

Secrets of Batch Process Scale-Up

Ensuring Effective Translation of
Laboratory Processes to Pilot Plant Scale

23-25 MAY 2017



Amsterdam,
The Netherlands
Amsterdam American
Hampshire Hotel

A 3 day course taught by
Francis X. McConville
Impact Technology Consultants
Author of "A Unique Handbook for the
Chemical Process Industry"

"The course offers a lot
of tips and tricks for
successful scale-up. A must
for every process chemist!"

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Secrets of Batch Process Scale-Up

A 3 day course taught by Francis X. McConville,
Impact Technology Consultants

23 - 25 May 2017 Amsterdam American Hampshire, Amsterdam, The Netherlands

INTRODUCTION

Operating a commercially viable chemical process requires a good chemical synthesis to start with, but is also subject to the interplay of a myriad of important physical phenomena – heat transfer, mass transfer, fluid flow, etc. which are traditionally the realm of the chemical engineer. An understanding of these scale-up phenomena is crucial for the laboratory development of processes that will scale successfully.

This course presents an overview of these issues and examines their impact on process operation in the pilot plant and beyond, including scale-up considerations for route selection, raw material charging, reaction steps, workup, crystallization, product isolation, drying, etc. Common bench techniques for each of these steps are contrasted to the safety and operability criteria for successful pilot plant operation. Numerous examples and case histories are presented, along with tips and techniques for operators and experimenters. Heavy emphasis is placed on process safety.

VENUE

Amsterdam American Hotel –
Hampshire Hotel
Leidsekade 97 - 1017PN - Amsterdam,
Nederland | www.hampshire-hotels.com
| +31 (0)20 261 0153

The Hampshire Hotel - Amsterdam American is located in the heart of Amsterdam and has a tram stop located close by.

A limited number of rooms have been reserved at the special rate of €195.00 per room per night, bed and breakfast. Please use the hotel booking form, which will be sent when you register.

COURSE OUTLINE

Process Design for Scale-Up

- > Process development strategies
- > Importance of engineering in PD

Scale-Up – An Overview

- > Role of the Pilot Plant
- > Overview of scale-up issues
- > Technology transfer issues

Batch Reactors

- > Typical plant operations and equipment
- > Characteristics of batch operations

Raw Materials

- > Raw material and route selection
- > Large-scale charging methods and issues

Temperature Control

- > Large scale temperature control
- > Heat transfer in batch reactor
- > Controlling exothermic reactions

Following Reaction Progress

- > Reaction endpoint determination
- > Sampling methods / issues
- > On-line analytical techniques

Agitation and Mixing

- > Large scale mixing equipment
- > Mixing limited reaction
- > Mixing scale-up / scale-down

Quench & Work-Up

- > Liquid-liquid extractions
- > Phase continuity issues and emulsions

Distillation & Stripping

- > Differential distillation
- > Azeotropes and solvent exchange

Crystallization and Precipitation*

- > Basic principles / yield estimation
- > Controlling supersaturation
- > Scale-up issues

Product Isolation and Drying

- > Large-scale solid-liquid separations
- > Filtration and drying equipment
- > Filtration and drying modeling

Process Hazards and Safety Assessment

- > Common hazards in large-scale processing
- > Process hazard assessments and evaluations

Multiple attendees discounts
UP TO 15% available

WHO SHOULD ATTEND?

This course has been designed for synthetic chemists, process development chemists and process engineers in the pharmaceutical and fine chemical industries with limited pilot plant experience, who wish to learn more about the potential pitfalls of process scale-up and ways to avoid them.

COMPLIMENTARY LITERATURE

As part of the registration fee of this course, each participant will receive a copy of The Pilot Plant Real Book – A Unique Handbook for the Chemical Process Industry, authored by Mr. McConville. In addition, a course binder containing the full content of the course materials will be provided.

