

#### Head

Maciej Stanisław Siekierski

#### Current research

- Novel fuel cell electrolytes
- Biocompatible conductive hydrogels
- Lead acid batteries diagnostics and models
- Hybrid polymeric electrolytes
- Advanced applications of immittance spectroscopy

#### Selected publications

Piszc M., Marczewski M., Żukowska G.Z., Wójcik J., Wieczorek W., Siekierski M., *Optimization of Methylalumoxane Based Composite Polymeric Electrolytes for Lithium Battery Applications*, Solid State Ionics 33, 245, 2013

Siekierski M., Mroczkowska-Szerszeń M., Letmanowski R., Zabost D., Michał P., Żukowska G., Sasim E., Wieczorek W., Dudek M., Struzik M., *Synthetic Preparation of Proton Conducting Polyvinyl Alcohol and TiO<sub>2</sub>-Doped Inorganic Glasses for Hydrogen Fuel Cell Applications*, Electrochimica Acta 104, 487, 2013

Piszc M., Marczewski M., Plewa-Marczewska A., Żukowska G.Z., Zalewska A., Pietrzykowski A., Siekierski M., *Hybrid Polymeric Electrolyte Based on Methylalumoxane*, Journal of Power Sources 195, 7495, 2010

Plewa-Marczewska A., Kalita M., Marczewski M., Siekierski M., *NMR Studies of Equilibriums in Electrolytes: Ionic Pairing in Glymes*, Electrochimica Acta 55, 1389, 2010

Hekselman A., Kalita M., Plewa-Marczewska A., Żukowska G.Z., Sasim E., Wieczorek W., Siekierski M., *Effect of Calix[6]Pyrrole Anion Receptor Addition on Properties of PEO-Based Solid Polymer Electrolytes Doped with LiTf and LiTfSI Salts*, Electrochimica Acta 55, 1298, 2010

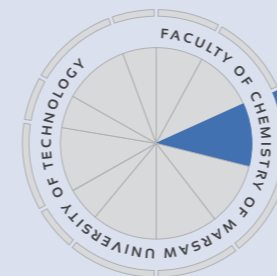
Marczewski M., Piszc M., Plewa-Marczewska A., Żukowska G.Z., Pietrzykowski A., Siekierski M., *Hybrid Polymeric Electrolyte Based on Methylalumoxane. Matrix Formation Reaction*, Electrochimica Acta 55, 1338, 2010

#### Current PhD students

Rafał Letmanowski  
Piotr Ryś  
Dariusz Zabost

#### Former PhD students

Michał Piszc



#### Research profile

Novel fuel cell electrolytes – protonically conductive mid-temperature range glasses

Biocompatible conductive hydrogels and their composites as electrolytes and 3D electrodes for biofuel cells

Lead acid batteries - battery management and diagnostic systems based on the fuzzy logic algorithms

Lead acid batteries – impedance models of electrodes performance and processes

Integration of the electrochemical energy storage systems into industrial UPS systems

Hybrid polymeric electrolytes – towards their application in implantable microbatteries

Advanced applications of immittance spectroscopy – nonlinear systems analysis, pulse techniques and applications of the Fourier and Hilbert transform in the immittance data processing

Fractal immittance models of composite materials

#### Collaboration

Oil and Gas Institute - National Research Institute, Cracow, (Poland)

Institute of Power Engineering, Warsaw (Poland)

Faculty of Chemistry, University of Warsaw, (Poland)

Faculty of Electrical Engineering, Warsaw University of Technology (Poland)

#### Research equipment

- Modular electrochemical analyzer VMP3 (Biologic)

