

**2017 WEEKLY BULLETIN**  
**DEPARTMENT OF CHEMISTRY, NORTHWESTERN UNIVERSITY**  
**EVANSTON, ILLINOIS**  
**June 5, 2017**

*For full schedule, including Center events, please see the Department Calendar:*  
<http://www.chemistry.northwestern.edu/events/calendar.html>

Tuesday June 6<sup>th</sup>:                      *Faculty Lunch Seminar: Chad Mirkin*  
Tech K140  
12:00 – 1:00pm

Thursday June 8<sup>th</sup>:                      *2017 Marple Schweitzer Memorial Lecture:*  
*Carolyn Bertozzi, Berkeley University*  
Tech Ryan Auditorium  
4:00-5:00pm

**BIP**

BIP meets every Friday 10-11:00am in Tech K140

**Arrivals**

Francesca Nicoletta joined the Facchetti Group  
Yang Wang joined the Marks Group

**Announcements**

Congratulations to the following students who have been elected to Phi Beta Kappa:

Seniors: Aislinn McMillan, Roya Zandi, and Jennifer Zhan  
Juniors: Sophie Brauer and Michael Daugherty

**Opportunities**

**Postdoctoral Position in Polymerization Catalysis and NMR**

The Hilty group is seeking to fill a postdoctoral position with immediately available starting date in the Department of Chemistry at Texas A&M University.

The goal of the research project is to determine mechanisms and kinetics of postmetallocene catalysts for olefin polymerization. Significant gains in NMR signal by hyperpolarization of nuclear spins will be used for in-situ, real-time spectroscopy of ongoing polymerization reactions.

The ideal candidate will have research experience in organometallic chemistry, in the design or synthesis of catalytically active complexes, or in advanced NMR methods. Familiarity with analytical characterization, as well as with the mechanisms of the catalyzed reactions, is advantageous. A high motivation to apply this expertise to an interdisciplinary project, which includes polymerization catalysis and state-of-the-art NMR methodology, is expected. Interested candidates must hold, or be in the process of defending a PhD degree in chemistry or a related discipline.

Our group is developing methods employing hyperpolarization by dissolution dynamic nuclear polarization for applications in chemistry. Signals from thus hyperpolarized spins, recorded after a stopped-flow injection, reveal reaction kinetics and intermediate species on a sub-second to second time scale and inform on molecular structure, dynamics and interactions. The present project will use these methods as a unique way of accessing the activity, deactivation pathways, stereo structure formation, and other properties of modern polymerization catalysts.

Applicants for this position should send a letter of interest, curriculum vitae, and the names of three references to [chilty@tamu.edu](mailto:chilty@tamu.edu).

Texas A&M University is an Equal Opportunity employer.

**Valspar** is currently looking for a emulsion polymer synthesis chemist. Provides high-level expertise for new product development, including synthesis, analysis, and formulation and testing of new products. Responsibilities may include serving as the day-to-day leader for projects, serving as the primary liaison with internal and external customers on technical questions and concerns, and independently working to commercialize new products, including interfacing and supporting manufacturing. The Chemist leads projects, has expert knowledge of several product lines, applications, and markets and has experience with various types of polymer synthesis and coating formulations. May supervise support level technicians on a day-to-day basis.

We are not offering visa sponsorship for this position.

#### CORE JOB RESPONSIBILITIES:

- Responsible for planning and performing R&D investigations for new product development under the supervision of the lead Senior Scientist.
- Serves as a key technical team member supporting complex cross-functional team project(s); collaborating with Analytical/Material Science, Process Chemistry, HSE and various Business groups to advance project(s) and achieve common goal(s).
- Performs numerous types of polymerization, including solution and emulsion polymerization, as well as coating formulation and application testing. Gathers and analyzes data, refines technical approach/strategy and recommends next steps. Communicates results effectively and writes project reports.
- Uses experimental design principles to increase fundamental understanding and find solution(s) for achieving the project goal(s).
- Reads and interprets patents, examines new product concepts and technology, and determines how to improve or utilize technology to develop new products.
- Serves as the primary contact for, and responds to highly technical and complex questions and concerns from production, research professionals, quality control, customers and other internal and external parties regarding development, application, quality assurance and related programs and services.
- Operates, cleans, and calibrates all forms of equipment that requires professional judgment and background; also utilizes technical or standard equipment during the course of projects
- May supervise or serve as a lead to lower level technicians or support personnel performing research projects.
- Interprets and applies department policies and procedures and applicable laws, rules and regulations; ensures compliance with these areas.
- Supports manufacture of various polymers across the corporation.
- Performs other duties as assigned.