Start 9.00am - Tuesday 23 May
Finish 1.00pm - Thursday 25 May
Course Dinner 7.00pm - Tuesday 23 May

Course Fee: €1,925

Which includes comprehensive course manual, refreshments throughout the day, lunch and one course dinner.

Course Fee: €1,925

COURSE TUTOR

Francis X. McConville

Francis X. McConville holds a B.Sc. degree in Chemistry and M.Sc. degrees in both Chemical Engineering and Biotechnology from Worcester Polytechnic Institute in Massachusetts. He has some 35 years of experience in the chemical and related industries, including positions at the Worcester Foundation for Experimental Biology and New England Renewable Fuels, where he was involved in such varied projects as oil recovery and biomass conversion.

He also spent 14 years at Sepracor, Inc. (now Sunovion) in the U.S. as a pharmaceutical process development engineer. His duties there included the design and operation of the company's kilo-labs, as well as the scale-up and transfer of many proprietary API processes to pilot and manufacturing sites in Taiwan, Japan, England, Scotland, and Canada. He was closely involved in the development and optimization of processes based on a variety of technologies including



selective biocatalysis, fermentation, ultrafiltration, and asymmetric crystallization.

For the past 12 years, Mr. McConville has worked at Impact Technology Development, Inc. in Devens, Massachusetts as a consultant, technology specialist and senior team leader. At Impact, Mr. McConville has been involved in such diverse projects as biomass conversion, emulsion polymerization, medical adhesives development, novel molten metal technology, and pharmaceutical crystallization optimization.

Mr. McConville is perhaps best known as the author of the popular manual for process development personnel entitled "The Pilot Plant Real Book - A Unique Handbook for the Chemical Process Industry". This highly practical handbook has garnered praise from readers in the fine chemical and pharmaceutical industries worldwide. Interested readers can learn more about the book at



www.pprbook.com

IN-HOUSE COURSE

For 8+ people contact us to discuss holding this event In-House - sciup@scientificupdate.co.uk

Course Aims and Objectives

To teach the practical aspects of designing a scaleable fine-chemical batch process and successfully implementing it at the kilo-lab and pilot plant scale, through an examination of the effects of large-scale operating methods and equipment limitations on process safety, operability, yield, selectivity and product quality.

Upon completion of the course, participants will be better equipped to:

- > Assess process safety and scaleability
- > Identify process operations that may be problematic on scale-up
- > Design processes that will minimize or avoid scale-up issues
- > Select operating methods
- and equipment for effective scale-up
- > Calculate heat removal rates and safe rates of addition of reagents
- > Determine mixing requirements for scale-up
- > Design crystallizations which can be successfully
- operated at scale
- > Predict the filterability of solid products upon scale-up
- > Minimize the effects of scale-up on yield, selectivity and product purity

REGISTRATION

You can either use our fast online booking system or mail or fax the attached registration form to:

Scientific Update
Maycroft Place, Stone Cross, Mayfield,
East Sussex, TN20 6EW, UK
Fax Number +44 1435 872734

How to Pay

When you register online, you can have the option to pay via credit card (Amex, Mastercard or Visa) For email payments please include course title, card number, expiry date and security code. A receipted invoice will be automatically generated once paid and sent via email. Should your company wish to pay by cheque or bank transfer bank details will be supplied with an invoice.

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Should your company wish to pay by cheque or bank transfer, on booking you can choose between paying in either £ or €. All bank details will be supplied with an invoice.

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Group discounts are available on multiples of 2 or more attendees - see registration form. This offer only applies if bookings are made simultaneously and from the same billing address.

Confirmation of your registration

Confirmation and your invoice will be sent via email.

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For late applications, please register on-line or fax the completed registration form, including credit card payment information.

Cancellations/Refunds

Should you be unable to attend and cancel in writing no later than 1 month before the start of the course, Scientific Update will refund your registration less £300 processing fee. Unfortunately refunds are not possible after that date. Substitutions can be made at any time.

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23 - 25 May 2017, Amsterdam, The Netherlands

No. of attendees @ €1,925

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