

Table 1

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Industrial Chemistry Courses and Curricula

School/Contact                      Offering

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Undergraduate Schools/Programs

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Babson College Babson Park, MA	course: Chemical Technologies in the Manufacturing System; directed toward future business managers
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D. L. Adams, "College Chemistry for Business Students Using the  
Issues-Directed Approach", J. Chem. Ed, 68, 483 (1991).

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Baldwin Wallace College Berea, OH Sheldon B. Greenbaum RTNG29D@prodigy.com	course: The U.S. Chemical Industry; UG; offered as elective for general student body
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text: Dynamics of the U.S. Chemical Industry;  
S.B. Greenbaum, "Bringing the Chemical Industry into the  
ClassRoom", CHEMTECH, June 1994, p9.

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Cal Poly University Pomona, CA Prof. Ernie Simpson (909) 869-3671	program: B.S. Chemistry - Industrial Chemistry Option; emerging focus on interaction with paint and coatings industry
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texts: Chenier, Emerson

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Clarkson University  
Potsdam, NY  
Dr. Richard Partch  
(315) 268-2351  
partch@agent.clarkson.edu

course: Industrial Chemistry;  
industrial speakers in special  
seminar; also "Semester in  
Industry" program: Industrial Hygiene  
(UG)

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Colby College  
Waterville, ME

course: Industrial Chemistry

W. L. Smith, "Industrial Chemistry and the Liberal Arts  
Curriculum", J. Coll. Sci. Teach., 10, 294 (1981).

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College of St. Elizabeth  
Morristown, NJ  
Dr. Divalkar Masilamani  
(201) 538-2705(h)

course: Industrial Chemistry

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Eastern Illinois University  
Charleston, IL  
Dr. Jonathan Blitz  
(217) 581-6369  
cfjpb@eiu.edu

course: Industrial Chemistry  
(planned)

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Harvey Mudd College  
Pomona, CA  
Dr. Gerald Van Hecke  
(909) 607-3935  
Gerald\_VanHecke@hmc.edu

course: Industrial Chemistry;  
UG juniors and seniors  
focuses on roles of chemists  
in industry

texts: A. Heaton and/or Clausen and Mattson

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Illinois State University  
Normal, IL  
Dr. Ted Ichniowski  
(309) 454-8686

course: Applied Catalysis;  
offered by industrial chemist  
on campus for the semester

M. J. Baird, "An Industrial Chemistry Course in Applied Catalysis at Illinois State University", J. Chem. Ed. 66, 567 (1989).

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Illinois State University  
Normal, IL  
Dr. Ted Ichniowski  
(309) 454-8686

course: Industrial Chemistry;  
covered industrial  
organization and basic  
engineering

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Iowa State University  
Ames, IA  
Dr. G. L. Schrader  
(515) 294-0519  
schrader@iastate.edu

course: Industrial and  
Engineering Chemistry;  
chemistry and ChemE students  
in same class; process  
chemistry

text: in preparation by Schrader  
G. L. Schrader, R.L. Pigford, and B.C. Gates, "Integrating  
Chemistry and Engineering: a Course in Industrial and Engineering  
Chemistry", Chem. Eng. Educ., 17, 16 (1983).

=====

Keene State University  
Keene, NH  
Dr. Howard Bohm  
hbohm@keene.edu

program: B.S. Industrial  
Chemistry

J. P. Jasinski and R.E. Miller, "Industrial Chemistry. A Series  
of New Courses at the Undergraduate Level", J. Chem. Ed., 62, 742  
(1985)

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Marshall University  
Huntington, WV  
Dr. Harry Persinger  
(304) 696-4358  
persingh@marshall.edu

course: Industrial Chemistry  
UG/graduate level; includes  
business lectures and  
laboratory work

text: Chenier

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Michigan Technological University  
Houghton, MI  
Dr. David Leddy  
(906) 487-3305  
dgleddy@mtu.edu

program: B.S. Industrial  
Chemistry; focuses on interface  
between traditional chemistry  
and chemical engineering  
(dormant); emphasis now on  
process analytical chemistry

D. K. Bates and A. B. Ponter, "Industrial Chemistry at Michigan  
Tech", J. Chem. Ed., 62, 745 (1985).

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Penn State University  
University Park, PA  
Dr. Chunshan Song  
(814) 863-4466  
csong@psu.edu

course: Industrial Organic  
Chemistry; UG; offered in Fuel  
Science Program for students  
in Energy and Fuels  
Engineering Option in Chemical  
Engineering (planned).

