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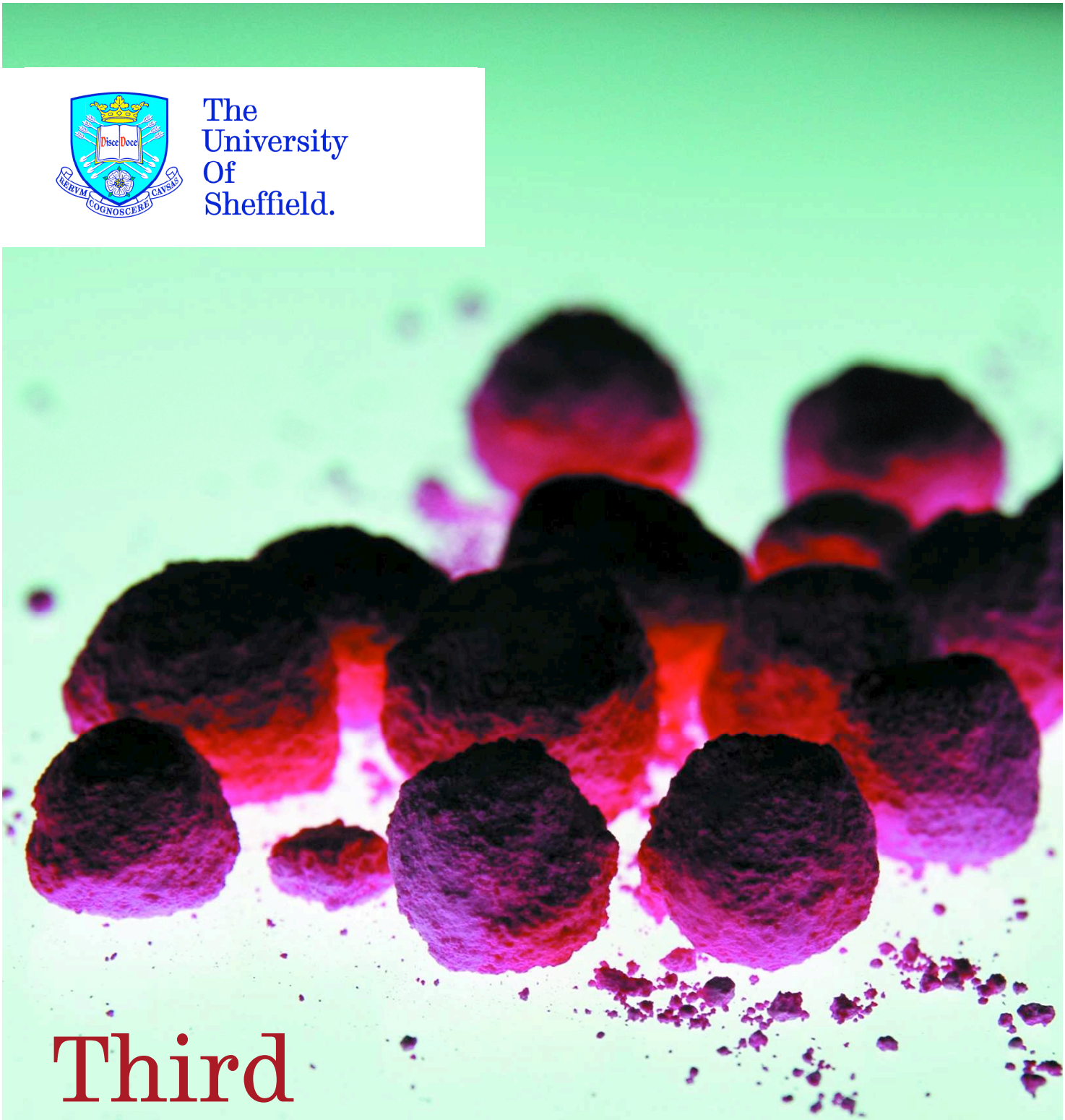

Third International Granulation Workshop.

Sheffield, 27-29 June 2007

EFCE

Third International Granulation Workshop

Academic and industrial interest in granulation continues to grow not least because it is an important step in the formulation and manufacture of many important solid products.

This workshop consists of a one-day course and a two-day meeting. Both aim to investigate one of the least understood solid processing steps – granulation – with a specific aim to improve granule properties by informed formulation and better process understanding.

