

2017 WEEKLY BULLETIN
DEPARTMENT OF CHEMISTRY, NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS
July 17, 2017

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

BIP

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

Arrivals

Andrea Carlini joined the Gianneschi Group
Cassandra Callman joined the Gianneschi Group

Opportunities

Motus Integrated in Holland, Michigan has an opening for a Materials Scientist/Engineer

Basic Responsibilities: Provide chemistry and manufacturing process expertise to tier one automotive interior supplier. Areas of expertise include engineering polymer formulation and processing to support company profitability. Candidates should be familiar with thermoplastics and thermoset polymers/composite materials and associated processes (polyurethanes, polypropylene, polyvinylchloride, etc..)

Specific Functions

1. Utilize experience with the manufacturing, formulating, processing and testing of polymers and systems.
2. Assess processing issues, root cause analysis and implementing countermeasures to reduce scrap and repair rates on production lines.
3. Develop and transfer new polymer technology into commercial value within company processes.
4. Optimize processing on current products
5. Monitor foam processing equipment condition and maintenance and recommend equipment improvements/upgrades.
6. Monitor injection molding equipment condition and maintenance and recommend equipment improvements/upgrades.
7. Apply existing knowledge and best practices of foam technology to current and future products.
8. Support quoting, innovation and advanced engineering activities with materials expertise and recommendations.
9. Support both launch and production in addressing quality and processing issues promptly.
10. Develop & maintain an experimental processing documentation system.
11. Requires travel to all Leon/Motus plant locations.
12. Advise on foam and plastics tooling feasibility and design optimization.
13. Solid understanding of interior trim products.
14. Solid knowledge of polyol and isocyanate manufacturing processes.

Reports To
Director of Innovation

Education Required

Bachelor's degree in chemical engineering, materials science and engineering, chemistry or related field. Advanced degree preferred.

Experience Required

For a bachelor's degree candidates, 3-5 years minimum of professional experience in chemical engineering/manufacturing & processing in automotive interior applications. For advanced degree candidates, 0-2 years experience in chemical engineering/manufacturing & processing in automotive interior applications.

Contact jfennell@motusintegrated.com (719) 648-9716

Cabot Microelectronics Corporation in Aurora, Illinois has an opening for a Research Scientist

The Research Scientist - Analytical Development will play an integral role in providing solutions to product development challenges in the support of research and commercialization of high-performance CMP Polishing Slurries and Pads used in the production of advanced semiconductor devices. Leveraging your expertise in organic, organometallic, and/or analytical chemistry, you will identify sources of variation resulting from component interactions and provide mechanistic understanding for CMP slurry formulations.

Responsibilities include the following:

- Support of R&D efforts towards the mechanistic understanding of slurry components (particles/small molecules/polymers/surfactants) for the development of next generation CMP products.
- Analytical method development to support R&D and commercialization efforts, with an emphasis on NMR methodology
Design of experiments for the characterization of CMP slurry components and variations within them.
- Grow in-house characterization capabilities and collaborate with external laboratories and universities to identify new characterization techniques.
- Document research results for intellectual property.

To be successful in this role, your background should include:

- Proven experience and demonstrable knowledge in a breadth of analytical methods and characterization techniques for chemical structure elucidation, (NMR, MS, FTIR, Chromatography).
- Demonstrated strong problem solving skills and the ability to develop novel analytical methodology and techniques for complex, multi-dimensional problems
- Results-oriented self-starter, capable of setting goals and then planning and executing complex research projects.
- Ability to balance multiple priorities and communicate timelines and results to key stakeholders in a clear and concise manner.
- Flexible, highly creative, innovative, and committed to continuous learning
- Graduate and/or post-doctoral experience, in university or industry, with examples of independent research Education: Ph.D. in Chemistry, Chemical Engineering, or Materials Science, or related degree/discipline is required.

Cabot Microelectronics Corporation, headquartered in Aurora, Illinois, is the world's leading supplier of CMP polishing slurries and a growing CMP pad supplier to the semiconductor industry. The company's products play a critical role in the production of advanced semiconductor devices, enabling the manufacture of smaller, faster and more complex devices by its customers. The company's mission is to create value by developing reliable and innovative solutions, through close customer collaboration, that solve today's challenges and help enable tomorrow's technology. <http://www.cabotcmp.com/>

Cabot Microelectronics Corporation in Aurora, Illinois has an opening for a Research Scientist - Formulation Development

The Research Scientist – Formulation Development will play an integral role in developing nanoparticle-based, high-performance CMP Polishing Slurries used in the production of advanced semiconductor devices. Leveraging your expertise in colloidal and materials science, you will innovate CMP slurry formulation designs by identifying new, effective slurry components, establishing key product characteristics, discovering mechanisms of action, and delivering differentiated performance to our customers.

