



**FACULTY OF
CHEMISTRY**

University of Lodz

Faculty of Chemistry University of Lodz

→ www.chemia.uni.lodz.pl





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GENERAL INFORMATION

AUTHORITIES

Dean

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Associate Professor Bogna Rudolf

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GENERAL INFORMATIONS

HISTORY OF THE FACULTY



Nobel laureate Professor Ada Yonath
as the guest of honor
III Lodz PhD Students Symposium
in Chemistry, April 2015,
Faculty of Chemistry University of Lodz.

Faculty of Chemistry at the University of Lodz was established on October 1, 2007 as a result of the reorganization of Faculty of Physics and Chemistry, but the first units conducting scientific research in the field of chemical sciences were established at the University of Lodz in May 1945 as part of Faculty of Mathematics and Natural Sciences.

The first meeting of the Council of Faculty of Chemistry took place on October 3, 2007. The deans of the faculty were Bogusław Kryczka in the 2007–2008 and 2008–2012 terms, Grzegorz Młostoń (2012–2016) and Sławomira Skrzypek (2016–2020) currently performing this function.

The Dean's Office of Faculty of Chemistry, relocated from 149/153 Pomorska Street, opened at 12 Tamka Street on April 20, 2009.



The first logo
of Faculty of Chemistry
University of Lodz.

FACTS AND FIGURES



Foundation date:
01.10.2007



Location:
ul. Tamka 12, 91-403 Lodz, Poland



Number of departments:
6



Academic staff

- Full professors: 11
- Habilitation degree holders: 23
- Doctoral degree holders: 63



Students

- BSc Programmes: 335
- Msc Programmes: 70
- Ph.D. Programmes: 25

STUDY OFFER

Study Programmes:

CHEMISTRY

Bachelor's Degree

- specialisation – Chemistry in science and economy
- specialisation – Chemistry and nanotechnology of modern materials
- specialisation – Cosmetic chemistry

Master's Degree

- specialisation – Chemistry in science and economy
- specialisation – Chemistry and nanotechnology of modern materials
- specialisation – Cosmetic chemistry

Study Programme:

CHEMISTRY OF COSMETICS AND PHARMACEUTICALS WITH ELEMENTS OF BUSINESS

Bachelor's Degree and Master's Degree

Study Programme:

ANALYTICAL CHEMISTRY

Bachelor's Degree and Master's Degree

Study Programme:

MATERIALS CHEMISTRY AND NANOTECHNOLOGY

Bachelor's Degree

Study Programme:

CHEMISTRY TEACHING

Master's Degree

STUDY OFFER

As part of the CHEMISTRY TEACHING, students will be prepared to solve complex problems in the field of psychology and pedagogy in the education of chemistry.

The students will acquire theoretical knowledge, which will be made use of during educational practice. They will also become familiar with the issues of methodology of chemistry teaching.

Our students can study partly (one or two semesters) at other universities in Europe thanks to Erasmus+, CEEPUS, and other exchange programmes. The student organisations, such as SKNCh 'Orbital' bring the most active and willing-to-work students together.

GENERAL INFORMATION



Student Science Club

Student Science Club of Chemists of the University of Lodz is one of the oldest students' organisations at our University. It was founded in spring 1945 by dr. B. Oprządek while he was a student.

During the Polish People's Republic the Club was closed down twice, then it was reactivated in 1983 and it has been operating since then. In 2019 its name was changed to SKNCH 'Orbital' UL, keeping all the previous traditions. As its community, we promote our Faculty and take active part in various initiatives such as the Academy of Interesting Chemistry or the Festival of Science, Technology and Art.

Furthermore, we organise scientific camps and educational trips. Our members participate in numerous scientific conferences, where they present results of their work, which are often realized in cooperation with our Faculty's scientists.

At the end of the Academic Year 2019/2020 the Student Science Club of Chemists of the University of Lodz 'Orbital' had 33 members. Dr. Paweł Urbaniak is its supervisor.



GENERAL INFORMATIONS



Student Science Club

Since 2012, the Scientific Club of Cosmetic Chemistry has been operating at the Faculty of Chemistry at the University of Lodz. It includes both first-cycle and second-cycle students as well as doctoral students. The tutor of the Scientific Club of Cosmetic Chemistry is dr. Anna Wrona-Piotrowicz. Students belonging to the Science Club actively participate in popularizing science by preparing and presenting scientific demonstrations during the Academy of Interesting Chemistry or various science picnics and science festivals. They take part in charity events. Students also conduct research that they present at Scientific Conferences.



DEPARTMENTS

Department of Inorganic and Analytical Chemistry



Head:

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GROUP MEMBERS:

prof. dr. hab. Witold Ciesielski, dr. hab. inż. Marek Zieliński, dr. hab. Łukasz Pótorak, dr. Mariola Brycht, dr. Barbara Burnat, dr. Karolina Czarny-Krzywińska, dr. Dariusz Guziejewski, dr. Barbara Krawczyk, dr. Andrzej Leniart, dr. Ewa Miękoś, dr. Konrad Rudnicki, dr. Karolina Sipa, dr. Sylwia Smarzewska, dr. Danuta Tomczyk, dr. Bożena Chmielewska-Bojarska, dr. Sławomir Domagała, dr. Paweł Krzyczmonik, dr. Janusz Kupis, dr. Piotr Seliger, dr. Monika Skowron-Jaskólska, dr. Dominik Szczukocki, dr. Paweł Urbaniak, Msc Anna Fenyk, Msc Renata Juszcak, dr. Dariusz Sroczyński, Msc Violetta Stegliška, Msc Katarzyna Gryciuk, dr. Kamila Koszelska

RESEARCH FIELD

Electrode materials preparation and their modifications with various materials, electrodes characterization (microscopic and electrochemical), square-wave voltammetry for electrode mechanisms and kinetics, electrode-biomolecules interactions, electrochemistry for miniaturisation and miniaturisation for electrochemistry, biomaterials (steel, titanium, alloys, ceramics), biomedical coatings (TiO₂, HAP, DLC), surface modification (sol-gel, electrooxidation, electrodeposition, nanoparticle deposition), recycling of waste from chemical and pharmaceutical industries, investigation of polymers and biopolymers in a static magnetic field, complexation and acid-base equilibria of cyclotriphosphazene derivatives of crown ethers and polyazamacrocycles with metal ions, toxic effects of various environmental pollutants on the growth of microorganisms, determination of pollutants in environmental samples.