#### QUALIFICATIONS:

##### EDUCATION AND EXPERIENCE REQUIREMENTS:

- Master's Degree in Polymer Chemistry, Chemistry, Chemical Engineering or equivalent area.
- Recent Master's graduate or Master's graduate with 1-2 years of industrial experience.

- Strong knowledge of polymer structure-property relationships, latex/coating film formation mechanisms, and rheology modifier/additive interactions.
- Experience with polymer synthesis for coating applications preferred. Proficiency in emulsion polymerization highly desired.
- Experience in industrial wood and metal coatings and applications a plus.
- Excellent communication skills with the ability to concisely present information and proposals to all organizational levels.

#### SKILL REQUIREMENTS:

- Prioritization of projects and assigning work
- Apply comprehensive professional chemistry principles and practices
- Perform highly technical synthesis and formulation tasks
- Apply comprehensive application methods and procedures
- Interpret and apply department policies and procedures and applicable laws, rules, and regulations
- Solve technical problems and recommending solutions
- Interpret data and develop reports
- Understanding patents
- Utilize experimental design principles
- Utilize basic project management concepts
- Apply commercialization principles and practices
- Provide and communicate technical information
- Microsoft Office proficiency (Word, Excel, PowerPoint, Outlook); and other applicable applications
- Communicate effectively with co-workers to provide and receive direction

<https://sjobs.brassring.com/TGWebHost/home.aspx?partnerid=26164&siteid=5081>

#### **Postdoctoral Positions at the University of Calgary**

In 2016, the University of Calgary was awarded \$75 million over seven years from the Canada First Research Excellence Fund (CFREF) for its initiative entitled: “*Global Research Initiative in Sustainable Low Carbon Unconventional Resources*”. The goal of this research is to dramatically reduce the impact of energy extraction and energy use on the environment.

As part of the implementation of its CFREF scientific strategy and to address the Grand Challenge aiming to develop next generation of CO<sub>2</sub> conversion catalysis, a project in the production climate neutral synthetic fuels through electrocatalytic carbon dioxide reduction is seeking team members at the Postdoctoral level.

Successful candidates will work within a multidisciplinary team of synthetic chemists, electrochemists, surface scientists and engineers consisting of 5-7 PI's, 5 PDFs and a similar number of graduate students. The primary aim will be to develop new, selective CO<sub>2</sub> conversion catalysts supported on novel conducting materials. While initially CO will be targeted as a product, other potential fuels will also be within scope.

Accordingly, we seek applications from qualified candidates within 2-4 years of their Ph. D. degree to fill up to 5 Postdoctoral Fellow positions with the following specific qualifications:

1. Synthetic inorganic chemistry (2): Ph.D. in inorganic chemistry with an emphasis on the synthesis and characterization of organometallic and coordination compounds, particularly of the first row transition series. The ability to prepare and manipulate air and moisture sensitive compounds, and

characterize them using a suite of modern spectroscopic and analytical techniques. Working knowledge of electrochemistry and/or X-ray crystallography is also strongly desired.

2. Electrochemistry and catalysis: Ph. D. in electrochemistry with an emphasis on electrocatalysis, including homogeneous and surface electrochemistry as well as novel electrode materials. Experience in the evaluation and benchmarking of new CO<sub>2</sub> reduction catalysts, liquid/gas phase product analysis, surface and materials characterization, and mechanistic analysis, would be an asset.

3. Electrochemical performance evaluation in a small-scale device: Ph.D. in chemical engineering with doctoral/post-doctoral experience in synthesis and characterization of electrocatalysts by physicochemical methods and electrochemical techniques including impedance spectroscopy. The position will entail fabrication and testing of electrode assemblies in a small-scale device. Familiarity with techniques to probe and quantify both the electrochemical kinetics and the mass transport contributions in porous electrodes will be an asset.

4. Modeling/screening (electrocatalysts): PhD in physical chemistry, chemical engineering or materials science with experience in application of Density Functional Theory (DFT) methods to model homo- or heterogeneous catalytic process and/or adsorption. Experience in electrocatalytic experiments and electrochemical characterization methods would be an asset.

Appointments will be for 2 years with a 55K/year salary (CND dollars); the positions also come with sufficient research support to be managed candidates in consultation with the PI members of the team. In addition, each candidate will be required to work within a team environment and so excellent communication skills and the ability to work effectively with a diverse group of interdisciplinary researchers is a must.

In assembling the CFREF research teams, aggressive diversity and equity targets are in place and so applications from under represented group are especially encouraged.

Applications should consist of a current CV, a list of 2-3 references with contact information and a cover letter indicating you are applying for a position with the Synthetic Fuels team and in which of the four areas listed above you are interested. Please also indicate your availability; the search will continue until the team is assembled. Send applications to Natalia Babanova ([nbabanov@ucalgary.ca](mailto:nbabanov@ucalgary.ca)) at your earliest convenience.

