



Salaries 2009:

Analysis of the American Chemical Society's 2009 Comprehensive Salary and Employment Status Survey

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ACS Department of Member Research & Technology*

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American Chemical Society

Salaries 2009

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SUMMARY AND COMMENTS

Results from the 2009 ACS Comprehensive Salary and Employment Status Survey indicate that salaries for chemists have decreased 3.2% from last year. Unlike in 2008, reported salaries for chemistry graduates for all degree levels decreased over the past year. Similar to 2008, chemists reported earning a median income of \$8,000 from consulting and \$9,000 from company bonuses. The receipt of stock options experienced a 1.7% decrease from the previous year.

In 2009, unemployment rates reached 3.9%, an all-time high since 2004 (3.6%). During the past year, chemists experienced a 1.6% increase in unemployment (from 2.3% to 3.9%). Additionally, 87.7% of chemists surveyed reported being employed in full-time positions (0.8% increase from last year), while 3.1% claimed to be working part-time (0.5% decrease) and 2.5% claimed to be working in postdoctorate positions (1.3% increase).

ALL CHEMISTS

In 2009, the median salary for all chemists responding to the ACS 2009 membership survey was \$90,000. From 2007 to 2008, survey respondents reported a 4.5% increase in median salaries; in contrast, over the past year the median overall chemist's salary decreased 3.2% (2.8% decrease after adjusting for inflation). In 2008, inflation was 4.0% per year, while inflation in 2009 was slightly negative (-0.4%).

From 2008 to 2009, median salaries for all degree levels decreased. The median bachelor's salary experienced the greatest decrease compared to 2008 (dropping from \$72,600 to \$66,252, or 8.7%). During this time period, master's and doctorate median salaries

decreased by 1.7% and 1.0%, respectively; master's salaries decreased from

| | Median Salary (2008 current dollars) | Median Salary (2009 current dollars) | % Change from 2008 (current dollars) | INFLATION -0.4% (constant dollars) |
|--------------|---|---|---|--|
| All Chemists | 93,000 | 90,000 | -3.2 | -2.8 |
| Bachelor's | 72,600 | 66,252 | -8.7 | -8.3 |
| Master's | 82,000 | 80,619 | -1.7 | -1.3 |
| Doctorate | 101,000 | 100,000 | -1.0 | -0.6 |

\$82,000 to \$80,619, while doctorate salaries decreased from \$101,000 to \$100,000. After adjusting for inflation, however, master's and doctorate salaries decreased by 1.3% and 0.6%, respectively. The median salary data appear in Table 1 by degree level.

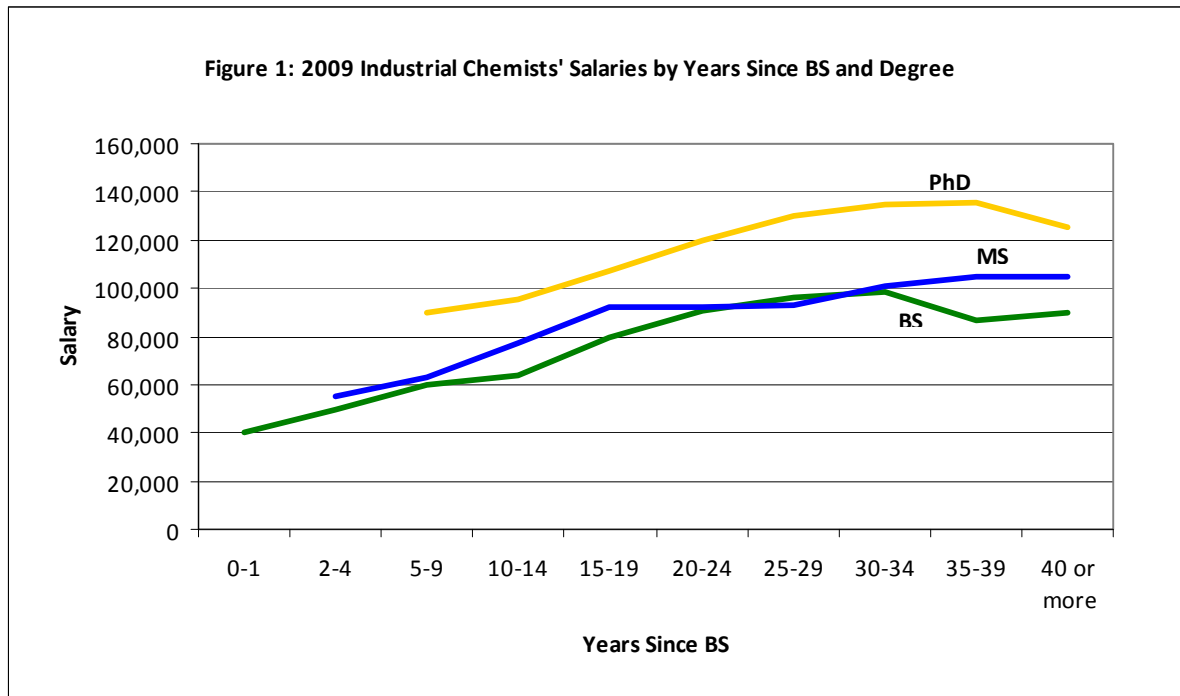
**INDUSTRIAL / PRIVATE
SECTOR CHEMISTS**

In addition to degree level, sector of employment was a major factor in determining chemist salaries. Chemists working in the private sector typically reported earning higher salaries than those working in other areas of employment, such as academia. Table 2 displays the reported median salaries by degree level for 2008 and 2009 of industrial/private

| Table 2. Change in Industrial/Private Sector Chemists' Salaries 2008-2009 | | | | |
|---|---|---|---|---------------------------------------|
| | Median Salary (2008 current dollars) | Median Salary (2009 current dollars) | % Change from 2008 (current dollars) | INFLATION -0.4% (constant dollars) |
| Bachelor's | 75,000 | 68,800 | -8.3 | -7.9 |
| Master's | 90,000 | 89,000 | -1.1 | -0.7 |
| Doctorate | 115,000 | 115,000 | 0.0 | 0.4 |

sector chemists. For the bachelor's and master's degree levels,

median salaries decreased by amounts ranging from \$6,200 and \$1,000, respectively, compared to levels from the previous year. However, doctorate salaries remained unchanged. The decrease in salary had the greatest impact for bachelor's recipients (8.3% decrease); master's recipients experienced only a 1.1% decrease in salary.



