



SHUTTERSTOCK

EMPLOYMENT & SALARY SURVEY

In 2007, job market for chemists continued to improve and **SALARY GAINS HELD** at recent level of close to 5%

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WHAT HAPPENED to the employment situation and salaries of chemists during the 12 months ending March 1, 2007, was not spectacular. But it was positive.

According to the American Chemical Society's latest annual survey of its members in the domestic workforce, 92.3% were employed full-time on that date, 3.6% were working part-time, 1.7% were on postdocs or fellowships, and 2.4% were unemployed but actively seeking employment.

The survey put the total of those with other than a full-time job at 7.7%. This was down from the all-time high of 9.2% in 2005, but it was still considerably higher than the recent low of 5.4% in 2001. The 2.4% unemployment rate for

2007 was the lowest since 2001, when it had been 1.5%.

The median salary for all respondents to the 2007 survey as a group paced inflation with a 3.5% increase to \$88,000 from the

median of \$85,000 from the year-earlier survey. The median 2007 salary for bachelor's degree chemists as a group was \$68,700. For those with master's degrees it was \$80,000 and for Ph.D.s, \$96,700. These salaries do not include overtime or bonuses.

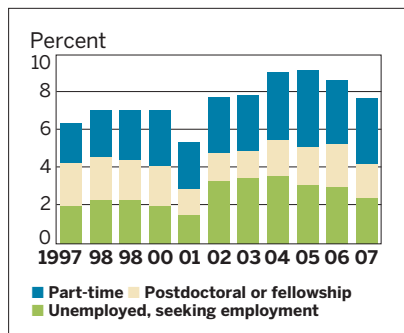
As always, in 2007, industrial chemists were the highest paid, with a median salary of \$96,700, followed by government chemists at \$90,000, and academics at \$65,600.

Chemists as individuals posted a larger 4.7% increase in their median salary between March 1, 2006, and March 1, 2007—from \$85,000 to \$89,000. This rate of gain was the same as the average annual gain for the past decade.

This finding comes from a question that

EMPLOYMENT STATUS Unemployment among chemists dips again

	FULL-TIME	OTHER THAN FULL-TIME EMPLOYMENT			TOTAL
		PART-TIME	POSTDOC	UNEMPLOYED/ SEEKING EM- PLOYMENT	
1997	93.5%	2.1%	2.3%	2.0%	6.4%
1998	92.9	2.5	2.3	2.3	7.1
1999	92.9	2.7	2.1	2.3	7.1
2000	92.9	3.0	2.1	2.0	7.1
2001	94.6	2.5	1.4	1.5	5.4
2002	92.2	3.0	1.5	3.3	7.8
2003	92.1	3.0	1.4	3.5	7.9
2004	90.9	3.6	1.9	3.6	9.1
2005	90.8	4.1	2.0	3.1	9.2
2006	91.3	3.4	2.3	3.0	8.7
2007	92.3	3.6	1.7	2.4	7.7



NOTE: As of March 1 each year. Based on population that excludes those fully retired or otherwise not employed and not seeking employment.
SOURCE: ACS salary survey 2007

asked respondents for their salaries as of both dates. This approach has the advantage that salary data for both years come from the same set of respondents to a single survey. It also accounts for pay gains due to promotions and growing responsibilities for individual chemists. It avoids the variance inherent in measuring salary gains as the difference between medians from separate surveys done one year apart and using different member samples.

The median salary is the middle salary—that which is equaled or exceeded by half of the population.

All of these changes came while the national employment situation, as measured by the Bureau of Labor Statistics (BLS), posted a fairly solid improvement between early 2006 and early 2007. This speeded up what had been a relatively slow recovery from the job losses that occurred during and after the mild economic recession in 2001. However, job growth nationally has slowed quite sharply in recent months.

The ACS 2007 survey involved sending 21,000 questionnaires to a random sample of about 90,000 members most likely to

have been in the domestic workforce. They were U.S. residents under 70 years old who were not in the emeritus, retired, or student membership categories. There were a total of almost 7,200 responses, including about 6,500 from members actually in the workforce. Respondents no longer working accounted for most of the rest.

Of the responses, 5,900 came by mail and 1,300 by Internet. Responses from those who indicated they were fully retired or otherwise not in the workforce were

a single group. As chemical engineers are traditionally somewhat better paid than chemists, there was a slight upward tick relative to the chemist-only salary data from earlier surveys.

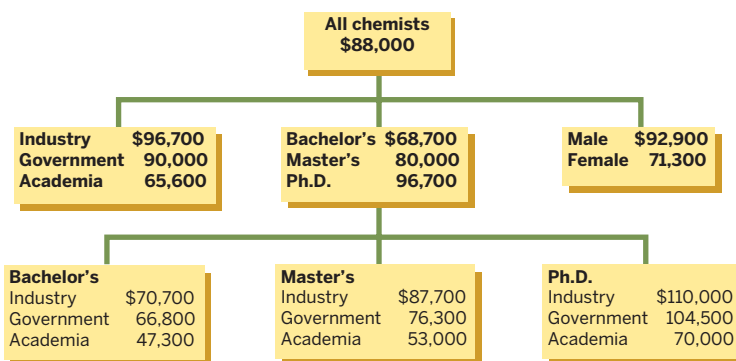
The 2007 survey was conducted by Gareth S. Edwards and Jeffrey R. Allum of the ACS Department of Member Research & Technology under the general guidance of the ACS Committee on Economic & Professional Affairs. A full report will be available later this year from the ACS Office of

Society Services. This report will also be available as a PDF on the ACS website (www.acs.org).