Advanced electrode materials



Head:

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Group members:

dr. Mariola Brycht, dr. Andrzej Leniart
dr. Paweł Krzyczmonik, prof. Witold Ciesielski

EQUIPMENT

- several potentiostats (e.g., Autolab 128N, Autolab 204, PAR 273, EmStat2)
- electrochemical quartz crystal microbalance M106 (Uelko)
- atomic force microscope Dimension Icon (Bruker)
- metallographic microscope MMT 800BT (microLAB)
- ultrasonic homogenizer SONOPULS HD 2200 (Bandelin)
- muffle furnace (Nabertherm, Neoterm)

PROJECTS

- The investigation of electrochemical activities of an innovative graphene electrodes based on the reduced graphene oxide as sensors for the voltametric studies, Preludium (NCN), 2015-2018
- New Electrochemical sensors based on boron-doped diamond and their applications in electroanalysis, Czech Operational Programme Research, 'Development and Education' (OP RDE), 2018-2019

PARTNERS

University of Graz (Graz, Austria), Charles University (Prague, The Czech Republic), Ankara University (Ankara, Turkey), University of Pardubice (Pardubice, The Czech Republic), University of Novi Sad (Novi Sad, Serbia), University of Split (Split, Croatia)

SELECTED PUBLICATIONS

- Brycht M.; Baluchová S.; Taylor A.; Mortet V.; Sedláková S.; Klimša L.; Kopeček J.; Schwarzová-Pecková K. 2021, Comparison of electrochemical performance of various boron-doped diamond electrodes: Dopamine sensing in biomimicking media used for cell cultivation. *Bioelectrochemistry* 137, 107646.
- Brycht M.; Leniart A.; Zavašník J.; Nosal-Wiercińska A.; Wasieński K.; Półrolniczak P.; Skrzypek S.; Kalcher K. 2018, Synthesis and characterization of the thermally reduced graphene oxide in argon atmosphere, and its application to construct graphene paste electrode as a naptalam electrochemical sensor. *Analytica Chimica Acta* 1035, 22-31.
- Krzyczmonik P.; Socha E.; Skrzypek S. 2018, Electrochemical detection of glucose in beverages samples using poly(3,4-ethylenedioxythiophene) modified electrodes with immobilized glucose oxidase. *Electrocatalysis* 9, 380-387.
- Leniart A.; Brycht M.; Burnat B.; Skrzypek S. 2016, Voltammetric determination of the herbicide protham on glassy carbon electrode modified with multi-walled carbon nanotubes, *Sensors and Actuators B* 231, 54-63.
- Krzyczmonik P.; Socha E.; Skrzypek S. 2015, Immobilization of glucose oxidase on modified electrodes with composite layers based on poly(3,4-ethylenedioxythiophene). *Bioelectrochemistry*, 101, 8-13.



RESEARCH PROFILES

- electrode materials preparation and their modifications with various materials, including nanomaterials and conductive polymers
- electrodes characterization (microscopic and electrochemical)
- electrodes with immobilized enzymes
- electrochemical deposition of metals and alloys
- electroanalytical and electrocatalytical applications of electrodes

RESEARCH GROUPS

Electrode mechanisms + electrokinetics



Head:

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Group members:

dr. Dariusz Guziejewski, dr. Sylwia Smarzewska,

dr. Sławomir Domagała, dr. Kamila Koszelska



EQUIPMENT

- μ Autolab potentiostat with GPES software v. 4.9
- multipotentiostat mAutolab with Nova software 1.11.3 and 2.1.1
- spectrophotometer UV/Vis Carry 100
- potentiostat DropSens with parallel spectrophotometric measurements

RESEARCH PROFILES

- square-wave voltammetry for electrode mechanisms and kinetics
- new electrochemical techniques
- electrode-biomolecules interactions
- electrochemical studies of DNA interactions
- thin-film and three-phase electrodes

PROJECTS

- Studying chosen electrode kinetics at a constant scan rate using square wave voltammetry, NCN Preludium, 2012-2014
- Studies of electrode reaction kinetics with square wave voltammetry, NCN Sonata, 2017-2020
- Physicochemical and biochemical properties of graphene-like layers, NCN, Miniatura, 2017-2018
- Electrochemical gas-sensors for hydrogen peroxide detection, NCN, Opus-Lap, 2022-2024
- Redox switchable sensors for electrochemical detection of calcium and magnesium ions, NCN, Preludium, 2022-2025

PARTNERS

University of Pardubice (The Czech Republic), Rudjer Boskovic Institute (Croatia), National Institute of Chemistry (Slovenia), Ss. Cyril and Methodius University (Macedonia)

SELECTED PUBLICATIONS

- Guziejewski, D.; 2020, *Electrode mechanisms with coupled chemical reaction-amplitude effect in squarewave voltammetry*. Journal of electroanalytical Chemistry 870, 114186.
- Morawska, K.; Popławski, T.; Ciesielski, W.; Smarzewska, S. 2020, *Rapid electroanalytical procedure for sesamol determination in real samples*. Food Chemistry 309, 125789.
- Mirčeski, V.; Guziejewski, D.; Stojanov, L.; Gulaboski, R. 2019, *Differential square-wave voltammetry*. Analytical Chemistry 91, 14904-14910
- K. Morawska, W. Ciesielski, S. Smarzewska; *First electroanalytical studies of methoxyfenozide and its interactions with dsDNA*. Journal of Electroanalytical Chemistry, (2021), 882, 115030.
- L. Stojanov, D. Guziejewski, M. Puiu, C. Bala, V. Mirceski; *Multi-frequency analysis in a single square-wave chronoamperometric experiment*. Electrochem. Commun., (2021), 124, 106943.
- J. Čović; V. Mirčeski; A. Zarubica; D. Enke; S. Carstens; A. Bojić; M. Randelović; *Palladium-graphene hybrid as an electrocatalyst for hydrogen peroxide reduction*. Applied Surface Science, (2022), 574, 151633.

RESEARCH GROUPS

Electrochemistry at soft interfaces (E@SI)



Head:

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Group members:

dr. Konrad Rudnicki, dr. Karolina Sipa,

dr. Mohammad Rizwan, dr. Bosirul Hoque

EQUIPMENT

- electrochemical hardware (e.g., Autolab 302N, Autolab 128N, EmStat3+)
- drop shape analyzer
- equipment used for the miniaturization and labware fabrication (e.g., 3D printers, home build miniaturization setups).
- 3D printer Pursa Mini; 3D printer Prusa i3Mks; Filament maker 3DEVO; Felfil Plastic Shredder
- Atomic Absorption Spectrometer – ContrAA 800

PROJECTS

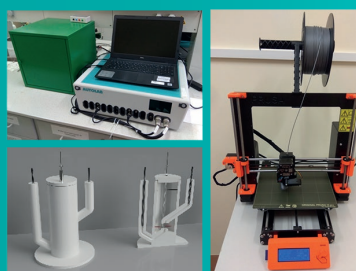
- electrochemically assisted patterning at three phase junctions. NCN, Miniatura 5, 2021-2022
- development of new electrochemical methods for the determination of sulfonamide compounds. IDUB, 2021-2022
- the polarized gel-gel interface placed in 3D printed support for urine diagnosis (eGGI), Preludium 20, NCN, 2022-2025
- miniaturization for electrochemistry. Electrochemical sensors for presumptive illicit drugs detection – SmallDrugSens, NCNS, Sonata, 2019-2022
- micro-patterned membranes constructed on the basis of heat-shrinkable polymeric films as innovative electrified liquid-liquid interface supports for sensing applications, NCN, Preludium 15, 2019-2022
- electrochemically controlled polarized liquid – liquid interface modification with polyamides, NCN, Preludium 19, 2021-2024

PARTNERS

Lorraine University (Nancy, France), Czech Academy of Sciences (Prague, The Czech Republic), Palacky University (Olomouc, The Czech Republic), Dutch Forensic Institute (Den Haag, The Netherlands), Central Forensic Laboratory of the Police (Warsaw, Poland), Technical University Delft (Delft, The Netherlands), Brno University of Technology (Brno, The Czech Republic), University of Graz (Graz, Austria), University of Ljubljana (Ljubljana, Slovenia), University of Białystok (Białystok, Poland)

SELECTED PUBLICATIONS

- Rudnicki, K.; Sobczak, K.; Borgul P.; Skrzypek S.; Poltorak L. 2021, *Determination of quinine in tonic water at the miniaturized and polarized liquid-liquid interface*. Food Chemistry 364, 130417.
- Borgul, P.; Pawlak, P.; Rudnicki, K.; Sipa, K.; Krzyczmonik, P.; Trynda, A.; Skrzypek, S.; Herzog, G.; Poltorak, L. 2021, *Ephedrine sensing at the electrified liquid-liquid interface supported with micro-punched self-adhesive polyimide film*. Sensors and Actuators B: Chemical 344, 130286.
- Poltorak, L.; Rudnicki, K.; Koliwoška, V.; Sebechlebská, T.; Krzyczmonik, P.; Skrzypek, S. 2021, *Electrochemical study of ephedrine at the polarized liquid-liquid interface supported with a 3D printed cel*. Journal of Hazardous Materials 402, 123411.



