

“Enhancing Surface and Thin Film Analysis through In-Situ Complementary XPS, UPS and ISS”

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ABSTRACT

Advanced materials present ever increasing challenges to the analytical scientist. Composite materials built from nanostructures or ultra-thin films, often with complex chemistry present, are now required in a broad range of applications, and achieving full characterization is rarely managed using only one analysis method. To maintain confidence in the results from the utilization of several different methods, it is advantageous to be able to perform experiments on the same platform. Ideally, this should be without having to move the sample, removing the need for additional registration or processing to ensure that the data is being collected from the same position.

For surface analysis, it has been very helpful to incorporate related analysis techniques onto the same instrument. For example, X-ray photoelectron spectroscopy (XPS) systems are commonly equipped with UV light sources to facilitate investigation of additional properties of materials via ultra-violet photoelectron spectroscopy (UPS). The ion source that is typically used for sample cleaning and depth profiling can also be used for low energy ion scattering (LEIS or ISS), providing more surface sensitive elemental composition information than can be delivered from XPS alone.

In this presentation we will discuss the strengths of the combined, in-situ approach to surface analysis, illustrated with examples from a range of applications including carbon nanomaterials and microelectronics.

BIOSKETCH

Dr. Paul Mack is a senior applications scientist at Thermo Fisher Scientific, East Grinstead. He studied for his PhD (high energy resolution spectroscopy) at the University of Southampton before joining Thermo Fisher as an engineer, with responsibility for testing, servicing and installing surface analysis instruments. Paul moved to applications in 2001 and has over eight years experience working with Surface Analysis techniques, including Auger electron spectroscopy and angle resolved XPS. Paul's work includes demonstrating Surface Analysis products to potential customers, performing sample and technique evaluations and providing applications support to customers. Paul has also been responsible for developing advanced data processing algorithms, including the Thermo Scientific software for extracting depth profiles from angle resolved XPS data. Paul can be met at tradeshow and Thermo Fisher Scientific Surface Analysis seminars and can be contacted via email at applications.ukegr@thermofisher.com.