The percentage of chemists in the workforce who are women has risen from about 9% 30 years ago to 15.0% in 1985 and 24.2% in 2000. Since then there has been little progress, with the percentage of women actually dropping from 25.8% in 2006 to 25.5% in 2007. However, with women today earning 52% of chemistry bachelor's degrees, 52% of master's degrees, and 31% of Ph.D.s, the potential for further feminization of chemistry is still there (C&EN, Dec. 3, 2007, page 73). In 2007, 33% of bachelor's degree respondents in

MEDIAN BASE SALARIES

Ph.D. chemists earn about 50% more than do bachelor's



NOTE: Median annual base salary for chemists with full-time employment. **SOURCE:** ACS salary survey 2007

SALARY TRENDS

Constant-dollar median base salary of Ph.D. chemists and of chemists as a group has been declining for past four years

\$ THOUSANDS	BACHELOR'S		MASTER'S		PH.D.		ALL CHEMISTS	
	CURRENT \$	CONSTANT \$ 2007	CURRENT \$	CONSTANT \$ 2007	CURRENT \$	CONSTANT \$ 2007	CURRENT \$	CONSTANT \$ 2007
1997	\$49.4	\$64.3	\$56.2	\$73.2	\$71.0	\$92.4	\$63.0	\$82.0
1998	49.6	63.6	57.7	74.0	73.3	94.0	65.0	83.3
1999	50.1	62.8	61.0	76.5	76.0	95.3	68.0	85.3
2000	53.1	64.4	62.0	75.2	79.0	95.8	70.0	84.9
2001	55.0	64.9	65.0	76.7	82.2	97.0	73.0	86.1
2002	58.0	67.3	68.5	79.5	85.2	98.9	76.5	88.8
2003	59.7	67.8	71.3	81.0	90.0	102.2	80.0	90.9
2004	62.0	68.6	72.3	80.0	91.6	101.3	82.0	90.7
2005	63.0	67.4	74.0	79.2	93.0	99.5	83.0	88.8
2006	65.2	67.5	77.5	80.3	95.0	98.4	85.0	88.1
2007	68.7	68.7	80.0	80.0	96.7	96.7	88.0	88.0

AVERAGE ANNUAL CURRENT-DOLLAR SALARY INCREASE

2006-07	5.4%	3.2%	1.8%	3.5%
1997-07	3.3	3.6	3.1	3.4

AVERAGE ANNUAL INCREASE IN CONSUMER PRICE INDEX

2006-07	3.6%			
1997-07	2.7			

NOTE: Median base salaries for those with full-time jobs as of March 1 each year. **SOURCES:** ACS salary surveys, Bureau of Labor Statistics (consumer price index)

SALARIES OF CHEMISTS AS INDIVIDUALS

Chemists log an average pay gain of 4.7%

MEDIAN SALARY, \$ THOUSANDS	2006-07			
	2006	2007	\$ GAIN	% GAIN
ALL	\$85.0	\$89.0	\$4.0	4.7%
BY DEGREE				
Bachelor's	65.0	69.7	4.7	7.2
Master's	78.0	81.6	3.6	4.6
Ph.D.	93.3	98.4	5.1	5.5
BY GENDER				
Men	90.0	94.0	4.0	4.4
Women	69.0	73.0	4.0	5.8
BY ETHNICITY				
Hispanic	78.0	81.6	3.3	4.2
BY CITIZENSHIP				
Native born	84.5	88.2	3.7	4.4
Naturalized	95.3	100.0	4.7	4.9
Permanent resident	83.9	89.9	6.0	7.2
Other visa	61.5	65.0	3.5	5.7
BY EMPLOYER				
Industry/business	93.6	98.0	4.4	4.7
Government	87.5	92.5	5.0	5.7
Academia	64.0	67.5	3.5	5.5
BY AGE				
20-29	46.6	50.0	3.4	7.3
30-39	69.0	73.0	4.0	5.8
40-49	87.5	92.5	5.0	5.7
50-59	97.7	100.6	2.9	3.2
60-69	94.0	98.5	4.5	4.8

NOTE: Salaries as of March 1. SOURCE: ACS salary survey 2007

the workforce were women, as were 36% of master's degree- and 21% of Ph.D.-holders

It should be noted that the growing presence of women chemists continues to percolate up through the ranks of the chemical profession by age. In 2007, 50% of survey respondents two to four years beyond earning their bachelor's degrees were women, as were 44% of those five to nine years beyond and 34% of those 10 to 14 years beyond. This tails off to just 14% of chemists 35 years or more beyond earning their bachelor's degree.

The makeup of the chemistry profession by race and ethnicity continues to change only slowly. In 1995, 85.8% of survey respondents identified themselves as white. In 2007, 84.5% did so. Asians showed a gain over the period—from 10.3% to 11.4%. Blacks, about 13% of the U.S. population, moved up from 1.4% of chemists to 1.9%. Hispanics, about 14% of the U.S. popula-

tion, showed a similar small gain, from 2.3% to 3.0%. Asians, who make up about 4% of the U.S. population, will remain well represented. This is largely due to foreigners who come to the U.S. for their chemistry education and stay. But all signs indicate that although blacks and Hispanics are making some progress in chemistry, they will remain substantially underrepresented, despite all best efforts to encourage them into the field. Chemistry continues to attract disproportionately few blacks or Hispanics, each accounting for only about 4% of chemistry graduating classes (C&EN, Dec. 3, 2007, page 73).

