

Scientific Update | Training Courses 2010



Safety and Selectivity in the Scale-Up of Chemical Reactions

A Two Day Course



25 & 26 January 2010
The Hilton DeSoto Hotel
Savannah, GA, USA

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Safety and Selectivity in the Scale-Up of Chemical Reactions

A Two Day Course

25 & 26 January 2010 | The Hilton DeSoto Savannah Hotel, Savannah, GA, USA

Fee

£1050.00, which includes lunches, refreshments and course dinner on Monday 25 January, plus the comprehensive course manual.

Course Introduction

The aim of the course is to give lab chemists an understanding of the issues that need to be considered during the early stages of scale up to large laboratory scale equipment (10-20 litre vessels) / kilo lab. The course will concentrate on chemical safety and selectivity issues and include information on what safety testing equipment is available and the uses and limitations of this equipment. Attendees will learn how to identify potential problems whether they be thermal hazards or selectivity issues. Methods used by other companies for handling hazardous reagents and reactions will be described as well as alternative chemistry to circumvent these reactions and/or reagents.

Course Outline

Introduction

- The safety literature
- Functional groups which can cause problems on scale up

Improving safety and selectivity in chemical reactions

- Inherent safety, choosing the right synthetic route
- Reaction criticality classes (Stoessel diagrams)
- Solvent selection
- Choosing the right reagent
- Catalysis – the plusses and minuses
- Choosing the right reaction conditions, the effect of concentration

Thermal Hazard Testing and Runaway Reactions

- Introduction and overview of safety issues in the chemical industry
- Heat loss considerations
- Desk screening – unstable groups, Oxygen balance equation etc
- Principles of hazard testing – equipment and uses
- Effect of changes to reaction variables

Solvent Selection and Solvent Effects

- Reasons for choosing a solvent
- The effect of solvents on chemical reactions
- Useful solvent parameters
- Phase transfer catalysis
- Water as a solvent
- Solvent free reactions
- Alternative solvents – supercritical fluids, ionic liquids, fluorous solvents

Oxidation and reduction

- Choice of reagent(s)
- Stoichiometric versus catalytic
- Reagent stability
- Safety issues

Hazardous Reactions and Reagents

- Azides
- Making triazoles and tetrazoles
- Diazo compounds, including diazomethane
- Petasis methylenation
- Grignard Reagents and Organolithiums
- Use of cyanide

Work Up

- Quenching reactions / reagents
- Minimising work up – Telescoping
- Catalyst removal
- Product isolation

Scaling up chemical reactions

- What can go wrong – it's not what you do but the way that you do it
- Heat transfer areas
- Importance of dose control and in process analysis
- Reactions with initiation periods
- Simple do's and don't's
- Flammability issues

Case studies

- Grignard reaction
- Azide chemistry
- Oxidation and reduction

“I very much enjoyed the course. Thanks!”
AstraZeneca

Tutor



Will Watson gained his PhD in Organic Chemistry from the University of Leeds in 1980. He joined the BP Research Centre at Sunbury-on-Thames and spent five and a half years working as a research chemist on a variety of topics including catalytic dewaxing, residue upgrading, synthesis of novel oxygenates for use as gasoline supplements, surfactants for use as gasoline detergent additives and non-linear optical compounds. In 1986 he joined Lancaster Synthesis and during the next 7 years he was responsible for laboratory scale production and process research and development to support Lancaster's catalogue, semi-bulk and custom synthesis businesses. In 1993 he was appointed to the position of Technical Director, responsible for all Production (Laboratory and Pilot Plant scale), Process Research and Development, Engineering and Quality Control. He helped set up and run the Lancaster Laboratories near Chennai, India and had technical responsibility for the former PCR laboratories at Gainesville, Florida. He joined Scientific Update as Technical Director in May 2000. He is also involved in an advisory capacity in setting up conferences and in the running of the events. He is active in the consultancy side of the business and sits on the Scientific Advisory Boards of various companies. He can be contacted by email at: will@scientificupdate.co.uk

Who Should Attend?

Any Laboratory Chemist involved in the scale-up to large scale equipment/kilo lab.

Venue



The Hilton Savannah DeSoto Hotel
15 East Liberty Street, Savannah, GA 31401 USA
Telephone: +1 912 232 9000 | Fax: +1 912 232 6018
www.desotohilton.com

Featuring 246 deluxe rooms and suites, the Hitlon Savannah DeSoto Hotel is ideally located in the heart of Savannah's popular historic dining, shopping and theatre districts and a short walk to Savannah's bustling River Street and city market. The hotel has leisure facilities and a roof top swimming pool and is just a short distance from Forsyth Park.

A limited number of rooms have been reserved at the hotel for the special rate of \$109 per room per night plus taxes (currently 13%), if booked before Friday 26 September 2008. A city occupancy fee of \$1.00 per night will apply to each room. Details of how to make your hotel reservation will be sent when you register.

General Information

The course begins with registration at 8.45am on Monday 25 January and finishes at approximately 4.30pm on Tuesday 26 January.

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

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