

# Department of Polymer Chemistry and Technology

## Laboratory of

# ELECTRONICALLY ACTIVE ORGANIC MATERIALS



## Current research works

- Preparation of new low and high molecular weight organic semiconductors
- Synthesis of high spin organic compounds
- Electrochemical and spectroelectrochemical investigations of electronically active organic materials
- Magnetic studies of high spin organic materials
- Development of "all organic" field effect transistors and photovoltaic cells
- Preparation of inorganic semiconductor nanocrystals and their hybrids with organic semiconductors and conductors

## Selected publications

- M. Gałęcka, I. Wielgus, M. Zagórska, M. Pawłowski, I. Kulszewicz-Bajer, *High-spin radical cations of poly(m-p-anilines) and poly(m-p-p-anilines): synthesis and spectroscopic properties*, *Macromolecules*, 40 4924-4932 (2007)
- R. Pokrop, K. Pamuła, S. Deja-Drogomirecka, M. Zagórska, J. Borysiuk, P. Reiss, A. Proń, *Electronic, Electrochemical, and Spectroelectrochemical Properties of Hybrid Materials Consisting of Carboxylic Acid Derivatives of Oligothiophene and CdSe Semiconductor Nanocrystals*, *Journal of Physical Chemistry C*, 113, 3487-3493 (2009)
- I. Kulszewicz-Bajer, V. Maurel, S. Gambarelli, I. Wielgus, D. Djurado, *Ferromagnetic spins interaction in tetraaza- and hexaazacyclophanes*, *Physical Chemistry, Chemical Physics*, 11, 1362-1368 (2009)
- P. Gawryś, D. Djurado, J.R. Rimarcik, A. Kornet, D. Boudinet, J.M. Verilhac, V. Lukes, I. Wielgus, M. Zagórska, A. Proń, *Effect of N-Substituents on Redox, Optical, and Electronic Properties of Naphthalene Bisimides Used for Field-Effect Transistors Fabrication*, *Journal of Physical Chemistry B* 114, 1803-1809 (2010)
- A. Proń, P. Gawryś, M. Zagórska, D. Djurado, R. Demadrille, *Electroactive materials for organic electronics: preparation strategies, structural aspects and characterization techniques*, *Chemical Society Reviews*, 39, 2577-2632 (2010)
- E. Kurach, D. Djurado, J. Rimarcik, A. Kornet, M. Włostowski, V. Lukes, J. Pecaut, M. Zagórska, A. Proń, *Effect of substituents on redox, spectroscopic and structural properties of conjugated diaryltetrazines-a combined experimental and theoretical study*, *Physical Chemistry, Chemical Physics* 13, 2690-2700 (2011)

## Staff:

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## PhD students:

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## Research profile

Electronically conducting polymers: synthesis and processing

Organic high spin polymers

Semiconducting materials for organic electronics

Preparation of inorganic semiconductor nanocrystals and their hybrids with organic semiconductors and conductors

Electrochemical and spectroelectrochemical investigations of organic semiconductors and conductors

Investigation of magnetic properties of high spin organic materials

Electronically active polymers in heterogeneous catalysis