Chemists in the workforce are becoming better educated. In 1985, 25% of respondents to the ACS survey had a bachelor's as their highest degree. By 2007, this was down to 19%. Over the same period, the percentage with a Ph.D. degree rose from 57% to 64%. Those with master's degrees held at close to 17%.

The biggest recent demographic change for chemists has been in their

ACS MEMBERS IN THE WORKFORCE

Since 1985, considerable change by gender and highest degree; since 1995, little change by race

	1985	1995	2000	2005	2006	2007
BY GENDER						
Men	85.0%	78.5%	75.8%	74.9%	74.2%	74.6%
Women	15.0	21.5	24.2	25.1	25.8	25.5
BY DEGREE						
Bachelor's	25.4	24.3	22.1	19.9	19.6	18.9
Master's	17.9	16.9	17.4	17.0	17.7	17.3
Ph.D.	56.7	58.8	60.5	63.1	62.7	63.8
BY RACE						
American Indian	na	0.2	0.2	0.2	0.2	0.2
Asian	na	10.3	11.1	10.9	11.7	11.4
Black	na	1.4	1.9	1.9	1.9	1.9
White	na	85.8	85.5	85.8	84.3	84.5
Other	na	2.3	1.3	1.2	1.9	2.0
BY ETHNICITY						
Hispanic	na	2.3	2.5	2.6	2.8	3.0
BY CITIZENSHIP						
Native born	87.6	82.3	79.5	79.8	79.3	79.7
Naturalized	8.0	8.5	10.2	10.2	10.7	10.5
Permanent residents	3.7	7.1	6.9	6.5	6.5	6.2
Other visa	0.7	2.1	3.4	3.5	3.5	3.6
BY AGE						
Under 40	42.8	40.7	34.1	27.8	33.0	27.9

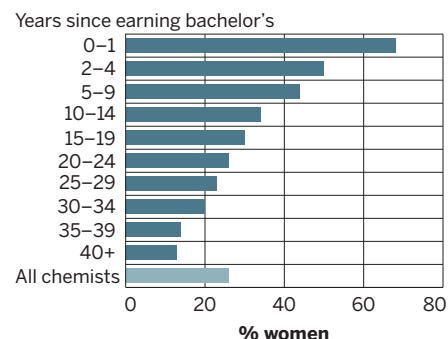
na = not available. SOURCE: ACS annual salary surveys

age. In 1985, 43% of survey respondents were younger than 40 years old, as were 41% in 1995. Since then, this has tumbled to 28%. The median age for all respondents is now 48—50 for men, 43 for women.

The demographics of chemists indicate that those with bachelor's and Ph.D.s are

A CHANGING DYNAMIC

The youngest working chemists are mostly women



NOTE: Based on working chemists with full-time jobs. SOURCE: ACS salary survey 2007

quite different populations. For instance, 92% of those with bachelor's degrees are born into U.S. citizenship, compared with a lower 75% of Ph.D.s. Only 2.2% of the bachelor's degree-holders are not U.S. citizens compared with 13% of Ph.D.s. Of the bachelor's respondents, 83% work in business or industry and 7%, in academia. For Ph.D.s, this breakdown is 52% and 39%, respectively.

THE EMPLOYMENT situation of chemists in 2007 showed the usual variations. Women are more likely than men to work part-time, 5.2% versus 3.0%. They are also more likely to be postdocs—2.3% versus 1.5%. Asians are also more likely to be postdocs, 4.6% versus 1.4% of whites. And the percentage of chemists working part-time increases with age, up to 9.3% of 60- to 69-year-olds.

A majority of chemists continue to work in manufacturing—51% in 2007. This is down from 55% in 2002. Chemical manufacturing now accounts for 15% of the jobs; pharmaceutical, biotech, and health-related manufacturing for 21%; and other manufacturing for another 15%. The percentage of those working in academia, including high schools, is on the rise, from 24% in 2002 to 29% in 2007. Analytical and research services jobs accounted for the jobs of another 7% in 2007 and government service, 8%.

In the 2007 survey, 39% of respondents indicated their work specialty to be a classic chemistry discipline—analytical, inorganic, organic, physical, or polymer chemistry. Another 3% indicated general chemistry, for a total of 42% indicating chemistry. Chemistry-related fields—such

as biochemistry and materials science—claimed 43%, whereas 4% worked in chemical engineering and 11% were involved in non-chemistry activities.

This profile of respondents' work specialties is at variance with the profile of the respondents' specialties for their highest degrees—a total of 69% in chemistry, 18% in chemistry-related fields, 6% in chemical engineering, and 7% in nonchemistry disciplines.

The profile of specialty by gender indicates relatively low percentages of women working in physical chemistry, 15% of the total; polymer chemistry, 18%; organic chemistry, 19%; and inorganic chemistry, 20%. Women's highest saturation is into biochemistry and chemical educa-

AGE OF CHEMISTS Me- dian age gap between men and women chemists is seven years

	MEDIAN AGE	MEAN AGE
ALL CHEMISTS	48	47.3
BY GENDER		
Men	50	48.8
Women	43	43.2
BY DEGREE		
Bachelor's	45	43.8
Master's	50	48.2
Ph.D.	48	48.0
BY EMPLOYER		
Industry/business	47	46.0
Government	50	48.4
Academia	47	47.3
BY RACE		
Asian	43	43.8
Black	45	45.3
White	49	48.0
BY ETHNICITY		
Hispanic	43	43.7
BY CITIZENSHIP		
Native born	49	48.0
Naturalized	50	50.1
Permanent resident	41	41.2
Other visa	35	35.9

