INTERNATIONAL CONFERENCE OF LITHUANIAN SOCIETY OF CHEMISTRY

Theodor v. Grotthuss

Dedicated to 210th anniversary of
publication of the first theory of electrolysis
proposed by

THEODOR GROTTHUSS
(1785 - 1822)

LITHUANIAN ACADEMY OF SCIENCE
Gedimino Str. 3, Vilnius, Lithuania
April 28-29, 2016

BOOK OF ABSTRACTS

CHEMISTRY & CHEMICAL TECHNOLOGY
CONFERENCE 2016 VILNIUS

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CHEMISTRY & CHEMICAL TECHNOLOGY
CONFERENCE 2016 VILNIUS

Thursday, April 28

08:00	**Registration**
09:00	**Opening**
09:15	Prof. J. Krikštopaitis (Lithuania)
09:30	Dr. F. Björefors (University of Uppsala, Sweden)
10:00	Prof. F. Scholz (Greifswald University, Germany)
10:30	Coffee break and poster session
11:15	Prof. E. Juzeliūnas (Klaipėda University, Lithuania)
11:45	Prof. A. Ramanavičius (Vilnius University, Lithuania)
12:05	Dr. E. Voitechovič (St. Petersburg State University, Russia)
12:20	Dr. M. Yıldırım (Canakkale Onsekiz Mart University, Turkey)
12:35	Prof. G. D. Sulka (Jagiellonian University Krakow, Poland)
12:50	P. M. Hannula (Aalto University, Finland)
13:05	Break
14:30	Prof. R Ramanauskas (FTMC, Lithuania)
15:00	Prof. E. Lust (Tartu University, Estonia)
15:30	Prof. M. Skompska (Warsaw University, Poland)
16:00	Coffee break and poster session
16:30	Prof. G. Valinčius (Vilnius University, Lithuania)
16:50	Prof. O. Forsen (Aalto University, Finland)
17:05	Dr. L. Niedzicki (Warsaw University of Technology, Poland)
17:20	H. Akbulut (Sakarya University, Turkey)
17:35	Prof. G. Lisak (Åbo Akademi University, Finland)
17:50	V. Čolić (Technische Universität München, Germany)

Friday, April 29

08:30	**Registration**
09:00	Dr. R. Skaudžius (Vilnius University, Lithuania)
09:20	Dr. E. Orentas (Vilnius University, Lithuania)
09:40	Dr. G. Juodeikienė (Kaunas University of Technology, Lithuania)
10:00	Dr. T. Malinauskas (Kaunas University of Technology, Lithuania)
10:20	Prof. H. Cesiulis (Vilnius University, Lithuania)
10:40	Coffee break
11:00	Dr. R. Valiokas (FTMC, Lithuania)
11:20	Dr. A. Sankauskaitė (FTMC, Lithuania)
11:40	Mr. J. Tunaitis (UAB "Achema", Lithuania)
12:00	M. Stankevičiūtė (Kaunas University of Technology, Lithuania)
12:15	A. Brangule (Riga Stradiņš University,Latvia)
12:30	M. Bakierska (Jagiellonian University, Poland)
12:45	Break
14:30	Poster Session
15:50	**Closing remarks**
16:00	Excursion
18:30	Gala dinner, "Taurakalnis", Universiteto Str. 7

DETAILED PROGRAM

Thursday, April 28

8:00-9:00 – Registration

Time	Type of presentation	Speaker, affiliation	Presentation title
9:00	Opening	*Conference Chair*: **Prof. Rimantas Ramanauskas** *Vice chancellor, Government of Lithuania*: **Prof. Rimantas Vaitkus** *President of LAS*: **Prof. Valdemaras Razumas** *FTMC Director*: **Prof. Gintaras Valušis** *ISE Regional Representative*: **Prof. Rasa Pauliukaitė**	
Session 1. Chairs: **Rimantas Ramanauskas, Enn Lust**			
9:15	Invited lecture I-1	**Juozas A. Krikštopaitis,** Lithuanian Association for the History and Philosophy of Science	Theodor von Grotthuss' contribution to the interpretation of electricity phenomenon in Volta's pile
9:30	Keynote lecture K-1	**Fredrik Björefors,** Dept. of Chemistry – Ångström Laboratory, Uppsala University, Uppsala, Sweden	*Electrolysis via Bipolar Electrochemistry*
10:00	Keynote lecture K-2	**Fritz Scholz,** Institute of Biochemistry, University of Greifswald, Greifswald, Germany	*The Thermodynamics of Insertion Electrochemical Systems*
10:30	Poster Session 1 and Coffee break		
Session 2. Chairs: **Fredrik Björefors, Eimutis Juzeliūnas**			
11:15	Keynote lecture K-3	**Eimutis Juzeliūnas,** Klaipėda University, Klaipėda, Lithuania	*Silicon Photoelectrochemistry for Solar Energy Applications*
11:45	Invited lecture I-2	**Arūnas Ramanavičius,** Department of Physical Chemistry, Vilnius University, Lithuania	*Conjugated Polymers in the Design of Sensors and Biosensors*
12:05	Oral presentation O-1	**Edita Voitechovič,** Institute of Chemistry, St. Petersburg State University, Russia	*Proteinase K Assisted E-Tongue for Protein Purity Evaluation*
12:20	Oral presentation O-2	**Mehmet Yıldırım,** Department of Materials Science & Engineering, Canakkale Onsekiz Mart University, Turkey	*Electrochromic Copolymers Synthesized from Aminothiazoles and Pyrrole*
12:35	Oral presentation O-3	**Grzegorz Sulka,** Department of Physical Chemistry and	*Metallic Nanowire, Nanotube and Nanocone Arrays Fabricated by Electrodeposition in Porous Anodic Alumina Templates*

		Electrochemistry, Jegelonian University, Poland	
12:50	Oral presentation O-4	**Pyry-Mikko Hannula,** Department of Materials Science and Engineering, Aalto University, Finland	*Electrochemical Behavior between Functionalized Carbon Nanotube Films and Copper*
13:05	*Lunch break*		
Session 3. Chairs: **Fritz Scholz, Gintaras Valinčius**			
14:30	Keynote lecture K-4	**Rimantas Ramanauskas,** Center for Physical Sciences and Technology, Vilnius, Lithuania	*The Development of Electrochemistry In Lithuania*
15:00	Keynote lecture K-5	**Enn Lust,** Institute of Chemistry, University of Tartu, Tartu, Estonia	*Novel Electrochemical Devices for Energy Recuperation Systems*
15:30	Keynote lecture K-6	**Magdalena Skompska,** Faculty of Chemistry, University of Warsaw, Warsaw, Poland	*Synthesis and Application of Nanostructured Metal Oxides: From Photovoltaics to Photocatalysis*
16:00	Poster Session 2 and Coffee break		
Session 4. Chairs: **Magdalena Skompska, Eugenijus Valatka**			
16:30	Invited lecture I-3	**Gintaras Valinčius,** Institute of Biochemistry, Life Science Center of Vilnius University, Vilnius, Lithuania	*Electrochemical Impedance of Tethered Bilayer Membranes*
16:50	Oral presentation O-5	**Olof Forsen,** Department of Materials Science, Aalto University, Finland	*The Effect of Electrolyte Composition on RuO_2-IrO_2-TiO_2 Anode Operation in Electrowinning of Metals*
17:05	Oral presentation O-6	**Leszek Niedzicki,** Polymer Ionics Research Group, Warsaw University of Technology, Poland	*Weakly Coordinating Anions for Electrolyte Applications: Salts, Functional Additives, Ionic Liquids*
17:20	Oral presentation O-7	**Hatem Akbulut,** Department of Metallurgical & Materials Engineering, Sakarya University, Turkey	*Enhanced Lithium Storage in Graphene/$LiMnPO_4$-C Nanocomposite Cathode Electrodes for High Performance Li-Ion Batteries*
17:35	Oral presentation O-8	**Grzegorz Lisak,** Laboratory of Analytical Chemistry, Åbo Akademi University, Finland	*Potentiometric Sensors with Bi-Layer Ion-Selective Membranes*
17:50	Oral presentation O-9	**Victor Čolić,** Physik-Department, Technische Universität München, Germany	*Structural Activity Descriptors for the Oxygen Reduction Reaction: A Step Towards The Rational Design of Catalysts*

