GEORGIA TECH PHOTO/GARY MEEK

DEMAND STILL SOFT FOR NEW CHEMISTS

Industrial hiring will remain depressed, but there is optimism in academia

AALOK MEHTA, C&EN WASHINGTON

By now, nearly everyone in the U.S. has been inundated with competing claims about the country's economic situation. As one of the tightest presidential elections in recent history winds its way to a conclusion, both major candidates have skirmished numerous times over the state of the U.S. economy and their plans for rectifying its problems. But whatever the claims, signs of recovery are mixed at best. Chemists who are just beginning their job hunt will face yet another year of weak hiring.

Though it is still quite early in the recruiting season, most of the employers C&EN spoke with about next year's prospects for chemists, biochemists, and chemical engineers said that not much has changed since last year; many university representatives, however, are cautiously optimistic. It's difficult to see how things could get worse; 2004 was one of the roughest years on record for the chemical industry. According to the American Chemical Society's 2004 Employment & Salary Survey of its members, unemployment of chemists is a record-high 3.6%, increasing from the 2003 figure of 3.5% and more than two points higher than the banner year of 2001 (see page 41).

An air of unpredictability surrounds the chemical industry, further complicating matters. In addition to continued global political and economic instability, feedstock prices have skyrocketed and may increase significantly this winter. Although companies are reluctant to comment directly, the U.S. presidential election could also impact the fortunes of the chemical industry. The candidates have clashed over a number of topics directly affecting the industry, including outsourcing of manufacturing jobs, rising health care costs, importing of cheaper drugs, and stem cell research.

Still, most chemical companies continue to recruit even during tough economic times, both as a means to refresh their organizations with scientists versed in the latest techniques and to replace staff who have retired or have left for other opportunities. The hardy pharmaceutical industry continues to hire scientists at a steady rate, as its long development cycles tend to overshadow economic effects. Bachelor's- and master's-level candidates—especially chemical engineers—will also find a number of opportunities. And there seems to be a good deal of optimism about the 2005 academic job market.

IF ANY SEGMENT of the chemical industry has proven resilient during the economic downturn, it's the pharmaceutical industry. Still the largest single sector employing chemists, pharmaceutical companies continue to hire scientists with synthetic organic and analytical specialties in large numbers for drug discovery and development efforts, though few companies are recruiting more aggressively than last year.

"My feeling is that the market will be very similar to the last two to three years; you won't see much change in the pharmaceutical industry," says Anabella Villalobos, executive director of central nervous system medicinal chemistry at Pfizer. "There will be a number of job openings, but I don't know if you'll see any significant growth."

Like many pharmaceutical companies, Pfizer will be recruiting at "steady-state levels," she says. The company plans on filling about half-a-dozen positions for Ph.D.-level organic chemists and more B.S./M.S.-level slots in the U.S. The company is also looking for experts in radiochemistry and biotransformations.

"I think our situation is not that different from the rest of the industry, even with our acquisitions," Villalobos says. "I don't think any company is really growing that tremendously."

Representatives from GlaxoSmithKline concur. "We are looking to recruit about the same number as last year," says Joseph R. Flisak, team manager for synthetic chemistry. "Within GSK, there are ample opportunities for chemists of all different kinds, chemical engineers, and biochemists."

In particular, the company is currently looking for organic chemists, synthetic organic chemists, analytical chemists, particle scientists, a small number of chemical engineers, and pilot plant operators. The company is aiming to hire at all education levels. "We have kept up our recruiting efforts even during the mergers in the past," Flisak says. "We are still going full steam ahead."

John Primeau, AstraZeneca's director of infection chemistry, also predicts a similar rate of hiring. "There's still a strong need at AstraZeneca for good chemists. In fact, there's still a general need in pharma for chemists," he says. "We're undergoing steady-state growth, and we will fill in skill levels as appropriate."

The company is looking for medicinal chemists and a smaller number of analytical chemists. Though it is currently focusing on B.S./M.S.-level recruiting, the company expects to hire at all levels in a similar fashion to last year. "We need synthetic organic chemists—people who can build molecules and fit into a medicinal chemistry environment or a process environment," Primeau says. "We'd like to continue to increase our size."

Smaller drug companies are also recruiting at roughly the same levels as recent years. "We expect a modest growth

for ourselves for next year," says Alexander Chucholowski, executive director of chemistry for ChemBridge Research Laboratories, San Diego. "This will be at a pace similar to last year's."

