SCIENTIFIC UPDATE

We've got chemistry

2 day Course

2020

DESIGNING RELIABLE ION-EXCHANGE CHROMATOGRAPHIC PROCESSES WITH A PROVEN PREDICTIVE APPROACH

NEW COURSE

Ran inconjunction with

YPSO *Your Process Secured & Optimized* | FACTO®

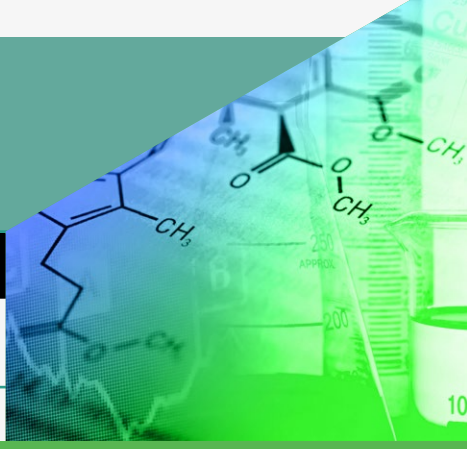
www.scientificupdate.com

info@scientificupdate.com

DESIGNING RELIABLE ION-EXCHANGE CHROMATOGRAPHIC PROCESSES WITH A PROVEN PREDICTIVE APPROACH

A 2 day course

Dr Lucrèce Nicoud | Dr Hector Osuna



INTRODUCTION

This course will present an overview of the state of the art in ion-exchange process chromatography: development, scale-up and optimization of preparative chromatographic processes. The attendees will learn how to develop ion-exchange preparative chromatographic processes. They will gain knowledge on the scale-up and optimization of ion-exchange processes.

The course will cover the fundamentals of process chromatography and the tutors will present a rational and proven methodology for the design of efficient and robust chromatographic processes. They will show how this approach serves both the design of new processes and the resolution of issues encountered in the daily life of chromatographers concerned by process transfer. The methodology rests upon the rigorous description of the physical phenomena at stake, which includes thermodynamics, kinetics of mass transfer and hydrodynamics of the separation. Predictive models are derived from the understanding of these phenomena and are then used to assess the impact of operating parameters on the process performances. A focus will be done on ion-exchange chromatography and main features of the thermodynamic model.

Major applications of ion-exchange chromatography will also be presented, spanning across the ton-scale amino-acids or organic acids production, sugar softening, metals separation or the purification of proteins with stringent purity constraints. Various case studies inspired from real industrial examples or taken from the most recent literature will illustrate that the general approach presented during these two day applies as a roadmap, irrespective of the application, and ultimately leads to the development of reliable and robust processes.

COURSE OUTLINE

Day 1

I. Basics

1. Introduction
   - > Generalities and definition
   - > A bit of history
   - > Introduction to modeling
2. Operating modes
   - > Single-column
   - > Multi-column applications

II. Concepts

1. Fluid partitioning
   - > Phases
   - > Volumes
   - > Porosities
   - > Inert tracers
2. Equilibria (Thermodynamics)
   - > Equilibria in solution
   - > Liquid-solid Equilibria
3. Hydrodynamics
   - > Band broadening
   - > The MC/PD models
4. Mass transfer (kinetics)
   - > Basic considerations
   - > Some notions about diffusion
   - > The Fick's law at a glance
   - > The LDF approximation
   - > Van Deemter equation, comparison of equilibrium and LDF models
5. The autopsy of a model
   - > List of model parameters
   - > Impact of the parameters on the chromatograms
   - > Orders of magnitude and rigorous estimation

Day 2

III. Design

1. Generalities on scale-up and economics
   - > Objectives
   - > Constraints
   - > Cost function
2. Single-column Chromatography
   - > Case study
3. Counter-current multi-column processes
   - > Fundamentals of counter-current chromatography
   - > Basic design and shortcut approach
   - > Case study

IV. Daily Life

1. Issues identification
2. Troubleshooting

V. Take home message and conclusions

1. Summary
2. Q&A discussion

WHO THE COURSE IS AIMED AT?

The course is designed for (Bio) Process Engineers, Scientists and Managers concerned by the downstream in the fields of fine chemicals, metals, pharma, biopharma, industrial biotechnology and bioprocessing.

SCIENTIFIC UPDATE

We've got chemistry

Registration 8.30
Start 8.45am on Day 1
Finish 4.30pm on Day 2
Course fees include a comprehensive course manual, refreshments throughout each day, lunches and one course dinner on the first evening
Course Fees: €1699.00

For all prices and dates please refer to our website

IT'S EASY TO REGISTER ONLINE

COURSE TUTORS

Dr Lucrèce Nicoud

Lucrèce is a (bio)chemical engineer with expertise in process modeling and separation science. She graduated from ENSIC (Nancy, France) with major in chemical engineering and obtained her PhD from the ETH Zurich (Switzerland) in 2015. Her doctoral work focused on the stability of therapeutic proteins. As a post-doctoral fellow at ETH Zurich, she worked on the modeling of chromatographic systems, both single and multicolumn. She also contributed to the book Continuous Biopharmaceutical Processes: Chromatography, Bioconjugation and Protein Stability.1 Then, she carried out a research project at MIT (Cambridge, MA, USA) in the field of pharmaceuticals crystallization. She joined Ypso-Facto in 2018, where she is currently involved both in scientific consulting and software development.

