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# Salaries 2012

Analysis of the American Chemical Society's 2012 Comprehensive Salary and Employment Status Survey

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ACS Department of Research and Member Insights*

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**American Chemical Society**

# Salaries 2012

## ANALYSIS OF THE AMERICAN CHEMICAL SOCIETY'S 2012 COMPREHENSIVE SALARY AND EMPLOYMENT STATUS SURVEY

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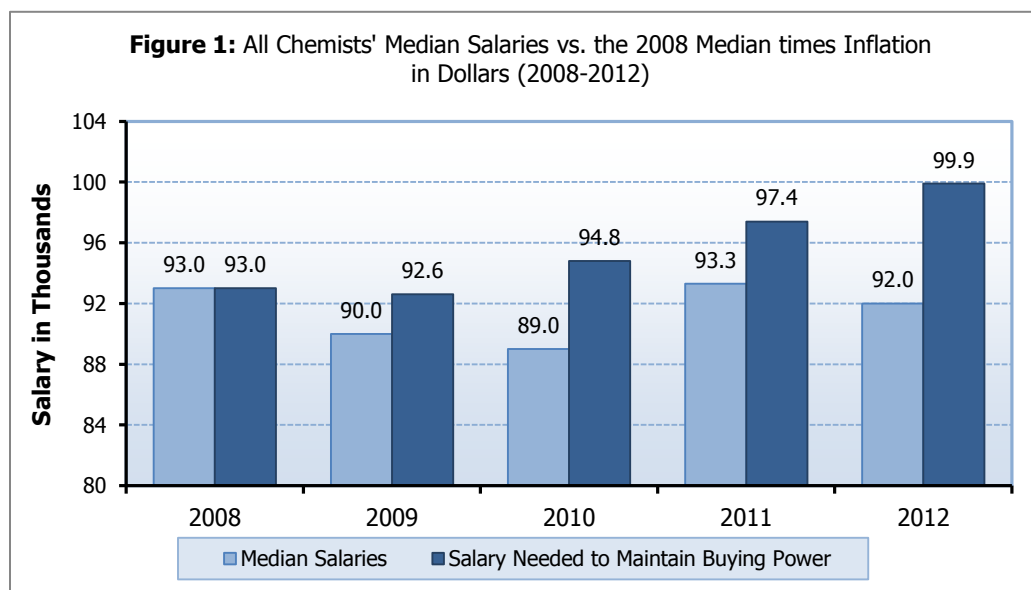
## ACKNOWLEDGEMENTS

This report presents detailed results of the 2012 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  
Department of Research and  
Member Insights

## PERSPECTIVE

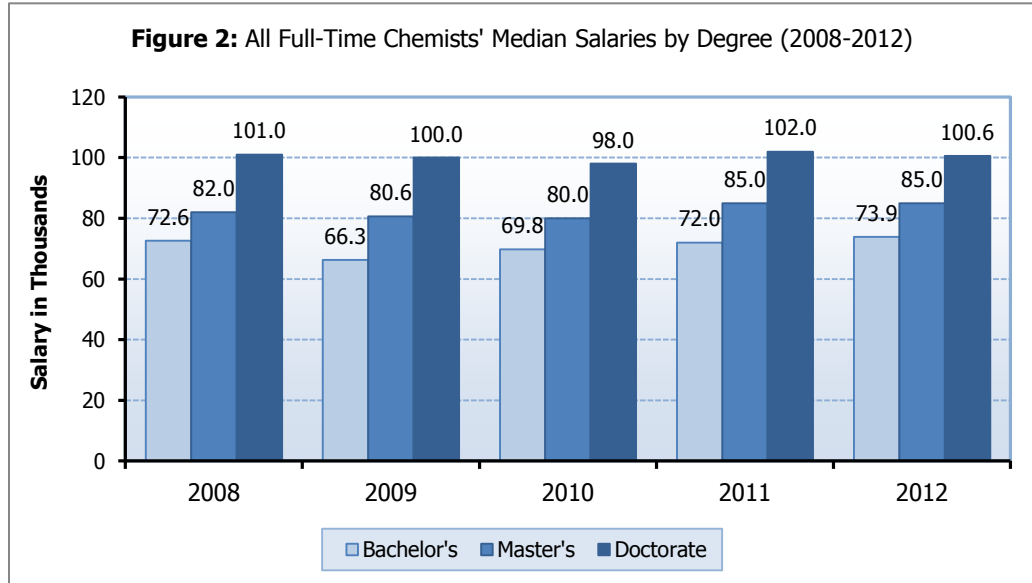
Median salaries for American chemists have increased just about every year in current dollars from 1985 through 2008. An international recession began in December 2007, and full-time chemists' median salaries hit their pre-recession high of \$93,000 as of March 1, 2008. The light blue bars in **Figure 1** show chemists' median salaries from 2008 through 2012 as reported in the annual ACS Comprehensive Salary and Employment Survey. The light blue bars dipped in 2009 and 2010, and then recovered. The dark blue show the salaries chemists would need to have received each year to keep up with inflation and be able to buy what \$93,000 would buy in 2008. That is, the average chemist would need a salary of \$99,900 in 2012 to buy what \$93,000 was able to buy in 2008 – an increase of 7.4% over four years or an addition of \$6,900.



**Figure 2** shows that during the 4-year period from 2008 to 2012, salaries for chemists with **bachelor's** degrees were hit the hardest. Starting with a current dollar median salary of \$72,600 in 2008, the median declined to \$66,252 in 2009 before rebounding to \$73,850 in 2012. To buy as much as \$72,600 would buy in 2008; a chemist would need to receive a salary of \$77,975 in 2012. The median salary for chemists with bachelor degrees in 2012 is \$73,850, which represents a loss of \$4,125 (-5.3%) in buying power since 2008.

Current (paycheck) dollar salaries for chemists with **master's** degrees remained in a range from \$80,000 to \$85,000 between 2008 and 2012. Median salaries for chemists with **PhDs** have been trying to break through and stay above a \$100,000 ceiling. To keep pace with inflation, a chemist with a master's degree making the median wage of \$82,000 in 2008 would need to receive \$88,068 in 2012. A PhD receiving the

2008 median of \$101,000 would need to receive \$108,475 in 2012 to retain the buying power he or she had in 2008.



## SUMMARY AND COMMENTS

Chemists have weathered the 2007 – 2009 recession. In 2012, chemists' salaries are back to pre-recession levels in current paycheck dollars. Income from consulting is down, but bonuses are about the same as last year. The proportion of chemists receiving stock options is down, but that may be because companies are hesitant to offer stock in a market that is volatile and risky.

