

Percentage of respondents who were unemployed job seekers in 2012:

**12.6**

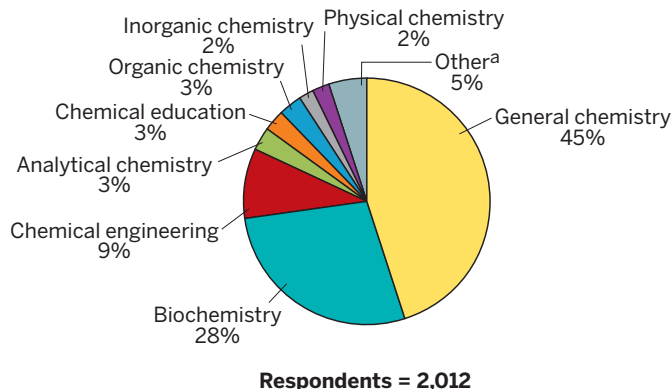
Percentage of respondents who are female:

**49.9**

Percentage of respondents who consider themselves to have a disability:

**1.5**

The highest degree for most respondents was in general chemistry or biochemistry.



**NOTE:** Of the respondents, 85.1% earned new bachelor's degrees, 6.9% earned master's degrees, and 8.0% earned Ph.D.s. <sup>a</sup> Includes respondents who selected agricultural/food chemistry, environmental chemistry, forensic chemistry, materials science, medical/pharmaceutical chemistry, and polymer chemistry as field of highest degree, as well as those who opted not to select a field.

Median age of 2012 survey takers:

**22** for bachelor's    **26** for master's    **30** for Ph.D.s

Top method for finding a job:

**Electronic tools**

Median 2012 starting salary for inexperienced grads:

**\$40,000**  
for bachelor's

**\$48,000**  
for master's

**\$80,000**  
for Ph.D.s

Percentage of employed Ph.D.s who went to work in academia:

**54.5**

Percentage of respondents who held temporary visas:

**4.4**

## NEW-GRADUATE SALARIES

Unemployment dropped slightly in 2012—but so did salaries for those who found jobs, **ACS SURVEY** shows

SUSAN R. MORRISSEY, C&EN WASHINGTON

**FOR NEWLY MINTED** graduates in chemically related fields, 2012 was a better year to find a job than previous years, as the unemployment rate for those looking for work fell from 13.3% in 2011 to 12.6% in 2012.

Despite the slight drop in unemployment, median starting salaries for new Ph.D. and master's degree recipients also dropped and those for bachelor's earners stayed flat. These findings come from the annual American Chemical Society survey of new graduates in chemistry and related fields.

Gareth S. Edwards of the ACS Department of Research & Member Insights conducts the survey under the guidance of the ACS Committee on Economic & Professional Affairs. The 2012 survey was sent to 12,132 recent graduates in early October 2012,

and data were collected until January 2013. In all, the new grads returned 2,012 usable responses for a response rate of 16.6%. The respondents can be divided into several categories—degree level, for instance, or field of study, gender, experience level, or type of employment. For some of these groups, the number of responses was small and not necessarily representative of the wider pool of chemistry graduates in a given group.

Of the 2012 respondents, 85.1% were

### STARTING SALARIES OF INEXPERIENCED GRADS

Constant-dollar salaries for M.S. degree earners grew slightly, while those for Ph.D.s and bachelor's degree earners fell

\$ THOUSANDS	B.A./B.S.		M.S.		PH.D.	
	CURRENT	CONSTANT	CURRENT	CONSTANT	CURRENT	CONSTANT
2005	\$37.0	\$37.0	\$52.0	\$52.0	\$75.0	\$75.0
2006	38.0	36.8	48.8	47.3	66.5	64.4
2007	40.2	37.9	52.0	49.0	77.0	72.5
2008	40.0	36.3	52.0	47.2	80.0	72.6
2009	38.0	34.6	60.0	54.6	76.3	69.4
2010	40.0	35.8	45.0	40.3	75.0	67.2
2011	40.0	34.7	46.7	40.6	85.0	73.8
2012	40.0	34.0	48.0	40.8	80.0	68.1

