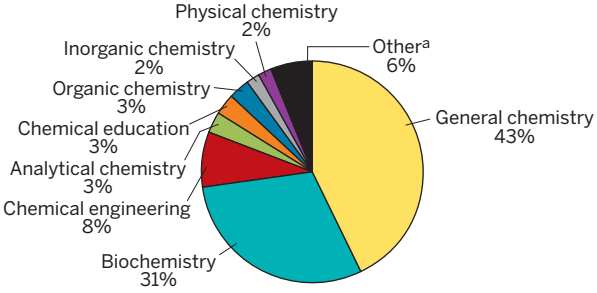
Percentage of respondents who were unemployed job seekers in 2013:

14.9

Percentage of respondents who are female:

51.2

Most respondents' highest degree was in general chemistry or biochemistry.



Respondents = 2,035

NOTE: Of the respondents who indicated both their highest degree earned and their field of highest degree, 85% earned new bachelor's degrees, 5% earned master's degrees, and 9% earned Ph.D.s. **a** Includes respondents who selected agricultural/food chemistry, environmental chemistry, forensic chemistry, materials science, medical/pharmaceutical chemistry, or polymer chemistry as field of highest degree, as well as those who opted not to select a field.

NOTE: For some respondent groups, the number of responses was small and not necessarily representative of the wider pool of chemistry graduates in a given group.

Median 2013 starting salary for inexperienced grads:

$39,560 for bachelor's

$55,000 for master's

$75,750 for Ph.D.s

Median age of 2013 survey takers:

23 for bachelor's

27 for master's

29 for Ph.D.s

STARTING SALARIES

ACS survey of 2013 graduates finds **HIGHER UNEMPLOYMENT RATE,** little change in entry-level salaries for those finding work

SUSAN R. MORRISSEY, C&EN WASHINGTON

STUDENTS WHO COMPLETED their studies and tried to enter the workforce in 2013 experienced a very high unemployment rate of 14.9%—up from 12.6% in 2012, and more than four times the 3.5% unemployment rate experienced by all ACS-member chemists in March 2013. The jump in unemployment is primarily driven by a large number of bachelor's degree earners who were unable to find jobs.

At the same time, the percentage of newly minted graduates who found full-time positions was up nearly three points from the prior year to 29.0%. The median starting salary for inexperienced individuals finding full-time jobs remained flat in current dollars at $41,600.

These are some of the key findings of the American Chemical Society's survey of individuals who graduated during the 2013 academic year with degrees in chemistry and related fields. The survey, which was sent to 11,454 recent graduates in October 2013, is conducted annually by Gareth S. Edwards of the ACS Department of Research & Brand Strategy under the guidance of the ACS Committee on Economic & Professional Affairs. A total of 2,035 usable responses were received for an overall response rate of 17.8%. The respondents can be divided into several categories—degree or experience level, for instance, or field of study, gender, 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.

RESPONDING GRADUATES' field of study varied by degree earned. For bachelor's degree recipients, nearly half earned a degree in general chemistry, a third in biochemistry, and almost 8% in chemical engineering. At the master's level, the top three degree areas were general chemistry (24.8%), biochemistry (16.5%), and analytical chemistry (11.9%). The top areas for new Ph.D.s were organic chemistry (18.5%), analytical chemistry (16.8%), and chemical engineering and biochemistry (both 13.6%).

Of the responding bachelor's degree recipients, 36.6% reported finding full-time positions. Those earning master's degrees and Ph.D.s had more success, with 48.1% and 46.1%, respectively, of respondents saying they had obtained a full-time job. On the other side of the coin, 15.8% of bachelor's degree earners, 16.0% of master's degree earners, and 6.1% of Ph.D. recipients were seek-

WHERE THE JOBS ARE

More respondents found employment in academia than in other sectors

	B.A./B.S.	M.S.	PH.D.
Academia	37%	44%	47%
Chemical industry	30	35	24
Other nonmanufacturing	25	12	21
Government	7	9	8
Self-employed	2	0	1

NOTE: Percentages are for all responding 2013 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.

The jump in unemployment is primarily driven by a large number of bachelor's degree earners who were unable to find jobs.

ing, but unable to find, employment. This unemployment rate is up from 2012 levels for bachelor's and master's degree earners but down slightly from 2012 for Ph.D. recipients (C&EN, April 22, 2013, page 47).

Most of those who did find jobs ended up working in industry. Some 55.2% of bachelor's degree, 46.9% of master's degree, and 45.0% of Ph.D. recipients reported finding full- or part-time work in industry. Academia provided jobs for 36.6% of bachelor's, 44.4% of master's, and 46.7% of Ph.D.s. Finding government jobs were 6.6% of bachelor's degree recipients, 8.6% of master's degree recipients, and 7.7% of Ph.D.s.

