

Tuning the particle size distribution of pharmaceutical crystals using a process systems engineering approach

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Abstract:

Obtaining pure products with well-defined properties at lowest possible cost and highest possible robustness/reproducibility is the goal of any chemical production process. However, in the pharmaceutical industry the demands on all these aspects are especially high. Crystallization is used as the main purification and isolation technique in more than 90% of the production processes for small molecular pharmaceuticals. A well-designed crystallization process does not only ensure crystal purity and the production of the correct crystalline form (polymorph, solvate, co-crystal, etc.), but also controls the particle size distribution of the product crystals, which in turn influences key properties such as the filterability of a material and its dissolution characteristics.

This seminar will focus on the latter aspect, i.e., on the tuning of particle size distributions of pharmaceutical crystals. It will therefore give an overview of the phenomena encountered in the crystallization of pharmaceutical crystals, how they can be modeled and how the resulting models can be used to design (robust) processes that yield particles of desired sizes. Case studies given in the seminar include batch and continuous crystallization processes, combined milling and crystallization processes; as well as examples of processes that integrate reaction, crystallization, milling and solvent recovery.

Bio:

Thomas Vetter received a BSc degree in Chemical Engineering (2007) and an MSc degree in Chemical and Bioengineering (2008) and a PhD in Process Engineering (2012) from ETH Zurich under the supervision of Prof. Marco Mazzotti. His thesis titled "Optimizing the crystallization of pharmaceutical compounds using additives" was awarded with the tri-annual EFCE Excellence in Crystallization award (<http://www.efce.info/Award+winners-p-111778.html>) in 2014. After his PhD, he obtained a Lilly Innovation Fellowship Award from Eli Lilly and Company, which funded his postdoctoral research stay in the USA in the research group of Prof. Michael Doherty at the University of California in Santa Barbara and in the Eli Lilly & Company research laboratories in Indianapolis.

In September 2014 he became a lecturer at the University of Manchester in the School of Chemical Engineering and Analytical Science. He is now heading the Laboratory for Intensified Particulate Processes (LIPP).



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CPSE Seminar room, RODH C615



CPSE Seminar room, RODH C615, Roderic Hill Bldg, Chemical Engineering department, Imperial College London, London SW7 2AZ
This event is free and open to the public. No registration is required.
Reception drinks after the seminar in CPSE Common room (top floor Roderic Hill Bldg).