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 started measuring it in 1972. It then came back down to 4.2% in 2012 (the second highest it has been). Unemployment is 6.2% among chemists with bachelor's degrees, but has come down to 5.2% and 3.6% among chemists with master's degrees and PhDs, respectively.

Full-time employment was at 86.9% in 2008, the same in 2011, but is up to 87.4% in 2012. In the 2012 ACS survey, 65% members employed full-time think their workplace is understaffed, 23% think the employment outlook will be better next year, and 31% expect staffing to increase in 2013.

## SALARIES

### ALL CHEMISTS

**Table 1.** Change in All Full-Time Chemist's Salaries 2011-2012

	Median Salary in Current Dollars		% Change from 2011	
	2011	2012	Current Dollars	Constant Dollars*
All Chemists	93,300	92,000	-1.4%	-4.1%
Bachelor's	72,000	73,850	+2.6%	-0.1%
Master's	85,000	85,000	0.0%	-2.7%
Doctorate	102,000	100,613	-1.4%	-4.1%

\* Rate of inflation = 2.7%

Shifting the focus to more recent changes from 2011 to 2012, median salaries for chemists with bachelor's degrees increased 2.6% (from \$72,000 in 2011 to \$73,850 in 2012). Due to an inflation rate of 2.7%, real buying power based on the median decreased by 0.1%. Chemists with masters' degrees saw their median salaries stay about the same as last year in current dollars, \$85,000 in both years. The result is a loss in buying power based on the U.S. Bureau of Labor Statistics' Consumer Price Index of 2.7% (actually 2.651%). During this time period, chemists with PhDs' salaries lost ground as the median dropped from



\$102,000 to \$100,613 for a current dollar loss of -1.4% and a loss in real value of -4.1%.

**SALARIES FOR CHEMISTS  
AND CHEMICAL ENGINEERS**

When comparing median annual salaries for full-time chemists with chemical engineers, chemical engineers command a 24% premium in 2012. Chemical Engineers with master's degrees appear to be in strong demand with annual median salaries that are 41% higher, on average, than chemists with master's degrees.

**Table 2.** Median Salaries for Chemists and Chemical Engineers 2012

	Chemists	Chemical Engineers	Percent Difference
<b>All Chemists</b>	\$92,000	\$114,000	+23.9%
<b>Degree</b>			
Bachelor's	73,850	93,000	+25.9%
Master's	85,000	120,000	+41.2%
Doctorate	100,613	120,000	+19.3%
<b>Employer</b>			
Industry	106,000	120,000	+13.2%
Government	104,000	114,500	+10.1%
Academic	71,158	91,000	+27.9%
<b>Age</b>			
20-29	47,000	65,000	+38.3%
30-39	76,163	88,050	+15.6%
40-49	92,200	122,000	+32.3%
50-59	108,000	132,360	+22.6%
60-69	108,466	138,500	+27.7%

**CHEMISTS BY EMPLOYMENT  
SECTOR**

The next sections of this report will break out chemists median salaries by the following employment sectors: Industry (manufacturing and non-manufacturing), Government, and Academia. A comparison of change from last year among the three sectors is shown in **Table 3**. Overall, median salaries increased on average by about 1% in current dollars and decreased by about 1.7% in real dollars.

**Table 3.** Chemists' Median Salaries by Employment Sector 2011-2012

	Median Salary in Current Dollars		% Change from 2011	
	2011	2012	Current Dollars	Constant Dollars*
Industry	105,000	106,000	+1.0%	-1.7%
Government	103,000	104,000	+1.0%	-1.7%
Academia	70,300	71,158	+1.2%	-1.5%

\* 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 2011 to 2012 for chemists in the private sector by their degree of educational attainment. For example, the median current dollar private sector salary for all chemists in 2011 was \$105,000 in last year's ACS survey. In 2012 the median salary moved up to \$106,000. However, in 2012 an individual would need to have received a salary of \$107,835 to buy as much as he or she could with \$105,000 in 2011.

**Table 4.** Change in Industrial/Private Sector Chemist's Salaries 2011-2012

	Median Salary in Current Dollars		% Change from 2011	
	2011	2012	Current Dollars	Constant Dollars*
All Chemists	105,000	106,000	+1.0%	-1.7%
Bachelor's	73,700	76,275	+3.5%	+0.8%
Master's	93,900	93,500	-0.4%	-3.1%
Doctorate	120,000	121,100	+0.9%	-1.8%

\* Rate of inflation = 2.7%

Once again, chemists with a bachelor's degree in Table 4 received the biggest salary increase in 2012, an increase of 3.5% in current dollars

and a net increase of 0.8% after inflation. Chemists with master's degrees fared the worst with a loss of 0.4% in current dollars and a 3.1% loss in real dollars. Those with doctorate degrees had a 0.9% gain in current dollars and a 1.8% loss in real dollars. It is important to note, that private sector chemists with master's degrees enjoyed a 6.1% gain in real dollars from 2010 to 2011, and their colleagues with doctorate degrees enjoyed a 2.6% real gain in buying power in 2011.

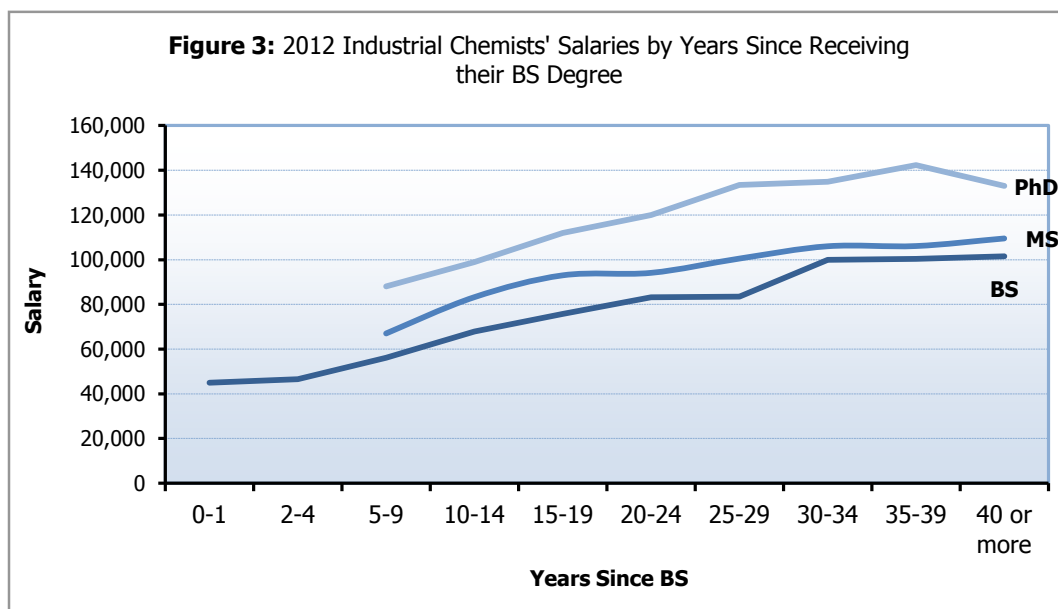
**Table 5** shows men's salaries in the industrial setting increased slightly from \$109,000 in 2011 to \$110,000 in 2012. The overall median for women's salaries remained about the same at \$90,000 in both years. The median salary for women with a bachelor's degree declined -3.3%, while women with master's degrees and PhDs median salaries increased (master's = +7.2% and PhDs = +5.1%).