FOR NEWLY MINTED and employed graduates with less than 12 months of experience, the median starting salary was down from 2012 for earners of bachelor's degrees and Ph.D.s. Specifically for 2013 graduates with bachelor's, the median salary was $39,560 in 2013, down slightly from $40,000 in 2012. For Ph.D.s, the median salary was $75,750, down from $80,000 in 2012.

But the situation was different for master's degree earners. The median starting salary for inexperienced graduates in this group was $55,000, up from $48,000 in 2012.

Those holding chemical engineering degrees reported higher pay. The median 2013 starting salary of Ph.D. chemical engineers was $90,500 as compared with the $66,000 salary reported by Ph.D. chemists. And for those who earned a bachelor's degree, the median salary was $66,700 for chemical engineers, almost twice the $35,900 earned by chemists in this group. There were insufficient data for chemical engineers earning master's degrees.

Median starting salaries also varied depending on sector. For all bachelor's degree respondents with less than 12 months of experience who took a job in the academic sector, the median salary in 2013 was $34,000. This figure is down $2,000 from the previous year. For those who took a job in industry, the median salary was $40,000, the same as it was in 2012. But for those who ended up with jobs in the government, median salaries were up by $1,500 from 2012 to $40,000 in 2013.

Still, for full-time employed graduates with less than 12 months of experience, the 2013 survey shows that the gender pay gap is narrowing. The median starting salary for men in this category was $44,000; it was $40,000 for their female counterparts. This $4,000 gender gap is down from $6,000 in 2012 and $8,000 in 2011.

EMPLOYMENT STATUS

Nearly half of Ph.D. and master's degree earners and slighly more than one-third of bachelor's grads were employed full-time last year

& MORE ONLINE To view an interactive graphic comprising these data, visit http://cenm.ag/salsurvey.

	2005	2006	2007	2008	2009	2010	2011	2012	2013
BACHELOR'S									
Full-time	**40%**	**42%**	**43%**	**40%**	**32%**	**33%**	**33%**	**34%**	**37%**
Permanent	31	34	33	31	23	24	23	24	27
Temporary	9	9	10	9	9	9	10	10	10
Part-time	**4**	**4**	**7**	**5**	**7**	**6**	**8**	**9**	**9**
Permanent	1	1	1	1	2	2	2	2	2
Temporary	3	4	5	4	5	5	6	7	7
Graduate/ professional school	**44**	**44**	**40**	**41**	**46**	**46**	**41**	**39**	**35**
Not employed	**12**	**10**	**11**	**14**	**15**	**15**	**17**	**18**	**20**
Seeking	8	6	8	10	12	12	14	13	16
Not seeking	4	4	3	4	3	4	4	4	4
MASTER'S									
Full-time	**50**	**52**	**54**	**49**	**43**	**47**	**48**	**50**	**48**
Permanent	45	44	48	41	38	37	38	44	40
Temporary	5	8	7	7	5	10	10	6	9
Part-time	**9**	**5**	**6**	**6**	**8**	**7**	**7**	**7**	**13**
Permanent	2	0	1	1	5	4	3	2	1
Temporary	8	4	4	5	3	4	4	4	12
Graduate/ professional school	**30**	**34**	**34**	**35**	**30**	**31**	**22**	**32**	**20**
Not employed	**11**	**9**	**6**	**10**	**18**	**15**	**23**	**11**	**19**
Seeking	8	6	3	7	15	11	18	10	16
Not seeking	3	4	3	3	3	4	5	2	3
PH.D.									
Full-time	**44**	**41**	**50**	**53**	**45**	**44**	**38**	**46**	**46**
Permanent	39	37	46	51	40	38	33	41	42
Temporary	5	4	3	3	5	7	5	6	4
Part-time	**2**	**2**	**2**	**2**	**3**	**2**	**4**	**5**	**6**
Permanent	0	1	1	1	0	0	0	1	1
Temporary	2	1	2	2	3	1	4	4	6
Postdoc	**45**	**49**	**41**	**37**	**44**	**45**	**47**	**41**	**42**
Not employed	**9**	**8**	**7**	**7**	**9**	**9**	**12**	**8**	**6**
Seeking	6	6	5	4	7	6	9	8	6
Not seeking	3	2	2	3	2	3	3	1	0

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.

STARTING SALARIES OF INEXPERIENCED GRADS

Constant-dollar salaries for M.S. degree earners grew in 2013 but declined for Ph.D. and bachelor's degree earners

	B.A./B.S.		M.S.		PH.D.	
$ THOUSANDS	**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
2013	39.6	33.2	55.0	46.1	75.8	63.5

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. Current dollars are 2005 dollars and are calculated using the Consumer Price Index.

