REFLECTING THE MODEST recovery in the U.S. economy, both salaries and the job market are improving for chemists, according to the latest figures compiled by the American Chemical Society. Full-time employment for chemists in 2013 is at its highest level in five years, while unemployment continues to retreat from its 2011 peak. And this year’s rise in median salary for chemists more than made up for last year’s dip. These results come from the 2013 Comprehensive Salary & Employment Survey of ACS members in the workforce, which the society conducted from March through early May this year.

The survey also shows that men continue to make more money than women, and that chemical engineers bring home bigger paychecks than chemists. In the U.S., salaries rose in the New England region while they dipped in the Central Southeast.

For overall employment, the pickup in the economy has generated moderate improvement in chemical company results, leading to a slight increase in hiring and a drop in layoffs, says David Harwell, assistant director for career management at ACS, which publishes C&EN. “As unemployment declines, we’re seeing full-time employment rise,” says Elizabeth C. McGaha, assistant director of ACS’s Research & Brand Strategy (RBS) department, which conducted the survey. That suggests that chemists are finding jobs in full-time positions—defined as at least 35 hours of work per week—rather than having to make do with part-time jobs. What’s more, the percentage of chemists holding part-time positions keeps dropping, and the percentage in postdoc positions is about the same in 2013 as it was last year. “That’s good news,” McGaha says, “because in previous years we were concerned that unemployment was being mitigated by underemployment.”

Still, Harwell cautions that the unemployment numbers might be artificially lowered by a small number of out-of-work chemists who have given up on searching for a job and thus are no longer counted in unemployment statistics. “We know that some people are dropping out,” he says. “We’re seeing people leaving chemistry.”

The situation is toughest for what he terms the “very long-term unemployed,” who find it difficult to reenter the workforce for myriad reasons. “Their connections go cold; it’s hard for them to keep up their skills,” Harwell says. “They can go back to school, but that costs money, and if they have kids or a mortgage that is also eating through their savings, they

Unemployment edged down and **SALARIES ROSE**, according to survey of ACS members

SOPHIE L. ROVNER, C&EN WASHINGTON

**2013 SALARIES & EMPLOYMENT**

Unemployment edged down and **SALARIES ROSE**, according to survey of ACS members

SOPHIE L. ROVNER, C&EN WASHINGTON

**MEDIAN BASE SALARIES** Industry and government salaries outstripped those in academia.

<table>
<thead>
<tr>
<th>Degree Type</th>
<th>Industry</th>
<th>Male</th>
<th>Median Annual Base Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s</td>
<td>$73,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s</td>
<td>$85,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ph.D.</td>
<td>$102,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree Type</th>
<th>Government</th>
<th>Median Annual Base Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s</td>
<td>$72,000</td>
<td></td>
</tr>
<tr>
<td>Master’s</td>
<td>$94,100</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree Type</th>
<th>Academia</th>
<th>Median Annual Base Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s</td>
<td>$74,100</td>
<td></td>
</tr>
<tr>
<td>Master’s</td>
<td>$85,000</td>
<td></td>
</tr>
<tr>
<td>Ph.D.</td>
<td>$105,200</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Median annual base salaries for chemists employed full-time as of March 1, 2013.

**SOURCE:** ACS salary and employment survey 2013
just have to do something to survive.”
And that doesn’t mean they are “making a targeted move from one sector of professional employment to another,” says Harwell. Instead, some of these chemists are now working at retail chains or in restaurants to make ends meet.

Nevertheless, says Harwell, the ACS survey results show that salaries for chemists are rising. And that lends credence to the notion that demand for chemists is edging up.

RBS conducted and analyzed the survey in a project headed by Gareth S. Edwards and guided by the ACS Committee on Economic & Professional Affairs.

The survey was sent to a random sample of 25,000 ACS members under the age of 70. The sample excluded student, emeritus, and retired members, as well as members living outside the U.S. The survey recipients returned 7,078 complete responses, for a response rate of 28%.

