



UNIVERSITY OF LEEDS

**Crystallisation Science & Engineering
Wednesday 22 – Friday 24 January 2020**

**School of Chemical Process and Engineering (SCaPE)
Faculty of Engineering and Physical Sciences**

Provisional Programme

Wednesday 22 January 2020

08:45 *Registration and coffee*

09:15 *Introduction*

Crystallisation Fundamentals

09:30 **Crystallisation route map**

Professor Kevin Roberts, SCaPE, University of Leeds

10:15 **Nucleation and crystal growth**

Dr Tom Turner, SCaPE, University of Leeds

11:00 *Coffee*

11:20 **Crystal morphology and habit modification**

Dr Ian Rosbottom, Imperial College London

12:05 **Fundamentals of polymorphism**

Dr Robert Hammond, SCaPE, University of Leeds

12:50 *Lunch*

13:35 **Solid-state analysis**

Dr Gerry Steele, PharmaCryst Consulting Ltd

14:20 **Screening for polymorphs (solid form selection)**

Dr Bob Docherty, Pfizer, Sandwich

15:05 **Characterisation of pseudo polymorphs (TGA, DVS, IGC)**

Dr Gerry Steele, PharmaCryst Consulting Ltd

15:50 *Tea*

16:10 **Laboratory Demonstrations**

D1 – Nucleation kinetics (SCaPE G.25)

Dr Tariq Mahmud and Dr Tom Turner, SCaPE, University of Leeds

D2 - Growth kinetics (SCaPE G.24)

Dr Xiaojun Lai and Muhammad Najib, SCaPE, University of Leeds

17:25 *End of day one*

19:00 *Course dinner*

Thursday 23 January 2020

Crystallisation Processes

08:45 *Coffee*

09:00 **Batch crystallisation processes**

Dr Elena Simone, School of Food Science & Nutrition, University of Leeds

09:50 **Hydrodynamics, mixing and heat transfer in batch crystallisers**

Dr Tariq Mahmud, SCaPE, University of Leeds

10:40 *Coffee*

11:00 **Continuous crystallisation processes**

Christian Melches, GEA, Duisburg, Germany

11:50 **Solvent selection: properties and solubility**

Professor John Blacker, School of Chemistry, University of Leeds

12:35 *Lunch*

13:20 **Workflow for crystallisation process development – a case study**

Dr Neil George, Syngenta/SCaPE, University of Leeds

14:10 **Post crystallisation unit operations: filtration and drying**

Dr Amgad Moussa, Syngenta, Switzerland

14:50 *Tea*

Thursday 23 January 2020 continued

Measurements and Control

- 15:10 **Particle size and shape measurements and characterisation**
Dr Umair Zafar, Novartis/University of Leeds
- 16:00 **Control of crystallisation processes for PSD**
Dr Tariq Mahmud, SCAPE, University of Leeds
- 16:40 **Laboratory Demonstrations**
D3 – Particle characterisation (SCAPE 2.01)
Dr Ben Douglas and Dr Tariq Mahmud, SCAPE, University of Leeds
D4 – Raman spectroscopy (SCAPE 3.10)
Dr Xiaojun Lai and Dr Tom Turner, SCAPE, University of Leeds
- 17:50 Poster and drinks reception and end of day two

Friday 24 January 2020

Measurements and Control continued

- 08:45 *Coffee*
- 09:00 **Process spectroscopic techniques (IR, UV-vis, Raman)**
Dr Xiaojun Lai, SCAPE, University of Leeds
- 09:40 **Particle properties and performance**
Dr Richard Storey, Astra Zeneca, Macclesfield

Co-Crystals

- 10:20 **Fundamentals of co-crystallisation and case studies of recent developments**
Dr Mingzhong Li, De Montfort University, Leicester
Professor Anant Paradkar, University of Bradford

11:10 *Coffee*

Crystallisation Modelling and Software Demonstrations

- 11:30 **Molecular to crystal science modelling route map**
Dr Robert Hammond, SCAPE, University of Leeds
- 12:15 **Software demonstration: VISUAL HABIT**
Dr Jonathan Pickering, SCAPE, University of Leeds
- 12:45 *Lunch*
- 13:30 **Digital design of crystallization processes**
Niall Mitchell, Process Systems Enterprise (PSE), London
- 14:15 *Transfer to PC Cluster / log-in*
- 14:25 **Software demonstration (SCAPE G.06) Introduction to the crystallization modules of gPROMS FormulatedProducts (Simulation & Global System Analysis)**
Niall Mitchell, PSE
- 15:10 **Wrap-up and feedback from delegates**
Dr Xiaojun Lai and Dr Tariq Mahmud
- 15:20 End of course