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Polytechnic University  
Brooklyn, NY  
Dr. Edward Weil  
(718) 260-3715  
eweil@photon.poly.edu

Course: Industrial Chemistry  
(planned)

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Rensselaer Polytechnic Institute  
Troy, NY  
Dr. Mark P. Wentland  
(518) 276-2234  
wentmp@rpi.edu

course: medicinal chemistry; G  
and UG chemistry, biology, and  
biochemistry majors; organic  
chemistry of drug discovery  
and development

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Saint Bonaventure University  
Saint Bonaventure, NY  
Dr. Justin W. Diehl (emeritus)  
(716) 373-1721 (h)

course: Industrial Chemistry  
focuses on walking the BS/MS  
chemist through the entry  
level years of employment  
(dormant)

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South Dakota State University  
Brookings, SD

course: Decision Making and  
Technology; case study  
approach; modules for use in  
courses beyond first semester  
of General Chemistry

case study modules: NutraSweet, Tagamet, Kevlar, B.J. Luberoff  
and Laurence I. Peterson, letter, C&EN, June 10, 1996, p2.

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Texas State Technical College  
Waco, TX  
Dr. Kirk P. Hunter  
(817) 867-2980  
khunter@tstc.edu

Course: Introduction to the  
Chemical Industry

text: Chenier

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University of Alabama  
Tuscaloosa, AL

course: intensive short course  
to help BS graduates be better  
prepared for industry

text: Shreeves, Chang; D. L. Gumprecht and J.S. Thrasher,  
"Industrial Chemistry", J. Chem. Ed., 67, 321 (1990)

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University of California-Davis  
Davis, CA

course: Careers in Chemistry  
UG/G; speakers from industry

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University of Central Oklahoma  
Edmond, OK  
Dr. William Utnage  
(405) 341-2980 x5992  
(405) 721-7734 (h)

course: Industrial Chemistry;  
UG juniors and seniors;  
focuses on teaching chemistry  
students how to solve function  
(solve problems) in industry

text written by instructor

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University of Delaware  
Newark, DE  
Dr. Al Matlack  
(302) 239-5383

course: Industrial Chemistry  
seniors and graduate students;  
focuses on industrial process  
chemistry

texts: Weisermel & Arpe, Buchner

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University of Detroit  
Detroit, MI

course: Industrial Chemistry

H. H. Szmant, "An Industrial Chemistry Course to Bridge the  
Academia-Industry Gap", J. Chem. Ed., 62, 736 (1985).

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University of Houston-Downtown      B.S. in Industrial Chemistry  
Houston, TX  
Dr. Byron Christmas  
(713) 221-8169

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University of Massachusetts -      course: Industrial Chemistry;  
Lowell                                      UG; considering M.S. in  
Lowell, MA                                  Industrial Chemistry

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University of Tennessee -      course: The Chemist in  
Chatanooga                                  Industry; UG seniors  
Chatanooga, TN  
Dr. T. A. Orofino  
(427) 267-1063 (h)

T. A. Orofino, "The Chemist in Industry: An Introductory Course",  
J. Chem. Ed., 66, 420 (1989).

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University of West Florida      Course: Industrial Chemistry  
Pensacola, FL                                  (planned)  
Dr. Tim Royappa  
(904) 474-2028  
royappa@uwf.edu

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University of Wisconsin-Eau Claire program: Chemistry/with a  
Eau Claire, WI                                  Business Emphasis; focuses on  
Dr. Philip J. Chenier                              careers outside of R&D,  
(715) 836-4360                                      marketing, management, etc.  
cheniepj@uwec.edu

text: Chenier

P.J. Chenier, "Teaching Industrial Chemistry and Business at the  
Baccalaureate Level", J.Chem. Ed., 61, 998 (1984).

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Western Carolina University  
Culowhee, NC  
Dr. Roger Bacon  
(704) 227-7260  
bacon@wcu.edu

program: B.S. Industrial  
Chemistry; "chemistry major  
with business minor"

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U. S. course: Industrial Chemistry

G.W. Campbell, "Education and Training of Chemists for the  
Inorganic Chemicals Industry", Spec. Publ. - Chem. Soc., 31, 46,  
(1977).