**Table 5.** Male and Female Full-Time ACS Industrial Chemists' Salaries 2011 & 2012

	2011			2012		
	Men	Women	Difference	Men	Women	Difference
All Degrees	\$109,000	\$90,000	-17.4%	\$110,000	\$90,000	-18.2%
Bachelor's	78,600	67,210	-14.5%	80,479	65,000	-19.2%
Master's	100,000	79,762	-20.2%	98,604	85,500	-13.3%
Doctorate	123,000	108,000	-12.2%	125,000	113,500	-9.2%

Table 5 shows that median salaries for male chemists were 17.4% higher than they were for female chemists working in private industry in 2011. The difference increased slightly by 8/10<sup>th</sup> of a percentage point to 18.2% in 2012.

Although median salaries are based on year over year calculations applied to a consistent workforce of chemists between 20 and 70 years of age, most chemists will receive many wage increases over the years as their experience and capabilities grow. **Figure 3** shows how salary increases across the career path of chemists with industrial or private sector jobs. Participants may hold one or more of these degrees. The chart shows how their salaries are likely to track from the date they receive their bachelor's degree.



Starting with the period 5-9 years after receiving a **B.S. degree**, where sample sizes are large enough to be representative of all 3 degree holders, salary growth is quite positive. Chemists with bachelor's degrees may expect their paycheck to grow about 81% from \$56,000 to \$101,500 as they move from 9 years of experience to 40.

Full-time employees with a **M.S. degree** are starting with a base salary of about \$11,000 higher than their B.S. degree counterparts. This deflates their salary growth rate as a percent of base salary to around 63% (using \$67,000 as the base and \$109,500 as the top end in 2012 dollars) as their experience develops from year 9 through year 40 after receiving a B.S. degree.

**PhDs** start with a base salary of \$88,000 in the 5<sup>th</sup> to 9<sup>th</sup> year after graduating with a B.S. degree. They may expect their median salary to grow to \$142,300 (+62%) in 2012 dollars based on the experience they've gained 35-39 years after receiving their B.S., on average. Understandably, salaries for many PhDs decline in years 40 and beyond,

as they shift their interests to consulting, part-time endeavors, or retirement.

### 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. The 2011 ACS Salaries report shows that in lieu of personnel cutbacks, chemists in government received an increase in median salary of 9.1%, and chemists with master's degrees received a median increase of 15.6% from 2010 to 2011. **Table 6** below suggests that those increases, for the most part, were short lived. The overall increase in median salaries for government chemists in 2012 was negligible (+0.1%). Government chemists with master's degrees saw their median salary retrace 11.6% to \$83,785 in 2012.

**Table 6.** Change in Full-Time Government Chemist's Salaries 2011-2012

	Median Salary in Current Dollars		% Change from 2011	
	2011	2012	Current Dollars	Constant Dollars*
All Chemists	\$103,000	\$104,000	+0.1%	-2.6%
Bachelor's	72,000	74,039	+2.8%	+0.1%
Master's	94,800	83,785	-11.6%	-14.3%
Doctorate	115,871	112,320	-3.1%	-5.8%

\* Rate of inflation = 2.7%

**ACADEMIC CHEMISTS**

Academic chemists in this study refer to:

- Mostly PhDs with a specialty in chemistry,
- who are 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** displays the median salaries of academic chemists by faculty rank and length of contract.

**Table 7.** Change in Academic Chemist’s Salaries 2011-2012 (by rank/contract length)

	Median Salary in Current Dollars		% Change from 2011	
	2011	2012	Current Dollars	Constant Dollars*
Full Professors -- 9/10 mos.	\$96,750	\$97,000	+0.3%	-2.4%
Full Professors -- 11/12 mos.	125,500	130,000	+3.6%	+0.9%
Associate Profs. -- 9/10 mos.	68,618	70,000	+2.0%	-0.7%
Associate Profs. -- 11/12 mos.	90,000	75,000	-16.7%	-19.4%
Assistant Profs. -- 9/10 mos.	59,700	60,000	+0.5%	-2.2%
Assistant Profs. -- 11/12 mos.	64,700	66,500	+2.8%	+0.1%

\* Rate of inflation = 2.7%

Academic chemists’ salaries tended to increase modestly from 2008 through 2012 as many people out of work due to the recession took advantage of the opportunity to head back to school and get a more advanced degree. 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.

Because median salary results for chemistry professors with 11 to 12 month contracts are based on samples of fewer than 100 respondents, their trend data is too volatile to comment on with confidence.

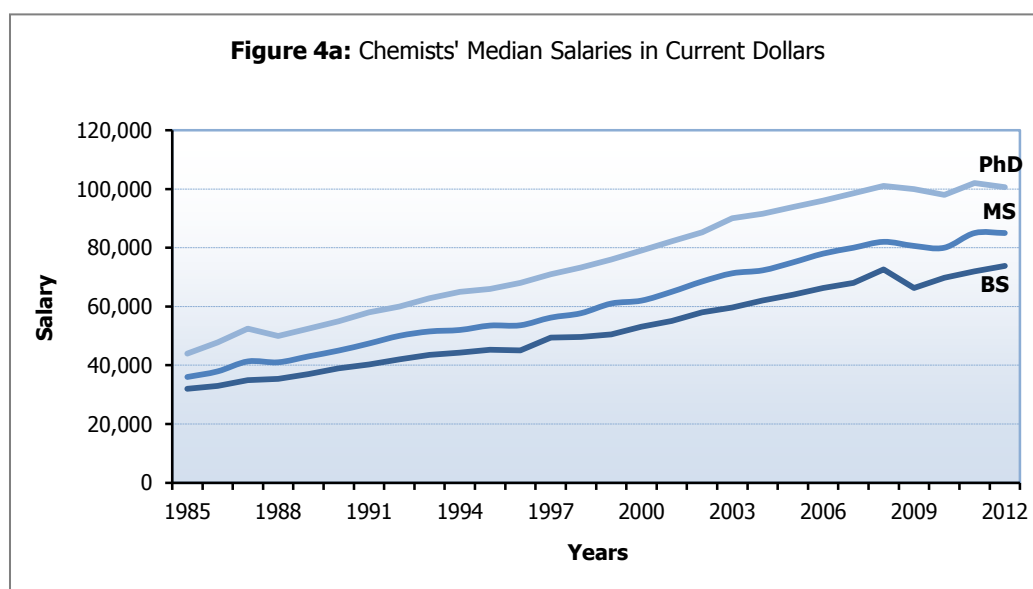
Median salaries for academics on 9-10 month contracts are based on larger, more stable samples. For example, full professors with 9 to 10 month contracts had a median salary of \$94,344 in 2009, which dipped to \$92,878 in 2010, but quickly rebounded to \$96,750 in 2011 and to \$97,000 in 2012. Associate Professors on 9-10 month contracts had a median salary of \$65,376 in 2009, which declined slightly to \$65,000 in 2010 before increasing to \$68,618 in 2011 and \$70,000 in 2012.