Another important factor influencing chemist salaries is length of experience. Figure 1 shows that salaries generally increase as the

number of years since earning a bachelor's degree increases. A similar pattern can be seen for all degree levels. Master's recipients reported salaries higher than those earned by bachelors (from 1.2% to 20.7% higher), while the reported doctorate salaries were substantially higher than master's salaries (from 14.0% to 42.9% higher).

ACADEMIC CHEMISTS

Although chemists in the private sector tend to report earning higher salaries than those in academia, the overall salary picture of academia is much more complex. Table 3 displays the median salaries of Ph.D. chemists working in academia by faculty rank and length of contract. Given the breakdown of academia into ranks and lengths of contracts, it could be problematic to compare salary increases between the private sector and academia. Compared to 2008 salaries, all ranks/contract lengths reported increases in salary.

| Table 3. Change in Ph.D. Academic Chemists' Salaries 2008-2009 (by rank/contract length) | | | | |
|---|-----------------------|-----------------------|---|--|
| | Median Salary 2008 | Median Salary 2009 | % Change from 2008 (current dollars) | INFLATION -0.4% (constant dollars) |
| Full 9/10 | 92,000 | 94,344 | 2.5 | 2.9 |
| Full 11/12 | 126,000 | 142,550 | 13.1 | 13.5 |
| Assoc 9/10 | 64,120 | 65,376 | 2.0 | 2.4 |
| Assoc 11/12 | 85,085 | 91,000 | 7.0 | 7.4 |
| Asst 9/10 | 57,000 | 57,600 | 1.1 | 1.5 |
| Asst 11/12 | 72,000 | 74,000 | 2.8 | 3.2 |

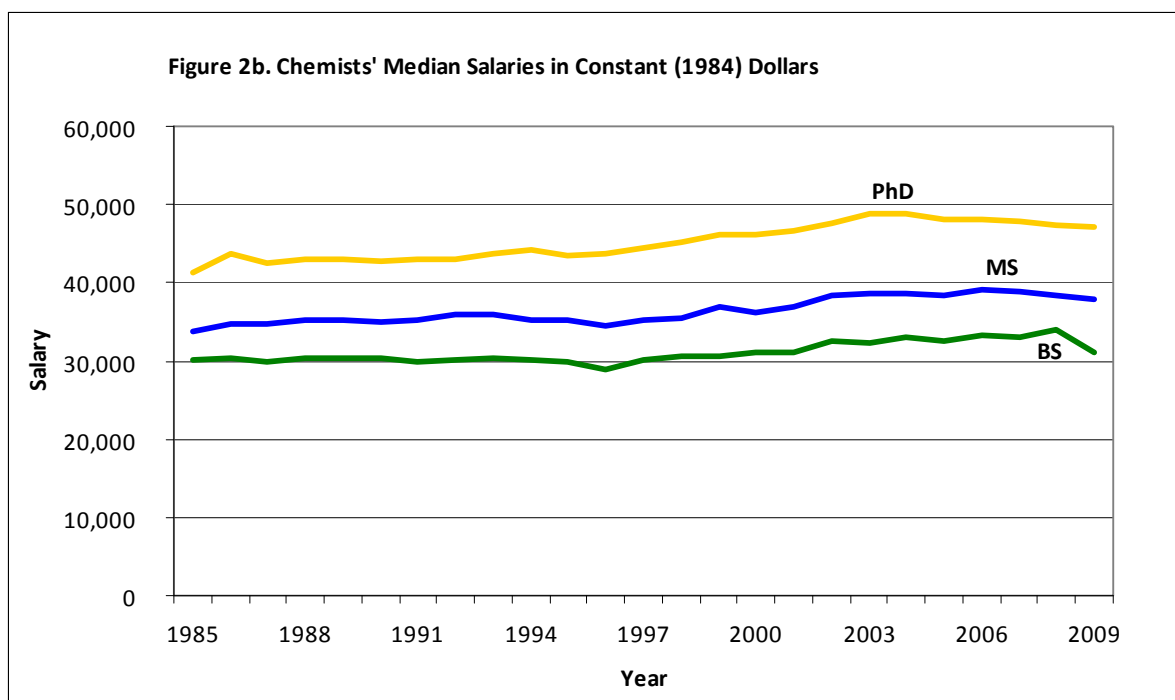
All academics, regardless of rank and length of contract, experienced salary increases. The higher the professor's rank, coupled with the longer contract period, the greater the reported salaries. Assistant professors on 9-10 month salary bases reported increases of 1.1%, while those on 11-12 month contracts reported a slightly greater increase of 2.8%. Over the past year, associate professors at the 9-10 month level experienced a 2.0% increase in salary (from \$64,120 to \$65,376), while their 11-12 month counterparts reported a 7.0% increase (from \$85,085 to \$91,000). Chemists with full professorships also experienced salary increases. Full professors on 9-10 month salary bases reported increases of only 2.5%, while those on 11-12 month contracts reported greater increases (13.1%).

