What can I do with a major in... Chemistry

ACTIVITIES CHEMISTRY MAJORS DO:
Many chemists and materials scientists work in research and development (R&D). In basic research, they investigate properties, composition, and structure of matter and the laws that govern the combination of elements and reactions of substances. In applied R&D, they create new products and processes or improve existing ones, often using knowledge gained from basic research. R&D chemists and materials scientists use computers and a wide variety of sophisticated laboratory instrumentation for modeling and simulation in their work. Chemical research has led to the discovery and development of new and improved synthetic fibers, paints, adhesives, drugs, cosmetics, electronic components, lubricants, and thousands of other products. Chemists and materials scientists also develop processes that save energy and reduce pollution, such as improved oil refining and petrochemical processing methods. Research on the chemistry of living things spurs advances in medicine, agriculture, food processing, and other fields.

Chemists also work in production and quality control in chemical manufacturing plants. They prepare instructions for plant workers that specify ingredients, mixing times, and temperatures for each stage in the process. They also monitor automated processes to ensure proper product yield, and test samples of raw materials or finished products to make certain that they meet industry and government standards, including the regulations governing pollution. Chemists report and document test results and analyze those results in hopes of further improving existing theories or developing new test methods.

A bachelor’s degree in chemistry is a minimum educational requirement (research assistant, analyst); however, many research jobs require a master’s degree or Ph.D. (teaching, applied research). According to the U.S. Department of Labor, chemists primarily work in manufacturing firms, research and development, engineering, education, sales, pharmaceuticals, and biotechnology.

INDUSTRIES CHEMISTRY MAJORS WORK IN (SAMPLE LISTING):
- Pharmaceuticals
- Petroleum
- Biotechnology
- Packaging
- Higher education
- Federal government
- Healthcare
- Industrial products
- Water treatment
- Food production
- Consulting
- Manufacturing

EMPLOYERS WHO HIRE CHEMISTRY MAJORS (SAMPLE LISTING):
- Cargill
- 3M
- Xcel Energy
- ALLETE/MN Power
- Land O’Lakes
- Bell Pharmaceuticals
- The Dow Chemical Company
- Ecolab
- Seagate Technology
- Virent Energy Systems
- ExxonMobil
- Intel Corporation
- U.S. Department of Agriculture
- NAVAIR Weapons Division
- Target Corporation
- Brady Corporation
- Schlumberger
- Oak Ridge Laboratory
- HB Fuller Company
- Thermotech Inc.
- BASF
- Pace Analytical Services
- OptiMetrics Inc.
- Applied Materials Inc.
- Beckman Coulter
- Cargill
- Flint Hills Resources
- General Mills

TYPES OF POSITIONS FOR CHEMISTRY MAJORS (SAMPLE LISTING):
- **General chemist:** Deals with the basic functions of chemistry. This can include atomic structure, chemical bonding, states of matter, and the nature of solutions.
- **Biochemist:** Deals with the chemistry of living things — proteins, fats, starches, DNA, and drugs.
- **Physical chemist:** Concerned with the physical properties of matter, such as thermodynamics, quantum mechanics, and kinetics.
- **Quality control engineer:** Monitors the manufacturing of products to ensure quality standards are maintained.
TYPES OF POSITIONS FOR CHEMISTRY MAJORS (Continued):

- **Organic chemist:** Focuses on carbon containing compounds, such as those produced by living organisms. Organic chemists work in the petroleum, coal, wood products, plastics, textiles, and food industries.
- **Inorganic chemist:** Focuses on non-carbon containing compounds. This includes atomic structure and the principles of chemical bonding, acids and bases, and many of the basic concepts of chemical interaction. Inorganic chemists commonly work in the mining and electronics industries.
- **Analytical chemist:** Analyze and troubleshoot the exact composition of substances and the purity of raw materials and finished projects. They may monitor air and water pollution as well as food and drug purity (pharmaceuticals).
- **Toxicologist:** Plans and carries out laboratory and field studies to identify, monitor, and evaluate the impact of toxic materials and radiation on human and animal health, the environment, and the impact of future technology.
- **Geochemist:** Applies chemistry to the earth and environmental sciences. Geochemists deal with topics such as the evolution of rocks, mineral stability, water chemistry, and geochemical cycles.
- **Polymer Chemist:** Deals with the nature and structure of polymers. A typical application of polymer chemistry might be the synthesis of materials for industrial or commercial applications.
- **Pharmacologist:** Develops and tests drugs for medicinal use.

**Some of these positions may require an advanced degree.**

USEFUL WEBSITES FOR CHEMISTRY MAJORS:

- Department of Chemistry: [chem.umn.edu](http://chem.umn.edu)
- Chemistry & Industry Magazine: [ww1.chemind.org](http://ww1.chemind.org)
- Biohealthmatics: [biohealthmatics.com](http://biohealthmatics.com)
- Lab Support: [oalabsupport.com](http://oalabsupport.com)
- Science Magazine: [sciencemag.org](http://sciencemag.org)
- Medzilla: [medzilla.com](http://medzilla.com)
- Federal Government Jobs: [usa.gov](http://usa.gov)
- Biospace: [biospace.com](http://biospace.com)
- Indeed: [indeed.com](http://indeed.com)

PROFESSIONAL ORGANIZATIONS:

- American Association for the Advancement of Science: [aaas.org](http://aaas.org)
- American Chemical Society: [chemistry.org](http://chemistry.org)
- American Institute of Chemists: [theaic.org](http://theaic.org)
- Association for Women in Science: [awis.org](http://awis.org)
- Association of Consulting Chemists and Chemical Engineers: [chemconsult.org](http://chemconsult.org)
- Federation of American Scientists: [fas.org](http://fas.org)
- Geochemical Society: [geochemsoc.org](http://geochemsoc.org)
- National Academy of Science: [nas.edu](http://nas.edu)
- National Science Teachers Association: [nstaa.org](http://nstaa.org)
- National Science Foundation: [nsf.gov](http://nsf.gov)
- Society of Chemical Industry: [soci.org](http://soci.org)
- Society of Environmental Toxicology and Chemistry: [setac.org](http://setac.org)
- American Academy of Forensic Scientists: [aafs.org](http://aafs.org)

*Additional job/internship search websites and resources can be found at cse.umn.edu/career.*

Information on this page was compiled from the Occupational Outlook Handbook, the Encyclopedia of Careers and Vocational Guidance, University of Minnesota departmental websites, and student-reported data.