In addition to synthetic and medicinal chemists, the company is looking to hire a few analytical chemists to meet some chemistry support needs, such as molecular modeling and cheminformatics.

Although the company is hiring at both the Ph.D. level and the bachelor's/master's level, Chucholowski is more optimistic about the job situation for the latter group. "We are looking for qualified B.S. and M.S. chemists," he says. "If they are good, they have a much easier time finding jobs. For Ph.D.s, we receive many résumés and CVs—too many to read. It's much harder to find a job at the Ph.D. level than the B.S./M.S. level."

EMPLOYMENT OUTLOOK

Despite its size, ChemBridge is facing the same issues as many larger pharmaceutical companies. "We're a small organization and still in a growth mode. We're doing well," Chucholowski says. "But it's now a much more competitive environment. Cost pressure is tremendous."

IN ADDITION, the company's efforts to recruit foreign-born scientists continue to face a number of obstacles. "Several of the highly qualified candidates we were interested in had visa issues that could not be resolved during the year, so we just could not hire them," he says.

Such difficulties are not uncommon, and may even end up changing the fundamental nature of recruiting chemists. "I think there will be a continuing challenge to match potential employee skills with labor needs. A specific example: A few years ago, when the H-1B [visa] allotments were high, it was much easier to hire non-U.S. citizens to fill in the knowledge gap," says Andrea M. Schulz, director of human resources at Albany Molecular Research. "The lowering of the H-1B cap has impacted our ability to do that, and the ongoing debate is whether the answer is to increase the cap or to put more emphasis on getting out-of-work or unemployed U.S. chemists the training they need so they can enter or reenter our workforce."

Albany Molecular will be recruiting chemists, biochemists, and chemical engineers, with an emphasis on B.S./M.S. candidates and a limited number of Ph.D.s. In particular, the company is looking for analytical chemists, organic/synthetic chemists, biochemists, microbiologists, and some chemical engineers.

"My perception is that the job market has contracted somewhat, but that has been offset somewhat by the shrinkage of the talent pool as a result of immigration issues," Schulz says. "Our needs have been fairly consistent over the past two years."

Representatives of Roche were the most optimistic of all the pharmaceutical companies C&EN talked with. "Our recruiting outlook is very clearly at a level above that of the last few years," says Hans Maag, vice president of chemistry at Roche Palo Alto. But, he adds, "we're one of few companies recruiting fairly aggressively this year. In chemistry as a whole, it seems to be an average year for recruiting."

The company is currently hiring at both the Ph.D. and the B.S./M.S. level in medicinal chemistry, process chemistry, and computational chemistry.

"We're currently in the process of increasing our chemistry resources by hiring additional staff," Maag says. "We recognize that to be successful in this industry you need to find and apply good medicinal chemists. Combinatorial chemistry methods have not really panned out. We still need to work on final optimization one compound at a time, so there is still a considerable amount of work left for smart medicinal chemists to identify the most promising set of candidates. Toxicity can also be fairly unpredictable, so we need to develop a number of compounds in parallel for a chance to get into the clinic in a reasonable amount of time."

Despite the steady levels of hiring, the pharmaceutical industry faces a number of unresolved issues, including concerns about the importation of less expensive drugs from outside the U.S. Mergers and acquisitions also continue to dramatically affect the recruiting situation of individual companies.

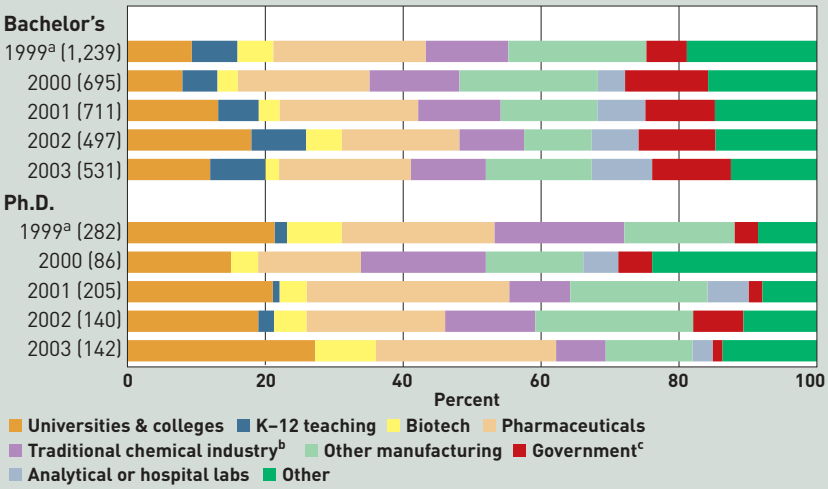
"Pfizer acquired Pharmacia in 2003. This acquisition has had an impact on recruiting, since we made a large effort to retain top talent during the acquisition," Villalobos says. "Since Pfizer has grown significantly through acquisitions, we have not been able to grow as much from hiring from the academic pool."

