Programme

Course Director: Professor Mojtaba Ghadiri  
Course Co-director: Dr Sadegh Nadimi  
School of Chemical and Process Engineering, University of Leeds

Tuesday 14 May 2019

Characterisation of Physical Properties of Particles

09:00 Registration and Coffee
09:30 Introduction  
Professor Mojtaba Ghadiri, University of Leeds
10:00 Sampling and sample preparation for particle characterisation  
Professor Mojtaba Ghadiri, University of Leeds  
- Origins of problems in particle property analysis  
- Sampling from particulate systems  
- Sample preparation
10:45 Coffee
11:10 Particle size analysis  
Dr Chandresh Malde, Johnson Matthey  
- Principles of size analysis  
- State-of-the-art instruments for particle sizing
12:40 Lunch
13:25 Particle shape and structure characterisation  
Dr Mehrdad Pasha, University of Leeds  
- Shape and shape description  
- Surface morphology and structure  
- Application to density determination
14:25 Suspension rheology  
Dr David Harbottle, University of Leeds  
- Introduction to the principles of suspension rheology  
- Particle structuring in suspensions  
- Measurement of suspension rheology
15:55 Tea
16:15 Bulk flow of powders  
Professor Norman Harnby, University of Bradford  
- Cohesive and free-flowing powders  
- Segregation and structure  
- Application of characteristics to process design
17:45 End of day one
17:45 Networking Drinks Reception, Nibbles and Poster Session

Wednesday 15 May 2019

Characterisation of Mechanical Properties of Particles

09:00 Mechanical properties of powders  
Dr Sadegh Nadimi, University of Leeds  
- Introduction to mechanical properties of powder  
- Characterisation of deformation and breakage of particles  
- Characterisation by nano-indentation  
- Particle breakage under brittle and semi-brittle failure modes  
- Impact and side crushing of single particles  
- Bulk compression and crushing
10:30 Coffee
10:55 Bulk characterisation of powders  
Dr Colin Hare, University of Surrey  
- Shear cells and powder rheometry  
- Frictional properties  
- Consolidation and unconfined yield stress
12:25 Lunch
Wednesday 15 May 2019 continued..

**Characterisation of Mechanical Properties of Particles**

13.10 **Electrostatics in powder systems**
   Professor Mojtaba Ghadiri, University of Leeds
   - Fundamentals of tribo-electrification of powders
   - Measurements of tribo-electrification of powders
   - Industrial applications of electrostatics in powder systems

14:40 Tea

15:00 **Powder characterisation practical demonstrations (Laboratories)**
   a. Lab B13: Nanoindentation and Malvern Mastersizer (Dr Umair Zafar)
   b. Lab 2.14: Shulze Shear Cell (Dr Sadegh Nadimi)
   c. Lab B13a: Freeman FT4 (Wei Pin Goh)
   d. Lab 201: XRT and G3 Morphology (Dr Mehrdad Pasha)

17.30 *End of day two*
19:00 *Course Dinner*

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Thursday 16 May 2019

**Characterisation of Chemical Properties of Particles**

09:00 **Adhesion**
   Dr Umair Zafar, University of Leeds
   - Principles
   - Measurement techniques
   - State-of-art in the field

10:15 *Coffee*

10:40 **Solubility and dissolution of particles**
   Dr David Berry, The Centre for Process Innovation (CPI)
   - Principles
   - Applications

12:10 *Lunch*

12:55 **Tabletting and compaction of powders**
   Dr Csaba Sinka, University of Leicester
   - Fundamentals of tabletting and compaction of powders
   - Industrial use of tabletting and compaction

14:25 *Tea*

14:45 **Determination of Powder Surface Energy and Surface Chemistry**
   Dr Jerry Heng, Imperial College London
   - Principles
   - Applications to powders

16:15 *End of day three and course*