**Ecolab** is the world's leader in water, hygiene and energy technologies and services that protect people and vital resources. With 2015 sales of \$13.5 billion and 47,000 associate, Ecolab's products and services touch people every day in nearly every corner of the world. We are dedicated to helping our customers achieve their goals by working together to tackle the world's most pressing and complex challenges – clean water, safe food, abundant energy and healthy environments.

Innovation is a cornerstone of Ecolab's growth. As part of our global Research, Development & Engineering team, you will be inspired by our purpose, to make the world cleaner, safer and healthier. Join our team of over 1,600 innovators dedicated to helping our customers meet their goals through innovative and effective science, technology, service and insights.

Together, we deploy unlimited resourcefulness to help businesses thrive and ensure the availability of the world's most precious natural resources for future generations.

You will work in a collaborative, customer-focused environment where your voice matters, your contributions are rewarded and you can make an impact.

It's time your talents took off – join our team and experience more.

Position Title: Lead Chemist, Research Analytical, RD&E  
Location: Naperville, Illinois

Research Analytical, located at Ecolab's Naperville campus, part of Ecolab's Global Analytical and Microbiological Services, has an opening for a Lead Chemist in the polymer characterization area.

The successful candidate must have a background in Chemistry, Polymer Science, Materials Science or related fields. In addition, a good understanding of polymer chemistry and solution properties, and a working knowledge of various polymer characterization techniques are necessary. The Lead Chemist will work in teams with associates across Ecolab RD&E to provide polymer characterization expertise in product development, manufacturing, intellectual property and regulatory support.

Specific responsibilities include:

- In collaboration with scientists from other RD&E groups, assess teams' analytical needs and recommend analytical solutions to guide new product development and chemistry understanding
- Develop and execute polymer analysis methods for a variety of research projects, provide data interpretation and analysis
- Explore and develop new breakthrough approaches and methods to meet critical analytical needs of RD&E and maintain world-class capabilities in polymer characterization
- Document and publish research results

Basic Qualifications:

- Ph.D. degree in Chemistry, Polymer Science, Materials Science or related field
- Experience in Size Exclusion Chromatography (SEC), Multi-Angle Light Scattering (MALS), thermal characterization techniques (TGA, DSC), and other appropriate characterization of polymers
- Knowledge of polymer synthesis/chemistry and dilute solution properties of polymers
- Proven problem solving skills, innovative and creative spirit
- Ability to manage a variety of technical projects and respond to shifting priorities
- Excellent technical writing and verbal communication skills and ability to present results clearly and concisely to variety of audiences
- The ability to work independently and to work collaboratively with colleagues from other groups to develop partnering relationships
- Willingness to spend majority of time in a laboratory

Preferred Qualifications:

- 2-5 years of experience in industrial polymer synthesis or analysis
- Hands-on knowledge of chromatographic theory and techniques
- Experience with water soluble polymers and polyelectrolytes
- Experience in the characterization of structural polymers, associated polymers, and natural polymers
- Experience with HPLC and MALDI-MS
- Experience in hyphenated techniques: SEC-MS, SEC-NMR, SEC-FT-IR and 2D-LC

<http://bit.ly/2qUkpk0>

**The Chemours Titanium Technologies Process Development Group** located in Wilmington, DE has a Research Investigator position available. This is a highly visible, key role within the Company and the R&D function. This position will report to the Process Development Group Manager and will require

significant interaction with scientists and engineers located at manufacturing facilities throughout the world.

The successful candidate will support and extend the competitive advantage of this best-in-class business by advancing capabilities in elemental analysis and providing insights into the elemental content of a wide variety of matrices found throughout the titanium dioxide manufacturing process.

The responsibilities of the position include, but are not limited to, the following:

- Supervise and contribute to the operation of the Elemental Analysis lab to ensure that customer needs are met in a safe, timely, efficient, and effective manner.
- Perform trace metals analysis on a wide variety of research, process, and product samples using ICP-MS, ICP-OES, and XRF instruments.
- Ensure proper sample preparation using standard techniques including digestion, extraction, separation, and dilution.
- Continually evaluate open literature and bring to light academic and industry trends that pertain to elemental analysis.
- Drive continuous improvement of lab operation and lead development and validation of new analytical methods when necessary.
- Ensure that analytical methods and results are accurate, properly documented, and effectively communicated.
- Provide training in areas of expertise.

