Tuesday Lunch, November 10, 2009

Exhibitor Workshops
Room: Exhibit Hall 1 - Session EW-TuL

Exhibitor Workshop
Moderator: B.R. Rogers, Vanderbilt University

12:40pm **EW-TuL3 New Developments in Spectroscopic Imaging from Thermo Fisher Scientific**, ***R.G. White***, *A.E. Wright, J. Wolstenholme*, Thermo Fisher Scientific, UK

Surface structure and chemistry are crucial to the successful production and operation of innumerable devices, materials and coatings. X-ray photoelectron spectroscopy, with its high surface specificity and chemical state sensitivity, is an ideal tool for the evaluation of material composition. XPS spectroscopic imaging, in which spectral data are acquired with some degree of lateral resolution, allows the identification of both spatial and chemical variations in materials. The expansive data sets that result from spectroscopic imaging must be treated with powerful software algorithms, to extract high levels of spatial and chemical information with a minimum of acquisition time.

Spectroscopic imaging solutions to structural and chemical problems are presented using the full range of state-of-the-art fully integrated X-ray Photoelectron Spectrometers from Thermo Fisher Scientific. Such analyses demonstrate the importance of small-scale structure on the integrity of a polymer blend, show the consequences of corrosion/dissolution of metallic and polymeric surfaces, and illustrate the nature of bonding failures. The effectiveness of spectroscopic imaging analyses, and intensive, automated data refinement processes using award-winning Avantage datasystem, are shown for each of these examples.

1:00pm **EW-TuL4 State-of-the-Art Nanostructure Compositional Analysis with Scanning Auger Microscopy**, ***J.S. Hammond***, *D.F. Paul, J.F. Moulder*, Physical Electronics

Advances in nanotechnology research now require analytical techniques that can image the elemental and chemical compositions of novel three dimensional structures. To meet these needs, a new state-of-the art Scanning Auger Nanoprobe has been developed with high energy resolution chemical state spectroscopy combined with Auger imaging uniquely tailored to nanostructure morphologies. The instrument design will be briefly discussed and highlights from the analysis of several nanostructures structures will be reviewed.

1:20pm **EW-TuL5 State of the Art in XPS**, *C.J. Blomfield*, Kratos Analytical Ltd, UK, ***D.J. Surman***, Kratos Analytical

Modern XPS instruments such as the Axis range from Kratos Analytical offer a variety of analytical capabilities extending beyond simple chemical characterisation of the upmost layers of a material surface. Advances in ion gun technology, chemical imaging resolution, instrument spectroscopic performance and data processing have made analysis faster, data more accurate and the previously impossible possible. XPS is becoming more wide spread with new users from fields such as photovoltaics, biocompatibility, pharmaceuticals and nano-science enjoying the benefits of surface analysis.

More specifically; improvements in ion gun technology have meant low energy monatomic sources can give better interface quality for multi-layer inorganic materials. The development of polyatomic ion sources has made XPS depth profiling of organic materials feasible. XPS imaging has developed into a technique to quantitatively characterise surface inhomogeneity and the application of multivariate data analysis techniques has reduced acquisition times while improving information content. Angle resolved XPS has benefited from new interpretation routines via the application of maximum entropy analysis methods to extract meaningful, non destructive, concentration profiles over the first few nanometres.

This presentation aspires to give an overview of the state of the art in XPS driven surface analysis by presenting examples and case studies from a number of important application areas ranging from thin film photovoltaics to bio-compatibility. Examples where hardware and software advances have helped the analyst will be given for techniques such as auto quantification, XPS depth profiling, angle resolved XPS, chemical state imaging, work function determination and electronic structure characterisation.

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