
Contents

Volume 1

What Is Industrial Chemistry	1
J.J. Siirola	
Section 1 Raw Materials for the Chemical Process Industries	
Petroleum and Its Products	13
Paul R. Robinson and Chang Samuel Hsu	
Coal Technology for Power, Liquid Fuels, and Chemicals	107
Burtron H. Davis and James C. Hower	
Natural Gas	185
Arland H. Johannes, Mahmood Moshfeghian, and Tyler W. Johannes	
Wood and Wood Products	215
Yuan-Zong Lai	
Biomass Conversion	285
Stephen R. Decker, John Sheehan, David C. Dayton, Joseph J. Bozell, William S. Adney, Andy Aden, Bonnie Hames, Steven R. Thomas, Richard L. Bain, Roman Brunecky, Chien-Yuan Lin, Antonella Amore, Hui Wei, Xiaowen Chen, Melvin P. Tucker, Stefan Czernik, Amie Sluiter, Min Zhang, Kim Magrini, and Michael E. Himmel	
Section 2 Industrial Organic Chemistry	
Synthetic Organic Chemicals	423
Scott D. Barnicki	
Chemistry in the Pharmaceutical Industry	531
John F. Kadow, Nicholas A. Meanwell, Kyle J. Eastman, Kap-Sun Yeung, and Albert J. DelMonte	
Manufacture of Dye Intermediates, Dyes, and Their Industrial Applications	581
R.W. Sabnis	

The Chemistry of Structural Adhesives: Epoxy, Urethane, and Acrylic Adhesives	677
Kirk J. Abbey and Denis J. Zalucha	
The Agrochemical Industry	709
K.N. Singh and Kavita Merchant	
Fertilizers and Food Production	757
Amit H. Roy	
Pigments, Paints, Polymer Coatings, Lacquers, and Printing Inks	805
Dean C. Webster and Rose A. Ryntz	
Animal and Vegetable Fats, Oils, and Waxes	823
Edmund W. Lusas, M.N. Riaz, M.S. Alam, and R. Clough	
Sugar and Other Sweeteners	933
Gillian Eggleston, Benjamin Legendre, and Mary An Godshall	
Soap, Fatty Acids, and Synthetic Detergents	979
Janine Chupa, Steve Misner, Amit Sachdev, Peter Wisniewski, George A. Smith, and Robert Heffner	
Chemical Explosives	1033
D. Lynn Gordon, Jordan L. Arthur, Verlene Lovell, and Lee F. McKenzie	
The Nuclear Industry	1063
Edward Lahoda and Keith Task	

Volume 2

Section 3 Industrial Inorganic Chemistry

Synthetic Nitrogen Products	1125
Gary R. Maxwell	
Phosphorus and Phosphates	1211
Brian K. Birky	
Sulfur and Sulfuric Acid	1241
Lori E. Apodaca, Gerard E. d'Aquin, and Robert C. Fell	
Salt, Chlor-Alkali, and Related Heavy Chemicals	1267
Thomas F. O'Brien	
Industrial Gases	1301
Steven J. Cooke	

Section 4 Polymer Chemistry

Manufactured Textile Fibers	1325
Bhupender S. Gupta	
Synthetic Resins and Plastics	1397
Margaret Sobkowicz-Kline, Bridgette M. Budhlall, and Joey L. Mead	
Rubber	1463
M. Rackaitis and D.F. Graves	

Section 5 Biochemistry

Industrial Biotechnology: Discovery to Delivery	1495
Gopal K. Chotani, Timothy C. Dodge, Caroline M. Peres, Peyman Moslemy, and Michael V. Arbige	
Industrial Enzymes and Biocatalysis	1571
Adam L. Garske, Gregory Kapp, and Joseph C. McAuliffe	
Industrial Production of Therapeutic Proteins: Cell Lines, Cell Culture, and Purification	1639
Marie M. Zhu, Michael Mollet, Rene S. Hubert, Yun Seung Kyung, and Green G. Zhang	

Volume 3**Section 6 Emerging Fields of Industrial Chemistry**

Nanoparticles: From Fundamentals to Applications	1673
Ranjit T. Koodali	
Electrochemical Energy Storage: Current and Emerging Technologies	1695
Neili Loupe, Jonathan Doan, Bogdan Gurau, and Eugene S. Smotkin	
Electrochemical Energy Production Using Fuel Cell Technologies	1729
Viola Birss, Ehab El Sawy, Sanaz Ketabi, Parastoo Keyvanfar, Xiaoan Li, and Jason Young	
CO₂ Utilization	1781
Chih-Hung Huang, Duy the Phan, and Chung-Sung Tan	

Section 7 Industrial Processing and Engineering

Safety Considerations in the Chemical Process Industries	1805
John F. Murphy	
Applied Statistical Methods and the Chemical Industry	1889
Stephen Vardeman and Robert Kasprzyk	

Green Engineering: Integration of Green Chemistry, Pollution Prevention, Risk-Based Considerations, and Life Cycle Analysis	1921
Palghat A. Ramachandran, David Shonnard, Robert Hesketh, Daniel Fichana, C. Stewart Slater, Angela Lindner, Nhan Nguyen, and Richard Engler	
Industrial Catalysis: A Practical Guide	1995
Robert J. Farrauto	
Dividing Wall Columns in the Chemical Industry	2037
Craig A. Hoyme	
Process Control in the Chemical Industry	2069
Terry Blevins and James J. Downs	
Industrial Chemistry of Steel	2117
Rama Bommaraju	
Managing an Emergency Preparedness Program	2141
Everette M. Spore, Thaddeus H. Spencer, and James W. Bowman	
Environmental Chemical Determinations	2175
William L. Budde	
Index	2199

Handbook of Industrial Chemistry and Biotechnology

Kent, J.A.; Bommaraju, T.; Barnicki, S.D. (Eds.)

2017, LIV, 2278 p. 1504 illus., 82 illus. in color. In 3

volumes, not available separately., Hardcover

ISBN: 978-3-319-52285-2