Responsibilities include the following:

- Design, analyses, and interpretation of experiments that advance slurry formulation performance and mechanistic understanding through robust property-activity relationships.
- Generate innovative solutions to complex problems through the use of multiple disciplines and technical principles. Willing to explore more creative approaches to problem-solving.
- Document and communicate research results effectively including presentations/publications to external stakeholders and filing for patents as needed to protect intellectual property.
- As a good team player, collaborate across R&D and CMC functions by sharing research outcomes, adopting best practices, and driving for continuous improvement

Position Requirements

To be successful in this role, your background should include:

- Proven experience and demonstrated knowledge in at least one of these disciplines: colloidal science, nanoparticle technology, surface science, or material science.
- Post-doctoral experience, in university or industry, with examples of independent research in diverse areas is preferred.
- Demonstrated ability to innovate and drive original ideas within project research scope.
- Results-oriented self-starter, capable of effective project management including setting goals, planning and executing research, and balancing multiple
- Flexible, highly creative, innovative, and committed to continuous learning

Education: Ph.D. in Chemistry, Chemical Engineering, or Materials Science, or related degree/discipline is required.

Cabot Microelectronics Corporation, headquartered in Aurora, Illinois, is the world's leading supplier of CMP polishing slurries and a growing CMP pad supplier to the semiconductor industry. The company's products play a critical role in the production of advanced semiconductor devices, enabling the manufacture of smaller, faster and more complex devices by its customers. The company's mission is to create value by developing reliable and innovative solutions, through close customer collaboration, that solve today's challenges and help enable tomorrow's technology. <http://www.cabotcmp.com/>

The Blitstein Institute of Hebrew Theological College is looking for an enthusiastic and passionate chemistry instructor for freshman chemistry. The Blitstein Institute is looking for PhD or ABD to teach one section of General Chemistry with lab during Fall 2017. This is a highly conservative college for Orthodox Jewish women, so the perfect instructor will be respectful of the culture of the students. The class meets Mondays and Wednesday from 1-4pm at our location near Evanston. The semester runs from Sept 5- Jan 19, with a long fall break in October. Please contact Dr. Laurie Erickson at Erickson@htc.edu

The Department of Chemistry at Mount Holyoke College invites applications for a tenure-track position in Analytical Chemistry at the Assistant Professor level to begin Fall, 2018. Applicants are expected to hold a PhD and post-doctoral experience is welcomed. The successful candidate will develop and teach courses in analytical chemistry, anchor this discipline within the department's curriculum, while also contributing to teaching at the introductory level and at the upper level in their area of expertise. Research interests in all areas and applications of analytical chemistry are welcomed, alongside a drive to develop an externally funded research program that will encourage and accommodate close collaboration with undergraduates. Superb facilities for teaching and research are available, housed in a modern, integrated science center.

Mount Holyoke is an undergraduate liberal arts college for women with 2,200 students and 220 faculty. Over half of the faculty are women; one-fourth are persons of color. The teaching load is 2/2. The College is located about 80 miles west of Boston in the Connecticut River Valley and is a member of the Five College Consortium, comprising Amherst, Hampshire, Mount Holyoke and Smith Colleges together with the University of Massachusetts, Amherst.

Mount Holyoke is committed to enriching the educational experience it offers through the diversity of its faculty, administration, and staff. The College seeks to recruit and support a broadly diverse faculty who will contribute to the College's academic excellence, diversity of viewpoints and experiences, and relevance in a global society. In pursuit of these aims the College strongly encourages applications from underrepresented groups in the academy, including African Americans, Hispanics, Native Americans, Alaskan Natives, Native Hawaiians, other Pacific Islanders, LGBTQ applicants, first generation college graduates, those who have followed non-traditional paths to college by demonstrating exceptional talent and drive in the face of adverse societal, economic or academic conditions, and those with a demonstrated commitment to applying and including diverse backgrounds and perspectives to learning, scholarship, service, and leadership. All strong applicants will embrace the opportunity to work with an exceptionally talented student body that is diverse with regard to race, ethnicity, socioeconomic background and status, gender, nationality, sexual orientation, and religion.

