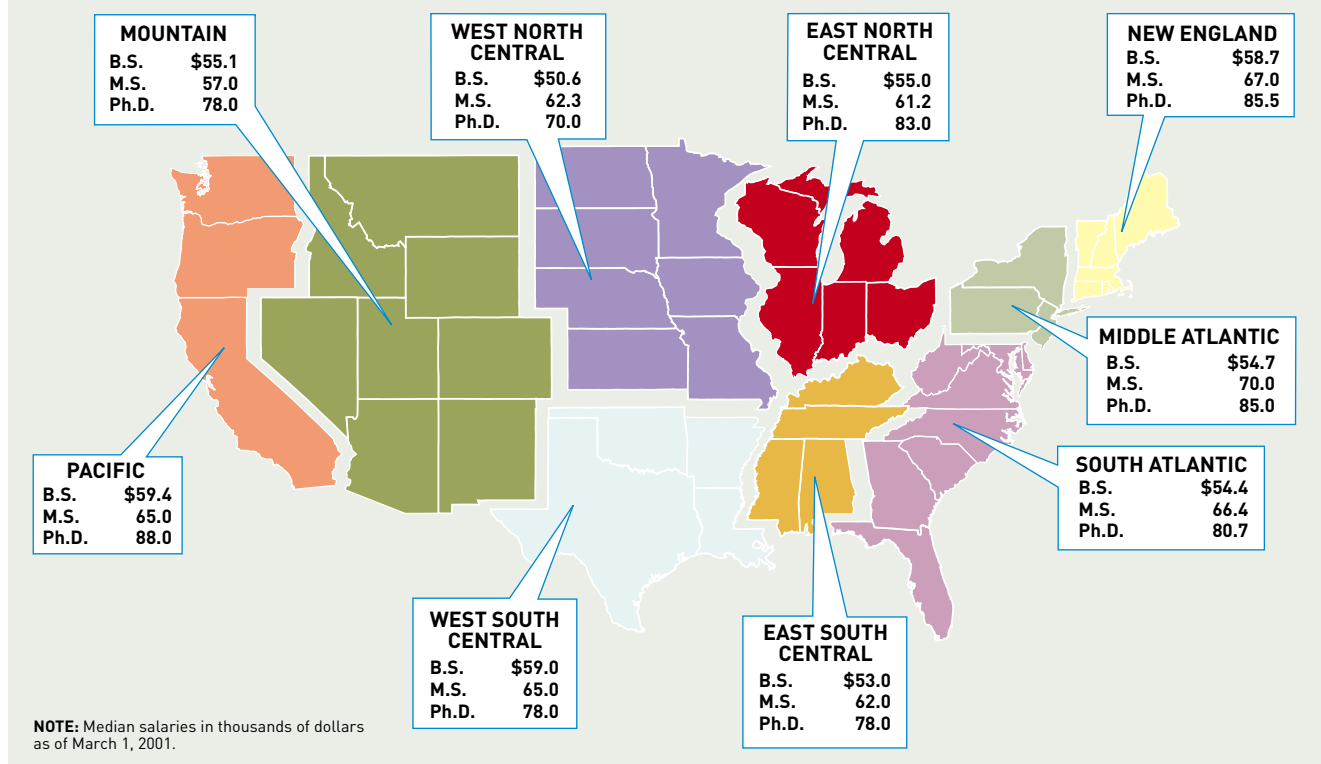


LOCATION, LOCATION

As in real estate, where you live has an impact on what you earn



SALARY SURVEY

Job situation for chemists finally approaches full strength, and salaries continue with solid growth as long economic boom fizzles. So, what next?

MICHAEL HEYLIN, C&EN WASHINGTON

THIS YEAR HAS BROUGHT THE BEST EMPLOYMENT SITUATION for chemists in more than a decade. Unemployment is down sharply from last year. Fewer chemists are in part-time or postdoctoral positions. The percentage of working chemists with a full-time job is at the highest level since 1990. In addition, salary increases over 2000 are both across the board and substantially in excess of the rate of inflation.

These trends are apparent from the data gathered for this year's American Chemical Society survey of the salary and employment status of its working members. As always, it asked for information as of March 1.

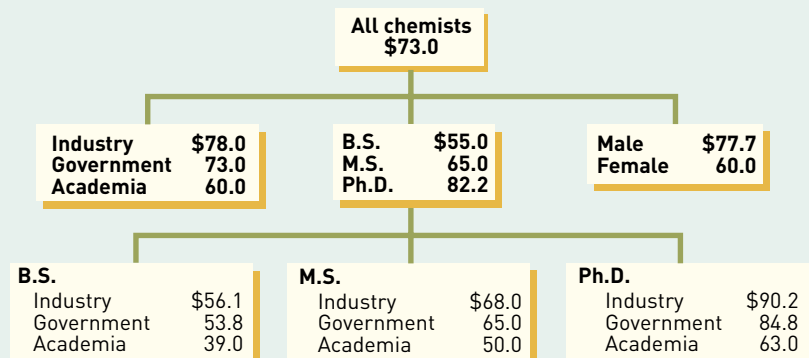
The society defines the chemical workforce as those chemists with full- or part-time jobs, on postdocs or fellowships, or unemployed but seeking employment. Excluded are the fully retired and others who are unemployed but not seeking employment.

