

8th ICPC Technical Program

May 22-24, 2023

The Westin Valencia Hotel. Valencia, Spain.

SHORT COURSE		<i>La Exposición Ballroom</i>
Sunday		May 21, 2023
7:30 - 8:15	Registration Short Course (<i>Main Entrance Hall</i>)	
8:15 - 17:30	Short Course on Polyolefin Characterization Techniques (<i>La Exposición</i>)	
CONFERENCE Registration and Welcome (<i>Sunday, May 21st</i>)		
18:00 - 19:00	Conference registration (<i>Main Entrance Hall</i>)	
19:00	Welcome Cocktail (<i>Garden</i>)	

CONFERENCE PROGRAM		<i>(La Exposición Ballroom)</i>
Monday		May 22, 2023
7:15 - 18:00	Registration (<i>Main Entrance Hall</i>)	
8:30 - 8:45	Opening Remarks	
Session 1: Separation		<i>Moderator: Colin Li Pi Shan</i>
8:45 - 9:30 <i>Keynote Speaker</i>	Benjamín Monrabal <i>Polymer Char (Spain)</i> A review of crystallization techniques for the analysis of the CCD in polyolefins from a personal perspective. Latest research in Dynamic Crystallization.	
9:30 - 10:00	Sara Ronca, Joep Vanderfeesten , Claudiu Melian, Miguel Cordova, Anthony Ndiripo <i>SABIC (The Netherlands)</i> A combined SSA – NMR - HT 2DLC approach to elucidate compositional differences in impact PP materials	
10:00 - 10:30	Coffee Break (<i>Hall</i>)	
Session 2: Sustainability		<i>Moderator: Harald Pasch</i>
10:30 - 11:00 <i>Invited Speaker</i>	Robert Brüll , Pia Klingenberg, Jan-Hendrik Arndt, Frank Malz <i>Fraunhofer Institute LBF (Germany)</i> An analytical toolbox to qualify and compare recyclates	
11:00 - 11:30	Colin Li Pi Shan ¹ , Harley Brown ¹ , Evelyn Auyeung ¹ , Stephanie Barbon ¹ , John Torkelson ² , Boran Chen ² , Logan Fenimore ² ¹ Dow (USA), ² Northwestern University (USA) Recent investigations into thermally reversible crosslinked polyolefins	
11:30 - 12:00	Peter Montag <i>Polymer Standard Services, PSS (Germany)</i> An approach to sustainability: The characterization of polyolefin recyclates	

Monday		May 22, 2023
Session 3: Separation Pt. 2		<i>Moderator: Harald Pasch</i>
12:00 - 12:30 <i>Invited Speaker</i>	Thippaya Pathaweeisariyakul , Lalita Bangtai <i>SCG Chemicals (Thailand)</i> Effect of operating conditions on Chemical Composition Distribution (CCD) in polyolefins in HT-Crystallization Elution Fractionation technique	
12:30 - 13:00	Rongjuan Cong , Cherry Hollis, Kimberly Bailey, Tim Hill, Paul Balding, Jingwei Fan, and Judith Bautista, Albert Parrott, Michael Cheatham <i>Dow (USA)</i> New technologies developed recently to quantify comonomer distribution of polyolefin materials	
13:00 - 14:00	<i>Lunch (Garden)</i>	
		<i>Moderator: Alberto Ortín</i>
14:00 - 14:30	Andreas Albrecht , Ljiljana Jeremic <i>Borealis Polyolefine (Austria)</i> Characterization of the chemical heterogeneity of complex PP compounds	
14:30 - 15:00	Laura Santonja , Benjamin Monrabal <i>Polymer Char (Spain)</i> Advances in characterization of polyolefins by column-supported crystallization techniques	
15:00 - 15:30	Jan-Hendrik Arndt , Tibor Macko, Robert Brüll <i>Fraunhofer Institute LBF (Germany)</i> Specific solutions for specific problems – Analytical options beyond the standard (HT-GPC, TREF, DSC, ...)	