Still, the long development times and steady demand for new health care products help to protect the pharmaceutical industry from economic vagaries and to ensure that chemists will continue to find employment in the sector for years to come. "Our hiring situation is a reflection of the fact that our basic research produces results 10 years down the road," Roche's Maag says. "We try not to be subject to short-term changes in the economic climate."

Although pharmaceuticals have been fairly resilient in the face of economic hardship, the traditional chemical industry sector has had no such luck. High raw materials costs and the continued erosion of manufacturing capacity in the U.S. have hit the segment especially hard during the economic downturn, so new graduates

WHERE DO YOU WORK?

More than 20% of last year's new bachelor's and Ph.D. chemists found full-time work in pharmaceuticals



NOTE: Data are for newly graduated chemists working full-time. The number in parentheses after each year is the number of respondents. **a** Survey categories for some manufacturing segments changed between 1999 and 2000. **b** Includes agricultural chemicals, basic chemicals, coatings, and inks, personal care products, petroleum, plastics, rubber, soaps and detergents, specialty chemicals, and textiles. **c** Federal, state, and local.
SOURCE: ACS's starting salary surveys, 1999–2003

seeking jobs in the area may continue to have great difficulty.

"Like last year, this is not a good year for chemistry, biochemistry, and chemical engineering grads," says Senyo Opong, staffing manager and Ph.D. and science recruiting consultant at DuPont. Hiring at chemical companies is down "due mainly to the uncertainty in the global economic climate."

In particular, "the needs of DuPont this year are similar to last year," he says. "Our number of Ph.D. hires has increased significantly the last few years, and we continue to focus on research and development for the future of DuPont. Our leadership has responded well to the urgent need in the renewal of the scientific workforce."

DuPont has already begun its campus recruiting season and is looking for chemists, chemical engineers, biochemists, biologists, materials scientists, and others at all degree levels. This year, the company has a high demand for organic and polymer chemists and biochemists, and less need for chemical engineers, though it will continue to hire a few for specialized tasks.

"We have evolved into a science company that is much broader than a chemical company," Opong adds. "But in terms of our frame-of-reference companies, I do not think our situation is very different. The uncertain economy is hurting the renewal effort of most of the U.S. manufacturing-based companies, and our industry is no exception."

Dow tells a similar story. "The overall market has improved slightly from last year," says Kevin Small, workforce planning leader for North America and Latin America. "But we're still in a recovery phase in the industry and in general. The market is improving for new graduates, but there is still room for some upswing. As the economy improves, it takes a while for that to trickle down through the system into hiring new graduates."

But in a significant contrast to DuPont, Dow is seeking mostly chemical engineers, at all levels of education. It also plans on hiring a small number of Ph.D. chemists, especially experts in polymer chemistry. "Our recruiting level is going to be consistent or similar to last year, which was lower than past years," Small adds. "We're not at full capacity yet. But this may be the new reality within the U.S. market. Much of our future growth is outside the country. The U.S. market may just need to find new products and new markets in order to expand."

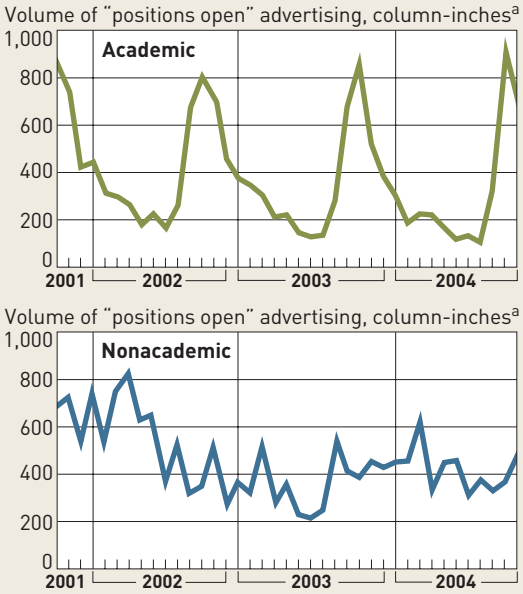
The company is very specific about its needs during the recruiting season but maintains a good deal of flexibility. "We look for very specific expertise in areas," Small says, "but that doesn't preclude us from looking at Ph.D.s that have exhibited expertise in their field."

