SCIENTIFIC UPDATE
We've Got Chemistry

Heterogeneous Catalytic Hydrogenation

27-28 JUNE 2017

Lisbon, Portugal
Sana Malhoa Hotel

A 2 day course presented by
Dr Felix Roessler

"A very comprehensive and thoroughly enjoyable course."
Syngenta

Professional Development Training

Scientific Update provides training courses for industrial chemists and chemical engineers in chemical development and scale-up and many other specialist topics in organic and process chemistry. Our short intensive training courses enable scientists to learn about highly relevant topics, to broaden their knowledge and to keep abreast of new science, new technology and new techniques.

www.scientificupdate.co.uk | info@scientificupdate.co.uk

Register for this course by using our fast online booking system or form on page 4 or call +44 (0)1435 873062

Heterogeneous Catalytic Hydrogenation

A 2 day course presented by Dr Felix Roessler

27 - 28 June 2017 Sana Malhoa Hotel, Lisbon, Portugal

Multiple attendees discounts **UP TO 15% available**

INTRODUCTION

Heterogeneous catalytic hydrogenation is of significant importance for the production of pharmaceuticals, nutraceuticals, flavours and fragrances, agrochemicals and fine chemicals. Indeed, an average of approximately 10% of all chemical steps in the production of such chemicals are catalytic hydrogenations. However, due to the multidisciplinary nature of heterogeneous catalytic hydrogenation, this technology is frequently improperly or inadequately used, which results in problems during scale up and negatively affects the economy of chemical processes and the quality of products.

Participants of this comprehensive course will be familiarized with all important aspects of heterogeneous catalytic hydrogenation. Attendees will learn how to successfully design, develop and realize economic, safe, foolproof and ecologic hydrogenation processes. The main focus will particularly be on a deeper understanding of the underlying disciplines such as catalysis on surfaces and transport processes. Guidelines on how to approach specific hydrogenation problems and concepts and tools for the design, development and scale up of catalytic hydrogenation processes will be presented, rather than summing up transformations of functional groups by catalytic hydrogenation, as this information can nowadays easily be searched and found in literature and patents.

Case Studies and Problem sessions will also be included throughout the course.

The organisers reserve the right to change the published programme of events and course content as circumstances dictate.

COURSE OUTLINE

In detail, the course covers the following topics:

- Surfaces and metal surfaces
- Theory of catalysis on surfaces
- Transport steps and chemical steps in heterogeneous catalysis
- Kinetics (micro- and macrokinetics)
- Influence of variables (overview)
- Hydrogen sources (molecular hydrogen, hydrogen transfer agents, hydrogen solubilities)
- Hydrogenation catalysts (catalyst types, catalyst preparation, catalyst properties, catalyst activation and deactivation)
- Influence of solvents
- Influence of acids, bases, additives, modifiers
- Influence of substrates
- Influence of reaction conditions (concentrations, temperature, agitation)
- Chemical group transformations
- Reaction engineering aspects: suspension and fixed bed reactors; batch, semibatch and continuous operation modes
- Tools and guidelines for selection of chemical systems, determination of basic reaction data needed for the successful scale up from laboratory to plant
- Hydrogenation in laboratory and plant, scale up issue
- Economical aspects
- Safety aspects
- Analysis of surfaces and catalysts
- Rules of thumb, pitfalls

The attendees will learn:

- Which equipment to use (exploratory screening, kinetic investigations etc.)
- How to select the appropriate catalytic system (catalyst, solvent, acids, bases, modifiers)
- How to properly determine the influence of pressure, temperature, mixing
- What are the relevant experiments and how to interpret experiment results correctly
- How to measure transport effects and how to determine the effect of transport limitations
- What are the causes of catalyst deactivation and how to prevent deactivation
- How to measure catalyst activity, selectivity and catalyst deactivation, changes of catalyst properties
- How to determine the basic data (micro- and macro kinetics, thermodynamics, pathways) needed for a successful and direct scale up from laboratory to plant scale
- How to integrate aspects of chemical reaction engineering
- How to scale up successfully; scale up – scale down approach
- When to run processes with suspended catalysts and when to use fixed bed reactors
- Batch, semi-batch and continuous mode of operation
- On the importance of back- and forward integration
- Hydrogenation in the laboratory and plant
- How to estimate catalyst costs
- How to handle catalysts safely and how to carry out catalytic processes safely
- Many tips, rules of thumb, pitfalls

