

ANOTHER GOOD YEAR BAD YEAR



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As in 2002, the ACS salary survey finds good pay gains for chemists with a “flip side” of record unemployment rates.

As was the case in 2002, the data from the 2003 ACS Comprehensive Salary and Employment Status Survey combines prosy raise percentages for employed ACS members with gloomy highs in jobless rates.

Nearly all degree groups of ACS chemists reported salary growth outpacing inflation (see Table 1); Ph.D. chemists led the way with a 5.3% increase over their 2002 median salary, followed by a 3.9% increase for M.S. chemists and 2.8% for B.S. chemists.

Industrial chemists continue to post higher medians than the general ACS membership across the board (see Table 2). Industrial chemists with M.S. degrees topped the chart with a 6.0% rise in their median salary; those with doctorates followed with a 4.1% increase. The smallest increase, 1.7% for industrial B.S. chemists, was the only pay hike that fell significantly short of the U.S. government’s 3.0% consumer price index (CPI) that approximates inflation over the same period. Moreover, the low

TABLE 1: Median Salary Gains of All ACS Chemists

Highest Degree	Median Salary		Salary Gain	
	2002	2003	2001–2002	2002–2003
B.S.	\$58,000	\$59,700	5.5%	2.8%
M.S.	\$68,500	\$71,300	5.4%	3.9%
Ph.D.	\$85,200	\$90,000	3.6%	5.3%

result for B.S. chemists is the greatest drop-off from last year’s increase (5.2%) for any group.

Level of education and time in the field are the two strongest indicators influencing salaries for chemists (Figure 1). For most chemists, salaries by degree across time rise until the end of their careers, about 35 years from earning the B.S. degree. For ACS members in manufacturing, salary medians remain higher than those of members working in all other sectors throughout their

TABLE 2: Median Salary Gains of ACS Industrial Chemists

Highest Degree	Median Salary		Salary Gain	
	2002	2003	2001–2002	2002–2003
B.S.	\$59,000	\$60,000	5.2%	1.7%
M.S.	\$71,900	\$76,500	5.7%	6.0%
Ph.D.	\$94,000	\$98,000	4.2%	4.1%

careers. But other variables also affect the salaries of chemists, including employment sector, job function, and size of employer. These factors account for about 70% of the variance between salaries. The other 30% of between-salary variance among chemists with the same measured attributes lies outside those indicators and within personal traits like special abilities, personality, and temperament.

Industrial chemists working in manufacturing outearned those working for all other employers, with the highest medians for all three degrees—\$62,000 for B.S. chemists, \$77,000 for M.S. chemists, and \$100,000 for Ph.D. chemists (Figure 2). The high median salaries in manufacturing are followed next by those in nonmanufacturing, except at the bachelor’s level, where government chemists held a significant \$6200 advantage. Other than



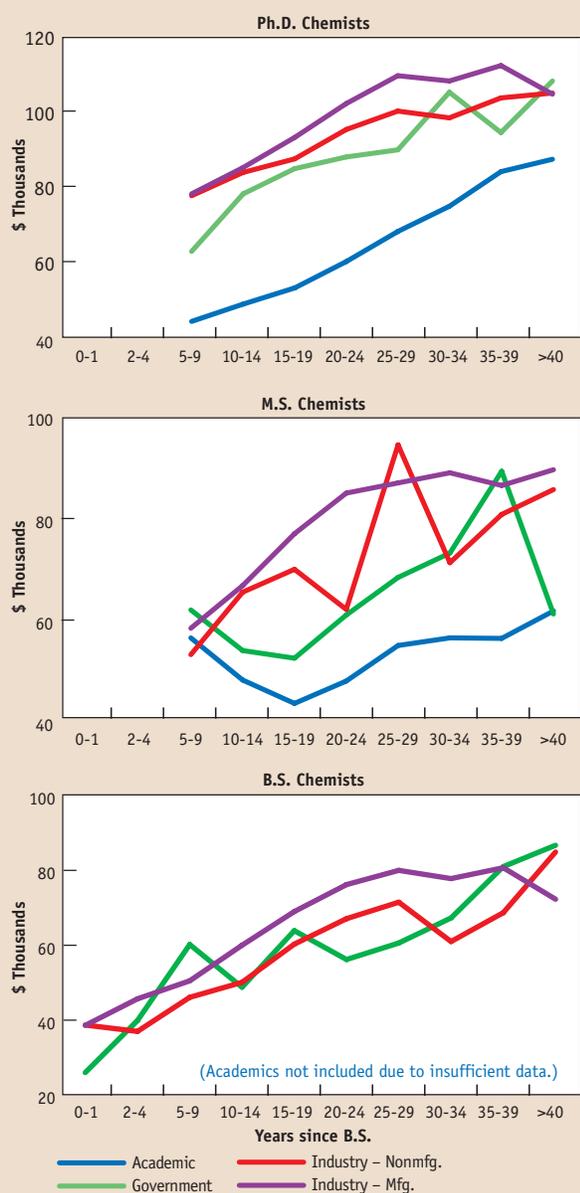
in that single category, industrial chemists outearn their counterparts in government and academia.

