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REPORT of

CHEMISTS' SALARIES

and EMPLOYMENT STATUS

Based on the 1974 Salary
and Employment Status Survey
of ACS Members

Office of Manpower Studies
American Chemical Society
Washington, D.C.

1974 REPORT

OF CHEMISTS' SALARIES

AND EMPLOYMENT STATUS

This report has been prepared as a service of the Department of Professional Relations and Manpower Studies, American Chemical Society.

American Chemical Society
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Acknowledgment

The 1974 Comprehensive Salary and Employment Status Survey was conducted by the Office of Manpower Studies in the American Chemical Society's Department of Professional Relations and Manpower Studies, Robert K. Neuman, Head, under the auspices of the ACS Committee on Economic Status, Alan L. McClelland, Chairman.

The supporting staff includes Maria D. Frizat, survey preparation, editing and analysis; Ronald J. Trubisky, computer programing staff supervisor; Frank Ford, production manager for ACS systems.

The Survey

The comprehensive salary survey program was initiated in 1941; in 1971 it was expanded to include questions about the employment status of the membership. In 1973 an additional question was incorporated to seek information on minority group classification.

Survey questionnaires were mailed in late February to approximately 20,500 members (1/4 of the domestic employable membership, selected at random). The survey reports data as of March 1, 1974. By mid-April 11,876 questionnaires, or 58%, had been returned and used in total or in part for this report. Analysis of the domestic membership, the selected sample, and survey responses is included in the appendix.

C O N T E N T S

(continued)

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Employment Status

Members were asked to give their employment status as of March 1, 1974. Departing from previous years' practice, we did not include in the 1974 survey members over 64 years of age. This accounts for the drop in the "retired, not seeking employment" category when compared with previous years (table E-2).

Table E-1 shows that those with the bachelor's degree have the largest percentage of "retired, not seeking employment" -- 2.4% compared with 0.9% for doctors and 1.4% for masters. The same table shows the 1974 employment status of the membership by degree. Masters have the highest unemployment rate, 1.7% compared with 1.2% for doctors and 1.3% for bachelors.

A separate analysis of the employment status of minorities (table E-3), shows their unemployment rate to be 2.7% overall -- higher than the rate for all ACS members of 1.4% but lower than the 3.5% unemployment rate for females (table E-4).

It is interesting to note that the percentage of minorities with postdoctoral positions is more than three times the percentage for all chemists -- 7.8% for minorities and 2.4% for all chemists.

We found some variation in unemployment rate by age. Those 24 years of age and under show no unemployment, but they represent only 0.7% of the toal responses. Apart from that, those in the age group 41 to 45 have the lowest unemployment rate (0.9%) while groups 46 to 50 and 51 to 55 show the highest, 1.8% (table E-5).

Unemployment by geographic region (table E-6) is seen to be lowest in the West North Central, 0.8%, while the Pacific region shows the highest, 1.7%. New England with 1.5% and Middle Atlantic with 1.6% have unemployment rates above the national average of 1.4%.

Other analyses of unemployed members include unemployed by most recent employer (table E-8), unemployed by most recent work activity (table E-9), and unemployed by field of specialty (table E-10). In the latter table we can see that chemical engineers and those in information science have the lowest rate

of unemployment -- 1.0% for both categories. Physical chemists have the highest, 2.2%.

7.3% of the total respondents indicated some unemployment during the past two years, with about 6 months as the average length of unemployment (tables E-11a and E-11b). When asked how they view the job market outlook for the next four years, almost half the respondents answered "fair." Chemical engineers were more optimistic -- 53% responded "good" (table E-12).

Table E-1 1974 Employment Status of the ACS Membership by Degree

	Bachelors	Masters	Doctors
Employed full-time	93.7%	93.9%	91.3%
Unemployed seeking employment	1.3	1.7	1.2
Temporarily or part-time employed	0.6	1.0	1.2
Subprofessionally employed	1.4	1.1	0.8
Postdoctoral or other fellowship	0.3	0.3	4.4
Retired, seeking employment	0.3	0.6	0.2
Retired, not seeking employment	2.4	1.4	0.9

Table E-2 Overall Employment Status of the ACS Membership 1971-1974

	1971	1972	1973	1974
Employed full-time	88.2%	88.0%	88.7%	92.5%
Unemployed seeking employment	2.8	3.1	1.7	1.4
Temporarily or part-time employed	2.3	1.5	1.3	1.0
Subprofessionally employed	2.5	2.8	2.0	1.0
Postdoctoral or other fellowship	1.6	2.0	2.9	2.4
Retired, seeking employment	-	0.4	0.4	0.3
Retired, not seeking employment	2.6*	2.2	3.0	1.4**

* Includes those retired but seeking employment
** Members over 64 years of age were not surveyed

Table E-3 Employment Status of Minorities

	Black	American Indian	Oriental	Spanish Surnamed	Overall
Employed full-time	89.5%	93.8%	81.9%	95.6%	85.5%
Unemployed seeking employment	1.5	6.3	3.1	1.5	2.7
Temporarily/part-time employed	-	-	0.8	1.5	0.7
Subprofessionally employed	4.5	-	1.8	-	2.2
Postdoctoral/other fellowship	2.3	-	11.3	1.5	7.8
Retired, seeking employment	-	-	0.5	-	0.3
Retired, not seeking employment	2.3	-	0.5	-	0.8

Table E-4 Unemployed by Sex

	Percent in Category	Percent Unemployed
Male	92.7%	1.2%
Female	7.3	3.5
Overall	100.0	1.4

Table E-5 Unemployed by Age

	Percent in Category	Percent Unemployed
≤ 24	0.7%	0%
25-30	9.8	1.3
31-35	17.0	1.2
36-40	14.2	1.7
41-45	13.2	0.9
46-50	14.5	1.8
51-55	14.2	1.8
56-64	16.4	1.0
Overall	100.0	1.4

Table E-6 Unemployed by Geographic Region

	Percent in Category	Percent Unemployed
Pacific	10.6%	1.7%
Mountain	3.2	1.1
West North Central	5.3	0.8
West South Central	6.8	1.0
East North Central	20.8	1.3
East South Central	3.6	1.2
Middle Atlantic	26.6	1.6
South Atlantic	15.9	1.0
New England	7.2	1.5
Overall	100.0	1.4