### Graduate Courses/Programs

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Indiana University-Purdue Univ.  
Indianapolis, IN

program: M.S. Industrial  
Chemistry with industrial  
co-op

W. K. Fife, "A Successful MS Industrial Co-op Program with a  
Paralllel Format", J. Chem. Ed., 65, 528 (1985).

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Lehigh University  
Bethlehem, PA  
N. D. Heindel  
(215) 758-3464  
ndh0@ns.cc.lehigh.edu

program: M.S. for industrial  
chemists

K.J. Schray, N.D. Heindel, J. E. Brown, M.A. Kerksmar, Appl.  
Technol. Teach. Chem., On-line Comput. Conf., Issue Available:  
[gopher://gopher.inform.umd.edu/11/EdRes/Faculty\\_Resources\\_and\\_Support/ChemConference/Paper08.txt](gopher://gopher.inform.umd.edu/11/EdRes/Faculty_Resources_and_Support/ChemConference/Paper08.txt)



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Polytechnic University  
Brooklyn, NY

program: M.S. in Industrial  
Chemistry (dormant)

University of Central Florida  
Orlando, FL  
Dr. Guy Mattson  
(407) 823-0003

program: M. S. Industrial  
Chemistry course: UG  
Industrial Chemistry

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University of Chicago  
Chicago, IL  
Northwestern University  
Evanston, IL  
Dr. Mukund S. Chorghade  
(847) 360-9175  
ztsu70a@prodigy.com

course: Industrial Chemistry;  
graduate level; natural  
products, pharmaceuticals, and  
agrochemicals

text: notes by instructor (to be completed in 1997)

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University of Delaware  
Dr. Manuel Panar  
(302) 477-0623  
panar@udel.edu

course: Industrial Practice;  
G; a non-technical course  
offered to near-exit chemistry  
graduate students to help them  
understand the "industrial  
culture"

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University of Massachusetts -  
Amherst  
Amherst, MA

course: Industrial Seminar  
series; Graduate level

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University of Minnesota  
Minneapolis, MN  
more information available  
from melton@utdallas.edu

course: Industrial Chemistry;  
G; taught by three scientists  
from 3M

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University of North Texas  
Denton, TX  
Susan Tribble  
(817) 565-3554

program: M.S. Industrial  
Chemistry focuses on upgrades  
for students currently  
employed in industry

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University of Texas at  
Arlington  
Arlington, TX

courses: Industrial Chemistry,  
Unit Operations, Regulatory  
Aspects of Chemical Industry,  
Economics  
Program: Ph.D. in Applied  
Chemistry

<http://www.utachem.uta.edu>

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University of Texas at Dallas  
Richardson, TX  
Dr. Lynn Melton  
(214) 883-2913  
melton@utdallas.edu

course: Industrial Chemistry;  
program: Doctor of Chemistry;  
prepares doctoral level  
problem solvers for industry

text: Clausen and Mattsen

L.A. Melton, "The Doctor of Chemistry Program: Career Preparation  
for Industrial Chemists, J. Chem. Ed., 68, 142 (1991).

L.A. Melton, "Preparing Problem Solvers", CHEMTECH, 22, 162  
(1992).

L.A. Melton, "The Doctor of Chemistry Program: An Academic  
Program for Industrial Chemists", Today's Chemist at Work, 4, 30  
(1995).

<http://www.utdallas.edu/dept/chemistry>

## Outside U.S.

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Australia  
University of New South Wales  
Sydney, Australia

program: B.S. Industrial  
Chemistry in School of  
Chemical Engineering and  
Industrial Chemistry; prepares  
problem solvers for industry;  
also M.S. Applied Science  
program

<http://www.ceic.unsw.edu.au/>

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Canada  
Queen's University  
Kingston, Ontario, Canada  
Dr. Ralph Whitney  
(613) 545-2641  
whitney@chem.QueensU.CA

program: B.S. Engineering  
Chemistry; accredited as  
science and engineering  
program; in existence for over  
100 years

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Canada  
University of Victoria  
Victoria, B.C., Canada  
Dr. Martin Hocking  
HOCKINGM@UVVM.UVIC.CA

Course: Industrial Chemistry

text: Modern Chemical Technology and Emission Control, by Martin  
Hocking

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India  
Dr. Narayan Bhat  
nbhat@unlinfo2.unl.edu  
(210) 381-3371

course: Industrial Chemistry

text: White

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Israel  
program: Industrial Chemistry;  
in secondary schools

N. Nae, A. Hofstein, and D. Samuel, "Chemical Industry. A New Interdisciplinary Course for Secondary Schools", *J. Chem. Ed.*, 57, 366 (1980).