**OTHER FACTORS
INFLUENCING SALARY**

Although the level of degree, employment sector, and length of experience may very well be the most influential correlates of salary, there are a variety of other factors that one should also consider. Some other factors influencing salary are type of work, work specialty, geographic region, and gender. The Appendix tables provide comprehensive detailed breakdowns of current base salary data that can be very helpful when assessing one’s present salary.

**TRENDS IN CHEMISTS’
SALARIES**

Since 1985, the median salaries of chemists have variably increased from year to year. Figure 2a-b displays the trend in chemists’ salaries each year by level of degree. Figure 2a shows these increases in chemists’ salary in current dollars (i.e., the amount actually reported at the time of the study). Over the last two decades, chemists’ salaries by this measure have more than doubled.



Additionally, salary differentials between chemists of varying education levels continue to grow. In 1985, the salary difference between B.S. and M.S. chemists was \$4,000; the salary difference between M.S. and Ph.D. chemists was \$8,000. By 1990, the median

salary differences had increased 50.0% for B.S. and M.S. (from \$4,000 to \$6,000) and 25% between M.S. and Ph.D. recipients (from \$8,000 to \$10,000). A decade later, in 2000, there was a reported \$8,900 salary difference between B.S. and M.S. (48.3% increase from 1990) and a \$17,000 difference between M.S. and Ph.D. (70% increase). Although the differences in median salaries appear to have stabilized over the past decade, the trend appears to have continued in 2009, with a \$14,367 difference in median salary between B.S. and M.S. chemists and a \$19,381 difference in median salary between M.S. and Ph.D. chemists.

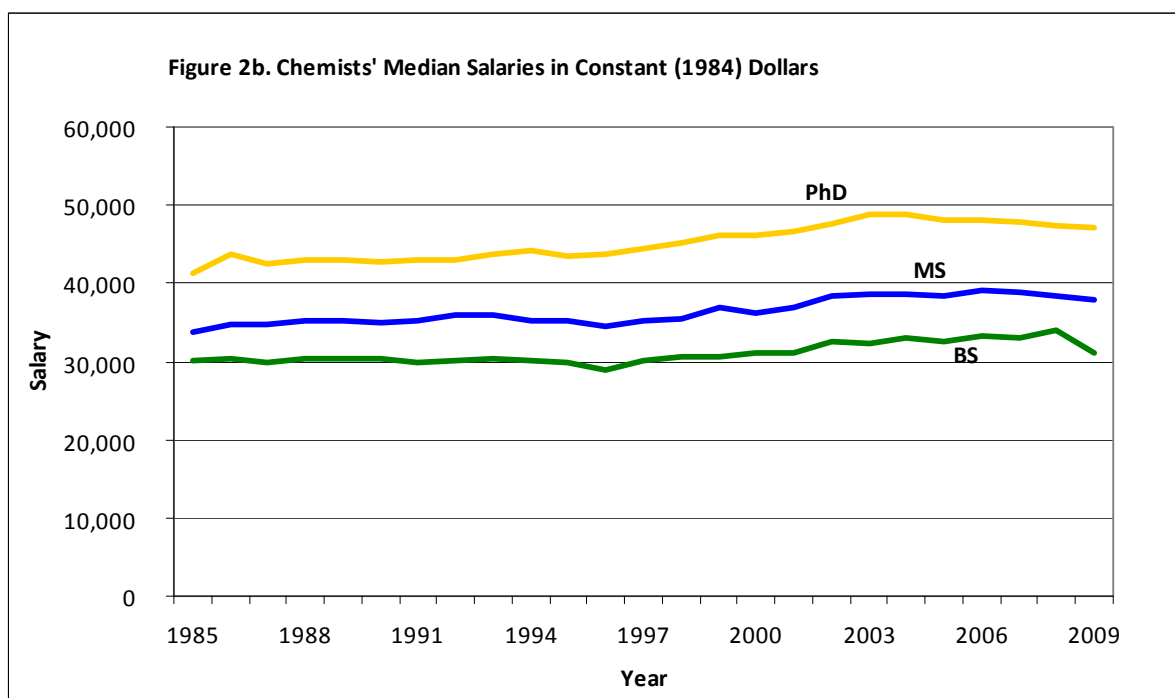


Figure 2b displays chemists’ median salaries in constant 1984 dollars (i.e., salaries accounting for inflation). These findings indicate that, for the most part, chemist’s salaries remained fairly constant until 1999 and increased slightly from 1999 to 2004. Since 2004, chemists’ salaries have been declining. In 2009, accounting for inflation, chemists of all degree levels experienced decreases in salaries from the previous year (Ph.D., -0.6%; M.S., -1.3%; B.S., -8.3%).

NON-SALARY INCOME

Salaries alone do not provide the total picture of the earning potential of chemists. This section of the survey examines the additional

income, such as consulting, bonuses, and company stock options received by chemists in 2009. Some chemists earn additional money by engaging in consulting work outside of their primary employment; meanwhile, certain employers provide yearly bonuses and/or company stock options in order to supplement chemists' salaries.

CONSULTING

In 2009, 8.9% of chemists reported earning a median income of \$8,000 from consulting. Approximately 19.0% of chemists employed by colleges and universities reported doing some consulting. Last year, academic consultants reported charging an average of \$100 per hour and earning a median income of \$4,200. For those academics who

were not working during the summer, consulting work provides an opportunity to earn additional income. Although chemists in academia reported the greatest percentage who were consulting, private sector employees reported receiving the largest income. Manufacturing chemists typically charged \$100 per hour and earned a median income of \$8,000, while non-manufacturing chemists earned a median income of \$57,500 at \$125 per hour.

