

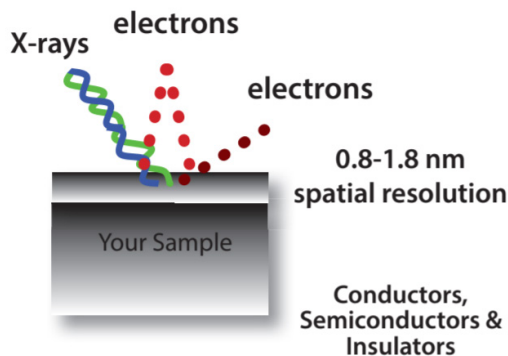
TECHNIQUE NOTE

# UHR-SEM-EDS: 1.4 nm NanoScale Imaging and Elemental Analysis Tool

## OVERVIEW

- Electrons IN - Electrons OUT
- Low Vacuum Capability
- Spatial Resolution: < 1 nm
- Image Depth of Info: 1-10 nm
- Insulators, Semi- Or Conductors
- Energy: 50 V to 30 kV
- EDS Depth Of Info: 0.2 - 3.0  $\mu$
- Sample Size: 200 x 200 x 50 mm

### Ultra-High Resolution (UHR) FE-SEM



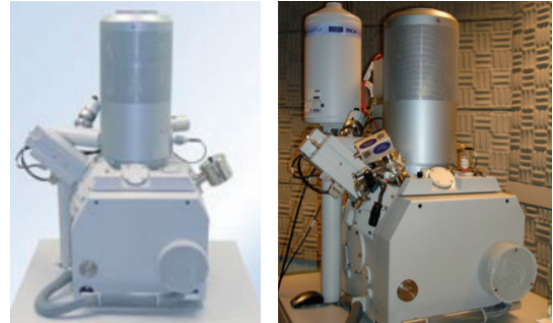
## STRENGTHS / ADVANTAGES

- 0.8 nm at 30 kV
- 1.4 nm at 1 kV
- Beam landing energy: 50 V - 30 kV
- In-lens SE & BSE detectors
- EDS for elemental analysis

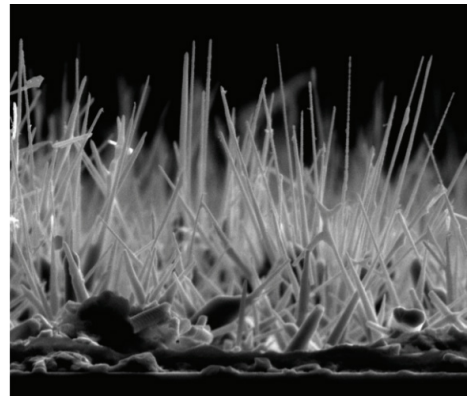
## DATA PRODUCED

- Ultra high resolution images
  - Up to 0.8 nm spatial resolution
  - TIFF (8/16 bit), BMP, JPEG
  - Backscatter (BSE) images
- Need special data - give us a call

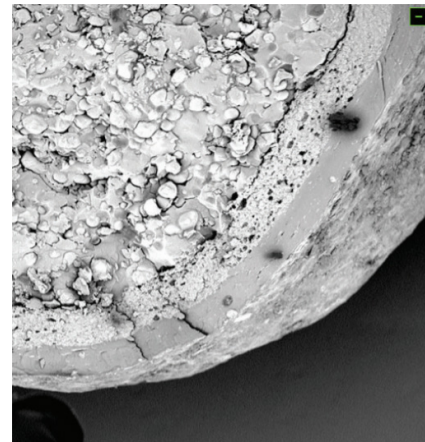
## NanoLab's State-Of-The-Art 'UHR-SEM-EDS'



## Nano-Wires (ZrO<sub>2</sub>)

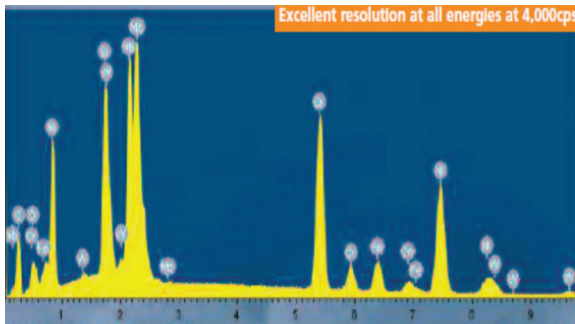


## Medicine Tablet - Cross-Sectioned

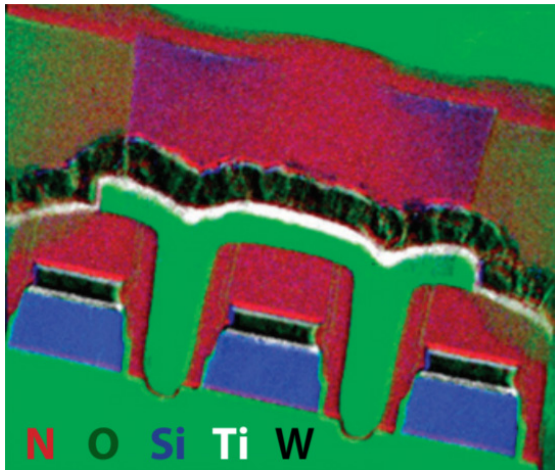


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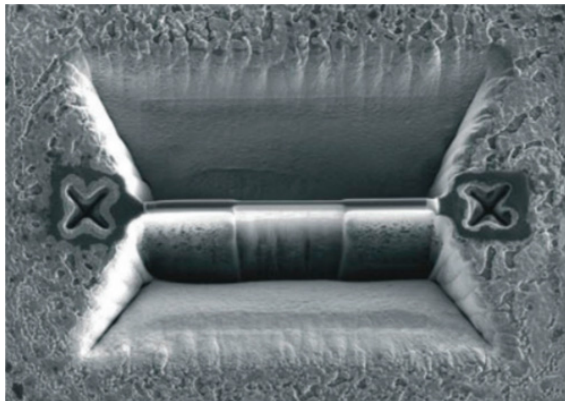
Survey Scan For The Elements - EDS



Element Map Using EDS



FIB Cut Inspections



## ROUTINE IMAGING AND ANALYSES

- Complete unknown - chemistry and thickness
- Particles, defects, fibers, nano-, contamination
- Elemental composition by EDS
- Low vacuum (2 mBar), low voltage (< 100 V)
- Insulators, semiconductors or conductors

## ADVANCED IMAGING AND ANALYSES

- Surface uniformity of elements (XY map)
- Quality control (QC)
- Viscous liquids, greases, fibers, nano-particle
- Specialty work? - Give us a call.

## GLOBAL USES

- Quality control
- Problem solving
- Failure analysis
- Production control
- Materials development
- Reverse engineering

## APPLICATIONS

- Particle analysis
- Contamination
- Thickness of films
- Delamination (peeling)
- Complete unknown
- Good versus bad (failed)
- A versus B
- Element composition
- Multi-point QC
- Powders, fibers, nano-
- Many more - let's talk.

## IMAGES & PLOTS

- 40-750,000 X imaging
- Survey scans - EDS
- Multi-point EDS spectra
- Angle dependent imaging
- Specialty spectra - call us.