NOTE: Median age of all chemists employed full-time as of March 1, 2007. **SOURCE:** ACS salary survey 2007

EMPLOYMENT DEMOGRAPHICS Ex- cept by age, job situation varies little by demographic factors

	EMPLOYED		POSTDOC	UNEMPLOYED/ SEEKING EMPLOYMENT
	FULL-TIME	PART-TIME		
ALL CHEMISTS	92.3%	3.6%	1.7%	2.4%
BY DEGREE				
Bachelor's	94.1	3.0	0.2	2.7
Master's	92.3	4.6	0.1	3.0
Ph.D.	91.7	3.5	2.6	2.2
BY GENDER				
Men	92.9	3.0	1.5	2.6
Women	90.4	5.2	2.3	2.0
BY RACE				
Asian	91.4	1.9	4.6	2.1
Black	92.9	3.1	2.4	1.6
White	92.3	3.9	1.4	2.5
BY AGE				
20-29	87.5	0.6	9.6	2.3
30-39	92.3	2.2	4.6	0.9
40-49	95.4	2.0	0.6	2.0
50-59	92.6	3.9	0.1	3.5
60-69	87.1	9.3	0.0	3.6

NOTE: As of March 1, 2007. Excludes those retired or otherwise unemployed but not seeking employment. **SOURCE:** ACS salary survey 2007

DEMOGRAPHICS BY DEGREE There are big differences between bachelor's and Ph.D. populations

	BACHELOR'S	MASTER'S	PH.D.	ALL
BY GENDER				
Men	66.9%	64.1%	79.1%	74.4%
Women	33.1	35.9	20.9	25.5
BY RACE				
American Indian	0.1	0.1	0.2	0.2
Asian	4.3	10.6	13.5	11.4
Black	2.3	1.6	1.6	1.7
White	91.0	85.6	83.1	84.9
Other	2.4	2.2	1.6	1.8
BY ETHNICITY				
Hispanic	3.3	2.5	3.0	3.0
BY CITIZENSHIP				
Native born	92.4	83.9	75.1	79.7
Naturalized	5.4	9.7	11.9	10.4
Permanent resident	1.6	4.0	8.1	6.3
Other visa	0.6	2.4	4.9	3.7
BY EMPLOYER				
Business/industry	82.6	69.7	52.0	60.4
Government	9.6	10.0	7.6	8.3
Academia	6.5	19.1	39.0	29.9
Self-employed	1.4	1.2	1.4	1.4

HOW TO READ THIS TABLE: Using the example of men, 66.9% of bachelor's degree respondents are male, as are 64.1% of master's, 79.1% of Ph.D.s, and 74.4% of all respondents. **NOTE:** Data are for employed ACS members as of March 1, 2007. **SOURCE:** ACS salary survey 2007

WHERE CHEMISTS WORK More than half of chemists work in manufacturing

% OF CHEMISTS	2002	2003	2004	2005	2006	2007
MANUFACTURING	55%	54%	56%	52%	51%	51%
Chemical & related	17	15	17	15	15	15
Pharma/health/biotech	22	21	23	22	23	21
Other manufacturing	16	18	16	15	13	15
ACADEMIA	24	26	24	27	29	29
University/four-year college	19	20	18	21	20	22
Two-year college	2	2	2	2	3	2
Medical school	1	2	2	2	3	3
High school	2	2	2	2	2	2
Other	na	na	na	na	1	na
NONMANUFACTURING/ NONACADEMIA	20	20	17	21	18	18
Analytical/research services	9	9	9	9	7	7
Government	8	8	7	8	8	8
Other	3	3	1	3	3	3
SELF-EMPLOYED	1	1	3	1	2	2

NOTE: Percentages of chemists at all degree levels with full-time jobs as of March 1, 2007. **SOURCE:** ACS salary survey 2007

WORK SPECIALTY/HIGHEST DEGREE Many with degrees in classic chemistry disciplines work in other fields

	PERCENT OF TOTAL		PERCENT WHO ARE WOMEN	
	WORK SPECIALTY	HIGHEST DEGREE	WORK SPECIALTY	HIGHEST DEGREE
GENERAL CHEMISTRY	3%	11%	33%	38%
CLASSICAL CHEMISTRY	39	58	23	22
Analytical	15	11	32	27
Inorganic	3	10	20	24
Organic	10	24	19	19
Physical	4	10	15	21
Polymer	7	3	18	22
OTHER CHEMISTRY	43	18	29	33
Agricultural/food	3	1	26	34
Biochemistry	4	8	37	33
Biotechnology	4	1	27	41
Chemical education	7	2	37	41
Clinical chemistry	1	0	26	71
Environmental chemistry	6	2	28	28
Materials science	5	1	17	26
Medicinal/pharmaceutical	10	2	24	25
Other chemical sciences	3	1	24	32
CHEMICAL ENGINEERING	4	6	15	18
NONCHEMISTRY	11	7	27	27
Business administration	2	2	23	17
Computer science	1	0	21	25
Law	1	0	23	11
Other nonchemistry	7	5	30	32

HOW TO READ THIS TABLE: Using the example of analytical chemistry, 15% of respondents, 32% of whom were women, work in analytical chemistry; 11% of respondents, 27% of whom are women, have their highest degree in analytical chemistry. **SOURCE:** ACS salary survey 2007

tion, each claiming 37% of the total, and analytical chemistry, 32%.