POSTER SESSION (Monday)		(Posters Area)
15:30	Posters Area Visit (<i>open until the end of the Conference on Wednesday</i>).	
	<i>Coffee Service (Posters Area)</i>	

5K Run /Walk Valencia Experience in the Old River Bed (Monday)	
18:00	Walk group leaves from the Westin Hotel
18:30	Run group leaves from the Westin Hotel
19:30	Regional Snacks & Refreshments at the finish line

Tuesday		May 23, 2023
Session 4: Separation Pt. 3		Moderator: Benjamin Monrabal
8:45 - 9:30 <i>Keynote Speaker</i>	Paul Eselem Bungu ¹ , Anthony Ndiripo ² , Harald Pasch ¹ ¹ Institute of Active Polymers, Helmholtz-Zentrum Hereon (Germany), ² SABIC Analytical Science Europe (The Netherlands) 20 years of high-temperature interaction chromatography – A personal perspective	
9:30 – 10:00	Tibor Macko , Subrajeet Deshmukh, Jan-Hendrik Arndt, Robert Brüll The Fraunhofer Institute LBF (Germany) Chemical composition distribution of amorphous or semicrystalline polyolefins is unknown? Liquid chromatography gives answers.	
10:00 - 10:30	Coffee Break (Hall)	
Session 5: Morphology		Moderator: Rongjuan Cong
10:30 - 11:00 <i>Invited Speaker</i>	Rufina Álamo , S.F. Marxsen, X. Zhang, D. Song, C. Germosen Department of Chemical and Biomedical Engineering, Florida State University (USA) Kinetic traps in the crystallization of sustainable polyethylene-like materials	
11:00 - 11:30	Ralf Kleppinger ¹ , Rieky Steenbakkens ² , Harm Caelters ² ¹ DSM Material Science & SABIC Technology Center (The Netherlands), ² SABIC Technology Center (The Netherlands) Challenges during design of thermal fractionation protocols for poly(propylene)-co-ethylene resins	
11:30 - 12:00	Lanti Yang ¹ , Dolinda van der Pluijm ¹ , Cristina Rodriguez Iglesias ² , Christelle Grein ² ¹ Analytical Science Europe, Corporate Technology & Innovation, SABIC (The Netherlands), ² Global Technology Polyolefin Compounds, SABIC (The Netherlands) Exploring the morphology of polypropylene compounds	
12:00- 12:30	Dario Cavallo ¹ , Enrico Carmelli ² , Gottfried Kandioller ² , Markus Gahleitner ² , Alejandro J. Müller ² , Davide Tranchida ² ¹ University of Genoa (Italy), ² Borealis Polyolefine (Austria) Continuous cooling curve diagrams of isotactic-polypropylene/polyethylene blends: mutual nucleating effects under fast cooling conditions	
12:30 - 13:00	Minqiao Ren , Xuanbo Liu ¹ , Xuefei Jia ¹ , Chunxia Luo ¹ , Juan Li ¹ , Longgui Zhang ¹ , Rufina G. Alamo ² ¹ SINOPEC Beijing Research Institute of Chemical Industry (China), ² FAMU-FSU College of Engineering (USA) Memory of crystallization in the melt of commercial linear low density polyethylenes processed in an open twin-screw extruder	
13:00- 14:00	Lunch (Garden)	
Session 6: Structure – Properties		Moderator: Rufina Álamo
14:00 - 14:30 <i>Invited Speaker</i>	Jesús Nieto ¹ , Anna Helgert ¹ , Sylvie Vervoort ² , Jaap Den Doelder ² , Kenneth Kearn ³ Dow (¹ Spain, ² The Netherlands, ³ USA) Interaction between molecular composition and blown film processing conditions of Polyethylene	