Friday, April 29

8:30-9:00 – Registration

Time	Type of presentation	Speaker, affiliation	Presentation title
Session 5. Chairs: **Arūnas Ramanavičius, Henrikas Cesiulis**			
9:00	Invited lecture I-4	**Ramūnas Skaudžius,** Department of Inorganic Chemistry, Vilnius University, Vilnius, Lithuania	*Luminescence Properties of Eu^{3+} Doped Garnets*
9:20	Invited lecture I-5	**Evaldas Orentas,** Vilnius University, Lithuania	*Towards General Strategy for Tubular Hydrogen-Bonded Polymers*
9:40	Invited lecture I-6	**Gražina Juodeikienė,** Kaunas University of Technology, Kaunas, Lithuania	*The Possibilities of Lactic Acid Bio-Production from Food Industry By-Products by Using Membrane Filtration Techniques*
10:00	Invited lecture I-7	**Tadas Malinauskas,** Department of Organic Chemistry, Kaunas University of Technology, Kaunas, Lithuania	*Solar Energy Harvesting: The Renaissance of Hybrid Solar Cells*
10:20	Invited lecture I-8	**Henrikas Cesiulis,** Department of Physical Chemistry, Vilnius University, Vilnius, Lithuania	*Electrodeposition of Co-W Alloys from Macro- to Nano- Scale*
10:40	Coffee break		
Session 6. Chairs: **Gražina Juodeikienė, Dainius Martuzevičius**			
11:00	Invited lecture I-9	**Ramūnas Valiokas,** Center for Physical Sciences and Technology, Vilnius, Lithuania	*Molecular Nanolithorgaphy: A Tool to Study and Employ Chemical Reactions at Nanoscale*
11:20	Invited lecture I-10	**Audronė Sankauskaitė,** Textile Institute, Center for Physical Sciences and Technology, Kaunas, Lithuania	*Influence of Bio-Ceramic on Thermoregulation Effectiveness of Pet Knits*
11:40	Invited lecture I-11	**Juozas Tunaitis,** UAB "Achema"	*From Science to Industry*
12:00	Oral presentation O-10	**Monika Stankevičiūtė,** Kaunas University of Technology, Lithuania	*Formation of Intermediate Phases during the Synthesis of α-C_2SH*

12:15	Oral presentation O-11	**Agnese Brangule,** Riga Stradiņš University, Latvia	*How Statistical Methods Guide the Selection of The FTIR Method*
12:30	Oral presentation O-12	**Monika Bakierska,** Faculty of Chemistry, Jagiellonian University, Poland	*The Effect of Cation and Anion Doping on the Structure, Chemical Stability and Electrochemical Performance of $LiMn_2O_4$ Cathode Material for Li-Ion Batteries*
12:45	Lunch break		
14:30	Poster Session 3		
15:50	Closing remarks		
16:00	Excursion in the Vilnius Downtown		
18:30	Gala dinner at Vilnius university, Faculty of History, Restaurant “Taurakalnis”, Universiteto str. 7		

Posters

Thursday, April 28

Electrochemistry			
Electrochemistry of Materials, Nanomaterials and Films			
No.	**Presenting author**	**Affiliation**	**Poster title**
P-1	**Dovilė Sinkevičiūtė**	Kaunas University of Technology, Lithuania	*Characterization of Ultra Thin Mo-O-Se Films Electrodeposited on SnO_2 Surface*
P-2	**Karolina Syrek**	Jagiellonian University, Poland	*Photoelectrochemical Performance of Nanoporous Titanium Oxide Layers Formed by Multi-Step Anodization*
P-3	**Karolina Syrek**	Jagiellonian University, Poland	*Photoelectrochemical and Photocatalytic Properties of Nanostructured Tungsten Oxide*
P-4	**Aliona Nicolenco**	Faculty of Chemistry, Vilnius University, Lithuania	*New Electrolyte for Fe-W Electrodeposition*
P-5	**Anna Pawlik**	Jagiellonian University, Poland	*Heat Treatment Effect on Crystalline Structure of Oxide Layers Grown on Fe by Anodization*
P-6	**Anna Pawlik**	Jagiellonian University, Poland	*Nanoporous Titanium Dioxide Layers Modified with Sodium Hydroxide and (3-Aminopropyl)triethoxysilane (APTES)*

P-7	**Asta Ona Češūnienė**	Center for Physical Sciences and Technology, Lithuania	*Characterization of As-Deposited and Annealed Cr-Zn-P Coating Electrodeposited from a Trivalent Chromium Bath*
P-8	**Zita Sukackienė**	Center for Physical Sciences and Technology, Lithuania	*Electroless Deposition of CoBW Coatings Using Morpholine Borane as Reducing Agent*
P-9	**Antanas Nacys**	Center for Physical Sciences and Technology, Lithuania	*Microwave-Assisted Synthesis of Platinum-Cobalt-Molybdenum/Graphene*
P-10	**Joanna Kapusta-Kołodziej**	Jagiellonian University, Poland	*Formation of Ordered Anodic TiO_2 Nanopore Arrays in Glycerine Based Electrolyte under Various Anodizing Potentials and Temperatures*
P-11	**Ewa Wierzbicka**	Jagiellonian University, Poland	*The Effect of Foil Purity on Morphology of Nanoporous Anodic ZrO_2*
P-12	**Karolina Gawlak**	Jagiellonian University, Poland	*The Effect of Chemical and Electrochemical Polishing of Tin on Morphology of Anodic Tin Oxide*
P-13	**Anna Brudzisz**	Jagiellonian University, Poland	*Mechanism of Voltage Detachment of Porous Anodic Alumina Membranes*
P-14	**Anna Brudzisz**	Jagiellonian University, Poland	*AAO Membranes with Serrated Nanopores as Templates for Fabrication of Metallic Nanowires*
P-15	**Egidijus Griškonis**	Kaunas University of Technology, Lithuania	*Electrochemical Properties of Modified with Electroless Ag Graphite Felt Electrode in Aqueous Solution of NaBr/Br_2*
P-16	**Vitalija Jasulaitienė**	Center for Physical Sciences and Technology, Lithuania	*The Influence of Electrodeposition Conditions on Structure and Optical Properties of Transparent ZnO Films*
P-17	**Agnieszka Brzózka**	Poznan University of Technology, Poland	*A Comparative Study of Electrochemical Barrier Layer Thinning of Porous Anodic Oxide (AAO)*
P-18	**Alexey Dronov**	National Research University of Electronic Technology, Russia	*Relationship between Heat and Mass Transport Conditions and Anodic TNT Layer Growth Process*
P-19	**Mariusz Szkoda**	Gdansk University of Technology, Poland	*Electrosynthesis of Mo/Moo_3 and its Structural and Photocatalytic Properties*
P-20	**Natalia Tsyntsaru**	Institute of Applied Physics of ASM, Moldova	*Electrochemical Co-Deposition of Tungsten with Cobalt and Copper*
P-21	**Laurynas Staišiūnas**	Center for Physical Sciences and Technology, Lithuania	*Corrosion of Mg-xNb Coated by ALD Grown Nb_2O_5 in Hanks' Solution*

