ACS Chemistry for Life™

Salaries 2011

Analysis of the American Chemical Society's 2011 Comprehensive Salary and Employment Status Survey

Prepared by:
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Data Based Insights, Inc. on behalf of the
ACS Department of Research and Member Insights

August, 2012

American Chemical Society

Salaries 2011

ANALYSIS OF THE AMERICAN CHEMICAL SOCIETY'S 2011 COMPREHENSIVE SALARY AND EMPLOYMENT STATUS SURVEY

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Available from the Department of Research and Member Insights

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ACKNOWLEDGEMENTS

This report presents detailed results of the 2011 ACS Comprehensive Salary and Employment Status Survey. The ACS Committee on Economic and Professional Affairs and its Subcommittee on Surveys planned and provided general oversight of the survey and its analysis. The committee extends its heartfelt appreciation to those who agreed to participate in this survey. The committee would also like to extend its appreciation to the development team. Gareth Edwards, senior research associate in ACS's Department of Research and Member Insights led the survey design process. Paul Nentwig and Andrew Bell at Intelliscan, Inc. performed the data collection. Steve and Clint Marchant of Data Based Insights, Inc. (an affiliate of Intelliscan) analyzed the results of the survey and prepared this report.

Gareth Edwards
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SUMMARY AND COMMENTS

Chemists' salaries are rebuilding after the 2007 – 2009 recession. In 2011, the median salary increased 4.8% from $89,000 in 2010 to $93,300 in 2011 for chemists with a bachelor's degree or higher. That figure nudges past the previous high of $93,000 in 2008. The median salary for chemical engineers in 2011 is $111,750, about 20% higher than the median for chemists.

Chemists' income from consulting is down 14%, but bonuses are about the same as they were in 2010. The proportion of chemists receiving stock options dropped from 18.0% in 2010 to 15.1% in 2011. Unemployment among ACS Chemists looking for work jumped from 2.3% in 2008 to 4.6% in 2011, the highest it has been since ACS began keeping records in 1972. Unemployment among chemical engineers was 4.5% in 2011.

SALARIES

ALL CHEMISTS

So far, 2010 has turned out to be the low point of the global recession for American chemists' salaries. In 2011, full-time chemists median salaries rebounded 4.8% overall. Median salaries for chemists with **master's** degrees increased 6.3%, an increment of $5,000, from $80,000 to $85,000. Inflation was 2.7% (after rounding from 2.682%), leaving chemists with master's degrees a net increase in buying power of 3.6%. **PhD** chemists also did well as their median salaries bounced back above $100,000, giving them a 4.1% gain in paycheck dollars and a 1.4% gain in real dollars. The rebound for holders of **bachelor's** degrees was not as robust with a gain of 3.1% in paycheck dollars and a real dollar gain of 0.4%.

Table 1. Change in All Chemist's Salaries 2010-2011

	Median Salary in Current Dollars		% Change from 2010	
	2010	2011	Current Dollars	Constant Dollars*
All Chemists	$89,000	$93,300	+4.8%	+2.1%
Bachelor's	69,825	72,000	+3.1%	+0.4%
Master's	80,000	85,000	+6.3%	+3.6%
Doctorate	98,000	102,000	+4.1%	+1.4%

* Rate of inflation = 2.7%

COMPARATIVE SALARIES FOR CHEMISTS AND CHEMICAL ENGINEERS

Median annual salaries for full-time chemical engineers tend to be about 20% (i.e., 19.8%) higher than median salaries for full-time chemists in 2011, on average. Chemical Engineers with bachelor's degrees and those with academic positions tend to have median salaries that are about 1½ times higher than the median salaries of their counterparts in chemistry – i.e., +48.6% and +53.6%, respectively. Percent differences in median salaries between chemists and chemical engineers are higher among younger CEs than among older CEs. However, the gap in paycheck dollars remains roughly the same across the range of age groups – from a low of $14K to a high of $26K.

Table 2. Median Salaries for Chemists and Chemical Engineers 2011

	Chemists	Chemical Engineers	Percent Difference
All Chemists	$93,300	$111,750	+19.8%
Degree			
Bachelor's	72,000	107,000	+48.6%
Master's	85,000	104,000	+22.4%
Doctorate	102,000	120,000	+17.6%
Employer			
Industry	105,000	115,123	+9.6%
Government	103,000	114,850	+11.5%
Academic	70,300	108,000	+53.6%
Age			
20-29	50,875	68,000	+33.7%
30-39	76,250	98,500	+29.2%
40-49	95,000	109,000	+14.7%
50-59	108,000	134,260	+24.3%
60-69	105,000	124,000	+18.1%

CHEMISTS BY EMPLOYMENT SECTOR

The next sections of this report will break out chemists median salaries by the following employment sectors: Industry, Government, and Academia. A comparison of change from last year among the three sectors is shown in **Table 3**. Overall, median salaries increased 4.6% on average in current dollars and 1.9% in real dollars. Government chemistry employees lead the way receiving a 9.1% increase in median paychecks, on average.