Level of degree, age, and gender also appear to be factors in determining hourly consulting rates. The higher the degree level, the more chemists charged per hour for their services. Those with a bachelor's and master's degree charged an average rate of \$100 per hour, while

Ph.D. recipients charged \$125 per hour. In addition to charging more, Ph.D.s were also more likely than holders of B.S. and M.S. degrees to perform consulting work. Surprisingly, the bachelor's recipients reported the largest median income from consulting (\$24,000).

| Table 4. Consulting in 2009 | | | |
|---|---------------------|--------------------|----------------------|
| | % Consulting | Hourly Rate | Median Income |
| All Chemists | 8.9 | \$110 | \$8,000 |
| Degree | | | |
| BS | 3.6 | \$100 | \$24,000 |
| MS | 5.4 | \$100 | \$20,000 |
| PhD | 11.4 | \$125 | \$6,375 |
| Employer | | | |
| Industry-mfg | 2.9 | \$100 | \$8,000 |
| Industry-non mfg | 6.4 | \$125 | \$57,500 |
| Government | 7.1 | \$100 | \$4,000 |
| College or University | 19.4 | \$100 | \$4,200 |
| Sex | | | |
| Men | 10.0 | \$125 | \$8,000 |
| Women | 5.8 | \$100 | \$6,000 |
| Age | | | |
| 20-29 | 2.7 | \$50 | \$6,000 |
| 30-39 | 5.1 | \$80 | \$3,000 |
| 40-49 | 8.1 | \$100 | \$6,850 |
| 50-59 | 10.7 | \$130 | \$9,600 |
| 60-69 | 15.9 | \$140 | \$15,000 |
| Note: This year's respondents were asked for previous year's consulting. | | | |

Also associated with hourly rates was a chemist’s age. As age increased, so did the hourly consulting rate. On average, chemists in their twenties charged \$50 per hour, while those over age 60 charged \$140 per hour. This difference is attributable to degree level as well as years of experience. In terms of gender, men were more likely to do consulting and charge higher hourly rates. Ten percent of men (\$125 per hour) reported doing consulting work, compared to 5.8% of women (\$100 per hour).

BONUSES

In 2009, 49.2% of all chemists reported being eligible to receive a bonus. However, not all employees eligible for bonuses received them. Of those eligible, 90.3% received bonuses with a median value of \$9,000. Degree level, sector of employment, age, and gender all

appeared to be factors in determining bonus amounts.

| Table 5. Bonuses in 2009 | | | |
|--|----------------------|-------------------------------|--------------|
| | % Eligible for Bonus | % of Eligible Receiving Bonus | Median Bonus |
| All Chemists | 49.2% | 90.3% | \$9,000 |
| Degree | | | |
| BS | 59.6% | 90.8% | \$5,000 |
| MS | 55.9% | 91.1% | \$7,500 |
| PhD | 44.4% | 89.9% | \$12,000 |
| Employer | | | |
| Industry-mfg | 76.8% | 92.7% | \$12,000 |
| Industry-non mfg | 60.2% | 86.9% | \$5,991 |
| Government | 37.2% | 91.0% | \$2,000 |
| College or University | 8.9% | 72.4% | \$2,000 |
| Sex | | | |
| Men | 51.8% | 91.0% | \$10,000 |
| Women | 42.5% | 88.3% | \$5,000 |
| Age | | | |
| 20-29 | 47.5% | 92.9% | \$3,000 |
| 30-39 | 45.2% | 89.7% | \$5,600 |
| 40-49 | 54.7% | 90.5% | \$12,000 |
| 50-59 | 54.9% | 90.9% | \$13,000 |
| 60-69 | 36.8% | 88.5% | \$10,000 |
| <i>Note: This year's respondents were asked for previous year's bonuses.</i> | | | |

Compared to master’s and Ph.D.s, bachelor’s recipients were more likely to be eligible for bonuses (59.6%), and 90.8% of those who were eligible for bonuses received them. The median bonus income amount for bachelor’s recipients was \$5,000. A smaller percentage of master’s recipients (55.9%) were eligible for bonuses last year. Of those eligible, 91.1% received bonuses and earned an additional median income of \$7,500. Although the Ph.D. recipients reported the smallest level of bonus eligibility (44.4%) and receipt (89.9%), they were awarded the largest amount (a median value of \$12,000). In terms of employment sector, college and university chemists were also less likely to be eligible for (8.9%) and to receive (72.4%) bonuses in comparison to private sector and government employees.

