

Frontiers in polymer science

5–8 May 2019, Budapest, Hungary

Programme

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Connecting the materials community



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Advanced precision synthesis	Merging polymer structure with dynamics	Polymer technology for solving societal challenges
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Programme Overview			
Sunday 5 May 2019			
14:30-16:00	Registration <i>Aula</i>		
16:00-17:30	Poster Session 1 with drinks reception <i>Aula/Mirror Corridor</i>		
Monday 6 May 2019			
08:30	Welcome and introductions, Leanne Mullen , Elsevier, UK		
08:40-10:40	[PL01] Stephen Z. D. Cheng , University of Akron, USA [PL02] Marc Hillmyer , University of Minnesota, USA [PL03] Sybrand van der Zwaag , TU Delft, The Netherlands		
10:40-10:45	Materials Today EPJ Award		
10:45-11:10	Coffee break <i>Aula/Mirror Corridor</i>		
11:10-12:30	Feature Speaker Presentations	Oral Presentations	Oral Presentations
12:30-13:30	Lunch <i>Aula/Mirror Corridor</i>		
13:30-15:10	Oral Presentations	Feature Speaker Presentations	Oral Presentations
15:10-15:40	Coffee break <i>Aula/Mirror Corridor</i>		
15:40-18:00	Oral Presentations	Oral Presentations	Feature Speaker & Oral Presentations
18:00-19:30	Poster Session 2 <i>Aula/Mirror Corridor</i>		
Tuesday 7 May 2019			
08:30-10:30	[PL04] Tanja Weil , Max Planck Institute for Polymer Research, Mainz, Germany [PL05] Christopher Barner-Kowollik , Queensland University of Technology, Australia [PL06] Sir J. Fraser Stoddart , Northwestern University, USA; Nobel Prize in Chemistry: Winner 2016		
10:30-11:00	Coffee break <i>Aula/Mirror Corridor</i>		
11:00-12:40	Feature Speaker Presentations	Oral Presentations	Oral Presentations
12:40-13:45	Lunch <i>Aula/Mirror Corridor</i>	13:00-13:45 <i>Room: Pátia</i> Materials Today Publishing Seminar	
13:45-15:25	Oral Presentations	Feature Speaker Presentations	Feature Speaker & Oral Presentations
15:25-16:00	Coffee break <i>Aula/Mirror Corridor</i>		
16:00-18:00	Oral Presentations	Oral Presentations	Oral Presentations
18:00-19:30	Poster session 3 <i>Aula/Mirror Corridor</i>		
19:30-22:00	Conference Dinner (ticket holders only)		
Wednesday 8 May 2019			
08:10-10:10	[PL07] Jian Ping Gong , Hokkaido University, Japan [PL08] Lei Jiang , Beihang University, China [PL09] Kookheon Char , SNU, Korea		
10:10-10:40	Coffee break <i>Aula/Mirror Corridor</i>		
10:40-12:30	Feature Speaker & Oral Presentations	Feature Speaker & Oral Presentations	Oral Presentations
12:30-13:20	Lunch <i>Aula/Mirror Corridor</i>		
13:20-16:20	Oral Presentations	Oral Presentations	Oral Presentations
16:20-16:30	Poster Prize Award and Close of Conference, 2019 Conference Chairs Stephen Z. D. Cheng , University of Akron, USA, Axel H.E. Müller , Johannes-Gutenberg-Universität Mainz, Germany Krzysztof Matyjaszewski , Carnegie Mellon University, USA Julius Vancso , University of Twente, The Netherlands		