**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 one should also consider. Some other factors influencing salary are type of work, work specialty, geographic region, and gender.

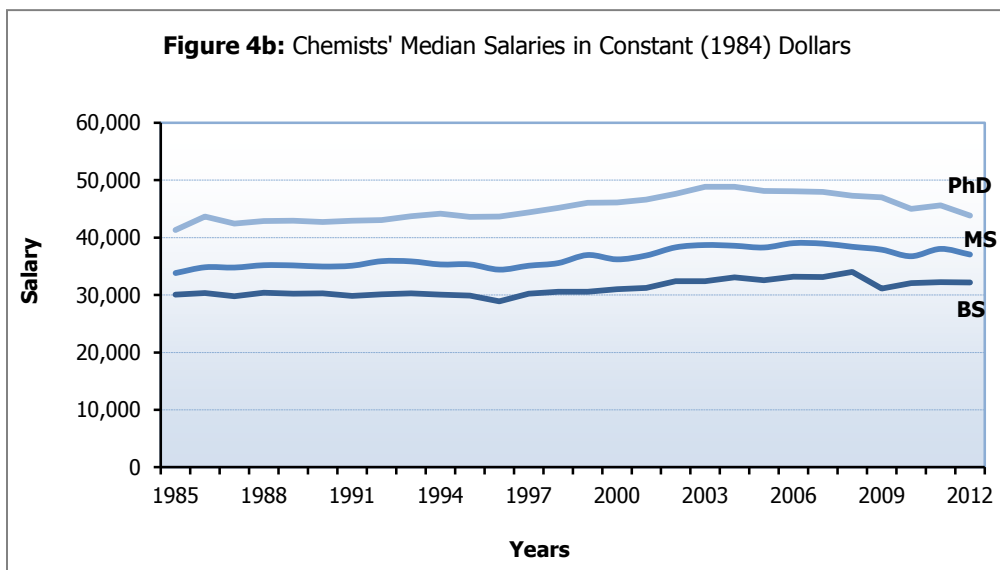
**TRENDS IN CHEMISTS'  
SALARIES**

The median salaries of chemists have increased by varying degrees from year to year since the ACS survey and analyses began in 1985. **Figure 4a** displays the trend in chemists' salaries each year by highest degree held in current paycheck dollars. Over the last 27 years, chemists' salaries by this measure have more than doubled.



Chemist's salaries have grown about 5% per year on average from 1985 through 2008. Due to the international recession that began in 2007, chemist's salaries dipped in 2009 and 2010, but rebounded back to about 2008 levels in 2011 and 2012. The rebound is a good sign that the decline in chemists' salaries has bottomed, but it is not robust enough to encourage expectations for much positive growth in 2013 and beyond.

**Figure 4a** depicts a growing divergence in the salaries for different degree holders. **Figure 4b** 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.



By converting salaries to constant 1984 dollars, the average 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 27 years later in 2012 had grown to \$32,194 -- an increase in real terms of \$78 per year, on average. The median salary for a chemist with a master's degree went from \$33,835 in 1985 to \$37,054 in 2012, or an increase in real value of \$119 per year, on average. For PhD's the increase went from \$41,353 in 1985 to \$43,861 in 2012, or \$93 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 received by chemists. 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 2012 ACS survey, approximately 10.8% of ACS members were engaged in consulting during 2011. Median income from consulting was down about 16.7%, from a median of \$6,000 in 2010 to \$5,000 in 2011.

**Table 8.** Consulting by ACS Chemists (Amounts received in 2011)

	% Any Consulting	Median Hourly Rate	Median Income
<b>All Members</b>	10.8%	\$100	\$5,000
<b>Degree</b>			
Bachelor's	3.8%	\$96	\$18,000
Master's	8.0%	\$88	\$3,000
PhDs	13.0%	\$120	\$5,000
<b>Employer</b>			
Industry	5.0%	\$125	\$6,500
Government	4.3%	\$100	\$3,000
College or University	17.7%	\$100	\$3,250
<b>Gender</b>			
Male	11.4%	\$123	\$6,000
Female	9.0%	\$90	\$2,950
<b>Age</b>			
20-29	1.4%	\$59	\$500
30-39	7.3%	\$75	\$3,500
40-49	10.5%	\$100	\$4,255
50-59	11.7%	\$130	\$5,000
60-69	18.4%	\$125	\$10,000

Only 3.8% of members with bachelor's degrees participated in consulting, and median income was down 48.5% from \$35,000 in 2010 to \$18,000 in 2011. Most likely, due to lack of business growth following the recession and pressure on budgets, the market for ad hoc consulting slowed down in 2012.

Nevertheless, 13.0% of PhDs do some consulting. They are able to command a median hourly rate of \$120 and a median income of \$5,000 in 2011

Approximately 17.7% of academic chemists employed by colleges and universities do consulting work, most likely during their summer break. On average, they received a median income of about \$3,250 in 2011.

As a consultant's age increases, so does his or her hourly rate and overall income from consulting. Members in their 20's charge a median rate of about \$60 per hour for consulting. As their experience and customer base grows, by the time they are in their 50's their median rate is likely to be about \$130 per hour.

**BONUSES**

In 2012, 45.3% of all chemists reported that they were eligible to receive a bonus in 2011. However, not all employees eligible for bonuses received them. Of those eligible, 93.1% did receive a bonus. The median value of bonuses in 2011 was \$10,000, which was the

same as last year. Degree level, sector of employment, age, and gender all appeared to be factors in determining bonus amounts.