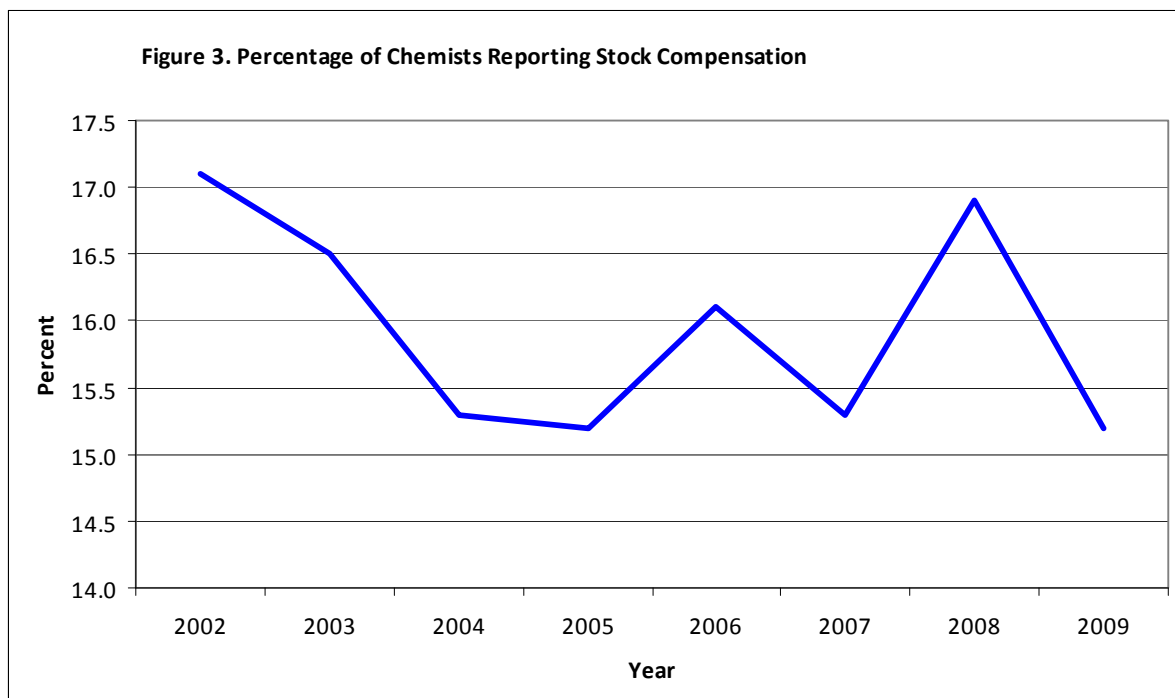
Similarly, compared to the private sector, government employees were also less likely to be eligible for bonuses. In 2009, 37.2% of government employees reported being eligible to receive a bonus. Of those who received a bonus (91.0%), the median value of the bonus was only \$2,000. In the private sector, bonuses are typically offered as a way for employers to motivate their employees and/or as a means to remain competitive with the benefits offered by other companies. Those working in manufacturing reported the greatest levels of bonus eligibility (76.8%), receipt (92.7%), and bonus award amounts (median value of \$12,000). In comparison, non-manufacturing industries were not as generous; their bonus eligibility rate (60.2%), receipt (86.9%), and bonus amounts (median value of \$5,991) were all lower than those of chemists in manufacturing industries.

Age was another factor that appeared to influence bonuses. For the most part, as the chemist's age or experience increased, so did the amount of the bonus awarded. Chemists in their twenties reported a 47.5% eligibility and typically earned a median bonus amount of \$3,000. Chemists in their fifties reported receiving a bonus with a median value of \$13,000. After age 59, fewer chemists were eligible for bonuses (36.8%) and the awarded amounts of bonuses also decreased (median value of \$10,000).

Men typically reported a higher eligibility rate and greater award amounts than women. In general, male chemists' eligibility rates were 9.3% higher than those of women, and they received twice as much in bonus amounts (median value of \$10,000). Female chemists had an eligibility rate of 42.5% and were awarded median bonus amounts of \$5,000. These results may be attributable to the under-representation of women in areas that seem to have the greatest impact on compensation, such as degree level and employment sector. Women represented only 21.1% of all Ph.D.s and 24.7% of all private sector chemists.

STOCK AS PART OF PROFESSIONAL INCOME

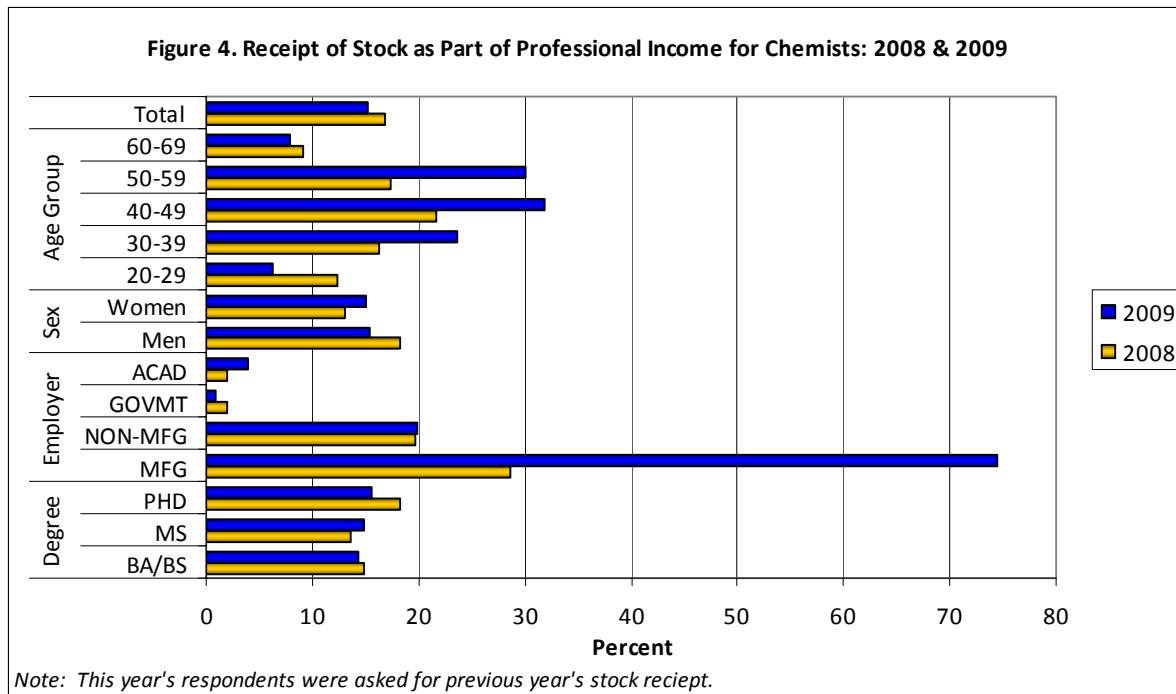
Another way for employers to compensate their employees is by offering them company stock. Since the 2001 survey, when ACS began asking members to report on stock options, the percentage of chemists reporting this type of compensation has experienced periods of increases and decreases (see Figure 3). Although employees experienced a 1.6% increase in the receipt of stock options from 2007 to 2008, a 1.7% decrease was reported for 2009.



