UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Abdullah, A. M., & O'Shea, K. E. (2019). TiO2 photocatalytic degradation of the flame retardant tris (2-chloroethyl) phosphate (TCEP) in aqueous solution: A detailed kinetic and mechanistic study. *Journal of Photochemistry and Photobiology A: Chemistry*, *377*, 130–137. https://doi.org/10.1016/j.jphotochem.2019.03.026

Air Products and Chemicals. (2019). *Nitogen blanketing to keep your product intact and your employees and equipment safe*. Air Products and Chemicals, Inc. https://www.chemicalprocessing.com/utilities-energy/air-energy/whitepaper/11304267/nitrogen-blanketing-keeps-employees-and-equipment-safe

Al-Dahhan, M. H., Larachi, F., & Dudukovic, M. P. (1997). *High-pressure trickle-bed reactors: A review*. Industrial & Engineering Chemistry Research, 36(8), 3292-3314.

Alfa Laval, *Plate Heat Exchanger Guide*, 2018.

Alharbi, A., & Alhujaily, M. (2024). Molecular Mechanism of Indoor Exposure to Airborne Halogenated Flame Retardants TCIPP (Tris(1,3-Dichloro-2-Propyl) Phosphate) and TCEP Tris(2-chloroethyl) Phosphate and Their Hazardous Effects on Biological Systems. *Metabolites*, *14*(12), 697. https://doi.org/10.3390/metabo14120697

Alibaba. (2026). *Tris(2-chloroethyl) phosphate CAS 115-96-8 industrial grade*. Diakses pada 21 Juni 2026, dari https://www.alibaba.com/

Allen, D. W., & Walker, B. J. (Eds.). (1992). *Organophosphorus Chemistry: Volume 23*. The Royal Society of Chemistry.

American Petroleum Institute (API), *API Standard 660: Shell-and-Tube Heat Exchangers*, 2015.

American Petroleum Institute. (2013). *API Standard 2510: Design and Construction of LPG Installations.* API Publishing.

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Anderson, J. J., & Camacho, V. G. (1975). *Preparation of Tris (2-Chloroethyl) Phosphite* (Patent No. 3888953). https://patents.google.com/patent/US3888953A/en

Anwar-ul-azim (2011). Synthesis of functionalized organophosphorus compounds of biological importance

Aries, R. S., & Newton, R. D. (1955). *Chemical Engineering Cost Estimation*. New York: McGraw-Hill Book Company.

Asri, C. (n.d.). *Chandra Asri*. Chandra Asri. https://chandra-asri.com/en/our-business/chemical-solutions/olefin

Bahadori, A., 2014, *Hazardous area classification* in Petroleum and Chemical Plants: AGuide to Mitigating Risk, CRC Press, Taylor & Francis Group, Florida.

Bank Indonesia. (2026). *Kalkulator kurs transaksi Bank Indonesia*. Diakses pada 21 Juni 2026, dari https://www.bi.go.id/id/statistik/informasi-kurs/transaksi-bi/kalkulator-kurs.aspx

Bauermeister. (1992) *Nucleophilic reactivity of phosphoric amides and related systems*.

Billet, R., *Evaporation Technology: Principles, Applications, Economics*, VCH Publishers, 1989.

Bright, D. A., Burkhardt, E. W., Kate, A. ten, Dashevsky, S., & Tomko, J. (2004). *Process For Purification of Phosphate Esters* (Patent No. US 7759522 B2). https://patents.google.com/patent/US7759522B2/en

Brown, G. G., Katz, D. L., Foust, A. S., and Schneidewind, C., 1950, Unit Operations, John Wiley and Sons, Inc., New York.

CA1050562A. (1979). *Production of phosphorus-containing esters with base to sequester HCl (forming base–hydrochloride salts).* Google Patents. Retrieved from https://patents.google.com/patent/CA1050562A/en

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Center for Chemical Process *Safety*., 1996, Guide*line* s for Evaluating Process Plant Buildings for External Explosions and Fires, American Institute of Chemical Engineers, New York.

Chemical Engineering. (2024). *Chemical Engineering Plant Cost Index (CEPCI)*. Diakses dari https://www.chemengonline.com/pci-home

Cheremisinoff, N. P. (2002). Handbook of water and wastewater treatment technologies. Butterworth-Heinemann.