Table E-7 Unemployed by Geographic Region 1971-1974

	1971	1972	1973	1974
Pacific	4.4%	4.6%	2.5%	1.7%
Mountain	2.6	1.9	1.6	1.1
West North Central	2.9	2.6	0.9	0.8
West South Central	2.8	2.2	1.5	1.0
East North Central	2.2	2.5	1.3	1.3
East South Central	2.0	2.1	3.0	1.2
Middle Atlantic	2.5	3.5	1.7	1.6
South Atlantic	2.1	2.7	1.5	1.0
New England	3.6	3.4	2.0	1.5
Overall	2.8	3.1	1.7	1.4

Table E-8 Unemployed by Most Recent Employer

	Percent in Category	Percent Unemployed
Industry	60.1%	1.5%
Education	22.9	1.2
Government	10.1	1.0
Self employed	1.3	1.4
Hospital/non-profit/other	5.6	1.5
Overall	100.0	1.4

Table E-9 Unemployed by Most Recent Work Activity

	Percent in Category	Percent Unemployed
Management/administration	28.4%	1.1%
Research/development	32.5	1.7
Marketing/production*	8.8	2.0
Teaching	16.7	0.7
Technical serv./writing/consulting	13.6	1.4
Overall	100.0	1.4

* Includes sales and quality control

Table E-10 Unemployed by Field of Specialty

	Percent in Category	Percent Unemployed
Analytical	16.6%	1.5%
Biochemistry/medicinal	12.3	1.3
Inorganic	6.0	1.4
Organic	17.3	1.2
Physical	8.8	2.2
Polymer	12.0	1.4
Chemical engineering	10.8	1.0
Literature/other	16.2	1.0
Overall	100.0	1.4

Table E-11a Have you been unemployed at any time since March 1, 1972?

Yes	7.3%
No	92.3
No report	0.4

Table E-11b If "yes" what was the length of unemployment?

		Cumulative
1 Month	9.9%	9.9%
1-2 Months	15.9	25.8
2-3 Months	11.5	37.3
3-6 Months	20.0	57.3
6-12 Months	18.8	76.1
>12 Months	22.4	98.5
No report	1.4	99.9

Table E-12 In your opinion, what is the chemical job market outlook for 1974-1977?

	Excellent	Good	Fair	Poor
Chemists	2.9%	32.9%	50.3%	13.8%
Chemical Engineers	16.3	53.3	25.1	5.4
Others	4.7	43.8	39.2	12.2
Overall	4.5	36.0	46.7	12.8

Salaries

Salaries and incomes of only those respondents indicating full-time employment were analyzed. Separate analyses were made for chemists and chemical engineers.

Overall, the median salaries for chemists have increased 5.2% since last year, while their incomes (basic salary plus any additional professional income) have gone up 5.7% (table S-3a and S-3b). These are weighted averages calculated from the percentage increases in each of the three degree categories. Similarly, for chemical engineers, overall salaries and incomes are up 4.9% and 4.8%, respectively (table S-3c and S-3d).

Analysis of salaries by degree and employer category (table S-6) shows self-employed masters and doctors to have the highest salaries, but they represent less than one percent of the respondents. In general, government employees are paid the highest salaries, followed by those in industry.

Table S-8 shows an analysis of chemists' median salary by geographic region. On the average, Atlantic coast states pay salaries above the national level; these states also have the highest concentration of chemists -- 49.9% of all chemists. On the other hand, the West North Central, Mountain, and East South Central regions pay the lowest salaries and represent 12.4% of the total chemists in the country.

Analysis of chemists' salaries by sex and years of experience (table S-9) shows that on the average men earned $5,300 more than women -- that is 36.8% more. The differential is biggest among older chemists; female doctors with 30 to 34 years of experience earned $8,800 less than their male conterparts. On the other hand, bachelors with 2 to 4 years of experience show the smallest difference -- women earning $800 less than men.

Comparisons of salaries of minorities with overall salaries for chemists by degree and years of experience show no great differences (table S-11); while younger minorities at the bachelors level reported slightly lower salaries, at the masters and doctors levels the differences are not significant.

Table S-1

Chemists' Salaries and Incomes by Percentiles and Experience

	Years of Experience																					
	≤ 1		2-4		5-9		10-14		15-19		20-24		25-29		30-34		35-39		40≥		Overall	
	Thousands of Dollars																					
Percentile rank	Salary+	Income*	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income
LOWER 10%																						
Bachelors	na	na	$ 8.1	$ 8.4	$10.2	$10.8	$12.0	$12.6	$13.0	$13.5	$14.0	$14.5	$14.0	$14.8	$14.0	$14.0	$14.0	$15.0	$15.0	$15.0	$11.0	$11.6
Masters	na	na	9.0	9.2	10.5	11.0	12.0	12.3	13.2	13.8	14.2	15.0	15.0	15.1	15.0	16.0	14.4	14.4	13.5	15.0	11.9	12.1
Doctors	na	na	11.0	12.0	12.5	14.0	14.5	16.0	16.8	18.0	18.0	19.0	18.2	19.0	17.7	18.5	18.5	19.5	15.0	15.0	14.0	15.0
LOWER 25%																						
Bachelors	na	na	10.0	10.1	12.0	12.5	14.1	14.7	15.6	16.0	16.2	17.0	17.0	17.0	16.8	17.0	18.0	18.0	17.0	17.0	14.0	14.5
Masters	na	na	10.6	11.2	12.5	13.0	14.2	14.5	16.0	16.4	17.5	18.0	19.0	19.8	18.5	19.5	17.0	18.0	19.0	19.0	14.5	15.0
Doctors	na	na	13.0	14.3	15.0	16.0	17.2	18.7	20.0	21.0	21.7	23.0	22.0	23.4	22.0	22.4	22.0	23.0	18.0	20.5	17.4	18.2
MEDIAN																						
Bachelors	na	na	11.2	11.4	14.0	14.1	16.1	17.0	18.0	18.5	19.8	20.0	20.0	20.9	21.3	21.9	21.5	22.7	22.2	22.9	17.5	18.0
Masters	na	na	12.5	13.0	14.5	15.0	17.0	17.8	19.0	19.5	21.1	22.0	23.0	24.0	22.3	23.0	22.4	24.1	24.0	29.0	18.4	19.0
Doctors	na	na	16.3	16.8	19.0	19.7	21.0	22.0	24.0	25.0	25.5	27.0	26.5	28.2	26.9	28.8	27.0	30.0	24.2	28.0	21.7	22.5
UPPER 25%																						
Bachelors	na	na	12.7	13.4	15.8	16.2	18.4	19.2	21.3	22.3	23.3	24.1	26.0	27.0	26.5	27.6	28.5	31.0	30.0	30.0	22.0	22.9
Masters	na	na	14.4	15.0	16.5	17.0	19.5	20.4	22.0	23.5	25.0	26.0	28.0	30.0	26.3	28.0	30.0	30.0	33.9	37.0	23.1	24.2
Doctors	na	na	18.4	19.0	21.8	22.5	24.5	26.0	27.5	28.6	30.0	32.2	31.8	35.0	33.0	36.0	35.0	38.0	36.0	36.0	26.4	28.0
UPPER 10%																						
Bachelors	na	na	14.5	15.5	17.5	18.7	21.0	22.9	25.5	27.5	27.8	30.0	31.1	35.0	32.0	34.0	36.0	49.0	36.0	39.0	27.9	30.0
Masters	na	na	15.7	16.4	18.5	19.0	23.0	24.5	26.7	27.7	30.0	33.0	35.0	38.0	33.8	36.0	33.0	40.0	40.0	45.0	29.4	31.0
Doctors	na	na	20.0	21.0	24.0	25.0	28.0	30.0	32.0	36.0	36.0	40.0	37.0	42.6	40.0	45.0	40.0	50.0	40.0	40.5	32.3	35.5