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Italy  
course: Industrial Chemistry

M. Gianlorenzo, "Teaching Organic Chemistry for Chemistry or Industrial Chemistry Courses. I. The Present Situation.", *Chim. Ind. (Milan)*, 60, 839 (1978).

=====

Italy  
program: Industrial Chemistry

L. Angiolini, P. Biscarini, A. Palazzi, and V. Ragaini, "The Contents of the Course for the Degree in Industrial Chemistry", *Chim. Ind. (Milan)*, 57, 366, (1980).

=====

Spain  
course: Industrial Chemistry

text: Industrial Chemistry Course (Curso de Quimica Technica) J. Costa, *Curso de Quimica Technica*, (Reverte, Barcelona, Spain, 1984).

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United Kingdom

Liverpool John Moores University  
Liverpool, England  
Dr. C. A. Heaton

text: Heaton

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University of East Anglia

course: each year six  
industrial chemists each spend  
a week on campus

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University of Glasgow  
Glasgow, Scotland  
Costandi Audeh  
75562.570@Compuserve.COM  
(graduated in 1955)

B.S. Industrial Chemistry

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University of York  
Professor Bruce Gilbert

course: Industrial Chemistry

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Dr. Alan E. Comyns  
21 Churchward Close  
Chester CH2 2BG  
England  
01244 382688  
101453.3265@CompuServe.COM

General industrial chemistry  
contact in UK; trying to raise  
profile of industrial  
chemistry in UK universities

## Industrial Sites

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Various Industries  
Dr. Harold Wittcoff  
(914) 631-2828

course: Industrial Chemistry  
(4-5 day short course);  
overview of chemical industry

text: Wittcoff

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Various Industries  
Dr. Robert A. Smiley  
(302) 764-0392  
SmileyRA@aol.com

course: Chemistry and the  
Chemical Industry (3 day short  
course); A Practical Guide for  
Engineers, Plant Operators,  
Technicians, Support Personnel  
and Others

text: copies of 120 slides; each participant is given a copy of  
Chenier

## Industrial Hygiene

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California State University  
Long Beach, CA

module: NIOSH instructional  
module

H.R. Kavianian, J.K. Rao, and G. V. Brown, "Application of Hazard Evaluation Techniques to the Design of Potentially Hazardous Chemical Processes. NIOSH Instructional Module", NTIS PB92-184290.

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School of Public Health  
UCLA  
Los Angeles, CA  
Dr. Shane S. Que Hee  
squehee@ucla.edu

course: Industrial Chemistry;  
graduate course in Unit  
Processes, taught as part of  
Industrial Hygiene program

text: Recognition of Health Hazards in Industry: A Review of  
Materials and Processes by W. A. Burgess

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American Chemical Society

Planning for a Career in Industry: Suggestions for Undergraduate Majors in Chemistry, Biochemistry, and Related Disciplines, Prepared and Issued Jointly by the American Chemical Society Committee on Professional Training and the ACS Committee on Corporation Associates, (1996), available through ACS, contains advice to undergraduates considering careers in industry, and extensive bibliography of resources on careers.

Table 2

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Industrial Chemistry References  
Phil Chenier  
University of Wisconsin-Eau Claire

Books

Agam, G. Industrial Chemicals: Their Characteristics and Development; Elsevier: New York, 1994.

Austin, G.T. Shreve 's Chemical Process Industries, 5th ed.; McGraw-Hill: New York, 1984.

Billmeyer, F.W.; Kelly, R.N. Entering Industry: A Guide for Young Professionals; John Wiley & Sons: New York, 1975.

B<sup>^</sup>ichner, W.; Schliebs, R.; Winter, G.; B<sup>^</sup>ichel, K.H. Industrial Inorganic Chemistry; VCH: New York, 1989.

Carraher, Jr., C.E. Seymour/Carraher's Polymer Chemistry, 4th ed.; Marcel Dekker: New York, 1996.

