

High Resolution XPS Mapping

Key Words

- Surface Analysis
- Constant Spatial Resolution
- Image Collection from Large Field of View
- Increased Mapping Speed
- Maximum Detection Efficiency
- Position Independent Transmission Function
- Position Independent X-ray Energy and Intensity

When using Thermo Scientific Sigma Probe, Theta Probe or Theta 300 to produce XPS maps, the precision stage is rastered under the X-ray spot while collecting photoelectrons. The analyzer can be set to fixed or scanned energies, and with Theta Probe and Theta 300, a 'snapshot' spectrum can also be acquired, thus high quality spectral information can be obtained at each pixel (see application note 31009). Theta Probe and Theta 300 can also acquire angular information at each pixel.

The images shown here illustrate the resolution available from the instruments and give some indication of the speed with which maps can be produced.

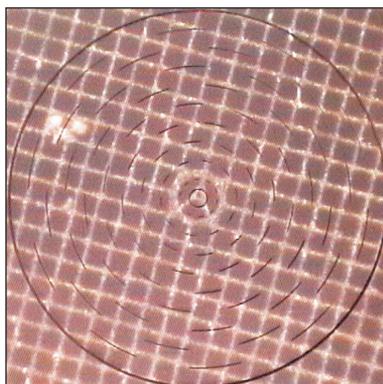


Figure 1: Optical image of an SEM grid at the instrument analysis position

Figure 4 shows a linescan taken from the grid to measure the lateral resolution. A resolution of less than 10 μm has been demonstrated.

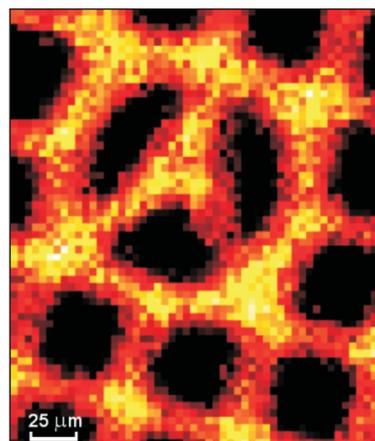


Figure 2: XPS map collected in less than 15 minutes from the same SEM grid

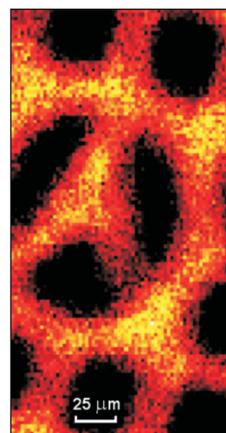


Figure 3: XPS map from the Ag 3d peak showing excellent resolution

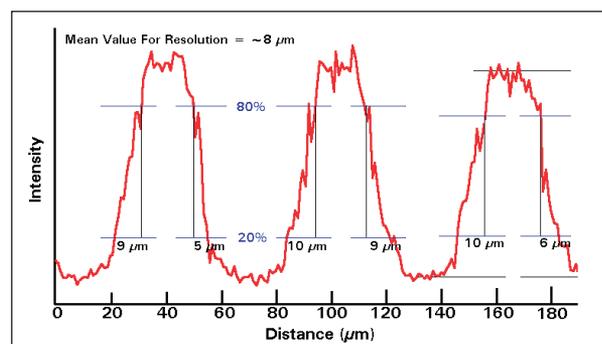


Figure 4: Linescan over the SEM grid showing that the 20% to 80% edge resolution is about 8 μm

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