**NOTE:** Median annual salaries of responding new graduates with full-time permanent employment and less than 12 months of technical work experience prior to graduation. Constant dollars are 2005 dollars and are calculated using the Consumer Price Index.

newly minted bachelor's degree holders, 6.9% held new master's degrees, and 8.0% had just completed a Ph.D. Among the bachelor's degree recipients, the top three fields of study were general chemistry (50.2%), biochemistry (30.5%), and chemical engineering (8.3%). For master's degree holders, a quarter of respondents earned a general chemistry degree, 18.1% a biochemistry degree, and 13.8% an analytical chemistry degree. At the Ph.D. level, 20.5% earned an analytical chemistry degree, 13.7% an inorganic chemistry degree, and 13.7% an organic chemistry degree. When all levels are combined, chemical engineering accounted for 8.6% of degrees.

Although the data show a small drop in the overall percentage of unemployed job seekers, the size of that decrease varied by degree level. For Ph.D. graduates, the overall unemployment level reported was 8.1%, with 7.5% of respondents saying they were actively looking for work as compared with 8.8% looking in 2011. And for bachelor's degree earners, nearly 18% of respondents were unemployed and 13.4% were actively job hunting, down from 13.6% in 2011.

The big change was among those earning master's degrees: 11.0% reported being unemployed. But only 9.6% were seeking employment in 2012, far below the 17.8% who were looking in 2011. However, the number of respondents in this category was small.

Another sign that the job market may be improving is that the number of graduates pursuing advanced study was down slightly for bachelor's degree earners, meaning a few more graduates were opting to enter the job market. Of bachelor's degree earners, 39.1% said they planned to continue their education immediately after receiving their degree. This is down from 41.1% in 2011. But the statistics for those earning a master's degree in 2012 can be interpreted less optimistically. A third of respondents in this group said they planned to continue their studies, up from 22.0% in 2011.

**THE TOP FIELDS** for those with bachelor's degrees opting to continue their studies include chemistry (30.7%), medicine (25.5%), and pharmacology (12.8%). Two-thirds of master's degree recipients said they planned to study chemistry.

The percentage of Ph.D.s who took a postdoctoral position after completing their degree was down. Some 40.6% of respondents indicat-

## EMPLOYMENT STATUS

The percent of unemployed job seekers dropped for all respondents in 2012

	2005	2006	2007	2008	2009	2010	2011	2012
<b>BACHELOR'S</b>								
<b>Full-time</b>	40%	42%	43%	40%	32%	33%	33%	34%
Permanent	31	34	33	31	23	24	23	24
Temporary	9	9	10	9	9	9	10	10
<b>Part-time</b>	4	4	7	5	7	6	8	9
Permanent	1	1	1	1	2	2	2	2
Temporary	3	4	5	4	5	5	6	7
<b>Graduate/professional school</b>	44	44	40	41	46	46	41	39
<b>Not employed</b>	12	10	11	14	15	15	17	18
Seeking	8	6	8	10	12	12	14	13
Not seeking	4	4	3	4	3	4	4	4
<b>MASTER'S</b>								
<b>Full-time</b>	50	52	54	49	43	47	48	50
Permanent	45	44	48	41	38	37	38	44
Temporary	5	8	7	7	5	10	10	6
<b>Part-time</b>	9	5	6	6	8	7	7	7
Permanent	2	0	1	1	5	4	3	2
Temporary	8	4	4	5	3	4	4	4
<b>Graduate/professional school</b>	30	34	34	35	30	31	22	32
<b>Not employed</b>	11	9	6	10	18	15	23	11
Seeking	8	6	3	7	15	11	18	10
Not seeking	3	4	3	3	3	4	5	2
<b>PH.D.</b>								
<b>Full-time</b>	44	41	50	53	45	44	38	46
Permanent	39	37	46	51	40	38	33	41
Temporary	5	4	3	3	5	7	5	6
<b>Part-time</b>	2	2	2	2	3	2	4	5
Permanent	0	1	1	1	0	0	0	1
Temporary	2	1	2	2	3	1	4	4
<b>Postdoc</b>	45	49	41	37	44	45	47	41
<b>Not employed</b>	9	8	7	7	9	9	12	8
Seeking	6	6	5	4	7	6	9	8
Not seeking	3	2	2	3	2	3	3	1

