Exhibitor Technology Spotlight
Room Hall C - Session EW-TuL

Exhibitor Technology Spotlight Session

Moderator: Chris Moffitt, Kratos Analytical Limited

12:40pm **EW-TuL2 Spin-resolved Momentum Microscopy***, Thomas Stempel Pereira,* SPECS Surface Nano Analysis GmbH

We present a newly developed lens design which provides a full 2π solid acceptance angle with highest angular, energy and lateral resolution. In contrast to standard electron analyzers, electronic structure data from and beyond the 1st Brillouin zone is recorded without any sample movement. In addition the lens can work in a lateral imaging mode for microscopy as well. This enables navigation on the sample and reduces the size of the area under investigation down to a few micrometers in diameter. We have combined this lens design with two different kinds of energy dispersive elements: a time-of-flight section or a hemisphere. Both versions combine large acceptance angle, high angular resolution and small acceptance area, making these instruments the ideal tools for electronic structure studies on small samples or sample areas. The functionality of these instruments can be further enhanced by replacing the standard 2D-DLD detector with a spin-resolving imaging detector. The spin-resolved imaging is achieved by electron reflection at a W(100) spin-filter in the [010] azimuth at 45° reflection angle crystal prior to the 2D detector. Varying the scattering energy one can choose positive, negative, or vanishing reflection asymmetry.

1:00pm **EW-TuL3 The New Generation of the Hemispherical Energy Analyser in the Novel Surface Science Research***, Lukasz Walczak,* PREVAC Sp z o.o., Rogow, Poland

The complexity and the range of materials and their surfaces studied will be expanded across a wide range of topics, including surface science, catalysis, corrosion, semiconductors research, photoelectrochemical energy conversion, battery technology, or energy-saving technologies [1-5]. An unique and exceedingly flexible analysis cluster with a detection system is needed for these fundamental and applied research. Here it will be described a new energy and angle resolved analyser for photoelectron spectroscopy. The analyser has a hemisphere shape with a mean radius of 150 mm and is based on combining an advanced focusing electron lens system, which can be operated in different modes, transmission, spatial resolution or angular resolution. An angular resolution of better than 0.06° and spatial resolution 100 µm can be obtained. The spectrometer includes highly stable 6 kV power supply, where each independent voltage module achieves temperature stability below 0.5 ppm of the voltage span per degrees Celsius. The modern 2-D low noise CCD-MCP assembly with a noise level of < 0.01 cps/channel and a 70 fps fast camera are used. Fully automation and environmental software system make it a user-friendly tool for the conducted researches. The combination of the new generation hemispherical energy analyser with a liquid helium/nitrogen manipulators and modular PREVAC surface analysis system as part of multi-technique surface analysis systems will be presented, in order to permit complete characterization of the surface structure via XPS, UPS, ISS and APRES mapping. We will report the first results from this techniques, using analyser and induced by four interaction sources: X-ray, UV, electron or ion impact. Also the results of temperature dependent study on the metallic crystal will be presented. UV excited Xe5p spectra recorded in the gas phase show that the energy resolution is better than 3 meV at 2eV analyser pass energy. The application of the system will be shown on photovoltaic materials, graphene, or self-assembled organic monolayers of organic molecules. This analyser opens up new possibilities for angular/spatial resolved electron spectroscopy, band-mapping and other applications.

References

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[4] N. Tomaszewska et. al, Surf. Sci. **632**, 103-110 (2015)

[5] K. Samson el. al, ACS Catalysis, **4**, 373-374 (2014)

[6] Yi-Chun Lu et. al, Sci. Rep. **2**, 715 (2012)

1:20pm **EW-TuL4 Latest Developments in XPS and Related Methods from Kratos Analytical***, Chris Blomfield, J.D.P. Counsell, S.J. Coultas, S.C. Page,* Kratos Analytical Limited, UK*; C. Moffitt,* Kratos Analytical Limited

The Axis Supra is the latest generation of XPS instrument from Kratos Analytical. In addition to offering enhanced energy resolution and sensitivity for XPS, it has a 15µm small area spectroscopy capability and 1µm imaging. The instrument is designed to offer a high level of flexibility and can be fitted with a range of complimentary surface analysis techniques such as UPS, ISS, AES, along with an additional surface science station and a range of sample treatment capabilities. In addition to offering benchmark level performance, the instrument and ESCApe data system combine to offer a high throughput platform optimized for the multiuser environment of today's surface analysis laboratory. Samples may be pre-aligned and analyses predefined so that, when combined with the automated sample transfer capability, high levels of throughput can be achieved with unattended operation. Applications of high resolution imaging, multispectral imaging, gas cluster ion source and GCIS-UPS studies will be presented on a range of new materials to underline the leading capabilities of the Axis Supra.

1:40pm **EW-TuL5 What's New with Physical Electronics***, John Newman,* Physical Electronics USA

Learn about all the new advances with Physical Electronics.

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