Tuesday		May 23, 2023
Session 7: Modeling		Moderator: Rufina Álamo
14:30 - 15:00	Siripon Anantawaraskul¹ , Kett Khayanying ¹ , João B. P. Soares ² ¹ Kasetsart University (Thailand), ² University of Alberta (Canada) Cross-Fractionation Characterization (CFC) between Temperature Rising Elution Fractionation and Gel Permeation Chromatography for ethylene/1-olefin copolymers: model development	
15:00 - 15:30	Vasileios Touloupidis , Andreas Albrecht Borealis (Austria) Exploring the constraints for random macromolecular configuration in space	
15:30 - 15:45	Coffee Break (Hall)	

15:45	Vendor Session
15:45 - 16:00	Polymer Char
16:00 - 16:15	Tosoh Bioscience
16:15 - 16:30	Agilent Technologies
16:30	UHMWPE Discussion Panel Chaired by Dr. Rongjuan Cong
18:00	Vendors Cocktail (Exhibitors Area)

Wednesday		May 24, 2023
Session 8: Sustainability Pt.2		Moderator: Robert Brüell
8:30 - 9:00 <i>Invited Speaker</i>	Michael Fischlschweiger¹ , Zengxuan Fan ¹ , Leif Steuernagel ² ¹ Institute of Energy Process Engineering and Fuel Technology, Clausthal University of Technology (Germany), ² Institute of Polymer Materials and Plastics Engineering, Clausthal University of Technology (Germany) The role of cross-fractionation chromatography in the context of the development of mechanochemical polymer recycling	
9:00 - 9:30	Juan F. Vega¹ , V. Souza-Egipsy ¹ , Teresa Expósito ² , Beatriz Paredes ² , Víctor Cruz ¹ , Javier Ramos ¹ ¹ Institute for the Structure of Matter, CSIC (Spain), ² ESCET, King Juan Carlos University (Spain) The key role of polyolefins for the design of recyclable packaging multilayers	
9:30 - 10:00	Gemma Buron-Moles¹ , Virginie Vandenbossche ² , Nathalie Gorret ¹ , Xavier Cameleyre ¹ , Stephane Guillouet ¹ ¹ Toulouse Biotechnology Institute, TBI(France), ² LCA École nationale supérieure des ingénieurs en arts chimiques et technologiques (France) A solution for plastic waste pollution - SOLFORPLAS	
10:00 - 10:30	Coffee Break (Hall)	

Wednesday		May 24, 2023
10:30 - 11:00	Rafael Juan Rodríguez¹ , Aymara Blanco Romero ² , Beatriz Paredes Martinez ² , Carlos Domínguez Vizcaya ¹ , Rafael Ángel García Muñoz ² ¹ Polymer Technology Laboratory, King Juan Carlos University (Spain), ² Chemical and Environmental Engineering Group, King Juan Carlos University (Spain) Evaluation of thermal, spectroscopic and compositional methodologies for quality control of recycled HDPE resins	
Session 9: Spectroscopy		Moderator: Thippaya Pathaweeisariyakul
11:00 - 11:30 <i>Invited Speaker</i>	Zhe Zhou Dow (USA) New NMR technologies developed recently for polyolefin characterization	
11:30 - 12:00	Sander Niessen , Martin van Duin, Peter Meijers, Gerard van Doremaele, Alexandra Berthoud ARLANXEO Technology & Sustainability (The Netherlands) A study on polymer microstructure of EPDM with different catalyst systems	
Session 10: Rheology		Moderator: Thippaya Pathaweeisariyakul
12:00- 12:30	Yingxin Liu , Jacques Tacx SABIC (The Netherlands) Nonlinear 2-dimensional rheology for long chain branching semi-quantification in polyethylene	
12:30 - 13:00	Andrés Cardil¹ , Sandeep Garrepally ² , Olivier Lhost ² , Juan Francisco Vega ¹ ¹ Institute for the Structure of Matter, CSIC (Spain), ² TotalEnergies OneTech (Belgium) Use of non-linear viscoelastic properties to characterize the polyethylene long chain branching topology	
13:00 - 13:20	Final Remarks	
13:20 - 14:30	Lunch and Goodbye (Garden)	

8th ICPC Poster Presentations

May 22, 15:30h

Posters Area

The Westin Valencia Hotel. Valencia, Spain.