**NOTE:** Employment status of all respondents as of October each year. Respondents listed by highest degree received. Numbers may not sum to subtotals, or total 100%, because of rounding. Table contains some data derived from sample sizes too small to generalize.

## WHERE THE JOBS ARE

Nearly half of respondents were hired into academia

	B.A./B.S.	M.S.	PH.D.
Academia	41%	51%	55%
Chemical industry	21	20	17
Pharmaceuticals	5	9	2
Analytical/clinical labs	10	2	6
Other nonmanufacturing	16	14	9
Government	7	4	11
Self-employed	2	0	0

**NOTE:** Percentages are for all responding 2012 graduates with full- or part-time employment. Numbers may not sum to 100% because of rounding. Table contains some data derived from sample sizes too small to generalize.

## BACHELOR'S SALARIES BY EMPLOYER SIZE

Biggest firms were the highest payers in 2012

SIZE OF EMPLOYER	MEDIAN SALARY (\$ THOUSANDS)
Fewer than 50 employees	\$36.5
50-99	35.0
100-499	39.0
500-2,499	36.0
2,500-9,999	46.9
10,000-24,999	38.0
25,000 or more	56.0

**NOTE:** Median salaries of responding 2012 bachelor's degree graduates with full-time permanent employment.

## CHEMISTS VS. CHEMICAL ENGINEERS

Chemical engineering grads were less likely to pursue advanced degrees and were better paid than chemists

	B.A./B.S.		M.S.		PH.D.	
	CHEMISTS	CHEMICAL ENGINEERS	CHEMISTS	CHEMICAL ENGINEERS	CHEMISTS	CHEMICAL ENGINEERS
<b>BY EMPLOYMENT</b>						
Full-time	31%	65%	52%	30%	44%	65%
Part-time	10	4	6	10	6	0
Further study	41	13	33	30	41	35
Unemployed	18	18	10	30	9	0
Seeking	13	14	8	30	9	0
Not seeking	4	4	2	0	1	0
<b>BY EMPLOYER</b>						
Academia	43	17	52	50	60	25
Industry	49	76	45	50	29	70
Government	7	7	4	0	12	5
Self-employed	2	0	0	0	0	0
<b>BY GENDER</b>						
Women	53	24	48	60	44	26
<b>BY CITIZENSHIP</b>						
Temporary visas	1	2	14	46	28	35
<b>SALARIES (\$ thousands)</b>						
Full-time permanent	\$36.2	\$65.0	\$49.5	\$75.2	\$68.8	\$93.0

**NOTE:** Median salary data for all responding 2012 graduates regardless of experience. Numbers may not sum to subtotals, or total 100%, because of rounding. Table contains some data derived from sample sizes too small to generalize.

## ADVANCED STUDIES BY TOPIC

Chemically trained bachelor's continued studies in a variety of areas

FIELD OF FURTHER STUDY	B.A./B.S.
Chemistry	31%
Other sciences	31
Pharmacology	13
Biochemistry	8
Life sciences	4
Other/math	7
Engineering	4
Chemical/biochemical	3
Other	1
Health	29
Medicine	26
Dentistry	4
Other <sup>a</sup>	5

**NOTE:** Percentages are of respondents who were continuing advanced studies full-time after earning a bachelor's degree in a chemical field in 2012. Numbers may not sum to subtotals, or total 100%, because of rounding. <sup>a</sup> Includes business management, education, and law.

ed they would be doing a postdoc, whereas in 2011, 46.9% pursued this option.