RESEARCH PROFILES

- electrochemistry for miniaturization and miniaturization for electrochemistry
- 3DP for electrochemistry
- electrochemically assisted materials deposition
- electrified liquid-liquid interfaces
- sensors for quality control
- interface modification and characterization
- electrochemistry of (bio)membranes
- electrochemically based recovery technologies
- flame and electrothermal atomic absorption spectrometry

RESEARCH GROUPS

Biomaterials and Corrosion (BioMatCor)



Head:

dr. Barbara Burnat

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Group members:

dr. Andrzej Leniart

EQUIPMENT

- potentiostat-galvanostat PGSTAT 30 (Autolab/Metrohm)
- potentiostat-galvanostat 128N (Autolab/Metrohm)
- atomic force microscope Dimension Icon (Bruker)
- metallographic microscope MMT 800BT (microLAB)
- dip-coater DC MONO 75 (NIMA Technology)
- thermostatic cabinet ST1 (POL-EKO)
- muffle furnaces (Nabertherm, Neoterm)

PROJECTS

- The effect of titanium dioxide coatings on corrosion resistance of ISO 5832-9 standard in the presence of proteins, MNiSW, 2010-2013
- Functionalized titanium dioxide-based coatings for biomedical applications, IDUB UL, 2021-2022

PARTNERS

Lodz University of Technology (Lodz, Poland), Medical University of Lodz (Lodz, Poland), University of Silesia in Katowice (Katowice, Poland), University of Ljubljana (Ljubljana, Slovenia), University of Split (Split, Croatia)

SELECTED PUBLICATIONS

- Burnat B., Olejarz P., Batory D., Cichomski M., Kaminska M., Bociaga D., 2020, *Titanium Dioxide Coatings Doubly-Doped with Ca and Ag Ions as Corrosion Resistant, Biocompatible, and Bioactive Materials for Medical Applications*. *Coatings*, 10, 169
- Burnat B., Robak J., Leniart A., Piwoński I., Batory D., 2017, *The effect of concentration and source of calcium ions on anticorrosion properties of Ca-doped TiO₂ bioactive sol-gel coatings*. *Ceramics International* 43, 13735–13742.
- Burnat B., Robak J., Batory D., Leniart A., Piwoński I., Skrzypek S., Brycht M., 2015, *Surface characterization, corrosion properties and bioactivity of Ca-doped TiO₂ coatings for biomedical applications*. *Surface & Coatings Technology* 280, 291–300.
- Burnat B., Błaszczyk T., Leniart A., 2014, *Effects of serum proteins on corrosion behavior of ISO 5832-9 alloy modified by titania coatings*. *Journal of Solid State Electrochemistry*, 18, 3111–3119.
- Burnat B., Dercz G., Błaszczyk T., 2014, *Structural analysis and corrosion studies on an ISO 5832-9 biomedical alloy with TiO₂ sol-gel layers*. *Journal of Materials Science: Materials in Medicine*, 25, 623–634.



RESEARCH PROFILES

- biomaterials (steel, titanium, alloys, ceramics)
- biomedical coatings (TiO₂, HAP, DLC)
- surface modification (sol-gel, electrooxidation, electrodeposition, nanoparticle deposition)
- surface characterization (composition, morphology, topography, thickness)
- corrosion investigation (accelerated corrosion tests, immersion tests)

RESEARCH GROUPS

Laboratory of Magnetostatic Research



Head:

dr. hab. inż. Marek Zieliński, prof. UL

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Group members:

dr. Ewa Miękoś, dr. Dariusz Sroczyński

EQUIPMENT

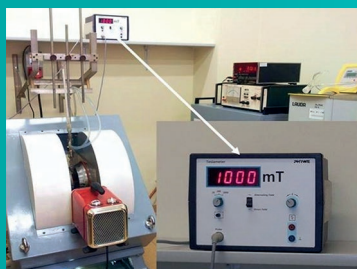
- laboratory Electromagnet ER 2505, teslameter
- potentiostat EmStat Blue
- container for recycling of pharmaceutical blisters
- muffle furnaces (Nabertherm, Neoterm)

PARTNERS

Lublin University of Technology (Lublin, Poland), Lodz University of Technology (Lodz, Poland), Łukasiewicz Research Network - Institute of Biopolymers and Chemical Fibres (Lodz, Poland)

SELECTED PUBLICATIONS

- Zieliński M., Burnat B., Miękoś E. 2020, *Effects of a Constant Magnetic Field on the Electrochemical Reactions of Quercetin*, Chemistry Open, 9, 1229-1235.
- Miękoś E., Zieliński M. et al. 2019, *Application of industrial and biopolymers waste to stabilize the subsoil of road surfaces*, Road Materials and Pavement Design, 20, 440-453.
- Smarzewska S., Miękoś E., Guziejewski D., Zieliński M., Burnat B. 2019, *Graphene oxide activation with a constant magnetic field*, Analytica Chimica Acta, 1011, 35-39.
- Zieliński M., Miękoś E., Szczukocki D., Skrzypek S. et al. 2020, *Method for separation of waste components from pharmaceutical blisters*, Polish Patent Pending 234513.
- Zieliński M., Miękoś E., Szczukocki D. et al. 2018, *Method for producing plaster coated insulating layers*, Polish Patent Pending 230130.



RESEARCH PROFILES

- recycling of waste from chemical and pharmaceutical industries
- investigation of polymers and biopolymers in a static magnetic field
- investigation of chemical, electrochemical and biochemical processes in a static magnetic field

Laboratory of Coordination Compounds



Head:

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Group members:

Msc Anna Fenyk, dr. Piotr Seliger, dr. Paweł Urbaniak



EQUIPMENT

- potentiostats/galvanometers ECO CHEMIE AUTOLAB PGSTAT128N and PGSTAT10
- spectrophotometers UV/VIS/NIR JASCO V-630 and VIS METERTECH
- microtitrators CERKO
- magnetic balance Sherwood Scientific.

RESEARCH PROFILES

- complexation and acid-base equilibria of cyclotriphosphazene derivatives of crown ethers and polyazamacrocycles with metal ions
- modifications of electrodes by transition metals complexes with heteroaryl, salen and macrocyclic derivatives

PARTNERS

Centre of Polymer and Carbon Materials Polish Academy of Science (Zabrze, Poland), Faculty of Chemistry / Rzeszów University of Technology (Rzeszów, Poland)

SELECTED PUBLICATIONS

- Gutowska, N.; Seliger, P.; Romański, J.; Zięba, M.; Adamus, G.; Kowalczyk, M., 2020, *Mass Spectrometry Reveals Complexing Properties of Modified PNP-Lariat Ether Containing Benzyl Derivative of (S)-Prolinamine*. *Molecules* 136 (25), 1-19.
- Bester, K.; Bukowska, A.; Myśliwiec, B.; Hus, K.; Tomczyk, D.; Urbaniak, P.; Bukowski, W., 2018, *Alternating ring-opening copolymerization of phthalic anhydride with epoxides catalysed by salophen chromium (III) complexes*. *Polymer Chemistry* 9, 2147-2156.