SCIENTIFIC UPDATE
We've Got Chemistry

Start 09.00am - Tuesday 27 June
Finish 3.00pm -Wednesday 28 June
Course dinner 7.30pm - Tuesday 27 June

Course Fee: €1,675
Which includes comprehensive course manual, refreshments throughout the day, lunch and one course dinner.

Course Fee: €1,675

COURSE TUTOR

Dr. Felix Roessler

Felix Roessler studied chemistry at the University of Zürich (UZH), Switzerland. After obtaining his PhD at UZH, he moved to Cambridge (GB) to work on organosilicon chemistry with Ian Fleming. He started his industrial career with Roche in Basel in 1980, first with central research where his focus was heterogeneous catalysis for the production of pharmaceuticals and fine chemicals and where he invented and developed an inhouse high throughput screening system, particularly for investigating chemical reactions under elevated pressure/ temperature conditions on a small scale, 10 years ahead of the emergence of commercially available systems. Next step was process research and development within the Roche's pharma division, supporting medicinal chemistry, development and production regarding heterogeneous catalytic reactions. In 2000 Felix joined the vitamins division of Roche, where he initiated, developed and introduced highly economic and ecologic heterogeneous catalytic processes for the production of nutraceuticals. Along with the take over of Roche vitamins by DSM in 2004, Felix worked as catalysis expert for DSM where he supported catalysis for the nutraceutical, pharma and base chemical divisions.

Felix was honoured twice with the Sandmeyer award in 1997 and 2008, granted by the Swiss Chemical Society. He is author of 18 publications, co-author of monographs and holds 4 patents.

Since his retirement in 2007, Felix is active as independent consultant for all aspects of heterogeneous catalytic processes, from consulting regarding selection of the proper equipment, consulting regarding the selection of appropriate chemical systems and determination of basic reaction data, trouble shooting along with production processes, analysis of production processes regarding potential for improvements, to consulting and coaching R&D-chemists in the development of highly economic processes and successful scale up directly from laboratory to plant.

IN-HOUSE COURSE

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

VENUE

Sana Malhoa Hotel Av Jose Malhoa
1099 – 089
LISBON Portugal
P. +351 21 006 1803
www.sanahotels.com

Located in a main financial district, this glass-fronted business hotel is a 7-minute walk from a metro stop and 5 km from Praça do Comércio's trendy shops and nightlife.

The modern rooms come with free Wi-Fi, flat-screen TVs and minibars. Suites add verandas and sitting areas with sofas. There's 24-hour room service.

Breakfast is included and served in a Mediterranean restaurant with an atrium dining room. Other amenities include a lobby bar/piano lounge, plus a health club with a fitness area, a sauna, and a whirlpool tub. Parking is complimentary.

A Limited number of rooms have been reserved at the hotel for the special rate of €80.00 per night including breakfast and VAT. A hotel booking form will be sent when you register.

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.

Bank Transfer or Cheque
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.

Group Discounts
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.

Late Applications
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.

Course:

Dates: **Location:**

No. of attendees

Special Offer!
Register 2 delegates and receive 5% on 2nd booking
Register 3 delegates and receive 10% on 3rd booking
Register 4 or more delegates and receive a 15% discount

NEW FAST ONLINE REGISTRATION 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 SAVE 5%

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 SAVE 10%

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.

*** Currency Payments**
If you select to pay in GBP or Dollars, 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 Tel +44 (0)1435 873062 sciup@scientificupdate.com