And he remains optimistic about a possible economic recovery. "I think the chemical industry in general is coming out of a trough, but we've been hit hard by hydrocarbon costs," he says. "I don't think that is exclusive to Dow. The market is turning, but it still has a ways to go to get to peak condition."

PACIFIC NORTHWEST NATIONAL LABORATORY PHOTO

HELP WANTED

Both academic and industrial job postings in C&EN remain at depressed levels



a Column-inches published during consecutive periods of four weeks each.

At Procter & Gamble, "we expect the numbers for the current year will be as good as, if not better, than the previous year, and the previous year was better than the year before," says Ron Webb, manager of doctoral recruiting and university relations. "We're starting to see an upswing in our hiring over two fiscal years."

THE COMPANY continues to hire broadly across the life sciences and chemistry fields, though it remains weak in hiring of chemical engineers. Analytical, bioanalytical, and synthetic organic chemists are in high demand at the company, and polymer, colloid, and inorganic specialists will also do well, Webb says, as will molecular biologists, biochemists, medical specialists, and pharmacists.

But he tempers that by pointing out that the chemical industry is still "not robust" and that pharmaceutical and biotech companies, not traditional chemical firms, continue to see the greatest hiring increases.

Susan Allen of Chevron Phillips Chemical Co. says that the company's recruiting situation for full-time hires is similar to last year and that their available intern positions have slightly increased. The company is looking for both full-time Ph.D. chemists and chemical engineers, in addition to chemical and mechanical engineers at the bachelor's and master's levels. "Chevron Phillips Chemical is in a better position to hire new graduates than in previous years, primarily because of the improved economic climate," he says. "Based on feedback from our college recruiting teams, the job market for chemical engineers seems to be slightly improved over last year. Additionally, the recruiting atmosphere is more time-sensitive, as organizations are quickly moving on the top students."

Chemical engineers continue to boast a number of advantages over chemists when it comes to job hunting. For example, a bachelor's degree is the usual terminal degree for most companies hiring chemical engineers, and employers rarely look for specialized training or a particular emphasis in course work, as they do for chemists. Because chemical engineers mostly go on to work in industry, they also enjoy higher average salaries (especially at the bachelor's level); in addition, they traditionally have been employed at a higher rate.

"Good engineers have no problem find-

ing a job," says Ron Lehman, director of manufacturing for Rhodia North America's home, personal care, and industrial ingredients line. As Rhodia's largest line of business in North America, Lehman's unit conducts annual searches for chemical and mechanical engineers.

"Even though the chemical industry is in some tough times, we have constantly and continuously been in the job market for new chemical engineers every year," Lehman says. "Everybody is struggling right now with high material prices and an inability to pass high material costs down along the value-added chain. But recruiting efforts are integral to our success as a company. You have to keep the pipeline stocked with new talent, or you'll end up with a lack of skill and talent that'll hit you later down the line."

Though the company does hire a few candidates for local positions, many candidates are drawn to the company because of its extended rotational program. Rhodia typically hires a number of engineers in North America for this program, where they work in three or more different positions in at least two locations over a five-year period. "This hones their skills and gets them used to different focuses, plants, and chemistry," Lehman says.

The Westinghouse Savannah River Co. in Aiken, S.C., looks for similar traits in the engineers it hires. But the company is more dour about its hiring prospects for engineers as it shifts its business emphasis this year to decontamination and decommissioning work and environmental restoration.

"We will probably experience a downturn," says Willie Bell, the company's team leader for employment. "We'll be very low in our hiring this year. Overall in engineering fields, we'll hire about 12 to 15 people, and I don't see us hiring more than two in chemical engineering. We're just not operating facilities as much as we have in the past."

ACADEMIC chemical sciences departments largely echo the sentiments of industrial chemical companies, though a number that C&EN spoke with were optimistic that both industrial recruiting and academic recruiting will be substantially better this year than in recent years. And as usual, most large chemistry departments are searching for multiple new faculty members.

"Overall, I predict a stronger year in 2005 than 2004," says Gregory S. Girolami, professor and chairman of the chemistry department at the University of Illinois, Urbana-Champaign. "There is evidence that the employment opportunities for Ph.D. chemists will be better than last year. And the number of faculty openings is slowly returning to normal levels as universities make up for the reduced pace of hiring in 2002 and 2003."