\+ Basic annual salary

* Income includes salary plus bonuses, royalties, fees, honoraria, and the like

na = not available

Table S-2

Chemical Engineers' Salaries and Incomes by Percentiles and Experience

			Years of Experience																			
	≤1		2-4		5-9		10-14		15-19		20-24		25-29		30-34		35-39		40≥		Overall	
	Thousands of Dollars																					
Percentile rank	Salary+	Income*	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income	Salary	Income
LOWER 10%																						
Bachelors	na	na	$ 9.6	$ 9.6	$12.0	$12.0	$11.8	$12.4	$15.6	$16.0	$16.8	$16.9	$17.5	$17.6	$18.1	$18.5	$18.0	$18.0	$15.0	$15.0	$14.7	$15.0
Masters	na	na	12.0	12.3	13.5	14.2	15.6	15.6	15.7	16.0	16.7	17.0	18.2	18.6	15.0	15.0	18.0	18.0	na	na	15.4	16.0
Doctors	na	na	15.0	15.0	15.8	17.5	18.4	19.2	19.0	19.7	19.6	20.4	19.0	21.0	19.0	19.4	18.0	23.2	na	na	17.4	18.7
LOWER 25%																						
Bachelors	na	na	10.1	11.0	13.8	14.0	14.7	15.2	18.4	19.0	18.9	19.4	20.0	20.0	20.2	21.0	19.5	20.0	18.2	18.7	18.0	18.4
Masters	na	na	13.0	13.0	16.0	16.0	16.8	17.0	18.1	19.2	20.2	20.6	21.0	21.0	22.8	22.8	20.0	22.0	na	na	18.0	19.0
Doctors	na	na	17.7	17.7	18.0	19.4	20.0	20.8	23.4	24.0	22.5	25.0	23.5	24.8	24.0	24.8	24.0	27.5	na	na	20.0	21.0
MEDIAN																						
Bachelors	na	na	12.0	13.0	15.3	15.5	17.4	18.0	20.6	22.0	21.0	22.0	22.3	23.5	24.5	26.0	24.0	26.5	21.4	26.0	21.3	22.0
Masters	na	na	14.2	14.2	17.6	17.8	18.1	18.9	21.3	21.5	24.0	24.9	25.0	26.6	25.0	28.0	24.8	26.0	na	na	22.4	23.3
Doctors	na	na	18.3	18.6	20.4	21.0	23.0	24.0	26.0	27.8	26.8	29.0	28.4	30.8	26.5	30.3	28.2	31.0	na	na	24.8	26.0
UPPER 25%																						
Bachelors	na	na	13.0	15.0	17.6	17.8	20.0	20.4	24.0	25.0	23.5	25.0	26.4	28.0	30.0	34.0	33.3	39.0	30.0	33.9	25.4	28.0
Masters	na	na	16.1	16.1	18.5	19.0	20.0	21.0	25.0	25.5	28.4	30.0	30.0	34.0	30.0	32.5	30.0	31.0	na	na	28.0	30.0
Doctors	na	na	18.7	19.0	22.8	23.0	26.0	28.4	32.2	33.2	33.0	36.0	36.0	37.0	35.0	36.0	32.0	35.0	na	na	30.0	33.5
UPPER 10%																						
Bachelors	na	na	14.0	16.1	18.0	19.0	23.0	25.0	28.0	29.0	27.5	30.0	32.5	35.0	39.0	43.0	45.6	53.0	39.0	43.0	34.0	37.0
Masters	na	na	16.6	17.5	19.0	21.5	23.0	24.0	29.5	30.0	33.3	37.9	42.0	47.5	47.0	51.0	36.0	36.3	na	na	36.0	40.0
Doctors	na	na	20.0	20.0	24.5	25.0	31.0	34.0	35.0	38.0	36.0	46.0	39.0	39.9	45.0	55.0	40.0	48.0	na	na	36.0	40.0

\+ Basic annual salary

* Income includes salary plus bonuses, royalties, fees, honoraria, and the like

na = not available

Table S-3a Chemists' Overall Median Salaries

	1972	1973	Change	1974	Change
Bachelors	$15.6	$16.8	7.7%	$17.5	4.2%
Masters	16.3	17.5	7.4	18.4	5.1
Doctors	19.2	20.5	6.8	21.7	5.9
Weighted Average			7.2%		5.2%

Table S-3b Chemists' Overall Median Incomes

	1972	1973	Change	1974	Change
Bachelors	$16.0	$17.0	6.3%	$18.0	5.9%
Masters	17.0	18.0	5.9	19.0	5.6
Doctors	20.0	21.3	6.5	22.5	5.6
Weighted Average			6.3%		5.7%

