

Crystallization - Mastering Seeded Cooling

DIRECTED BY

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3

Hours

ACCREDITED
COURSE

- Concept of Crystallization from Solution
- Seeded Crystallization in Practice
- Scale-Up Considerations
- Q&A and Discussion
- Conclusion and Recap

about the course

Crystallization plays a pivotal role in the production of high-quality specialty bulk products. This process will influence particle size, purity, and product yield all while needing to be monitored and controlled to meet a product's specifications.

This 3-hour fully accredited training course will provide participants with a comprehensive understanding of the vital role of crystallization, focusing on organic compounds like drug substances and intermediates. The course aims to address the common challenges in controlling cooling crystallization processes within industries such as pharmaceuticals, food, fine chemicals, and cosmetics. By exploring advanced techniques in seeded crystallization, participants will acquire practical knowledge of fundamental principles, phase diagrams, and seeding strategies via real-world case studies. The course objectives include delving into the intricacies of temperature control, and diverse seeding techniques, and highlighting innovative in-situ seedbed formation techniques using high-shear wet mill or sonication. Additionally, participants will explore scaling up processes, addressing challenges, ensuring safety, and considering environmental factors. By the end of the course, attendees will be well-equipped to navigate the complexities of seeded cooling crystallization processes, applying learned techniques effectively in diverse industrial settings to contribute to the efficient and consistent production of large-scale crystallized products with defined physical properties.

Live attendees will have the option to directly ask questions to the instructor. A webcam, microphone, and speakers/headset are highly encouraged for maximum participation capability.

who should attend

This course is designed for professionals within the process industries of pharmaceutical, food, fine chemicals, and cosmetics.

These professionals include, but are not limited to:

- Chemist
- Material Science
- Other roles responsible for ensuring the successful development and production of organic compounds
- Engineer
- Project Management

learning objectives

Upon completion of this course, you will be able to:

- Identify and explain the fundamental concepts of crystallization from solution, encompassing principles, phase diagram essentials, and strategies to avoid secondary nucleation.
- Make use of practical insights into seeded crystallization, including effective temperature control, various seeding techniques, and monitoring strategies through real-world case studies.
- Maximize your toolkit with a unique focus on in-situ seedbed formation using a high-shear wet mill or sonication, providing additional strategies for achieving optimal crystallization outcomes.
- Show valuable insights into scaling up these processes, addressing challenges such as seed supply for GMP setting, and ensuring safety and environmental considerations.
- Apply acquired knowledge and practical skills to navigate the complexities of seeded crystallization, enabling you to contribute to efficient and robust large-scale crystallization processes in diverse industrial settings.

course outline

Review of Learning Objectives

Concept of Crystallization from Solution

- **Crystallization Basics**
 - Definition and Principles
 - Phase Diagram Essentials
- **From Solution to Crystals**
 - Supersaturation and Nucleation
 - Metastable Zone Width
 - Temperature Control Strategies

Seeded Crystallization in Practice

- **Introduction to Seeded Crystallization**
 - Purpose and Benefits
 - Types of Seeds
- **Practical Applications: Seed supply strategy**
 - Temperature Control and Seeding Techniques
 - Monitoring and Control Strategies
 - Real-world Case Studies and Examples
- **In-Situ Seed Bed Formation**
 - High Shear Wet Mill
 - Sonication
 - Advantages and Considerations

Scale-Up Considerations

- Overview of Scaling Up
 - Challenges and Opportunities
 - Safety and Environmental Considerations

- **Best Practices in Large-Scale Seeded Crystallization**

- Managing Scale-Up Challenges
- Ensuring Consistency and Efficiency

Q&A and Discussion

- Open floor for questions
- Practical experiences and challenges

Conclusion and Recap

- Key Takeaways and Critical Concepts
- Additional Resources for Further Learning

Assessment Opportunity

course instructor

Moussa Boukerche is a highly experienced crystallization scientist with a Ph. D in Chemical Engineering (France). He has over 25 years of expertise in industrial crystallization process development and solid form control. He has worked for renowned companies like Eli Lilly (USA), Abbvie (USA), Pfizer (UK), Aughinish Alumina (Ireland), and SANOFI (France). After leaving AbbVie (USA), Moussa founded Moussa Boukerche Consulting LLC, a consulting company specializing in industrial crystallization. He is also the founder of InCryst Ltd (Innovative Crystallization www.incryst.com), a crystallization company focused on delivering innovative solutions in crystallization and solid form screening. Moussa continues to provide guidance and training on crystallization fundamentals, offering valuable insights to pharmaceutical, fine chemical, cosmetic, agro, and food companies seeking process design, development, and optimization.

Accreditations



International Accreditors for Continuing Education and Training (IACET)

Cobblestone has been approved as a CEU Accreditor by IACET and awards CEUs for participation in qualified courses. Cobblestone has demonstrated that it complies with the ANSI/IACET Standards and is authorized to offer IACET CEUs for its programs. CEUs will be awarded for participation in Cobblestone's courses at the rate of .1 CEU per contact hour upon successful completion of the entire course and 70% accuracy in the required Learners' Assessment. A minimum score of 80% is required for all courses within a Cobblestone Certification Program. This course offers a total of 3 contact hours or .3 CEUs. For further information, visit www.iacet.org

AIC- American Institute of Chemists

Cobblestone is committed to enhancing the ongoing professional development of Cost Engineering professionals and other stakeholders through appropriate learning activities and programs. Many Cobblestone courses offer training that may be helpful in meeting the AACE continuing education requirements for recertification as a Certified Chemist, Certified Chemical Engineer, or Chemical Technician.

For more information about AIC, visit:

www.theaic.org

