



9th Meeting on

CHEMISTRY
& LIFE

for Sustainable Future

CONFERENCE PROGRAM

Dear Participants,

welcome to the Chemistry & Life Conference!

The **9th Meeting on Chemistry & Life**, with this year's theme "**for a Sustainable Future**," will take place at the Faculty of Chemistry, Brno University of Technology, on 12–13 September 2024. This year's conference is dedicated to exploring modern trends in sustainable chemistry, chemical and materials technology, and biotechnology.

Our primary goal is to provide a professional and social platform for experts, young scientists, and students from various chemical and technological fields to gather and share their knowledge, experiences, and ideas within the context of the conference's central themes.

As the conference motto suggests, this year's event aims to address the key aspects of chemistry and related sciences in the context of the pressing challenges faced by both the chemical industry and modern society at large. The main topics of the conference span a wide range of activities in chemistry and materials technology, environmental technology and biotechnology, and physical and applied chemistry. Consequently, the conference program is divided into two thematic sessions: (i) Waste Valorisation for a Sustainable Future: Chemistry, Biotechnology, and Materials, and (ii) Advanced Organic Materials and Technologies for a Sustainable Future. In addition to the main scientific program of the conference, the 2nd autumn workshop on functional organic materials for a sustainable future is being held under the auspices of the 9th Chemistry & Life meeting.

At Chemistry & Life, our aim is to foster connections between academics and industry professionals who share a strong commitment to sustainable chemical processes and technologies. With nearly 40 oral presentations and over 60 posters, we are proud to showcase the latest breakthroughs and trends in chemical research. This conference will serve as a platform for sparking discussions, sharing innovative ideas, and forging new relationships with experts from Europe and beyond.

We extend our heartfelt gratitude to our sponsors, whose unwavering support has been instrumental in the success of this conference: onsemi, Saint-Gobain ADFORS CZ, Anamet, Anton Paar, Chemagazín, GDP Koral, Hartmann-Rico, Merck, Měřící technika Morava, Metrohm Česká republika, and ZwickRoell.

In closing, we wish you an inspiring and productive time here in Brno. May the Chemistry & Life Conference not only deepen your interest in sustainable chemistry but also provide you with unforgettable experiences and lasting connections.

Jiří Smilek

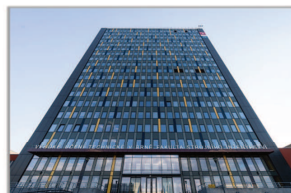
On behalf of the Organizing Committee

Brno University of Technology

Brno University of Technology (BUT) is a public university with a history dating back to 1899. A significant part of the activities of the BUT consists of research and development, which is carried out mainly at the research centres. The university has managed to build five research centres of its own, thanks mainly to grant support, and is also involved in two centres of excellence together with other universities and scientific institutions.



**BRNO
UNIVERSITY
OF TECHNOLOGY**



**FACULTY
OF CHEMISTRY**

Faculty of Chemistry

The Faculty of Chemistry of Brno University of Technology (FCH BUT), which continues its activities in the long tradition of chemical university education in Brno, which began with

the establishment of the chemical department of the Czech Technical University in November 1911 and was interrupted in 1951 by the transformation of the Brno Technical University into a Military Technical Academy. It is therefore one of the oldest Czech chemical faculties. FCH BUT places great emphasis on excellent basic research as well as on cooperation with industrial partners to ensure the transfer of the results of professional and scientific activities into practice and at the same time to keep an overview of current needs and trends in industry-related manufacturing companies. The professional scope of FCH align particularly with the areas of food chemistry and biotechnology, materials chemistry, physical and consumer chemistry and environmental chemistry and technology.



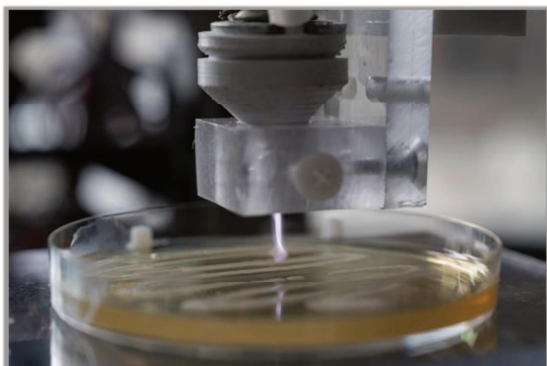
Materials Research Centre

Another key part of the faculty is the Materials Research Centre, which was built in 2010-2013 with the support of European funding as a centre of excellence focused mainly on high-tech applied research in two research directions: inorganic materials, and advanced organic materials and biomaterials. The main objective of the centre is to strengthen the cooperation between university research and the application sphere in the form of contract research and joint research projects, thus accelerating the transfer of knowledge and technology into practice.



