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Webinar Q&A Report: **Efficient Multi-Technique Surface Analysis Through Automation**

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Are the RAMAN laser sources internal or external? How many wavelengths are available?

Currently the Raman spectrometer of the Nexsa G2 can be fitted with 3 different laser wavelengths 455, 532 and 785 nm.

Are there any limitations as to what features can be run remotely?

Once samples are placed in the Nexsa G2 or K-alpha load lock everything is controlled by the system PC and avantage software, therefore with a good internet connection everything can be controlled from anywhere in the world.

What is the benefit of using cluster ions over conventional ion beams?

The key parameter to keep in mind for ion beam etching is the energy per atom (e/n), for monatomic ions this is very high as the e/n value is equal to e/ion, usually around 1-4 keV. Whereas in a cluster ion the beam energy is divided by the number of atoms in the cluster therefore producing an e/n value orders of magnitude lower than the monatomic beam, this can be as low as 1 eV. The result of this is a much gentler ion beam etch of the surface which is isolated to the top surface so no surface penetration. So, the cluster ion is perfectly suited to depth profiling organic materials as they can etch away material without inducing damage to the sample chemistry.

How do the instruments deal with air sensitive samples?

All of our systems can be fitted with a glovebox attachment to the load lock to deal with air sensitive samples, however we also provide vacuum transfer module options that can be loaded with samples inside any existing glove box or glove bag. These modules can then be loaded directly into the system ready for analysis without risking air exposure.

What is the smallest size that can be analyzed?

All of our systems provide small area analysis. The Nexsa G2 system has a micro-focussed X-ray spot that can set as small as 10µm. on our Escalab Xi+ system the analysed area can be reduced down to <5µm using imaging modes for spectroscopy.

With regards to the depth profiling using the cluster parameter, how do you know much material is removed?

In XPS measuring the etching rate or sputtering yield is non-trivial. Unlike techniques like SIMS where you are measuring the sputtered material, in XPS we are measuring what is left on the surface. There are several methods for calculating the etch rate or amount of sputtered material however most of these rely on retrospective analysis of the data. For example, for a single overlayer we can look for signal from the substrate material and from the attenuation length of that element or compound extrapolate the etch rate achieved for the sample. Some of our customers have retrofitted the stage of our systems with quartz crystal microbalances to measure the removed mass during etching and this has worked quite well also.

What is the sampling depth of REELS?

This will depend on the beam energy used. On our systems we can tune the electron beam of the REELS source up to 1keV, this gives a sampling depth comparable to XPS (top 10nm) and reducing the beam energy down to say 250 eV will give a shallower sampling depth depending on the attenuation length of the sample material.

Contact Information

If you have additional questions for Thermo Fisher Scientific regarding content from their webinar or wish to receive additional information about their products and services, please contact them at:

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