

Head

Urszula Domańska-Żelazna

Staff

Tadeusz Hofman
Marek Królikowski
Marta Królikowska
Andrzej Marciniak
Kamil Padaszyński
Aneta Pobudkowska-Mirecka
Halina Szatyłowicz
Maciej Zawadzki

Current PhD students

Mohammed Halayqa
Marcin Okuniewski
Patrycja Okuniewska
Mateusz Reda
Olga Stasyuk
Elena Vadimovna Lukoshko
Michał Wlazło

Former PhD students

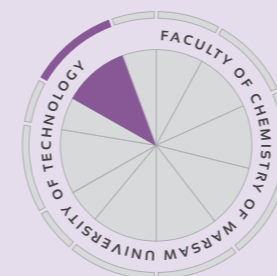
Ewa Bogel-Łukasik
Rafał Bogel-Łukasik
Marek Królikowski
Marta Królikowska
Joanna Łachwa
Andrzej Marciniak
Małgorzata Marciniak
Dobrochna Matkowska
Piotr Morawski
Kamil Padaszyński
Aleksandra Pelczarska
Aneta Pobudkowska-Mirecka
Maciej Zawadzki
Zuzanna Żotek-Tryznowska

Current research

- Physicochemical properties of ionic liquids and their mixtures with molecular solutes; Measurements of activity coefficients at infinite dilution – estimation of selectivity and capacity for different extraction problems. Development of extraction processes i.e. extraction of sulfur compounds from diesel oil, extraction of *t*-butanol from water
- Study of ionic liquids – water systems as a working system for absorption cooling
- Thermodynamic modeling of complex molecular systems (including polar compounds and ionic liquids) with modern tools of applied chemical thermodynamics: molecular-based equations of state (i.e. SAFT, cell-hole theories), COSMO, UNIFAC, DISQUAC
- Molecular geometry as a source of physicochemical information: quantum-mechanical calculations of hydrogen bonded systems

Selected publications

- Padaszyński K., Domańska U., *Thermodynamic Modeling of Ionic Liquid Systems: Development and Detailed Overview of Novel Methodology Based on the PC-SAFT*, Journal of Physical Chemistry B 116, 5002, 2012
- Domańska U., Wlazło M., *Effect of the Cation and Anion of the Ionic Liquid on Desulfurization of Model Fuels*, Fuel 134, 114, 2014
- Domańska U., Lukoshko E. V., Królikowski M., *Separation of Thiophene from Heptane with Ionic Liquids*, Journal of Chemical Thermodynamics 61, 126, 2013
- Szatyłowicz H., Sadlej-Sosnowska N., *Characterizing the Strength of Individual Hydrogen Bonds in DNA Base Pairs*, Journal of Chemical Information and Modeling 50, 2151, 2010
- Domańska U., Zawadzki M., Królikowski M., *Heat Capacity, Excess Molar Volumes and Viscosity Deviation of Binary Systems of *N*-Octylisoquinolinium Bis{(Trifluoromethyl)Sulfonyl}Imide Ionic Liquid*, Zeitschrift für Physikalische Chemie, 227, 217, 2013
- Marciniak A., *Influence of Cation and Anion Structure of the Ionic Liquid on Extraction Processes Based on Activity Coefficients at Infinite Dilution. A Review*, Fluid Phase Equilibria 294, 213, 2010



Research profile

Thermodynamic of liquid mixtures
Phase equilibria: vapor – liquid,
liquid – liquid, solid – liquid
Excess molar volumes and enthalpies of mixing
Thermodynamics of associated solutions
Physicochemical properties: DSC, density, viscosity, surface tension

Collaboration

University of KwaZulu – Natal (South Africa)
University of Aveiro (Portugal)
University of Lorraine (France)
University of Rostock (Germany)
University of Delhi (India)

Scientific Awards

- Warsaw University of Technology Scientific award for U. Domańska-Żelazna, 2014
- Jan Zawadzki's Medal for Urszula Domańska-Żelazna, 2014
- Awards of HM Rector of the Warsaw University of Technology in the years 1969-2014
- 2nd Degree Award of the Ministry of Science and Higher Education, 1989 for U. Domańska-Żelazna
- 1st Degree Award of the Ministry of Science and Higher Education, 1993,2006 for U. Domańska-Żelazna
- Ministry Stipend for Young Scientists: A. Pobudkowska-Mirecka, A. Marciniak, M. Królikowska, M. Królikowski and K. Padaszyński

Research equipment

- Titration Microcalorimeter – TA Inst TAM III
- HPLC/UV-Vis – Agilent Technologies 1200
- GC/FID,TCD – Perkin Elmer 500
- DSC 1 Star Sytems with liquid nitrogen cooling – Mettler Toledo
- Densimeter, Viscometer – Anton Paar