Table 3. Chemists' Median Salaries by Employment Sector 2010-2011

	Median Salary in Current Dollars		% Change from 2011	
	2010	2011	Current Dollars	Constant Dollars*
All Chemists	$89,000	$93,120	+4.6%	+1.9%
Industry	100,000	105,000	+5.0%	+2.3%
Government	94,400	103,000	+9.1%	+6.4%
Academia	68,000	70,300	+3.4%	+0.7%

* Rate of inflation = 2.7%

INDUSTRIAL / PRIVATE SECTOR CHEMISTS

Full-time chemists working for corporations and businesses in the private sector tend to earn higher salaries than their counterparts in academia. **Table 4** presents changes in median salaries from 2010 to 2011 for industrial chemists by their degree of educational attainment. For example, the median current dollar private sector salary for all chemistry degree holders in 2010 was $100,000. In 2011 the median salary moved up to $105,000 for a $5,000 gain. However, inflation reduced the real gain by $2,700, leaving a net increase in real spending dollars of $2,300, or the equivalent of a net salary of $102,300 in 2010 dollars. Of course, chemists will pay taxes on the $5,000 increase.

Table 4. Change in Industrial/Private Sector Chemist's Salaries 2010-2011

	Median Salary in Current Dollars		% Change from 2010	
	2010	2011	Current Dollars	Constant Dollars*
All Chemists	$100,000	$105,000	+5.0%	+2.3%
Bachelor's	72,000	73,700	+2.4%	-0.3%
Master's	86,300	93,900	+8.8%	+6.1%
Doctorate	114,000	120,000	+5.3%	+2.6%

* Rate of inflation = 2.7%

Industrial chemists with a bachelor's degree in Table 4 received the lowest private sector salary increase in 2011. They had an increase of 2.4% in current dollars, and a net loss of 0.3% in real dollars after inflation. In contrast, chemists with master's degrees did quite well with an 8.8% increase in paycheck dollars and a 6.1% increase in real dollars after discounting for inflation. Those with doctorate degrees had a 5.3% gain in current dollars and a still welcome 2.6% gain in real dollars.

Tables 5a and 5b assess pay differences by gender among full-time industrial chemists. Table 5a shows that median salaries rose 4.3% for male chemists and 5.9% for female chemists from March 2010 to March 2011. Men with Master's degrees and doctorates enjoyed increases in median salaries of 8.7% and 6.0%, respectively. Women, on the other hand, received their largest increase in median salaries (6.7%) at the bachelor's level.

Table 5a. Male and Female Full-Time ACS Industrial Chemists' Salaries 2010 & 2011

	Men			Women		
	2010	2011	% Change	2010	2011	% Change
All Degrees	$104,500	$109,000	+4.3%	$85,000	$90,000	+5.9%
Bachelor's	77,000	78,600	+2.1%	63,000	67,210	+6.7%
Master's	92,000	100,000	+8.7%	78,000	79,762	+2.3%
Doctorate	116,000	123,000	+6.0%	105,800	108,000	+2.1%

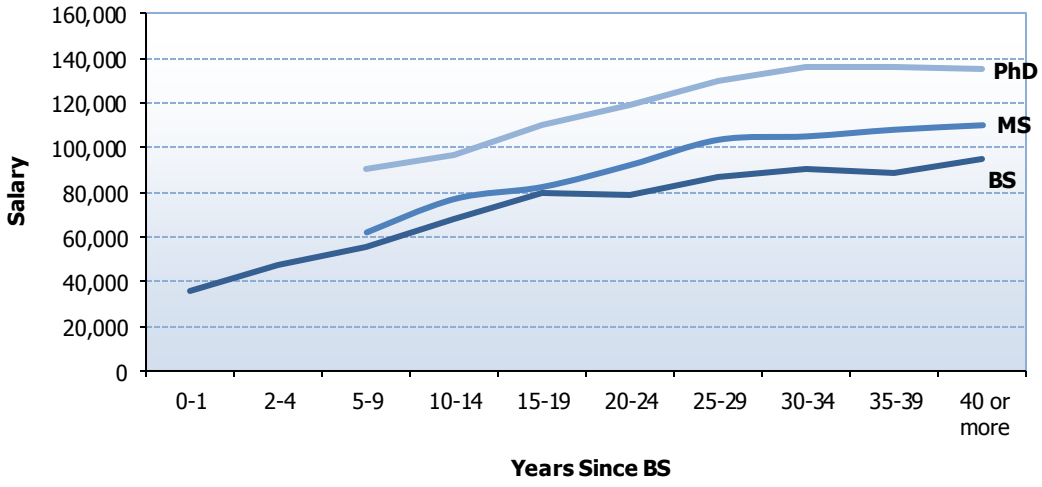
Table 5b shows that median salaries for male chemists were 18.7% higher than they were for female chemists working in private industry in 2010. The difference dropped 1.3 percentage points in 2011 to 17.4%.

Table 5b. Male and Female Full-Time ACS Industrial Chemists' Salaries 2010 & 2011

	2010			2011		
	Men	Women	Difference	Men	Women	Difference
All Degrees	$104,500	$85,000	-18.7%	$109,000	$90,000	-17.4%
Bachelor's	77,000	63,000	-18.2%	78,600	67,210	-14.5%
Master's	92,000	78,000	-15.2%	100,000	79,762	-20.2%
Doctorate	116,000	105,800	-8.8%	123,000	108,000	-12.2%

Putting overall median salaries aside, salaries for most people tend to increase over the years. This is particularly true for people who remain in a particular line of work where they gain knowledge and experience over time. **Figure 3** shows how salary increases across the career path of chemists with industrial or private sector jobs. The chart shows how salaries increase over time by highest degree level from the date each cohort received their bachelor's degree.