Of academics responding to the 2007 survey, 16% of full professors were women, as were 27% of associate professors and 29% of assistant professors. These levels are somewhat higher than the 11%, 20%, and 22% levels, respectively, from a recent C&EN survey of faculty at the 100 chemistry departments spending the most on research (C&EN, Dec. 24, 2007, page 44). That the ACS survey includes faculty members from nonresearch departments may explain this difference; such departments tend to have a higher percentage of women faculty.

MEDIAN SALARIES of \$71,300 for all women respondents to the ACS 2007 survey and \$92,900 for all male respondents, at first glance, indicate something amiss in these days of legislated equal opportunity and reward. However, two factors explain much of this difference: The men, on average are seven years older than the women, and the men are, as a group, better qualified academically.

Comparison of the salaries of men and women chemists with the same degree, the same amount of experience, and the same type of employer reveals a more even playing field. By five-year age groups from five to nine years beyond the bachelor's degree to 30 to 34 years beyond, women Ph.D. chemists in industry earn from 90 to 99% what their comparable male colleagues earn. With the exception of one anomaly in each case, the range is from 91 to 99% for master's degree chemists and from 88 to 102% for those with a bachelor's.

The pattern is similar for academic chemists. Women full professors with nine-month contracts in bachelor's-granting departments actually earn more than men, \$78,200 versus \$73,200. At master's and Ph.D. institutions, women earn 91% as much. All this does not demonstrate full salary equality for female chemists. But it indicates that equality is closer than the overall medians for men and women might suggest.

The dominant single determining factor in chemists' salaries remains their experience. In 2007, chemists 35 to 39 years beyond their bachelor's degree had a median salary of \$100,000. This is almost 40% higher than the \$72,000 for chemists 20 years their junior.

The data on academic salaries bring out the financial significance of a full professorship. Full professors with 11- to 12-month contracts at Ph.D.-granting schools had a median salary of \$131,200 in 2007. This com-

pares with \$77,900 for associate professors and \$68,900 for assistant professors.

For those with nine-month contracts, salary medians were \$110,000, \$75,800, and \$65,000, respectively.

As would be expected, industrial chemists' salaries vary considerably by work function. Those in R&D management and general management are well-rewarded with median salaries for Ph.D.s of \$140,000 and \$121,000, respectively. At the other end of the scale are Ph.D.s in analytical services, with a median of \$100,000, and in production/quality control at \$102,100. Basic and applied research both come in at \$105,000.

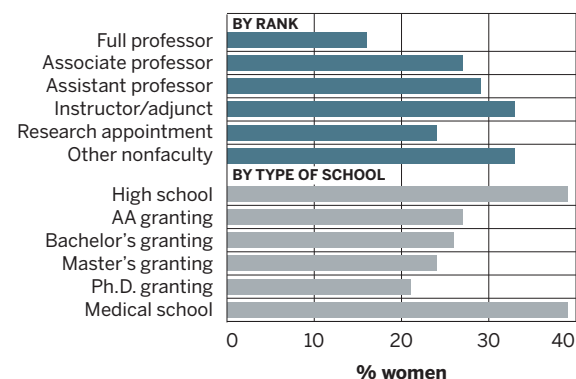
In 2007, as always, industrial salaries varied by size of the employer. For Ph.D.s,

the range was from \$92,000 for employers with fewer than 50 employees to \$120,000 for employers with 25,000 or more.

The salaries of chemists in industry cover a quite broad range. In 2007, the highest paid 10% of those with a bachelor's had a median salary of \$112,000 compared with \$41,600 for the 10% lowest paid. The differential for master's degree chem-

CHEMISTRY FACULTIES BY GENDER

Women have more than a foothold, but their share of full professorships is still low



AA = associate of arts degree. SOURCE: ACS salary survey 2007

INDUSTRIAL CHEMISTS' SALARIES BY EXPERIENCE AND GENDER Ph.D. women's pay holds close to that of men

YEARS SINCE BACHELOR'S DEGREE	BACHELOR'S			MASTER'S			PH.D.		
	MEN	WOMEN	WOMEN AS % OF MEN	MEN	WOMEN	WOMEN AS % OF MEN	MEN	WOMEN	WOMEN AS % OF MEN
2-4	\$47.3	\$43.8	93%	na	na	na	na	na	na
5-9	54.5	55.7	102	\$63.5	\$57.7	91%	\$82.2	\$78.5	95%
10-12	65.0	64.0	98	77.5	71.2	92	90.3	89.0	99
15-19	75.0	66.0	88	84.0	77.7	93	101.0	100.0	99
20-24	81.0	71.0	88	94.8	90.0	95	115.0	104.0	90
25-29	93.4	72.0	77	97.5	81.0	83	116.0	115.0	99
30-34	93.8	84.5	90	98.0	97.0	99	127.3	116.5	92

NOTE: Median full-time base salaries as of March 1, 2007. na = not applicable. SOURCE: ACS salary survey 2007

WHO IS A CHEMIST?

A Challenge For Surveyors Of Chemists

Those who gather data on chemists are faced with the task of defining who they will gather it from. There is no single definition of a chemist. Is it anybody with a chemistry degree, or chemistry as their highest degree? Is it anybody who works in chemistry or a related science? Is it a member of the American Chemical Society?

In gathering data on the number of new chemistry graduates each year at the bachelor's, master's, and Ph.D. levels, the National Science Foundation (NSF) and the National Center for Education Statistics (NCES) use a narrow definition of

chemistry. They include only those who earn their degrees in a classic chemistry discipline. They count such graduates from more than 1,000 departments.

The ACS Committee on Professional Training (CPT) also compiles annual data on chemistry graduates. But its totals are of all degrees awarded by the about 630 chemistry departments that have undergraduate programs CPT has approved.