The two-day meeting on 28 and 29 June will see a range of invited speakers cover both industrially and academically relevant areas of the discipline in order to provide a complete overview of the field. Papers presented will be considered for a special issue of Powder Technology.

The Workshop is organised by the Particle Products Group of the Department of Chemical and Process Engineering, with support from the European Federation of Chemical Engineering (EFCE) Working Party on Agglomeration.

We hope the workshop will be even more successful than last time and look forward to seeing you here in Sheffield.

Professor Agba Salman
Professor Mike Hounslow
Particle Products Group

Granulation Course

Wednesday 27th June 2007

This one-day and hands-on course is run by Professor David York, Mr. Nigel Somerville Roberts (P&G), Dr. Karen Hapgood (Monash University, Australia), and Professor Jonathan Seville (University of Birmingham). It will be held in the Particle Products Group (PPG) laboratories in the Department of Chemical and Process Engineering at the University of Sheffield.

Course Contents

1. Elements of granulation technology – key technological issues, particle size distributions, properties of wet and dry assemblies of particles
2. Equipment for granulation: low and high shear mixers – types of tumbling and impeller mixers, mechanics of powder mixing, design and scale-up issues
3. Demonstrations – operation of high-shear mixer-agglomerator and fluidised bed agglomerator
4. Understanding granule formation:
   a. Mechanisms in mixer agglomeration – mechanisms of size enlargement, effects of liquid distribution, binder selection, control of granule size
   b. Mechanisms in fluidised bed agglomeration – effects of liquid distribution and atomisation, effects of binder properties, control of granule size
5. The complete process – flow sheet for the process, drying/cooling, classification and recycle, sensors for control of the process, case studies

Scientific Committee

Prof. Hans Kuipers, Twente University of Technology, The Netherlands
Prof. Jean Paul Remon, Ghent University, Belgium
Prof. Hans Leuenberger, University of Basel, Switzerland
Prof. Karl Sommer, TU München-Weihenstephan, Germany
Prof. Stefaan Simons, University College London, UK
Prof. John Dodds, Ecole des Mines d'Albi, France
Dr. Judith Bonsall, Unilever, UK
Dr. Gabrie Meesters, DSM, The Netherlands
Prof. Jonathan Seville, University of Birmingham, UK
Prof. Anne Juppo, University of Helsinki, Finland
Prof. Mike Adams, University of Birmingham, UK
Dr. Tibor Attila Nagy, Gedeon Richter, Hungary
Dr. Stefan Palzer, Nestlé, Germany
Prof. David York, Procter & Gamble, UK
Dr. Gavin Reynolds, AstraZeneca, UK
Dr. James N. Michaels, Merck, USA
Dr. Hermann Feise, BASF, Germany
Dr. Kendal Pitt, GSK, UK
Dr. Renee Boerefijn, Purac, The Netherlands
Prof. Mojtaba Ghadiri, University of Leeds, UK
Prof. Richard Turton, West Virginia University, USA
Mr. Klaus Eichler, Technology Training Center, Germany
Dr. Paul Mort, Procter & Gamble, USA
Prof. Donald L. Feke, Case Western Reserve University Cleveland, USA
Prof. Ian. T. Cameron, University of Queensland, Australia
Prof. Pierre Guigon, Université de Technologie de Compiègne, France
Prof. Satoru Watano, Osaka Prefecture University, Japan
Prof. Peter Kleinebudde, Heinrich-Heine-University Duesseldorf, Germany
Prof. Jim Litster, University of Queensland, Australia
Prof. Masayuki Horio, Tokyo University of Agriculture & Technology, Japan
Prof. Stefan Heinrich, Otto-von-Guericke-Universität, Germany
Prof. Mike Hounslow, University of Sheffield, UK
Prof. Agba Salman, University of Sheffield, UK

Granulation Meeting Programme

Abstracts are online at: **www.sheffield.ac.uk/granulationworkshop**

Thursday 28th June 2007

SESSION 1: Granulation: The Big Picture

Agglomeration at the Sharp End - Industrial Practice and Needs
D. York (Procter and Gamble, UK)

Manufacturing Pharmaceutical Granules: Is the Granulation End Point a Myth?
H. Leuenberger (Institute for Innovation in Industrial Pharmacy, Switzerland)