Institutes at Faculty of Chemistry

- Institute of Material Science and Engineering
- Institute of Physical and Applied Chemistry
- Institute of Chemistry and Technology of Environmental Protection
- Institute of Food Chemistry and Biotechnology



Research Groups at Materials Research Centre

- Laboratory of Inorganic Materials
- Laboratory of Organic Electronics and Photonics
- Advanced Materials Synthesis Laboratory
- Laboratory of Biocolloids
- Laboratory of Bioplastics
- Laboratory of Metals and Corrosion
- Laboratory of Analytical and Environmental Chemistry
- Laboratory of Biotechnology and Biomaterials
- Laboratory of Photochemistry and Plasmochemistry



Prof. Chien-Hsiang Chang

Department of Chemical Engineering,
National Cheng Kung University, Tainan, Tchaj-wan

Dr. Chang received his Ph.D. degree in 1993 in Chemical Engineering at Purdue University, USA. He was appointed as an associate professor in 1994 at the Department of Chemical Engineering, National Cheng Kung University, Tainan, Taiwan and was promoted as a professor in 2000. His research interest is colloid and surface chemistry. Dr. Chang was the president of the Taiwanese Colloid and Interface Society in the periods of 2009-2013 and 2015-2017. He has been a committee member of the Asian Society for Colloid and Surface Science since 2005 and become the president since 2022. Dr. Chang is now working as a professor at the Department of Chemical Engineering and vice dean of the College of Engineering, National Cheng Kung University, Tainan, Taiwan and serving as an Associate Technical Editor of the Journal of Surfactants and Detergents.



prof. Iain McCulloch

Andlinger Center for Energy and the Environment,
Princeton University, University of Oxford, UK

Prof. McCulloch is director of the Andlinger Center for Energy and the Environment and a Professor of Electrical and Computer Engineering at Princeton University, as well as holding a Visiting Professor position in the Department of Chemistry at the University of Oxford. He previously held joint appointments as Professor of Chemical Science and Director of KAUST Solar Center at KAUST, as well as a Chair in Polymer Materials in the Chemistry Department at Imperial College.

Before joining academia, he spent 18 years managing industrial research groups at Hoechst in the US and Merck in the UK. He is a Fellow of the Royal Society, the Royal Society of Chemistry, the European Academy of Sciences and a Member of Academia Europaea. He is the recipient of the 2022 Royal Society Armourers and Brasiers Prize, the 2020 Blaise Pascal Medal for Materials Science, the Royal Society of Chemistry 2020 Interdisciplinary Prize, 2014 Tilden Medal for Advances in Chemistry and the 2009 Creativity in Industry Prize. His interests are in the design and investigation of organic semiconducting materials..

Prof. Izabela Radecka

Faculty of Science and Engineering, University of Wolverhampton, UK

Iza Radecka is a Full Professor in Biotechnology at University of Wolverhampton, UK. Her research is focused on the cost-effective synthesis of novel biodegradable materials using eco-sustainable feedstock and their chemical derivatization into a range of highly valuable products, including novel biodegradable and bioactive mulch films with slow-release delivery systems of herbicides on crop plants. She has published numerous research papers and several book chapters. She has coordinated and participated in co-funded research projects at the EU as well as national level. Iza has also given a broad number of invited lectures at international conferences. Iza teaches on a wide variety of microbiology and biotechnology courses, both undergraduate and postgraduate level where she puts her knowledge and experience to good effect.



Univ. Prof. Niyazi Serdar Sariciftci

Institute of Physical Chemistry, Johannes Kepler University, Linz, Austria

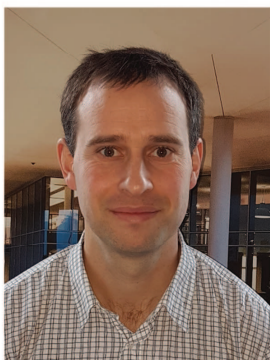
Professor Sariciftci, an Ordinarius Professor for Physical Chemistry and the Founding Director of the Linz Institute for Organic Solarcells at Johannes Kepler University, Austria, focuses on sustainable fuels via CO₂ recycling. With a background in physics, which includes work experience at the University of California, Santa Barbara, under Nobel Laureate Professor Alan J. Heeger, Sariciftci has made significant contributions to photoinduced optical, magnetic resonance, and transport phenomena in semiconducting and metallic polymers. His work includes the invention of conjugated polymer and fullerene-based "bulk heterojunction" solar cells. With over 600 publications and 89,000 citations, he ranks among the top scientists in material science. He has authored 8 books, founded seven spin-off companies, and received numerous recognitions including the Wittgenstein Prize in 2012. Sariciftci is a fellow of prestigious scientific societies and has received honorary doctorates and awards globally.



