# RESEARCH AND IMPLEMENTATION OF GREEN INORGANIC TECHNOLOGIES

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**TEMATYKA / ZAGADNIENIA**

The course will be divided into four separate sections:

- Spectroscopic techniques are an essential tool to evaluate degradation of different classes of materials. The lecture will focus on discussing the possibilities and limitations of popular surface analysis techniques, facilitating their selection for specific needs. Examplary results to evaluate the degradation of metals and semiconductor materials will be presented and discussed in the second part of the course.
- The lecture will provide students with the fundamentals of the atomic force microscopy (AFM) including the principle of operation, modes of measurement and potential information obtained. The lecture will be supported with practical classes aimed at performing the AFM measurement on selected samples and presentation of image processing operations.
- Energy storage and conversion devices are of importance considering sound progress in the field of energy consumption in modern society. The aim of the lecture is to present consolidated knowledge about novel technologies implemented in synthesis of electrochemically active nanomaterials. Focus is given on chemistry and technology dedicated to electrochemical capacitors and high energy galvanic cells.
- As the range of emerging pollutants increases, the environmental fate of these chemicals needs to be determined, for risk assessment and treatment. The lecture will discuss method of predicting environmental fate of EPs in the environment, and their possible risk.

**SPOSÓB ZALICZENIA PRZEDMIOTU (EGZAMIN I W JAKIEJ FORMIE)**

The course will be assessed by written exam during session.

**LITERATURA**

Suggested literature:

- Magonov, Sergei N., and Myung-Hwan Whangbo. *Surface analysis with STM and AFM: experimental and theoretical aspects of image analysis*. John Wiley & Sons, 2008.
- Szociński, M., K. Darowicki, and K. Schaefer. "Identification and localization of organic coating degradation onset by impedance imaging." *Polymer Degradation and Stability* 95.6 (2010): 960-964.
- Arico, Antonino Salvatore, et al. "Nanostructured materials for advanced energy conversion and storage devices." *Nature materials* 4.5 (2005): 366-377.
- La Farre, Marinel, et al. "Fate and toxicity of emerging pollutants, their metabolites and transformation products in the aquatic environment." *TrAC Trends in Analytical Chemistry* 27.11 (2008): 991-1007.

| Termin | Dzień tygodnia | Godzina | Miejsce |
|---|---|---|---|
| 18.04.2016<br>25.04.2016 | Poniedziałek | 7.30 – 9.00<br>(bez przerwy) | Sala 112/113 Chemia A |
| 09.05.2016<br>16.05.2016 | Poniedziałek | 7.30 – 9.00<br>(bez przerwy) | Sala 112/113 Chemia A |
| 02.06.2016<br>03.06.2016 | Czwartek<br>Piątek | 10.15 – 12.00<br>10.15 – 12.00 | Sala 400 Gmach Główny PG |
| 06.06.2016<br><br>13.06.2016 | Poniedziałek | 7.30 – 9.00<br>(bez przerwy)<br>7.30 – 8.15 | Sala 112/113 Chemia A |