Solid Lipid Extrusion for the Production of Sustained Release Pellets
P. Kleinebudde and C. Reitz (Heinrich-Heine-University Düsseldorf, Germany)

Wet Granule Breakage in a Breakage Only Granulator: Effect of Formulation properties on Breakage Behaviour
L. Liu, R. Smith and J. Litster (University of Queensland, Australia)

Compression and Compaction of Binary Mixtures of Granules
G. Frenning, J. Hellström and G. Alderborn (Uppsala University, Sweden)

Comparison of Fibre Optical Measurements and Discrete Element Simulations for the Study of Granulation in a Spout Fluidised Bed
J.M. Link[1], W. Godlieb[1], P. Tripp[2], N.G. Deen[1], S. Heinrich[3], J.A.M. Kuipers[1], M. Schönherr[4], M. Peglow[3] ([1]University of Twente, The Netherlands; [2]Vibra Maschinenfabrik Schultheis, Germany; [3]Otto-von-Guericke-University Magdeburg, Germany; [4]BASF AG Ludwigshafen, Germany)

SESSION 2a: Compaction and Extrusion

Investigations on Roll Press Compaction – Interaction of Screw Feeding and Rollers
D. Herold and K. Sommer (Technical University of Munich, Germany)

Frontiers in Extrusion Spheronisation
D.I. Wilson[1], S.L. Rough[1] and P.J. Martin[2]
([1]University of Cambridge, UK; [2]University of Oxford, UK)

Validation of a Continuous Wet Granulation Process Using a Twin-Screw Extruder
B. Van Melkebeke, C. Vervaet and J.P. Remon (Ghent University, Belgium)

SESSION 2b: Fluidized Bed Processes

Formulation and Polymorphic Screening Using Miniaturised Fluid Bed
N. Kivikero[1], M. Murtomaa[2], J. Aaltonen[1], K. Kogermann[1,3], E. Räsänen[4], J-P. Mannermaa[5] and A. Juppo[1]
([1]University of Helsinki, Finland; [2]University of Turku, Finland; [3]University of Tartu, Estonia; [4]South Carelian Hospital Pharmacy, Finland; [5]Oy Verman Ab, Finland)

ProCell Technology: Modelling and Application
M. Jacob (Glatt Ingenieurtechnik, Germany)

Towards a Complete Population Balance Model for Fluidised Bed Spray Granulation: Simultaneous Drying and Particle Formation
M. Peglow, S. Heinrich and E. Tsotsas (Otto-von-Guericke University Magdeburg, Germany)

SESSION 3a: High Shear Processes 1

Particle-Particle Coating in a Cyclomix Impact Mixer
Y. Ouabbas, J. Dodds, A. Chamayou, L. Galet and M. Baron (Ecole Nationale Supérieure des Techniques Industrielles et des Mines d'Albi-Carmaux, France)

A Narrow Size Distribution on a High Shear Mixer by Applying a Flux Number Approach
R. Boerefijn (Purac, The Netherlands)

Encapsulation Process: A Way to Produce Dry Water
K. Saleh, L. Forny, I. Pezron L. Komunjer and P. Guigon (Université de Technologie de Compiègne, France)

Motion and Mechanisms in High Shear Mixers Using Positron Emission Particle Tracking
A.Tran[1], J. Litster[1], A.Ingram[2], S. Bakalis[2], X. Fan[2] and J. Seville[2]
([1]University of Queensland, Australia; [2]University of Birmingham, UK)

SESSION 3b: Pharmaceutical Granulation 1

Nucleation and Granulation of Hydrophobic Powders
K.P. Hapgood and B. Khanmohammadi (Monash University, Australia)

Fluidised Bed Granulation of Pharmaceutical Materials: Characterisation using Raman Spectroscopy
G. Walker, S. Bell, M. Vann and G. Andrews (Queens University Belfast, UK)

The Effect of Powder Flow and Die Fill on Tablet Properties
I.C. Sinka[1], F. Motazedian[1], A.C.F. Cocks[2] and K.G. Pitt[3]
([1]University of Leicester, UK; [2]University of Oxford, UK; [3]GlaxoSmithKline, UK)

Mechanistic Based Prediction of Granulation Output Through Multidimensional Population Balances and PAT Sensors
I.N. Björn (AstraZeneca, Sweden)

Friday 29th June 2007

SESSION 4: High Shear Processes 2

Scale-up and Control of Binder Agglomeration Processes – Batch and Continuous
P.R. Mort (Procter and Gamble, USA)