Figure 3: 2011 Industrial Chemists' Salaries by Years Since Receiving their BS Degree



Comparative analysis begins with the period 5-9 years after receiving a **B.S. degree**, where sample sizes for all 3 degree holders are large enough to be representative. In 2011, chemists with bachelor's degrees who have been working 5 to 9 years are likely to receive annual salaries in the neighborhood of $55,500. Their counterparts who have been working 40 or more years are more likely to be receiving annual salaries in the neighborhood of $94,800, an increase of 71% over 30 years.

In years 5 to 9, full-time private sector employees with a **M.S. degree** are likely to be making about $62,000 a year. Their salary is likely to grow over the next 30 years to about $110,000 in 2011 dollars, an increase of 77%.

Five to 9 after receiving their BS.degree, **PhDs**, may expect to make a median salary of around $90,000. After 20 more years (i.e., year 30) they may expect to earn a median salary of around $136,000, an increase of 51%. Using 2011 data, they may expect their salary to level off over years 30 to 40.

GOVERNMENT CHEMISTS

According to a line chart in a BLS presentation titled Current Employment Statistics Highlights July 2012 published on August 3, 2012, government employment (federal, state and local) peaked in March 2010, or there about, and has been declining ever since. **Table 6** shows that median salaries for chemists working for government rose 9.1% from March 2010 to March 2011. The one year increase was also 9.1% for chemists with bachelor's degrees and 15.6% for chemists with master's degrees. In a year when government began laying off thousands of employees, these salary increases suggest that job security among government chemists is quite positive relative to many other government job categories.

Table 6. Change in Full-Time Government Chemist's Salaries 2010-2011

	Median Salary in Current Dollars		% Change from 2010	
	2010	2011	Current Dollars	Constant Dollars*
All Chemists	$94,400	$103,000	+9.1%	+6.4%
Bachelor's	66,000	72,000	+9.1%	+6.4%
Master's	82,000	94,800	+15.6%	+12.9%
Doctorate	109,000	115,871	+6.3%	+3.6%

* Rate of inflation = 2.7%

ACADEMIC CHEMISTS

Academic chemists listed below refer to:

- Mostly PhDs with a specialty in chemistry
- either full professors, associate professors, or assistant professors
- who work at a college or university (excluding medical schools)
- and, have either a 9-10 month or an 11 to 12 month contract.

Table 7 below breaks out median salaries for academic chemists by faculty rank and length of contract.

Table 7. Change in Academic Chemist's Salaries 2010-2011 (by rank/contract length)

	Median Salary in Current Dollars		% Change from 2010	
	2010	2011	Current Dollars	Constant Dollars*
Full Professors 9/10 mos.	$92,878	$96,750	+4.2%	+1.5%
Full Professors 11/12 mos.	112,015	125,500	+12.0%	+9.3%
Associate Professors 9/10 mos.	65,000	68,618	+5.6%	+2.9%
Associate Professors 11/12 mos.	74,911	90,000	+20.1%	+17.4%
Assistant Professors 9/10 mos.	55,000	59,700	+8.5%	+5.8%
Assistant Professors 11/12 mos.	56,000	64,700	+15.5%	+12.8%

* Rate of inflation = 2.7%

Academic chemists' appear to be in strong demand. During recessions many unemployed people go back to school, which pushes up enrollments. According to the BLS, employment opportunities at for-profit institutions are expected to grow through 2020. However, public colleges and universities subject to government budgets and deficits are likely to see some lay-offs.

The salaries for professors in 2010 are based on a census of ACS members so the samples are large and quite reliable. In contrast, the median salaries for professors with 11 to 12 month contracts in 2011 are quite small and may be unreliable. Therefore, the significant salary increases shown above for professors with 11 to 12 month contracts in 2011 should be interpreted with caution.

The samples for professors with 9 to 10 month contracts for both years are fairly robust. The table shows that their salary increases are consistent with other employment sectors. From 2010 to 2011, the median salary for full professors with a 9 to 10 month contract increased 4.2%, while the median salary for associate professors' grew 5.6% and the median for associate professor grew by 8.5%.

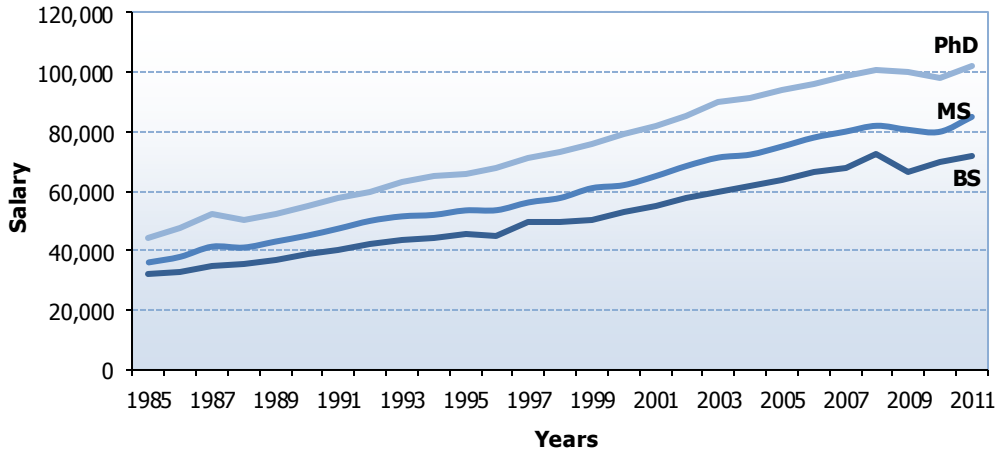
OTHER FACTORS INFLUENCING SALARY

Although the level of education, employment sector, and length of experience may be the most influential correlates of salary, there are a variety of other factors that should also be considered. Some other factors influencing salary are type of work, work specialty, geographic region, and gender.