Job function in industry is also generally thought to be an important variable in setting salaries. For B.S. chemists in industry, the medians distributed by job function and degree show that those in management have the highest median: \$89,200 for R&D managers and \$79,300 for general managers (Figure 3). These are followed by B.S. chemists in marketing and sales (\$73,000) and consulting (\$70,500). The order of median salaries for industrial M.S. chemists is similar, with R&D management leading the way (\$100,400), followed by general management (\$95,800), consulting (\$80,500), and marketing and sales (\$80,000). Again, Ph.D. chemists report the top two salaries by job function

as R&D management (\$125,000) and general management (\$117,700), followed by the basic research (\$99,600) and applied research (\$92,600) functions.

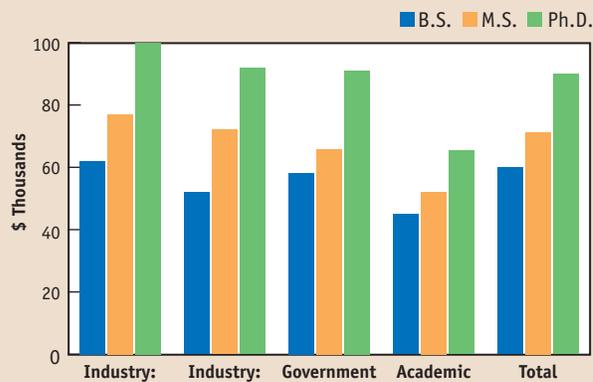
Salaries of industrial members are influenced by the size of their employer (Figure 4). The influence is very nearly a linear and positive correlation—the larger the firm, the higher the expected salary. This holds true across degrees but is especially true this year for Ph.D.s, whose data show a

FIGURE 1: Median Salary by Degree and Years since B.S.



Source: ACS 2003 Comprehensive Salary & Employment Status Survey

FIGURE 2: Median Salary per Economic Sector



Source: ACS 2003 Comprehensive Salary & Employment Status Survey

\$19,000 difference between firms with fewer than 50 employees and firms that have 25,000 or more employees.

Beyond Basic Salaries

In addition to asking about basic salaries, the survey asks for information on additional professional income in the form of stock,

About the Survey

The data used in this article were derived from the 2003 ACS Comprehensive Salary and Employment Status Survey. The survey was sent to a random sample of 22,350 ACS regular members who resided in the United States and excluded retired, emeritus, and student members. Out of the total 9492 usable responses received, 4905 were from member-chemists working in industry.

Each year, the median data point is used to describe salaries because it is not subject to outlier data that would influence a mean (average). The median salary is the point where half of all salaries are above and half are below it. Also, this year the respondents were older on average than usual, so that the statistical data had to be weighted. A model was formed using five years of ACS employment data, and the age-factor weighting was based on that model. Any questions regarding the data used in this article can be addressed to Mary Jordan via e-mail at m_jordan@acs.org.

The Office of Employment Information, ACS Department of Career Services, conducts the survey. A more detailed full report, *Salaries 2003*, will be available in the fall for \$250 from the ACS Office of Society Services, 1155 16th St., NW, Washington, DC 20036. Copies of previous reports are also available.



bonuses, and consulting fees. Industrial chemists, along with their higher median salaries, are also more apt to have additional income in the form of stock options and bonuses. More than a quarter of chemists working in manufacturing (25.6%) received stock as part of their professional income. Chemists working in nonmanufacturing were less likely to receive stock (20.7%), but more likely than those working in other sectors.