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Jan Skoček, Ph.D.

Heidelberg Materials, Leimen, Germany

Since 2012, Dr. Jan Skoček has been working at Heidelberg Materials, Global R&D, currently as R&D Program Manager Carbonation Technologies and as Senior Scientist before. He is currently managing R&D projects on CO₂ reduction by concrete recycling, enforced carbonation and CO₂ mineralization, which got awarded by German Innovation prize for climate and environment in 2022. Before joining industry, he followed academic career in the field of material science related to concrete and cement (2006-2012, DTU, Copenhagen) and of numerical methods and modelling (2003-2006, CTU, Prague).

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Thursday, 12th September

7:30 – 9:00	<i>Registration</i>			
8:45 – 9:00	<i>Conference opening</i>			
Plenary lecture 1 (Main conference hall)				
9:00 – 10:00	OP1:	Niyazi Serdar Sariciftci	Bio-organic Semiconductors for a Sustainable Electronics and Their Biomedical Integration	
Plenary lecture 2 (Main conference hall)				
10:00 – 11:00	OP2:	Izabela Radecka	From Trash To Treasure – Importance of Microbes In Circular Economy	
11:00 – 12:00	<i>Lunch</i>			
Plenary lecture 3 (Main conference hall)				
12:00 – 13:00	OP3:	Iain McCulloch	Designing Organic Semiconducting Polymers for Transistors	
13:00 – 13:10	<i>transfer to parallel sessions</i>			
Parallel session 1 (Room P17)			Parallel session 2 (Room P16)	
Waste Valorisation for a Sustainable Future: Chemistry, Biotechnology and Materials			Advanced Organic Materials and Technologies for a Sustainable Future	
<i>Keynote lectures</i>				
13:10 – 13:50	OWK:	Apostolis Koutinas	Sustainable Process Development on Biorefinery Electrification and Chemical Recycling of Post-Consumer Bioplastics	OOK: Gianluca Maria Farinola Living Materials for Optoelectronics from Photosynthetic Microorganisms and Biopolymers
<i>Regular lectures</i>				
13:50 – 14:10	OW1:	Stanislav Obruča	Thermophiles: A Promising Platform for Advancing Sustainable Industrial Microbial Biotechnology	OO1: Michael Daniele Bio-Derived and Biodegradable Materials for Bioelectronics
14:10 – 14:30	OW2:	Nabanita Saha	Bacterial Cellulose Hydrogel: An Emerging Biomaterial for Chemistry and Life	OO2: Tomáš Slanina Reversible Photoresponsive Systems and Materials
14:30 – 14:50	OW3:	Anastasiia Ieremenko	An Initial Genome Editing Toolset for <i>Caldimonas thermodepolymerans</i>	OO3: Bong Sup Shim Multifunctional Nanocomposites from Naturally Derived Materials: Conductive Melanin and Crystalline Nanocellulose