The median salary for all chemists responding this year is \$73,000. This is up from the \$70,000 median for those responding to the 2000 survey. It represents a 4.3% increase for chemists as a group and is comfortably ahead of the 2.9% increase in the Consumer Price Index for the period.

For Ph.D. chemists as a group, the median salary is \$82,200, up 4.1% from last year. For chemists with master's degrees, it is \$65,000, up 4.8%, and for chemists with bachelor's degrees, it is \$55,000, for a 3.6% gain.

MEDIAN SALARIES

Industry chemists enjoy substantial edge



NOTE: Median base annual salary in thousands of dollars for chemists employed full time as of March 1, 2001.

Median salary increases are larger for chemists as individuals because, in addition to inflation, such gains take into account promotions, increasing experience, and other factors affecting an individual's salary. In 2001, the median year-to-year gain for individual chemists working for the same employer both this year and last is in the 5 to 7% range, depending on how it is calculated.

The unemployment rate among chemists is at 1.5% this year, down from 2.0% last year. And with fewer chemists on postdocs, 1.4% compared with 2.1% last year, and in part-time positions, 2.5% compared with 3.0%, the percentage of working chemists with full-time jobs has risen to 94.6%. This is up from 92.9% last year and a recent low of 91.1% in 1995.

These improvements for the chemistry profession came just as the longest and strongest economic expansion in U.S. history ran out of steam earlier this year. This mother of all booms started in 1993. It generated 15 million more jobs nationally to bring the civilian domestic workforce to 142 million people. It engendered the strongest national employment market since 1969. And it dropped the overall unemployment rate from 7.8% in March 1992 to 4.3% this March, with monthly lows below 4% last year.

However, until this year, this national upsurge had not fully carried the chemical profession along with it. Chemists' salaries have shown solid growth over the past several years after stalling in the mid-'90s. But joblessness among chemists, as measured by the ACS surveys, rose steadily from

Personal gains

Individual chemists post 5% salary gain

SALARY INCREASE, 2000-2001	MEDIAN SALARY INCREASES				MEAN SALARY INCREASES			
	B.S.	M.S.	PH.D.	TOTAL	B.S.	M.S.	PH.D.	TOTAL
ALL CHEMISTS	5.0%	4.9%	4.8%	4.9%	7.5%	6.8%	6.6%	6.9%
BY EMPLOYMENT								
Industry	5.3	5.0	5.1	5.1	7.8	6.8	7.3	7.4
Government	4.3	4.3	4.3	4.3	6.1	7.6	6.7	6.7
Academia	5.1	4.4	4.2	4.3	6.8	6.5	5.6	5.8
BY AGE								
20-29	8.2	8.0	5.5	7.7	11.6	8.5	8.5	10.5
30-39	5.9	6.2	6.0	6.0	8.5	8.6	8.1	8.3
40-49	4.5	4.5	5.0	4.8	6.2	6.2	6.9	6.6
50-59	4.2	4.3	4.2	4.2	5.3	5.8	5.5	5.5
60-69	3.9	4.2	4.0	4.0	4.4	5.4	5.0	5.0

NOTE: Salary increase between March 1, 2000, and March 1, 2001, for individual chemists employed full time by the same employer over the period.

Inflation

Chemists' salaries grow faster than cost of living

\$ THOUSANDS	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	AVERAGE ANNUAL INCREASE		
												2000-2001	1996-2001	1991-2001
BY DEGREE														
B.S.	\$40.3	\$42.0	\$43.5	\$44.3	\$45.4	\$45.0	\$49.4	\$49.6	\$50.1	\$53.1	\$55.0	3.6%	4.1%	3.2%
M.S.	47.4	50.0	51.5	52.0	53.5	53.6	56.2	57.7	61.0	62.0	65.0	4.8	3.9	3.2
Ph.D.	58.0	60.0	62.8	65.0	66.0	68.0	71.0	73.3	76.0	79.0	82.2	4.1	3.8	3.5
ALL CHEMISTS	52.0	54.6	56.0	57.9	59.7	60.0	63.0	65.0	68.0	70.0	73.0	4.3	4.0	3.4
Change in Consumer Price Index												2.9	2.5	2.7

NOTE: Median base annual salary of chemists employed full time as of March 1, 2001. SOURCES: ACS surveys and Bureau of Labor Statistics

Employment

Overall job situation is best in a decade

EMPLOYMENT STATUS ^a	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Employed full time	94.0%	93.4%	92.8%	91.9%	91.1%	91.5%	93.5%	92.9%	92.9%	92.9%	94.6%
Employed part time	1.8	2.2	2.2	2.5	2.7	2.7	2.1	2.5	2.7	3.0	2.5
Postdoctoral or fellowship	2.6	2.4	3.0	2.9	3.6	2.8	2.3	2.3	2.1	2.1	1.4
Unemployed	1.6	1.9	2.0	2.7	2.6	3.0	2.0	2.3	2.3	2.0	1.5

^a As of March 1, 2001. Based on population that excludes those unemployed but not seeking employment.

1992 though 1996, when it peaked at 3.0%. This was very close to its all-time high of 3.2% in 1972. For the next four years it lingered at, or just above, 2.0%, before finally dropping to this year's more comfortable 1.5%.