Compared to last year, fewer chemists reported receiving stock options in almost every sub-category. Degree level had an influence on those receiving stock options. The higher the degree level, the greater the percentage. Doctorate recipients (15.5%) were more likely to receive stock options as part of their overall compensation compared to holders of bachelor's (14.3%) and master's (14.9%) degrees. Those chemists working in the private sector reported higher percentages of stock receipt (94.4%) than those in government (0.9%) or academia (3.9%). Within the private sector, the greatest percentages of chemists receiving stock options were in manufacturing (74.5%) compared to non-manufacturing (19.9%). The percentage of chemists who received stock options in 2008 and 2009 by degree level, sector of employment, age, and gender are shown in Figure 4.

In addition to level of degree and sector of employment, age and gender were also important factors in determining the receipt of stock options. Chemists in their twenties experienced a 6.0% decrease (from 12.3% to 6.3%) from last year, while those in their fifties reported the largest increase, from 17.3% to 30.1%. In 2009, chemists in their forties were most likely to receive stock options (31.8%). A slightly greater proportion of men (15.4%) reported receiving stock options than did women (15.0%). On the other hand, compared to the previous year, men experienced a 2.9% decrease, while women

reported a 2.0% increase. These findings might suggest a move toward parity with men.



EMPLOYMENT AND UNEMPLOYMENT

EMPLOYMENT STATUS

As shown in Table 6, full-time employment status over the past decade appears to be fairly stable. In 2009, 87.7% of chemists surveyed reported being employed in full-time positions, while 3.1% claimed to be working part-time. From last year, these percentages represent a 0.8% increase for full-time employees and a 0.5% decrease for part-time. The decrease in part-time positions may be attributable to the increase of those chemists choosing to work full-time and/or pursue postdoctorate positions.

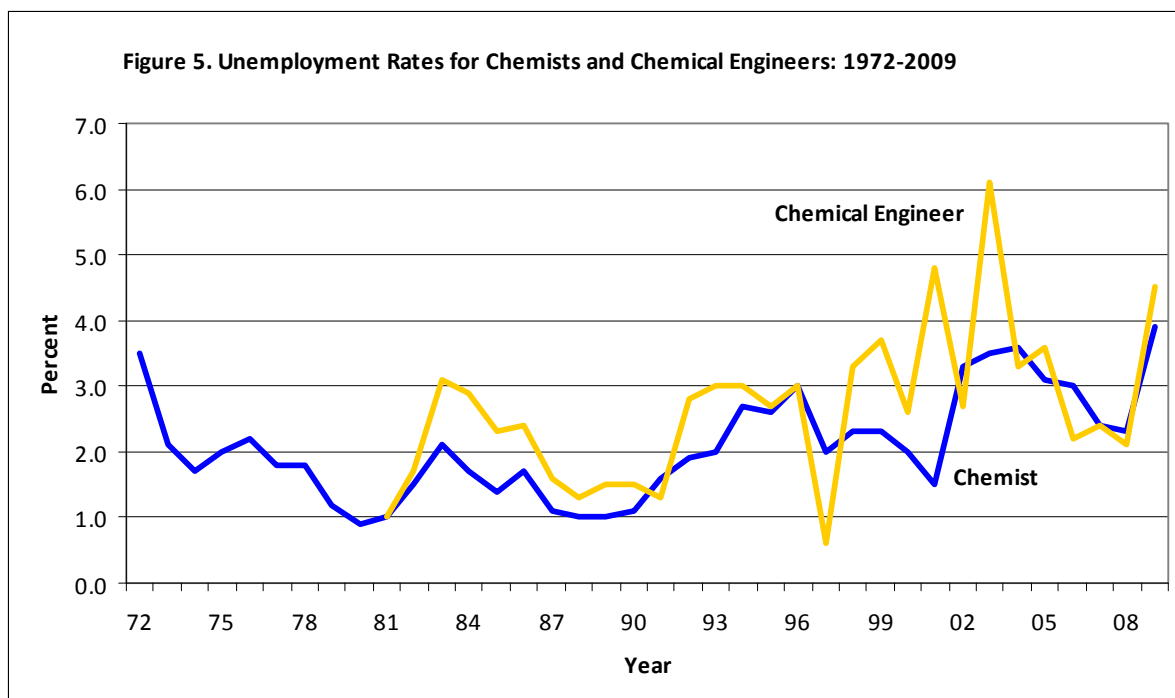
One of the noteworthy developments over the past year appears to be in the percentage of chemists employed in postdoctorate positions. To put this in a larger context, over the past 14 years, the percentage of chemists employed in postdoctorate positions fell from a high of 3.5% in 1995 to a low of 1.2% in 2008. In 2009, however, the percentage of chemists working in postdoctorate positions more than double