Chang, R.; Tikkanen, W. The Top Fifty Industrial Chemicals; Random House: New York, 1988.

Chenier, P.J. Survey of Industrial Chemistry, 2nd ed.; VCH: New York, 1992.

Eveleth, W.; Kollonitsh, V. The Kline Guide to the Chemical Industry, 5th ed.; Kline and Company: Fairfield, NJ, 1990.

Greenbaum, S.B. Dynamics of the US Chemical Industry; Kendall/Hunt: Dubuque, IA, 1994.



- Heaton, A. *The Chemical Industry*, 2nd ed.; Blackie Academic and Professional: New York, 1994.
- Heaton, A. *An Introduction to Industrial Chemistry*, 3rd ed.; Blackie Academic and Professional: New York, 1996.
- Kent, J.A. *Riegel 's Handbook for Industrial Chemistry*, 9th ed.; Van Nostrand Reinhold: New York, 1992.
- Kroschwitz, J.I. *Concise Encyclopedia of Polymer Science and Engineering*; John Wiley & Sons: New York, 1990.
- Lowenheim, F.A.; Moran, M.K. Faith, Keyes, and Clark 's *Industrial Chemicals*, 4th ed.; John Wiley: New York, 1975.
- Reddy, M.A.; Darnay, A.J. *Market Share Reporter*; Gale Research: Detroit, 1995.
- Reddy, M.A.; Lazich, R.S. *World Market Share Reporter*; Gale Research: New York, 1995.
- Reuben, B.G; Burstall, M.L. *The Chemical Economy*; Longmans: London, 1973.
- Stocchi, E. *Industrial Chemistry*, vol. 1; Ellis Horwood: New York, 1990.
- Szmant, H.H. *Organic Building Blocks of the Chemical Industry*; John Wiley: New York, 1989.
- Thompson, R. *Industrial Inorganic Chemicals*; 2nd ed.; Royal Society of Chemistry: Cambridge, 1996.
- Ulrich, H. *Raw Materials for Industrial Polymers*; Oxford University Press: New York, 1988.
- White, H.L. *Introduction to Industrial Chemistry*; John Wiley: New York, 1986.

Wittcoff, H.A.; Reuben, B.G. Industrial Organic Chemicals; John Wiley: New York, 1996.

Wittcoff, H.A.; Reuben, B.G. Industrial Organic Chemicals in Perspective. Part One. Raw Materials and Manufacture; John Wiley: New York, 1980.

Wittcoff, H.A.; Reuben, B.G. Industrial Organic Chemicals in Perspective. Part Two. Technology, Formulation, and Use; John Wiley: New York, 1980.

Wiseman, P. Petrochemicals; Ellis Horwood Limited: Chichester, 1986.

## Multi-Volume Works

Chemical Economics Handbook; Stanford Research Institute International: Menlo Park, CA, present.

Kirk-Othmer's Encyclopedia of Chemical Technology, 4th ed.; John Wiley: New York, present.

Ullmann's Encyclopedia of Industrial Chemistry; VCH: New York, present.

## Periodicals

Chemical and Engineering News; American Chemical Society: Washington, DC. Contains many interesting articles each week and valuable annual series including "Facts and Figures for the Chemical Industry," "Facts and Figures for Chemical R&D," "Salary Survey," "Employment Outlook," "Top 50 Chemicals," and "Top 100 Chemical Companies."

Chemical Marketing Reporter; Schnell Publishing Co.: New York. Contains many informative articles in each issue and up-to-date chemical prices each week.

Chemical Week; McGraw-Hill: New York. Similar to Chemical and Engineering News.

"Chemical Profiles," a weekly series in Chemical Marketing Reporter. This series is also available on the Internet under <http://www.chemexpo.com/news/profile.html>.

## Government Documents

Annual Survey of Manufactures; U.S. Department of Commerce, Bureau of the Census, each year.

Statistical Abstract of the United States; U.S. Department of Commerce, Bureau of the Census, each year.

Synthetic Organic Chemicals; U.S. Department of Commerce, International Trade Commission, each year.

U.S. Industrial Outlook; U.S. Department of Commerce, International Trade Commission, each year.

## The Internet

ChemExpo is the chemical industry's source for over 20,000 chemicals, latest news, chemical profiles, business briefs, a directory of chemical products and companies, forums, a calendar of events, a business card exchange, and a column on people and jobs.