Regardless of work experience, for those who decided to enter the job market and found a job, the median starting salary for most categories in 2012 was flat or down from 2011 values. The largest change was for new Ph.D.s, who saw starting salaries drop to \$75,000 in 2012 from \$85,000 the previous year. For those earning master's degrees, the reported median starting salary fell from \$55,000 in 2011 to \$49,500 in 2012. Starting salaries for bachelor's degree earners held flat at \$40,000.

**THE SURVEY DATA** also provided mixed results about the correlation between median salary and experience levels. At the bachelor's degree level, experience did not matter, whereas for hires with new master's degrees, more experience meant more money in their paycheck. The outlier here is the reported salaries for fresh Ph.D.s. Those starting jobs with less than 12 months of experience reported earning \$80,000, those with 12–36 months of experience reported earning \$64,200, and those with more than 36 months of experience, \$74,000. It's important to note, however,

that the response rate for 2012 Ph.D.s was lower than previous years and therefore may not be representative.

The size of companies hiring new graduates also affected salaries. Bachelor's degree holders who work for large companies with more than 25,000 employees earned \$56,000. The next highest earners, with a median salary of \$46,900, were bachelor's degree holders hired by firms with 2,500 to 9,999 employees.

The gender of graduates with less than

a year of experience also affected starting salaries. Male bachelor's degree recipients indicated that their median salary was \$43,000, whereas for women, the median salary was \$36,500. Similarly for Ph.D.s, the median salary for men was \$81,300, and for women it was \$74,000. Women who earned master's degrees, however, reported earning more than their male counterparts—\$48,000 compared with \$45,000.

Inexperienced bachelor's degree holders who found work in industry earned more than those who took jobs in academia and the government. The median salary for new hires in industry was \$40,000 in 2012 com-

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pared with \$36,000 and \$38,500 for new employees in academia and government, respectively.

Having a chemical engineering degree also translated to higher earnings. The median starting salary of Ph.D. chemical engineers was \$93,000 in 2012, some 35.2% more than Ph.D. chemists. And for those who earned a bachelor's degree, the median salary was \$65,000, 80% more than for chemists with a bachelor's degree. There were insufficient data for chemical engineers earning master's degrees.

For all respondents, the most popular technique to find a job was using electronic media such as Internet job boards. Other common job-finding methods included placement services, informal channels, and faculty adviser help.

### SALARIES BY PRIMARY WORK FUNCTION

Men's salaries were higher than women's in all functions

\$ THOUSANDS	MEN	WOMEN	ALL
Development/design	\$60.1	\$55.0	\$60.0
Management	58.0	41.5	55.0
Professional services	54.5	53.8	54.5
Research	45.0	40.0	42.0
Production/quality control	45.0	36.0	40.0
Teaching	39.7	37.5	39.0
Other	44.5	34.8	40.0
<b>ALL</b>	<b>\$49.8</b>	<b>\$40.0</b>	<b>\$42.5</b>

**NOTE:** Median salaries for responding 2012 bachelor's degree graduates with full-time permanent employment.

When it comes to liking one's job, those who completed advanced degrees reported being more satisfied. For example, 70.3% of bachelor's degree recipients felt professionally challenged in their jobs,

while 79.6% of master's degree holders and 86.2% of Ph.D.s felt challenged.

Similarly, when it comes to feeling like their education relates to the field in which they work, 75.3% of bachelor's degree earners agreed, but 92.7% of master's earners and 95.2% of Ph.D. holders agreed. And when asked if their training and education is commensurate with their job, 70.0% of bachelor's degree earners agreed, as compared with 84.4% and 90.3% of master's earners and Ph.D. holders, respectively.

But when it comes to feeling that their jobs are what they expected them to be when they began their studies, only 62.6% of Ph.D.s reported understanding exactly what those positions would entail. ■



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