The belated nature of these improvements in the job market for chemists raises the question of what they can expect in the workplace if the current economic deceleration persists or even evolves into a recession.

The economy has been very flat since the survey was taken on March 1. As exemplified by the recently completed Dow-Union Carbide merger (C&EN, May 7, page 11), mass layoffs of chemists are by no means a thing of the past. The chemical industry is having another poor financial year. And, despite the recent gains, the chemical job market is still not as strong as it was a decade ago.

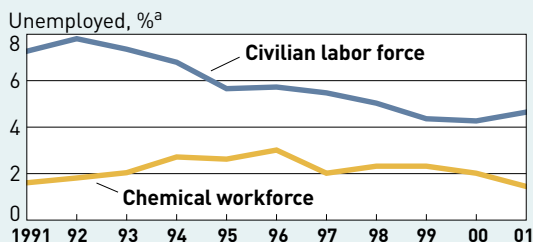
In 1990, only 1.1% of the chemists responding to the ACS survey were unemployed as of March 1. And only 3.0% were unemployed at any time during that year. This compares with 2.0% unemployed as of March 1, 2000, and 4.9% unemployed at some time during 2000. And although the unemployment rate among chemists of 1.5% as of March 1 this year was the lowest in a decade, the percentage of chemists who will be unemployed at some time during this year remains unknowable at this time. Nevertheless, it will probably turn out to be more than the 3% of a decade ago.

But there are some positive signs for chemists. The seemingly recession-proof drug industry continues to hire more chemists. The past two employment clearinghouses at ACS national meetings had considerably more openings than applicants. And until the recent decline in the economy, the volume of paid classified (employment) advertising in C&EN was running at a record level.

It can be said that the economic boom of 1993 through early 2001 has brought some significant change to employment prospects for chemists. As traditional employment opportunities in the chemical industry have stagnated or declined, the market has eventually strengthened and become more lively with a higher rate of turnover as chemists seek to exploit broadening opportunities in pharmaceuticals, biotech, and other rapidly developing enterprises on the frontiers of chemistry. Only time will tell how long these

UNEMPLOYMENT

For chemists, it went up, then down during 1993–2000 boom



a Unemployment rates as of March 1 each year.
SOURCES: ACS survey and Bureau of Labor Statistics

new fields of opportunity will hold up for chemists if the economy does indeed descend into recession.

THE SURVEY. This year, the four-page survey questionnaire was sent to a random sample of a little more than 20% of the society's domestic members who are less than 70 years old and not categorized as emeritus, retired, or student members. The response rate was 44%, or 9,800 out of 22,400. Of the responses, 8,700 were from chemists in the workforce. Another 400

were from working chemical engineers. Most of the remaining respondents turned out to be either retired or otherwise not in the workforce.

Chemists are defined for ACS survey purposes as those who are in either of two categories. One is those who identify any one of 15 chemical subdisciplines or specialties—such as analytical, environmental, or organic chemistry—as being the most closely related to their current or most recent job. The other category is those who have their highest degree in chemistry

and identify business administration, computer science, law, or other nonchemistry activities as their specialty.

All those who identify chemical engineering as their specialty are considered chemical engineers, even if their highest degree is in chemistry. Conversely, those with their highest degree in chemical engineering, but who identify with a chemical specialty, are counted with the chemists. The data for those considered chemical engineers are analyzed separately.

Last year's survey was actually a cen-

SOME DIFFERENCES

Salary And Employment For Chemical Engineers

A total of 398 respondents to ACS's 2001 salary and employment survey identify themselves as chemical engineers. Of these, 77% have jobs in industry, 14% are academics, 7% have government positions, and 2% are self-employed.

By employment status, 92.0% are employed full time, 2.8% have part-time jobs, 0.5% are on postdoctoral fellowships, and 4.8% were unemployed as of March 1 but seeking employment.

By race, 81% are white, 3% are "other," and a high 16% are Asian. However, only one black and one American Indian responded.

By gender, 12% are women.

The salary profile this year again brings out the wide acceptance of the B.S. and M.S. in chemical engineering as terminal, professional qualifications.

Bachelor's degree chemical engineers working in industry have a median salary of \$71,000 in 2001. This is 27% higher than the \$56,100 median for industrial

bachelor's degree chemists. For master's degrees, the differential is 21%—\$82,400 for chemical engineers compared with \$68,000 for chemists.

However, Ph.D. chemical engineers are paid slightly less, \$90,200, than Ph.D. chemists in industry, with a median salary of \$90,400.

Academic chemical engineers responding to the ACS survey also have a salary advantage over their chemist colleagues. The median 2001 salary for doctoral chemical engineering academics is \$91,000. This compares with the much lower \$63,000 median for doctoral academic chemists.

The median salary for academic chemists is pulled down by the 58% of them who are not full professors and so are in the lower paying ranks of the profession. However, the relatively few chemical engineers who are both academics and ACS members are more likely to hold well-paid positions at large research universities.

