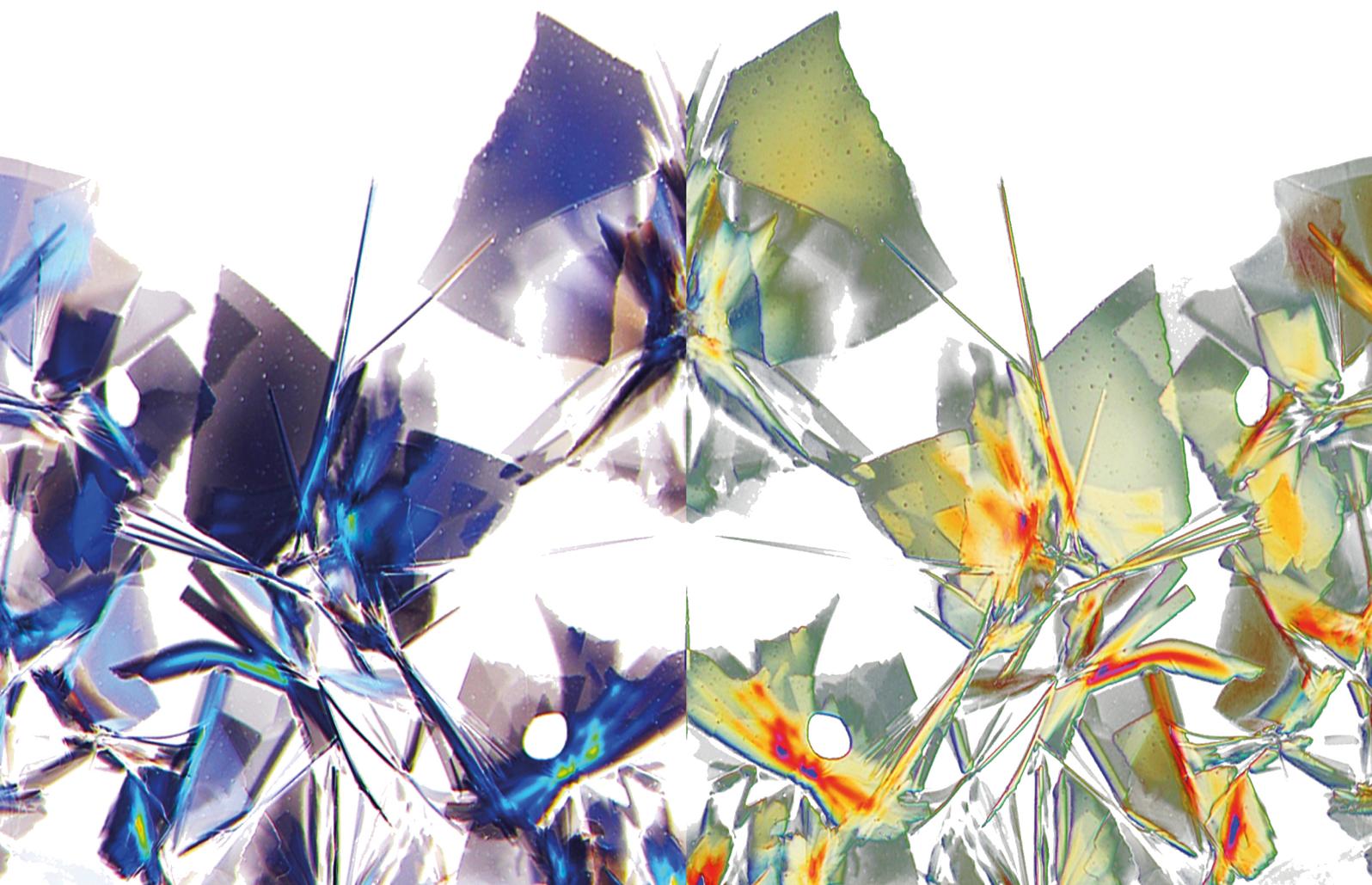


Polymer Meeting 14

Graz University of Technology

Aug. 30-Sept. 2, 2021

BOOK OF ABSTRACTS



Impress

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Foreword

Welcome to the 14th Polymer meeting PM14!

