



**Microencapsulation
Tuesday 18 – Thursday 20 June 2019**

PROVISIONAL PROGRAMME

Tuesday 18 June

Basic science and key points around microencapsulation - what you need to know to get started

09:00	<i>Registration</i>
09:30	Introduction to the course
09:40	Map to guide you through the course: microencapsulation methods vs product requirements Professor David York, University of Leeds
10:20	Important properties of system to encapsulate (Hansen solubility parameter) Professor Steven Abbott, TCNF & University of Leeds
11:00	<i>Coffee</i>
11:20	Important properties of microcapsules (type, shape, size, release characteristics, strength) Dr Olivier Cayre, University of Leeds

Spray drying

12:00	Introduction to spray drying for encapsulation Professor Andrew Bayly, University of Leeds
12:40	<i>Lunch</i>
13:40	Droplets and sprays in encapsulation: background in forming droplets from nozzles and common process units Professor Nik Kapur, University of Leeds
14:20	Demonstration session 1 <ul style="list-style-type: none">- Spray drying Professor David York, University of Leeds- Highly-upscaled, size-controlled microencapsulation: step emulsification Alessandro Ofner, Microcaps- Gelatin/complex coacervation Soyeb Manga, University of Leeds- Metal shell capsules preparation – achieving retention and triggered release of small volatile actives James Hitchcock, University of Leeds
15:35	<i>Tea</i>

Coating of particles

15:55	Coating of solid particles Professor Nik Kapur, University of Leeds
16:30	End of day one
19:00	Course dinner

Wednesday 19 June

Coating of particles cont...

09:00	Process – fluid bed coaters, pan coaters Professor David York, University of Leeds
09:40	Industry presentation on coating of solid particles using fluid beds Dr. Stephan Sternowsky, Neuhaus Neotec

10:30 Coffee

Emulsion-based methods

- 10:50 **How to decide on an affordable microencapsulation method – economics behind encapsulation**
Professor David York, University of Leeds
- 11:30 **Emulsion theory, importance of miscibility/cLogP, how useful is HLB of surfactants, Pickering emulsions/colloidosomes**
Professor Brent Murray, University of Leeds
- 12:10 *Lunch*
- 13:10 **Introduction on what the rest of the course will focus on regarding these methods – focus on emulsion-based encapsulation methods**
Dr Olivier Cayre, University of Leeds
- 13:20 **Complex Coacervation Methods**
Alex Kerr, Micropore
- 14:00 **Demonstration session 2**
- **Spray drying**
Professor David York, University of Leeds
 - **Highly-upscaled, size-controlled microencapsulation: step emulsification**
Alessandro Ofner, Microcaps
 - **Gelatin/complex coacervation**
Soyeb Manga, University of Leeds
 - **Metal shell capsules preparation – achieving retention and triggered release of small volatile actives**
James Hitchcock, University of Leeds
- 15:15 *Tea*
- 15:35 **Droplet size control theory, importance of surface energy, viscosity and size of molecules**
Professor Megan Povey, University of Leeds
- 16:15 **Industry presentation – Application of emulsion based methods**
Susana Fernandez Prieto, P&G Brussels
- 16:55 Poster/wine reception followed by end of day two

Thursday 20 June

Emulsion-based methods: Turning emulsions into core-shell microcapsules

- 09:00 **Key properties and evaluation I**
Dr Olivier Cayre, University of Leeds
- 09:30 **Interfacial polymerisation: traditional vs potential of living radical polymerisation methods**
Soyeb Manga, University of Leeds
- 10:10 *Coffee*
- 10:30 **Pickering emulsions for food applications with emphasis on the controlled delivery of actives**
Fotis Spyropoulos, University of Birmingham
- 11:30 **Size controlled microencapsulation at industrial scale**
Alessandro Ofner, Microcaps
- 12:10 **Presentation title to be confirmed**
Givaudan
- 12:50 *Lunch*
- 13:50 **Key properties and evaluation II**
Dr Nicole Hondow, University of Leeds
- 14:20 **Forming barriers on droplet and particle surfaces**
Dr Olivier Cayre, University of Leeds
- 15:00 **Evaluating mechanical properties and release rates – techniques, challenges and watch outs**
Professor David York/Dr Olivier Cayre, University of Leeds
- 15:40 Optional lab tour
- 16:30 *End of day three and course*