Note: the poster number will be assigned in the upcoming days

- 1. Development of an analytical approach to characterize PP based recyclates by CRYSTEX technology**
Andreas Albrecht¹, Ljiljana Jeremic¹, Pilar del Hierro², Pia Wolfger¹
¹Borealis Polyolefine (Austria), ²Polymer Char (Spain)
- 2. Tailor-making chain microstructures of Ethylene/1-Butene copolymers using machine learning**
Orathai Amnuaykijvanit, Kett Khayanying, Siripon Anantawarasakul, Thanawin Rakthanmanon
Kasetsart University (Thailand)
- 3. Comprehensive analysis of Low-Density Polyethylene using analytical methods**
Jan-Hendrik Arndt¹, Tibor Macko¹, Subrajeet Deshmukh¹, Masud Monwar², Youlu Yu²,
Robert Brüll¹
¹Fraunhofer Institute LBF (Germany), ²Chevron Phillips Chemical Company (USA)
- 4. Cloud Point temperature investigations – key information about slurry polymerization**
Jan-Hendrik Arndt¹, Tibor Macko¹, Francisco Pérez², Robert Brüll¹
¹Fraunhofer Institute LBF (Germany), ²SABIC Technology & Innovation (The Netherlands)
- 5. Characterization of maleic anhydride functionalized polyolefins with HT-GPC-IR6 and HT-GPC-UV**
Jan-Hendrik Arndt¹, Tibor Macko¹, Henk Verhoogt², Joep Vanderfeesten², Robert Brüll¹
¹Fraunhofer Institute LBF (Germany), ²SABIC Technology & Innovation (The Netherlands)
- 6. Recycled HDPE from milk bottles: Cross-contamination problems and possible solutions**
Aymara Blanco Romero¹, Rafael Juan Rodríguez¹, Carlos Domínguez Vizcaya¹, Beatriz Paredes¹
Martínez¹, Rafael A. García- Muñoz¹
¹King Juan Carlos University (Spain)
- 7. Deconvolution of polymerization kinetics and polymer microstructures for Ethylene/1-Olefin copolymers produced from two-reactor system**
Wannida Boopphakome¹, Tamed Chayrattanoj¹, Siripon Anantawarasakul¹, João B. P. Soares²
¹Kasetsart University (Thailand), ²University of Alberta (Canada)
- 8. Measurement of the intrinsic viscosity of polyolefins and PET by IVA**
Olivier Boyron¹, Alberto Ortín², Pilar del Hierro², Manel Taam¹, Olivier Boulan¹, Thomas Soullié¹
¹CNRS Lyon (France), ²Polymer Char (Spain)
- 9. Chemical Composition of LLDPE using raman spectroscopy and chemometrics**
Olivier Boyron¹, Sofiane Ferchichi², Stéphane Lebras³, Anaud Di Bitetto³
¹CNRS Lyon (France), ²IFPEN (France), ³Thermofisher (France)
- 10. Characterization of entanglement of UHMWPE**
Olivier Boyron, Olivier Boulan, Roberta Lopes do Rosari, Manel Taam
CNRS Lyon (France)

