZnO-MgO/activated carbon adsorbents boost H₂S room temperature adsorption and catalytic oxidation. *Applied Catalysis B: Environmental*, 266(November 2019), 118674. <https://doi.org/10.1016/j.apcatb.2020.118674>
- Yang, C., Wang, Y., Fan, H., de Falco, G., Yang, S., Shangguan, J., & Bandosz, T. J. (2020b). Bifunctional ZnO-MgO/activated carbon adsorbents boost H₂S room temperature adsorption and catalytic oxidation. *Applied Catalysis B: Environmental*, 266(January), 118674. <https://doi.org/10.1016/j.apcatb.2020.118674>
- Zhao, S., Yi, H., Tang, X., Jiang, S., Gao, F., Zhang, B., Zuo, Y., & Wang, Z. (2013). The hydrolysis of carbonyl sulfide at low temperature: A review. *The Scientific World Journal*, 2013. <https://doi.org/10.1155/2013/739501>