

Job posting preview

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Req ID	28546BR
Title	Research Scientist-Process Safety Chemist or Engineer
City	Indianapolis
State / Province	Indiana
Country	USA

Company Overview At Lilly, we unite caring with discovery to make life better for people around the world. We are a global healthcare leader headquartered in Indianapolis, Indiana. Our 39,000 employees around the world work to discover and bring life-changing medicines to those who need them, improve the understanding and management of disease, and give back to our communities through philanthropy and volunteerism. We give our best effort to our work, and we put people first. We're looking for people who are determined to make life better for people around the world.

Responsibilities Chemical Hazards Lab (CHL)
The Chemical Hazards Lab (CHL) within the Process Design and Development division of Small Molecule Design and Development (SMDD) at Eli Lilly and Company provides thermal hazards analyses for products and processes using rigorous experimental design and execution in conjunction with established methods for assessing thermal stability. The majority of the CHL's activity is related to small molecule development assets, although consultation and services are also provided to other Lilly Divisions (e.g., Manufacturing, Biologics R&D, Discovery Chemistry and Elanco). The CHL workflow includes internal experimental activities (calorimetry, flash point determination), oversight of outsourced thermal testing activities (Fallhammer tests, Dust explosivity, SADT Determination, Vent Sizing), and collaborating with SMDD scientists to design, develop and execute inherently safe processes with Lilly Manufacturing or in our third party supplier network.

Nature of the Work:

Process Safety Design, Development, Testing and Consulting

- Perform and/or oversee the design and implementation of reaction calorimetry, thermal stability, flammability, explosivity, and chemical compatibility tests.
- Interpret experimental data and provide specific guidance to scientists to eliminate or minimize/mitigate risks due to detected thermal hazards.
- Serve as a champion for good process safety practices through specific proactive guidance to development teams.
- Participate in root-cause experimentation and analysis to determine if incidents were caused by reactive chemical hazards.
- Coordinate outsourced thermal hazards testing for Lilly Development Projects
- Perform process safety literature reviews
- Perform theoretical calculations as necessary to estimate heat of decomposition, heat of reaction, flammability parameters, and other difficult to measure quantities.
- Ensure creation of accurate test reports and timely delivery of results/interpretation for all thermal hazards testing.
- Author and/or Review Process Safety Reports containing process safety testing, compound test analysis and synthetic route safety analysis for projects reaching appropriate milestones or as requested; ensure timely delivery of reports to project teams, Lilly manufacturing and third party organizations as appropriate.
- Oversee chemical hazards database improvement
- Review SURFs (Scale-Up Review Forms) prior to scale-up execution for the Discovery Chemistry Synthesis Group (DCSG) and SMDD as needed.

- Provide process safety training and consultation for Lilly employees and our network partners.
- Increase performance and capabilities of the lab
 - Review and assess process safety needs for new or additional test capabilities
 - Research and develop new technology for applicability to process development
- Review proposed synthetic routes and provide process safety input to aid in prioritization of route design efforts.
- Model critical scale-up parameters to predict potential hazardous behavior on scale-up.
- Model decomposition kinetics through application of Model-Free kinetics and other techniques as appropriate.
- Complete risk assessments for API synthetic route development at all stages (Route Design, Route Definition, Route Optimization) of development
- Collaborate with Development Teams to implement inherently safer chemical design changes or safety-mitigating process improvements
- Author internal technical reports for broad-based safety topics.
- Maintain current working knowledge of US and European Union process safety laws and shipping practices laws as they relate to process safety, chemical reactivity and thermal stability.

Employee Development and Management

- Develop skills and internal contacts to become a trusted expert on chemical process safety, inherently safer chemical process design, and chemical reactivity matters within Lilly
- Act as technical mentor for technical staff across SMDD
- Publish safety related articles in applicable journals
- Attend and present at process safety-related conferences. Develop and enhance Lilly's process safety reputation by representing Lilly as contributing member or leader in local, national or global process safety professional organizations

Basic Qualifications

- PhD in Chemistry or Chemical Engineering or related discipline or
- MS in Chemistry or Chemical Engineering or related discipline with minimum of 8+ years of relevant experience

Additional Skills/Preferences

- Experience in small molecule drug substance process development and related safety assessments
- Reaction Calorimeter, Differential Scanning Calorimeter, Accelerating Rate Calorimeter, differential Accelerating Rate Calorimeter and micro calorimeters, HPLC, GC and Optimelt.
- Knowledge and experience for data interpretation and analysis of experimental results as applied to process safety assessments, including concepts of adiabatic temperature rise, adiabatic time to maximum rate, Stoessel reactivity classes, Semenov Diagrams and critical temperatures.
- Basic knowledge of dust explosivity (K_{st} and P_{max}), vent sizing calculations, electrostatics and other tests/test methods applicable to commercial scale process safety analysis and shipping practices.
- Knowledge of industry best practices for process safety, process safety test analysis and chemical reactivity analysis
- Experience with commercial manufacturing scale process design and processing equipment, including scale-up and troubleshooting.
- Experience with commercial scale process controls and basic knowledge of process control design
- Experience with inherently safer chemical process design
- Knowledge of chemical reactivity and industrial chemical reactivity accidents
- Knowledge of Organic Chemistry and/or Chemical Engineering fundamentals, including reaction mechanisms, kinetics and thermodynamics.

- Understanding and implementation of first principles modeling and use of modeling tools such as DynoChem, Aspen Properties, gPROMS Process Builder, CHETAH and AKTS software
- Oral and written communication skills
- Organizational skills
- Interpersonal skills
- Leadership and team work skills
- Coaching/mentoring skills

Additional Information

- Potential exposure to chemicals, allergens and loud noises.
- Travel: 0 to 10%
- Position Local: Indianapolis, IN
- Lilly is an EEO/Affirmative Action Employer and does not discriminate on the basis of age, race, color, religion, gender, sexual orientation, gender identity, gender expression, national origin, protected veteran status, disability or any other legally protected status.

Removal Date 01-Dec-2016

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The Lilly logo is written in a red, cursive script font.