In order to be qualified for this role, you must possess the following:

- PhD in Analytical Chemistry
- Minimum of 3 years of hands-on experience with ICP-MS techniques
- Supervisory experience
- Demonstrated ability to develop, adapt, and validate new analytical methods
- Proficiency in sample preparation techniques for trace metals analysis
- Strong awareness of chemical hazards and analytical laboratory operation
- Expertise in experimentation, data analysis, and interpretation of results
- Ability to work with people who have diverse backgrounds and skill sets
- Strong spoken and written communication skills
- Demonstrated ability to publish technical work through peer review
- 

The following skill sets are preferred by the business unit:

- Experience with ICP-OES and XRF techniques
- Experience in analysis of inhomogeneous, mixed, and poorly defined samples
- Experience with microwave digestions
- Experience working with hazardous materials and particularly hydrofluoric acid
- Experience in a high volume analytical laboratory
- Proficiency in an extended range of analytical techniques
- Six Sigma certification or training in statistical analysis

Chemours is an equal opportunity employer.

Chemours is an E-Verify employer.

Candidates must be able to perform all duties listed with or without accommodation

<http://careers.chemours.com/jobsearch/job-details/research-investigator-elemental-analysis/JR914/1/>

**Bell Laboratories in Madison, Wisconsin** is accepting applications for an Analytical Chemist

Job Function: Perform quantitative method development, validation and analyses to support a chemical manufacturing facility.

Responsibilities:

1. Perform analytical method development, validation and quantitation of small molecules using UPLC / MS.
2. Develop high-throughput methods for the extraction of small molecules from solid matrices.
3. Perform quantitative analysis of gases using a GC with Headspace Analyzer.
4. Assist in developing qualitative methods for routine UPLC / MS usage by chemistry team.
5. Maintain laboratory equipment and confidently troubleshoot analytical instrumentation.
6. Review and evaluate data, write reports and robust protocols for smooth operation of laboratory facilities.
7. Keep and maintain a meticulous laboratory notebook with transparent scientific reasoning.
8. Assist in the creation of well-written, accurate, and timely reports to company management.
9. Solves complex analytical problems as well as recommend/implement continuous laboratory improvements
10. Recognize errors, identify root causes, and recommend process improvements
11. With minimal supervision, safely and effectively develop, establish, and validate analytical testing methodologies used to control raw materials, production intermediates, and final products.
12. Provide timely analytical services using other techniques such as HPLC, GC, Microwave and Karl Fischer titration to cross-functional groups within the organization.
13. Act as Study Director in support of new product development within compliance of Good Laboratory Practice (GLP) guidelines.

Education: Ph.D. in Analytical Chemistry with 0-3 years' experience or M.S. in Analytical Chemistry with 7-10 years' experience preferred.

Experience: Must include practical hands-on experience with the qualitative and quantitative analysis of small molecule pharmaceuticals. Must have hands-on and demonstrated expertise in creating quantitative analysis methods using GC, HPLC, LCMS and UPLC instrumentation. Knowledge and usage of Empower software is desirable.

Qualifications: Must demonstrate expertise in theory and application of LC-MS to develop quantitative analyses of small molecules embedded within a sample matrix. Must display strong analytical reasoning and communication skills in areas outside of Analytical Chemistry. A working knowledge of computer and work processing/spreadsheet programs, more JMP statistical discovery software is desired.

Familiarity with Waters instrumentation a plus. [www.belllabs.com](http://www.belllabs.com)

**The University of Chicago has an opening for a Teaching Support Specialist:** Supports instruction in teaching chemistry laboratories or classrooms by providing miscellaneous services such as: Preparation and testing of lecture demonstrations consistent with course content. Working with faculty or staff to determine the suitability of demonstrations for specific lectures. Informing faculty of new demonstration developments and materials. Instructing faculty in the proper usage of technical scientific apparatus. Promoting safety in handling hazardous equipment and materials. Researching and developing new lecture demonstrations and making improvements on existing demonstrations. Recommending purchases of computers, software, and technical apparatus and supplies. Providing general audio/visual support. Maintaining and documenting the use of demonstration equipment or materials and identifying building maintenance problems.

Bachelor's degree in chemistry or a relevant field required.

Advanced degree in a relevant field preferred.

A minimum of one year relevant experience preferred.

Lecture and/or demonstration related experience preferred.

Supervisory skills preferred.  
Budget management skills preferred.  
Ability to train others preferred.  
Knowledge of research techniques or methods required.  
Ability to develop demonstrations required.  
Ability to design and construct relevant instructional equipment required.  
Knowledge of basic laboratory procedures and safety requirements required.  
Analytical skills required.  
Problem-solving skills required.  
Attention to detail required.  
Organizational skills required.  
Verbal and written communication skills required.  
Interpersonal skills required.  
Ability to work independently and as part of a team required.  
Ability to work on multiple projects simultaneously, set priorities, and meet deadlines required.  
Knowledge of computers and relevant software required.

<http://www.uchicago.edu/>

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