We cordially welcome you to the Graz University of Technology. It is a great honor and pleasure to us to be the host of the 14th polymer meeting.

The 14th Polymer Meeting in Graz is the continuation of the very successful three river DVSPM-conference series (Danube-Vltava-Sava-Polymer meeting) which became one of the most important meetings in polymer science in Central Europe, as well as on the predecessor conferences “Austrian Slovenian Polymer Meetings” and “Advances in Polymer Science & Technology”. However, the origin can be traced back to the Austrian Polymer Meetings, which started more than 25 years ago in Seggau, very close to Graz. Polymers are everywhere in today’s life and find applications in packaging, storage, buildings, agriculture, transportation, mobility, electronics, medicine, energy and many more.

The 14th Polymer Meeting in Graz will address all major aspects of polymer science spanning from novel synthetic approaches, the creation of new functional polymers, the characterisation of macromolecules and polymers, innovative processing technologies, polymer testing, and polymers@work in many applications, but will also include topics of renewable polymers, recycling and sustainability aspects.

In memoriam of Prof. Klaus Hummel, who passed away on May 15th 2021 the Klaus Hummel prize will be established and awarded for the most outstanding contributed lecture.

We are very thankful for your support in these difficult times caused by the Covid-19 pandemic. Thus, for us it is important to restart “normal” academic life. We hope that you enjoy this conference and get inspired by the presentations and vivid discussions within the polymer community.

Sincerely,

Gregor Trimmel,

on behalf of the organizing committee

Wednesday, Sept. 1, 2021 – Afternoon Session

	P1 // Chairman: D. Pahovnik	P2 // Chairwoman: S. Hild
13:30-13:45	CL-A20: <i>Biomimetic models of the aortic arch for surgical planning</i> Rupert Kargl	CL-B20: <i>Software-based simulation and method optimization for polymer- and nanoparticle separations by Field-Flow Fractionation</i> Gerhard Heinzmann
13:45-14:00	CL-A21: <i>Balancing strength and ductility – Tough and transparent nanopapers through mercerisation</i> Florian Mayer	CL-B21: <i>Effect of sequence blockiness on the retention behavior of gradient copolymers with various liquid chromatographic techniques</i> Blaž Zdovc
14:00-14:15	CL-A22: <i>Fully bio-based high-performance composite</i> Andrea Todorovic	CL-B22: <i>Degradation of monomers during hydroxyl-terminated polyester synthesis and their influence on the polymer structure</i> Viktoria Kreuzer
5 min	Break	
14:20-14:35	CL-A23: <i>Solvent and operating condition effects on the reaction rates of typical lignin bond cleavage during organosolv pretreatment</i> Tina Ročnik	CL-B23: <i>Differential Scanning Calorimetry with pressure cell for determining the polymer crystallinity changes in presence of gaseous penetrant</i> Martina Kukrálová
14:35-14:50	CL-A24: <i>Bio-Pulping: Delignification and hybridisation of lignocellulosic material utilising fungi</i> Kathrin Weiland	CL-B24: <i>Sulfonation of unsaturated polyester – analytical challenges due to solubility change</i> Klara M. Saller
14:50-15:05	CL-A25: <i>Bio-based polymers for transport packaging – possibilities & limitations</i> Nadine Wild	CL-B25: <i>Integrative material characterization of crystalline nanocellulose reinforced filaments for fused filament fabrication</i> Helena Weingrill
30 min	Coffee	
Lecture room P1 // Chairman: W. Kern		
15:35-16:00	IL-23: <i>Impact of counterions on the propagation rate coefficient in radical polymerization of ionized monomers</i> Igor Lacík	
16:00-16:25	IL-24: <i>Improving the quality of recycled polymer waste through advanced mechanical sorting</i> Gernot Oreski	
16:25-16:50	IL-25: <i>Engineering catalytic conversion pathways of lignocellulose to functional alcohol or carboxylic monomers</i> Blaž Likozar	
16:50-17:15	IL-26: <i>Modeling macro-effects of micro-structures</i> Martin Pletz	
17:15-17:40	IL-27: <i>Polyheterocyclics by hydrothermal synthesis</i> Miriam M. Unterlass	