Cheremisinoff, N. P. (2013). *Handbook of Chemical Processing Equipment.* Butterworth-Heinemann. Kister, H. Z. (1992). *Distillation Design.* McGraw-Hill.

Corma, A. (1997). *From Microporous to Mesoporous Molecular Sieve Materials and Their Use in Catalysis*. Chemical Reviews, 97(6).

Cortés, E. (2025). Tandem sustainability. *Science*, *389*(6764), 977–978. https://doi.org/10.1126/science.aea6759

Coulson, J. M., Richardson, J. F., Backhurst, J. R., & Harker, J. H. (2019). *Coulson and Richardson's Chemical Engineering* (Vol. 6). Elsevier.

Crittenden, J. C., Trussell, R. R., Hand, D. W., Howe, K. J., & Tchobanoglous, G. (2012). MWH's water treatment: Principles and design (3rd ed.). John Wiley & Sons.

Crowl, D. A., & Louvar, J. F. (2011). *Chemical Process Safety: Fundamentals with Applications* (3rd ed.). Prentice Hall.

Crowl, D. A., & Louvar, J. F. (2019). Chemical Process Safety: Fundamentals with Applications (4th ed.). Pearson.

Crowl, D.A, Louvar, J.F. 2002. Chemical Process *Safety*. Prentice Hall. New Jersey.

Cryogenic Distillation Process: A guide to air separation - Jalon. (n.d.). Jalon. https://www.jalonzeolite.com/cryogenic-distillation-process-air-separation/

Daft, R. L. (2016). Organization Theory and Design (12th ed.). Cengage Learning.

UNIVERSITAS GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Dever, J. P., George, K. F., Hoffman, W. C., & Soo, H. (2004). Ethylene oxide. Kirk-Othmer Encyclopedia of Chemical Technology. https://doi.org/10.1002/0471238961.0520082504052205.a01.pub2

Disnakertrans Kota Cilegon. (2025). *Surat Keputusan Wali Kota Cilegon tentang Penetapan Upah Minimum Kota (UMK) Cilegon Tahun 2026*.

Dudukovic, M. P., Larachi, F., & Mills, P. L. (2002). *Multiphase catalytic reactors: A perspective on current knowledge and future trends*. Catalysis Reviews, 44(1), 123-246.

Edwards, D. P., "Design of Shell and Tube Heat Exchangers," *IChemE Symposium Series*, 2005.

Ertl, G., Knözinger, H., Schüth, F. (2008). *Handbook of Heterogeneous Catalysis*. Wiley-VCH.

Fayol, H. (1949). General and Industrial Management. (C. Storrs, Trans.). Pitman Publishing.

Fogler, H. S. (2016). *Elements of chemical reaction engineering* (Fifth edition). Prentice-Hall, Pearson.

Frederick, T., Lenahan, R., Gulledge, B., Brust, L., & Zenick, E. (2023). ETHYLENE OXIDE PRODUCT STEWARDSHIP GUIDANCE MANUAL (2023). *American Chemistry Council*. https://www.americanchemistry.com/content/download/12874/file/Ethylene-Oxide-Product-Stewardship-Manual-%282023%29.pdf

Frisch, K.C., Reegen, S.L. (1975). Relationship Between Chemical Structure and Flammability Resistance of Polyurethanes. In: Lewin, M., Atlas, S.M., Pearce, E.M. (eds) Flame-Retardant Polymeric Materials. Springer, Boston, MA. https://doi.org/10.1007/978-1-4684-2148-4_7

Frisch, K.C., Reegen, S.L. (1975). Relationship Between Chemical Structure and Flammability Resistance of Polyurethanes. In: Lewin, M., Atlas, S.M., Pearce, E.M. (eds) Flame-Retardant Polymeric Materials. Springer, Boston, MA. https://doi.org/10.1007/978-1-4684-2148-4_7

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Froment, G. F., & Bischoff, K. B. (1990). *Chemical Reactor Analysis and Design* (2nd ed.). New York: Wiley.

Gama, S., Rodrigues, I., Marques, F., Palma, E., & Correia, I. (2014). *New ternary Bipyridine-Terpyridine Copper(II) complexes as self-activating chemical nucleases*.