P-22	**Ramūnas Levinas**	Faculty of Chemistry. Vilnius University, Lithuania	*Study of Tungsten Anodization and Photoelectrochemical Behavior of Obtained Oxide Films*
P-23	**Virginija Kepenienė**	Center for Physical Sciences and Technology, Lithuania	*Synthesis and Characterization of $AuCo_3O_4CD/C$ Nanocomposites*
P-24	**Monika Bakierska**	Faculty of Chemistry, Jagiellonian University, Poland	*An Influence of Carbon Matrix Origin on Electrochemical Properties of Carbon-Tin Anode Nanocomposites*
P-25	**Joanna Świder**	Faculty of Chemistry, Jagiellonian University, Poland	*The Studies of Thermophysical and Electrochemical Properties of $C/LiFePO_4$ Nanocomposite Materials*
P-26	**Loreta Tamašauskaitė-Tamašiūnaitė**	Center for Physical Sciences and Technology, Lithuania	*Investigation of Electrodeposition of MnO_2 by EQCM*
P-27	**Anton M. Pastukhov**	Ural Federal University, Russia	*Electrochemical Reduction of Uranium in Strip Product Solutions on Carbon Electrode*
P-28	**Anton M. Pastukhov**	Ural Federal University, Russia	*Thermodynamic Studies of Geochemical Processes at Uranium In-Situ Leaching Mining*
P-29	**Olga Girčienė**	Center for Physical Sciences and Technology, Lithuania	*Active Corrosion Protection of Steel by Phosphate Conversion Coatings Dopped with Cerium*
P-30	**Yu. M. Baikov**	Ioffe Institute, RAS, Russia	*Solid Hydroxiode Eutectics as Self-Organized Nanostructured Electrolytes for Small-Sized and Low-Power Electrochemical Devices at 250-420 K*
P-31	**Yulia Nazarkina**	National Research University of Electronic Technology, Russia	*Features of Porous Anodic Alumina Galvanostatic Growth in Selenic Acid Electrolyte*
P-32	**Leszek Zaraska**	Jagiellonian University, Poland	*Formation of Crack-Free Nanoporous Tin Oxide Layers by Simple Anodization in Alkaline Electrolyte at Low Potentials*
P-33	**Leszek Zaraska**	Jagiellonian University, Poland	*Anodic Growth of ZnO Nanowires in Bicarbonate Electrolytes*
Electroanalysis			
P-34	**Karolina Syrek**	Jagiellonian University, Poland	*Photoelectrochemical Sensors for Glucose Based on Nanostructured Metal Oxides*
P-35	**Raimonda Celiešiūtė**	Center for Physical Sciences and Technology, Lithuania	*Electrochemical Glutamate Sensing Applying Poly(Riboflavin) and Graphene Oxide-Chitosan Film Modified Electrodes*

P-36	**Ewa Wierzbicka**	Jagiellonian University, Poland	*Epinephrine Sensing at Au Nanotube Array Electrode and Determination Its Oxidative Metabolism*
P-37	**Karolina Gawlak**	Jagiellonian University, Poland	*Synthesis of Nanoporous Silver Nanowires as Electrochemical H_2O_2 Sensor*
Electrocatalysis			
P-38	**Aykut Caglar**	Yüzüncü Yıl University, Turkey	*Syhnthesis and Characterization of Ag Promoted Pd Nanoparticles and their Enhanced Ethanol Electrooxidation Activity*
P-39	**Zelal Kor**	Yüzüncü Yıl University, Turkey	*Ni Promoted Pd Ethanol Electrooxidation Catalysts*
P-40	**Jolita Jablonskienė**	Center for Physical Sciences and Technology, Lithuania	*Methanol and Ethanol Electro-Oxidation on Platinum-Cobalt/Graphene Catalysts Prepared by Microwave Synthesis*
P-41	**Rasa Mardosaitė**	Kaunas University of Technology, Lithuania	*Structure and Properties of Electrodeposited Cobalt Sulfide Catalyst*
P-42	**Aldona Balčiūnaitė**	Center for Physical Sciences and Technology, Lithuania	*Evaluation of Au/Co and Au/CoB Electrocatalysts in Borohydride Fuel Cell Anodes*
P-43	**Raminta Stagniūnaitė**	Center for Physical Sciences and Technology, Lithuania	*Cerium Oxide/Graphene Supported Pt and Pt-Co as Electrocatalysts for Methanol Oxidation and Oxygen Reduction Reaction*
P-44	**Irena Stalnionienė**	Center for Physical Sciences and Technology, Lithuania	*Anodic Oxidation of Formaldehyde on Electroless Copper Coatings Deposited from Cu(II)-EDTA Solutions*
P-45	**Virginija Kepenienė**	Center for Physical Sciences and Technology, Lithuania	*Comparison of Electrocatalytic Properties of $PtCoCeO_2$/Graphene and $PtCoNb_2O_5$/Graphene Catalysts Towards Methanol Oxidation*
P-46	**Aušrinė Zabielaitė**	Center for Physical Sciences and Technology, Lithuania	*Fiber Cobalt Decorated with Platinum Nanoparticles as Electrocatalysts for Hydrazine Oxidation*
P-47	**Ina Stankevičienė**	Center for Physical Sciences and Technology, Lithuania	*Autocatalytic Reduction of Platinum(IV) By Cobalt(II)-Diethylenetriamine Complex*
P-48	**Aldona Jagminienė**	Center for Physical Sciences and Technology, Lithuania	*Electroless Cobalt Deposition in Diethylenetriamine Solutions Using Morpholine Borane as a Reducing Agent*
P-49	**Dijana Šimkūnaitė**	Center for Physical Sciences and Technology, Lithuania	*Investigation of Borohydride Oxidation onto a Spontaneously Bi-Modified Polycrystalline Pt Electrode*

