

TROUBLESHOOTING POLYMERIZATIONS

Tools for Polymerization Troubleshooting: A case study and problem-solving approach

Seventeenth
Intensive Short Course

**Monday, June 7
to
Wednesday, June 9
2004**

Directed by

Dr. A. Penlidis, FCAE, FCIC
Canada Research Chair in Polymer Engineering
Professor and Director of the
Institute for Polymer Research
Department of Chemical Engineering
University of Waterloo

Dr. A.E. Hamielec, FRSC, FCIC
Professor Emeritus and Director of
McMaster Institute for Polymer Production
Technology,
McMaster University

Dr. T. A. Duever
Institute for Polymer Research
Professor and Chair
Department of Chemical Engineering
University of Waterloo

to be held at:

**Porto Carras Grand Resort
Sithonia, Halkidiki, GREECE**

REGISTRATION INFORMATION

You may register in the following ways:

via email to Professor A. Penlidis at
penlidis@cape.uwaterloo.ca

via fax to Professor A. Penlidis at:
519/746-4979

via mail to Professor A. Penlidis at:
Institute for Polymer Research
Department of Chemical Engineering
University of Waterloo
Waterloo, Ontario, Canada N2L 3G1

*For further information, see also our website
(check under “Events” section) at:
www.ipruw.com*

WHO SHOULD ATTEND?

Engineers and chemists involved with polymerization, polymer production technology, polymerization kinetics, process engineering, product development and characterization, modeling, polymer reactor design and optimization, product/process improvement, design of polymerization experiments, data analysis and handling.

Everyone will benefit from learning **problem-solving techniques** and tips for **troubleshooting polymerization behaviour**. The lecturers have more than 75 years of accumulated experience in polymer process/product development and polymerization technology.

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PROGRAMME

Session 1 Monday, June 7 9:00 am - 12:30 pm

Introduction to chain growth polymerization mechanisms and kinetics (radical/ionic); linear, branched, crosslinked chains; rate expressions; molecular weight and long-chain branching expressions; instantaneous property methods; examples of troubleshooting with typical polymerization data

Session 2 Monday, June 7 5:00 - 8:00 pm

Analysis of data using linear regression; pitfalls of linearized models; examples from copolymerization; reactivity ratio estimation techniques; parameter estimation using linear and non-linear regression techniques with single and multiple responses; parameter identifiability; examples from terpolymerization

Session 3 Tuesday, June 8 9:00 am – 12:30 pm

Emulsion/suspension processes; batch, semi-batch and continuous reactors; copolymer composition control policies; energy balances; effect of impurities in emulsion polymerization; troubleshooting with particle size and molecular weight distributions; diffusional limitations (from low to high conversions)

Session 4 Tuesday, June 8
5:00 – 8:00 pm

Discriminating between different models; examples from copolymerization; optimal sensor location and selection; hierarchical designs for estimating variance components in measurement errors; factorial design of experiments; sequential experimental designs; Bayesian approaches; troubleshooting with multiple site catalysts; multivariate analysis with many experimental factors; filtering techniques

Session 5 Wednesday, June 9
9:00 am – 12:30 pm

Troubleshooting with branched/crosslinked systems; population balances; gelation criteria; examples with crosslinking systems; reactive processing issues; process optimization examples; from product properties to recipe design (inverse design problem)

All sessions will include **case studies** from a variety of polymerization systems (free radical and catalytic), reactors and monomers. Participants can discuss their own examples and interact with the lecturers. The lecturers have organized courses for more than 20 years involving more than 1000 industrial participants representing more than 60 companies worldwide. The examples used represent state-of-the-art.

GENERAL INFORMATION

COURSE FEES

The cost per person is 1200 Euros. The course fee includes registration, room for three nights, breakfast and dinner for three days, beverage breaks and course notes. Special discounts exist for two or more participants from the same company.

Upon receipt of intent to register, **further information** will be sent regarding payment options.

CANCELLATION

An administration fee of 15% will be charged for cancellations received before May 31, 2004. **There will be no refunds after that date.**

COURSE NOTES

The course notes have recently been updated and expanded and are included in the cost of registration. Copies are available for purchase by non-participants for 500 Euros. Notes will be given to participants at 8:50 am just before lectures start.

RECEPTION

An informal reception and wine and cheese welcoming party will be held on Sunday evening (8:00 pm), June 6, 2004. The reception will be followed by dinner.

HOTEL AND TRANSPORTATION

Information about the hotel and transportation will be given to the participants later in May 2004. For questions or special requests, please email the Course Director, Professor A. Penlidis at penlidis@cape.uwaterloo.ca

Further information on this course or other courses may be obtained from Professor A. Penlidis at:

Institute for Polymer Research
Department of Chemical Engineering
University of Waterloo
Waterloo, Ontario, Canada N2L 3G1
Tel: 519/888-4567 ext. 6634
Fax 519/746-4979
Eml: penlidis@cape.uwaterloo.ca
WEB www.ipruw.com