Gianetto, A., & Specchia, V. (1992). *Trickle-bed reactors: State of art and perspectives*. Chemical Engineering Science, 47(13-14), 3197-3213.

Glover, W. B., "Select the Right Evaporator," *Chemical Engineering Progress*, Vol. 100, No. 12, 2004.

Green, D. W., & Maloney, J. O. (Eds.). (1997). *Perry's chemical engineers' handbook* (7th ed.). McGraw-Hill. ISBN 0-07-115448-5

Guoyan, J., Chengrong, D., Guofu, Z., Sheng, J., Guoyao, J., Xiaoying, J., & Huadong, Y. (2016). *METHOD OF PREPARING TRIS-(2-CHLOROETHYL)PHOSPHITE* (Patent No. EP 2 974 789 A1). https://patents.google.com/patent/EP2974789A1/en

Hanson, R. M. (1991). "The Synthetic Utility of C2-Symmetric Diols and Bis(oxazolines)". *Chemical Reviews*, 91(4), 437-460. (Membahas mekanisme pembukaan cincin epoksida).

Heizer, J., Render, B., & Munson, C. (2017). Operations Management: Sustainability and Supply Chain Management (12th ed.). Pearson.

Hessel, V., Hardt, S., & Löwe, H. (2005). *Chemical Micro Process Engineering: Fundamentals, Modelling and Reactions*. Wiley-VCH.

Hydraulic Institute. (2010). Pump handbook (4th ed.). McGraw-Hill.

IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. (1990). *Some flame retardants and textile chemicals, and exposures in the textile manufacturing industry*. IARC ; Distributed for the International Agency for Research on Cancer by the Secretariat of the World Health Organization. https://www.ncbi.nlm.nih.gov/books/NBK519191/

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

IEC., 2016, Functional *Safety – Safety* Instrumented Systems for the Process Industry Sector – *Part* 1: Framework, Definitions, System, Hardware and Application Programming Requirements, Geneva.

Industry Research Biz. (2025). *Global flame retardant chemicals market outlook 2025-2034*. Industry Research Reports.

Industry Research Biz. (2025). Global TCEP (Tris(2-chloroethyl) Phosphate) Market Research Report 2025–2034.

International Electrotechnical Commission. (2014). IEC 60034-1: Rotating electrical machines – Part 1: Rating and performance. IEC.

International Programme on Chemical Safety & Weltgesundheitsorganisation (Ed.). (1998). *Flame retardants: Tris(chloropropyl) phosphate and Tris(2-chloroethyl) phosphate*. World Health Organization.

Jiang, Y., & Renata, H. (2024). Modular chemoenzymatic synthesis of ten fusicoccane diterpenoids. *Nature Chemistry*, *16*(9), 1531–1538. https://doi.org/10.1038/s41557-024-01533-w

K.C. Chong, S.O. Lai, H.S. Thiam, H.C. Teoh, S.L. Heng, Recent progress of oxygen/nitrogen separation using membrane technology, J. Eng. Sci. Technol. 11 (2016) 1016–103

Kakaç, S., & Liu, H., *Heat Exchangers: Selection, Rating, and Thermal Design*, 3rd Edition, CRC Press, 2012.

Karassik, I. J., Messina, J. P., Cooper, P., & Heald, C. C. (2008). Pump handbook (4th ed.). McGraw-Hill.

Kementerian Tenaga Kerja dan Transmigrasi. (2010). Peraturan Menteri Tenaga Kerja dan Transmigrasi Nomor PER.08/MEN/VII/2010 tentang Alat Pelindung Diri.

Kemmer, F. N. (1988). The NALCO water handbook (2nd ed.). McGraw-Hill.

Kern, D. Q. (1950). Process heat transfer. McGraw-Hill.

UNIVERSITAS GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Kirk-Othmer. (2005). "Flame Retardants, Phosphorus". *Kirk-Othmer Encyclopedia of Chemical Technology*. John Wiley & Sons.

Kissin, Y. V. (2008). *Alkene Polymerization Reactions with Transition Metal Catalysts*. Elsevier.