Effect of Granulation Scale-up on the Structure and Strength of Granules
M. Ghadiri (University of Leeds, UK)

Detecting and Measuring Nucleation in High Shear Granulation
M. Oullion[1], G.K. Reynolds[2] and M.J. Hounslow[1]
([1]University of Sheffield, UK; [2]AstraZeneca, UK)

Freezing the High Shear Granulation Process
K. van den Dries(Organon, The Netherlands)

SESSION 5a: Industrial Granulation

Aspects of Industrial Granulation
K. Ax, M. Schöenherr and H. Feise (BASF, Germany)

Influence of the Material Properties on the Agglomeration of Food Particles
S. Palzer (Nestlé, Germany)

Process Parameter Analysis and Process Understanding – Some Industrial Examples
T.A. Nagy[1] and Z.G. Meszena[2] ([1]Gedeon Richter, Hungary; [2]Budapest University of Technology, Hungary)

Determination of the Drying Conditions of Sticky Food Powders in a Spray Drier
G. Meesters (DSM Food Specialties, The Netherlands)

SESSION 5b: Pharmaceutical Granulation 2

A Comparative Study of Compaction Properties of Binary and Bilayer Tablets
C. Wu and J.P.K. Seville (University of Birmingham, UK)

Binder Spreading and Wetting Phenomena in Granulation Processing
D.R. Williams (Imperial College London, UK)

Single Drop Behaviour in a High Shear Granulator
G.K. Reynolds[1], V.A. Chouk[2], M.J. Hounslow[2] and A.D. Salman[2]
([1]AstraZeneca, UK; [2]University of Sheffield, UK)

Microscopic Interpretation of Granule Strength in Liquid Media
M.J. Adams[1], Y.S. Cheong[2], M.J. Hounslow[3] and A.D. Salman[3]
([1]University of Birmingham, UK; [2]University of Cambridge, UK; [3]University of Sheffield, UK)

SESSION 6: The Micro Scale: Granules and Smaller

Reactive Binders: Wettability and Adhesion Behaviour in Detergent Granulation
S. Simons[1], S. Germaná[1], J. Bonsall[2]
([1]University College London, UK; [2]Unilever, UK)

Surface and Wetting Analysis: An Insight into the Products of Granulation
S. Dorvlo[1], M. Hartmann[2], S. Palzer[2] and A.D. Salman[1]
([1]University of Sheffield, UK; [2]Nestlé, Germany)

Mechanistic Modelling of the Formation and Dissolution of Multi-Component Granules
F. Stepanek[1], M. Ansari[1] and P. Rajniak[2]
([1]Imperial College London, UK; [2]Merck & Co, USA)

Posters

There will be two poster competitions. Registered PhD students will have the opportunity to present their work and compete for the "Best Poster" award (sponsored by the IChemE Particle Technology Subject Group).

Open to any researcher is the "Most Innovative Application of Granulation" category (Sponsored by TTC). Hopefully this will provoke some novel applications of granulation with some serious and not so serious entries.

For both competitions a one-page abstract must be submitted to the organisers by 1 April 2007.

Exhibitors

We will host an exhibition of Particle Technology equipment from leading manufactures and suppliers. There is also an opportunity to demonstrate/present equipment during the granulation course run on 27 June. Exhibitors can contact Robert Sochon for further details: r.sochon@sheffield.ac.uk

Further information

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Telephone: _____

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Please indicate if you have any special needs or dietary requirements:

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Fees

Course on Granulation (27 June)

☐ £150 Course fee excluding accommodation

Granulation Meeting (28—29 June)

☐ £200 Early registration — before 1 March 2007
☐ £220 Full registration
☐ £150 Students
☐ I want to present a poster
☐ I wish to attend the Meeting Dinner on 28 June (no additional charge)

Accommodation

The meeting registration fee includes accommodation for the night of 28 June.

I require additional accommodation (£50/night)

☐ 26 June ☐ 27 June ☐ 29 June

I enclose a total payment of: £_____

Please note that fees must be paid in advance and are non-refundable after 1 April 2007.
Fees are payable to **The University of Sheffield**.

Please send this form with payment to the following address:
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Tel: +44 (0) 114 222 7560 Fax: +44 (0) 114 222 7501 E-mail: h.charles-williams@sheffield.ac.uk