P-50	**Teofilius Kilmonis**	Center for Physical Sciences and Technology, Lithuania	*Graphene Supported PtM (Mo, W) Catalysts for Borohydride Oxidation*
P-51	**Anna Brudzisz**	Jagiellonian University, Poland	*Silver Nanowires and Nanocones Arrays as Electrocatalytic Electrodes*
P-52	**Žana Činčienė**	Department of Catalysis, Center for Physical Sciences and Technology, Lithuania	*Fabrication, Characterization and Properties of PtCoB/Cu Catalysts*
P-53	**Aagata Fedorczyk**	Faculty of Chemistry, University of Warsaw, Poland	*Synthesis and Electrocatalytic Properties of Au-Pt Catalyst Electrodeposited on Poly(1,8-diaminocarbazole) for Formic Acid Oxidation*
P-54	**Edita Vernickaitė**	Faculty of Chemistry, Vilnius University, Lithuania	*Electrocatalytic Properties of Electrodeposited Molybdenum Alloys for Hydrogen Evolution Reaction*
Polymer electrochemistry			
P-55	**Aneta Radzevič**	Center for Physical Sciences and Technology, Lithuania	*Electrocopolymerization of B-Group Vitamins*
P-56	**Maciej Jeszke**	Gdańsk University of Technology, Poland	*Investigation of Conductive Polymers Influence on Ion-Selective Electrodes Based on Derivatives of Benzo-15-Crown-5*
P-57	**Hanuma Reddy Tiyyagura**	National Institute of Technology, India	*Electrochemical Studies of Pure Magnesium Surface Coated with Electrospun Cellulose Acetate (CA) Nanofibers*
P-58	**Mariusz Szkoda**	Gdansk University of Technology, Poland	*The Impact of Polymerisation Conditions onto the Morphology and Properties of Ordered Inorganic-Organic Heterojunction*
Batteries and Energy Conversion			
P-59	**Gizem Hatipoglu**	Sakarya University, Turkey	*Graphene Supported Tin-Based Nanocomposite Anodes as Flexible and Free−Standing for High Performance Li−Ion Batteries*
P-60	**Mirac Alaf**	Bilecik Seyh Edebali University, Turkey	*α-MnO_2/MWCNT/Graphene Nanocomposite Electrodes and their Electrochemical Behaviours for Li-O_2 Batteries*
P-61	**Mehmet Oguz Guler**	Sakarya University, Turkey	*Investigation of Graphene/$LiNiPO_4$-C Nanocomposite Cathode Electrodes for Enhanced Lithium Storage Battery Applications*
P-62	**Mustafa Guzeler**	Sakarya University, Turkey	*High-Capacity Grapehen/Cu_6Sn_5-C Composite Thin Film Anodes For Lithium Ion Batteries*

P-63	**Marta Kasprzyk**	Faculty of Chemistry, Warsaw University of Technology, Poland	*Amorphous Mixtures of Solvents and Lithium Electrolytes*
P-64	**Seyma Ozcan**	Sakarya University, Turkey	*High Reversible MnO_2/Graphene Cathodes for Improved Li-Ion Batteries*
P-65	**Aslihan Guler**	Sakarya University, Turkey	*Improved Electrochemical Performance of Graphene/$LiMn_2O_4$ Nanocomposites For Li-Ion Batteries*
P-66	**Hatem Akbulut**	Sakarya University, Turkey	*Optimization SiO_2 and Al_2O_3 Nanoparticles on the Stability of TEGDME-$LiPF_6$/ PEO Electrolytes for Li-Air Batteries*
P-67	**Ubeyd Toçoğlu**	Sakarya University, Turkey	*Synthesis and Characterization of Graphene/MWCNT/Silicon Free-Standing Electrodes for Lithium-Ion Batteries*
P-68	**Leszek Niedzicki**	Faculty of Chemistry, Warsaw University of Technology, Poland	*New Trivalent Imidazole-Derived Salt for Lithium-Ion Cell Electrolyte*
P-69	**Ewelina Karpierz**	Faculty of Chemistry, Warsaw University of Technology, Poland	*Ternary Mixtures of Ionic Liquids and Lithium Salt with Solvated Cation as Li-Conducing Electrolyte*
P-70	**Deniz Nalci**	Sakarya University, Turkey	*Structural and Electrochemical Characterization of $Li_3Fe_2(PO_4)_3$ as a Cathode Electrode for Energy Storage Applications*
P-71	**Jurga Juodkazytė**	Institute of Chemistry, Center for Physical Sciences and Technology, Lithuania	*Formation and Investigation of Fe_2O_3/Cu_xO Heterojunction for Possible Use in Solar Energy Conversion*
P-72	**Svetlana Lichušina**	Institute of Chemistry, Center for Physical Sciences and Technology, Lithuania	*Fabrication of Nanoporous Co by Dealloying Single-Phase γ-$Zn_{21}Co_5$ Alloy for Use in Electrochemical Supercapacitors*
Bio- and Pharmaceutical Electrochemistry			
P-73	**Anna Pawlik**	Jagiellonian University, Poland	*Nanoporous Titanium Dioxide for Simultaneous Delivery of Ibuprofen snd Gentamicin*
P-74	**Inga Morkvėnaitė-Vilkončienė**	Department of Physical Chemistry, Vilnius University, Lithuania	*Scanning Electrochemical Microscopy for the Determination of Enzymatic Kinetics*
P-75	**Ayman Chmayssem**	Institut Sciences Chimiques de Rennes, École Nationale Supérieure de Chimie Rennes, France	*Improvement of bisphenol A biodegradability by electro-Fenton process in a plug-flow electrochemical reactor with fixed bed three-dimensional cathode*

P-76	**Magdalena Z. Wiloch**	Faculty of Chemistry, Warsaw University of Technology, Poland	*Electrochemical Properties of Copper Complexes with β-Amyloid 4-16 and β-Amyloid 1-16*
P-77	**Evelina Polmickaitė**	Institute of Biochemistry, Vilnius University, Lithuania	*Flavoenzyme-Catalyzed Reduction Reactions and Cytotoxic Actions of Substituted Pyridine N-Oxides*
P-78	**Evelina Polmickaitė**	Institute of Biochemistry, Vilnius University, Lithuania	*Nitro-Derivatives of N-Heterocyclic Ortho-Quinones: Synthesis, X-Ray Structure, Quantum Mechanical, Electrochemical, Enzymatic and Cytotoxic Studies*
Analytical and Environmental Chemistry			
P-79	**Audrius Padarauskas**	Faculty of Chemistry, Vilnius University, Lithuania	*Determination of coumestrol in perennial legumes by ultra-high pressure liquid chromatography-mass spectrometry*
P-80	**Vilma Olšauskaitė**	Faculty of Chemistry, Vilnius University, Lithuania	*Hydrophilic Interaction Chromatography-Tandem Mass Spectrometry for the Determination of Swainsonine in Plants*
P-81	**Audrius Zolumskis**	Faculty of Chemistry, Vilnius University, Lithuania	*Limit of Detection Improvement in Gas Chromatography System Equipped with Programmable Temperature Vaporization (PTV) Injector*
P-82	**Greta Ragaitė**	Institute of Synthetic Chemistry, Kaunas University of Technology, Lithuania	*New Sensitive, Selective and Stable Chemosensors Based on 5-Trifluormethyl-2,3,3-Trimethyl-3H-Indole*
P-83	**Zita Žukauskaitė**	Center for Physical Sciences and Technology, Lithuania	*Electrodeposition Application to the Sample Preparation for Plutonium Determination*
P-84	**Dana Kaušpėdienė**	Center for Physical Sciences and Technology, Lithuania	*Treatment of Fluoride-Containing Solutions from a Chemical Etching of Silicon*
P-85	**Eglė Valančienė**	Kaunas University of Technology, Lithuania	*The Influence of Zeolite Catalyst on Kinetics and Thermodynamics of Various Plastic Waste Thermolysis*
P-86	**Laima Nedzveckienė**	Institute of Physics, Center for Physical Sciences and Technology, Lithuania	*Comparative Research of Vertical Migration of ^{137}Cs in the Soil of Flooded and Upland Banks of Lakes*
P-87	**Agnė Leščinskytė**	Center for Physical Sciences and Technology, Lithuania	*Prussian Blue Based Nano-Composites for Radiocesium Removal*
P-88	**Sergej Šemčuk**	Center for Physical Sciences and Technology, Lithuania	*Study of Radionuclides and Heavy Metals Sorption on GO*

