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COURSE!

DESIGNING ROBUST CHROMATOGRAPHIC PROCESSES WITH A PROVEN PREDICTIVE APPROACH

6-7 NOVEMBER 2018

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A 2 day course given by
Dr Roger-Marc Nicoud
and **Dr David Pfister**

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DESIGNING ROBUST CHROMATOGRAPHIC PROCESSES WITH A PROVEN PREDICTIVE APPROACH

A 2 day course given by Dr Roger-Marc Nicoud and Dr David Pfister

6-7 November 2018 Basel, Switzerland, Radisson Blu Basel

Multiple attendees discounts
UP TO 15% available

INTRODUCTION

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

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.

Major applications will also be presented, spanning across the tone-scale glucose/fructose separation or the purification of therapeutic protein 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 days 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. Phase equilibria and adsorption isotherms (thermodynamics)
 - > The linear case
 - > Non-linear adsorption isotherms
 - > Consequence on the shape of the chromatograms
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
 - > From the true moving bed to the simulated moving bed
 - > Case study

IV. Daily Life

1. Issues identification
2. Troubleshooting

V. Take home message and conclusions

1. Summary
2. Q&A discussion

VENUE

Radisson Blu Basel
Steinentorstrasse 25
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the main train station, where you can board a free shuttle to EuroAirport Basel-Mulhouse-Freiburg.

Other hotel amenities include free Wi-Fi, a fitness center, sauna and indoor pool with massage jets.

There is a special accommodation rate of 279 CHF details on how to book this rate will be given on the course joining instructions.



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Start 8.45am - Tuesday 6 November
Finish 4.30pm - Wednesday 7 November
Course dinner 7.30pm - Tuesday 6 November
Course Fee: €1,699

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

Course Fee: €1,699

COURSE TUTORS

Roger-Marc Nicoud, PhD

Roger-Marc Nicoud, founder and CEO of Ypso-Facto, earned a PhD in process simulation for the nuclear industry from the University of Lorraine (Nancy, France).

Roger-Marc Nicoud founded Novasep in 1995 to develop comprehensive solutions to produce bio- and synthetic molecules, including the development of industrial preparative chromatography for the food, biotech, pharma, biopharma and fine chemical industries.

He founded Ypso-Facto in 2014 and he has been heading this service company since then.

Roger-Marc Nicoud has a strong expertise in the field of industrial preparative chromatography and he has gathered his 30 years of experience in a reference book entitled *Chromatographic processes: modeling, simulation and design*.¹ The content of this training course is inspired from this publication.

1. Chromatographic Processes - Modeling, Simulation, and Design, Roger-Marc Nicoud, 672 pages, Cambridge University Press, Cambridge Series in Chemical Engineering, New-York (2015), ISBN: 9781107082366.



David Pfister, PhD

David is a chemical and biochemical engineer with expertise in process modeling, reaction engineering and separation science.

He graduated from the University of Lorraine (ENSIC, Nancy, France) with major in chemical and process engineering and obtained his Ph.D. from the ETH Zürich (Switzerland). His doctoral work focused on the synthesis of protein/polymer conjugates for therapeutic applications and on their purification by chromatography. As a post-doctoral fellow at the ETH Zürich, he continued his work in protein purification and on the modeling of chromatography for bio applications. In 2016, he joined Ypso-Facto as an expert on the modeling of chromatographic processes, where he is currently working on the development of premier simulation software solutions for the development and optimization of chromatographic processes.



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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 two or more attendees - see registration form. This offer only applies if bookings are made simultaneously and from the same billing address.

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