**Table 9. Chemist Only Bonuses in 2012 (Amounts received in 2011)**

	% Eligible for Bonus	% of Eligible Receiving Bonus	Median Bonus
<b>All Chemists</b>	45.3%	93.1%	\$10,000
<b>Degree</b>			
Bachelor's	60.8%	94.4%	\$5,950
Master's	52.3%	92.9%	\$8,089
PhD	40.2%	92.7%	\$13,694
<b>Employer</b>			
Industry	72.8%	94.5%	\$11,000
Government	42.5%	88.2%	\$2,000
College or University	9.0%	82.1%	\$2,000
<b>Gender</b>			
Male	48.9%	92.6%	\$10,100
Female	37.3%	94.2%	\$7,000
<b>Age</b>			
20-29	37.0%	94.2%	\$3,000
30-39	40.4%	93.6%	\$7,000
40-49	47.3%	94.0%	\$10,000
50-59	51.9%	93.1%	\$14,000
60-69	39.7%	89.5%	\$10,900

Compared with master's and PhD recipients, chemists with bachelor's degrees were more likely to be eligible for bonuses (60.8%), and 94.4% of those who were eligible for bonuses received them. The median bonus income amount for bachelor's recipients was \$5,950. A smaller percentage of master's recipients (52.3%) were eligible for bonuses last year. Of those eligible, 92.9% received bonuses and earned an additional median income of \$8,089. Although the Ph.D. recipients reported the lowest level of bonus eligibility (40.2%), 92.7% were awarded bonuses and they received the largest amount (a median value of \$13,694).

In terms of employment sector, college and university chemists were the least likely to be eligible for a bonus (9.0%). Of those eligible, 82.1% received a bonus

and the median value was \$2,000.

Similarly, compared to the private sector, government employees were less likely to be eligible for bonuses. In 2012, 42.5% of government employees reported being eligible to receive a bonus in 2011. Of those who received a bonus (88.2% of the 42.5%), 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 business and industry reported the greatest levels of bonus

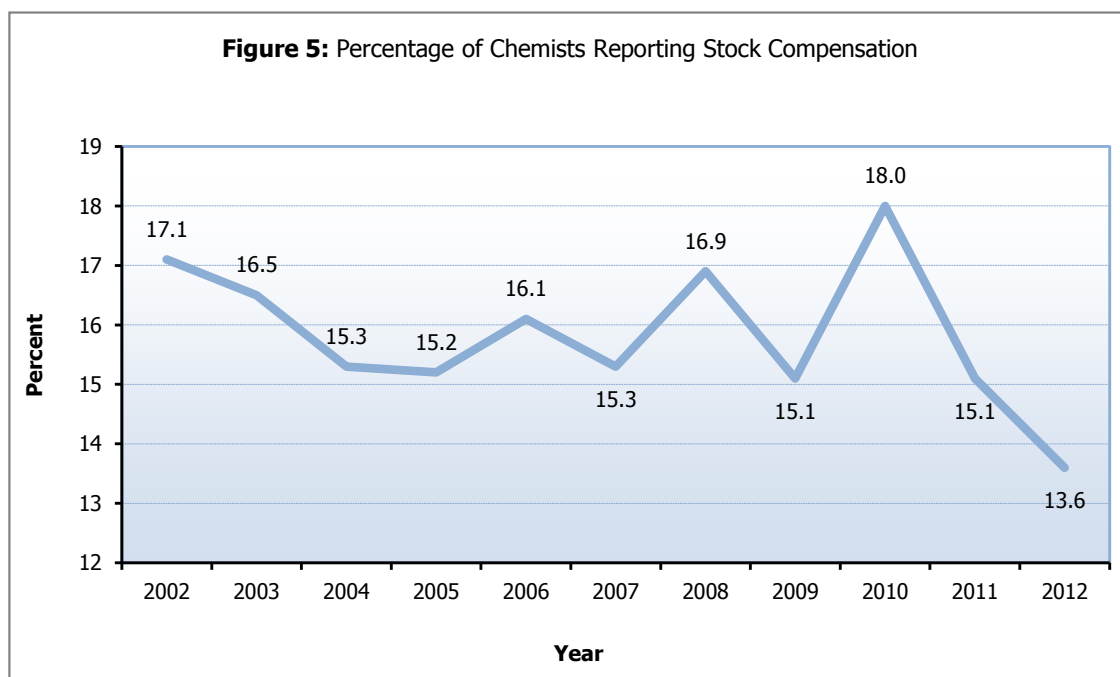
eligibility (72.8%), receipt (94.5%), and bonus award amounts (median value of \$11,000).

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 20's reported 37.0% eligibility and typically earned a median bonus amount of \$3,000. Chemists in their fifties reported receiving a bonus with a median value of \$14,000. After age 59, fewer chemists were eligible for bonuses (39.7%) and the awarded amounts of bonuses also decreased (median value of \$10,900).

Men typically reported a higher eligibility rate and greater award amounts than women. Almost half (48.9%) of the ACS men surveyed were eligible to receive a bonus, and 92.6% of those eligible did receive a bonus with the median value coming in at \$10,100. Female chemists had an eligibility rate of 37.3%, with a 94.2% of them awarded a bonus where the median amount was \$7,000.