RESEARCH GROUPS

Laboratory of Environmental Threats



Head:

dr. Dominik Szczukocki

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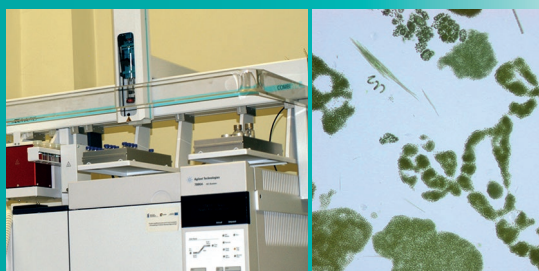
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Group members:

dr. Barbara Krawczyk, dr. Karolina Czarny-Krzywińska,
Msc Renata Juszcak

EQUIPMENT

- chromatographic techniques (GC-FID/ECD/MS, HPLC-DAD/-FLD)
- separation techniques (SPE, SBSE)
- toxicological methods (optical microscope, phytotron chamber, laminar chamber, AlgaeChek Ultra, Microtox bioassay, Microbial Assay for Risk Assessment (MARA), XenoScreen YES/YAS assay)



RESEARCH PROFILES

- environmental analysis of the cyanobacterial toxins and the degree of eutrophication
- toxic effects of various environmental pollutants on the growth of microorganisms
- determination of pollutants in environmental samples

PROJECTS

- Increasing the safety of residents exposed to natural hazards occurring in water reservoirs of Lodz region by modernizing equipment and introducing innovative methods of monitoring at the Laboratory of Environmental Threats at University of Lodz, RPO WL, 2010-2015
- Raising competence of students and graduates: Environmental monitoring using modern analytical techniques and chemometrics training, EEA, 2015-2016

SELECTED PUBLICATIONS

- Czarny K., Szczukocki D., Krawczyk B., Zieliński M., Miękoś E., Gadzała-Kopciuch R. 2017, *The impact of estrogens on aquatic organisms and methods for their determination*, Critical Reviews in Environmental Science and Technology, 47 (11), 909-963.
- Czarny K., Szczukocki D., Krawczyk B., Skrzypek S., Zieliński M., Gadzała-Kopciuch R. 2019, *Toxic effects of single hormones and their mixtures on the growth of Chlorella vulgaris and Scenedesmus armatus*, Chemosphere, 224, 93-102.
- Czarny K., Szczukocki D., Krawczyk B., Juszcak R., Skrzypek S., Gadzała-Kopciuch R. 2019, *Molecularly imprinted polymers film grafted from porous silica for efficient enrichment of steroid hormones in water samples*, Journal of Separation Science, 42 (17), 2858-2866.

DEPARTMENTS

Department of Organic Chemistry



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GROUP MEMBERS:

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RESEARCH FIELD

- Organometallic chemistry.
- Application of organometallic compounds in biochemistry and medical science.
- Development of antibacterial and anticancer agents.
- Chemistry of xeno-nucleic acids and bioimaging, Organic asymmetric synthesis.
- Chemistry of organophosphorus compounds.
- Fluorescent polycyclic aromatic compounds for materials and biological application.

RESEARCH GROUPS

Rudolf's research group



Head:

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Group members:

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Msc Agnieszka Łaska-Jesionowska, Msc Karolina Koprowska

EQUIPMENT

- PhotoLAB Batch-M Mid volume photoreactor
- ultrasonic homogenizer Omni-Ruptor 4000

PROJECTS

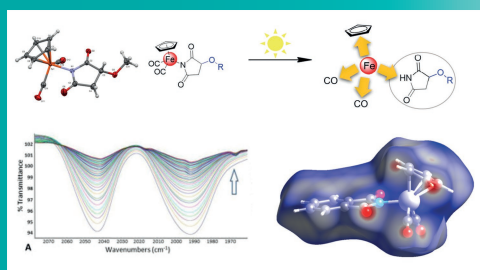
- synthesis of biologically active succinimide derivatives
- synthesis of aminophosphonic acids and their metalcarbonyl derivatives

PARTNERS

Ecole Nationale Supérieure de Paris (Paris, France), ENSCM Chimie Montpellier (Montpellier, France), Faculty of Chemistry, University of Białystok (Białystok, Poland), Faculty of Biology and Environmental Protection, University of Lodz (Lodz, Poland), Medical University of Lodz (Lodz, Poland)

SELECTED PUBLICATIONS

- D. Jamroz, N. Fischer-Durand, M. Palusiak, S. Wojtulewski, S. Jarzyński, M. Stepniewska, M. Salmain, B. Rudolf, *Appl. Organometal. Chem.* 2020, 34, 5507.
- M. Salmain, N. Fischer-Durand, B. Rudolf, *Eur. J. Inorg. Chem.* 2020, 21.
- M. Malinowska, S. Jarzyński, A. Pieczonka, M. Rachwałski, S. Leśniak, A. Zawisza, *J. Org. Chem.* 2020, 85, 11794.
- A. Z. Wilczewska, A. Kosińska, I. Misztalewska-Turkowicz, A. Kubicka, K. Niemirowicz-Laskowska, K. H. Markiewicz, R. Bucki, G. Celichowski, B. Kalska-Szostko, B. Rudolf, *Applied Surface Science* 2019, 487, 601.



RESEARCH PROFILES

- organometallic chemistry
- transition metallo-carbonyl complexes
- application of organometallic compounds in biochemistry
- functionalization of nanoparticles and dendrimers with metalcarbonyl compounds
- enantioselective synthesis

RESEARCH GROUPS

Jóźwiak's research group



Head:

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Group members:

dr. Magdalena Ciechańska, dr. Monika Nowak,
dr. Zbigniew Malinowski

EQUIPMENT

- microwave reactor
- Anton Paar Synthos 3000

PROJECTS

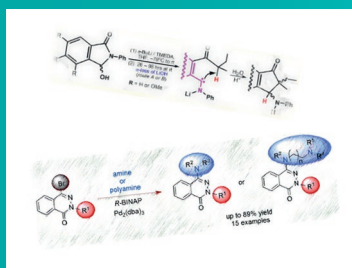
Studies of coordination properties and biological activity of amino-sulfanyl and phosphonatederivatives of phtahalazinone and quinazolinones.

PARTNERS

Faculty of Biology and Environmental Protection, University of Lodz (Lodz, Poland), Department of Pathophysiology, Medical University of Lublin (Lublin, Poland)

SELECTED PUBLICATIONS

- M. Ciechanska, et al. *J. Org. Chem.* 2019, 84, 11425–11440.
- M. Ciechanska, et al. *J. Org. Chem.* 2018, 83, 12793–12797.
- Z. Malinowski et al. *Tetrahedron*, 2016, 72, 7942-7951.
- M. Nowak et al. *Tetrahedron* 2015, 71, 9463-9473.



