9th PULS Conference on Pulse Investigations in Chemistry, Physics, and Biology

and

4th Reaction Kinetics in Condensed Matter (RKCM) Meeting

Lodz (Poland), 2-7 September 2018

Schedule

Sunday, 2 September 2018

18:00 – 21:00 Registration

19:00 – 21:00 Welcome reception

Monday, 3 September 2018

8:30 – 9:00 Registration

9:00 – 9:15 Opening

Session 1: Experimental techniques and equipment

Chairperson: **Andrzej Chmielewski,** Institute of Nuclear Chemistry and Technology (Poland)

9:20 – 10:05 **James Wishart**, Brookhaven National Laboratory (USA)
Perspective on recent and future developments in radiation chemistry techniques and instrumentation

10:05 – 10:30 **Eberhard Riedle**, University of Munich (Germany)
Complex and comprehensive chemical processes: the need for new spectroscopic approaches

10:30 – 11:00 Coffee break

11:00 – 11:25 **Adam Round**, European XFEL (Germany)
Current research opportunities and recent advances in instrumentation for XFEL structural studies at the SPB/SFX instrument at the European XFEL

11:25 – 11:45 **Libor Juha**, Institute of Physics, Czech Academy of Sciences (Czechia)
Short and ultra-short XUV/x-ray laser pulses in radiation research: a brief overview and outlook

11:45 – 12:05 **Tomer Zidki**, Ariel University (Israel)
Conversion of a continuous radiotherapy linear accelerator to a research pulse radiolysis unit – a cheaper mode for achieving an advanced research instrumentation

12:05 – 12:25 Chairman's time

12:25 – 13:20 Lunch

Session 2: Radiation chemistry, pulse radiolysis

Chairperson: **Jay LaVerne**, University of Notre Dame (USA)

13:20 – 14:05 **Mehran Mostafavi**, Paris-Sud University (France)
Reactivity of the electron in excess in the water before undergoing the hydration process

14:05 – 14:30 **Ireneusz Janik**, Notre Dame Radiation Laboratory (USA)
The nature of primary intermediates formed in early events of OH radical induced oxidation of SCN^- in water

14:30 – 14:50 **Sergey Denisov**, Paris-Sud University (France)
Ultrafast charge localization following ionizing irradiation of aqueous uridine monophosphate: prehydrated electron attachment and hole transfer

14:50 – 15:10 **Łukasz Kaźmierczak**, Lodz University of Technology (Poland)
Oxidation of Cl^- to $Cl_2^{\bullet-}$ in reaction with $^{\bullet}OH$ radical by DFT calculations, kinetic modelling and pulse radiolysis

15:10 – 15:30 **Israel Zilbermann**, NRCN, Beer-Sheva (Israel)
Reactions of carbonate radical anion with amino-carboxylate complexes of manganese(II) and iron(III)

15:30 – 16:00 Coffee break

16:00 – 16:25 **Yoichi Yoshida**, Osaka University (Japan)
Study of primary process of radiation chemistry by femtosecond pulse radiolysis

16:25 – 16:50 **Amitava Adhikary**, Oakland University, Rochester (USA)
Reactions of guanine cation radical in DNA-models

16:50 – 17:10 **Luděk Vyšín**, Institute of Physics, Czech Academy of Sciences (Czechia)
Chemical dosimetry of nanosecond soft x-ray pulses: Ferric ion and hydroxyl radical yields in aqueous solutions irradiated in the water window

17:10 – 17:30 **Marian Wolszczak**, Lodz University of Technology (Poland)
Scavenging of hydrated electron by HSA or ligand/HSA adduct. Pulse radiolysis study

17:30 – 17:50 **Jerzy L. Gębicki**, Lodz University of Technology (Poland)
Small radicals in reverse micelles as studied by pulse radiolysis

17:50 – 18:10 Chairman's time

Tuesday, 4 September 2018

Session 3: Photophysics, photocatalysis

Chairperson: **Yuri Berlin**, Northwestern University (USA)

9:00 – 9:45 **Prashant Kamat**, University of Notre Dame (USA)
Photocatalysis to photovoltaics: Impact of charge transfer at semiconductor interface