**IN THE SURVEY, members were queried about their status as of March 1, 2013. Some of the survey results reported in this article are based on answers from all respondents; those data shed light on the demographics of the ACS membership as a whole. Other reported results focus on those ACS members who are in the chemical workforce and exclude members who work in other fields, such as chemical engineering, business administration, computer science, or law. In each table in this article, the headline and footnote indicate the group whose data are presented. In some cases, data differ between tables because some respondents didn’t answer all the questions.**

Some 91.1% of chemists who responded to this year’s survey indicated they were employed full-time, up from 90.6% in 2012 and considerably better than the low of 88.1% seen in 2010.

Concurrently, the fraction of chemists without full-time employment dropped from 10.0% to 8.9% between 2012 and 2013. This group includes the 2.7% of respondents who indicated they had part-time jobs in 2013, down from 3.1% the prior year. Another 2.7% of respondents said they were holding postdoctoral positions, up a tick from last year’s 2.6%. The biggest change occurred in the fraction of chemists who were unemployed but looking for a job; their ranks thinned from 4.2% of respondents in 2012 to 3.5% in 2013. In fact, this improvement brings unemployment down to levels not seen since 2008–09. Over the past decade, the unemployment rate for chemists has ranged from a low of 2.3% in 2008—early in the Great Recession—to a high of 4.6% in 2011. “We were encouraged that unemployment fell across all degree levels,” which hasn’t always been the case in recent years, McGaha says.

Still, the ACS data show that “the higher your education level, the better off you tend to be,” Harwell says. Ph.D.s—who account for about two-thirds of survey respondents—are in fact the least likely to be unemployed, McGaha says (respondents with bachelor’s and M.S. degrees account for roughly equal shares of the remaining one-third). Just 3.0% of this group of ACS members were seeking work as of this March, compared with 3.4% a year ago. Some 4.7% of those holding a master’s degree were seeking work this March, down from 5.4% in 2012. The situation improved even more for bachelor’s degree members, dropping from 5.9% to 4.6%.

Disparities among degree levels also show up in the salary data from the survey. The median salary for chemists who were
employed full-time rose 2.2% to $94,000 between March 2012 and March 2013, but that increase was due solely to a rise in median pay for Ph.D.s. Between 2012 and 2013, the median salary for Ph.D.s grew 1.4% to $102,000. Salaries for M.S. degree holders remained unchanged at $85,000 over that period.

Chemists with a bachelor’s degree fared worse, suffering a 2.6% drop in median pay to $72,000.

These findings are stated in current dollars, and therefore don’t account for changes in the cost of living. Calculating salaries in constant dollars—a practice that eliminates the effects of inflation—shows that chemists at all degree levels are losing ground with respect to the rising cost of living.

Between 2012 and 2013, salaries in constant dollars slipped 0.1% for Ph.D. chemists, 1.5% for M.S. chemists, and 4.0% for those with a bachelor’s degree. Salaries for all three groups are also lower than they were a decade ago, with Ph.D. paychecks shrinking the most. Measured in constant dollars—a practice that eliminates the effects of inflation—shows that chemists at all degree levels are losing ground with respect to the rising cost of living.

Between 2012 and 2013, salaries in constant dollars slipped 0.1% for Ph.D. chemists, 1.5% for M.S. chemists, and 4.0% for those with a bachelor’s degree. Salaries for all three groups are also lower than they were a decade ago, with Ph.D. paychecks shrinking the most. Measured in constant dollars, the median salary for this group plunged from $90,000 in 2003 to $80,700 in 2013.

Limiting the pool to chemists working full-time who had not changed jobs during the prior year, the median salary rose 2.5% in current dollars between 2012 and 2013. Within this group, it slipped 1.2% for bachelor’s-level chemists. The median pay for master’s degree and Ph.D. chemists rose 2.9% and 2.0%, respectively.

ALL KINDS OF dissimilarities emerge when survey responses are broken down into other subgroups. For instance, the survey confirms that industry and government jobs pay much better than those in academia, on average.