RESEARCH PROFILES

- organometallic chemistry
- chemistry of pyrene, phthalazine, isoindole, quinoxaline
- synthesis and photophysical properties of pyrene fluorophores
- copper- and palladium-catalyzed C-S, C-N, C-P, C-O bond formation

RESEARCH GROUPS

Kowalski's research group



Head:

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Group members:

dr. Joanna Skiba, dr. Łukasz Szczupak, dr. Rafał Karpowicz, dr. Michał Piotrowicz, Msc Przemysław Biegański

EQUIPMENT

- Edinburgh Spectrofluorometer FS5
- Shimadzu Prominence HPLC system
- potentiostat PAR

PROJECTS

'Functional GNA nucleosides, nucleotides and oligonucleotides: synthesis and properties'
National Science Center (NCN), 2019-2021

PARTNERS

University of South Florida (Tampa, US), Imperial College London (London, UK), Technische Universität Braunschweig (Braunschweig, Germany), University of Würzburg (Würzburg, Germany), University of Regensburg (Regensburg, Germany), University of Zaragoza (Zaragoza, Spain), Technische Universität Chemnitz (Chemnitz, Germany), University of Konstanz (Konstanz, Germany), University of Zagreb (Zagreb, Croatia)

SELECTED PUBLICATIONS

- Ł. Szczupak, A. Kowalczyk, D. Trzybiński, K. Woźniak, G. Mendoza, M. Arruebo, D. Steverding, P. Stączek, K. Kowalski, *Dalton Trans.*, 2020, 49, 1403-1415.
- M. Piotrowicz, A. Kowalczyk, D. Trzybiński, K. Woźniak, K. Kowalski, *Organometallics*, 2020, 39, 813-823.
- M. Z. Shafikov, A. V. Zaytsev, A. F. Suleymanova, F. Brandl, A. Kowalczyk, M. Gapińska, K. Kowalski, V. N. Kozhevnikov, R. Czerwieniec, *J. Phys. Chem. Lett.* 2020, 11, 5849-5855.
- J. Skiba, A. Kowalczyk, D. Trzybiński, K. Woźniak, V. Vrček, M. Gapińska, K. Kowalski, *Eur. J. Inorg. Chem.* 2021, 2171-2181.
- E. Pensa, R. Karpowicz, A. Jabłoński, D. Trzybiński, K. Woźniak, D. Šakić, V. Vrček, N. J. Long, T. Albrecht, K. Kowalski *Organometallics* 2019, 38, 2227-2232.



RESEARCH PROFILES

- development of antibacterial and anticancer agents
- chemistry and biology of xeno nucleic acids (XNA)
- luminescent compounds for materials and biological applications

Plażuk's research group



Head:

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Group members:

dr. Anna Wiczorek-Błaż, dr. Michał Łomzik,
dr. Paweł Tokarz, Msc. Karolina Kowalczyk

EQUIPMENT

- analysis and purification – analytical and preparative HPLC with PDA, HPLC-MS systems
- spectrofluorometer – fluorescence, life time, and fluorescence quantum yield measurements
- synthesis – Microwave reactor

PROJECTS

- Organometallic compounds as selective inhibitors of selected multidrug resistance proteins, OPUS, 2019-2023
- Synthesis and study of the influence of organometallic moiety on the biological activity of half sandwich conjugates with colchicine, Preludium 2019-2023
- Synthesis and preliminary biological activity studies of ferrocenyl and ruthenocenyl derivatives of selected cyclin-dependent kinase inhibitors, MINIATURA4, 2020-2021

PARTNERS

University of Warsaw (Warsaw, Poland), University of Auckland (Auckland, New Zealand), Nicolaus Copernicus University in Toruń (Toruń, Poland)

SELECTED PUBLICATIONS

- Chrabąszcz K., Błaż A., Plażuk D. et al. *Synthesis and biological activity of ferrocenyl and ruthenocenyl analogues of etoposide – discovery of a novel dual inhibitor of topoisomerase II activity and tubulin polymerization* Chem. Eur. J. 2021
- Łomzik M., Hartinger C. G., Plażuk D. et al. *Metal-Dependent Cytotoxic and Kinesin Spindle Protein Inhibitory Activity of Ru, Os, Rh, and Ir Half-Sandwich Complexes of Ispinesib-Derived Ligands*, Inorg. Chem. 2020, 14879–14890
- Głodek M., Plażuk D. et al. *The Impact of Crystal Packing and Auophilic Interactions on the Luminescence Properties in Polymorphs and Solvate of Aroylacetylido-Gold(II) Complexes* Chem. Eur. J. 2019, 13131-13145
- Głodek M., Makal A., Plażuk, D. *Functionalization of the "bay Region" of Perylene in Reaction with 1-Arylalk-2-yn-1-ones Catalyzed by Trifluoromethanesulfonic Acid: One-Step Approach to 1-Acyl-2-alkylbenzo[ghi]perylene* J. Org. Chem. 2018, 14165-14174



RESEARCH PROFILES

- organic and organometallic chemistry – development of new synthetic methods and new organometallic compounds; noble metal complexes
- bioorganometallic and medicinal chemistry of metallocene and half-sandwich complexes

RESEARCH GROUPS

Zakrzewski's research group



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Group members:

dr. Anna Wrona-Piotrowicz

EQUIPMENT

- spectroscopic techniques (UV/VIS, fluorescence)

PROJECTS

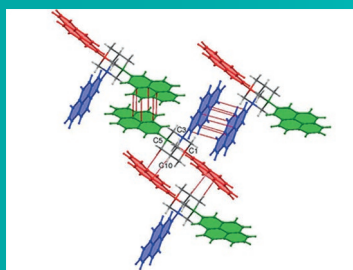
Synthesis of new fluorophores
for potential applications in optoelectronics, IDUB, 2020-2021

PARTNERS

Université Paris-Saclay, ENS Paris-Saclay, CNRS, PPSM, 91190 Gif-sur-Yvette (Paris, France)

SELECTED PUBLICATIONS

- Wrona-Piotrowicz, A.; Makal, A.; Zakrzewski, J. 2020, The Journal of Organic Chemistry. 85 (17), 11134-11139.
- Wrona-Piotrowicz, A.; Witalewska, M.; Zakrzewski, J.; Makal, A. 2017, Beilstein Journal of Organic Chemistry. 13 (1), 1032-1038
- Witalewska, M.; Wrona-Piotrowicz, A.; Makal, A.; Zakrzewski, J. 2018, The Journal of Organic Chemistry. 83 (4), 1933-1939.



RESEARCH PROFILES

- synthesis and photophysical properties of pyrene derivatives;
- chemistry of PAHs, amides, thioamides, thiazoles, pyrazoles, etc.;
- organometallic chemistry;
- palladium catalysis.

Laboratory of Molecular Spectroscopy



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dr. Beata Pasternak, dr. Paweł Tokarz, Msc Karolina Kowalczyk, Elżbieta Zbicińska

EQUIPMENT

- NMR Bruker 600 MHz spectrometer equipped with an Avance III console and Double Resonance Broad Band Probe (BBO 600 MHz S3 5mm with Z-gradient) or Triple Resonance Broad Band Probe (TBI 600 MHz S3 5mm with Z-gradient) and autosampler for 24 samples
- FT-IR spectrometer Thermo Nicolet Nexus
- Varian 500-MS Ion Trap - MS spectrometer
- spectrofotometer PerkinElmer Lambda 45
- spectrofluorimeter PerkinElmer LS 55
- polarymeter Anton Paar MCP 500



RESEARCH PROFILES

- 1D and 2D NMR spectroscopy of organic and organometallic compounds
- variable-temperature NMR (VT NMR) spectroscopy
- diffusion-ordered spectroscopy (DOSY)
- HPLC-MS and MS analysis of organic and inorganic compounds
- IR spectroscopy of solid and liquid sample
- UV-VIS and Fluorescence spectroscopy
- analysis of chiral compounds
- determination of concentration and purity of sample using qNMR (quantitative NMR)