By degree

Ph.D. industrial chemists earn about 40% more than bachelor colleagues

MEDIAN SALARY, ^a \$ THOUSANDS	YEARS SINCE B.S. DEGREE									40 OR MORE	OVERALL MEDIAN
	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 OR MORE		
BY DEGREE											
B.S.	\$42.0	\$48.2	\$56.5	\$65.8	\$70.0	\$75.0	\$72.7	\$72.0	\$75.0	\$56.2	
M.S.	48.8	54.0	62.0	68.0	75.0	84.0	84.0	80.6	72.1	68.0	
Ph.D.	—	72.0	79.0	86.5	96.0	101.0	104.0	105.5	97.0	90.2	
BY GENDER											
Men	B.S.	42.5	50.0	58.8	68.4	72.0	77.7	75.0	73.5	75.0	60.0
	M.S.	—	56.5	62.0	70.0	79.4	85.0	84.0	85.0	76.5	73.0
	Ph.D.	—	72.0	79.5	88.5	97.8	101.0	105.0	106.0	97.0	92.5
Women	B.S.	41.0	46.4	54.0	58.9	67.3	62.5	60.6	—	—	50.0
	M.S.	—	53.0	60.0	65.0	66.8	62.0	68.6	—	—	59.0
	Ph.D.	—	76.8	76.5	84.0	90.2	99.5	94.7	—	—	81.0

NOTE: Where no salary data are shown, sample is too small (fewer than 15) to provide meaningful figure. ^a As of March 1, 2001.

By percentile

Pay of top 10% of industrial chemists is more than twice that of bottom 10%

MEDIAN SALARY, \$ THOUSANDS	YEARS SINCE B.S. DEGREE									40 OR MORE	OVERALL MEDIAN
	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 OR MORE		
B.S.											
90%	\$53.0	\$65.0	\$79.2	\$90.0	\$104.3	\$105.3	\$104.0	\$126.0	\$115.5	\$93.0	
75	48.5	56.7	68.0	78.1	87.5	92.0	88.5	93.0	89.0	73.4	
50	42.0	48.2	56.5	65.7	70.0	75.0	72.7	72.0	75.0	56.2	
25	36.2	40.2	47.8	51.0	58.0	58.5	55.0	57.3	50.2	44.0	
10	31.6	36.4	40.3	42.7	45.6	45.7	43.3	47.5	45.0	36.2	
M.S.											
90%	55.2	66.0	83.0	93.0	110.0	115.0	112.0	132.0	125.0	100.2	
75	53.5	59.0	70.0	76.6	90.0	96.0	97.0	95.0	92.6	85.0	
50	48.8	54.0	62.0	68.0	75.0	84.0	84.0	80.6	72.1	68.0	
25	42.0	48.6	54.0	57.0	60.0	67.5	66.4	65.0	55.0	55.6	
10	40.0	44.0	47.4	49.0	48.0	57.3	50.8	50.1	42.0	47.8	
Ph.D.											
90%	—	86.3	100.4	114.0	135.0	142.0	160.0	170.0	140.4	135.0	
75	—	80.0	88.6	98.0	114.0	120.0	125.1	130.0	118.7	108.6	
50	—	72.0	79.0	86.5	96.0	101.0	104.0	105.5	97.0	90.2	
25	—	67.0	71.6	75.0	80.0	88.1	88.9	90.0	79.0	75.1	
10	—	59.4	63.0	65.0	68.5	73.2	73.5	67.3	60.0	65.0	

How to read this table: Using, as an example, industrial B.S. chemists two to four years after they have received their B.S. degree, 90% of these chemists have annual base salaries of \$53,000 or less; 75% have annual base salaries of \$48,500 or less, 50% have annual base salaries of \$42,000 or less, 25% have annual base salaries of \$36,200 or less, and 10% have annual base salaries of \$31,600 or less, as of March 1, 2001.

sus—ChemCensus 2000—in that the survey was sent to all workforce members (C&EN, Aug. 14, 2000, page 46). It generated responses from 42,000 working chemists and 2,000 working chemical engineers. Since 1985, a census has been conducted every fifth year.

Since 1996, ACS's annual salary and employment surveys of its members, as well as its annual surveys of the starting salaries of new chemistry graduates, have been conducted by Mary W. Jordan, senior research analyst for the society's Department of Career Services under the general direction of the Committee on Economic & Professional Affairs.

The full report on the latest survey will be available this fall for \$150 per copy from ACS, Office of Society Services, 1155—16th St., N.W., Washington, DC 20036; phone (800) 227-5558 or (202) 872-4600. Questions on the substance of the reports should be addressed to Pamela R. Steiner at (202) 872-6153 or p_steiner@acs.org.

DEMOGRAPHICS. Of the working chemists responding to this year's survey, 22% have a bachelor's degree as their highest degree; 17% have a master's; and 60% have a doctorate.

By employer, 64% work for industry, 26% are academics, 9% have government jobs, and 1% are self-employed.

By work function, the largest category is R&D at 39%. This is followed by a combined general and R&D management at 15% and teaching at 13%.

By race, 84.3% are white, 11.4% Asian, 1.8% black, 0.3% American Indian, and 2.2% "other." By ethnicity, 2.5% are Hispanic.

By gender, 24.8% are women.

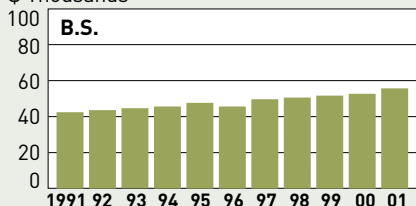
By citizenship, 79.8% are native-born Americans, 10.4% are naturalized, 6.5% have permanent resident visas, and 3.3% are on other visas.