**STOCK AS PART OF PROFESSIONAL INCOME**

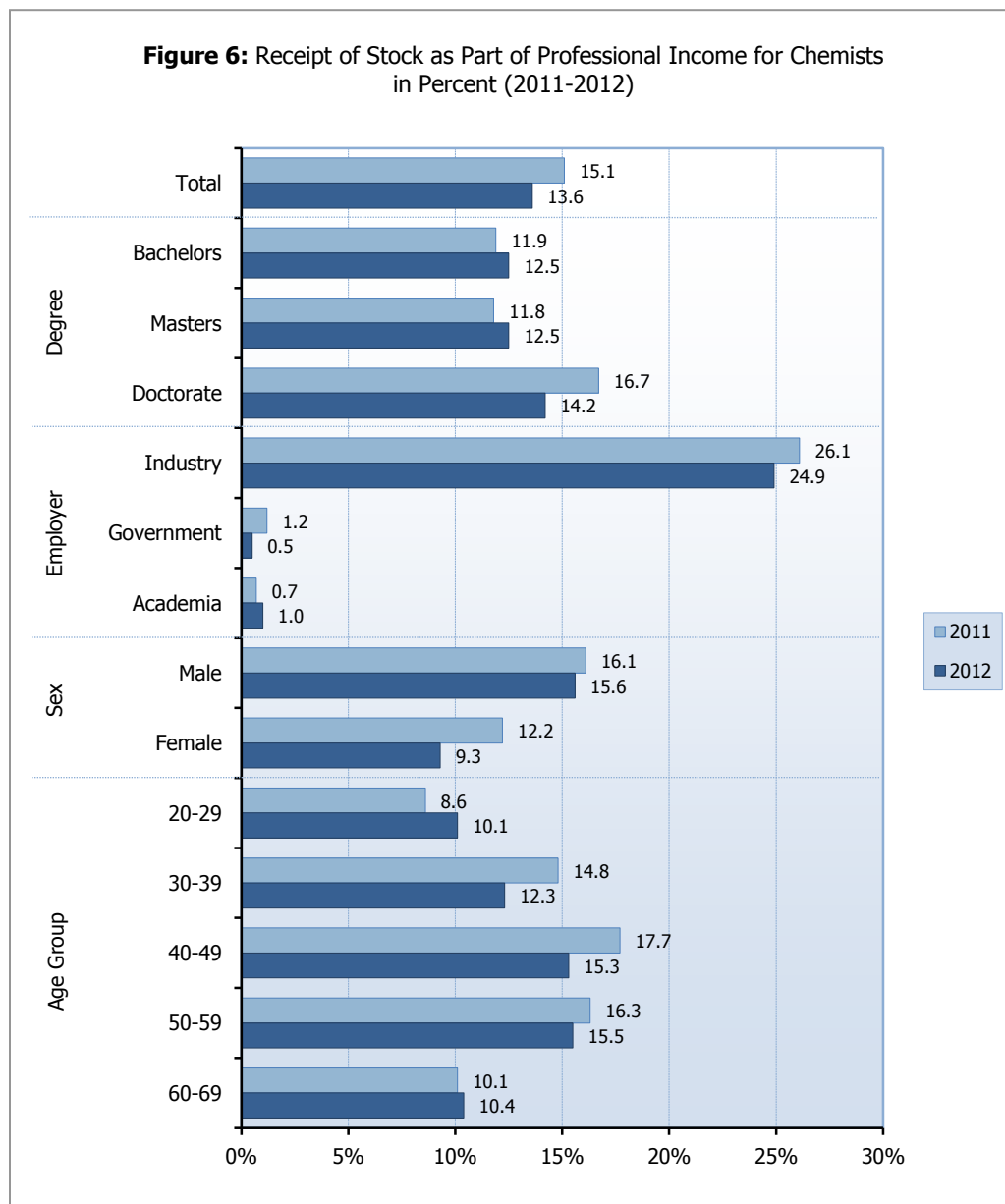
Another way for employers to compensate their employees is by offering them company stock. Since the 2002 survey, when ACS began asking members to report on stock options, the percentage of chemists reporting this type of compensation is shown in **Figure 5**. Through 2011, the proportion of ACS members offered stock options by their employer remained in a range from 15.1% to 18.0%. In 2012, the range was broken and the proportion of members being offered stock as part of their compensation dropped to 13.6%.



As recent as 2010, 18.0% of ACS chemistry members received stock options. However, the stock market has been quite volatile in recent times. Due to the recession many employees have experienced their 401K retirement savings getting cut in half. Perhaps companies are starting to re-think this method of compensation, as it may not be as appropriate for some companies as it once was.

**Figure 6** shows the percentage of chemists who received stock options in 2010 for 2011 and in 2011 for 2012 by highest degree, sector of employment, gender and age group. Doctorate recipients (14.2%) were slightly more likely to receive stock options as part of their overall compensation in 2012 compared to holders of bachelor's and master's degrees (both 12.5%). Those chemists working in the private sector for industrial manufacturing companies were the most likely group to receive stock options (24.9% in 2012). In contrast, their counterparts

in government (0.5%) and academia (1.0%) were not very likely to receive stock as a method of compensation.



## EMPLOYMENT AND UNEMPLOYMENT

### EMPLOYMENT STATUS

As shown in **Table 10**, notwithstanding a dip in full-time member employment to 84.3% in 2010, employment status for ACS members over the past decade appears to be fairly stable. In 2012, 87.4% of chemists surveyed reported being employed in full-time positions. Compared with 2011, the 2012 figure represents a 0.5% increase in full-time employment, a 0.6% decrease in part-time employment, and a 0.4% decrease in unemployed chemists seeking a job.

**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
<b>Not Employed</b>									
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)

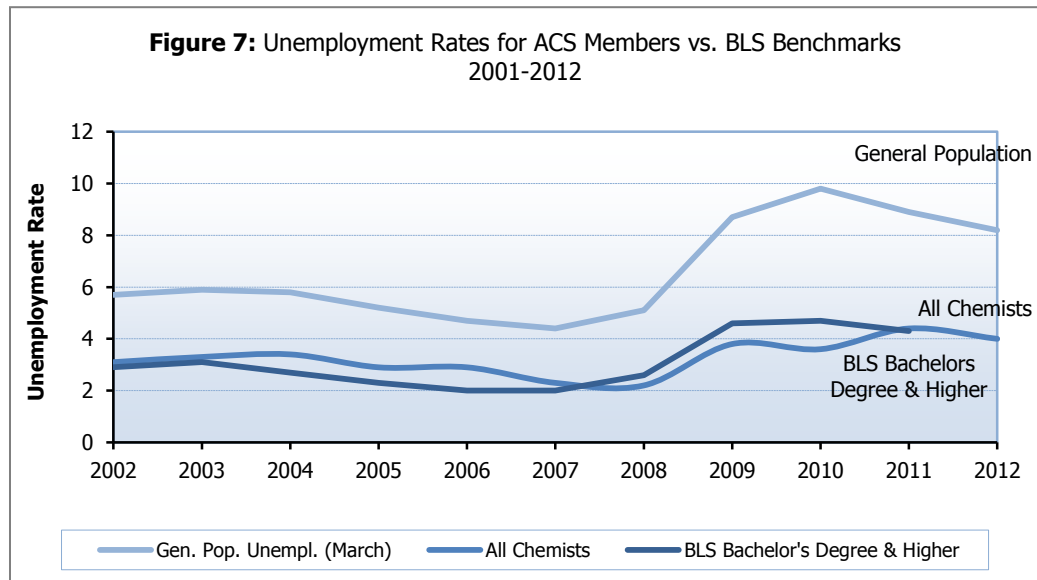
	2004	2005	2006	2007	2008	2009	2010	2011	2012
Full Time	86.7	86.0	86.9	87.4	86.9	87.7	84.3	86.9	87.4
Part Time	3.4	3.9	3.3	3.4	3.6	3.1	3.7	3.7	3.1
Post Doc	1.8	1.9	2.2	1.6	1.2	2.5	3.8	1.7	2.6
<b>Not Employed</b>									
Seeking	3.4	2.9	2.9	2.3	2.2	3.8	3.6	4.4	4.0
Not Seeking	1.4	1.9	1.7	1.7	1.5	1.0	2.0	1.3	1.1
Fully Retired*	3.2	3.4	2.7	3.6	4.6	1.9	2.6	2.0	1.7
Overall Unemployment**	3.6	3.1	3.0	2.4	2.3	4.0	3.8	4.6	4.2