Table S-3c Chemical Engineers' Overall Median Salaries

	1972	1973	Change	1974	Change
Bachelors	na	$20.2	na	$21.3	5.4%
Masters	na	22.0	na	22.4	1.8
Doctors	na	23.1	na	24.8	7.4
Weighted Average					4.9%

Table S-3d Chemical Engineers' Overall Median Incomes

	1972	1973	Change	1974	Change
Bachelors	na	$21.0	na	$22.0	4.8%
Masters	na	22.5	na	23.3	3.6
Doctors	na	24.5	na	26.0	6.1
Weighted Average					4.8%

Table S-3e 1974 Salary-Income Differentials Compared

	Salary	Income	Differential
CHEMISTS			
Bachelors	$17.5	$18.0	2.9%
Masters	18.4	19.0	3.3
Doctors	21.7	22.5	3.7
Weighted Average			3.4%
CHEMICAL ENGINEERS			
Bachelors	21.3	22.0	3.3
Masters	22.4	23.3	4.0
Doctors	24.8	26.0	4.8
Weighted Average			4.0%

Table S-4

Chemists' Salaries by Work Activity

Years of Experience

	≤ 1	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40≥	Overall
					Thousands of Dollars						
Management/Administration (28.2%)*											
Bachelors	na	na	$15.0	$18.0	$21.4	$22.9	$26.0	$25.0	$26.3	na	$22.2
Masters	na	na	16.6	19.0	22.0	24.9	26.3	25.8	25.0	na	24.0
Doctors	na	18.5	22.0	25.0	26.7	29.0	31.0	31.8	31.0	na	27.0
Research/Development (32.3%)											
Bachelors	na	11.2	13.5	16.3	16.8	18.5	18.6	19.5	20.0	na	16.1
Masters	na	12.2	15.1	17.0	18.8	21.0	21.6	21.3	17.9	na	17.6
Doctors	na	17.5	20.0	22.0	23.9	24.8	24.6	25.0	25.0	na	21.5
Teaching (18.5%)											
Bachelors	na	na	na	na	na	na	na	na	na	na	11.0
Masters	na	na	12.0	13.5	14.0	15.0	17.5	18.2	16.0	na	13.4
Doctors	na	12.5	14.1	16.7	18.7	20.0	22.1	22.0	24.3	na	16.8
Marketing/Sales Prod./Quality Control (8.6%)											
Bachelors	na	11.9	14.0	15.9	18.1	19.0	18.0	19.0	19.6	na	17.0
Masters	na	na	15.5	18.6	22.0	21.0	22.9	na	na	na	19.1
Doctors	na	17.6	20.3	22.4	na	24.0	26.3	na	na	na	23.0
Other (12.4%)•											
Bachelors	na	10.8	13.7	15.6	16.6	17.7	18.0	18.0	20.0	na	15.5
Masters	na	13.3	14.7	16.0	18.1	17.5	17.5	20.0	21.9	na	16.1
Doctors	na	16.0	19.7	20.0	22.0	24.1	na	24.6	25.2	na	20.3

* Proportion of respondents in each category

• Includes technical services, laboratory analysis, writing, editing, abstracting, consulting

na = not available

Table S-5

Chemists Median Salaries by Field

Years of Experience

	≤1	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40≥	Overall
					Thousands of Dollars						
Analytical Chemistry (19.0%) *											
Bachelors	na	$11.3	$13.3	$15.8	$17.1	$18.0	$19.1	$18.0	$18.0	na	$15.8
Masters	na	12.8	15.0	16.6	19.2	19.3	21.3	21.2	23.4	na	18.0
Doctors	na	16.2	18.1	19.5	22.0	24.0	25.0	23.3	25.3	na	19.9
Biochemistry (13.3%)											
Bachelors	na	9.5	14.1	15.0	15.4	18.8	18.2	19.0	na	na	15.0
Masters	na	na	13.0	16.5	17.5	21.0	20.5	na	na	na	15.1
Doctors	na	15.0	18.4	20.8	24.0	27.0	27.8	26.5	30.8	na	21.5
Inorganic Chemistry (6.7%)											
Bachelors	na	10.6	13.2	16.2	17.0	20.8	24.0	na	na	na	19.0
Masters	na	na	13.0	14.4	17.3	18.6	20.0	na	na	na	16.0
Doctors	na	13.0	14.6	20.5	21.0	23.4	20.6	22.2	na	na	18.5
Organic Chemistry (19.0%)											
Bachelors	na	11.1	14.0	16.9	19.0	20.6	20.5	22.2	21.6	na	18.4
Masters	na	12.2	14.4	17.5	19.4	20.0	23.0	23.8	22.3	na	18.0
Doctors	na	16.0	19.6	21.0	23.3	24.4	25.3	28.0	26.5	na	21.0
Physical Chemistry (9.9%)											
Bachelors	na	na	12.8	18.0	18.4	19.0	na	na	na	na	18.0
Masters	na	na	na	15.0	16.9	20.2	24.8	na	na	na	18.0
Doctors	na	17.0	17.4	19.6	23.0	26.0	27.5	25.0	na	na	21.0
Polymer Chemistry (13.8%)											
Bachelors	na	11.5	15.0	17.6	19.5	20.6	20.3	21.1	22.0	na	18.9
Masters	na	na	15.8	19.7	20.3	22.0	24.9	22.9	na	na	20.5
Doctors	na	17.8	21.0	22.7	24.0	27.0	30.0	29.1	28.7	na	23.7
Other Specialties (18.3%)											
Bachelors	na	11.1	14.4	16.0	19.5	21.0	21.0	24.0	22.0	na	19.1
Masters	na	13.0	14.1	17.8	18.0	23.6	24.0	23.5	24.0	na	19.5
Doctors	na	17.3	20.4	23.4	25.2	26.5	26.4	30.0	26.2	na	24.1

* Proportion of respondents in category

na = not available

Table S-6

Chemists' Overall Median Salaries by Employer

	Bachelors			Masters			Doctors		
	1973	1974	Change	1973	1974	Change	1973	1974	Change
	Thousands of Dollars								
Industry (59.9%)	$16.9	$17.5	3.6%	$18.0	$19.7	9.4%	$22.0	$23.3	5.9%
Self-employed (0.9%)	16.0	15.0	-6.3	17.5	22.0	25.7	24.5	25.0	2.0
Educational Inst. (23.0%)	9.8	10.8	10.2	12.5	13.3	6.4	17.0	17.2	1.2
Government (10.7%)	17.9	18.1	1.1	19.5	19.0	-2.6	23.0	24.0	4.3
Non-profit (4.3%)*	14.6	15.0	2.7	16.0	15.1	-5.6	21.0	20.7	-1.4
Other (1.2%)	na	14.3	na	na	17.7	na	na	21.0	na