Some of these degrees are in chemistry-related disciplines, such as biochemistry and materials science, that NSF and NCES do not classify as chemistry. Those orga-

nizations consider biochemistry to be a biological science and materials science an engineering discipline. Also, CPT does not collect data on graduates from the schools, mostly small ones, it has not certified.

The population that ACS examines for its annual salary and employment survey of its domestic members are all chemists in the sense that they have at least a bachelor's degree in chemistry or a chemistry-related discipline. It is a requirement for society membership. And as they are society members, they presumably have an abiding interest in

the science. But they don't all have a degree in a classic chemistry discipline, and they don't all actually work in chemistry.

Of course, not all chemists, however defined, are members of ACS. But ACS membership is the largest identifiable congregation of those involved in the science. As such, it provides the largest and best sample of members of the chemical profession. So, as long as its inherent limitations are kept in mind, ACS membership provides a reasonable basis for a survey to follow trends in the general welfare of working chemists in the U.S.

ists was from \$130,000 to \$55,000 and for Ph.D.s, from \$166,000 to \$76,500.

About all that can be said about chemists' salaries by geographic region is that they follow national trends and tend to be high on the East and West Coasts. For instance, the median salary for Ph.D.s exceeds \$100,000 only in New England, the Middle Atlantic states, and the Pacific region.

Bonuses for chemists mostly go to those in industry. In general, such payments are a relatively small component of total compensation. In 2007, 75% of chemists in

ACADEMIC SALARIES In academia, it pays to be a full professor

\$ THOUSANDS	NINE-MONTH CONTRACTS		11- TO 12-MONTH CONTRACTS	
	NON-PH.D. SCHOOL	PH.D. SCHOOL	NON-PH.D. SCHOOL	PH.D. SCHOOL
Full professor	\$76.4	\$110.0	\$109.9	\$131.2
Associate professor	58.6	75.8	72.5	77.9
Assistant professor	50.0	65.0	65.0	68.9
Instructor/adjunct	40.6	46.0	44.6	60.0
Research appointment	id	id	49.2	47.4

id = insufficient data to be meaningful. SOURCE: ACS salary survey 2007

PH.D. FACULTY SALARIES BY GENDER Women's base salaries are reasonably comparable with those of men

\$ THOUSANDS	MEN	WOMEN	WOMEN'S SALARIES AS % OF MEN'S
FULL PROFESSOR			
Bachelor's granting	\$73.2	\$78.2	107%
Master's granting	79.5	72.4	91
Ph.D. granting	111.4	101.5	91
ASSOCIATE PROFESSOR			
Bachelor's granting	58.0	56.5	97
Master's granting	65.0	id	id
Ph.D. granting	75.8	75.0	99
ASSISTANT PROFESSOR			
Bachelor's granting	49.0	49.5	101
Master's granting	54.0	id	id
Ph.D. granting	66.0	58.8	89

NOTE: Median salaries for nine- or 10-month contracts as of March 1, 2007. id = insufficient data to be meaningful. SOURCE: ACS salary survey 2007

INDUSTRIAL SALARIES BY WORK FUNCTION R&D management pays the most, analytical work among the least

\$ THOUSANDS	BACHELOR'S	MASTER'S	PH.D.
RESEARCH			
Basic research	\$62.7	\$78.1	\$105.0
Applied research	72.4	82.4	105.0
MANAGEMENT/SALES			
R&D management	98.0	112.5	140.0
General management	89.1	106.0	121.0
Marketing/sales	83.0	93.1	105.0
ANALYTICAL			
Analytical services	58.9	80.0	100.0
Production/quality control	65.0	80.0	102.1
OTHER			
Health/safety	83.5	92.0	124.5
Chemical information	id	id	95.8
Computers	id	id	100.0

NOTE: Median full-time base salaries. id = insufficient data to be meaningful. SOURCE: ACS salary survey 2007