Nanotechnology			
P-89	**Kristina Bliekaitė**	Vilnius University, Lithuania	*Study of Canvas Deacidification Process Using Magnesium Nanomaterials*
P-90	**Eva Raudonytė-Svirbutavičienė**	Faculty of Chemistry, Vilnius University, Lithuania	*Photochemical Approcah to the Inorganic Synthesis of Semiconductor Nanoparticles*
P-91	**Rūta Sidaravičiūtė**	Kaunas University of Technology, Lithuania	*PAN/TiO_2 Catalyst Formation by Electrospinning and its Structural Characterization*
P-92	**Olegas Eicher-Lorka**	Center for Physical Sciences and Technology, Lithuania	*Functionalization of Magnetic Nanoparticles with New Isocyanate Compound*
P-93	**Daina Upskuvienė**	Center for Physical Sciences and Technology, Lithuania	*Gold Nanoparticles: Synthesis, Characterazation and Application*
P-94	**Ieva Kulakauskaitė**	Center for Physical Sciences and Technology, Lithuania	*Nickel Sorption by Magnetic Nanocomposites*
P-95	**Aušra Baradokė**	Center for Physical Sciences and Technology, Lithuania	*Soft Lithographic Fabrication of Electrodes for Detection of Hydrogen Peroxide*
P-96	**Dovilė Baziulytė**	Faculty of Chemistry, Vilnius University, Lithuania	*Upconvertion Core-Shell Nanoparticles with Enhanced Photoluminescence for Application in Bioimaging and Cancer Therapy*
P-97	**Konrad Trzcinski**	Faculty of Chemistry, Gdańsk University of Technology, Poland	*The Influence of Gold Interlayer on Photoelectrochemical Properties of TiO_2 nanotubes/ $BiVO_4$ Junction*
P-98	**Konrad Trzcinski**	Faculty of Chemistry, Gdańsk University of Technology, Poland	*Micropatterned $BiVO_4$ Films as Templates for Photodeposition of Various Metallic Nanoparticles*
P-99	**Ieva Mikalauskaitė**	Faculty of Chemistry, Vilnius University, Lithuania	*Synthesis and Investigation of Upconverting $NaYF_4$ Nanoparticles Obtained in Oleylamine*
P-100	**Tomas Gadišauskas**	Kaunas University of Technology, Lithuania	*Electrochemically Etched Nano-Probes for Scanning Near-Field Optical Microscopy*
P-101	**Natalia Rezanova**	Kyiv National University of Technologies & Design, Ukraine	*Morphology and Rheological Properties of Incompatible Polymer Compositions with Nanoparticles TiO_2/SiO_2*
P-102	**Simona Streckaitė**	Center for Physical Sciences and Technology, Lithuania	*Formation of Silver Nanoparticles and their Influence on Fluorescence of Organic Materials*
P-103	**Rokas Žalnėravičius**	Center for Physical Sciences and Technology, Lithuania	*Nanoplatelet MoS_2 Films Decorated with Pt Quantum Dots for Effective Hydrogen Production*

Friday, April 29

No.	Presenting author	Affiliation	Poster title
Chemistry and Chemical Technology of Organic Materials			
P-104	**Gintarė Kručaitė**	Kaunas University of Technology, Lithuania	*Wet- and Dry-Process Feasible Carbazole Type Hosts for Highly Efficient Phosphoresent OLEDs*
P-105	**Daiva Tavgenienė**	Kaunas University of Technology, Lithuania	*Phenylvinyl-Substituted Carbazole Twin Compounds as Hole Transporting Materials for Organic Light Emitting Diodes*
P-106	**Titas Deksnys**	Kaunas University of Technology, Lithuania	*Dimethoxydiphenylamino-Substitted 9-Naphthylcarbazole Derivative as Bipolar Emitter for Colour-Tunable OLEDs*
P-107	**Simona Streckaitė**	Center for Physical Sciences and Technology, Lithuania	*Fluorescence Quenching of Indolo[3,2-B]carbazole Compounds by Conformational Motions of Attached Substituents*
P-108	**Raminta Mazėtytė**	Center for Physical Sciences and Technology, Lithuania	*Fluorescence Quenching Of Glucose Oxidase Self-Encapsulated Within Polypyrrole*
P-109	**Ernestas Kasparavičius**	Kaunas University of Technology, Lithuania	*Dyes with 3-Pyrrolin-2-one Electron Accepting Moiety: Sintesis and Investigation in the Dye–Sensitized Solar Cells*
P-110	**Ingrida Tumosienė**	Kaunas University of Technology, Lithuania	*Synthesis and Antioxidant Activity of 1,3,4-Oxa(thia)diazole and 1,2,4-Triazole-5-(Thio)one Derivatives*
P-111	**Birutė Sapijanskaitė**	Kaunas University of Technology, Lithuania	*Transformation of Ethyl 1-Aryl-2-methyl-4-oxo-1,4,5,6-tetrahydropyridine-3-carboxylates under the Influence of Nitrogen Nucleophiles*
P-112	**Irena Ramanauskaitė**	Kaunas University of Technology, Lithuania	*Synthesis of 3-[4-(Aminosulfonyl)anilino]propanoic Acids with Azole Moieties*
P-113	**Birutė Grybaitė**	Kaunas University of Technology, Lithuania	*Synthesis of 5-Substituted N-(1-naphtyl)-N-(4-oxo-4,5-dihydro-1,3-thiazol-2-Yl)-β-alanines*
P-114	**Romualdas Striela**	Center for Physical Sciences and Technology, Lithuania	*An Efficient Conversion of 2-aminopyridines to 2-halogenpyridines*
P-115	**Artūras Peleckis**	Kaunas University of Technology, Lithuania	*Synthesis of 1-(5-Chloro-2-hydroxyphenyl)-5-oxopyrrolidine-3-carbohydrazide Derivatives*
P-116	**Vaida Laukaitytė**	Kaunas University of Technology, Lithuania	*Synthesis of Novel Pyrazole Scaffold-Based Heterocyclic Systems*