Although such demographics change little from one year to the next, some of them

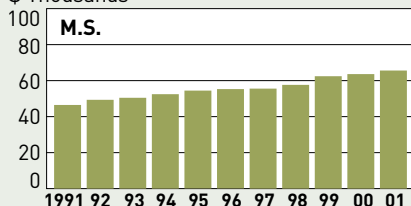
SALARY GAINS

An upward surge followed a pause in the mid-'90s

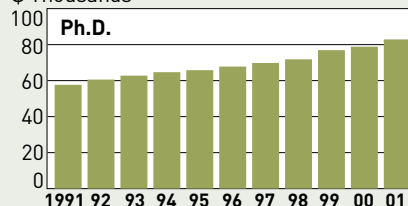
\$ Thousands



\$ Thousands



\$ Thousands



NOTE: Median base annual salary for chemists employed full time as of March 1 each year.

have evolved quite considerably over the past decade. For instance, today's 24.8% for women is up from 18.5% in 1990.

The chemical profession has also become more diverse in other ways in the past decade. The percentage who are Asian has almost doubled since 1990, when it was 6.3%. The percentage of chemists who are not native-born Americans has increased from 11.2% to 20.2% over the same period.

A more detailed look at the data for chemists who identify themselves as Asians reveals that they constitute a well-qualified and enduring part of the chemical workforce. Almost three-quarters of them, 74%, have a doctorate, and 86% are either native-born, naturalized, or permanent residents. The other 14% are on temporary visas.

However, 36, or 32%, of the 114 chemistry postdocs responding to this year's survey are Asians on temporary visas. This is nearly as many as the 43, or 37%, that are native-born Americans of all races. In all, 58, or 51%, of the postdocs responding are on temporary visas.

Another demographic that has changed considerably for chemists is their age. In 1990, the median age of working chemists was 41. Today it is 45. The mean age has risen from 41.3 to 44.7. This shift transcends chemistry. It is driven by the population bulge created by the now-aging baby-boom generation that has pushed the median age of the entire U.S. domestic labor force from 36.4 in 1990 to 39.2 in 2000.

Baby boomers are defined as those born between 1947 and 1964. In the chemical profession, they are marked by the large graduating classes of bachelor's degree chemists from the late 1960s through the mid-'80s.

SALARIES. The median salaries quoted here are for the base pay from respondents' primary jobs. Medians are used to avoid the distortions that a relatively few very high salaries can cause in averages or means. The median salary is that which is equaled or exceeded by one-half of respondents.

Data on additional professional income, such as from bonuses or consulting, are collected and analyzed separately.

The median base salary for all chemist respondents this year of \$73,000 is 40% higher than the 1991 median of \$52,000. Over the same period, the Consumer Price Index rose by 31%. This indicates a useful constant-dollar gain of about 7% in the salaries of chemists as a group.

However, in terms of tangible value to chemists as individuals, this gain is more virtual than real. With the median 2001

By age

Industrial chemists maintain salary advantage in all age groups

MEDIAN SALARY, ^a \$ THOUSANDS	YEARS SINCE B.S. DEGREE									OVERALL MEDIAN
	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 OR MORE	
ALL CHEMISTS	\$42.0	\$55.0	\$66.0	\$72.1	\$80.0	\$84.3	\$87.6	\$86.0	\$84.0	\$73.0
BY GENDER										
Male	43.2	56.7	69.0	75.0	83.0	88.0	90.0	90.0	85.0	77.9
Female	40.0	53.0	60.0	65.0	70.0	67.0	67.4	69.8	71.0	60.0
BY DEGREE										
B.S.	41.0	48.0	55.0	63.0	67.6	70.0	67.5	71.5	70.0	55.1
M.S.	46.5	53.0	60.0	65.0	72.0	75.0	74.0	73.8	65.0	65.0
Ph.D.	—	67.9	72.0	77.9	87.2	92.0	95.0	92.5	87.4	82.2
BY EMPLOYER										
Industry	42.5	58.0	72.0	78.0	87.2	91.4	95.0	95.0	88.7	78.0
Government	36.5	51.0	60.0	69.0	72.1	74.7	84.0	82.2	87.1	73.0
Academia	31.0	42.0	48.0	50.3	60.0	62.9	67.7	75.4	89.6	60.0

^a As of March 1, 2001.

chemist being four years older than the median 1991 chemist, a constant-dollar gain in the median salary over the decade is inevitable. In fact, the apparent 7% gain is less than would be expected from the extra four years.

Individual, as opposed to group, salary gains, are garnered from responses to questions that ask respondents for their salaries as of both March 1 in the current year and March 1 in the previous year. Such data are relatively reliable and consistent. They

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Bigger is better in industry

Size of employer and size of salary are closely linked

NUMBER OF EMPLOYEES	B.S.	M.S.	PH.D.
Fewer than 50	\$50.4	\$63.0	\$80.0
50-99	50.0	66.7	88.7
100-499	52.8	66.0	85.4
500-2,499	54.0	70.0	89.9
2,500-9,999	60.0	70.0	91.9
10,000-24,999	64.0	72.2	92.3
25,000 and more	60.0	70.0	94.7

NOTE: Median salary in thousands of dollars as of March 1, 2001.