9:45 – 10:10 **Laurens Siebbeles**, Delft University of Technology (The Netherlands)
Exciting multiple electrons by one photon in nanomaterials for photovoltaics

10:10 – 10:35 **Kazuhiko Seki**, AIST, Tsukuba (Japan)
Theoretical study on fundamental kinetic processes in photoelectric and photoelectrochemical conversion

10:35- 10:55 **Mateusz Gierszewski**, Adam Mickiewicz University in Poznań (Poland)
Femtosecond studies of solar cells sensitized with carbazole and indoline dyes with alkoxysilyl anchoring group

10:55 – 11:20 Coffee break

11:20 – 11:45 **Valentine Vullev**, University of California, Riverside (USA)
Multifaceted complexity of dipole effects on charge transfer

11:45 – 12:05 **Stanisław Niziński**, Adam Mickiewicz University in Poznań (Poland)
Photoprotection in selected molecular systems studied with time-resolved UV-vis absorption spectroscopy

12:05 – 12:25 **Arkadiusz Jarota**, Lodz University of Technology (Poland)
Ultrafast dynamics of diarylethene derivatives

12:25 – 12:45 **Ireneusz Piwoński**, University of Lodz (Poland)
TiO_2 photonic crystals modified with bimetallic silver-platinum nanostructures for photocatalytic applications

12:45 – 13:05 Chairman's time

13:05 – 14:00 Lunch

Session 4: Kinetics in biochemical/biological systems

Chairperson: **Attila Szabo**, National Institutes of Health (USA)

14:00 – 14:45 **Huan-Xiang Zhou**, University of Illinois at Chicago (USA)
Rate constants and mechanisms of protein–ligand binding

14:45 – 15:10 **Nobuhiro Ohta**, National Chiao Tung University (Taiwan)
Nanosecond pulsed electric field effects on intracellular function of live cells

15:10 – 15:30 **Beata Brożek-Płuska**, Lodz University of Technology (Poland)
Pump-probe femtosecond spectroscopy and high resolution Raman imaging of human digestive tract

15:30 – 16:00 Coffee break

16:00 – 16:25 **Iñaki Tuñón**, University of Valencia (Spain)
Enzymatic reaction pathways and transition states

16:25 – 16:50 **Yuri Berlin**, Northwestern University (USA)
Behavior of photo-induced charge carriers in DNA: key processes, mechanisms and applications

16:50 – 17:10 **Szymon Żaczek**, Lodz University of Technology (Poland)
An insight into protonation of a substrate prior to prenylated flavin mononucleotide formation

17:10 – 17:30 Chairman's time

17:30 – 17:50 **Bumsoo Han**, International Atomic Energy Agency
Advanced material development and the role of IAEA

Wednesday, 5 September 2018

Session 5: Free-radical chemistry

Chairperson: **Chantal Houée-Lévin**, Paris-Sud University (France)

9:00 – 9:45 **Michael Davies**, University of Copenhagen (Denmark)
Kinetics and mechanisms of protein oxidation, peroxidation and cross-linking

9:45 – 10:10 **Christian Schöneich**, University of Kansas (USA)
Selective free radical reactions of cysteine, methionine and histidine: kinetics, mechanisms, and relevance for protein stability

10:10 – 10:30 **Bronisław Marciniak**, Adam Mickiewicz University in Poznań (Poland)
Photoxidation of methionine-containing peptides: from model compounds to proteins

10:30- 10:50 **Thomas Nauser**, ETH Zürich (Switzerland)
Rapid equilibria involving radicals and aromatic structures

10:50 – 11:20 Coffee break

11:20 – 11:45 **Jacek Zielonka**, Medical College of Wisconsin (USA)
Kinetic aspects of the detection of reactive oxygen and nitrogen species in cellular and cell-free systems

11:45 – 12:05 **Marta Ignasiak Kciuk**, Adam Mickiewicz University in Poznań (Poland)
Role of iodide anions in sensitized oxidation of amino acids, peptides and proteins

12:05 – 12:25 **Julio De la Fuente**, University of Chile, Santiago (Chile)
Photoreductions of quinoxalin-2-one derivatives. Flash photolysis study.