P-117	**Monika Dargytė**	Kaunas University of Technology, Lithuania	*Synthesis of 5-Aryl-3,3-dimethyl-2,3-dihydro-1H-indole Carboxylic Acid Derivatives*
P-118	**Gabrielė Gudžinskaitė**	Kaunas University of Technology, Lithuania	*Synthesis of New 2-Aminothiazole Derivatives*
P-119	**Jurga Būdienė**	Center for Physical Sciences and Technology, Lithuania	*Eupatorium Cannabinum L. Essential Oils and their Bioactive Properties*
P-120	**Aušra Linkevičiūtė**	Center for Physical Sciences and Technology, Lithuania	*Lipid Liquid Crystalline Systems for the Protection of Flavonoids*
P-121	**Gita Matulevičiūtė**	Kaunas University of Technology, Lithuania	*Conversion of 2-Thioxo-2,3-dihydroquinazolin-4(1H)-ones to N(3)-Unsubstituted 2-(Het)arylquinazolin-4(3H)-ones*
P-122	**Vaida Milišiūnaitė**	Kaunas University of Technology, Lithuania	*A Straigtforward Approach to Novel Fused Pyrazole Systems*
P-123	**Ieva Matulaitienė**	Center for Physical Sciences and Technology, Lithuania	*Spectral Markers of N-(6-mercapto)hexylpyridinium (MHP) in Low and High Frequency Spectral Regions*
P-124	**Aistė Kveselytė**	Kaunas University of Technology, Lithuania	*Microwave-Assisted Synthesis of New Fluorescent Imidazo[1,2-a]indolone Derivatives by Suzuki-Miyaura Cross-Coupling Reaction in Aqueous Media*
P-125	**Matas Steponaitis**	Kaunas University of Technology, Lithuania	*Organic Quaternary Ammonium Compounds as Hole Transporting Materials for Optoelectronic Applications*
P-126	**Edvardas Golovinas**	Center for Physical Sciences and Technology, Lithuania	*Study of Temperature Influence on Molecular Interactions in Cholesterol Using Raman Spectroscopy*
P-127	**Sigita Kašėtaitė**	Kaunas University of Technology, Lithuania	*Photorheometrical Study of Compositions Based on Glycerol Diglycidyl Ether and Di- or Trihydroxylic Alcohols*
P-128	**Martynas Talaikis**	Institute of Biochemistry, Vilnius University, Lithuania	*FTIR Characterization of Amyloids*
P-129	**Elena Ščerbetkaitė**	Kaunas University of Technology, Lithuania	*Synthesis of 3'-Substituted 1,1,3-trimethyl-1,3-dihydro-4'H-spiro[benzo[e]indol-2,5'-[1,2]oxazole] Derivatives yy 1,3-Dipolar Cycloaddition*

P-130	**Jolita Kuginytė**	Institute of Synthetic Chemistry, Kaunas University of Technology, Lithuania	*Flow Synthesis of Cynnamic Acids Derivatives*
P-131	**Emilis Gudelis**	Institute of Synthetic Chemistry, Kaunas University of Technology, Lithuania	*Synthesis of Ionic Liquids from Natural Amino Acids*
P-132	**Linas Labanauskas**	Center for Physical Sciences and Technology, Lithuania	*Effects of Polyol Ester Structure on Their Visocsity and Solidification Trends*
P-133	**Karolis Petrauskas**	Center for Physical Sciences and Technology, Lithuania	*Utilization of Elastomer Swelling to Evaluate Rubber, De-Vulcanized by Environmentally Friendly Method*
P-134	**Svajus Asadauskas**	Center for Physical Sciences and Technology, Lithuania	*Improvement in Resistance to Wear and Corrosion of Anodized Alumina by Impregnation in Biobased Filler*
P-135	**Robertas Tiažkis**	Kaunas University of Technology, Lithuania	*Hole-Transporting Molecular Glasses Containing Fluorene/Triphenylamine Moieties*
P-136	**Aurimas Bieliauskas**	Kaunas University of Technology, Lithuania	*Synthesis of Highly Fluorescent 3-Substituted 4-styryl-1H-pyrazole Derivatives*
P-137	**Koleta Majewska**	Gdańsk University of Technology, Poland	*Solid-State Characterization of Tricyclic Pharmaceutical Compound and Cyclodextrin Inclusion Complex*
P-138	**Beata Kamińska**	Gdańsk University of Technology, Poland	*UV/$S_2O_8^{2-}$ Process for Degrading a Tricyclic Muscle Relaxant Pharmaceutical in Aqueous Solutions*
P-139	**Agnieszka Pazik**	Gdańsk University of Technology, Poland	*The Shiff Bases As Sensitive Analytical Reagents for F^- and Cu^{2+}, Pb^{2+}, Zn^{2+}, Al^{3+} Ions*
P-140	**Gitarė Naujokaitytė**	Faculty of Natural Sciences, Vytautas Magnus University, Lithuania	*Phytochemical Analysis Diploid and Polyploid Forms of Ribes Using Spectrophotometric, Liquid and Gas Chromatographic Methods*
P-141	**Monika Kudžmaitė**	Kaunas University of Technology, Lithuania	*Products of Condensation Reactions of 5-Oxo-1-[4-(phenylamino)phenyl]pyrrolidine-3- carboxylic Acid and their Antioxidant Activity*
P-142	**Alisa Palavenienė**	Kaunas University of Technology, Lithuania	*Preparation and Characterisation of Ionically Cross-Linked Alginate/Cuttlebone Beads*
P-143	**Ilja Ignatjev**	Center for Physical Sciences and Technology, Lithuania	*Rapid Method to Determine Suitability of Acrylonitrile-Butadiene-Styrene Plastic for Metallization*