CONTRIBUTED LECTURES



Bio-based polymers for transport packaging – possibilities & limitations

Nadine Wild,^a Michael Feuchter,^a Paul Anton Schindler,^b Anette Poczi,^b
Ille C. Gebeshuber,^c Maja Vasiljevic,^c Mark MacQueen,^d
Harald Pamminger,^e Andreas Brandstätter^f

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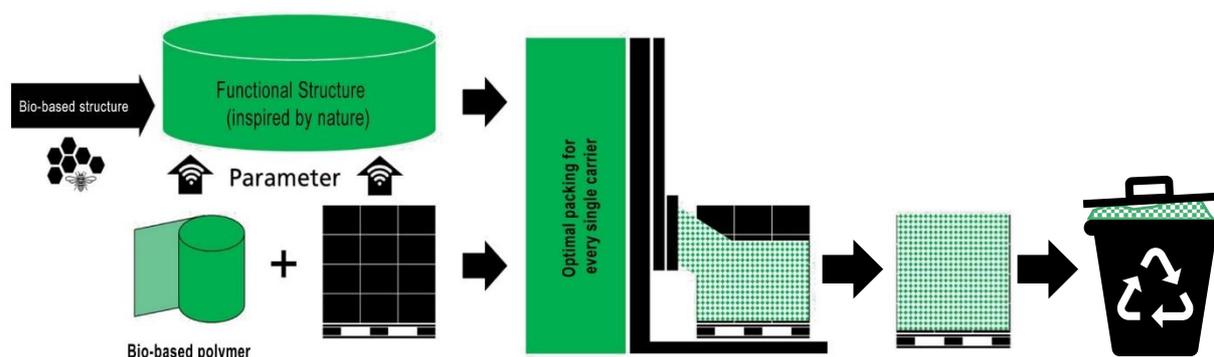
^c *Institute of Applied Physics, Vienna University of Technology, Wiedner Hauptstraße 8-10, A 1040 Vienna, Austria*

^d *AN-COR-TEK Ltd., Office Park 1, A 1300 Vienna Airport, Austria*

^e *Pamminger Verpackungstechnik Ges.m.b.H., Petzoldstrasse 24, A4020 Linz, Austria*

^f *Lenzing Plastics GmbH & Co KG., Werkstraße 2, A 4860 Lenzing, Austria*

Within the FTI initiative “Production of the future” the FFG project “EFFIE – efficient, bio-based and recyclable stretch wrap” works on an eco-design-study for stretch wrap. The whole product-life-cycle will be displayed, beginning from the material selection followed by a biomimetic design, the usage and completed by the end of life options for the stretch film.



Eco-Design study for a material-efficient, bio-based and recyclable stretch wrap

Within the material-selection process a material profile was created based on a systematic literature research and interviews with the project and LOI partners. This profile includes: besides mechanical, optical and thermal properties also sustainable aspects (bio-based content, biodegradability and recyclability). In the first step the mechanical properties (e.g. tensile strength, strain at break, stress retention) of 25 biopolymers were analysed and compared with the properties of a conventional stretch wrap. Due to the results 3 biopolymers were selected for further characterization. Which include optical, thermal and sustainable aspects and a large-scale test on an automatic pallet wrapping machine. The large scale-test should serve to evaluate: the behaviour of the bio-based stretch wrap during the winding process, the stress retention after the winding process, and the containment force of the bio-based stretch wrap. These results serve as a basis for the following biomimetic design process and the optimization of the bio-based material.

V akalopoulou, E.	P-34
Verdross, P.	CL-A19
W allner, G. M.	CL-B17, P-23, P-24, P-25, P-49, P-50, P-52
Wanghofer, F.	P-48
Weiland, K.	CL-A24, CL-A18
Weingrill, H.	CL-B25
Wiesbrock, F.	IL-22, P-6
Wild, N.	CL-A25, CL-A30
Wolff, R. J. B. A.	CL-A10
Wolfsgruber, N.	CL-B3, P-51
Woodward, R. T.	CL-B13, CL-B15
Y ousefi, N.	CL-B2
Z dovc, B.	CL-B21
Zojer, E.	CL-B14
Zuccalà, E.	P-28