Kumar, P., Banerjee, R., & Pal, S. (2017). Design and optimization of cryogenic air separation units for large-scale oxygen production. *Energy Conversion and Management, 148*, 915–927.

Kunii, D., & Levenspiel, O. (2012). *Fluidization engineering* (2. ed., reprinted). Elsevier ; Butterworth-Heinemann.

Kuppan, T., *Heat Exchanger Design Handbook*, Marcel Dekker, 2000.

LeticiaChem. (n.d.). *Tris(2-Chloroethyl) Phosphate | TCEP 115-96-8*. Retrieved November 28, 2025, from https://leticiachem.com/product/tris2-chloroethylphosphatetcep-115-96-8/

Levenspiel, O. (1999). *Chemical Reaction Engineering* (3. ed). Wiley.

LookChem. (n.d.). *Tris(2-chloroethyl) phosphate 115-96-8*. Retrieved November 28, 2025, from https://www.lookchem.com/casno115-96-8.html

Ludwig, E. E., *Applied Process Design for Chemical and Petrochemical Plants*, Vol. 3, 3rd Edition, Gulf Professional Publishing, 2001.

Maase, M., Massonne, K. Dr., Halbritter, K., & Noe, R. (2002). *Separation of acids from reaction mixtures by means of an auxiliary base that forms a liquid salt with the acid to result in two non-miscible phases with the product or solution of the product in a suitable solvent*. https://europepmc.org/article/PAT/DE10248902

Maddela, N. R., Megharaj, M., & Venkateswarlu, K. (2020). Tris (2-chloroethyl) phosphate, a pervasive flame retardant: Critical perspective on emissions into the environment and human toxicity. *Environmental Science: Processes & Impacts*, *20*(5), 747–756. https://doi.org/10.1039/C8EM00023A

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Maryland Department of Health and Mental Hygiene. (1983). *Toxic Substance Storage Tank Containment Assurance And Safety Program*. Ecology and Environment, Inc. Buffalo, New York. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9400801S.TXT

Matough, M. F. S. (1968). *ASPECTS OF ORGANIC SYNTHESIS USING PHOSPHORW DERIVATIVES*.

McCabe, W. L., Smith, J. C., & Harriott, P., *Unit Operations of Chemical Engineering*, 7th Edition, McGraw-Hill, 2005.

Metcalf & Eddy, Tchobanoglous, G., Stensel, H. D., Tsuchihashi, R., & Burton, F. (2014). Wastewater engineering: Treatment and resource recovery (5th ed.). McGraw-Hill Education.

Metcalf & Eddy, *Wastewater Engineering: Treatment and Reuse*, 4th Edition, McGraw-Hill, 2002.

Mewes, D., Loser, T., & Millies, M. (1999). *Modelling of two-phase flow in packings and monoliths*. Chemical Engineering Science, 54, 4729-4747.

Muir, D.C.G. (1984). Phosphate Esters. In: Anthropogenic Compounds. The Handbook of Environmental Chemistry, vol 3 / 3C. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-38819-7_2

Mujumdar, A. S., *Handbook of Industrial Drying*, 4th Edition, CRC Press, 2014.

Mukherjee, R., "Effectively Design Shell-and-Tube Heat Exchangers," *Chemical Engineering Progress*, 1998.

Mullin, J. W., *Crystallization*, 4th Edition, Butterworth-Heinemann, 2001.

Nalco Chemical Company. (1988). The Nalco guide to boiler failure analysis. McGraw-Hill.

Nauman, E. B. (2008). *Chemical Reactor Design, Optimization, and Scaleup* (1st ed.). Wiley. https://doi.org/10.1002/9780470282076

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

New Jersey Department of Health and Senior Services. (2001). *Hazardous Substance Fact Sheet*. https://www.nj.gov/health/eoh/rtkweb/documents/fs/1523.pdf

Occupational *Safety* and Health Administration. (2000). Process *Safety* Management (OSHA 3132). U.S. Department of Labor.

OGP Risk Assessment Data Directory, Process Release Frequencies, Report No. 434-01, September 2019.

OGP Risk Assessment Data Directory, Storage Incident Frequencies, Report No. 434-03, March 2022.

OSHA. (2000). *Process Safety Management of Highly Hazardous Chemicals* (OSHA 3132). U.S. Department of Labor, Occupational *Safety* and Health Administration.