TRENDS IN CHEMISTS' SALARIES

The median salaries of chemists have increased by varying degrees from year to year since the ACS survey and analyses began in 1985. **Figure 2a** displays the trend in chemists' salaries each year in current paycheck dollars by highest degree held. Over the last 26 years, chemists' salaries by this measure have more than doubled.

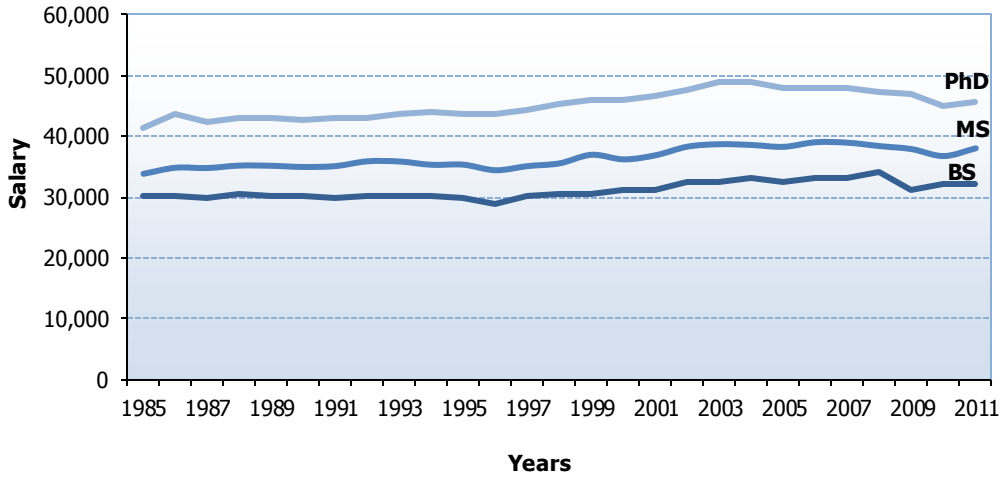
Figure 2a: Chemists' Median Salaries in Current Dollars



Chemist's salaries grew about 5% per year on average from 1985 to a near term high in 2008. Due to the international recession, chemist's salaries dipped in 2009 and 2010, but rebounded back to about 2008 levels in 2011. Hopefully the negative impact of the recession will dissipate and salary growth will resume.

Figure 2a depicts a growing divergence in the salaries for different degree holders. **Figure 2b** brings that divergence back to reality by showing that the buying power of salaries in constant 1984 dollars has not changed much at all across the years.

Figure 2b: Chemists' Median Salaries in Constant (1984) Dollars



By converting salaries to constant 1984 dollars, median salaries for chemists (or anyone else) have hardly moved in terms of what you can buy for your money as measured by the Consumer Price Index (CPI). In 1985 the median salary for a chemist with a bachelor's degree was $30,075. In constant 1984 dollars, the median salary for chemists with a B.S degree 26 years later in 2011 has grown to $32,220 -- an increase in real terms of $83 per year, on average. The median salary for a chemist with a master's degree went from $33,835 in 1985 to $38,037 in 2011, or an increase in real value of $162 per year on average. For PhD's the increase went from $41,353 in 1985 to $45,644 in 2011, or $165 in real buying power per year, on average.

Keep in mind that the *median* represents the salary in the middle of the range. Most chemists reading this who were working in 1985 were probably just starting out and were most likely making a salary in the bottom quartile. Today, those same chemists are likely to be making salaries in the top quartile and they have accumulated a substantial gain in buying power even in 1984 constant dollar terms.

NON-SALARY INCOME

Salaries alone do not provide the total picture of the earning potential for chemists. This section examines additional income, such as consulting, bonuses, and company stock options. That is, some chemists earn additional money by engaging in consulting work outside of their primary employment. Meanwhile, there are a substantial number of employers providing yearly bonuses and/or company stock options in order to supplement their chemists' salaries.

CONSULTING

In the 2011 ACS survey, approximately 11.3% of chemists reported being engaged in at least some consulting work during 2010. A breakdown of the details are presented in **Table 8**.

Table 8. Consulting (Amounts received in 2010)

	% Consulting	Hourly Rate	Median Income
All Chemists	11.3%	$125	$6,000
Degree			
Bachelor's	4.3%	$104	$35,000
Master's	8.1%	$100	$7,075
Doctorate	13.8%	$130	$5,500
Employer			
Industry	5.9%	$130	$10,000
Government	3.4%	$125	$5,000
College or University	18.7%	$100	$4,000
Gender			
Males	12.4%	$128	$7,000
Females	8.1%	$105	$5,000
Age			
20-29	1.7%	$80	$3,000
30-39	7.2%	$80	$2,500
40-49	10.6%	$100	$5,000
50-59	12.6%	$150	$8,200
60-69	19.3%	$150	$15,000

Income from consulting was down 14.3% in 2010. An all chemist median income of $7,000 in 2009 (reported in the 2010 survey) declined to a median income of $6,000 in 2010 as reported in this table.