* Includes hospital and independent laboratory

na = not available

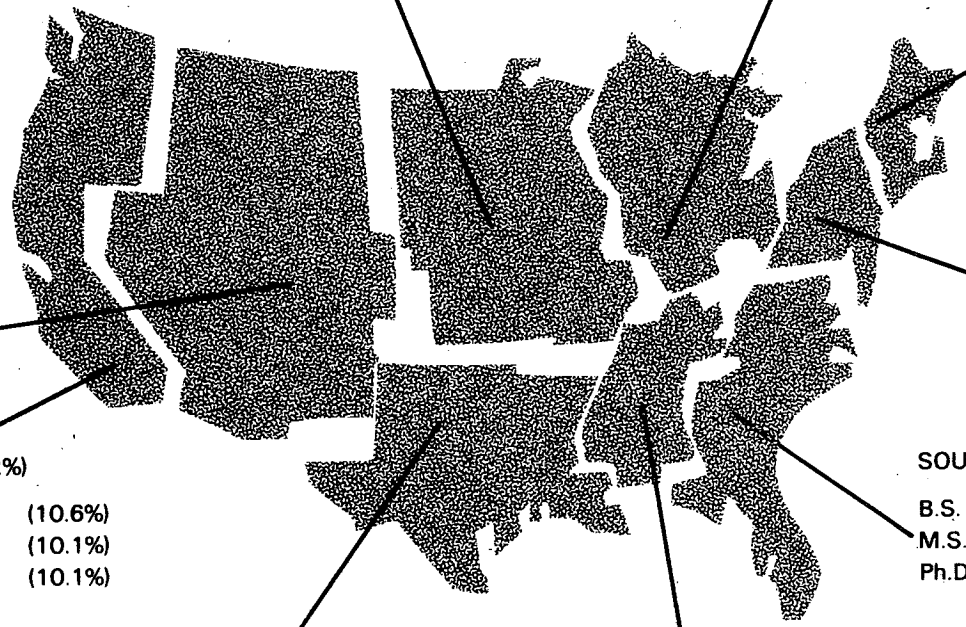
Table S-7 Industrial Chemists' Salaries by Percentiles and Experience

	Years of Experience										
	≤1	2-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40≥	Overall
	Thousands of Dollars										
LOWER 10%											
Bachelors	na	$ 9.5	$11.3	$12.0	$13.5	$14.2	$14.7	$14.6	$14.6	$16.7	$12.0
Masters	na	10.3	12.0	13.2	15.2	16.0	16.2	16.8	14.5	18.2	13.2
Doctors	na	15.6	17.8	18.8	20.0	20.5	20.5	20.0	20.3	na	17.9
LOWER 25%											
Bachelors	na	10.6	12.5	14.4	16.0	16.5	17.0	16.8	18.0	18.0	14.5
Masters	na	11.9	14.0	15.8	17.5	19.0	20.0	20.0	17.7	22.0	16.0
Doctors	na	16.7	19.2	21.0	22.5	23.8	24.0	24.0	23.0	na	20.0
MEDIAN											
Bachelors	na	11.5	14.0	16.2	18.0	19.9	20.0	21.0	21.6	23.0	17.8
Masters	na	13.0	15.3	18.0	19.8	22.0	24.0	23.5	23.5	25.0	19.9
Doctors	na	18.0	21.0	23.5	25.0	26.5	27.5	29.1	28.0	na	23.5
UPPER 25%											
Bachelors	na	13.0	16.0	18.3	22.0	23.3	25.3	25.3	28.8	32.0	22.0
Masters	na	14.5	17.0	20.7	22.5	26.0	30.0	27.5	30.0	34.3	24.5
Doctors	na	19.3	23.0	26.0	28.7	31.5	33.2	35.5	36.0	na	28.0
UPPER 10%											
Bachelors	na	14.8	18.0	22.0	26.5	28.0	31.0	33.0	40.0	40.0	28.2
Masters	na	15.8	18.8	24.0	27.2	32.7	37.0	35.0	34.0	40.0	31.3
Doctors	na	20.8	25.0	29.0	35.0	38.0	40.0	44.4	45.0	na	35.0

na = not available

Table S–8

Chemists' Median Salaries by Geographic Regions*



WEST NORTH CENTRAL (5.5%)

B.S.	$16.0	(4.4%)
M.S.	16.6	(5.6%)
Ph.D.	20.0	(6.1%)

EAST NORTH CENTRAL (21.0%)

B.S.	$17.0	(21.0%)
M.S.	18.0	(22.9%)
Ph.D.	21.0	(20.6%)

NEW ENGLAND (7.2%)

B.S.	$18.0	(7.5%)
M.S.	18.0	(7.6%)
Ph.D.	22.0	(7.0%)

MIDDLE ATLANTIC (26.8%)

B.S.	$18.0	(28.1%)
M.S.	19.0	(27.6%)
Ph.D.	22.0	(25.8%)

MOUNTAIN (3.3%)

B.S.	$16.9	(3.2%)
M.S.	17.0	(3.4%)
Ph.D.	18.7	(3.4%)

PACIFIC (10.2%)

B.S.	$17.0	(10.6%)
M.S.	18.4	(10.1%)
Ph.D.	21.6	(10.1%)

SOUTH ATLANTIC (15.9%)

B.S.	$19.0	(14.8%)
M.S.	18.6	(13.6%)
Ph.D.	23.0	(17.3%)

WEST SOUTH CENTRAL (6.2%)

B.S.	$16.1	(6.0%)
M.S.	19.2	(6.0%)
Ph.D.	20.0	(6.3%)

EAST SOUTH CENTRAL (3.6%)

B.S.	$15.8	(4.3%)
M.S.	15.8	(3.3%)
Ph.D.	20.0	(3.4%)

How to read: Using New England as an example, 7.2% of responding chemists work in the U.S. census division; 7.5% of all B.S. chemists work there and they reported an overall median salary of $18.0 in 1974.