<http://www.chemexpo.com>

Chemistry and Industry magazine has a web site that contains news and features from the current issue, plus hundreds of articles from past issues. It has a searchable database of jobs in chemistry, a list of meetings, and daily science news.

<http://ci.mond.org>

A chemical engineering page has relevant text on various topics involving industrial chemistry.

<http://www.che.ufl.edu/WWW-CHE/index.html>

Full texts of U.S. patents, 1994 to present, are available.

<http://town.hall.org/patent/patent.html>

ACS Information can be obtained easily and covers a multitude of information on chemistry, chemists, chemical education, and the chemical industry.

<http://www.acs.org/>

The Environmental Protection Agency has a series of factsheets on hazardous chemicals.

<gopher://ecosys.drdr.virginia.edu:70/11/library/gen/toxics>

A searchable hazardous chemicals database is available from the University of Akron.

<http://odin.chemistry.uakron.edu/cgi-bin/wwwwais>

The Journal of Chemical Education has useful information on many topics related to teaching chemistry.

<http://jchemed.chem.wisc.edu>

Material Safety Data Sheets contain health and safety information on thousands of chemicals. These are available at a number of locations. Some of the sites are alphabetical by chemical name. Some allow the user to key in a chemical name.

Vermont Safety Information

<http://hazard.com/>

University of Utah

<http://listeria.nwfsc.noaa.gov/msds.html>

Oxford University

<http://physchem.ox.ac.uk/msds/>

U.S. Dept. of Commerce

<http://research.nwfsc.noaa.gov/msds.html>

Pesticide information is readily obtainable on the Extoxnet.

<http://ace.orst.edu/info/extoxnet>

Some Chemistry Resources on the Internet by Gary Wiggins, Indiana University, is the best, most up-to-date, and complete compilation of all resources dealing with chemistry on the Internet.

<http://www.rpi.edu/dept/chem/cheminfo/chemres.html>

## Videotapes

Available from Films for the Humanities & Sciences, Princeton, NJ.

Chemicals from NaCl

Polyethylene

Out of the Air

Soaps

Glues

Limestone

Man-made Macromolecules, Open University, BBC-TV.

Manufactured Fibers, American Fiber Manufacturers Association, Washington, DC.

Vinyl the Versatile Plastic: Issues and Answers, The Vinyl Environmental Resource Center, Akron, OH.

## Audio Courses

Jonnard, A. Business Aspects of Chemistry; American Chemical Society Audio Course: Washington, DC, 1974.

Wittcoff, H. Industrial Organic Chemistry; American Chemical Society Audio Course: Washington, DC, 1979.

**Table 3**

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**Industrial Chemistry References**

**Lynn Melton  
University of Texas at Dallas**

**Supplement to Phil Chenier's List**

Chemistry in the Economy, An American Chemical Society Study, ACS, Washington, 1973.

Alexander, G., Silica and Me: The Career of an Industrial Chemist, ACS, Washington, 1973.

Brewer, M.M., Ed., Milton Harris: Chemist, Innovator, and Entrepreneur, ACS, Washington, 1982.

Clausen, CA, and Mattson, G., Principles of Industrial Chemistry, Wiley, New Yor, NY, 1978.

Elias, H-G., Megamolecules, Springer-Verlag, New York, 1987.

Emerson, W.S., Guide to the Chemical Industry: Technology, R&D, Marketing, and Employment, Krieger, Malabar, FL, 1991; Wiley, New York, 1993.

Fuseld, H.I, Industry's Future: Changing Patterns of Industrial Research, ACS, Washington, DC, 1994.

Hounshell, D.A., and Smith, J.K., Jr., Science and Corporate Strategy: DuPont R&D, 1902-1980, Cambridge University Press, Cambridge, 1988.

Leffler, W.L., Petroleum Refining for the Non-Technical Person, PennWell, Tulsa, OK, 1979.

Maynard, J.T., *Understanding Chemical Patents: A Guide for the Inventor*, ACS, Washington, 1978.

Niederhauser, W.D., and Meyer, E.G., *Legal Rights of Chemists and Engineers*, *Advances in Chemistry Series*, 161, ACS, Washington, 1977.

Tarbell, D.S., and Tarbell, A.T., *Roger Adams: Scientist and Statesman*, ACS, Washington, 1981.