Academia

Full professors earn high salaries

MEDIAN SALARY, ^a \$ THOUSANDS	9- TO 10-MONTH CONTRACTS		11- TO 12-MONTH CONTRACTS	
	NON-PH.D. SCHOOL	PH.D. SCHOOL	NON-PH.D. SCHOOL	PH.D. SCHOOL
Full professor	\$65.0	\$90.0	\$99.3	\$115.0
Associate professor	49.0	59.0	73.0	70.0
Assistant professor	42.0	50.4	50.0	58.0

a As of March 1, 2001.

come from precisely the same set of respondents to a single survey.

The estimates of the annual increases in the median salaries of chemists as a group are less reliable. They have to be interpreted with greater care because they can, on occasion, be quite erratic from one year to the next, especially for subsets of the chemist population. This is due to the inherent uncertainties of the surveying and polling process. Such increases are derived as the difference between the medians from two surveys taken one year apart and using different member samples. This approach also faces the vagaries of deducing any relatively small number as the difference between two much larger numbers determined independently.

The median of the individual increases in 2001 for those with the same employer both this year and last is 4.9%. For industrial chemists, it is 5.1%, and for both academics and government workers, 4.3%. As

usual, younger chemists do better—7.7% for those between ages 20 and 29, dwindling down steadily to 4.0% for those 60 through 69.

Using the same data set but calculating the increase in a different way—as the difference between the 2000 and 2001 salary medians for all respondents—indicates a larger increase. The gain is from \$70,100 in 2000 to \$75,000 this year, or 7.0%.

As has always been the case, the median salary for all women respondents remains substantially lower than for all men. This year, women are at \$60,000, 77% that of men, who are at \$77,700. This is only a modest improvement over 10 years ago, when women were at the 75% mark—\$40,700 compared with \$54,000.

There are two major reasons for this persistent differential. Women, as a group, are both seven years younger than men and less qualified. For example, in industry,

35% of women chemists have Ph.D.s compared with 58% of the men.

In general today, women chemists apparently get equal pay for equal work. This has, in essence, been confirmed statistically by a salary comparison system developed for ACS by regression analysis of data from ACS employment surveys.

This system, known as the ACS Salary Comparator, is on the ACS website at <http://www.chemistry.org/careers>. It enables society members to place their own salaries into perspective with those of others. Members provide the system with information about themselves—their highest degree, years since their bachelor's degree, what they do, their work specialty, the type and size of their employer, and where they live—and it calculates the median salary and salary range of all those with the same profile. Significantly, the system does not ask for gender.

However, this does not mean that women no longer face barriers in chemistry. Although they get equal pay for equal work, at issue is the nature of the work they get. Women are still overrepresented in generally lower paying and less prestigious specialties and functions of the profession and correspondingly underrepresented in the better paying and more prestigious ones.

For example, with 25% of the total chemical workforce being women, 38% of those who identify their work specialty as the relatively poorly paid field of chemical education are women. In contrast, only 17% of those designating organic chemistry as their work specialty are women, as are only 18% of physical chemists.

Of those whose primary work function is chemical education, 31% are women, as are 27% of those in production. But a far lower 13% of much better paid R&D managers are women, as are 17% of general managers. Similarly, only 12% of full professors are women.

Work function has a very large impact on salary. For example, the median salaries

Aging

Median age of chemists gains four years in past decade

	MEAN AGE				MEDIAN AGE			
	1990	1995	2000	2001	1990	1995	2000	2001
ALL CHEMISTS	41.3	43.3	44.8	44.7	41	42	45	45
BY GENDER								
Male	42.6	44.6	46.3	46.3	42	44	46	47
Female	36.3	38.7	40.4	40.8	35	37	39	40
BY DEGREE								
B.S.	37.5	39.3	40.9	40.7	35	38	41	41
M.S.	41.2	43.3	44.6	44.5	41	43	45	45
Ph.D.	42.9	45.0	46.2	46.2	43	45	46	46
BY EMPLOYER								
Industry	39.9	42.1	43.3	43.2	39	41	43	43
Government	42.1	45.0	47.1	48.1	40	45	48	49
Academia	44.2	44.9	46.9	48.0	46	45	47	49
BY RACE/ETHNICITY								
White	41.6	43.7	45.2	45.3	41	43	45	46
Asian	40.0	41.3	42.5	42.6	40	39	41	40
Black	39.1	41.5	42.8	44.7	39	40	43	45
American Indian	39.9	41.9	43.7	42.0	39	43	42	44
Hispanic	38.5	39.9	41.9	42.1	37	38	41	41

for chemists with bachelor's degrees, working in industry range from \$50,000 for those in analytical services to \$80,000 for those in R&D management. For chemists with master's degrees, the parallel range is from \$62,000 to \$97,000,

and for doctorates, it is from \$83,300 to \$112,000.