* Thousands of dollars

STATES/REGIONS

1. Pacific

   Washington
   Oregon
   California
   Alaska
   Hawaii

2. Mountain

   Montana
   Idaho
   Wyoming
   Nevada
   Utah
   Colorado
   Arizona
   New Mexico

3. West North Central

   North Dakota
   Minnesota
   South Dakota
   Iowa
   Nebraska
   Kansas
   Missouri

4. West South Central

   Oklahoma
   Arkansas
   Texas
   Louisiana

5. East North Central

   Wisconsin
   Michigan
   Illinois
   Indiana
   Ohio

6. East South Central

   Kentucky
   Tennessee
   Mississippi
   Alabama

7. Middle Atlantic

   New York
   Pennsylvania
   New Jersey

8. South Atlantic

   Delaware
   Maryland
   West Virginia
   District of Columbia
   Virginia
   North Carolina
   South Carolina
   Georgia
   Florida

9. New England

   Maine
   New Hampshire
   Vermont
   Massachusetts
   Connecticut
   Rhode Island

Table S-9 Chemists Median Salaries by Sex

Years	Bachelors Men	Bachelors Women	Masters Men	Masters Women	Doctors Men	Doctors Women	Distribution Men	Distribution Women
			Thousands of Dollars					
≤ 1	na	na	na	na	na	na	83.3%	16.7%
2-4	$11.4	$10.6	$12.8	$11.3	$16.5	$14.5	89.0	11.0
5-9	14.0	12.0	15.0	12.5	19.2	14.6	90.1	9.9
10-14	16.5	14.0	17.4	14.0	21.2	18.0	90.8	9.2
15-19	18.0	15.0	19.5	15.2	24.0	19.7	91.5	8.5
20-24	20.0	15.7	21.5	17.0	25.7	21.0	92.6	7.4
25-29	20.9	16.0	23.4	15.7	26.8	21.3	92.7	7.3
30-34	21.8	16.3	23.0	16.5	27.5	18.7	92.7	7.3
35-39	21.6	18.3	22.5	na	27.3	na	93.0	7.0
40 ≥	23.0	na	24.5	na	25.6	na	93.0	7.0
Overall	18.0	13.0	19.0	13.5	22.0	16.8	93.0	7.0

Male average salary $19.7
Female average salary $14.4

na = not available

Table S-10 Comparison of Chemists' Salaries by Sex

	Bachelors				Masters				Doctors				Overall Dist.	
	Men		Women		Men		Women		Men		Women		Men	Women
	Salary	%+	Salary	%	Salary	%	Salary	%	Salary	%	Salary	%		
	Thousands of Dollars													
EMPLOYER														
Industry	$18.0	78.5	$13.2	56.4	$20.0	68.0	$14.4	43.5	$23.4	50.8	$21.0	18.7	61.4%	40.3%
Self-employed	15.1	1.6	na	1.2	22.0	1.2	na	0	25.0	0.6	na	0.9	0.9	0.7
Educational Inst.	11.5	2.7	9.0	10.0	14.0	13.6	11.0	32.7	17.5	34.8	15.0	53.4	22.4	31.0
Government	18.7	12.9	15.2	20.0	19.5	11.8	15.0	13.6	24.0	8.6	20.9	14.6	10.3	16.3
Non-profit*	15.8	3.0	11.0	10.4	16.3	3.8	12.1	8.9	21.0	4.3	17.0	11.4	3.8	10.2
Other	14.7	1.4	na	2.0	17.9	1.6	na	1.4	21.2	1.0	na	0.9	1.2	1.5
WORK ACTIVITY														
Management/admin.	22.7	30.1	15.0	10.6	24.1	30.5	18.0	9.7	27.0	28.6	23.0	14.4	29.4	11.6
Research/development	16.6	27.3	13.2	33.6	18.3	30.9	14.0	36.9	21.6	35.2	18.0	26.5	32.3	32.3
Teaching	11.0	1.6	na	4.3	14.0	11.6	11.2	25.7	17.0	28.1	14.5	45.1	18.0	24.4
Marketing/sales production/qual.con.	17.2	20.7	12.0	11.1	19.1	11.8	na	1.0	23.4	2.3	na	0.5	9.0	4.4
Other°	16.0	20.3	12.8	40.4	17.0	15.2	12.8	26.7	21.0	5.7	18.4	13.5	11.3	27.3
FIELD														
Analytical	16.0	32.6	14.1	40.9	18.3	22.5	14.2	22.3	20.0	10.5	14.1	10.2	18.5	25.0
Biochemistry++	16.0	4.9	10.5	15.7	16.5	6.6	12.0	18.4	22.0	18.2	17.4	37.2	12.5	23.6
Inorganic	19.2	5.3	na	2.6	17.0	8.5	12.0	10.2	19.0	6.6	13.5	11.2	6.6	7.8
Organic	19.0	12.1	12.7	8.5	18.6	15.9	12.5	15.0	21.2	24.4	16.8	14.9	19.6	12.7
Physical	18.2	3.5	na	2.6	18.5	5.6	na	5.3	21.2	14.9	15.6	9.8	10.2	5.8
Polymer	19.0	17.4	na	3.0	21.0	15.7	na	3.9	23.8	12.9	na	4.2	14.6	3.7
Other**	20.0	24.3	13.3	26.8	20.3	25.3	13.8	24.8	24.7	12.6	18.0	12.6	18.0	21.5

\+ Percent in category
* Includes hospital and independent laboratory
° Includes technical services, laboratory analysis, writing, editing, abstracting, consulting
++ Includes clinical and medicinal chemistry
** Includes literature, information science
na = not available

Table S-11

Comparison of Median Salaries of Minorities and Overall Chemists' Salaries

Years	Bachelors		Masters		Doctors	
	All Chemists	Minorities	All Chemists	Minorities	All Chemists	Minorities
			Thousands of Dollars			
≤1	na	na	na	na	na	na
2-4	11.2	10.0	12.5	na	16.3	16.5
5-9	14.0	13.0	14.5	15.0	19.0	19.1
10-14	16.1	15.1	17.0	17.0	21.0	22.7
15-19	18.0	19.1	19.0	18.4	24.0	24.8
20-24	19.8	19.0	21.1	23.0	25.5	25.0
25-29	20.0	na	23.0	na	26.5	26.1
30-34	21.3	na	22.3	na	26.9	na
35-39	21.5	na	22.4	na	27.0	na
40≥	22.2	na	24.0	na	24.2	na
Overall	17.5	15.4	18.4	16.6	21.7	20.0

na = not available

Note: Minorities reported an average of 10-14 years of experience.
All chemists reported an average of 15-19 years of experience.