In general, survey respondents who reported taking a full-time position said they were satisfied, although the degree of job satisfaction varied with advanced degree level. For example, when it comes to feeling professionally challenged by their position, only 69.2% of bachelor's degree recipients indicated they were, whereas 80.3% of master's degree holders and 87.6% of Ph.D.s said the same.

Similarly, when it comes to feeling like their education relates to the field they work in, 74.8% of bachelor's degree earners agreed, compared with 86.6% of master's earners and 93.5% of Ph.D. holders. And when asked if their training and education is commensurate with their job, 70.5% of bachelor's degree earners and 78.0% of master's earners agreed, as compared with 90.6% of Ph.D. holders. More than half of Ph.D. earners—58.0%—said that the position they accepted is what they expected to be doing when they began their doctoral studies.

LANDING A JOB remained challenging in 2013, and respondents continued to look to a mix of sources for help finding openings. More than a quarter of all respondents said electronic media was the most effective job search method. The most popular electronic job search methods included Internet searches, employee websites, and job-posting sites such as Monster.com, CareerBuilder, Indeed.com, LinkedIn, and CraigsList. Other common job-finding methods included faculty adviser help, informal channels, and placement services.

But not all survey respondents opted to join the workforce. Slightly more than a third of them opted to pursue advanced studies or postdoctoral positions. For newly minted Ph.D.s, 41.7% indicated they were taking a postdoc position. This is roughly flat from 2012.

Of respondents graduating with bachelor's degrees, 35.1% opted to continue their studies. More than 35% of this group reported pursuing advanced studies in chemistry, while 25.8% were going on to study medicine and 10.3% pharmacy or pharmacology. Of the survey respondents who received a master's degree, 19.8% were pursuing advanced studies, with 61.9% of this group continuing on with chemistry studies. ■

CHEMISTS VS. CHEMICAL ENGINEERS

Chemical engineering grads were more likely to go into industry and were better paid than chemists

	B.A./B.S.		M.S.		PH.D.	
	CHEMISTS	CHEMICAL ENGINEERS	CHEMISTS	CHEMICAL ENGINEERS	CHEMISTS	CHEMICAL ENGINEERS
BY EMPLOYMENT						
Full-time	34%	66%	48%	46%	45%	52%
Part-time	9	2	13	18	6	4
Further study	37	13	19	27	41	44
Unemployed	20	19	20	9	7	0
Seeking	16	19	17	9	7	0
Not seeking	4	0	3	0	0	0
BY EMPLOYER						
Academia	39	16	46	38	49	35
Industry	53	82	46	50	43	57
Government	7	2	8	13	8	4
Self-employed	2	0	0	0	0	4
BY GENDER						
Women	54	38	48	50	45	32
BY CITIZENSHIP						
Temporary visas	2	2	13	30	23	24
SALARIES ($ thousands)						
Full-time permanent	$35.9	$66.7	$52.5	$78.0	$66.0	$90.5

NOTE: Median salary data for all responding 2013 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.

BACHELOR'S SALARIES BY EMPLOYER SIZE

Median pay scaled with size of firm

SIZE OF EMPLOYER	MEDIAN SALARY ($ THOUSANDS)
Fewer than 50 employees	$31.1
50–99	32.9
100–499	36.0
500–2,499	40.0
2,500–9,999	45.0
10,000–24,999	41.0
25,000 or more	49.0

NOTE: Median salaries of responding 2013 bachelor's degree graduates with full-time permanent employment.

ADVANCED STUDIES BY TOPIC

Most chemically trained bachelor's grads continued studies in a field other than chemistry

FIELD OF FURTHER STUDY	B.A./B.S.
Chemistry	35%
Other sciences	27
Pharmacology	10
Biochemistry	10
Life sciences	4
Other/math	3
Engineering	4
Chemical/biochemical	3
Other	1
Health	30
Medicine	26
Dentistry	5
Other[a]	4

NOTE: Percentages are of respondents who were continuing advanced studies full-time after earning a bachelor's degree in a chemical field in 2013. Numbers may not sum to subtotals or total 100% because of rounding. **a** Includes business management, education, and law.

SALARIES BY PRIMARY WORK FUNCTION

Salaries for women were higher than those for men in some job areas

$ THOUSANDS	MEN	WOMEN	ALL
Development/design	$60.0	$63.0	$62.0
Management	45.0	34.5	45.0
Professional services	60.0	51.0	56.0
Research	43.8	41.5	42.0
Production/quality control	37.2	40.5	40.0
Teaching	44.5	38.0	40.0
Other	35.0	37.0	36.0
ALL	**$45.0**	**$40.8**	**$43.0**

NOTE: Median salaries for responding 2013 bachelor's degree graduates with full-time permanent employment.