- 11. Chain Microstructures of Olefin Block Copolymers (OBCs): theoretical model and its applications in materials design**
Tamaned Chayrattanaroj¹, Sompob Buaparungsri¹, Suwicha Sottesakul¹, Poramet Buakrong¹, Siripon Anantawaraskul¹, João B. P. Soares²
¹Kasetsart University (Thailand), ²University of Alberta (Canada)
- 12. Unlocking superior properties in Polypropylene/Polyethylene Terephthalate (PP/PET) blends using reactive compatibilization**
Sebastián Coba-Daza¹, Itziar Otaegi², Nora Aramburu², Gonzalo Guerrica-Echeverria², Georg Ramer³, Lourdes Irusta², Alba Gonzalez², Dario Cavallo⁴, Davide Tranchida⁵, Alejandro J Müller²
¹Basque Country University- Borealis Polyolefine (Spain-Austria), ²Basque Country University (Spain), ³TU Wien (Austria), ⁴University of Genova (Italy), ⁵Borealis Polyolefine (Austria)
- 13. Development of an in-line filter for analysis of complex polyolefin compounds with CRYSTEX technique and comparison with off-line filtration**
Pilar del Hierro¹, Ljiljana Jeremic², Andreas Albrecht²
¹Polymer Char (Spain), ²Borealis Polyolefine (Austria)
- 14. Automatic differential dual capillary viscometer for low temperature measurement of PET and other polymers**
Pilar del Hierro
Polymer Char (Spain)
- 15. A novel approach for evaluating the suitability of non-chlorinated solvents for liquid adsorption chromatography of polyolefin elastomers**
Subrajeet Deshmukh¹, Jan-Hendrik Arndt¹, Tibor Macko¹, Raffaele Bernardo², Gerard van Doremaele², Robert Brüll¹
¹Fraunhofer Institute LBF (Germany), ²Arlanxeo (The Netherlands)
- 16. Application of high-temperature size exclusion chromatography coupled with dual detection for measuring the distribution of unsaturation in EPDM terpolymers**
Subrajeet Deshmukh¹, Jan-Hendrik Arndt¹, Tibor Macko¹, Raffaele Bernardo², Sander Niessen², Robert Brüll¹
¹Fraunhofer Institute LBF (Germany), ²Arlanxeo (The Netherlands)
- 17. Hyphenating CEF and MALS detector: Challenges and overcomes**
Manoela Ellwanger
Braskem (Brazil)
- 18. Advances in Dynamic Crystallization technique for the characterization of the Chemical Composition Distribution.**
Tonica González, Laura Santonja, Jean Paul Soliva, Benjamín Monrabal
Polymer Char (Spain)
- 19. Enhancing Crystallization Rate of Polyethylene in Immiscible blends with Polypropylene: The Role of Self-Nucleation of Polypropylene and Polyethylene Chain Regularity**
Magdalena Góra¹, Sebastián Coba-Daza², Enrico Carmeli³, Davide Tranchida³, Andreas Albrecht³, Alejandro J Müller², Dario Cavallo¹
¹Università degli studi di Genova (Italy), ²Basque Country University (Spain), ³Borealis Polyolefine (Austria)
- 20. Simultaneous and fast determination of key design parameters of PP compounds by Crystex**
Ljiljana Jeremic, Daniela Mileva, Andreas Albrecht, Pia Wolfger
Borealis Polyolefine (Austria)