Slightly more than half the survey respondents work in industry and about one-third work in academia; government accounts for most of the rest of the positions. This year’s median salary was $106,600 for a chemist in industry, $105,200 for one in government, and just $74,100 for a chemist in academia.

The discrepancy between the sectors is most marked for Ph.D. chemists. For this group, the median academic salary was $76,500. Median pay in a government job was $113,400, whereas in industry it was $125,000.

Men and women are still far apart in pay. Male chemists reported a median salary of $100,000 as of March 2013, far greater than the $79,500 reported by women, who represent about 30% of survey respondents. It should be noted, however, that the salary gulf between men and women diminishes when respondents are grouped by the number of years since they earned a bachelor’s degree.

For instance, for chemists who earned the degree two to four years ago, the median salary for men was $48,500, and for women was $45,500. The median salary for chemists who earned their degree 10 to 14 years ago was $80,000 for men and $75,100 for women. The gender-based gap was much greater for chemists who earned a bachelor’s degree more than 14 years ago.

Some of the other large differences revealed by the survey arise in a comparison of chemists and chemical engineers: Chemists continue to make considerably less than their engineering colleagues. As of this March, the median salary for chemical engineers who are members of ACS was $117,900—or 25% higher than the median salary for chemists.

The spread was greatest for those with a bachelor’s degree. For this group, chemical engineers earned a median salary of $103,200, which is 43% higher than the median salary for chemists.

The only subcategory in which the median salary for chemists was similar to that for chemical engineers was in government.

Geographic differences in compensation are also apparent. For instance, U.S. regions in which median salaries rose the most for Ph.D. chemists between 2012 and 2013.
**INDUSTRIAL CHEMISTS’ SALARIES BY EXPERIENCE AND GENDER**

Women’s salaries most closely matched men’s for chemists who earned their bachelor’s degree five to nine years ago

<table>
<thead>
<tr>
<th>YEARS SINCE BACHELOR’S DEGREE</th>
<th>(IN THOUSANDS) MEN</th>
<th>(IN THOUSANDS) WOMEN</th>
<th>WOMEN AS % OF MEN</th>
<th>(IN THOUSANDS) MEN</th>
<th>(IN THOUSANDS) WOMEN</th>
<th>WOMEN AS % OF MEN</th>
<th>(IN THOUSANDS) MEN</th>
<th>(IN THOUSANDS) WOMEN</th>
<th>WOMEN AS % OF MEN</th>
<th>(IN THOUSANDS) MEN</th>
<th>(IN THOUSANDS) WOMEN</th>
<th>WOMEN AS % OF MEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–4</td>
<td>$48.5</td>
<td>$46.4</td>
<td>96%</td>
<td>id</td>
<td>id</td>
<td>na</td>
<td>id</td>
<td>id</td>
<td>na</td>
<td>id</td>
<td>id</td>
<td>na</td>
</tr>
<tr>
<td>5–9</td>
<td>59.3</td>
<td>60.0</td>
<td>101</td>
<td>$66.6</td>
<td>$65.4</td>
<td>98%</td>
<td>id</td>
<td>id</td>
<td>98%</td>
<td>id</td>
<td>id</td>
<td>98%</td>
</tr>
<tr>
<td>10–14</td>
<td>71.2</td>
<td>70.0</td>
<td>98</td>
<td>83.0</td>
<td>77.6</td>
<td>93</td>
<td>97.5</td>
<td>94.5</td>
<td>97</td>
<td>101.2</td>
<td>93.2</td>
<td>92</td>
</tr>
<tr>
<td>15–19</td>
<td>76.5</td>
<td>71.3</td>
<td>91.4</td>
<td>97.5</td>
<td>94.5</td>
<td>97</td>
<td>105.8</td>
<td>96.9</td>
<td>92</td>
<td>107.9</td>
<td>102.8</td>
<td>95</td>
</tr>
<tr>
<td>20–24</td>
<td>95.0</td>
<td>88.3</td>
<td>93.3</td>
<td>105.8</td>
<td>96.9</td>
<td>92</td>
<td>107.9</td>
<td>102.8</td>
<td>95</td>
<td>107.9</td>
<td>id</td>
<td>na</td>
</tr>
<tr>
<td>25–29</td>
<td>96.9</td>
<td>85.8</td>
<td>89.0</td>
<td>107.0</td>
<td>id</td>
<td>na</td>
<td>107.0</td>
<td>id</td>
<td>107.0</td>
<td>102.0</td>
<td>id</td>
<td>na</td>
</tr>
<tr>
<td>30–34</td>
<td>106.2</td>
<td>108.4</td>
<td>102</td>
<td>102.0</td>
<td>id</td>
<td>na</td>
<td>102.0</td>
<td>id</td>
<td>102.0</td>
<td>144.5</td>
<td>id</td>
<td>na</td>
</tr>
<tr>
<td>35–39</td>
<td>101.5</td>
<td>92.0</td>
<td>91.2</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>40 or more</td>
<td>100.0</td>
<td>id</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
</tbody>
</table>