2003 was disappointing because "industrial employers of chemists increased their recruiting activities but did not offer many positions," he says. "Essentially all of our students who were seriously hunting found a position. Owing to the weak job market, some students who preferred industrial jobs accepted postdoctoral positions instead, but most who did so found this fallback choice acceptable, if not optimal."

Other academics are also cautiously hopeful. "There seems to be a significant number of academic openings this year; industrial openings are harder to assess. But what I see now is some level of optimism with regard to employment in the chemical sciences," says Michael P. Doyle, professor and chairman of the department of chemistry and biochemistry at the University of Maryland, College Park. "I'm seeing more advertisements and requests coming to my office than last year."

The university is doing its part in contributing to that larger pool of academic openings. "We are recruiting for faculty—this year, next year, the year after that—because of a large number of retirements and because we're in the process of growing," Doyle says. "Last year, we made seven offers and hired three people. And we are hoping to hire three people a year for the next five years." The university is looking at chemists across the board, in all fields, though it is placing an emphasis on nanoscience, biomaterials, and other interdisciplinary fields.

Doyle is optimistic about the response to the job postings. "As of Oct. 1, it appears to us that there is a higher quality applicant pool this year than we had last year."

At Northwestern University, the mood is similar. "The recruiting situation seems pretty similar to the average in the past three years. It's been pretty typical in terms of recruiters coming in," says Hilary A. Godwin, chairman of the Northwestern University chemistry department. "But from casual conversation, it seems companies are actually hiring as opposed to asking just in case. We're pretty optimistic."

Northwestern is conducting two faculty searches, one for a junior position and one that is open level, both of which are in the department's traditional area of strength, inorganic chemistry.

"We will openly search in an area and recruit for the best candidates," Godwin says. "Our primary criterion in all searches is research excellence—a strong and innovative research proposal is absolutely essential. To a lesser extent, in some circumstances, we look to see if the person is able to lead the kinds of courses we need them to teach, especially when we're looking at more interdisciplinary candidates."

Cornell University is also running two faculty searches this year, one for a junior-level experimental physical chemist and the other an open-rank search for a chemical biologist, says Héctor D. Abruña, chairman of the university's department of chemistry and chemical biology.

The large response to the job postings surprises him, though.

JOB SEEKERS SUFFER

Number of job openings at ACS's national meeting employment centers is still way down

	TOTAL CANDIDATES	EMPLOYERS	POTENTIAL OPENINGS	INTERVIEWS SCHEDULED
1999				
Anaheim	1,018	118	1,628	2,178
New Orleans	964	134	829	3,049
2000				
San Francisco	1,052	169	1,069	3,367
Washington, D.C.	1,057	156	1,616	3,479
2001				
San Diego	897	209	1,429	4,299
Chicago	1,112	169	1,392	4,377
2002				
Orlando	867	131	436	3,146
Boston	1,231	137	521	4,688
2003				
New Orleans	1,151	96	305	1,751[a]
New York City	1,374	97	291	1,673[a]
2004				
Anaheim	1,281	121	271	1,605[a]
Philadelphia[b]	1,494	107	303	1,602[a]

a Figures for interviews scheduled may not be comparable with previous years' because of implementation of a computerized registration and communication system. **b** The National Employment Clearing House officially became the Chemjobs Career Center beginning with the Philadelphia meeting.
SOURCES: American Chemical Society Department of Career Services, Chemjobs Career Center

"Last year, we had open searches. Even so, the number of applicants this year is similar to last year's," he says. "Given the focused nature of our searches, I would say that there is a larger applicant pool, and this might reflect a backlog of people staying in postdoc positions."

At Purdue University, "from what I'm hearing from students, the hiring process is going well," says Timothy Zwier, professor and chairman of the university's department of chemistry. "One thing I have seen is that the outlook is quite good for academic positions. There seem to be good opportunities out there for students looking for those positions. And from what I can tell, recruiters are coming to campus in typical numbers."

The school is conducting two faculty searches, one in analytical chemistry/advanced instrumentation, and the other in inorganic chemistry/materials science. "We look for candidates that show real potential, with a good track record from graduate school and postdoc work and a research plan that is both cutting edge and shows good prospects for long-term funding," he says. "The ability to communicate well, and communicate about science as a teacher and educator, is also important. So is candidates' openness to being part of interdisciplinary teams and how their interests might dovetail with other interdisciplinary research at the university."

At the University of Illinois, "we search for junior faculty every year and typically hire one or two," Girolami says. "It is too early to assess the current pool. Last year, however, we saw a very strong group of applicants."