Dr. Hector Osuna

Hector is a chemical engineer with expertise in process modeling, reaction engineering and separation science. He graduated from CPE Lyon Engineering School (Lyon, France) with major in chemical engineering and obtained his Ph.D. from the University of Lyon (UCB Lyon1) (France). He worked at Novasep as an expert on the modeling and simulation of chromatographic processes for pharma and biopharma. He also contributed at lab-scale on proof-of-concept of multicolumn processes. As Innovation Manager at Processium, he then developed processes by combining chemical engineering and numerical tools. He joined Ypso-Facto in 2018 as Head of Biotech Modeling and is currently working on the development of simulation software solutions for the development and optimization of chemical and bio processes.

[1] *Continuous Biopharmaceutical Processes: Chromatography, Bioconjugation and Protein Stability. D. Pfister, L. Nicoud, M. Morbidelli. Cambridge University Press. Cambridge Series inChemical Engineering. ISSN: 9781108420228*

YPSO FACTO® — *Your Process Secured & Optimized*

Ypso-Facto®, Your Process Secured and Optimized

Ypso-Facto is a service company offering assistance to industrial firms to develop, optimize and secure their chemical and bioprocesses.

With the vision to combine strong industrial experience and scientific expertise, Ypso-Facto gathers the complementary know-how of (bio)chemists and process engineers to develop efficient, robust and innovative processes.

We offer global support for your production strategy based on our rational approach to industrial processes and our large experience in various technologies.

We supply technical assistance and scientific analyses from the development of new concepts to the resolution of production issues. For projects needing long or complex developments, we also propose full process development & design services. In addition, we develop a portfolio of powerful and user-friendly software to streamline industrial process design, development and optimization.

www.ypsofacto.com

REGISTRATION

Use our **fast online booking system by visiting www.scientificupdate.com**

Alternatively you can 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). A receipted invoice will be automatically generated once paid and sent via email. Should your company wish to pay by cheque or bank transfer, on booking, bank details will be supplied with an invoice.

Group Discounts

Group discounts are available on two 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

These will be sent via email.

Late Applications

For late applications, please register online 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 £300.00 (or equivalent in €/$) processing fee. Unfortunately refunds are not possible after that date. Substitutions can be made at any time.

DON'T MISS OUT - REGISTER TODAY

EVENT:

DATES: **LOCATION:**

No. of attendees **Price**

NEW FAST ONLINE REGISTRATION
Why not register quickly online and receive instant confirmation? Look for the **register** button on the event of your choice. **www.scientificupdate.com**

First attendee

Company
Title (Dr/Prof/Mr/Mrs/Ms)
First name
Surname
Job Title
Address
Post Code / Zip
Country
Tel
Fax
Email
Mobile
Special Diet

I would like to subscribe to your FREE bi-monthly newsletter What's new in Process Chemistry? ☐

Second attendee

Title (Dr/Prof/Mr/Mrs/Ms)
First name
Surname
Job Title
Tel
Fax
Email
Special Diet

I would like to subscribe to your FREE bi-monthly newsletter What's new in Process Chemistry? ☐

Third attendee

Title (Dr/Prof/Mr/Mrs/Ms)
First name
Surname
Job Title
Tel
Fax
Email
Special Diet

I would like to subscribe to your FREE bi-monthly newsletter What's new in Process Chemistry? ☐

Invoice Address (if different to delegate address)

Address
Post Code / Zip
Country
Tel
Fax

☐ Please invoice my company

Purchase Order:
Promotion Code:

Payment Methods

Payment will be made by:
☐ Cheque ☐ Bank Transfer ☐ Credit Card

In Currency:
☐ Euros ☐ GBP ☐ or Dollars

We accept the following credit cards:
Amex* Mastercard Visa

To pay by credit card a secure link will be provided once you receive your booking confirmation email, this will then take you to a secure payment gateway.
*payments via Amex can only be made in US dollars

Currency Payments
If you select to pay in a different currency than the event is advertised in, the amount charged will be based on the exchange rate at the time of preparing the invoice.

Discounts
Complete the details for either two or three delegates and your discount will automatically be applied. This offer only applies where all delegates are booked simultaneously and at the same billing address.

Cancellations
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 fee less £300 (or equivalent in €/$) processing fee. Unfortunately refunds are not possible within 1 month of the course date. Substitutions can be made at any time.

Data Protection
Scientific Update Ltd is registered under the Data Protection Act 1998. We will store your information securely and only share your contact details with other attendees at this event. If you are happy for your details to be passed to any third parties please tick here: ☐

For full terms of business and payment details please see our website

Please complete this form and fax to +44 (0)1435 872734

You can also download the PDF from www.scientificupdate.com, complete the form online and email back

Scientific Update, Maycroft Place, Stone Cross, Mayfield, E. Sussex TN20 6EW, UK
+44 (0)1435 873062 sciup@scientificupdate.com