P-144	**Titas Braukyla**	Kaunas University of Technology, Lithuania	*Synthesis and Investigation of V-Shaped Hole-Transporting Materials Containing Tröger`s Base Core and Phenylethenyl Branches*
P-145	**Dalia Bražinskienė**	Center for Physical Sciences and Technology, Lithuania	*Influence of Oleate Oxidation on Metal Surface*
Chemistry and Chemical Technology of Inorganic Materials			
P-146	**Paulius Gibieža**	Institute of Cardiology, Lithuanian University of Health Sciences, Lithuania	*Preparation and Study of Antimicrobial Water-Soluble Cationic Starch Iodophors*
P-147	**Lina Pavasarytė**	Department of Inorganic Chemistry, Vilnius University, Lithuania	*Synthesis and Luminescence Properties of Eu^{3+}-Doped $Y_{3-x}Nd_xAl_3O_{12}$*
P-148	**Olga Opuchovič**	Department of Inorganic Chemistry, Vilnius University, Lithuania	*Mössbauer Spectroscopy for Mixed-Metal Yttrium Aluminium-Iron Garnets*
P-149	**Jurga Bagdzevičienė**	Lithuanian Art Museum, Pranas Gudynas Restoration Center, Lithuania	*Natural pieces of Baltic Amber: Investigation into the Reasons for their Disintegration and Preventive Conservation*
P-150	**Mantas Norkus**	Faculty of Chemistry, Vilnius University, Lithuania	*Synthesis of MoS_2 Thin Films from Ammonium Tetrathiomolybdate*
P-151	**Neringa Petrašauskienė**	Kaunas University of Technology, Lithuania	*Morphology of Cadmium Selenide Based Coatings Formed on Polyamide Substrate*
P-152	**Ingrida Ancutienė**	Kaunas University of Technology, Lithuania	*XPS Characterization of Mo-Cu-S Layer on Glass*
P-153	**Algimantas Ivanauskas**	Kaunas University of Technology, Lithuania	*XPS Studies of Cu-In-Se Layers on Glass*
P-154	**Kristina Jančaitienė**	Kaunas University of Technology, Lithuania	*Properties of Liquid – Multicomponent Systems*
P-155	**Giedrė Grincienė**	Center for Physical Sciences and Technology, Lithuania	*Properties and Characterization of CZTS Crystals Prepared by Microwave Heating Irradiation*
P-156	**Aurimas Urbutis**	Kaunas University of Technology, Lithuania	*Studies of Adsorbate Reactions on Single and Activated CuO Based Catalysts*
P-157	**Rasa Šlinkšienė**	Kaunas University of Technology, Lithuania	*Adsorption of Potassium, Zinc and Copper Ions on Clinoptilolte*
P-158	**Domantė Niūniavaitė**	Department of Silicate Technology, Kaunas University of Technology, Lithuania	*The Chemosorption Properties of Synthetic α-C_2S Hydrate*

P-159	**Gabrielė Sarapajevaitė**	Kaunas University of Technology, Lithuania	*C-S-H (I) Sample Stability under Different Partial Water Vapour Pressure Environment*
P-160	**Domas Stungys**	Kaunas University of Technology, Lithuania	*The Influence of Graphene Additive on The Hydration Properties of Binder Material Based on α-C_2S Hydrate*
P-161	**Kristina Ruginytė**	Kaunas University of Technology, Lithuania	*The Influence of Graphene Additive on the Hydration Properties of OPC*
P-162	**Laura Jefimovaitė**	Kaunas University of Technology, Lithuania	*The Simultaneous Adsorption Capacity of Hydrotalcite for Co^{2+}, Cr^{3+}, Cu^{2+} Ions*
P-163	**Viktorija Ringytė**	Kaunas University of Technology, Lithuania	*Effect of Partial Water Vapour on Hydrotalcite Sample Structure*
P-164	**Jolanta Donėlienė**	Kaunas University of Technology, Lithuania	*Surface Microstructure and Specific Surface Area of Synthetic Calcium Aluminium Hydrate*
P-165	**Aliona Iljina**	Kaunas University of Technology, Lithuania	*The Formation of Dibasic Calcium Silicate Hydrates*
P-166	**Agnė Šmigelskytė**	Kaunas University of Technology, Lithuania	*Influence of Forming Pressure on the Synthesis of Clinker Minerals*
P-167	**Pranas Ušinskas**	Faculty of Chemistry, Vilnius University, Lithuania	*Preparation of Calcium Titanate Powders and Thin Films by Sol- Gel Method*
P-168	**Birutė Šimkūnaitė-Stanynienė**	Center for Physical Sciences and Technology, Lithuania	*Formation of ZnO by the Silar Method for Thin Solar Cells*
P-169	**Giedrius Smalakys**	Kaunas University of Technology, Lithuania	*The Synthesis of 1.13 nm Tobermorite from Granite Polish Waste*
P-170	**Danas Sakalauskas**	Faculty of Chemistry, Vilnius University, Lithuania	*Synthesis of $Sr_{1-x}Y_xF_{2+x}$ via Co–Precipitation Method*
P-171	**Monika Skruodienė**	Faculty of Chemistry, Vilnius University, Lithuania	*Doping Effect of Tb^{3+} Ions on Luminescence properties of $Y_3Al_5O_{12}:Cr^{3+}$ Phosphor*
P-172	**Tadas Matijošius**	Center for Physical Sciences and Technology, Lithuania	*Wear Behavior of Dry Sliding and Lubricated Titanium Alloys*
P-173	**Eglė Gražėnaitė**	Faculty of Chemistry, Vilnius University, Lithuania	*Commercial and Sol-Gel Derived Cobalt Chromites as Ceramic Pigments: a Comparative Study*
Polymer Chemistry			
P-174	**Rasa Keruckienė**	Kaunas University of Technology, Lithuania	*2-Phenylindolylcarbazole Derivatives with Reactive Functional Groups as Electroactive Materials*

P-175	**Ramunė Rutkaitė**	Kaunas University of Technology, Lithuania	*Immobilization of Rosemary Oil in Electrospun Cellulose Acetate Fibers*
P-176	**Vesta Navikaitė**	Kaunas University of Technology, Lithuania	*Electrospun Cellulose Acetate Fibers Containing Essential Oils for Active Food Packaging*
P-177	**Dalia Buivydienė**	Kaunas University of Technology, Lithuania	*Review: Biodegradable Polymers and Melt Electrospinning Method for Nanofiber Fabrication*
P-178	**Gintautas Šimkus**	Kaunas University of Technology, Lithuania	*Synthesis and Properties of Photocross-Linkable Carbazole-Based Monomers*
P-179	**Dainora Jankūnaitė**	Kaunas University of Technology, Lithuania	*Carbazole-Based Derivatives Having Donor and Acceptor Moeties*
P-180	**Karolis Norvaiša**	Kaunas University of Technology, Lithuania	*Derivatives of 9-Phenyl Carbazole with Indole Moieties for Electrophosphorecent Devices*
P-181	**Anton Magomedov**	Kaunas University of Technology, Lithuania	*Cheap and Efficient Carbazole-Based Hole Transporting Materials for Perovskite Solar Cells*
P-182	**Ieva Petrikytė**	Kaunas University of Technology, Lithuania	*Efficiency Enhancement of Perovskite Solar Cells via Incorporation of Phenylethenyl Side Arms into Indolocarbazole-Based Hole Transporting Materials*
P-183	**Deimantė Simanavičiūtė**	Kaunas University of Technology, Lithuania	*Adsorption of Chlorogenic Acid on Cationic Cross-Linked Starch with Quaternary Amino Groups*
P-184	**Dovilė Liudvinavičiūtė**	Kaunas University of Technology, Lithuania	*Starch Derivatives with Tertiary Amino Groups for Immobilization of Bioactive Phenolic Acids*
P-185	**Rasa Paleckienė**	Kaunas University of Technology, Lithuania	*Starch-Based Biodegradable Films for Coating Urea: Preparation and Properties*
P-186	**Rita Butkutė**	Kaunas University of Technology, Lithuania	*Vinyl-Functionalized Phenanthroimidazole: Synthesis, Properties and Self-Polymerization*
P-187	**Joana Bendoraitienė**	Kaunas University of Technology, Lithuania	*Cationic Starch Obtained by Reactive Extrusion*
P-188	**Edita Paluckienė**	Kaunas University of Technology, Lithuania	*SEM Investigation of Polyethylene, Polypropylene and Polyester with Cu_xS Layers*
P-189	**Joanna Świder**	Faculty of Chemistry, Jagiellonian University, Poland	*Copolymers of N-Vinylformamide as Support for Immobilization of Cellulolytic Enzymes*
Physical Chemistry			
P-190	**Linas Samardokas**	Kaunas University of Technology, Lithuania	*Optical Properties of Thallium Selenide Layers on the Polyamide Film Surface*