Minorities

The 1974 survey is the second consecutive annual ACS survey to include a question on minorities -- those classifications recognized by the Equal Employment Opportunity Commission (EEOC): Black, American Indian, Oriental (defined by EEOC to include those of Chinese, Japanese, Korean or Taiwanese origin), Spanish-Surnamed American (defined by the EEOC to include those of Mexican, Puerto Rican, Cuban or Spanish origin).

Almost 9% of the respondents failed to answer this question. Possibly some respondents were confused because they had five choices -- the four minority categories plus "None of the categories above." The latter was intended for all those minorities not recognized by the EEOC as well as non-minorities. Some non-minority respondents indicated they were not sure whether to skip this question or check category five. We believe this to be the reason why the percentage of no responses is higher this year (table M-1).

Table M-2 gives us a breakdown of minorities by sex; all other analyses were made regardless of sex.

Tables M-5 through M-7 show distribution of chemists by employer, work activity, and field of specialty. Comparisons were made independently for all chemists, regardless of sex and minority group classification; women, regardless of minority group classification; and minorities, regardless of sex.

Table M-1 Percentage of Minorities in Survey Responses

	1973	1974
Minorities	4.8%	5.1%
Non-minorities	93.1	86.2
No response	2.1	8.7

Table M-2 Distribution of Minorities by Sex

	Black	American Indian	Oriental	Spanish-Surnamed
Male (4.4%)+	91.0%	82.4%	84.6%	91.2%
Female (0.7%)	9.0	17.6	15.4	8.8

+ Percent of total responses
* Percent in category

Table M-3 Distribution of Minorities by Degree

	Overall	Bachelors	Masters	Doctors
Black	1.1%	1.6%	1.4%	0.8%
American Indian	0.1	0.2	0	0.2
Oriental	3.2	1.6	3.0	4.3
Spanish-Surnamed	0.6	0.6	0.8	0.5
All minorities	5.1	4.1	5.2	5.7

+ Percent of total responses in degree category

Table M-4 Distribution of Minorities by Degree and Field of Specialty

	Overall	Bachelors	Masters	Doctors
Analytical	17.8%+	40.5%	19.1%	7.6%
Biochemistry	19.9	11.2	13.0	26.4
Inorganic	6.1	5.2	6.1	6.5
Organic	14.8	10.3	10.4	18.5
Physical	9.5	3.4	4.3	14.1
Polymer	10.1	8.6	8.7	11.2
Engineering	8.5	5.2	20.0	5.1
Other	13.4	15.5	18.3	10.5

+ Percent in category

Table M-5 Distribution of Full-time Employed Chemists by Employer

	All Chemists	Women	Minorities
Industry	59.9%	40.3%	53.1%
Self-employed	0.9	0.7	1.2
Educational Institution	23.0	31.0	21.1
Goverment	10.7	16.3	17.4
Hospital/non-profit	4.3	10.2	6.3
Other	1.2	1.5	0.8

Table M-6 Distribution of Full-time Employed Chemists by Work Activity

	All Chemists	Women	Minorities
Management	28.2%	11.6%	21.3%
Research & Development	32.3	32.3	43.8
Teaching	18.5	24.4	14.0
Marketing/Sales			
Production/Quality Cont.	8.6	4.4	6.7
Other	12.4	27.3	14.2

Table M-7 Distribution of Chemists by Field of Specialty

	All Chemists	Women	Minorities
Analytical	18.6%	25.0%	19.4%
Biochemistry/Medicinal	13.8	23.6	21.8
Inorganic	6.7	7.8	6.7
Organic	19.4	12.7	16.2
Physical	9.9	5.8	10.3
Polymer	13.4	3.7	11.0
Other	18.1	21.5	14.7

A P P E N D I X

Analysis of the ACS Membership, Selected Sample and Survey Responses

One quarter of the ACS domestic membership (exclusive of students, emeriti, and those over 64 years of age) was selected at random for this survey. Tables A-1 through A-5 show an analysis of the ACS membership as it compares with the random sample and survey respondents.

It is interesting to observe that when comparing the total ACS membership with the sample selected for this survey, variations are only fractions of one percent. When comparing the sample with the respondents, those characteristics that do not change (i.e., sex and year of birth) show a maximum variation of one percent for those in age groups 25 to 30 and 31 to 35. Analysis of the geographic distribution (information for the ACS membership was based on the address reported by the members and presumably up-dated soon after a change of address occurs) also shows variations of less than one percent. We consider these variations to be statistically insignificant, and the survey therefore is representative of the total ACS membership.

When comparing highest degree earned, we note a discrepancy between information on the member's record, and information obtained from the survey responses. For example, the membership data file shows 44% of the total membership hold a doctors degree compared with 51% of those responding to the survey. The difference may be attributed to two factors or a combination of both: a) the membership record does not have the latest information; b) doctors respond to the survey at a higher rate. The opposite can be said for bachelors.

Comparison of field of specialty -- chemistry, chemical engineering, others (by "others" we mean those who have obtained their highest degree in a field other than chemistry, i.e., medicine, law, business administration, etc.) -- shows a difference in the number of chemical engineers and "others" responding to the survey when compared with the membership record. This discrepancy could be attributed to the different bases used in surveying and in obtaining information for the member's record -- while the survey asks for field of specialty associated

with the member's latest employment, the membership application form seeks information about the field of highest degree earned.

The employer classification -- industry and non-industry -- shows a discrepancy between the ACS membership file and the survey responses concerning the number employed in industry. This might be attributed to either or both of two factors: industrial chemists may respond to the survey at a higher rate than non-industrial chemists (although there is no basis for this assumption), and the information obtained in the survey is more up to date. An effort is made to update employer information in the ACS member records by means of a small questionnaire sent every year to 1/3 of the total membership; thus members changing employers have an opportunity to update their records every three years. At any given time, however, a significant percentage of the members may not have current employer information in the ACS file.

