POLYOLEFIN CHARACTERIZATION

SHORT COURSE PROGRAM

September 14th, 2008, *The Westin Valencia* –Turia Room-.

7:15 – 8:30	**Registration and Breakfast**	

8:30 – 9:15	**Introduction to Polyolefin Microstructure**	**João Soares**

- Molecular Weight Distribution
- Chemical Composition Distribution
- Bivariate Distribution (Long Chain Branching, Block co-polymers…)

Molecular Weight Distribution

9:15 – 10:15	**GPC - Basics**	**Wallace Yau**

- 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 Plot

10:15 – 10:30	**Coffee break**

10:30 – 11:15	**GPC – Practical Considerations**	**David Gillespie**

- System Considerations:
    - Choosing an Appropiate Column Set
    - Pump Degradation
    - Thermal Stability
    - Data Acquisition
- Sample Considerations:

- Solvent Preparation
- Sample Preparation
- Polymer Degradation
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• Calculation Considerations:
- Flow rate Analysis
- Mass Analysis
- Viscosity Analysis
- MW Analysis
- Copolymer Analysis
- Band broadening corrections

| 11:15 – 12:15 | **GPC – Applications in Polyolefins** | **Willem deGroot** |

- Commercial Polymers:
  - HDPE/LDPE/LLDPE/Metallocenes
  - iPP/ICP/RCP
- System Set Up:
  - Detector Alignment - Peak Position
  - Hamielec Band Broadening Method
  - Systematic Method
- Detector Calibration
- LCB Analysis
- Relationship Between Mw and Rheology
- Practical Examples and Applications

| 12:15 – 13:30 | **Lunch at *Rosmarino* Restaurant** |

Chemical Composition Distribution

| 13:30 – 15:00 | **TREF / CRYSTAF / CEF** | **Benjamin Monrabal** |

- Fundamentals of Crystallization Techniques
- TREF
- CRYSTAF
- Calibration and Calculations
- Kinetic effects
- Hyphenated techniques
- Applications
- CEF and High Throughput analysis

15:00 – 15:15   **Coffee break**

Bivariate Distribution

15:15 – 16:00   **Cross Fractionation**   **David Gillespie**

- System Considerations:
    - Types of Crossfractionation
    - Crossfractionation Modes
    - Resolution in 2-dimensions

- Calculation Considerations:
    - MW and Crystallinity reconstruction
    - Calibration of 2-D system
    - 3D Analysis

- Practical Examples:
    - Blends
    - Copolymers

16:00 – 16:30   **Preparative Fractionation**   **Benjamin Monrabal**

- Solvent – Non solvent   (Molecular weight Fractionation)
- Dissolution Fractionation (Composition Fractionation TREF)
- Crystallization Fractionation (Composition Fractionation CRYSTAF)

16:30 – 17:00   **Open Discussion**

Closing Session