DEPARTMENTS

Department of Organic and Applied Chemistry



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GROUP MEMBERS:

Sub-department of Heteroorganic Compounds: dr. hab. Marcin Jasiński, prof. UL (Head), prof. dr. hab. Grzegorz Mlostoń, dr. hab. Jarosław Romański, prof. UL, dr. Emilia Obijalska, dr. Katarzyna Urbaniak, dr. Greta Utecht-Jarzyńska

Sub-department of Catalysis and Organic Synthesis: dr. hab. Michał Rachwalski, prof. UL (Head), prof. dr. hab. Stanisław Leśniak, prof. dr. hab. inż. Piotr Kaszyński, dr. hab. Stanisław Porwański, prof. UL, dr. hab. Anna Zawisza, prof. UL, dr. inż. Paulina Bartos, dr. Robert Kołodziuk, dr. Adam Pieczonka, Msc Justyna Adamczyk

Secretary: Zenona Frydrych

Technical Assistant: Małgorzata Celeda

RESEARCH FIELD

The research work in the Department of Organic and Applied Chemistry focuses on broad aspects of synthetic organic chemistry and related fields of bioorganic and materials chemistry. The ongoing projects cover such areas as the chemistry of heteroatom, heterocyclic compounds and stable radicals, fluoroorganic compounds, reactive intermediates and reaction mechanisms, synthesis of natural products and structurally related pharmaceuticals, organocatalytic asymmetric synthesis, homogeneous catalysis with transition metal complexes, liquid crystals and organic paramagnetic functional materials.

DEPARTMENTS

Department of Organic and Applied Chemistry

EQUIPMENT

- differential scanning calorimeter (Mettler Toledo)
- elemental analyzer (Elementar)
- EPR (Bruker)
- flash chromatography system (Reveleris)
- FTIR spectrophotometer (Agilent)
- HPLCs (Agilent, Knauer, Varian)
- hydrogenation shaker apparatus (Parr)
- microwave synthesizer (CEM)
- mixer mill (Retsch)
- polarizing microscope (Opta-Tech)

EDUCATION

Our Department offers lectures, seminars and laboratory classes at the basic and advanced levels in organic chemistry, biochemistry, spectroscopy and physical organic chemistry. The courses with students of both the Faculty of Chemistry and the Faculty of Biology and Environmental Protection of the University of Lodz are conducted either in Polish or in English. Laboratory training in carrying out small research projects (e.g., in the frame of Student Research Grants funded by the University of Lodz) as well as tutoring is also offered by the Department.

PARTNERS

Free University of Berlin (Berlin, Germany),
Friedrich Schiller University Jena (Jena, Germany),
Justus Liebig University Giessen (Giessen, Germany),
Middle Tennessee State University (Murfreesboro, US),
University of Zurich (Zurich, Switzerland),
University of Pau and the Adour Region (Pau, France)

SELECTED PUBLICATIONS

- G. Mlostoń, J. Wręczycki, K. Urbaniak, D. M. Bieliński, H. Heimgartner, *Molecules* 2021, 26, e822.
- S. Kapuściński, J. Szczytko, D. Pocięcha, M. Jasiński, P. Kaszyński, *Mater. Chem. Front.* 2021, 5, 6512.
- A. Buchcic-Szychowska, J. Adamczyk, L. Marciniak, A. M. Pieczonka, A. Zawisza, S. Leśniak, M. Rachwałski, *Catalysts* 2021, 11, 968.
- P. Bartos, V. G. Young Jr., P. Kaszyński, *Org. Lett.* 2020, 22, 3835.
- M. Malinowska, S. Jarzyński, A. Pieczonka, M. Rachwałski, S. Leśniak, A. Zawisza, *J. Org. Chem.* 2020, 85, 11794.
- G. Mlostoń, K. Urbaniak, M. Jasiński, E.-U. Würthwein, H. Heimgartner, R. Zimmer, H.-U. Reissig, *Chem. Eur. J.* 2020, 26, 237.



Department of Physical Chemistry



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Sub-department of Theoretical and Structural Chemistry: Prof. dr. hab. Marcin Palusiak, dr. Marta Adamiak, dr. hab. Agnieszka Boroń, dr. hab. Lilianna Chęcińska, dr. hab. Małgorzata Domagała, dr. Justyna Dominikowska, dr. hab. Anna Ignaczak, prof. UL, dr. Zdzisław Kinart, dr. hab. Piotr Matczak, prof. UL, dr. Kinga Wzgarda-Raj, dr. hab. Agnieszka Rybarczyk-Pirek

Sub-department of Biophysical Chemistry: dr. hab. Magdalena Małecka, prof. UL, dr. Sylwia Belica-Pacha, dr. Adam Buczkowski, prof. dr. hab. Bartłomiej Pałecz, dr. Artur Stępnik, dr. Dariusz Waliszewski

Sub-department of Physical Chemistry of Macromolecules: Prof. dr. hab. Małgorzata Józwiak, dr. Katarzyna Łudzick, dr. Mariola Tkaczyk, dr. Magdalena Tyczyńska, dr. Michał Wasiak

Secretary: Małgorzata Puchyr

Technical Assistants: dr. Aneta Ćwiklińska, Msc Tomasz Majak

SUB-DEPARTMENTS

Theoretical and Structural Chemistry



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Group members:

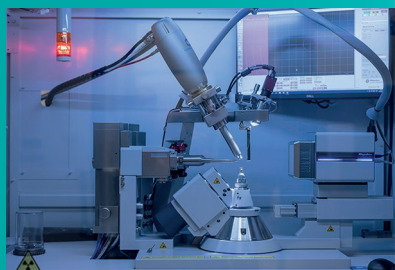
dr. Marta Adamiak, dr. hab. Agnieszka Boruń,
dr. hab. Lilianna Chęcińska, prof. UL, dr. hab. Małgorzata Domagała, dr. Justyna Dominikowska, dr. hab. Anna Ignaczak, prof. UL, dr. hab. Piotr Matczak,
dr. Zdzisław Kinart, dr. Agnieszka Rybarczyk-Pirek,
dr. Kinga Wzgarda-Raj

EQUIPMENT

- Oxford XtaLAB Synergy-S single crystal diffraction system
- Malvern Panalitical powder diffraction system
- ThermoScientific Nicolet iS5 FT-IR ATR system

SELECTED PUBLICATIONS / PATENTS

- J. Dominikowska, Phys. Chem. Chem. Phys., (2020), 22, 21938-21946
- M. Adamiak, A. Ignaczak, Comput. Theor. Chem., (2019), 1167, 112591 (9 pp)
- Z. Kinart J. Mol. Liq., (2019), 292, 111405 (7pp)
- A. J. Rybarczyk-Pirek, M. Łukomska-Rogała, K. Wzgarda-Raj, S. Wojtulewski, M. Palusiak, Cryst. Growth Des., 18, (2018), 7373-7382
- P. Matczak, Appl. Organometal. Chem., 33(4), (2019), e4811
- Boruń, J. Mol. Liq., 276, (2019), 214-224
- M. Domagała, A. Lutyńska, M. Palusiak, J. Phys. Chem. A, 24, (2018), 5484-5492
- R. Zaremba, M. Dranka, B. Trzaskowski, L. Chęcińska, P. Horeglad, Organometallics, 37, (2018), 4585-4598



RESEARCH PROFILES.