\* Note: Retirement status was added in 1997

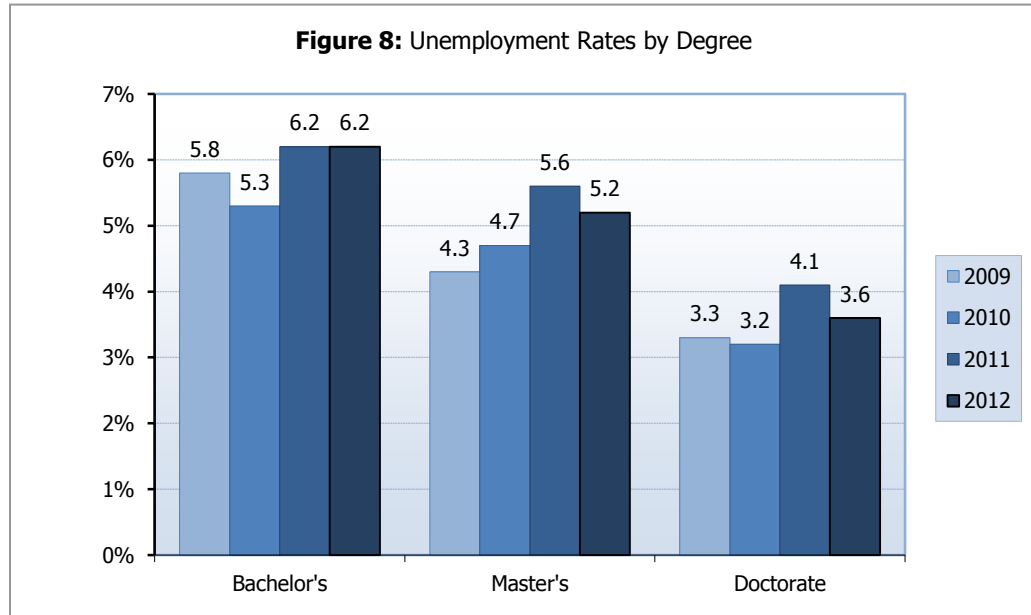
\*\* Note: Unemployment rate measures a status of the active workforce. Thus, "not seeking" and "fully retired" populations are dropped from the calculation of the unemployment rate.

**UNEMPLOYMENT STATUS**

By 2009, the United States was experiencing unemployment levels not seen since the early 1980's. **Figure 7** compares ACS members who are currently unemployed and seeking work with BLS data for (1) the general U.S. population, and more specifically with (2) unemployed people who have a bachelor's degree or higher. Unemployment among ACS members is always much lower than it is for the general population. However, ACS member unemployment was consistently higher than unemployment among the portion of the population with bachelor's degrees or higher from 2002 through 2007. The global recession's impact on unemployment built up during 2008 and into 2009. It increased unemployment among people in the BLS sample with bachelor's degrees and higher by about 2 percentage points, on average. ACS members also experienced higher unemployment beginning in 2009, but not by as much as their BLS counterparts.



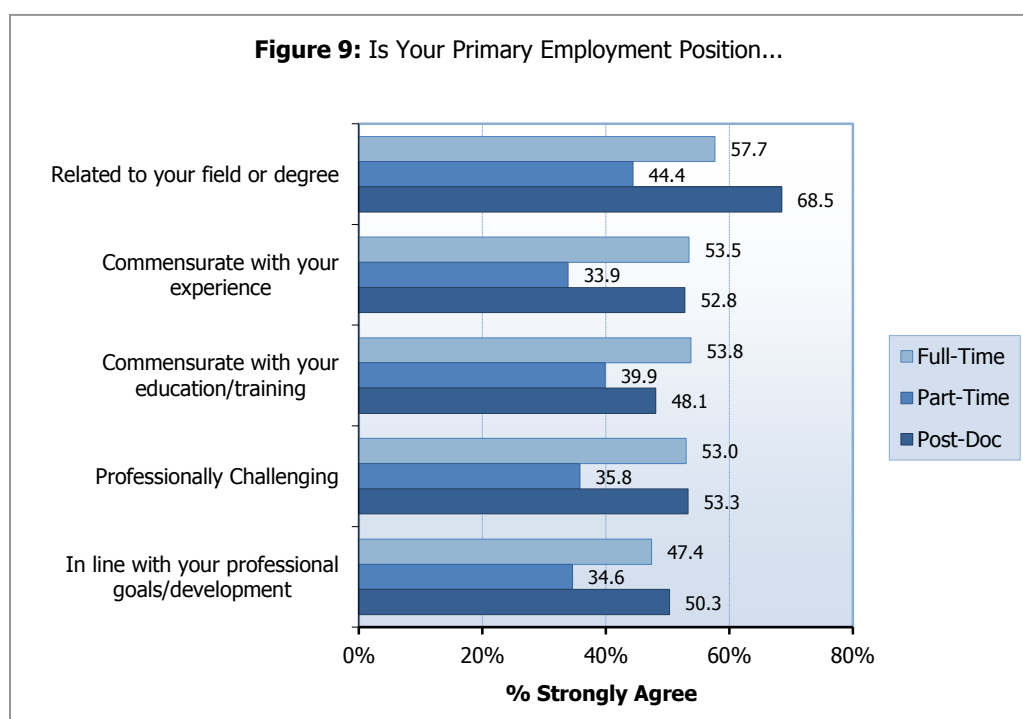
**Figure 8** shows that the higher the education level, the less likely members are to be unemployed. For example, in 2012 among ACS members with a bachelor's degree, 6.2% were unemployed and seeking work. Among members with a master's degree or a PhD, 5.2% and 3.6% of members, respectively, were unemployed and seeking work. Note, individuals "not seeking" and "fully retired" were not included in these unemployment calculations.