Parallel session 1 (Room P17) Waste Valorisation for a Sustainable Future: Chemistry, Biotechnology and Materials			Parallel session 2 (Room P16) Advanced Organic Materials and Technologies for a Sustainable Future		
<i>Regular lectures</i>					
14:50 – 15:10	OW4: Abolfazl Heydari	Cyclodextrin Polymers and Their Derivatives Containing Ionic Groups: From Synthesis and Characterization to Applications	OO4: Roberta Ragni	Exploring End of Life Automotive Wastes as Catalysts in Carbon-Carbon bond forming reactions	
15:10 – 15:30	<i>Coffee break</i>				
15:30 – 15:50	OW5: Giuseppe Cavallaro	Hybrid Biomaterials Based on Halloysite Clay Nanotubes and Cellulose Recovered from Egagropili	OO5: Pavel Kocán	Nanopatterning of 2D Materials by High-performance Pigment Molecules	
15:50 – 16:10	OW6: Pavel Šiler	Effect of Zinc on the Properties of Potland Cement	OO6: Dominik Farka	Epitaxial Guidance of Adamantyl-Substituted Polythiophenes by Self-Assembled Monolayers	
16:10 – 16:30	OW7: Pavel Diviš	Wheat Bran Based Biorefinery – Proof of Concept	OO7: Martin Vala	Colour-Tuneable Solid-State Fluorescence of Push–Pull Substituted 2,5-Diphenyl-Stilbenes	
16:30 – 16:50	OW8: Milan Krcalík	Nanotechnology in Polymer Recycling	OO8: Petr Dzik	Graphitic Carbon Nitride Coatings: Synthesis, Processing and Environmental Applications	
16:50 – 17:10	OW9: Zdenka Kozáková	Plasma Treated Water Solutions for Sustainable Agriculture	OO9: Mihai Irimia-Vladu	Kraft Lignin as Bio-Based Dielectric Polymer for Organic Field-Effect Transistors	
17:10 – 17:30	OW10: Helena Zlámalová Gargošová	Effect Evaluation of Poly-3-hydroxybutyrate Microplastics on Selected Freshwater Organisms	0010: Šárka Tumová	Novel PEDOT-Based Hydrogel for Bioelectronic Applications	
17:30 – 19:00	<i>Poster session</i>				
19:00 – 21:00	<i>Banquet dinner</i>				

Friday, 13th September

8:30 – 9:00	<i>Registration</i>	
Plenary lecture 4 (Main conference hall)		
9:00 – 10:00	OP4: Jan Škoček	CO ₂ Mineralization: CCU for and by Building Materials
Plenary lecture 5 (Main conference hall)		
10:00 – 11:00	OP5: Chien-Hsiang Chang	Cationic Systems for a Sustainable Future: Applications as Drug Carriers
11:00 – 12:00	<i>Lunch</i>	
Student session (Room P16)		
<i>Regular lectures</i>		
12:00 – 12:15	OS1: Alessandro Digregorio	Chemically Responsive Melanin-Like Polymers for Living Cell Display Technology
12:15 – 12:30	OS2: Jan Šindelář	Tissue Engineering Scaffolds Prepared by Supercritical Carbon Dioxide Foaming From Polyhydroxyalkanoates
12:30 – 12:45	OS3: Mariia Kostenko	Biodegradable Nanocomposites Based on the Ecovio® (PBAT and PLA): Thermal and Rheological Properties
12:45 – 13:00	OS4: Lucía Ivanová	Green Energy Production Using Flavin-inspired Photosensitisers
13:00 – 13:15	OS5: Martin Kolář	Acrylated and Itaconated Plant Oils as Eco-Friendly Monomers for Emulsion Polymerisation
13:15 – 13:30	OS6: Thessa-Carina Bauer	Macro- and Microrheological Characterization of Cerebrospinal Fluid
13:30 – 13:45	OS7: Apostolos Petropoulos	Bioprocess Optimization for Succinic Acid Production with an Engineered <i>Escherichia coli</i> Strain Cultivated on Hydrolysates Derived from Municipal Solid Waste
13:45 – 14:00	OS8: Davide Mesto	From Lignocellulosic Biomasses to Advanced Biopolymers in Just One Step
14:00 – 14:15	OS9: Kryštof Koller	Aging of PE Hysteresis Loops of Hybrid-Doped PTC Ceramics
14:15 – 14:30	OS10: Stevan Gavranović	Bismuth and Antimony Halide Perovskites – Progress and Potential Practical Application of Environmentally Friendly Hybrid Semiconductors
14:45 – 15:00	<i>Conference closing, Student conference award</i>	

List of posters (Waste Valorisation for a Sustainable Future: Chemistry, Biotechnology and Materials)