Only 4.3% of chemists with bachelor's degrees participated in consulting, but their reported median income from this work was a relatively high $35,000.

In contrast, 13.8% of PhDs do at least some consulting, and their median income was a more modest $5,500 in 2010.

As consultants increase in age, so does their hourly rate and consulting income. In 2010 consultants under age 40 charged a median rate of $80 an hour and made a median income from consulting of $3,000 or less. In contrast, chemists over 50 charged a median rate of $150 an hour and enjoyed significantly higher supplemental incomes from consulting.

BONUSES

Bonuses reported in 2011 were received in 2010. Among all survey respondents with a work specialization in chemistry, 47.3% reported being eligible to receive a bonus. Of those eligible, 91.9% did receive a bonus and the median value was $9,966. Degree level, sector of employment, gender, and age all appeared to be factors in determining bonus amounts.

Table 9. Chemist Bonuses in 2011 (Amounts received in 2010)

	% Eligible for Bonus	% of Eligible Receiving Bonus	Median Bonus
All Respondents	47.3%	91.9%	$9,966
Degree			
Bachelor's	59.9%	94.5%	$5,000
Master's	51.7%	93.3%	$7,000
Doctorate	43.2%	90.7%	$12,000
Employer			
Industry	72.6%	93.1%	$10,080
Government	43.1%	89.0%	$2,500
College or University	8.0%	80.9%	$2,000
Gender			
Male	49.8%	91.2%	$10,000
Female	40.8%	94.2%	$6,000
Age			
20-29	40.6%	93.5%	$2,500
30-39	42.2%	92.8%	$6,545
40-49	49.7%	92.1%	$10,000
50-59	53.2%	91.2%	$12,000
60-69	40.4%	92.2%	$9,400

Note: This year's respondents were asked for the previous year's bonuses.

Compared with master's and PhD recipients, chemists with bachelor's degrees were more likely to be eligible for bonuses (59.9%), and 94.35% 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 (51.7%) were eligible for bonuses. Of those eligible, 93.3% received bonuses and earned an additional median income of $7,000. Although Ph.D. recipients reported the smallest level of bonus eligibility (43.2%) and receipt (90.7%), they were awarded the largest amount (a median value of $12,000).

In terms of employment sector, college and university chemists were the least likely to be eligible for a bonus (8.0%). Of those eligible, 80.9% received a bonus and the median value was $2,000.

Government employees fall in between industrial and academic employees when it comes to being eligible for bonuses. In 2011, 43.1% of government employees reported being eligible and 80.9% of the 43.1% received a bonus. The median value of the bonus was $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 industrial and corporate positions reported the greatest levels of bonus eligibility (72.6%), receipt (93.1%), and bonus award amounts (median value of $10,080).

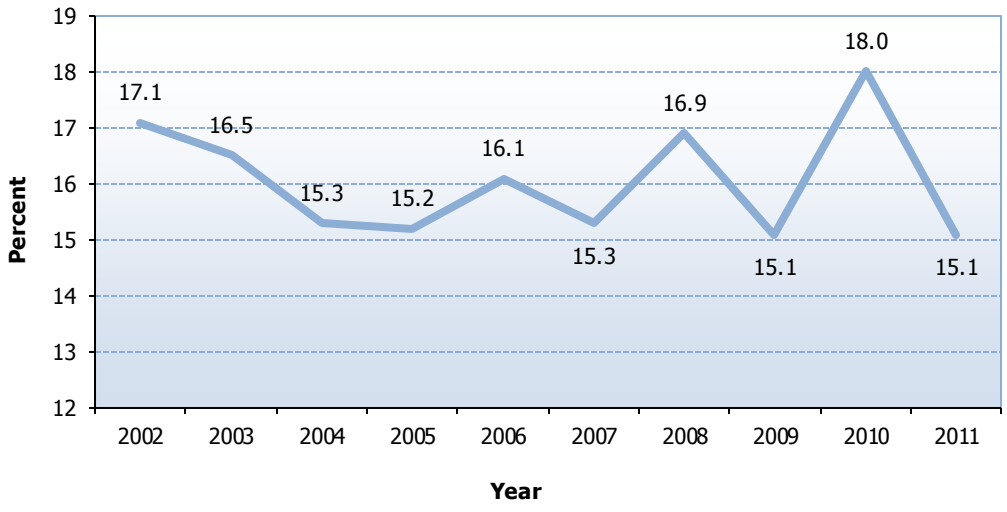
Age is another factor that influences bonuses. As the chemist's age or experience increases, so does the amount of the bonus awarded. Chemists in their twenties report 40.6% eligibility and typically earn a median bonus amount of $2,500. Chemists in their fifties report receiving a bonus with a median value of $12,000. After age 59, fewer chemists are eligible for bonuses (40.4%) and the award amounts decrease (median value is $9,400).

Men typically report higher eligibility rates and greater award amounts than women. Slightly less than half (49.8%) of the ACS men surveyed were eligible to receive a bonus, and 91.2% of those eligible did receive a bonus with the median value coming in at $10,000. Female chemists had an eligibility rate of 40.8%, with 94.2% of them awarded a bonus where the median amount was $6,000.

STOCK AS PART OF PROFESSIONAL INCOME

Another way employers compensate their employees is by offering them company stock. **Figure 3** shows the proportion of ACS chemists offered stock as part of their compensation since the 2002 survey, when ACS began asking members to report stock options. From 2002 through 2011, the proportion of ACS members receiving stock options from their employers was bounded by a range from 15.1% to 18.0%.