On the other hand, bonuses were prevalent across multiple sectors. Here again, chemists in manufacturing led the list with 70.4% eligible for bonuses and 89% of that group receiving them in 2002. More than half (52.5%) of those working in nonman-

ufacturing chemists, remains primarily the territory of academics. Nonetheless, industrial chemists fared well with their salaries and added income, but also saw an unrelenting decline in jobs, especially in the manufacturing sector.

Unemployment: Gloomier than Ever

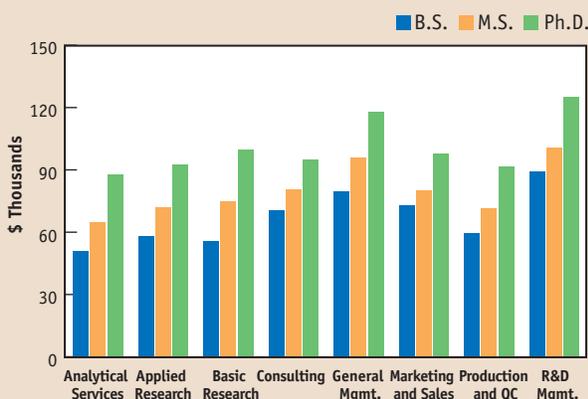
Following the lead of the U.S. economy as a whole, this year's unemployment level exceeded last year's. Manufacturing has shown the longest unabated decline in employment for more than a decade. This includes the chemicals manufacturing sector, with white-collar and professional jobs subject to continuing cuts at an increasing rate.

Overall, ACS workforce members posted a jobless rate of 3.5% on March 1, 2003, slightly exceeding last year's record of 3.3%. The only salve for the wounds is the fact that the total U.S. workforce is considerably worse off at 6.5% for the same March 1 milestone.

Again this year, the record high unemployment rate consists mainly of ACS members working in industry and over the age of 45. Overall, the unemployment in industry was 4.5%, up from 4.1% in 2002.

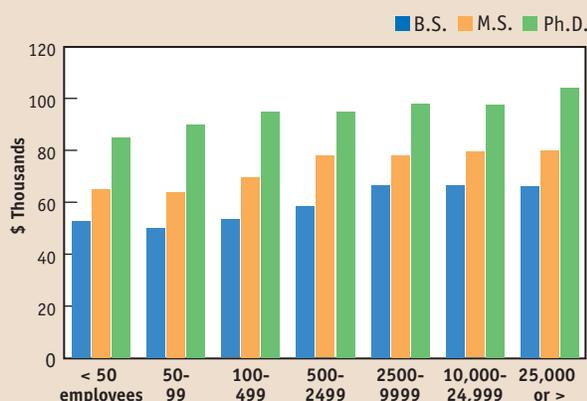
Joblessness was not spread evenly across employment sectors (Figure 5). Chemists working in the manufacturing sector posted an average unemployment rate of 4.4%, the same as last

FIGURE 3: Median Salary vs Job Function



Source: ACS 2003 Comprehensive Salary & Employment Status Survey

FIGURE 4: Median Salary per Size of Employer



Source: ACS 2003 Comprehensive Salary & Employment Status Survey

ufacturing were eligible for bonuses, and 81.5% of that group received them. Fewer government chemists (35.9%) and academic chemists (8.6%) were eligible, but if eligible, they were as likely to receive bonuses (82.6% and 85.9%, respectively) as those working in both manufacturing and nonmanufacturing. Chemists working in manufacturing also received the largest median bonuses at \$6500, followed by nonmanufacturing (\$4000), academia (\$2500), and government (\$1500).

Consulting, other than that performed full-time by industri-

How ACS Can Help You Deal with Unemployment

It was a tumultuous year for chemists, with no relief in sight anytime soon. Yet chemical professionals are not alone. In particular, job losses in the manufacturing sector reflect national economic trends. ACS offers numerous forms of support to members who are facing unemployment. They are:

Career Consultants: Seasoned professionals can assist you in your career path. chemistry.org/portal/a/c/s/1/acsdisplay.html?DOC=careers%5Cguidance%5Ccareerconsult.html

Coping with Job Loss: This brochure can help you deal with the trauma. chemistry.org/portal/a/c/s/1/resources?id=67e41acaca4011d6f6636ed9fe800100