| Table 6. Employment Status of Chemists (Percentages by Year) | | | | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Full Time | 88.8 | 89.4 | 90.5 | 89.8 | 89.4 | 88.7 | 91.8 | 88.3 | 87.9 | 86.7 | 86.0 | 86.9 | 87.4 | 86.9 | 87.7 |
| Part Time | 2.7 | 2.7 | 2.1 | 2.4 | 2.6 | 2.9 | 2.4 | 2.8 | 2.9 | 3.4 | 3.9 | 3.3 | 3.4 | 3.6 | 3.1 |
| Post Doc | 3.5 | 2.7 | 2.3 | 2.2 | 2 | 2 | 1.3 | 1.4 | 1.3 | 1.8 | 1.9 | 2.2 | 1.6 | 1.2 | 2.5 |
| Not Employed | | | | | | | | | | | | | | | |
| Seeking | 2.5 | 2.9 | 1.9 | 2.3 | 2.2 | 2.9 | 1.5 | 3.1 | 3.3 | 3.4 | 2.9 | 2.9 | 2.3 | 2.2 | 3.8 |
| Not Seeking | 2.6 | 2.3 | 0.8 | 0.9 | 1.3 | 1.7 | 1.4 | 1.5 | 1.7 | 1.4 | 1.9 | 1.7 | 1.7 | 1.5 | 1.0 |
| Fully Retired* | | | 2.3 | 2.4 | 2.5 | 2.8 | 1.6 | 2.8 | 2.9 | 3.2 | 3.4 | 2.7 | 3.6 | 4.6 | 1.9 |
| Overall Unemployment Rate** | 2.6 | 3.0 | 2.0 | 2.3 | 2.3 | 2.0 | 1.5 | 3.3 | 3.5 | 3.6 | 3.1 | 3.0 | 2.4 | 2.3 | 3.9 |
| <i>Note: Retirement status was added in 1997</i> | | | | | | | | | | | | | | | |
| <i>Note **Unemployment rate measures a status of the active workforce. Thus, "not seeking" and "fully retired" populations are dropped from the calculation of the unemployment rate.</i> | | | | | | | | | | | | | | | |

compared to the previous year (climbing from 1.2% to 2.5%). Meanwhile, approximately 3.0% of chemists surveyed were outside of the labor force, either through retirement (1.9%) or by choosing not to seek work (1.0%).

UNEMPLOYMENT TRENDS

Over the past year, the U.S. economy has experienced an extreme financial crisis, causing a large number of Americans to become unemployed. Data from the U.S. Bureau of Labor Statistics suggests that during the first quarter of 2009, the U.S. chemical workforce shrank by 11,300, while the overall U.S. economy lost 663,000 jobs (Voith, 2009). Aside from salaries, trends in unemployment rates can be used as an additional method to assess the workforce for chemical scientists. Figure 5 displays annual unemployment rates for chemists and chemical engineers in the workforce who were seeking employment.



During the past decade, unemployment rates reached all-time highs for chemists in 2004 (3.6%) and for chemical engineers in 2003 (6.1%), and had been gradually improving in the years following (falling to 2.3% for chemists and 2.1% for chemical engineers in 2008). In 2009, however, the unemployment rate for chemists reached a new all-time high of 3.9%, while the rate among chemical engineers reached its

third-highest recorded level (4.5%)¹. These figures do not take into account those chemists who have given up on finding work or have chosen not to work (not working not seeking). Given that 85.0% of survey respondents were primarily chemists, the reliability of the findings regarding chemical engineers may be questionable.

HEALTHCARE COVERAGE

The ACS salary survey includes questions of varying topics from year to year. The 2009 survey included some questions pertaining to healthcare coverage. The majority of participants claimed to either be enrolled in a Preferred Provider Organization (PPO; 60.6%) or a Health Maintenance Organization (HMO; 22.5%). As for medical coverage, 97.8% of employers provided medical coverage for their employees, and 97.2% provided coverage for their employees' families as well. Of those employees who were offered coverage, 90.1% reported participating in their company's healthcare plan, while 71.8% participated in family coverage. Ninety-eight percent reported that their employers paid all or part of their medical premiums (all, 14.7%; part, 83.2%).

A large majority of employers also provided dental and vision coverage for their employees. Virtually all (96.0%) of employers provided an employee dental plan and 95.2% provided a dental plan for employees' family members. Slightly less than 87% claimed to be enrolled in their companies' employee dental plans, while only 71.1% enrolled their family members. Approximately 90.0% claimed that their employers paid all (13.6%) or part (77.7%) of their dental premiums.

Eighty-eight percent of employers provided vision plans for their employees, and 86.6% provided vision plans for employees' family members. Seventy-five percent of respondents opted to enroll in the employee vision plan and 61.3% enrolled their family members. Approximately 82.0% claimed that their employers paid all (12.0%) or part (70.3%) of their vision premiums. Other kinds of company healthcare coverage included annual physicals, prescription drug programs, and wellness/fitness programs. Approximately 88.0% of respondents claimed to be enrolled in the annual physical and prescription drug program offered through their employers, while only 70.0% enrolled in their company's wellness/fitness program.

The survey found that 85.7% of respondents claimed that healthcare premiums had increased over the past five years (increased by some,

¹ According to the U.S. Bureau of Labor Statistics, the national unemployment rate for March 2009 was 8.5% (<http://data.bls.gov>).

57.5%; by a lot, 28.2%)². Overall, 82.1% of survey respondents are satisfied with their healthcare coverage and 64.7% feel that their current healthcare package is competitive. In addition, an overwhelming majority (91.4%) claimed they were neither covered by Medicare in 2008, nor had anyone in their household who was.

TECHNICAL NOTES

THE SAMPLE

Participant demographics appear in Tables 7 and 8 by degree level, field of highest degree, gender, ethnicity, and age. As shown in Table 7, the majority of participants held a Ph.D. (62.8%), majored in a field of chemistry (85.0%), were white (81.2%), and were between the ages of 30-59 (77.5%). In addition, there were almost three times as many male (73.5%) respondents compared to female (26.5%). A breakdown of field of highest degree, gender, ethnicity, and age per degree level appears in Table 8. In general terms, the majority of participants were white male chemistry Ph.D.s between the ages of 30 and 59.