Table A-1 Sex Distribution

	Male		Female		Total
	No.	%	No.	%	
ACS membership	75780	92.5	6140	7.5	81920
Random sample	18952	92.6	1522	7.4	20474
Survey responses	10985	92.7	864	7.3	11849

Table A-2 Age Distribution

	ACS Membership		Random Sample		Survey Responses	
	No.	%	No.	%	No.	%
≤ 24	478	0.6	100	0.5	78	0.7
25-30	7050	8.8	1763	8.8	1129	9.8
31-35	12949	16.1	3214	16.0	1963	17.0
36-40	11331	14.1	2891	14.4	1642	14.2
41-45	11401	14.2	2800	13.9	1528	13.3
46-50	12036	14.9	3063	15.2	1674	14.5
51-55	11702	14.5	2896	14.4	1632	14.2
56-64	13621	16.9	3407	16.9	1893	16.4
Total	80568		20134		11539	

Table A-3 Geographic Distribution

	ACS Membership		Random Sample		Survey Responses	
	No.	%	No.	%	No.	%
Pacific	8609	10.5	2153	10.5	1237	10.6
Mountain	2476	3.0	619	3.0	372	3.2
West North Central	4300	5.3	1075	5.3	619	5.3
West South Central	5741	7.0	1435	7.0	791	6.8
East North Central	16813	20.5	4204	20.5	2434	20.8
East South Central	2996	3.7	749	3.7	418	3.6
Middle Atlantic	22359	27.3	5590	27.3	3108	26.6
South Atlantic	12638	15.4	3159	15.4	1856	15.9
New England	5930	7.2	1482	7.2	840	7.2
Total	81862		20466		11675	

Table A-4 Degree Distribution

	Bachelors		Masters		Doctors		Less Than Bachelors		Total
	No.	%	No.	%	No.	%	No.	%	
ACS membership	28405	36.7	13593	17.6	34353	44.4	953	1.2	77304
Random sample	7100	36.7	3444	17.8	8583	44.3	233	1.2	19360
Survey responses	3326	28.3	2355	20.1	5987	51.0	72	0.6	11740

Table A-5 Distribution by Field of Specialty

	Chemists		Chemical Engineers		Other (non chemical)		Total
	No.	%	No.	%	No.	%	
ACS membership	58385	81.8	10113	14.2	2904	4.1	71402
Random sample	14666	82.0	2513	14.1	706	3.9	17885
Survey responses	9573	81.1	1270	10.8	954	8.1	11797

Table A-6 Employer Distribution

	Industry		Non-Industry		Total
	No.	%	No.	%	
ACS membership	34846	48.5	36983	51.5	71829
Random sample	8794	48.8	9221	51.2	18015
Survey responses	7115	60.1	4721	39.9	11836

AMERICAN CHEMICAL SOCIETY
1974 Comprehensive Salary and Employment Status Survey

1 A. Sex: (1)___Male (2)___Female 2-3 B. Year of birth_____

4 C. Highest degree earned: (1)___Bachelors (2)___Masters (3)___Doctors (4)___Less than bachelors

5-6 D. Year of highest degree:_____ 7-8 E. Year of bachelors degree:_____

9-10 F. State of residence_____ 11-15 G. Zip Code_____

17 H. EEOC minority (or non-minority) category in which you are included:

(1)___Black/Negro
(2)___American Indian
(3)___Oriental (those of Chinese, Japanese, Korean or Taiwanese origin)
(4)___Spanish-American (those of Mexican, Puerto Rican, Cuban or Spanish origin)
(5)___None of the categories above

Please check the one response in each question which most aptly describes your status as of March 1, 1974.

18 I. Current Employment Status:

(1)___Employed full-time
(2)___Unemployed and seeking employment
(3)___Temporarily or part-time employed
(4)___Postdoctoral or other fellowship
(5)___Employed subprofessionally
(6)___Retired, seeking employment
(7)___Retired or otherwise not seeking employment

20 J. Current, or most recent full-time professional employer:

(1)___Industry
(2)___College or university
(3)___High school or other school
(4)___Federal government
(5)___State or local government
(6)___Self employed
(7)___Hospital, independent laboratory
(8)___Other non-profit organization
(9)___Other (specify)_____

21 K. Category which most closely approximates your present, or most recent principal employment:

(1)___General management/administration
(2)___Management, research/development
(3)___Research/development (non-managerial)
(4)___Teaching
(5)___Marketing/sales
(6)___Production/quality control
(7)___Technical services/lab. analysis
(8)___Writing/editing/abstracting
(9)___Consulting
(0)___Other (specify)_____

22 L. Specialty which is most closely related to your present, or most recent principal employment:

(1)___Analytical
(2)___Inorganic
(3)___Organic
(4)___Physical
(5)___Biochemistry/clinical/medicinal
(6)___Polymer
(7)___Chemical engineering
(8)___Literature, information science
(9)___Other chemical field
(0)___Non-chemical function

23-27 M. Basic annual salary associated with your principal professional employment, to the nearest $100. $_____

28-32 N. 1974 estimated gross annual income from all professional activities, to the nearest $100. $_____
(Income is ALL payment for professional activities including basic salary, plus bonuses, royalties, fees, honoraria, etc.)

33-34 O. How many years of professional work experience, including postdoctoral study, have you had? _____

P. Have you been unemployed at any time since March 1, 1972? (1)___Yes (2)___No
(Students, graduate assistants, or postdoctorals are not considered as unemployed for this survey.)

If "Yes," what was the length of unemployment (use average if more than one occurrence):

(1)___Less than 1 month
(2)___1-2 months
(3)___2-3 months
(4)___3-6 months
(5)___6-12 months
(6)___More than 12 months

37 Q. Have you changed jobs or employers since March 1, 1972? (1)___Yes (2)___No

38 If "Yes," was this change: (1)___Voluntary
(2)___Involuntary, e.g., due to layoff, forced retirement, etc.
(3)___Due to voluntary retirement
(4)___Other (specify)_____

39 Was your new position in the same field or one closely allied to your previous position? (1)___Yes (2)___No

40 Was specialized retraining required for the new position? (1)___Yes (2)___No

41 R. In your opinion, what is the chemical job market outlook for 1974-1977?

(1)___Excellent (2)___Good (3)___Fair (4)___Poor

(We would appreciate having your opinions, comments, or suggestions on the reverse side of this page. Survey responses will be treated anonymously for reporting purposes.)

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