Applications will be made on-line at <https://jobs.mtholyoke.edu> by submitting a CV and three documents concerning 1. a statement of teaching philosophy and pedagogical interests, 2. A detailed description of research plans, and 3. a statement of approach to mentoring a diverse student body. Applicants must also arrange for three letters of reference to be submitted on their behalf. Prompts for submission of these letters will be automatically generated once an online application is submitted. Review of completed applications, and their supporting letters, will continue until the position is filled. For additional information please go to: <https://www.mtholyoke.edu/acad/chemistry>

MilliporeSigma is the North American life science brand of Merck KGaA, Darmstadt, Germany – a leading science and technology company. It offers a broad range of innovative products and services to biotech and pharmaceutical drug therapies businesses. Through dedicated collaboration with the scientific and engineering communities, and as one of the top three R&D investors in the life science tools industry, the brand serves as a strategic partner to customers and helps advance the promise of life science.

The Chemical Synthesis franchise is a critical component of MilliporeSigma's Lab and Specialty Chemical business. Historically known for its chemistry-enabling catalog of building blocks, reagents and catalysts, our focus has evolved to complement this traditional offering of synthetic solutions to include new areas of growth such as Chemical Biology and Peptide Synthesis.

Your role:

The Emerging Chemical Synthesis team is the innovative arm of the Chemical Synthesis franchise, contributing to the growth of the portfolio through commercialization of new technologies in new and existing, strategic focus areas. Your role will be to collaborate with internal (R&D, BD) and external (academic and industry) partners to identify, develop and commercialize innovative technology for synthetic chemistry, including new platforms that change how chemical synthesis is conducted.

Who you are:

A strong background in synthetic chemistry should be coupled with a scientific curiosity and keen interest in life sciences marketing. Further, the ability to recognize and cultivate technology areas that address unmet customer needs in Chemical Synthesis- and develop meaningful revenue- is crucial for this role.

- Fluent in Written and Spoken English
- PhD in Chemistry with experience in synthetic organic chemistry. Post Doc and/or Industry experience viewed favorably.
- 25% Travel should be expected

What we offer: With us, there are always opportunities to break new ground. We empower you to fulfill your ambitions, and our diverse businesses offer various career moves to seek new horizons. We trust you with responsibility early on and support you to draw your own career map that is responsive to your aspirations and priorities in life. Join us and bring your curiosity to life!

<https://career012.successfactors.eu/sfcareer/jobreqcareer?jobId=162876&company=merckgroup&username>

Supervisor, Product Development- Thermoplastic Polyurethane

We are Covestro. We are curious. We are courageous. We are colorful. We redefine chemical material solutions with game-changing products. Let us empower you to push boundaries. Join us and our 16,000 colleagues now and together we will MAKE the world a brighter place.

Your tasks and responsibilities:

The primary purpose of the Supervisor- Product Development is to conduct and direct laboratory, pilot, and production scale trial experiments. Major Activities: • Manages a group of laboratory technicians and/or engineers • Interacts with customer and commercial organization to understand customer requirements to effectively direct new product development. • Interacts with raw material suppliers (sales and/or technical service personnel) to understand the potential and limitations of resins and additives that are considered for development. • Collaborates with Production, Engineering, and Technical Staff to scale-up development products to commercial production

Who you are:

- Master's Degree with 3+ years of industrial experience or Ph.D. with 0+ years of industrial experience in Chemical Engineering, Polymer Science or Related Science • Polymer extrusion experience preferred, TPU and/or PC film products and processes a plus. • Strong communication skills, both verbal and written. • Capability and motivation to perform in the office, in the lab, and on the production floor. •

Ability to effectively motivate and manage group of R&D technicians. • Strong computer skills (Excel, Word). Access and SAP familiarity a plus.

<https://career.covestro.us/job/Supervisor-Product-Development-Thermoplastic-Polyurethane--0000009129.html><https://career.covestro.us/job/Supervisor-Product-Development-Thermoplastic-Polyurethane--0000009129.html>

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.

Texas A&M University is an Equal Opportunity employer.

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 CO₂ 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 CO₂ 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 CO₂ 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) 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 the 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/2qUkkp0>