## EMPLOYMENT OUTLOOK

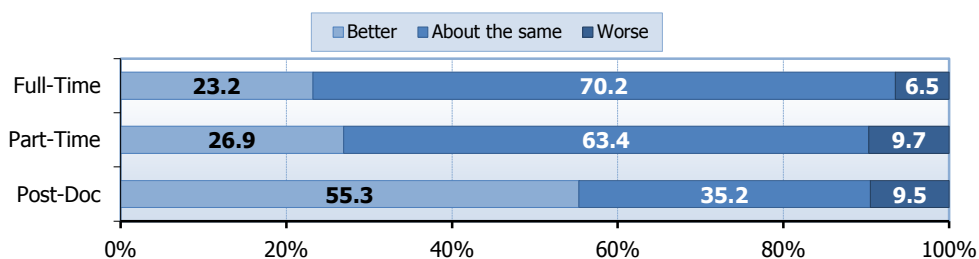
Each year the ACS salary survey explores an ad hoc topic of interest to members. Since the global recession has hopefully put in a bottom, at least in the U.S., the 2012 survey will probe member chemists' opinions on their outlook for future employment. The first chart, **Figure 9**, covers how satisfied members are with the opportunities they are likely to derive from their current position and their current employer. The chart shows the percent of full-time, part-time and post doctorate members who "strongly agree" with each statement. Strongly agree is the top rating on a 5-point scale.



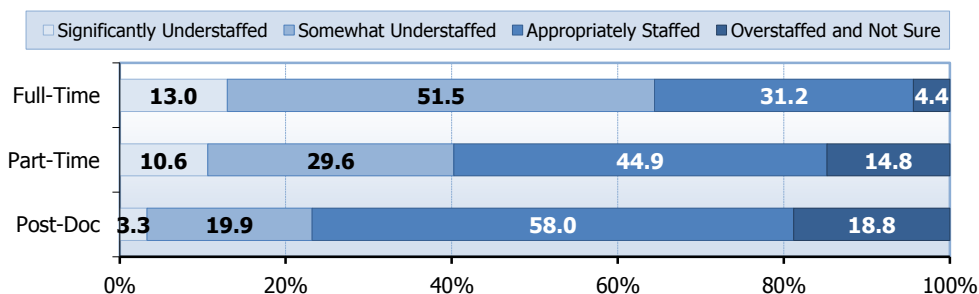
Full-time employees and post doctorate members are the most likely to "strongly agree" with all five of the statements. If it can assumed that attributes like "professionally challenging," "in line with my professional goals and development," "commensurate with my experience" and "commensurate with my education and training" are measures of job satisfaction, then job satisfaction is relatively high among ACS members.

ACS members were asked, "Over the past three years, have you accepted a position or compensation package that was less than your previous position in order to maintain employment?" 11% said "yes" and 89% said "no." About 41% of part-timers and 35% of the self-employed fell into the "yes" category.

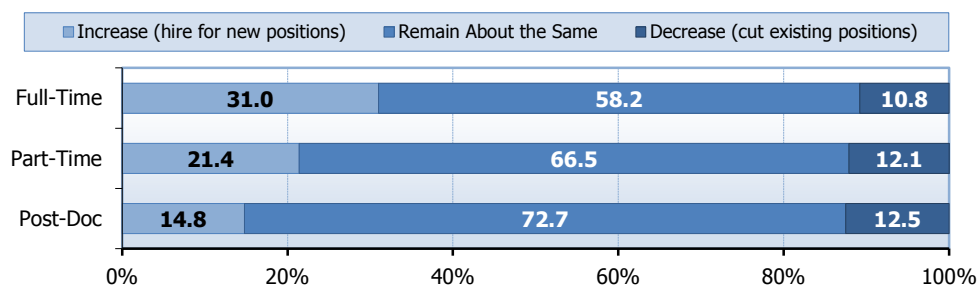
**Figure 10:** A year from now, do you expect your employment situation will be...



**Figure 11:** Is Your Department...



**Figure 12:** Over the next year, do you expect staffing to...



**Figures 10, 11 and 12** suggest that the economy in general and the chemical industry in particular is getting healthier. **Figure 10** tells us that 23.2% of full-time member employees believe the employment situation will be better next year. **Figure 11** shows that currently 64.5% (i.e., 13.0% + 51.5%) of full-time working members believe their work units or departments are understaffed while only 4.4% think they are overstaffed. Finally, **Figure 12** relates that next year 31.0% of full-time employees expect hiring to increase while only 10.8% think hiring will decrease. Although the charts are not overly optimistic, they do suggest that in the not too distant future there will likely to be a change for the better in demand for chemists.

## TECHNICAL NOTES

### THE SAMPLE

Participating member demographics appear in **Tables 11 and 12** by degree level, field of highest degree, gender, ethnicity, and age. As

**Table 11.** Demographics

	Number	Percent
<b>Highest Degree</b>		
Bachelor's	1,195	17.1%
Master's	1,163	16.6%
Doctorate	4,650	66.4%
<b>Field of Highest Degree</b>		
Chemical Engineering	409	5.8%
Chemistry	5,991	85.4%
Non-Chemistry	615	8.8%
<b>Gender</b>		
Male	4,941	70.6%
Female	2,053	29.4%
<b>Ethnicity</b>		
American Indian	24	0.3%
Asian	749	10.9%
Black	170	2.5%
White	5,734	83.3%
Other	132	1.9%
<b>Age</b>		
20-29	368	5.3%
30-39	1,586	22.8%
40-49	1,764	25.3%
50-59	2,166	31.1%
60-69	1,068	15.3%

shown in Table 11, the majority of participants held a Ph.D. (66.4%), majored in a field of chemistry (85.4%), were white (83.3%), and were between the ages of 30-59 (79.2%). In addition, 7 in 10 respondents were males (70.6%) compared with 3 in 10 females (29.4%). A breakdown of field of highest degree, gender, ethnicity, and age per degree level appears in Table 12. In general terms, the majority of participants were white male chemistry PhDs between the ages of 30 and 59.

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 20,128 members drawn from a database consisting of ACS members meeting the above criteria.

In March 2012, 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, 7,064 useable surveys were received, for a response rate of 35.1% percent.

**Table 12.** Demographics by Degree

	Bachelors	Masters	Doctorate
<b>Field of Highest Degree</b>			
Chemical Engineering	7.8%	6.6%	5.2%
Chemistry	83.5%	71.5%	89.5%
Non-Chemistry	8.8%	21.9%	5.3%
<b>Gender</b>			
Male	66.3%	61.9%	74.0%
Female	33.7%	38.1%	26.0%
<b>Ethnicity</b>			
American Indian	0.9%	0.3%	0.2%
Asian	3.1%	7.1%	13.8%
Black	3.4%	2.5%	2.1%
White	89.2%	87.2%	81.0%
Other	1.5%	2.0%	2.0%
<b>Age</b>			
20-29	19.3%	5.0%	1.8%
30-39	17.4%	17.4%	25.5%
40-49	20.1%	24.3%	27.0%
50-59	31.0%	35.9%	29.7%
60-69	11.9%	17.1%	15.7%

**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, 2012. 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.Ds, 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.Ds 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.