P-191	**Elena Binkauskienė**	Center for Physical Sciences and Technology, Lithuania	*Characterization of Long-Term Atmospheric Corrosion Products of Zinc*
P-192	**Skirma Žalenkienė**	Kaunas University of Technology, Lithuania	*Properties of CdSe Films Deposited by CBD-Silar Method on Polymer*
P-193	**Jonas Reklaitis**	Center for Physical Sciences and Technology, Lithuania	*Influence of Chloride Concentration in Thermofication Water on Formation of β-FeOOH on Carbon Steel*
P-194	**Agnė Mikalauskaite**	Center for Physical Sciences and Technology, Lithuania	*Synthesis, Characterization and Application of Red-Luminescent Gold Clusters*
P-195	**Austėja Bukauskytė**	Center for Physical Sciences and Technology, Lithuania	*Fluorescence Quantum Yield of Perylenediimide Derivatives*
P-196	**Renata Karpicz**	Center for Physical Sciences and Technology, Lithuania	*Structural and Fluorescence Studies of Polycrystalline A-Al_2O_3 Obtained on Anodic Alumina*
Chemical Engineering			
P-197	**Justė Kupčiūnaitė**	Faculty of Chemistry, Vilnius University, Lithuania	*Surface Active Materials for Paper Cleaning*
P-198	**Ieva Vilkaitė**	Kaunas University of Technology, Lithuania	*Hardening and Hydration Properties of Blended Cements*
P-199	**Marius Baltakys**	Kaunas University of Technology, Lithuania	*The Influence of Structure and Mineral Composition on Properties of Autoclaved Aerated Concrete*
P-200	**Jolita Rusinavičiūtė**	Kaunas University of Technology, Lithuania	*Analysis of Physical and Chemical Composition of Protein Fibres*
P-201	**Valentina Krylova**	Kaunas University of Technology, Lithuania	*Incorporation of Silver Selenide into Silk Matrice*
Biochemistry			
P-202	**Rasa Alaburdaitė**	Kaunas University of Technology, Lithuania	*Influence of Metal Ions Additives on Enzymatic Hide Unhairing in Oxidative Medium*
P-203	**Veslava Matikevičienė**	JSC “Biocentras”, Lithuania	*Characterization of Hydrogel with Antibacterial Activity*
P-204	**Iwona Ufnalska**	Warsaw University of Technology, Poland	*Yeast Pheromon as an Example of Biologically Active Oligopeptides Forming Ternary Complexes*
P-205	**Elena Binkauskienė**	Center for Physical Sciences and Technology, Lithuania	*The Influence of Mycobiota on the Interface of The Polyaniline Coatings*

P-206	**Maksym Koliada**	Kyiv National University of Technologies & Design, Ukraine	*Collagen Derivatives Application for Biodegradable Films Formation*
P-207	**Kristina Teišerskytė**	Kaunas University of Technology, Lithuania	*Impact of 4-[(9-Alkylcarbazol-3-yl)amino]-3-carboxybutyric Acid Disodium Salts on Rape (Brassica Napus L.) Germination In Vitro*

EFFECTS OF POLYOL ESTER STRUCTURE ON THEIR VISOCSITY AND SOLIDIFICATION TRENDS

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This research is dedicated to turning non-edible Camelina and Crambe oils into sustainable source of basestocks for lubricants, preferably hydraulic fluids. From diverse spectra of possible products, based on these non-food oils, medium chainlength fatty acids (MCFA) appear as promising candidates for basestock building blocks. Esters of polyhydric alcohols with tertiary β-carbon, a.k.a. polyols, are frequently used for the basestocks, because of improved thermal and oxidative stability. During this study, MCFA esters of neopentyl glycol (NP), trimethylol propane (TMP) and pentaerythritol (PE) were synthesized to investigate the influence of molecular structure on viscosity and low temperature solidification of obtained fluids. Kinematic viscosities at 40°C were measured using capillary viscometers. Pour points were determined using the same thermal cooling regime, as instructed by ASTM D97. The results are presented in Fig. 1.

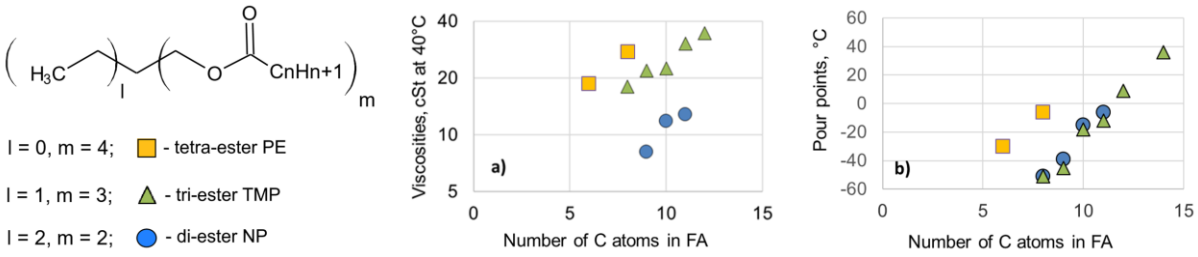

Figure 1. Structures of synthesized compounds as candidates for lubricant basestocks along with their viscosities (Fig. 1 a) and solidification tendencies (Fig. 1 b).

As expected, synthesized esters demonstrate a distinct tendency to increase in viscosity with higher molecular weights. In order to design a basestock of necessary viscosity grade, conventional methods of viscosity prediction can be used both for individual esters and their blends. The relationship between ester structure and pour points is much more complex (Fig. 1 b). Compared to tri-esters (i.e. TMP+MCFA), NP esters of the same MCFA (i.e. di-esters) solidify easier despite significantly lower mol. wt. Nearly as counterintuitive is the observation that tri-ester pour points are lower than those of tetra-esters of similar mol. wt. This suggests that polyol tri-esters, such as those of TMP, give more beneficial low temperature fluidity than polyol esters of NP or PE. Further improvement can be achieved by esterifying not one, but several MCFA during the synthesis. When NP and TMP esters were synthesized using a 1:1 blend of C9 and C11 MCFA, their pour points appeared in between of those for respective esters of pure MCFA, but much closer to those of C9 than C11. Synthesis iterations can provide further improvement in low temperature fluidity of MCFA esters and provide excellent opportunities to utilize Crambe and Camelina oils in industrial applications.

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