Laboratory of Fine Technologies




Head

Janusz Serwatowski

Current research

- Synthesis and characterization of organometallic compounds containing main group metals (boron, aluminum, lithium, silicon, germanium, tin). Scalling up processes
- The metalation and halogen-lithium exchange reaction in aromatic and heteroaromatic compounds - mechanism and application in synthesis
- Elaboration of new synthetic procedures employing metalated aromatic and heteroarylboranes as the key reagents en route to highly functionalized compounds including systems potentially applicable in material chemistry
- Studies on structure-reactivity relationships with a special emphasis on X-ray experimental techniques and theoretical calculations
- Physicochemical studies of obtained compounds and their application in material chemistry, for example as luminescence, porous materials or as biologically active reagents

Staff

Marek Dąbrowski
Tomasz Kliś
Sergiusz Luliński

Current PhD students

Krzysztof Durka
Krzysztof Gontarczyk
Agnieszka Górska
Paweł Kurach
Mateusz Urban

Former PhD students

Kinga Kacprzak
Tomasz Kliś
Sergiusz Luliński
Rafał Moszczyński-Pętkowski
Agnieszka Wilmowicz

Selected publications

Kliś T., Durka K., Serwatowski J., Woźniak K., *Influence of the Silyl Group on the Reactivity of Some Ortho-Lithiated Aryl Alkyl Sulfides*, Organometallics 32 (11), 3145, 2013

Kliś T., Durka K., Górska A., Serwatowski J., Woźniak K., *Formation of Dilithiated Bis-(1H-Pyrazol-1-yl)Alkanes and Their Application in the Synthesis of Diboronic Acids*, Tetrahedron Letters, 55, 1234, 2014

Kliś T., Dąbrowski M., Durka K., Serwatowski J., Woźniak K., *Substituent Effect on Benzylic Lithiation of Sulfides. Synthesis of Diboronic Acids Derived from Aryl–Alkyl Sulfides*, Tetrahedron 69 (15), 3159, 2013

Borowska E., Durka K., Luliński S., Serwatowski J., Woźniak K., *On the Directing Effect of Boronate Groups in the Lithiation of Boronated Thiophene*, European Journal of Organic Chemistry, 2208, 2012

Durka K., Jarzembska K. N., Kamiński R., Luliński S., Serwatowski J., Woźniak K., *Nanotubular Hydrogen-Bonded Organic Framework Architecture of 1,2-Phenylenediboronic Acid Hosting Ice Clusters*, Crystal Growth&Design, 13, 4181, 2013

Wesela-Bauman G., Ciećwierz P., Durka K., Luliński S., Serwatowski J., Woźniak K., *Heteroleptic (2-Fluoro-3-Pyridyl)Arylborinic 8-Oxyquinolinates for the Potential Application in OLEDs*, Inorganic Chemistry, 52, 10846, 2013

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Research profile

Synthesis of organoboron compounds

Bimetallic boro-lithio compounds and their application in synthesis

Metalation and halogen-lithium exchange reaction

Luminescence boronate complexes in OLED devices

Porous covalent organic frameworks

Structural and theoretical studies of organoboron compounds

Interaction of organoboron compounds with biologically active reagents

Collaboration

Aldrich Chemical Company, Milwaukee, Wisconsin (USA)

Crystallochemistry Laboratory, Department of Chemistry, University of Warsaw (Poland)

Department of Chemistry, Department of Molecular Physics, Lodz University of Technology, (Poland)

Department of Pharmaceutical Microbiology, Medical University of Warsaw (Poland)

Scientific Awards

- Scientific Award of HM Rector of the Warsaw University of Technology for the research group: J. Serwatowski, M. Dąbrowski, T. Kliś, S. Luliński, 2008
- The 1st prize for Krzysztof Durka for a poster presentation: *Complexes of diboronic acids and boranthrene systems with 8-hydroxyquoline - towards the luminescence materials*, the 54th Polish Crystallographic Meeting, Wrocław, Poland, 2013
- The 1st prize for Krzysztof Durka for an oral presentation: *Experimental, structural and theoretical studies of arylboronic azaesters. Towards the investigation of the nature of B-N interaction*, Polish Chemical Society Meeting, Łódź, 2009

Research equipment

- Double Beam Spectrophotometer UV-VIS, Hitachi UV2300II.
- Gas chromatography-mass spectroscopy (GCMS), Perkin-Elmer Clarus 580 (GC), Clarus 560S (MS)

Additional activity

- Collaboration with the Aldrich Chemical Company: development of preparative procedures of organometallic compounds