The school has changed its recruiting strategy. "We rarely, if ever, conduct 'targeted' hires as we used to do in the past," he says. "We now hire the brightest faculty members with strong records of accomplishment, irrespective of area of interest, and this approach has been extremely successful."

Like Cornell's Abruña, Girolami is concerned that academic job hunters may start to feel increased competition. "Most of our students still find jobs in industry. Those in graduate school over the last four years, however, have been keenly aware of the weak industrial job market, and many have adjusted their career goals," he says. "As a result, compared with a few years ago, more of our students are making preparations for other kinds of jobs, mostly in academia."

At Emory University, "I get the general sense that things have been slightly improving since 2001. We're seeing more recruiters and more job openings," says Joel M. Bowman, chairman of the school's chemistry department. "Our students seem to be doing well finding employment," especially with pharmaceutical companies.

The university is conducting three faculty searches: Two are inorganic chemistry tenure-track positions, one for a senior scientist and one at the junior level; the other is a lecture-track position in physical chemistry.

But unlike other schools, Bowman has not found the academic job market flooded with high-quality applicants. "This is the third year of our inorganic search," he says. "We didn't succeed in the past two years—there's some sense that there are not enough good quality people out there to fill positions."

He also expresses concern about the continuing erosion of talent from traditional chemistry departments. "It appears that chemistry departments are now competing with other departments for the same pool of candidates," he says, pointing out in particular biochemistry and other departments at medical schools. "And I think we're going to see—we already are seeing—physics departments competing for people doing things like single-molecule spectroscopy or chemical physics."

One effect of the ongoing interest in methods for detecting and countering chemical, biological, and nuclear weapons has been increased funding in the physical sciences for such research. Chemists—especially those at the bachelor's or master's level and those interested in postdocs—therefore might find increased opportunities at government research organizations, including national labs.

"We definitely have a lot of science that applies to homeland security and defense," says Michelle V. Buchanan, director of the Chemical Sciences Division at Oak Ridge National Laboratory. "I see this as a continually growing area."

SUCH RESEARCH is a small but significant factor in the lab's aggressive plans to recruit chemists this year. "We intend to have more of a recruiting effort this year than we have in years past," Buchanan says. "We anticipate openings primarily at the Ph.D. level, but also some at the B.S./M.S. level, in a large variety of subjects dealing with chemistry. A lot of this is fundamental research funded out of DOE's Office of Basic Energy Sciences [BES]." National labs, she points out, also hire a large number of postdocs.

A large portion of the increase in recruiting stems from the anticipated opening of Oak Ridge's Center for Nanophase Materials Science, one of five nanoscience centers being funded by BES and the first to officially open. The lab plans to fill a number of positions in advance of the center's opening. In addition, Oak Ridge is looking for a variety of chemists for other projects—primarily multidisciplinary efforts—including those specializing in separations, polymer science, radiochemistry, mass spectrometry, catalysis, and other fields.

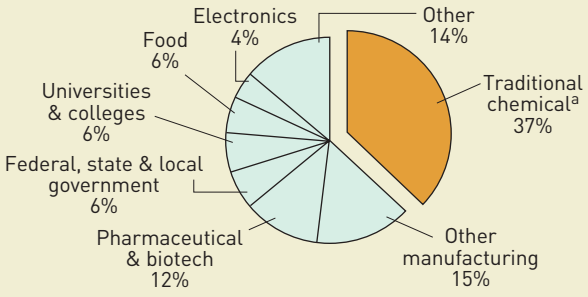
"A lot of the work we do is at the interface between disciplines," Buchanan says. "It's a trademark of Oak Ridge—we really enjoy getting in and working in new areas and working in multidisciplinary teams."

Westinghouse Savannah River Co.'s Bell also points out that the company now operates the newest national laboratory, the Savannah River National Lab, under contract. "That means we will be going out and looking for more Ph.D. candidates—both Ph.D. chemical engineers and Ph.D. chemists," he says.

"A lot of that work will be research and development, especially into homeland security and other DOE projects," he adds. "And in order to do the R&D, you have to have the talent." ■

ENGINEERING A JOB

Traditional chemical companies still employ large numbers of chemical engineers



New chemical engineering bachelor's = 204

NOTE: Data are for newly graduated chemical engineers working full-time. **a** Includes agricultural chemicals, basic chemicals, coatings and inks, personal care products, petroleum, plastics, rubber, soaps and detergents, specialty chemicals, and textiles. **SOURCE:** ACS's 2003 Starting Salary Survey