**NOTE:** Median annual base salaries for industrial chemists employed full-time as of March 1, 2013. id = insufficient data. na = not applicable.

**SOURCE:** ACS salary and employment survey 2013
chemists traveled to a professional meeting abroad in the past two years.

Almost half used virtual meeting technology—including Skype Conference, WebEx, GoToMeeting, or some other live electronic forum—to work with colleagues in other countries.

The take-home message, says Harwell, is that “experience with other, non-U.S. cultures is helpful for jobs in industry. You may not work overseas, but you will likely work on a virtual team of international collaborators. And understanding the cultural norms for your collaborators can make you much more successful.”

Looking ahead, Harwell warns that the continued federal budget spending cuts known as sequestration and the upcoming debate about raising the nation’s debt ceiling to avoid a government shutdown could limit further economic recovery in the coming year. But he predicts that growth in sales of cars and new homes—two of the most significant markets for chemicals—will continue to drive a modest increase in demand for chemists.

More results from the ACS salary and employment survey can be found at http://cenm.ag/salary2013.

ACS members can obtain further information about salaries and employment at www.acs.org/salary. Resources on the website include the Salary Comparator and the ACS Employment Dashboard. Members can use the comparator to find salary data for specific categories of chemists by using filters such as degree level, years since earning a degree, and other factors. The dashboard provides highlights of survey results, including salary, employment status, and demographic data broken down by year, employer category, degree level, and geographic region.

Career resources for unemployed ACS members can be found at www.acs.org/unemployed.

## More on This Topic

**Temperature Control**

- Flow Range: 1 μL/min to 150 mL/min
- Delivers multiple reagents at independent rates.
- 100% Glass and Teflon fluid path
- Free PC control software
- Optional features: pH, temperature, and pressure control

**Endeavour Robotics**

J-KEM’s most affordable robot

Do-it-yourself: $8000

Complete solutions from $12,000

Resolution: 0.02mm
Speed: 300mm/sec
Compact

* Weighing applications - Tubes/Vials
* Dissolution - Fluid dispensing
* Rearranging - Reaction setup

Precision Syringe Pump

Automate Reagent Delivery

- Data logging
- Remote PC Control
- Multi-temp Ramp

* 0.1°C regulation of any volume from 10 μL to 100 L.
* < 1°C overshoot of the setpoint

**DATA ONLINE**

More results from the ACS salary and employment survey can be found at http://cenm.ag/salary2013.

ACS members can obtain further information about salaries and employment at www.acs.org/salary. Resources on the website include the Salary Comparator and the ACS Employment Dashboard. Members can use the comparator to find salary data for specific categories of chemists by using filters such as degree level, years since earning a degree, and other factors. The dashboard provides highlights of survey results, including salary, employment status, and demographic data broken down by year, employer category, degree level, and geographic region.

Career resources for unemployed ACS members can be found at www.acs.org/unemployed.