Résumé Reviews: Our experts can help you make it the best it can be. chemistry.org/portal/resources/ACS/ACSContent/careers/empres/resumetips99.pdf

C&EN ChemJobs: Check new listings or post your résumé. www.Cen-chemjobs.org

Interviewing Skills: Get some tips from the pros in this publication. chemistry.org/portal/resources/ACS/ACSContent/careers/empres/interview99.pdf

Salary Comparator: Determine what you should be paid in your job. <http://center.acs.org/applications/acscparator/page01.cfm>

Career Development Library: Read publications that can develop your job-searching skills. chemistry.org/portal/a/c/s/1/career.html?DOC=careers/pub02.html

Local Sections: Many have career centers already established. Contact your local section for information.

For more tips, visit chemistry.org/portal/a/c/s/1/career.html?DOC=careers/archive/midcareer_teaser.html



year. But those in the nonmanufacturing sector had the highest unemployment rate at 4.6%, up from 3.1% and making up most of the increase in the unemployment rate for 2003. Within each of the industrial sectors—manufacturing and nonmanufacturing—layoffs were more likely in some categories than in others. Among manufacturing employers, agricultural chemicals topped the list of high unemployment with 12.1%, followed by medical devices (10%), electronics (7.9%), plastics (5.4%), and specialty chemicals (4.7%). Pharmaceuticals, the manufacturing sector that employs the largest proportion of ACS members, still shows relative strength with an unemployment rate of 2.4%, virtually even with last year's 2.3%. Within the nonmanufacturing sector, biotech research firms' unemployment leaped from 1.5% last year to 6.6%, undoubtedly reflecting the slowdown in the biotechnology industry as a whole. The rising nonmanufacturing jobless rate also included chemists who work for contract research firms (5.0%) and professional services (4.9%).

Many of the industrial work functions showing very high unemployment rates last year continued with high rates this year.