- X-ray diffraction on single crystal samples
- X-ray diffraction on powder samples
- FT-IR / ATR analysis
- quantum-chemical modelling with use of home and external HPC machines
- crystal and co-crystal synthesis

Biophysical Chemistry



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Group members:

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dr. Sylwia Belica-Pacha, dr. Artur Stępiak,
dr. Dariusz Waliszewski

EQUIPMENT

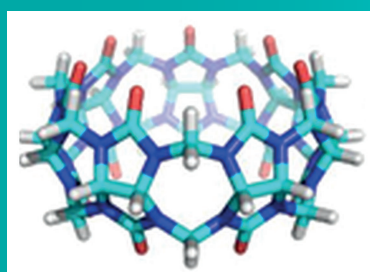
- isothermal titration calorimeter VP-ITC
- DSC and isoperibol calorimeters
- IR and UV-Vis spectrophotometers
- micro-equilibrium dialyzers
- Anton Paar density meter
- FT-IR Spectrometer Nicolet iS5 Thermo Fisher Scientific

PARTNERS

Institute of Biochemistry, National Academy of Sciences (Grodno, Belarus), Institute of Food Technology and Analysis, Lodz University of Technology (Lodz, Poland), Department of General Biophysics, University of Lodz, (Lodz, Poland), University of Bayreuth, Universität Marburg (Philipps-University Marburg), Deutsches Elektronen-Synchrotron DESY, Stockholm University

SELECTED PUBLICATIONS

- Buczkowski A.; Malinowska-Michalak M.; Pałecz B. et al. 2020 Spectroscopic, electrochemical and calorimetric studies on the interactions of PPI G4 dendrimer with 5-fluorouracil in aqueous solutions. *Journal of Molecular Liquids* 313, 113534.
- Buczkowski A.; Stępiak A.; Malinowska-Michalak M.; Pałecz B. et al. 2020 Physicochemical and *in vitro* cytotoxicity studies of inclusion complex between gemcitabine and cucurbit[7]uril host, *Bioorganic Chemistry* 99, 103843.
- Belica-Pacha, S., Miłowska, K., Ionov, M., Bryszewska, M., Buczkowski, A., Budryn, G., Oracz, J., Zaczyńska, D., Wróblewska, A., Urbaniak, P., Pałecz, B. 2020, The impact of β -cyclodextrin on biological and chemical properties of mianserin hydrochloride in aqueous solution, 2020 *Journal of Molecular Liquids*, 314, 113589.
- Stępiak, A., Buczkowski, A., Zawodnik, L., Belica-Pacha, S., Pałecz, B., 2017, Study of the interaction of β -cyclodextrin with albendazole in aqueous solutions, *Journal of Molecular Liquids*, 248, 19.
- Małecka, M., Kusz, J., Eriksson, L., Adamus-Grabicka, A., Budzisz, A., 2020, The relationship between Hirshfeld potential and cytotoxic activity: a study along a series of flavonoid and chromanones derivatives, *C76*, 723.



RESEARCH PROFILES

- thermodynamic analysis of supramolecular complex formation with dendrimers, cyclodextrins, cucurbiturils and drugs in solutions
- calorimetric, spectroscopic and densimetric characterization of interactions between cyclodextrins and biological active substances in solutions
- X-ray crystal structure determination

Physical Chemistry of Macromolecules



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Group members:

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dr. Magdalena Tyczyńska, dr. Michał Wasiak

EQUIPMENT

- VP-ITC MicroCal
- Micro DSC III Setaram
- Wayne Kerr 6440 and B905 bridges with three electrode vessels
- Anton Paar DMA 5000
- isoperibol calorimeters



RESEARCH PROFILES

- thermodynamics and structure of solutions
- physicochemical properties of solutions
- characterization of intermolecular interactions in the solution
- thermodynamics of micellar solutions

PARTNERS

Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research (Dubna, Russia)

SELECTED PUBLICATIONS

- M. Józwiak, K. Łudzik, M. Cokot, A. Józwiak, A. Kłys, J. Mol. Liq., (2020), 314, 113733
- M. Komudzińska, M. Tyczyńska, M. Józwiak, A. Burakowski, J. Gliński, J. Mol. Liq., (2020), 300, 112321
- K. Łudzik, S. Woloszczuk, W. Zając, M. Jażdżewska, A. Rogachev, A. Ivanowicz Kuklin, A. Zawisza, M. Józwiak, Int. J. Mol. Sci. (2020), 21(16), 5828
- M. Wasiak, J. Mol. Liq., (2019), 285, 557-561

DEPARTMENTS

Department of Material Technology and Chemistry



Head:

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dr. hab. Maciej Psarski, dr. hab. Katarzyna Ranoszek-Soliwoda, dr. Aneta Kisielewska, dr. Renata Stanecka-Badura,
dr. Emilia Tomaszewska, Msc Marta Sieradzka-Solecka, Msc Agnieszka Lech, Msc Katarzyna Bednarczyk

RESEARCH FIELD

- metallic nanoparticles synthesis with controlled size and narrow size distribution in water and nonpolar solvents.
- metallic nanoparticles surface modification
- silver nanowires: synthesis, modification and application
- microscopic and tribology research of SAMs on DLC
- preparation and characteristic of self-assembled monolayers (SAMs)
- hybrid superhydrophobic and anti-icing coatings
- nanocomposites based on TiO₂ for photocatalytic applications
- photonic crystals and porous solids based on TiO₂

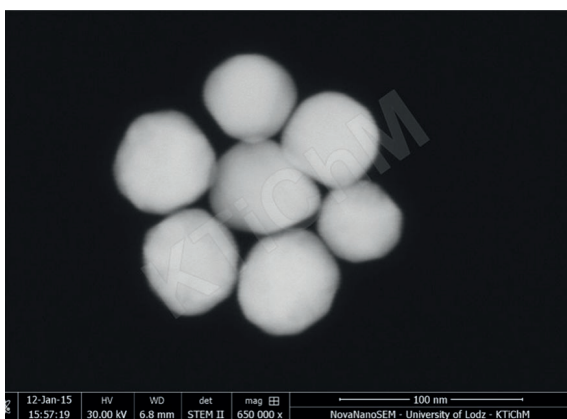
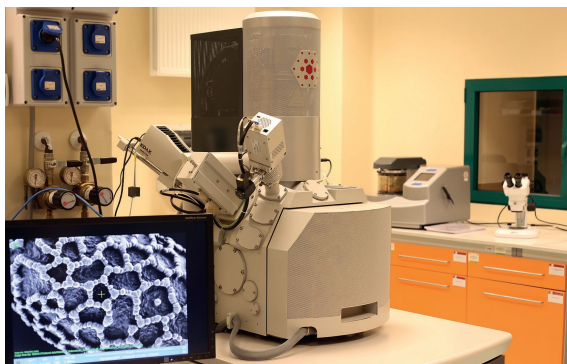
Department of Material Technology and Chemistry

EQUIPMENT

- high resolution FEI Nova NanoSEM 450 electron microscope with EDS
- Phenom G2 Pure electron microscope
- Atomic Force Microscope, SOLVER P47 NT-MDT
- spektrofotometr Nicolet iS50 FT-IR
- Drop Shape Analyzer DSA25, KRUSS GmbH
- elevated temperature ball-on-disk and pin-on-disk tribotester T-11

TOPICS OF CURRENT AND PAST PROJECTS

- functionalized nanoparticles of noble metals as stimulators of immune response in HSV-1/2 infection
- fibrous structures with a hybrid metallic-ceramic coating
- hybrid superhydrophobic and anti-icing coating – HybridCoat
- regenerative activity of silver nanoparticles modified with tannins in dermal uses
- analysis of antioxidative potential of proteins immobilized on nanoparticles. Study in vitro, in vivo
- study of the relationships between the chemical structure and topography of superhydrophobic surfaces and their anti-icing properties
- silver nanoparticles modified with tannic acid - research on their antiviral and immunomodulatory activity.
- hybrid organic/inorganic memory elements for integration of electronic and photonic circuitry - HYMEC.
- study of anti-icing coatings of aircraft lifting surfaces
- self-cleaning and antibacterial titanium dioxide coatings modified with silver nanoparticles
- preparation of ultrathin film of organofluorine compounds for tribological applications.
- synthesis and characterization of gold, silver and copper nanoparticles.



