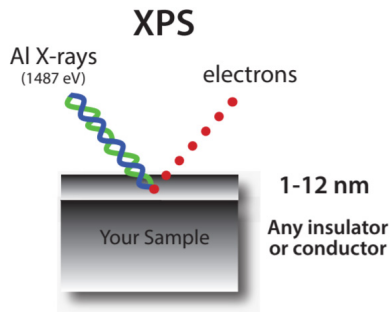


TECHNIQUE NOTE

XPS: Surface Chemical Analysis Tool

OVERVIEW

- X-rays IN - Electrons OUT (UHV)
- All elements, Except H, He
- Detection Limit: < 0.1 atom %
- Smallest Analysis Area: ~ 30 μ
- Depth Of Info: 1-12 nm
- Surface Or Bul, (Ion Profiling)
- Any Solid Or Heavy Oil
- Sample Size: 60 x 60 x 15 mm



STRENGTHS / ADVANTAGES

- Chemical states
- All elements, except H, He
- Reliable quantification
- Analyzes insulators & conductors
- Extremely low sample degradation

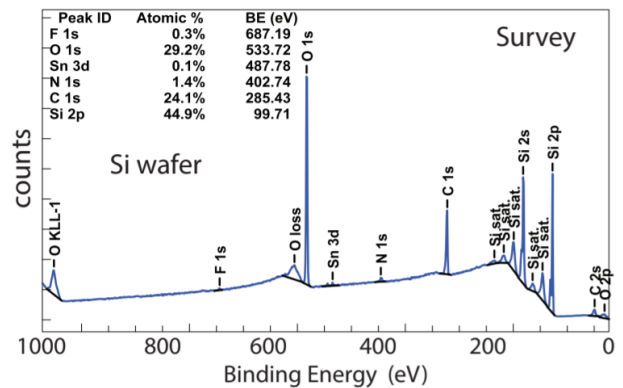
DATA PRODUCED

- Elemental analysis in atom %
- Chemical state information
 - spectra
 - depth profiles
 - line profiles
 - maps
- Angle dependent chemistry profiles

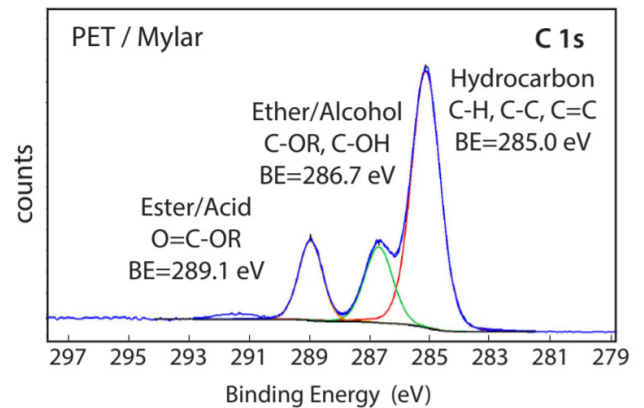
NanoLab's State-Of-The-Art 'XPS'



Survey Spectrum (all elements)



Chemical State Spectrum (one element)



XPS: Surface Chemical Analysis Tool

ROUTINE ANALYSES

- Surface contamination, corrosion, discoloration
- Complete unknown - chemistry and thickness
- Elemental analysis with > 95% accuracy
- Chemical state info (e.g. C-H vs C-F vs C=O)
- Chemistry versus depth down to 200 nm

ADVANCED ANALYSES

- Chemical depth profile down to 1000 nm
- Non-destructive chemistry versus depth from 1 to 12 nm (AR-XPS)
- Surface uniformity of chemical states (XY map)
- Quality control (QC) with > 95% accuracy
- Specialty work? - Give us a call.

GLOBAL USES

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

APPLICATIONS

- Contamination
- Adhesion
- Thickness of films
- Delamination (peeling)
- Complete unknown
- Good vs bad (failed)
- A versus B
- Chemical state info
- After processing
- QC / QA (> 95%)
- Bulk analysis
- Powders, fibers, oils
- Many more - let's talk.

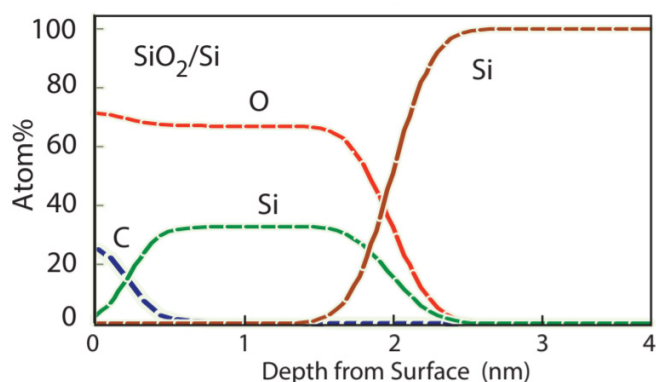
SPECTRA & PLOTS

- Survey scans
- Chemical state scans
- Atom % vs depth plots
- 3D Montage plots
- Non-destructive profiles
- Specialty spectra - call us.

SAMPLE TREATMENTS

- As-received
- Argon ion etch
- Carbon reduction by Ar+
- Freeze fracture under argon
- Advanced treatments - let us help with your special needs.

Non-Destructive Tilt Depth Profile



Ion Etched Depth Profile (3D Montage Plot)