The target population of the 2009 ACS Comprehensive Salary and Employment Status Survey was ACS regular members under the age of 70 who had U.S. mailing addresses and had neither student, retired, nor emeritus membership status. Volunteers were solicited from a randomized sample of 20,000 members drawn from a database consisting of ACS members meeting the above criteria.

In March 2009, an “early bird” announcement was e-mailed to all those in the sample with valid e-mail addresses, inviting them to complete the online membership survey. Two days later, a reminder was e-mailed to them. Next, a pre-notification postcard, containing a Web address for the online survey, was mailed notifying ACS members that they would soon be receiving a paper version of the survey. The printed survey questionnaires, along with alternate instructions for completing the Web version of the survey, were sent to members by first-class mail during the fourth week of March. A fifth contact consisted of a reminder postcard mailed about two weeks after the first printed mailing; a sixth was an e-mail reminder of the online survey; a seventh was another mailing of the paper survey, and an eighth was a “last chance e-mail.” Ultimately, 7,149 useable surveys were received, for a response rate of 35.8% percent.

² Chemists were asked to rate how much their healthcare premiums had changed.

| Table 7. Participant Demographics by Degree Level, Field of Highest Degree, Gender, Ethnicity, and Age (n = 7,149) | | |
|---|---------------|----------------|
| | Frequency (n) | Percentage (%) |
| Degree Level | | |
| Bachelor's | 1,377 | 19.3 |
| Master's | 1,228 | 17.2 |
| Doctorate | 4,478 | 62.8 |
| Field of Highest Degree | | |
| Chemical Engineering | 459 | 6.5 |
| Chemistry | 6,049 | 85 |
| Non-Chemistry | 606 | 8.5 |
| Gender | | |
| Male | 5,160 | 73.5 |
| Female | 1,856 | 26.5 |
| Ethnicity | | |
| American Indian | 27 | 0.4 |
| Asian | 969 | 13.9 |
| Black | 195 | 2.8 |
| White | 5,650 | 81.2 |
| Other | 116 | 1.7 |
| Age | | |
| 20-29 | 456 | 6.5 |
| 30-39 | 1,736 | 24.8 |
| 40-49 | 1,755 | 25.0 |
| 50-59 | 1,942 | 27.7 |
| 60-69 | 1,095 | 15.6 |
| 70 and older | 25 | 0.4 |

| Table 8. Participant Demographics by Field of Highest Degree, Gender, Ethnicity, and Age per Degree Level | | | |
|--|-----------------------------------|---------------------------------|----------------------------------|
| | Bachelor's (n = 1,377) | Master's (n = 1,228) | Doctorate (n = 4,478) |
| Field of Highest Degree | | | |
| Chemical Engineering | 6.9 | 7.8 | 6 |
| Chemistry | 84.6 | 72.6 | 88.7 |
| Non-Chemistry | 8.5 | 19.6 | 5.3 |
| Gender | | | |
| Male | 63.4 | 65.8 | 78.9 |
| Female | 36.6 | 34.2 | 21.1 |
| Ethnicity | | | |
| American Indian | 0.5 | 0.6 | 0.3 |
| Asian | 5.0 | 10.1 | 17.9 |
| Black | 4.1 | 2.4 | 2.5 |
| White | 88.1 | 85.1 | 77.9 |
| Other | 2.2 | 1.7 | 1.4 |
| Age | | | |
| 20-29 | 19.9 | 6.2 | 2.5 |
| 30-39 | 21.5 | 19.6 | 27.4 |
| 40-49 | 23.1 | 24.1 | 25.9 |
| 50-59 | 25.9 | 32.3 | 26.8 |
| 60-69 | 9.5 | 17.5 | 16.9 |
| 70 and older | 0.1 | 0.2 | 0.4 |

DEFINITIONS

For the purposes of the survey analysis, the following definitions were used:

Chemist: A respondent who indicated a work specialty of chemistry or biochemistry (categories 2 through 16 of Part 1, Question 3 of the questionnaire) or if a non-chemistry work specialty (categories 17 through 20 of the same question), a degree field of chemistry or biochemistry.

Chemical Engineer: A respondent who indicated a work specialty of chemical engineering (category 1 of Part 1, Question 3 of the questionnaire).

Non-chemist: A respondent whose work specialty category was other than chemistry or chemical engineering or if non-chemistry work specialty, no degree field of chemistry or biochemistry.

Academic: Pertaining to a Ph.D. working in a college or university (i.e., a private or public institution that awards a degree of associate or higher).

Unemployed: A respondent who was not employed and was seeking employment (category 4 of Part 1, Question 4 of the questionnaire). The unemployment rate was calculated to compare with the national rate by dropping those “not seeking” or “fully retired” from the labor force.

Respondents indicated their employment status, base annual salaries, and ages as of March 1, 2009. Each respondent’s place of employment (current or most recent) determines his or her geographic region. The listing of states by geographic regions follows this section.

DISCREPANCIES AMONG TABLES

Some pairs of tables contain totals that should be identical but are not. For example, two tables that represent information about Ph.D. respondents should show the same total number of Ph.D.s., but for various reasons might not. Missing response items in individual surveys generally causes this phenomenon. Not every respondent answers all questions all of the time. To illustrate, if one table groups the Ph.D.s according to specialty and another groups them according to work function, the totals will differ unless the number who did not indicate their specialty is the same number as those who did not indicate their work function.

Voith, M. (2009, April 13). Chemical jobs disappear: Even if business rebounds, layoffs may continue. *C&EN*, 87 (15), 6.