Another significant influence on the salaries of industrial chemists is the size of their employer. For chemists with bachelor's degrees, the 2001 salary median varies

from \$50,400 for those working for tiny firms with fewer than 50 employees to \$60,000 for those working for firms employing 25,000 or more. For chemists with master's degrees, the spread is from \$63,000 to \$70,000, and for those with

Job status

Many factors affect employment

	EMPLOYED			UNEMPLOYED SEEKING EMPLOYMENT
	FULL TIME	PART TIME	POSTDOCS	
ALL CHEMISTS	94.6%	2.5%	1.4%	1.5%
BY DEGREE				
B.S.	96.1	2.0	0.1	1.7
M.S.	95.1	3.3	0.0	1.6
Ph.D.	94.0	2.4	2.2	1.4
BY GENDER				
Men	95.6	1.6	1.3	1.5
Women	91.8	5.2	1.4	1.6
BY RACE/ETHNICITY				
White	94.9	2.6	0.9	1.6
Asian	92.8	1.7	4.5	0.9
Black	96.8	1.3	1.3	0.6
American Indian	100.0	0.0	0.0	0.0
Hispanic origin				
Yes	92.3	1.0	2.9	3.8
No	94.7	2.5	1.3	1.4

BY CURRENT/MOST RECENT EMPLOYER

Industry	96.4	1.8	0.1	1.7
Government	92.4	4.7	1.8	1.1
Academia	91.5	3.4	4.3	0.8
Self-employed	93.2	1.7	0.0	5.1

BY CURRENT/MOST RECENT JOB FUNCTION

R&D	94.3	1.4	3.4	0.9
R&D management	97.7	0.5	0.0	1.8
General management	97.9	1.0	0.0	1.1
Teaching	93.9	4.9	0.4	0.8
Marketing	95.3	2.7	0.0	2.0
Production	96.0	1.1	0.0	2.9

BY AGE

Under 25	100.0	0.0	0.0	0.0
25 to 29	93.2	1.3	4.9	0.6
30 to 34	92.1	1.8	5.4	0.7
35 to 39	94.9	2.2	2.0	0.9
40 to 44	95.7	2.7	0.6	1.0
45 to 49	95.4	1.9	0.1	2.5
50 to 54	96.6	1.3	0.0	2.2
55 to 59	94.4	3.5	0.0	2.1
60 to 64	92.4	5.5	0.4	1.7
65 to 69	93.7	6.3	0.0	0.0

BY REGION

Pacific	92.7	2.9	2.6	1.8
Mountain	95.5	2.5	0.8	1.3
West North Central	95.5	1.6	1.1	1.8
West South Central	95.2	2.6	0.5	1.7
East North Central	95.9	2.1	0.6	1.3
East South Central	94.3	1.3	1.7	2.7
Middle Atlantic	95.3	2.1	1.4	1.2
South Atlantic	94.3	3.3	1.4	1.0
New England	94.3	3.0	1.5	1.2

NOTE: Based on a population that excludes those either fully retired or unemployed but not seeking employment. Data as of March 1, 2001.

Work function

Salaries vary widely in industry by type of work

MEDIAN SALARY, ^a \$ THOUSANDS	B.S.	M.S.	PH.D.
Analytical services	\$50.0	\$62.0	\$83.3
Applied research	58.0	65.0	84.0
Basic research	49.5	64.3	89.5
Chemical information	—	—	85.0
Computers	57.0	—	84.0
Consulting	54.0	61.9	91.4
General management	72.5	85.0	110.0
Health & safety	61.0	73.0	95.0
Marketing & sales	68.0	78.0	95.4
Patents	—	—	100.0
Production/ quality control	53.8	63.9	82.0
R&D management	80.0	97.0	112.0

NOTE: Where no salary data are shown, sample is too small (fewer than 15) to provide a meaningful figure. ^a Median salaries of those with full-time jobs as of March 1, 2001.

Women

Penetration varies markedly into various chemical fields . . .

DISCIPLINE	PERCENTAGE THAT ARE WOMEN	
	WORK SPECIALTY	HIGHEST DEGREE
Chemical education	38%	42%
General chemistry	34	36
Clinical chemistry	31	19
Law	30	—
Agricultural/food chemistry	28	30
Analytical chemistry	28	26
Biochemistry	28	31
Environmental chemistry	27	28
Biotechnology	23	36
Medical/pharmaceutical chemistry	23	22
Inorganic chemistry	20	23
Materials science	20	27
Polymer chemistry	20	22
Computer science	20	—
Physical chemistry	18	19
Organic chemistry	17	17
Business administration	13	21

. . . as it does in management functions

WORK FUNCTION	PERCENTAGE THAT ARE WOMEN
Teaching	31%
Production	27
Marketing	24
Research & development	23
General management	17
R&D management	13

Ph.D.s, salaries range from \$80,000 to \$94,700.

Academia shows a characteristic hierarchical salary structure. Full professors with 11- to 12-month contracts at Ph.D.-granting schools have a median 2001 salary of \$115,000, holding their own with their more senior industrial chemical colleagues. Associate professors with similar contracts at the same schools have to get by on two-thirds as much, at \$70,000, and assistant professors, on half as much, \$58,000.

Location is another significant determining factor for chemists' salaries—mostly for regional economic, and not chemically related, reasons. In general, salaries are highest on the Atlantic and Pacific Coasts. Falling in the midrange are chemists in the chemical-industry-heavy upper Midwest and the West South Central region anchored by Houston.