Peavy, H. S., Rowe, D. R., & Tchobanoglous, G. (1985). Environmental engineering. McGraw-Hill.

Pemerintah Provinsi Banten. (2025). Keputusan Gubernur Banten Nomor 703 Tahun 2025 tentang Upah Minimum Kabupaten/Kota di Provinsi Banten Tahun 2026.

Perry, R. H., & Green, D. W. (2008). Perry's chemical engineers' handbook (8th ed.). McGraw-Hill.

Perry, R. H., & Green, D. W. (2019). *Perry's Chemical Engineers' Handbook* (9th ed.). McGraw-Hill Education.

Peters, M. S., Timmerhaus, K. D., & West, R. E. (2003). *Plant Design and Economics for Chemical Engineers* (5th ed.). New York: McGraw-Hill.

Pharmchem, N. I. (2025, October 30). Understanding TCEP as a flame retardant plasticizer. *NINGBO INNO PHARMCHEM CO.,LTD.* https://www.nbinno.com/article/flame-retardants/understanding-tcep-as-a-flame-retardant-plasticizer-bi

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Plechkova, N. V., & Seddon, K. R. (2008). *Applications of ionic liquids in the chemical industry*. Chemical Society Reviews, 37.

PT PLN (Persero). (2024). *Tarif tenaga listrik untuk konsumen industri menengah dan besar*. Jakarta: PT PLN (Persero).

Ranade, V. V., Chaudhari, R. V., & Gunjal, P. R. (2011). *Trickle Bed Reactors: Reactor Engineering & Applications*. Elsevier.

Republik Indonesia. (2003). Undang-Undang Nomor 13 Tahun 2003 tentang Ketenagakerjaan.

Republik Indonesia. (2007). Undang-Undang Nomor 40 Tahun 2007 tentang Perseroan Terbatas.

Republik Indonesia. (2011). Undang-Undang Nomor 24 Tahun 2011 tentang Badan Penyelenggara Jaminan Sosial.

Republik Indonesia. (2021). Peraturan Pemerintah Nomor 35 Tahun 2021 tentang Perjanjian Kerja Waktu Tertentu, Alih Daya, Waktu Kerja dan Waktu Istirahat, dan Pemutusan Hubungan Kerja.

Republik Indonesia. (2021a). Peraturan Pemerintah Nomor 36 Tahun 2021 tentang Pengupahan.

Robbins, S. P., & Coulter, M. (2018). Management (14th ed.). Pearson.

Ryans, J. L., & Cropsey, D. L., *Process Vacuum System Design and Operation*, McGraw-Hill, 1986.

Ryu, J. B., 유정복, Yuk, D. S., 육덕수, Jang, K. J., 장국진, Kyoung, J. S., 주소경, Kim, W. J., & 김완주. (2013). *Method for producing supported ionic-liquid products*. https://www.freepatentsonline.com/y2015/0024926.html

Sadeghbeigi, R. (2020). *Fluid catalytic cracking handbook: An expert guide to the practical operation, design, and optimization of FCC units* (Fourth edition). Butterworth-Heinemann, an imprint of Elsevier.

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Sánchez, A. P., García, J. G. B., Viart, J. R. M., González, E. R., & Sánchez, E. J. P. (2022). Simulation of the ethylene oxide production process in ChemCAD® simulator. Revista De Ciencia Y Tecnología, 37, 15–31. https://doi.org/10.36995/j.recyt.2022.37.002

Sánchez, A. P., García, J. G. B., Viart, J. R. M., González, E. R., & Sánchez, E. J. P. (2022). Simulation of the ethylene oxide production process in ChemCAD® simulator. *Revista De Ciencia Y Tecnología*, *37*, 15–31. https://doi.org/10.36995/j.recyt.2022.37.002

Satterfield, C. N. (1975). *Trickle-bed reactors*. AIChE Journal, 21(2), 209-228.

Schweitzer, P. A. (1997). Handbook of separation techniques for chemical engineers (3rd ed.). McGraw-Hill.

Seader, J. D., Henley, E. J., & Roper, D. K. (2010). *Separation Process Principles with Applications using Process Simulators*. Wiley.