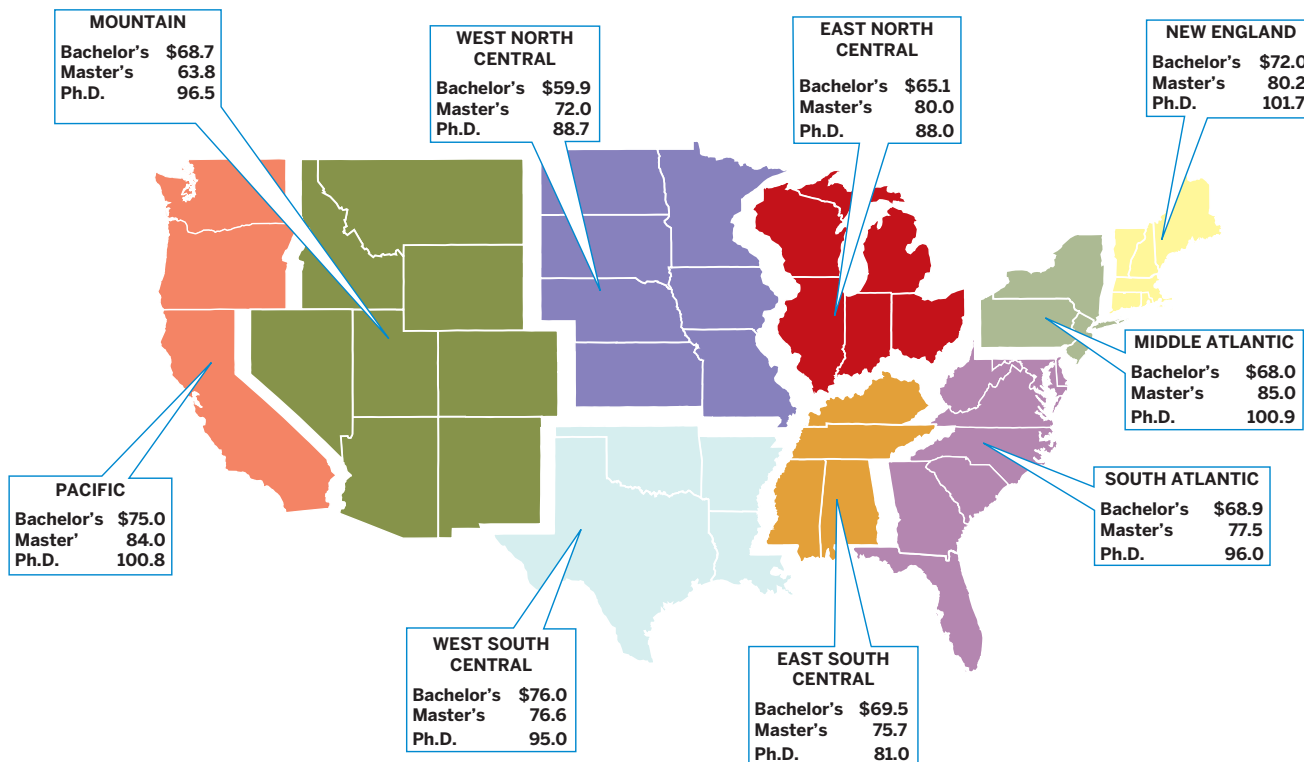
SALARIES OF ALL CHEMISTS BY EXPERIENCE Chemists 50 years and older have median salary of \$100,000 plus

\$ THOUSANDS	YEARS SINCE BACHELOR'S DEGREE									ALL ^a
	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
ALL CHEMISTS	\$45.4	\$57.0	\$72.0	\$82.0	\$94.9	\$100.0	\$104.0	\$100.0	\$100.0	\$88.0
BY GENDER										
Men	47.3	60.0	75.0	83.8	97.0	102.0	107.5	103.0	103.0	92.8
Women	45.0	53.1	65.5	76.2	82.7	83.5	96.0	77.4	86.0	71.5
BY DEGREE										
Bachelor's	44.8	54.2	63.5	71.0	73.5	87.3	88.5	82.4	75.0	68.7
Master's	id	60.0	71.0	75.3	85.5	85.8	93.6	88.6	89.5	80.0
Ph.D.	id	59.0	75.4	88.9	100.0	105.6	115.0	106.0	104.0	96.8
BY EMPLOYER										
Industry	47.0	64.3	80.9	92.0	102.0	105.0	113.0	108.9	110.0	97.0
Government	id	57.0	73.0	85.0	88.7	92.5	107.4	105.0	107.0	90.0
Academia	38.5	45.0	53.0	58.0	61.5	73.6	80.0	77.1	91.5	65.4

NOTE: Median full-time salaries as of March 1, 2007. ^a Respondents giving their age. id = insufficient data to be meaningful. SOURCE: ACS salary survey 2007

CHEMIST'S SALARIES BY REGION

New England, Middle Atlantic, and Pacific states have salary edge



NOTE: Median full-time base salaries in thousands of dollars as of March 1, 2007. SOURCE: ACS salary survey 2007

SALARY SPREAD FOR INDUSTRIAL CHEMISTS

Top 10% of Ph.D.s approach \$200,000 salaries

\$ THOUSANDS	YEARS SINCE BACHELOR'S DEGREE									ALL
	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
BACHELOR'S										
90th percentile	\$65.0	\$75.0	\$90.0	\$100.0	\$125.0	\$130.1	\$135.0	\$128.0	\$121.0	\$112.0
75th	53.3	66.1	77.9	85.0	101.0	101.5	111.0	103.0	105.0	90.0
50th	45.4	55.0	65.0	72.5	76.1	90.0	91.5	82.4	77.0	70.7
25th	35.0	46.0	55.1	59.3	60.7	72.0	73.0	72.0	65.0	54.6
10th	32.0	37.5	50.0	52.5	50.0	57.6	56.0	52.0	50.8	41.6
MASTER'S										
90th percentile	na	84.4	93.0	114.0	148.0	130.0	138.4	137.5	150.0	130.0
75th	na	72.0	84.0	98.4	105.0	110.0	118.0	118.0	120.0	107.5
50th	na	61.8	75.0	80.0	92.5	92.5	98.0	100.3	97.7	88.0
25th	na	53.0	67.0	68.0	76.5	75.0	83.0	77.0	70.0	69.0
10th	na	47.0	58.0	50.4	65.0	56.0	59.0	67.1	50.0	55.0
PH.D.										
90th percentile	na	96.8	114.0	134.0	165.0	165.0	185.0	182.5	192.0	166.0
75th	na	90.0	101.9	116.5	133.2	143.2	152.6	149.5	150.0	135.0
50th	na	81.0	90.0	100.7	110.5	116.0	126.0	120.8	123.5	110.0
25th	na	74.0	80.6	89.0	97.0	100.0	107.0	97.5	93.0	92.0
10th	na	62.5	70.0	74.5	82.0	88.0	90.0	80.0	50.0	76.5

HOW TO READ THIS TABLE: Using the example of bachelor's degree chemists five to nine years after they have received their bachelor's degrees: The 10% best paid had a median base salary of \$75,000, whereas the 10% worst paid had a median salary of \$37,500. na = not applicable. SOURCE: ACS salary survey 2007

manufacturing indicated they were eligible for a bonus. Of these, 95% got one. Its median size was \$10,000. Government is less generous, with 38% in that category eligible, 78% of these receiving, and a median of \$1,900. Academics come in at 12% eligible, 81% of these receiving, and a median of \$3,000.

