4th ICPC Short Course on Polyolefin Characterization Techniques Agenda

4th International Conference on Polyolefin Characterization
October 21 - 24, 2012, The Woodlands, TX, U.S.A.

ICPC

Sunday, October 21st, 2012

7:30 - 8:20	Registration
8:20 - 8:30	Opening and Introduction to the Short Course

Introduction to Polyolefin Microstructure — *João Soares*

8:30 - 9:15	· **Molecular Weight Distribution.** · **Chemical Composition Distribution.** · **Bivariate Distribution** (Long Chain Branching, Block Co-polymers…). · **Microstructure - Properties.**

GPC Basics — *Wallace Yau*

9:15 - 10:15	· **Molecular Weight Average Concept.** · **Basic GPC Mechanism.** · **GPC Retention.** · **Band Broadening.** · **Different ways to do Calibrations.** · **Basics on IV concept.** · **Universal Calibration.** · **Basic LS.** · **Mark Houwink (MH) Plot.**
10:15 - 10:30	Coffee Break

GPC - Practical Considerations — *David Gillespie*

10:30 - 11:30	· **System Considerations:** - Choosing an Appropriate Column Set. - Pump Degradation. - Thermal Stability. - Data Acquisition. · **Sample Considerations:** - Solvent and Solvent Preparation. - Sample Preparation. - Polymer Degradation. · **Calculation Considerations:** - Flow rate analysis. - Mass analysis. - Viscosity analysis. - MW analysis. - Copolymer analysis.
	· **System Set Up:** - Detector Calibration. - Detector Alignment and Peak Position. - Hamielec Band Broadening Method. - Systematic Method. - Band Broadening Corrections.

GPC - Applications in Polyolefins — *Wallace Yau*

11:30 - 12:15	· **Commercial Polymers:** - HDPE/LDPE/LLDPE/Metallocenes. - iPP/ICP/RCP. · **Questions regarding Precision and Accuracy.** · **Questions regarding cc-GPC MW, LS-MW, UC-MW.** · **LCB analysis:** - MH Plot with IR5 SCB Correction. - LS Conformation Plot. - LCBI Methodology with Rheology. · **MWD and Rheology.** · **Practical Examples and Applications:** - A case of a Dual Reactor PE. - A case of Polymer Blend. - Tubular and Autoclave LDPE. - Reactive Extrusion. - PAO Samples. - Polymer Additives. - Block Copolymers. - EP Composition by IR5 and MH Plot.
12:15 - 13:30	Lunch

TREF, CRYSTAF and CEF — *Benjamin Monrabal*

13:30 - 15:00	· **Importance of the CCD.** · **Analytical Techniques.** · **Fundamentals of Crystallization techniques.** · **TREF.** · **CRYSTAF.** · **CEF.** · **Molar Mass Dependence.** · **Calibration and Calculations.** · **Kinetic Effects and Co-crystallization.** · **Hyphenated Techniques.** · **Applications.**
15:00 - 15:15	Coffee Break

High Temperature HPLC of Polyolefins — *Willem Degroot*

15:15 - 16:15	· **Fundamentals of Liquid Chromatography.** · **Classic Liquid Chromatography of Polymers – Examples.** · **Crystallization Elution Fractionation (CEF).** · **Background of HT-LC Development.** · **High Temperature Solvent Gradient Interaction Chromatography.** · **High Temperature Thermal Gradient Interaction Chromatography.** · **Applications and New Developments.** · **References.**

Cross-Fractionation Techniques — *Alberto Ortín*

16:15 – 17:00	· **Importance of the Bivariate Distribution.** · **Hyphenated techniques.** · **Preparative Fractionation followed by Analytical techniques.** · **2D - HPLC × SEC Instrumental considerations** · **Analytical Cross Fractionation.** - TREF x GPC technique description. - Calibration and data processing. - Application examples: blends, copolymers, HDPE, EP. - Additional detectors: IR and LS.

Preparative Fractionation — *Benjamin Monrabal*

17:00 - 17:45	· **Importance of Preparative Fractionation.** · **Solvent–Non solvent (Molecular Weight Fractionation).** · **Dissolution Fractionation (Composition Fractionation TREF).** · **Crystallization Fractionation (Composition Fractionation CRYSTAF).** · **TGIC Fractionation.** · **Characterization of an unknown sample.**
17:45	**Open Discussion**