Seider, W. D., Seader, J. D., Lewin, D. R., & Widagdo, S., *Product and Process Design Principles*, 3rd Edition, Wiley, 2008.

Shen, Y., Shi, C., Zhang, L., Bu, S., Xu, W., Zhang, Z., Zhu, B., Xu, C., & Liu, X. (2021). Falling film evaporation in a vertical tube with a new type of liquid distributor designed using the brachistochrone principle. *Vacuum*, *187*, 110023. https://doi.org/10.1016/j.vacuum.2020.110023

Singh, K. P., & Soler, A. I., *Mechanical Design of Heat Exchangers and Pressure Vessel Components*, Arcturus Publishers, 1984.

Sinnott, R. K. (2005). Coulson & Richardson's chemical engineering volume 6: Chemical engineering design (4th ed.). Elsevier Butterworth-Heinemann.

Sinnott, R. K., & Towler, G. (2020). *Chemical Engineering Design* (6th ed.). Elsevier.

Sinnott, R., & Towler, G. (2020). *Chemical Engineering Design* (6th ed.). Oxford: Butterworth-Heinemann.

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Smith, A. R. (2001). Review of air separation and oxidation processes in chemical manufacturing. *Fuel Processing Technology, 70*(1–3), 115–134. Sun, Y., Li, M., & Gao, X. (2020). Modeling and performance evaluation of pressure swing adsorption processes for oxygen generation. *Separation and Purification Technology, 242*, 116784.

Smith, J. M. (1981). *CHEMICAL ENGINEERING KINETICS*.

Smith, M. B., & March, J. (2007). *March's Advanced Organic Chemistry*. Wiley.

Smith, R. (2005). Chemical process design and integration. John Wiley & Sons.

Speight, J.G., 2019, Handbook of Petrochemical Processes, CRC Press Taylor & Francis Group, New York.

Stapleton, P. J., & Glover, M. A. (2001). *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations* (2nd ed.). NSF International.

Stevenson, W. J. (2018). Operations Management (13th ed.). McGraw-Hill Education.

Stoessel, F. (2008). *Thermal Safety of Chemical Processes: Risk Assessment and Process Design*. Wiley-VCH.

Sun, Y., Zhang, C., Zhu, X., Dong, L., & Sun, X. (2023). Mass and Heat Transfer of Pressure Swing Adsorption Oxygen Production Process with Small Adsorbent Particles. Processes, 11(8), 2485. https://doi.org/10.3390/pr11082485

Svara, J., et al. (2002). "Phosphorus Compounds, Organic". *Ullmann's Encyclopedia of Industrial Chemistry*. Wiley-VCH Verlag GmbH & Co. KGaA.

SynergenOG. (2026). *ALARP in risk assessment*. Diakses pada 12 Juni 2026, dari https://synergenog.com/alarp-in-risk-assessment

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Tan, Q., Chu, Z., Z (yi), Z., & Zhou, L. (2012). *Method for preparing TCPP (Tris(Chloroisopropyl)Phosphate) flame retardant* (China Patent No. CN 101775031A). China National Intellectual Property Administration.

Tchobanoglous, G., Burton, F. L., & Stensel, H. D. (2003). Wastewater engineering: Treatment and reuse (4th ed.). McGraw-Hill.

Thomas, J. M., & Thomas, W. J. (2015). *Principles and Practice of Heterogeneous Catalysis*. VCH.

Thulukkanam, K., *Heat Exchanger Design Handbook*, 2nd Edition, CRC Press, 2013.

Titow W.V., 1990, PVC Plastics: Properties, Processing, and Applications, Elsevier Applie Science, New York.

Towler, G., & Sinnott, R. (2013). Chemical engineering design: Principles, practice and economics of plant and process design (2nd ed.). Elsevier.

Towler, G., & Sinnott, R. (2021). *Chemical Engineering Design: Principles, Practice and Economics of Plant and Process Design*. Butterworth-Heinemann.

Trambouze, P., & Euzen, J. P. (2004). *Chemical Reactors: From Design to Operation*. Editions Technip.

Twigg, M. V. (1989). *Catalyst Handbook*. 2nd Edition. Manson Publishing.