Figure 3: Percentage of Chemists Reporting Stock Compensation



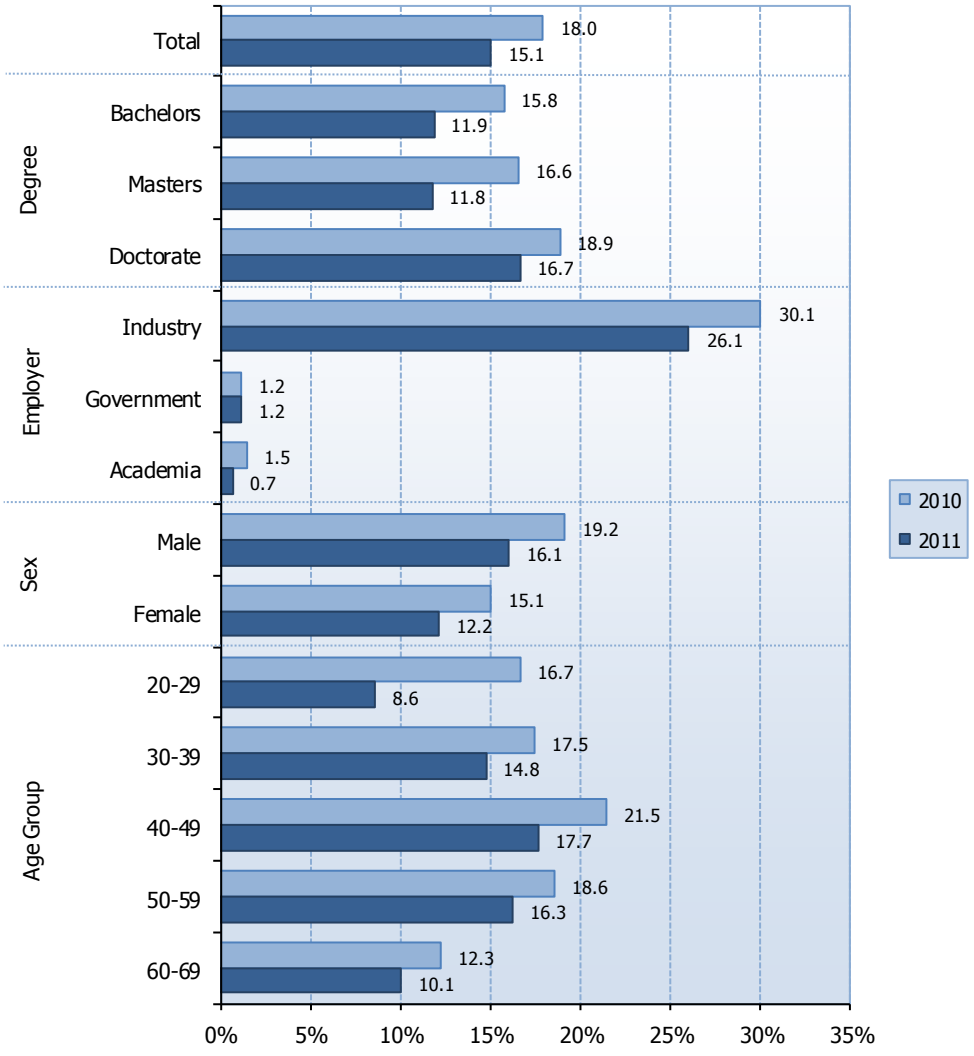
Last year, 2010, was the peak year where 18.0% of members were given stock as part of their annual compensation. The peak year was flanked on either side by years where the smallest proportion of members were given stock – that is, eligibility dropped to 15.1% of members in both 2009 and 2011. A review at Figure 3 suggests that the consistency of employers offering stock options seems to be becoming more volatile along with the stock market itself.

Figure 4 shows the percentage of chemists who received stock options in 2010 and 2011 by highest degree of education attainment, sector of employment, gender, and age group. The two total bars at the top of the chart repeat the last two data points in Figure 3, reflecting a drop from 18.0% to 15.1% of members receiving company stock.

Doctorate recipients (16.7% in 2011) were slightly more likely to receive stock options as part of their overall compensation compared with holders of bachelor's and master's degrees (11.9% and 11.8%, respectively). Those chemists working in industry were the most likely group to receive stock options (26.1% in 2011). In contrast, their

counterparts in government (1.2%) and academia (0.7%) were not very likely to receive stock as a method of compensation.

Figure 6: Receipt of Stock as Part of Professional Income for Chemists in Percent (2010-2011)



EMPLOYMENT AND UNEMPLOYMENT

EMPLOYMENT STATUS

As shown in **Table 10**, full-time member employment dipped to 84.3% in 2010 – the lowest point in the table -- then rebounded 2.6 percentage points to 86.9% in 2011. Despite the improvement in full-time employment, unemployment also increased 0.8 points among unemployed chemists seeking a job (from 3.6% to 4.4%) and by the BLS labor force unemployment calculation (from 3.8% to 4.6%), which excludes people who are "not working and not seeking" and those who are fully retired.

