



Institute of Physical Chemistry

Polish Academy of Sciences

address: Kasprzaka 44/52
01-224 Warsaw, Poland
tel.: +48 22 3432000
fax/tel.: +48 22 3433333, 6325276
email: ichf@ichf.edu.pl
WWW: <http://www.ichf.edu.pl/>

Warsaw, 27 November 2012

Surface analysis techniques for advanced materials enhance Mazovia's research potential

Properties of several of the most external atomic layers of materials can be studied at Mazovia Centre for Surface Analysis by a number of modern techniques. Just opened at the Institute of Physical Chemistry of the Polish Academy of Sciences, Warsaw, Poland, the Centre provides a spectrum of surface analysis tools including a state-of-the-art scanning electron microscope and specialised spectroscopic equipment for surface studies in high and ultra high vacuum.

The Mazovian Centre for Surface Analysis (MCSA) has opened today at the Institute of Physical Chemistry of the Polish Academy of Sciences (IPC PAS) in Warsaw, Poland. The Centre is housing research instruments financed from different programs, among other from EU-funded NOBLESSE project. This equipment allows studies of material samples with over a dozen spectroscopic and microscopic techniques.

“Laboratories working with scanning techniques had since long been operated at our Institute. Now we have upgraded their equipment, and the European funds allowed us for buying the last missing component, the electron microscope. All that was left to do was to dot the i's and to merge the laboratories into one unit specialising in surface analysis techniques”, explains Prof. Robert Hołyst, the managing director of the IPC PAS.

The ceremony was combined with the opening of a new, three-story laboratory building, apart from the Mazovian Centre for Surface Analysis providing space for the laboratories working on nanostructures and microfluidics, and also in part for the CHEMIPAN R&D Laboratories, operating as part of the IPC PAS and synthesising chemicals used for protection of the environment.

The analysis of materials surface properties plays a substantial role in science and industry. Even tiny amounts of impurities in a solid, on a few molecules per million scale, may emerge out of the material and cover its surface. The layer resulting from such a segregation significantly modifies the properties of the sample. At present, the equipment at the Mazovian Centre for Surface Analysis allows for analysing physico-chemical properties of even only two the most external atomic layers of the sample. The results of the analyses are used, for instance, in materials engineering and electronics.

The most essential equipment of the Centre include: a PHI 5000 VersaProbe multi-chamber spectrometer, an ESCALAB-210 spectrometer, a NanoSEM 450 scanning electron microscope, a MICROLAB 350 scanning Auger microanalyser, and an Autolab PGSTAT302N Electrochemical System for Corrosion Studies.

“At present, the Centre provides over a dozen surface science techniques for studying the surfaces of solids, including photoelectron spectroscopy, Auger spectroscopy, tunnelling microscopy, atomic force microscopy and others. It’s quite a unique mix of methods used in a single ultra high vacuum”, says Prof. Aleksander Jabłoński, the head of the MCSA. “It’s also noteworthy that our equipment will be recorded in the ELAD – an electronic laboratory equipment database, designed for the use by small and medium-size enterprises and research institutions cooperating under the Mazovian Valley of Green Chemistry project”, he adds.

Much of the measurement time at the MCSA is devoted to orders from scientific and research institutions belonging to the NANOBIO consortium, working on application of quantum semiconductor nanostructures in biology and medicine. “At present, 40% of the research time is related to the commissioned work, more and more often for the industry. All in all, we collaborated with nearly one hundred external organisations. And it’s to be remembered that we are also doing our own research using our equipment”, stresses Prof. Jabłoński.

The opening ceremony of the Mazovian Centre for Surface Analysis was attended by the representatives of the Polish Ministry of Science and Higher Education, the local self-government authorities, the Mazovian Valley of Green Chemistry and representatives of over a dozen higher education institutions and research and scientific organisations – including the Institute of Organic Chemistry of the PAS, the Institute of Physics of the PAS, the Institute of High Pressure Physics of the PAS, the Institute of Nuclear Chemistry and Technology, the Industrial Chemistry Research Institute, the Pharmaceutical Research Institute, the Institute of Industrial Organic Chemistry, Warsaw University of Technology, Warsaw University, and Military University of Technology.

This press release was prepared thanks to the NOBLESSE grant under the activity “Research potential” of the 7th Framework Programme of the European Union.

The Institute of Physical Chemistry of the Polish Academy of Sciences (<http://www.ichf.edu.pl/>) was established in 1955 as one of the first chemical institutes of the PAS. The Institute’s scientific profile is strongly related to the newest global trends in the development of physical chemistry and chemical physics. Scientific research is conducted in nine scientific departments. CHEMIPAN R&D Laboratories, operating as part of the Institute, implement, produce and commercialise specialist chemicals to be used, in particular, in agriculture and pharmaceutical industry. The Institute publishes approximately 200 original research papers annually.

CONTACTS:

Prof. **Robert Holyst**
Institute of Physical Chemistry of the Polish Academy of Sciences
tel. +48 22 3433123
email: rholyst@ichf.edu.pl

Prof. **Aleksander Jabłoński**
Institute of Physical Chemistry of the Polish Academy of Sciences
tel. +48 22 3433331
email: ajablonski@ichf.edu.pl

RELATED LINKS:

http://ichf.edu.pl/res/res_pl/labs/mcap/mcap_pl.html
Website of the Mazovian Centre for Surface Analysis.

<http://www.ichf.edu.pl/>
Website of the Institute of Physical Chemistry of the Polish Academy of Sciences.

<http://www.ichf.edu.pl/press/>
Press releases of the Institute of Physical Chemistry of the PAS.

IMAGES:

ICHF121127b_fot01s.jpg

HR: http://ichf.edu.pl/press/2012/11/ICHF121127b_fot01.jpg

The Mazovian Centre for Surface Analysis, opened at the Institute of Physical Chemistry of the Polish Academy of Sciences in Warsaw, provides over a dozen surface science techniques for studying properties of the most external layers of materials. (Source: IPC PAS, Grzegorz Krzyżewski)