12:25 – 12:45 **Tomasz Pędziński**, Adam Mickiewicz University in Poznań (Poland)
Unexpected reaction pathway of the alpha-aminoalkyl radical derived from one-electron oxidation of S-alkyl-glutathiones

12:45 – 13:45 Lunch

13:45 – 14:10 **Chryssostomos Chatgilialoglu**, ISOF, Bologna (Italy)
Hydroxyl radical–induced formation of purine lesions in doubled-stranded 23-mer oligonucleotides: A fine-tuning of the mechanism

14:10 – 14:30 **Katarzyna Taras-Goślińska**, Adam Mickiewicz Univ. in Poznań (Poland)
Photochemical and radiation induced radical reactions involving 2-thiouracil derivatives

14:30 – 14:50 **Konrad Skotnicki**, Inst. of Nuclear Chemistry and Technology (Poland)
Three-electron bonded sulfur-centered radicals in nitrogen heterocycles

14:50 – 15:10 Chairman's time

15:10 – 16:30 **Poster session**

19:00 – 22:00 **Conference dinner – Poznański Palace**

Thursday, 6 September 2018

Session 6: Polymer systems – kinetic studies

Chairperson: **Mohamad Al-Sheikhly**, University of Maryland (USA)

9:00 – 9:45 **Krzysztof Matyjaszewski**, Carnegie Mellon University (USA)
Macromolecular engineering via dynamic exchange between radicals and dormant species in controlled radical polymerization

9:45 – 10:10 **Dominik Wöll**, RWTH Aachen University (Germany)
Nanoscopic insights into polymer gels and their relation to polymerization kinetics

10:10 – 10:35 **Igor Lacik**, Slovak Academy of Sciences, Bratislava (Slovakia)
Pulsed-laser initiated polymerization in aqueous solution

10:35 – 10:55 **Piotr Sawicki**, Lodz University of Technology (Poland)
Determination of Arrhenius coefficients of N-vinylpyrrolidone polymerization in aqueous solution by Pulsed Electron Polymerization – Size Exclusion Chromatography (PEP–SEC)

10:55 – 11:20 Coffee break

11:20 – 11:45 **Xavier Coqueret**, University of Reims (France)
Concomitant cationic and free radical photopolymerization of epoxy and acrylate blends: experimental design for controlling polymerization kinetics

11:45 – 12:05 **Florinella Muñoz Bisesti**, National Polytechnic School (Ecuador)
Preparation of inulin hydrogels by electron beam irradiation: thermal properties and arsenic removal as a possible application

12:05 – 12:25 **Lucille Abad**, Philippine Nuclear Research Institute (Philippines)
Stability of irradiated κ-carrageenan: A kinetic approach

12:25 – 12:45 Chairman's time

12:45 – 13:45 Lunch

Session 7: General problems in diffusion-assisted processes, the theory of diffusion

Chairperson: **Sergey Traytak**, Institute of Chemical Physics, RAS (Russia)

13:45 – 14:30 **Gleb Oshanin**, Pierre and Marie Curie University, Paris (France)
Diffusion-limited binding of molecules to partially-reactive target sites

14:30 – 14:55 **Sangyoub Lee**, Seoul National University (South Korea)
A new method of solution for the Fredholm integral equation and its application to the diffusion-influenced reaction kinetics

14:55 – 15:20 **Anatoly Shushin**, Institute of Chemical Physics, RAS (Russia)
Manifestation of interparticle interaction in the kinetics of condensed phase migration-assisted processes

15:20 – 15:40 **Piotr Polanowski**, Lodz University of Technology (Poland)
Diffusion in a crowded environment – influence of cooperativity

15:40 – 16:10 Coffee break

16:10 – 16:35 **Gonzalo Angulo**, Institute of Physical Chemistry, PAS (Poland)
Diffusion assisted photo-induced electron transfer reactions: experiments and models

16:35 – 17:00 **Nikita Lukzen**, International Tomography Center, SB RAS (Russia)
Effect of magnetic field on radical recombination on two-dimensional manifold

17:00 – 17:20 Chairman's time

17:20 – 17:30 Concluding remarks, closing

Friday, 7 September 2018

8:00 – Departure