EDUCATION

- chemical technology
- chemistry of materials
- tribology and tribochemistry
- nanotechnology
- measurement techniques – material properties
- microscopic surface analysis of solids
- introduction to materials engineering
- physics of modern materials
- advanced measurement techniques in nanotechnology and materials engineering
- thin coatings engineering
- special and biomedical materials
- elements of mechanics in nanoscale
- application of chemical processes in nanotechnology

DEPARTMENTS

Department of Environmental Chemistry



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RESEARCH FIELD

- application of separation techniques in analysis of biological samples
- analytic of homocysteine thiolactone, their metabolites and other biologically important sulfur compounds
- use of CE in analysis of real samples with the use of on-line preconcentration techniques

CURRENT PROJECTS

- Creation of chromatographic tools for examination of thiazolidine derivatives of vitamin B6, NCN Opus 14, 2018-2022
- Determination of antioxidant capacity of lipoyllysine and the impact of food processing on the level of lipoic acid and lipoyllysine in foodstuffs, NCN Preludium, 2017-2021.

Department of Environmental Chemistry

EQUIPMENT

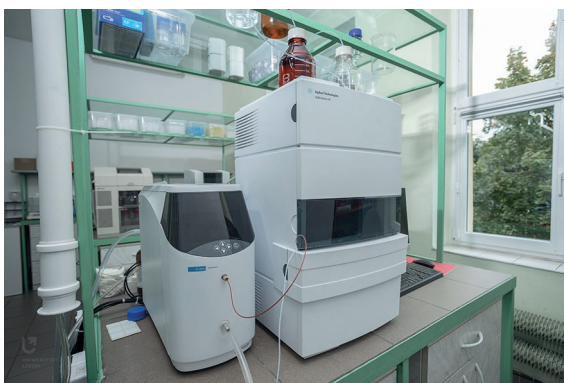
- liquid chromatographs with different detectors: (MS/MS, UV-Vis DAD, fluorescence - FD, evaporative light scattering - ELSA)
- gas chromatograph (GC-MS)
- capillary electrophoresis systems (CE-UV-Vis DAD)

PARTNERS

Rutgers – New Jersey Medical School, Department of Microbiology, Biochemistry and Molecular Genetics (Newark, USA), Jagiellonian University, Medical College, Sub-department of Medical Biochemistry (Cracow, Poland), Medical University of Lodz, Department of Hemostatic Disorders (Lodz, Poland)

SELECTED PUBLICATIONS/PATENTS

- Piechocka J., Wrońska M., Głowacki R. 2020, Chromatographic strategies for the determination of amino thiols in human saliva, *TrAC* 126, 115866
- Kaminska A., Chwatko G. 2020, Estimation of lipoyllysine content in meat and its antioxidative capacity, *J. Agric. Food Chem.* 68(39), pp. 10992-10999
- Olejarz P., Chwatko G., Kubalczyk P., Purgat K., Głowacki R., Borowczyk K. 2020, Application of high-performance liquid chromatography for simultaneous determination of tenofovir and creatinine in human urine and plasma samples, *Pharmaceuticals* 13(11), 367, pp. 1-12
- Piechocka J., Wieczorek M., Głowacki R. 2020, Gas chromatography–mass spectrometry based approach for the determination of methionine-related sulfur-containing compounds in human saliva, *IJMS* 21(23), 9252, pp. 1-18
- Purgat K., Olejarz P., Kośka I., Głowacki R., Kubalczyk P. 2020, Determination of homocysteine thiolactone in human urine by capillary zone electrophoresis and single drop microextraction, *Anal. Biochem.* 596, 113640



SUB-DEPARTMENT

Chemistry Teaching and Science Popularization



Head:

dr. hab. Robert Zakrzewski, prof UL
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phone: +48 42 635 57 90

Group members:

dr. Anna Wypych-Stasiewicz, dr. Aleksandra Szcześniak,
dr. Lech Leszczyński, dr. Krzysztof Prawicki,
Msc Ewa Stronka-Lewkowska



EQUIPMENT

- accredited chemical laboratory equipped with multimedia equipment

PROJECTS

- Model education of future teachers of mathematics and natural sciences at the University of Lodz, NCBiR, 2019-2023.
- Developing key competences through experimental chemistry classes for non-standard higher education recipients. NCBiR, 2019-2023

PARTNERS

Cooperation with selected primary-and secondary-school from the area of Lodz and the region of Lodz (Poland) and the Central Examination Board as well as the Regional Examination Board in Lodz (Poland)

SELECTED PUBLICATIONS

- Zakrzewski R., Wypych-Stasiewicz A. *Increasing the competences of students of the Faculty of Chemistry of University of Lodz in the field of verification of matriculation examination papers in chemistry*, XXIIth Educational Diagnostics Conference, Łódź 2017
- Kupis B., Zakrzewski R., Kupis J. *Diagnosing of skills in the course of educational and examination. Diagnostowanie umiejętności praktycznych w toku kształcenia i egzaminowania*, XXIIth Educational Diagnostics Conference, Łódź 2017
- Stronka-Lewkowska E., Lewkowski J., Zakrzewski R., *Chirality - what exactly is it?* *Chemia w Szkole* 63(1) (2017) 33
- Zakrzewski R., Skowron M., Ciesielski W., Rembisz Ż., *Spectrophotometric Determination of 6-Propyl-2-thiouracil in Pharmaceutical Formulations Based on Prusiam Blue Complex Formation: An Undergraduate Instrumental Analysis Laboratory Experiment*, *Journal of Chemical Education* 93 (2016) 182-185.

RESEARCH PROFILES

- research in the field of university didactics
- research in the field of chemistry teaching at school level
- propagating chemical sciences among the primary- and secondary-school students in order to develop their passion for science as well as their science-awareness preconcentration techniques

SUB-DEPARTMENT

Laboratory of Practical Organic Chemistry



Head:

dr. Katarzyna Urbaniak
e-mail: katarzyna.urbania@chemia.uni.lodz.pl
phone: +48 42 635-57-68

Group members:

4 permanent staff members



RESEARCH PROFILES

Laboratory of Practical Organic Chemistry is a typical educational unit of the Faculty of Chemistry. The laboratory consists of four experimental rooms located on one floor.

The lab is equipped with chemicals, solvents, glassware and instrumentation necessary to teach experimental organic chemistry to Bachelors and Msc students. The patron of the Laboratory is Stanisław Kostanecki (1860-1910), one of the most outstanding Polish organic chemists. He published about 200 scientific papers. Professor Kostanecki researched the theory of the organic compounds colours and the structure of natural pigments.

The basic and priority task of the unit is to educate students from the Faculty of Chemistry and Faculty of Biology and Environmental Protection in the corresponding fields:

- modern methods of organic compounds analysis,
- organic synthesis,
- biochemistry,
- synthesis of cosmetics,
- polimer chemistry