Table 10a. Unemployment Status of Chemists (Percentages by Year)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Full Time	88.8	89.4	90.5	89.8	89.4	88.7	91.8	88.3	87.9
Part Time	2.7	2.7	2.1	2.4	2.6	2.9	2.4	2.8	2.9
Post Doc	3.5	2.7	2.3	2.2	2.0	2.0	1.3	1.4	1.3
Not Employed									
Seeking	2.5	2.9	1.9	2.3	2.2	2.9	1.5	3.1	3.3
Not Seeking	2.6	2.3	0.8	0.9	1.3	1.7	1.4	1.5	1.7
Fully Retired*	--	--	2.3	2.4	2.5	2.8	1.6	2.8	2.9
Overall Unemployment**	2.6	3.0	2.0	2.3	2.3	3.0	1.5	3.3	3.5

Table 10b. Unemployment Status of Chemists (Percentage by Year -- Continued)

	2004	2005	2006	2007	2008	2009	2010	2011
Full Time	86.7	86.0	86.9	87.4	86.9	87.7	84.3	86.9
Part Time	3.4	3.9	3.3	3.4	3.6	3.1	3.7	3.7
Post Doc	1.8	1.9	2.2	1.6	1.2	2.5	3.8	1.7
Not Employed								
Seeking	3.4	2.9	2.9	2.3	2.2	3.8	3.6	4.4
Not Seeking	1.4	1.9	1.7	1.7	1.5	1.0	2.0	1.3
Fully Retired*	3.2	3.4	2.7	3.6	4.6	1.9	2.6	2.0
Overall Unemployment**	3.6	3.1	3.0	2.4	2.3	4.0	3.8	4.6

* Note: Retirement status was added in 1997

** 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.

UNEMPLOYMENT STATUS

Unemployment rates among chemists and chemical engineers are fairly similar. However, because annual datasets for CEs are based on smaller samples, the findings are more erratic as shown in **Figure 7.** Since 1985, the overall trend in unemployment amongst chemists and CEs has been increasing. In the late 1980's both areas of specialization had unemployment rates around 1%. Although the transition was not smooth, the norm for unemployment grew to and stayed above 3% from 2002 through 2006 for chemists. For CEs, unemployment spiked to 6.1% during this period. Then unemployment among both specialties declined to the mid-2s, until the 2007-2009 recession brought both of them back up to the high-3s and the mid-4s.

Figure 7: Unemployment Rates for Chemists and Chemical Engineers 1985-2011

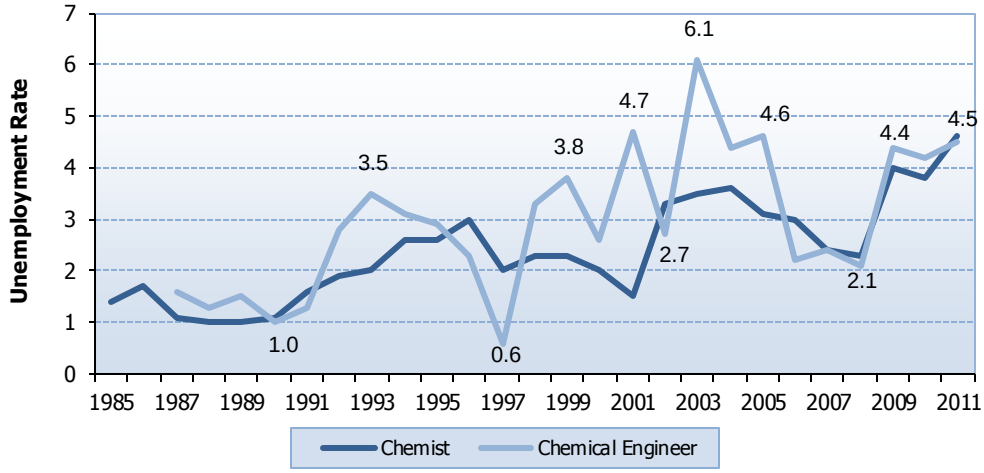
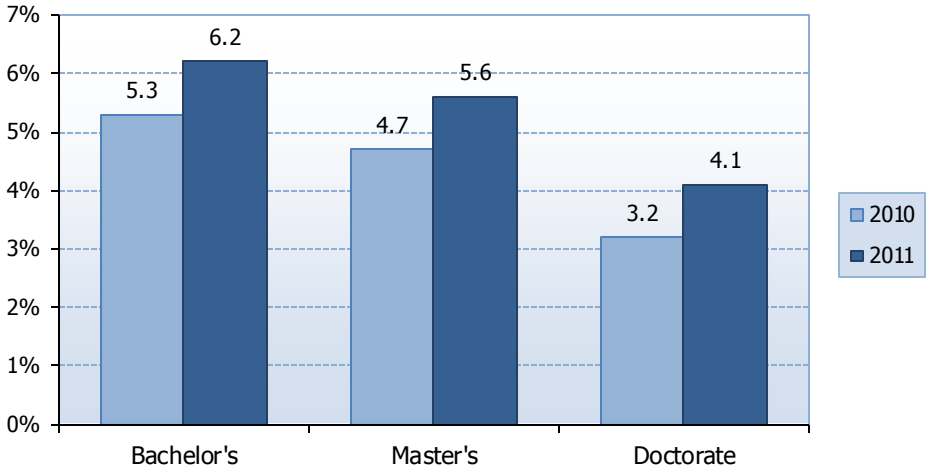


Figure 8 shows that the higher the education level, the less likely members are to be unemployed. For example, in 2011 among ACS members with a bachelor's degree, 6.2% were unemployed and seeking work. Among members with a master's degree or a PhD, 5.6% and 4.1% of members, respectively, were unemployed and seeking work. Note, individuals "not seeking" and "fully retired" were not included in these unemployment calculations.