PW1:	Shivani Gaurangumar Adhvaryu	Search for Poly-Hydroxyalkanoates Producers in the Microbiota from Hypersaline Environments
PW2:	Iva Buchtíková	Interesting Metabolism of Polyhydroxyalkanoate Production in the "Hot" Genus <i>Aneurinibacillus</i>
PW3:	Viola Caminiti	Microbial Cultivation: <i>Cupriavidus Necator</i> DSM 545 and <i>Hydrogenophaga Pseudoflava</i> DSM 1034 in Prosecco Wine Lees
PW4:	Kristýna Heřmánková	PHA-Related Regulatory Small RNAs in <i>Caldimonas Thermodepolymerans</i>
PW5:	Xenie Kouřilová	The Promise of <i>Caldimonas thermodepolymerans</i> in Sustainable Production of Polyhydroxyalkanoates
PW6:	Christos Margioulas	Pretreatment of Sawdust Using Deep Eutectic Solvent for Poly(3-hydroxybutyrate) (PHB) Production
PW7:	Veronika Řeháková	Thermophilic Bacteria of the <i>Aneurinibacillus</i> Genus: Producers of Unique α -Methylated PHA Copolymers
PW8:	Abdullah Bilal Öztürk	Process Simulation and Techno-Economic Evaluation of Various Polyhydroxyalkanoates (PHA) Production Processes
PW9:	Vendula Hrabalová	Conversion of Ferulic Acid by Extremophilic Bacteria
PW10:	Silvia Kollerová	Production of Microbial Pigments by Selected Members of Genus <i>Massilia</i>
PW11:	Markéta Khýrová	Characterization of Topography and Mechanical Properties of Bacterial Cells
PW12:	Jan Obračaj	Cultivation of Carotenogenic Yeasts on Complex Waste Substrates from the Food Industry under Combined Stress
PW13:	Viktorie-Alexandra Pacasova	Effect of Adaptation to Continuous Osmotic Stress on the Bacterium <i>Rhodospirillum Rubrum</i>
PW14:	Viktorie-Alexandra Pacasova	Biohydrogen - the Fuel of the Future, or the Study of Hydrogen Production by <i>Clostridium Butyricum</i> and <i>Clostridium Tyrobutyricum</i>
PW15:	Kateřina Šabatová	Transcriptomic Analysis of <i>Rhodospirillum Rubrum</i> Wild-Type and Mutant Strains
PW16:	Katarína Šlosárová	Nobody is Perfect – Genetic Modification of Thermophilic Bacteria
PW17:	Mohammad Umair	Study of Methylomes in <i>Aneurinibacillus</i> Species using Third Generation Sequencing Platform
PW18:	Diana Černayová	Hydrogel Bioinoculants: Enhancing Plant Resistance to Drought Stress

PW19:	Michal Kalina	The Effect of Plant Growth-Promoting Rhizobacteria Application on Soil Properties and Growth of Model Plants in a Pot Cultivation Experiment
PW20:	Štěpán Krobot	Slow-release Nitrogen Fertilizers with Biodegradable Poly(3-hydroxybutyrate) Coating
PW21:	Martin Súdeňík	Enhancing Soil Health: Hydrogel Self-Encapsulation of <i>Azotobacter</i>
PW22:	Helena Doležalová-Weissmannová	The Interaction of Hazardous Metals - Microplastics
PW23:	Renata Komendová	The Study of the Content of Risk Elements in Power Plant Ash
PW24:	Sajida Perveen	Thin Porous Carbon Layers on Ceramics for Environmental Applications
PW25:	Marek Trojan	The Interaction of Microplastics and Microbioplastics with Soil and a Comparison of Their Potential to Spread Pathogens
PW26:	Jan Vespalec	Macro and Micro Views of Pressure Membranes Used for Wastewater Treatment
PW27:	Jan Fučík	Innovative Integration of High-Resolution Mass Spectrometry and In-Silico Libraries for Pharmaceutical Metabolite Identification in Lettuce (<i>Lactuca sativa</i>)
PW28:	Jana Fojtíková	Adsorption Behaviour of Hyaluronan Derivatives with Reduced Carboxyl Groups at Charged Hydrophobic Surface
PW29:	Vojtěch Jeřábek	Exploring Intermolecular Interactions in Aqueous γ -Valerolactone Mixtures with a Combination of Molecular Dynamics Simulations and Experimental Techniques
PW30:	Elke Bradt	Application of Macro- and Microrheology for Cerebrospinal Fluid Under Different Temperature Conditions
PW31:	Martin Kadlec	Rheological Characterization of Hydrogel Materials Using Oscillatory Rheometry and Microrheological Technique Fluorescence Correlation Spectroscopy
PW32:	Ludmila Kouřilová	Alternative Crosslinking Methods for Sodium Alginate Resulting in Hydrogels with Suitable Application Properties
PW33:	Jitka Krouská	Hybrid Gellan Hydrogels – Preparation and Characterization
PW34:	Jiří Příbyl	Structural Characterization of Monomer Composition of Sodium Alginate by Vibrational Spectroscopy
PW35:	Jiří Smilek	Targeted Functionalization of Atomic Force Microscopy Tips for the Study of Polysaccharide Hydrogel Systems
PW36:	Monika Trudičová	Unveiling Hydrogel Microarchitecture: Correlating Macrorheology and Microscopy for Sustainable Material Design