The range in median salaries is quite large. For 2001, for chemists with bachelor's degrees, it is from \$50,600 in the West North Central region to \$59,400 in the Pacific states. For chemists with master's degrees, it is from \$57,000 in the mountain states to \$70,000 in the mid-Atlantic. For those with Ph.D.s, the high is again in the Pacific states, at \$88,000. The low is in the West North Central region at \$70,000.

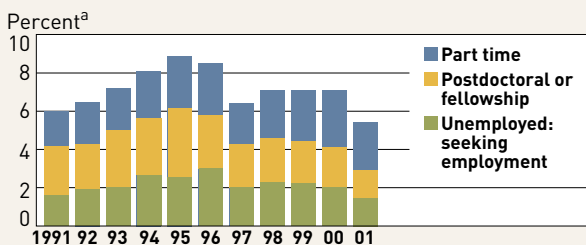
EXTRA PROFESSIONAL INCOME. Almost half, 49%, of the chemists responding to the 2001 survey were eligible for a monetary bonus in 2000. Of these, 93% actually received one. For those who received one, the median was \$5,000.

Not surprisingly, bonuses are most common in industry. Of industrial chemists, 66% were eligible, 94% of whom actually received one, with a median of \$5,500. Government chemists fall into the middle ground with 35% eligible, 84% receiving, and a median of \$1,500. Only 9% of academic chemists were eligible, 89% of whom received one, with a median of \$2,500.

Academics do better with extra income from consulting. Almost a quarter, 24%, of academic chemist respondents received such income during 2000. The median for those who did was \$4,000. Only 5% of industrial chemists consulted, with a median of \$5,000. Government chemists were again in the middle, with 11% consulting and a surprisingly high median of \$25,000. Overall, 10% of chemists con-

EMPLOYMENT

Chemists without full-time jobs are at decade low



^a As of March 1 each year. Based on population that excludes those unemployed but not seeking employment.

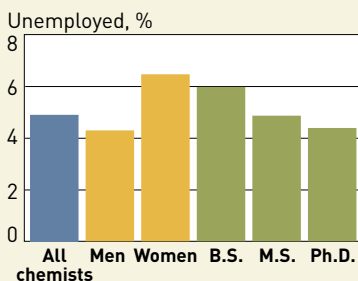
sulted during 2000 for a median of \$5,000.

A new question this year asked respondents if they received stock as part of their annual professional income in 2000. Overall, 17% of chemists indicated that they did. Of those in business, 25% did. For academics, it was 2%, and for government chemists, 1%. The gender difference was small: 17% of men versus 14% of women. And it did not vary greatly by age except for a drop-off to only 9% for those 60 to 69 years old.

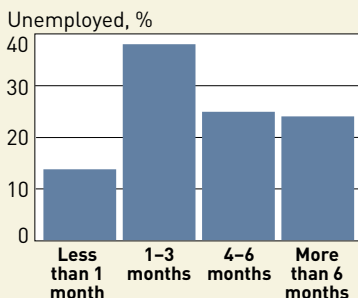
EMPLOYMENT. The recent strengthening of the job situation for chemists involves more than just the decline in the actual unemployment rate from 3.0% in 1996 and 2.0% in 2000 to 1.5% this year.

JOBLESSNESS

In 2000, almost 5% of chemists were unemployed at some time . . .



. . . with half for more than three months



In addition, the percentage of postdoc chemists has dropped from an all-time high of 3.6% in 1995 to an all-time low of 1.4% this year. This shift apparently reflects a buildup in postdoc ranks during the tough times about five years ago and a quite sudden exodus since then due to the more ready availability of full-time permanent jobs.

The 1.4% of chemists on postdocs this year is particularly low. In earlier good times, it has hovered at or just above 2%. The previous 20-year low was 1.9% in 1985.

On the other hand, the 2.5% of chemists with part-time jobs remains considerably above the historic ideal level of about 1.5%. However, there are indications that this gain may be partly voluntary as more chemists seek greater flexibility in their lifestyle. Responses to ChemCensus indicated that more chemists want part-time jobs.

Traditionally, women have been more likely to hold part-time positions. This is true this year—5.2% compared with 1.6% for men.

Unemployment among chemists is gender neutral: This year, 1.5% of men and 1.6% of women are without a job but looking for one.

By race, all 23 American Indian chemists responding this year have full-time jobs. Of black chemists, 151 of 156, or 97%, have full-time employment. Of Asians, a lower 93% have full-time jobs. This is because a high 4.5% of them are postdocs, compared with 0.9% of white chemists who are postdocs.

The employment profile by age varies, as would be expected. The percentage of chemists who are postdocs declines from about 5% of those between 25 and 34 to essentially zero for those 45 and older. Part-time work increases with age, with 4.5% of those 55 and older holding such positions. This compares with 1.9% of chemists up to age 54.

Unemployment does vary somewhat by age. For this year's survey, it ranges from 0.5% of those up to 29 years old to 2.5% of 45- to 49-year-olds. Seeming variations in unemployment by location are probably not significant because of the very small absolute numbers of respondents unemployed in most geographic regions. ■

→MORE ONLINE

More information about salaries and employment is available at *C&EN Online*, <http://pubs.acs.org/cen>, click on C&EN Classifieds.