

# The Competition for Industrial Positions

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## **Chemical Engineers**

These people are already trained in the things industry likes; namely, business, law, management, ethics, finance, economics, marketing, advanced computer programming, writing of technical reports for various audiences, etc. The undergraduate engineering degree program has these already built in. Moreover, the training of engineers is focussed on problem solving. People with Ph.D.s in chemistry have none of these skills as standard requirements as part of their educational training. Ph.D. chemists acquire these skills independently outside their graduate work environment or, if they are lucky, through special mentorship relationships with advisors who have appropriate contacts who are professionals in the above areas.

You can make yourself more attractive to industry by having a M.Sc. degree in chemistry coupled with another degree in either law, finance, business, computer science, or ethics. The number of positions asking for M.Sc. degrees is far greater than for Ph.D. degrees. This trend is expected to continue the more Departments of Chemistry remain stagnant on changing their Ph.D. programs to reflect the needs of industry. See below.

## **M.Sc. Chemists with Other Degrees**

More and more companies are looking to hire people with interdisciplinary skills. In the chemical industry knowledge of chemistry can be easily found in candidates applying for industrial positions. There is no shortage of talented people who know their chemistry. The market is over-saturated, that is, there are more people with some kind of chemistry degree or diploma than there are positions available, particularly in Canada. Furthermore, there are many institutions that offer chemistry related degrees other than universities such as community colleges, technical schools, university-colleges, and private specialized institutions. What is lacking in people's training, however, is their skill level in other areas such as technical writing, effective oral communication skills, and knowledge of other areas relevant to a position in the chemical industry. This is what industry keeps harping about as deficiencies found in graduates from university. Communicating scientific data and results to business people, lawyers, and government officials who have limited scientific knowledge is both important and necessary because they are the ones who often make strategic decisions with respect to funding and regulations that directly impact companies. One needs to learn the dual art of informing and convincing an audience either via written or oral communication for success as a scientist. These are the skills that are prized and allow one to move up the corporate ladder.

Key areas include regulatory affairs, patent law, ethics, business and economics, quality control and process chemistry, supervisory and management skills, general computer programming and database programming, and statistics. No university chemistry degree (M.Sc. or Ph.D.) qualifies or trains one adequately for any of these areas. Chemical engineers can fulfill some or all of these requirements better than chemists, hence their high demand. It is not uncommon for technical teams in industry to have ratios of chemical engineers to chemists exceeding 3:1. Learning chemistry at a technical school has the advantage of being trained by people who have had significant

industrial experience and are willing to teach the required skills. There is a greater turnover of instructors at these institutions than at universities so that ideas and skills brought forward are always current and relevant to the needs of the industry. Those with Masters degrees in chemistry show that they have a good knowledge of chemistry, have the necessary skills to work independently in the lab, and have the capacity to initiate projects. They need to finish off their skill set in the above key areas to make them marketable for industrial positions.

Chemical engineering departments in Canadian universities:

University of Alberta, Edmonton, AB  
 University of Calgary, Calgary, AB  
 University of New Brunswick, Fredericton, NB  
 Technical University of Nova Scotia, Halifax, NB  
 Queen's University, Kingston, ON  
 Royal Military College, Kingston, ON  
 University of Ottawa, Ottawa, ON  
 University of Toronto, Toronto, ON  
 University of Waterloo, Waterloo, ON  
 University of Western Ontario, London, ON  
 Laval University, Laval, PQ  
 McGill University, Montreal, PQ  
 Ecole Polytechnique, Montreal, PQ  
 University of Saskatchewan, Saskatoon, SK

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