PW37:	Luboš Bocian	UHPC Made with Recycled PET Fibers for the Improvement of Fire Resistance
PW38:	Michaela Fanglová	Photoactive Foil with Antibacterial Properties
PW39:	Denisa Filipi	Optimization of Printing Clichés for Pad Printing
PW40:	Cristian-Vlad Irimia	Kraft Lignin as Bio-Based Dielectric Polymer for Organic Field-Effect Transistors
PW41:	Eliška Kobzinková	Preparation and Characterization of Layered Double Hydroxides on Mg Substrates Prepared by Powder Metallurgy
PW42:	David Markusík	Comparative Study of the Effect of Lignosulfonate Plasticizer on Rheological Behaviour of Various Alkali-Activated Materials and Cement Pastes
PW43:	Maksim Menshikh	Design of Hollow Fiber Membrane Module for Membrane Distillation
PW44:	Veronika Řezáčová	Thermal Properties of Selected Bio Phase Change Materials
PW45:	Monika Wikarská	Valorization of Hemp Processing Byproducts for Innovative Cosmetic Applications

List of posters (Advanced Organic Materials and Technologies for a Sustainable Future)

PO1:	Katsiaryna Arkhiptsava	Synthesis and Electrochemical Characterization of New Semiconductive Materials with Amino Acid Side Chain for Bioelectronics
PO2:	Jan Blahut	Organic Electrochemical Transistor as a Device for Studying Electrical Properties of Smart Ionic Liquids
PO3:	Martin Cigánek	Thionation of Lactam-Containing Organic Pigments as a Synthetic Tool for Near-Infrared Absorbing n-Type Semiconductors
PO4:	Nicole Černeková	Use of Polyhydroxyalkanoates for Preparation of 3D Printable Hydrogels
PO5:	Stevan Gavranović	Design of capacitive touch sensor
PO6:	Stevan Gavranović	Additive touch technology: maximizing production efficiency
PO7:	Alžběta Gjevik	Glass Microfluidics for Planar Lipid Bilayer Formation
PO8:	Marcela Králová	Testing the Antimicrobial Activity of Photocatalytic Surfaces Using Resazurin Assay
PO9:	Matouš Kratochvíl	Indigo Derivatives for Applications in Thin Film Organic Electronics
PO10:	Romana Malečková	Novel Conductive PEDOT:DBSA Hydrogel Exhibits Tunable Properties for Bioelectronics
PO11:	Aneta Marková	Real-time study of ion exchange and transport in organic bioelectronic devices
PO12:	Sylvia Patakyová	Graphitic Carbon Nitride Coatings with Enhanced Porosity
PO13:	Jan Pospíšil	Diffusion Model for Halide Perovskites via Impedance Spectroscopy
PO14:	Jan Richtár	Flavin-Inspired Electrocatalysts Towards Sustainable Hydrogen Production
PO15:	Corina Schimanofsky	Bio-inspired Polymers for CO ₂ Capture and O ₂ Reduction
PO16:	Rastislav Smolka	Enhanced Fluorescence in Stilbene-Based Photoluminescent Materials: Host-Guest Systems and Förster Resonance Energy Transfer for Far-Red and White-Light Emission
PO17:	Jan Truksa	Investigating the Spectroscopy of Lumazine and Flavin in the DMSO-Water Mixture
PO18:	Martin Vala	Combined Detection Method as a New Approach for the Selective Study of Ion Exchange and Transport in Organic Bioelectronic Devices
PO19:	Dominik Veselý	Optical Properties Manipulation with Novel Phenylene-Thienyl Chalcone Derivatives





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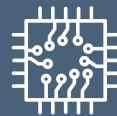
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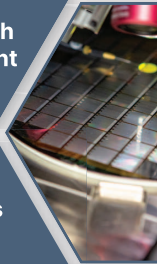
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- / Creep testing machines
- / Load cells, specimen grips and extensometers
- / Temperature and environmental chambers
- / Pendulum impact testers
- / Drop weight testers
- / Hardness testers
- / Extrusion plastometers
- / HDT/Vicat
- / Automated testing solutions
- / Specimen preparation

... you don't have to test anything else



9th Meeting on
**CHEMISTRY
& LIFE**
for Sustainable Future