Figure 8: Unemployment Rates by Degree



FRINGE BENEFITS

Each year the ACS salary survey explores an ad hoc topic of interest to members. In 2011 the topic is **fringe benefits**. All participants were asked to indicate the types of benefits available to them in the areas of *taking or scheduling leave from work, retirement and savings programs,* and *professional development benefits.* The table below is a follow-up to the benefits questions that appeared in the 1998 and 2006 Salary Surveys. The responses for 2011 shown below are designed to highlight the differences among employees working for:

- Manufacturing and Industrial Companies
- Non-Manufacturing Companies
- Federal, State and Local Government
- High Schools
- Colleges and Universities

Table 11. Employee Fringe Benefits

% of respondents answering "Yes" these benefits are available to me	Manufacturing/ Industry	Non-Manufacturing	Government	High School	College/ University	2011 All	2006 All	1998 All
Paid Leave								
Holiday	99%	97%	100%	74%	77%	91%	96%	97%
Vacation	99	97	100	53	62	86	93	93
Sick Leave	94	89	98	97	83	90	93	94
Family Sick Leave	68	61	87	76	63	67	72	67
Newborn Leave	71	59	72	68	65	68	74	68
Funeral Leave	90	81	78	88	60	79	86	87
Jury Duty Leave	93	84	91	83	70	84	91	92
Retirement/Savings								
Defined Contribution	96	91	89	82	92	93	93	91
Stock Ownership	53	34	3	0	1	31	38	46
Employer Matching Savings	80	57	68	25	48	65	72	70
Profit Sharing	32	21	2	1	0	18	27	33
Stock Options	40	33	3	0	1	24	33	34
Flexible Spending Accounts	90	80	84	57	77	83	81	59
Employer Defined Pension	49	23	80	68	47	48	58	nm
Professional Development								
College Tuition Reimbursement	75	58	53	51	62	66	74	77
Diversity Training	61	35	75	47	61	58	42	34
Education Leave	26	19	30	36	38	29	31	35
In-House Training	84	66	90	81	71	78	80	80
Outside Training	87	76	88	81	62	78	82	85
Professional Association Dues	79	65	30	33	30	58	62	60
Sabbatical Leave	11	9	19	34	73	32	29	28
Travel to meetings	88	82	88	48	80	84	88	89
Other Programs								
Work From Home	47	49	50	1	48	47	nm	nm
Telecommuting	36	39	49	0	30	35	nm	nm
Flexible Hours	80	78	82	6	78	77	69	64
Compressed Schedule	22	25	56	3	28	27	nm	nm

nm = not meaningful. **Source:** ACS salary surveys 1998, 2006 and 2011.

TECHNICAL NOTES

THE SAMPLE

Participating member demographics appear in **Tables 12a and 12b** by degree level, field of highest degree, gender, ethnicity, and age. Table 12a shows that the majority of participants held a doctorate degree (65.4%), majored in a field of chemistry (85.8%), were white (84.6%), and were between the ages of 30-59 (79.1%). In addition, 7 in 10 respondents were males (72.5%) compared with 3 in 10 females (27.5%). A breakdown by field of highest degree, gender, ethnicity, and age per degree level appears in Table 12b. In general terms, the majority of participants were white male chemistry PhDs between the ages of 30 and 59.

Table 12a. Demographics

	Number	Percent
Highest Degree		
Bachelor's	1,219	17.4%
Master's	1,214	17.3%
Doctorate	4,589	65.4%
Field of Highest Degree		
Chemical Engineering	404	5.7%
Chemistry	6,061	85.8%
Non-Chemistry	599	8.5%
Gender		
Male	4,954	72.5%
Female	1,882	27.5%
Ethnicity		
American Indian	14	0.2%
Asian	667	9.8%
Black	156	2.3%
White	5,732	84.6%
Other	117	1.7%
Age		
20-29	290	4.2%
30-39	1,438	21.0%
40-49	1,815	26.5%
50-59	2,158	31.6%
60-69	1,136	16.6%

The target population of the ACS Comprehensive Salary and Employment Status Survey is ACS regular members under the age of 70 who have U.S. mailing addresses and have 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 2011, 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, **7,256** useable surveys were received, for a response rate of **36.3%** percent.

Table 12b. Demographics by Degree

	Bachelors	Masters	Doctorate
Field of Highest Degree			
Chemical Engineering	8.3%	4.9%	5.3%
Chemistry	83.4%	73.1%	90.4%
Non-Chemistry	8.3%	22.0%	4.3%
Gender			
Male	66.7%	64.6%	76.2%
Female	33.3%	35.4%	23.8%
Ethnicity			
American Indian	0.3%	0.1%	0.2%
Asian	3.8%	6.1%	12.5%
Black	2.6%	2.6%	2.1%
White	90.2%	88.4%	82.2%
Other	1.4%	1.4%	1.9%
Age			
20-29	14.1%	5.3%	1.4%
30-39	19.3%	17.3%	22.5%
40-49	23.0%	22.4%	28.6%
50-59	30.6%	37.7%	30.2%
60-69	13.0%	17.3%	17.2%

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 17 of Part 1, Question 3 of the questionnaire) or if a non-chemistry work specialty (categories 18 through 21 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, 2011. 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 PhDs, 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 PhDs 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.