- 21. Structural correlation of branching estimation with mechanical, optical and thermal characteristics of mLLDPE**
Sangeetha Karthikeyan, Virendra Kumar Gupta
Reliance Industries (India)
- 22. Processing-Dependent Polymer Chain Orientation In HDPE Pipes After Biaxial Drawing In The Solid-State**
Ralf Kleppinger¹, Ajay Taraiya²
¹*DSM Material Science & SABIC Technology Center (The Netherlands)*, ²*SABIC Technology Center (The Netherlands)*
- 23. Novel approaches to compositional analysis of mixed polyolefins for recycling applications**
Pia Klingenberg¹, Nigel D.J. Visser², Floris J.A. Gerritsen², Jan-Hendrik Arndt¹, Robert Brüll¹
¹*Fraunhofer Institute LBF (Germany)*, ²*Veridis Technologies (The Netherlands)*,
- 24. Electrifying the world of polyolefins: exploring the electrical properties of these versatile materials**
Dirk Lellinger
Fraunhofer Institute LBF (Germany)
- 25. GPC-IR analysis of PET and PE-PET blends, a new application field of filter-based IR detector**
Esther López, Alberto Ortín, Benjamín Monrabal
Polymer Char (Spain)
- 26. Supporting the sustainability of polyolefins by developing analytical methods for recycled materials**
Esther López, Alberto Ortín, Benjamín Monrabal
Polymer Char (Spain)
- 27. Revealing non-reproducibility in the synthesis of LLDPE using high-temperature size exclusion chromatography coupled with an infrared detector (HT-SEC-IR5)**
Hamza Mahmoud Aboelanin¹, Subrajeet Deshmukh¹, Jan-Hendrik Arndt¹, Stepan Podzimek², Tibor Macko¹, Robert Brüll¹
¹*Fraunhofer Institute LBF (Germany)*, ²*Pardubice University (Czech Republic)*
- 28. Characterization of chemical composition distribution of ethylene-1-hexene copolymers, which form solution at room temperature**
Tibor Macko¹, Subrajeet Deshmukh¹, Jan-Hendrik Arndt¹, Youlu Yu², Masud Monwar², Robert Brüll¹
¹*Fraunhofer Institute LBF (Germany)*, ²*Chevron-Phillips Chemical (USA)*
- 29. Effect of SCBs on Mechanical Performance of Pipe Grade HDPE Exposed to Chlorinated Water**
Susan Mantell¹, Andrew Hagen¹, Ebuka Ezugwu¹, Mrinal Bhattacharya¹, Alberto Ortín², Esther López²
¹*University of Minnesota (USA)*, ²*Polymer Char (Spain)*
- 30. Reduction of solvent consumption in polyolefin characterization techniques**
Nuria Mayo, Laura Santonja, Alberto Ortín
Polymer Char (Spain)
- 31. Moving from TCB to oDCB in CRYSTEX QC**
Francisco Sampler, Jesús Montesinos, Pilar del Hierro, Alberto Ortín, B. Monrabal
Polymer Char (Spain)

- 32. Automated measurement of intrinsic viscosity of synthetic polymers using new versatile automated instrumentation**
Alba Cárdenas, Pilar del Hierro, Olivier Boyron, Alberto Ortín
Polymer Char (Spain)
- 33. Application of Machine Learning on Estimation of Propylene Polymerization Conditions in a Two-Reactors System**
Jirayu Pornjaturawit, Siripon Anantawaraskul
Kasetsart University (Thailand)
- 34. A combined SSA – NMR - HT 2DLC approach to elucidate compositional differences in impact PP materials**
Sara Ronca, Joep Vanderfeesten, Claudiu Melian, Miguel Cordova, Anthony Ndiripo
SABIC Technology & Innovation (The Netherlands)
- 35. Mathematical modeling of High Temperature Thermal Gradient and Solvent Gradient Interaction Chromatography (HT-TGIC and HT-SGIC) of Polyethylene and Ethylene/1-Olefin copolymers**
Worapath Sirithong¹, Siripon Anantawaraskul¹, Subrajeet Deshmukh², Jan-Hendrik Arndt², Robert Brüll², João B. P. Soares³
¹*Kasetsart University (Thailand)*, ²*Fraunhofer Institute LBF (Germany)*, ³*University of Alberta (Canada)*
- 36. Fast evaluation of process stabilization by means of online-rheology**
Bernd Steinhoff, Hans Kothe, Elke Metzsch-Zilligen, Robert Brüll
Fraunhofer Institute LBF (Germany)
- 37. Characterization of POE fractions by Cryo-TREF**
Qiansu YIN
ExxonMobil Asia Pacific Research & Development Co. Ltd. (China)
- 38. Identification of Polyethylene degradation at high gas pressures using cross fractionation chromatography**
Jana Zimmerman, Michael Fischlschweiger
Univ. Clausthal (Germany)