Putting chemists in context with what had been happening to the employment situation in the U.S. in general for past dozen years is not easy. The data are complex and a multitude of factors are involved.

There is no question employment nationally has been on a roller coaster since 1995, with six years of rapid growth followed by about four years of decline and recovery and two years of renewed growth, which may today be on the wane.

U.S. population growth has held steady over these years at about 2.7 million per year for those 16 years and older and about 2.3 million per year for those 25 years and older.

Such growth demands a related steady growth in the number of domestic jobs just to maintain the status quo on the job market.

But the ability to generate jobs has definitely weakened. Chemists fall into the BLS category of "nonfarm payrolls." And BLS data on these payrolls are widely regarded as one of the better measures of employment. They

INDUSTRIAL SALARIES BY SIZE OF EMPLOYER

The bigger the better for chemists' pay

EMPLOYEES	SALARY (\$ THOUSANDS)		
	BACHELOR'S	MASTER'S	PH.D.
Fewer than 50	\$67.7	\$75.0	\$92.0
50-99	74.0	81.0	100.0
100-499	72.0	85.0	105.0
500-2,499	65.0	88.0	104.6
2,500-9,999	67.5	90.3	109.1
10,000-24,900	72.6	94.5	105.0
25,000 and up	79.7	89.0	120.0

NOTE: Median full-time base salaries. SOURCE: ACS salary survey 2007

BONUSES

Bonuses are largely a creature of industry

	INDUSTRY				
	MANUFACTURING	NONMANUFACTURING	GOVERNMENT	ACADEMIA	ALL
Eligible for bonus	75%	61%	38%	12%	51%
Percent of those eligible who received a bonus	95	89	89	81	92
Median bonus	\$10,000	\$5,200	\$1,900	\$3,000	\$8,000

SOURCE: ACS salary survey 2007

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U.S. NATIONAL EMPLOYMENT

Rate of growth for jobs nationally has dropped sharply since 2001 ...

MILLIONS	1995	2001	2007	CHANGE	
				1995-2001	2001-07
Civilian population (16 years +)					
Total	198.0	214.3	231.0	16.3%	16.7%
Civilian labor force (16 years +)					
Total	131.4	143.7	152.2	12.3	8.5
Employment level (16 years +)					
Total	123.9	137.2	145.3	13.3	8.1
Unemployment level (16 years +)					
Total	7.5	6.5	6.9	-1.0	0.4
Nonfarm payrolls					
Total	116.0	131.7	136.8	15.7	5.1
Total private employment^a					
Total	97.4	111.6	115.4	14.2	3.8

... but for college graduates, the employment market has held up quite well

MILLIONS	1995	2001	2007	CHANGE	
				1995-2001	2001-07
Civilian population (25 years +)					
Total	165.7	179.7	193.7	14.0%	14.0%
College grads	38.2	46.8	55.6	8.6	8.8
Civilian labor force (25 years +)					
Total	110.6	121.6	130.6	11.6	9.0
College grads	31.1	37.2	43.5	6.1	6.3
Employment level (25 years +)					
Total	105.6	117.4	125.8	11.8	8.4
College grads	30.3	36.5	42.8	6.2	6.3
Unemployment level (25 years +)					
Total	5.0	4.3	4.8	-0.7	0.5
College grads	0.8	0.7	0.8	-0.1	0.1

NOTES: Data are as of March each year. ^a Seasonally adjusted. SOURCE: Bureau of Labor Statistics

grew by an average of 2.6 million per year from 1995 to 2001 but by only 800,000 per year from 2001 to 2007. Total private employment, another key BLS indicator, shows the same profile, up by 2.4 million annually from 1995 to 2001 and by about 650,000 annually from 2001 to 2007.

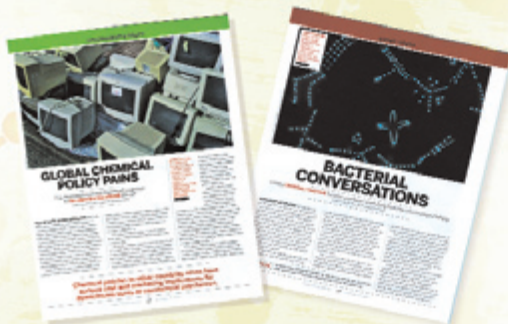
Two questions are key: Is the slow overall rate of job growth since 2001 not unexpected as this period includes the losses from the inevitable downturn that came in the aftermath of the exuberant job growth of the 1990s boom that ended in early 2001? Or is slower job growth chronic and due to such factors as the continued aging of the U.S. population; the downsizing of many domestic operations, especially manufacturing; the outsourcing of jobs overseas; other perturbations of globalization; or people just giving up on finding a job? Only time will tell.

However, an encouraging sign, especially for chemists, is the relatively strong and consistent workplace performance of college graduates in general. The number of those in the labor force who have at least a bachelor's degree in any subject and are at least 25 years old has risen very steadily from 31 million in 1995 to 37 million in 2001 and 44 million in 2007.

This trend quantifies the ongoing increase in the caliber of the U.S. workforce, something that is essential if this country is to remain competitive and economically strong. It also parallels the steady upgrade in the academic qualification of the U.S. chemical community. ■

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