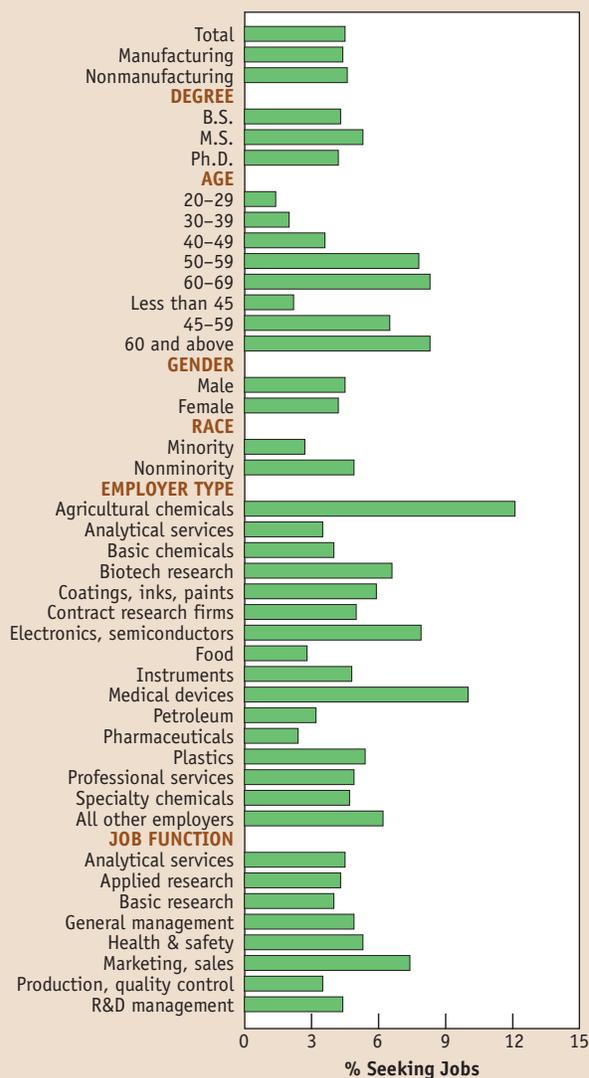
Women in Industry

Female industrial chemists have distinct demographics and employment patterns that set them apart, mainly because so many of them entered the job market in the past two decades. Overall, women constitute about 23% of the industrial workforce. They are far more apt than men to have a B.S. or M.S. as their highest degree. They make up 31% of the B.S. and 30% of the M.S. chemists, but less than 17% of the Ph.D. holders. Industrial women are overrepresented in the 20–29 (49.1%) and 30–39 (30.7%) age groups. Much of the high proportion in the 20–29 age group is a product of the high proportion of B.S. industrial women. Women ACS members have a higher propensity to be a member of a minority group (26.8 vs 21.9%). Workforce trends related to women chemists show particular patterns regarding where they work. Employers that display a higher-than-average proportion of women are those that were hiring and growing new jobs from the mid-1980s through the 1990s. Pharmaceutical manufacturing makes up a large proportion and became the largest single employer of chemists during that period; almost 28% of pharma chemists are women. This is significant because not only are women a high proportion of chemists, but they also represent a large number of chemists. Food manufacturers also have a higher-than-average proportion of women at 24.5%. All the major nonmanufacturing employers show proportions of women close to or above the average. Analytical service labs (27.2%) and research institutions (29.8%) employ the highest proportion of women in the nonmanufacturing sector.

The higher proportion of women in nonmanufacturing carries over to where they are clustered in their job functions. They are an increasing proportion across all work functions, but their largest growth has been as analytical chemists (31.5%) and health and safety chemists (31.6%). They are also well represented in basic research (29.3%) and production and quality control (26.7%). However, so far they fall well below average in general management (13.8%) and R&D management (13.8%).

Production and quality control chemists who suffered through the 1990s actually held a relatively low position this year with an unemployment rate of 3.5%, down from over 4% last year. At the other end of the spectrum, jobs became much scarcer in marketing and sales, which showed a 7.4% unemployment rate. After mostly escaping the high unemployment of the mid-1990s, research and R&D management showed unemployment rates higher than 4%. One of the larger groups of chemists, analytical chemists, sounded a relatively bright note among the symphony of gloom, chiming in with a significant decline in unemployment from last year's 7.8% to 4.5%.

FIGURE 5: Unemployment among Industrial Chemists



Source: ACS 2003 Comprehensive Salary & Employment Status Survey

Demographically, the age groups most affected by unemployment were those over the age of 45. From age 45 through 59, the unemployment rate rose to 6.5%, and for age 60 and above, the unemployment rate sharply rose to 8.3%. Industrial chemists under age 45 placed well below the average industrial unem-

ployment rate at 2.2%. Chemists in the oldest and youngest age groups tend to have higher jobless rates than those in the middle.

Chemists with master's degrees repeated their ranking as those with the highest unemployment (5.3%), followed by chemists with B.S. degrees (4.3%) and doctorates (4.2%). Men outpaced women with 4.5 versus 4.2%, respectively. Minority chemists had a far lower unemployment rate this year at 2.7 versus 4.9% for nonminority chemists.

The Salary Comparator

The salary disparity between men and women chemists is complex. Much, but certainly not all, of that disparity can be explained by the degrees women obtain, their ages, where they work, and what jobs they perform. Extensive salary modeling is part of the analysis that goes into the ACS Salary Comparator. To see how various factors influence pay differentials for jobs, chemical professionals are encouraged to try the Comparator at chemistry.org/careers.

For those who were out of work on March 1, 2003, more than one-third had been out of work for more than a year. Because the unemployment rate only shows a snapshot of employment on one day (March 1, 2003), another way to look at unemploy-



ment is to consider those who said they had an unemployed period during which they sought work in 2002. This does not include those who changed jobs without an unemployed period. This figure not only gives us another representation of unemployment for chemical professionals, it also reflects the high mobility of the chemical industrial workforce.

At the youngest age group, 20–29, a whopping 11.5% had an “unemployed and seeking” period in 2002. This is likely the same group that propelled the rate of B.S. chemists with an unemployed period in 2002 to 10.2%. Excluding the youngest age group, the other age groups with a period of unemployment ranged from 5.5% of 30- through 39-year-olds to 11.7% of 60- through 69-year-olds. Overall, almost 8% of ACS industrial chemists had a period of unemployment and sought work in 2002, up from 6.2% in 2001. More than 4% of those employed full-time in industry on March 1 had a period of unemployment in the past year. A third of those who had an unemployed period in 2002 were seeking work for longer than six months.

For those who are facing unemployment problems personally or know others who are, ACS offers coping services (see box, “How ACS Can Help You Deal with Unemployment”).

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