	R. Suriyatem ^{*1} , R.A. Auras ² , C. Rachtanapun ³ , P. Rachtanapun ¹ , ¹ Chiang Mai University, Thailand, ² Michigan State University, USA, ³ Kasetsart University, Thailand
[P2.103]	Original synthesis and purification method for obtaining prePGS for biomedical applications M. Wrzecieonek*, P. Ruśkowski, A. Gadmoska-Gajadur, Warsaw University of Technology, Faculty of Chemistry, Poland
[P2.104]	Compatibilization and degradation of PLA/sisal fibers composites: Effect of a compatibilizer and a hydrolysis stabilizer J.F. Ablan, M.C. Takahashi, S.H.P. Bettini*, Federal University of São Carlos, Brazil
Poster Session 3 Tuesday 7th May 2019 18:00-19:30	
[P3.001]	Accelerated physical ageing of poly(1,4-cyclohexylenedimethylene-co-2,2,4,4-tetramethyl-1,3-cyclobutanediol terephthalate) E. Andersen ^{*1,2} , R. Mikkelsen ² , S. Kristiansen ² , M. Hinge ¹ , ¹ Aarhus University, Denmark, ² LEGO System A/S, Denmark
[P3.002]	Depolymerization of lactic acid oligomers into lactide: novel views on the features of mechanism V. Botvin*, A. Filimoshkin, National Research Tomsk State University, Russia
[P3.003]	Change the strength of climbing ropes in karst caves S. Mazina ^{1,2} , E. Chernovnenko ^{*1} , M. Kharlamova ¹ , ¹ Peoples' Friendship University of Russia, Russia, ² Lomonosov Moscow State University, Russia
[P3.004]	Catalytic reactions in the boundary between LDPE film and thin ZnO coating: termination and branching of the oxidation chain A.F. Hambardzumyan*, E.R. Arakelova ¹ , S.G. Aloyan ² , G.H. Torosyan ¹ , ¹ National Polytechnic University of Armenia, Armenia, ² Institute of General and Inorganic Chemistry, Armenia
[P3.005]	Air pollutant emissions from thermal decomposition of polymeric foundry binders using in metal casting A. Kmita*, A. Benko, A. Rocznik, M. Holtzer, AGH University of Science and Technology, Poland
[P3.006]	The enhancement of degradation rate induced by elongation and stiffening of polymeric backbone - path to novel linker for degradable polycations based on alkylated DABCO R. Kopiasz*, M. Szczepanczyk, D. Janczewski, Warsaw University of Technology, Poland
[P3.007]	Morphology and thermal degradation studies of PHB/acetetylated lignin foils A. Kovalcik ^{*1} , J. Kovar ¹ , V. Krzyzanek ² , M. Machovsky ³ , I. Marova ¹ , ¹ Brno University of Technology, Czech Republic, ² The Czech Academy of Sciences, Czech Republic, ³ Tomas Bata University in Zlin, Czech Republic
[P3.008]	Thermally induced cross-linking and decomposition of poly(vinyl alcohol) under influence of p-toluenesulfonic acid A. Michele ^{*1} , G.E.M. Tovar ^{1,2} , A. Southan ¹ , ¹ University of Stuttgart, Germany, ² Fraunhofer-Gesellschaft, Germany
[P3.009]	Study of additives migration on polymeric insulators used in compact power distribution networks G. Chagas, C. Erbetta, M. Silva, R. Freitas, R. Sousa*, Universidade Federal de Minas Gerais, Brazil
[P3.010]	Flame retardancy of flax fibre reinforced bioepoxy composites B. Szolnoki*, A. Aljamal, A. Vörös, G. Marosi, K. Bocz, Budapest University of Technology and Economics, Hungary
[P3.011]	Modulation of solid-state emission from organic fluorophore via controlled radical polymerization Y. Bao*, J.C. Leroux, ETH Zürich, Switzerland
[P3.012]	Thermo-reversible polymer matrices for stimuli-responsive luminescent solar concentrators B. Rigatelli ¹ , G. Fortunato ¹ , E. Tatti ¹ , G. Lyu ² , S. Turi ¹ , R.C. Evans ² , G. Griffini ^{*1} , ¹ Politecnico di Milano, Italy, ² University of Cambridge, UK
[P3.013]	Preparation and photo-function of silica balls enclosing lanthanide oxides nanoparticles S. Hattori*, R-H. Jin, Graduate School of Engineering, Kanagawa University, Japan

[P3.007]

Title:

Morphology and thermal degradation studies of PHB/acetylated lignin foils

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Abstract:

Poly(3-hydroxybutyrate) (PHB) is biopolymer with the advantages including bio-origin, biocompatibility, and biodegradability. Unfortunately, rheological and mechanical properties of PHB are influenced by the range of thermal degradation occurred during polymer processing. This work takes advantage of acetylated lignin reinforcing PHB composites that originate from grape bunches or seeds. Lignin was isolated by formic acid/ acetic acid. PHB/acetylated lignin composites were prepared by solution casting followed by thermoforming. The solubility and compatibility of lignin have been improved by acetylation. Neat PHB foil was very brittle reaching crystallinity of 70 %. Such high crystallinity causes high brittleness, which is not suitable for foils with packaging application. Lignin is a rigid highly cross-linked natural polymer consisting of phenylpropane units with no plasticizing effect. We will present that there is a high potential for preparation of PHB/PHA blends to improve the flexibility of PHB/acetylated lignin foils. The decrease of brittleness correlates with the lower crystallinity degree. However, loss in crystallinity negatively influenced the thermal stability of PHB/PHA foils. The admixture of 50% PHA decreased the onset of thermal degradation about 40°C. It was proved that the incorporation of acetylated lignin in the concentration of 1 – 10 wt% increased the thermal stability of PHB/PHA blends about 30 - 40°C. The results indicate that PHB/PHA/acetylated foils with modified crystallization and improved flexibility might be applied in single-use packaging. It can be concluded that lignin isolated from winery waste from South Moravian region can be utilized as the active additive, modifying the degradation process of PHB/PHA blends.

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The authors are grateful for the support of the the project SoMoPro (project No. 6SA18032). This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie, and it is co-financed by the South Moravian Region under grant agreement No. 665860.

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