Ullmann's Encyclopedia of Industrial Chemistry. (2002). *Chemical Process Equipment Design.* Wiley-VCH.

Ulrich, G. D. (1984). A Guide to Chemical Engineering Process Design and Economics. John Wiley & Sons.

US3801683A. (1974). *Process for preparing trialkylphosphate by reacting phosphorus oxychloride with alcohol, and distilling off HCl under reduced pressure.* Google Patents. Retrieved from https://patents.google.com/patent/US3801683A/en

UNIVERSITAS GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

US6521097B1. (2003). *Process for separating hydrogen chloride from a mixture using a scrubber column and condensation.* Google Patents. Retrieved from U.S. Patent for Process for separating hydrogen chloride from a mixture comprising an N-alkyl-2-pyrrolidone and hydrogen chloride Patent (Patent # 6,521,097 issued February 18, 2003) - Justia Patents Search

Van Der Veen, I., & De Boer, J. (2012). Phosphorus flame retardants: Properties, production, environmental occurrence, toxicity and analysis. *Chemosphere*, *88*(10), 1119–1153. https://doi.org/10.1016/j.chemosphere.2012.03.067

Volland, M., Weiskopf, V., Matthias, M., Flores, M. Dr., Rainer, P., Massonne, K., Stegmann, V., Klaus, H., Ralf, N., Michael, B., Wolfgang, S., Becker, M., & Oliver, H. (2003). *Separation of acids from chemical reaction mixtures by means of ionic liquids*. https://patents.google.com/patent/US20080083606A1/en

Voutchkov, N., 2012, Desalination Engineering: Planning and Design, McGraw Hill.

Wan, H. (2021). *OF N-PHOSPHORYLATED NITROGEN MUSTARDS.*

Wang, Q., Wang, X., & Zhao, L. (2019). Dynamic modeling and optimization of pressure swing adsorption for oxygen enrichment. *Chemical Engineering Journal, 355*, 379–391.

Wei, T., & Elbert, R. (2010). *Preparation of Phosphorus Containing Propoxylation Products By Using Aluminium Trichloride* (Patent No. US 7820845 B2). https://patents.google.com/patent/US7820845B2/en

Weil, E. D., & Levchik, S. V. (2009). *Flame Retardants for Plastics and Textiles: Practical Applications*. Hanser Publishers.

Weil, E. D., & Levchik, S. V. (2009). *Flame Retardants for Plastics and Textiles: Practical Applications*. Hanser Publishers.

WHO/IPCS. (1998). "Tris(2-chloroethyl) Phosphate". *Environmental Health Criteria 209*. World Health Organization.

UNIVERSITAS
GADJAH MADA
PRARANCANGAN PABRIK TRIS(2-KLOROETIL) FOSFAT DARI FOSFOR OKSIKLORIDA DAN ETILEN OKSIDA DENGAN
KAPASITAS 10.000 TON/TAHUN
Reza Pramban Danu, Prof. Ir. Rochim Bakti Cahyono, ST., M.Sc. Ph.D., IPM.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Winterbottom, J. M., & King, M. B. (1999). *Reactor Design for Chemical Engineers*. CRC Press.

Wong, S. Y., et al. (2018). "Process intensification of organophosphate synthesis using microreactors". *Chemical Engineering Journal*, 334, 123-132.

Yoon, J. E., Lee, K. B., Yoo, C., Min, B. K., Lee, D. K., Won, D. H., Kim, S., Moon, J., Kim, C., & Lee, U. (2024). Investigation of the sustainable production of ethylene oxide by electrochemical conversion: Techno-economic assessment and CO2 emissions. Journal of Cleaner Production, 475, 143539. https://doi.org/10.1016/j.jclepro.2024.143539

Zeng, K., & Zhang, D. (2010). Recent progress in alkaline water electrolysis for hydrogen production and applications. *Progress in Energy and Combustion Science, 36*(3), 307–326.

张志炳, 张锋, **周政**, **李磊**, 孟为民, **王宝荣**, 杨高东, 罗华勋, 杨国强, & **田洪舟**. (2019, September 14). *WO202104704 6A1 - Microinterface-enhanced system and process for preparing ethylene oxide from ethylene - Google Patents*. https://patents.google.com/patent/WO2021047046A1/en