

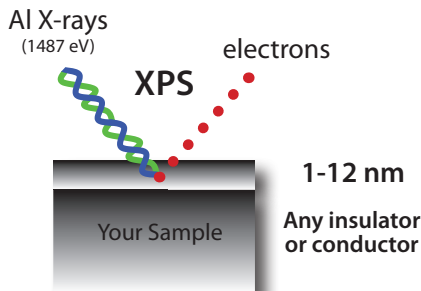


NanoLab Delivers!

Analytical Services On Demand

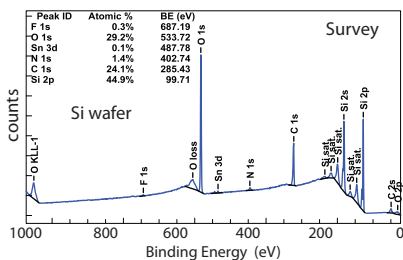
'XPS'
Your Chemical State
Information Tool

NanoLab's State-of-the-Art 'XPS'

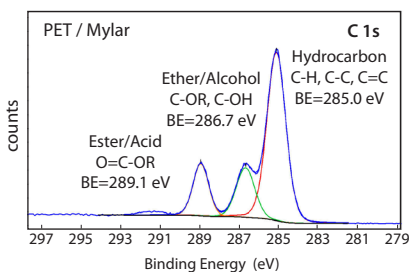


'XPS' in a Nano-Nutshell
X-rays IN - Electrons OUT (UHV)
All elements, except H, He
Detection Limit: < 0.1 atom%
Smallest analysis area: ~20 μm
Depth of info: 1-12 nm
Surface or bulk
Any solid or heavy oil
Sample size: 60 x 60 x 20 mm

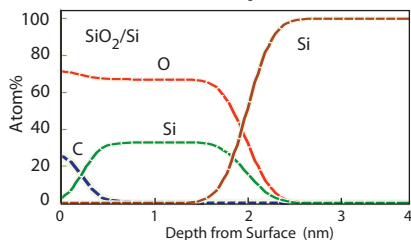
Survey Spectrum (all elements)



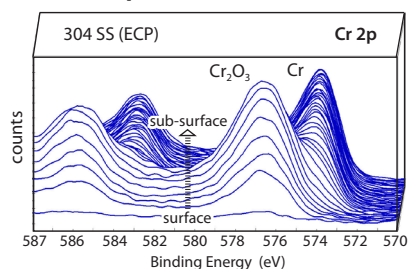
Chemical State Spectrum (one element)



Non-Destructive Tilt Depth Profile



Ion Etched Depth Profile (3D Montage Plot)



STRENGTHS / ADVANTAGES

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

DATA PRODUCED

- Elemental composition in atom%
- Chemical state information
 - spectra
 - depth profiles
 - line profiles
 - maps
- Angle dependent profiles
- Need special data - give us a call.

**You bring the samples,
We provide the results you need.**

Call us - We're ready to help!

ROUTINE ANALYSES

- Surface contamination, corrosion, discoloration
- Complete unknown - chemistry and thickness
- Elemental composition with >97% 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 >99% accuracy
- Specialty work? - Give us a call.
We're here to serve your needs.

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 (>99%)
- 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.

NanoLab Technologies, 3833 North 1st Street, San Jose, California 95134 USA **Website:** www.nanolab1.com
E-mail: sales@nanolab1.com, **Sales Tel:** 1.408.433.3320

Free consultation by phone.
First hour of analysis is free.
Work On-Site with us.
Call Vince at: 1.650.919.3940



NanoLab Delivers!

NANOLAB ADVANTAGES

- Newest instrumentation
- Glove-box (Argon or N₂)
- 30 yr XPS Expertise
- 40,000 XPS Spectra Database
- NIST 25,000 BE Database
- ISO TC/201 Member
- Internationally known expert
- SDP v5.0 Software (70% discount)

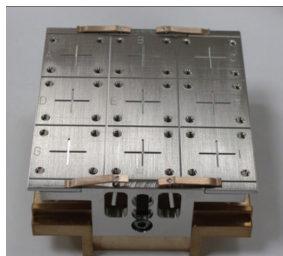
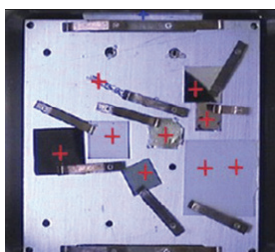
BUILT-IN GLOVE-BOX ADVANTAGE / USES

- Fracture under Argon
- LN₂ freeze fracture under Argon
- Scrape clean under Argon
- Heat under Argon



SAMPLE MOUNTS

- Sample size: max 60 x 60 x 20 mm
- Rotation mounts for profiling (Zalar)
- Powder mounts
- Tilt stage (0-90 deg)

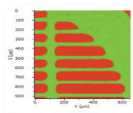


Got a Question! Let's Talk. Give us a Call.

TYPICAL ANALYSIS TIMES

- Survey scan: 1-10 min
- High res scan: 5-15 min
- Depth Profile: 1-4 hr
- AR-XPS: 1-2 hr
- XY Map: 1-4 hr

Chemical State Map

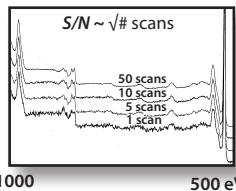


SPECIALTY WORK / DATA

- Valence bands (DOS)
- Auger spectra
- REELS spectra
- XY maps (up to 60 x 60 mm)
- Supporting techniques (ToF-SIMS, AFM...)

HIGH QUALITY CHOICES

- Longer # of scans
- Better pass energy
- Grazing angle
- Large step sizes
- Ask for our data quality comparisons



MONOCHROMATIC X-RAYS

- No heat damage (150 C)
- No high energy X-ray damage
- No overlapping X-ray satellites
- Ultimate chemical information
- True atom % (no satellite overlaps)
- Database of 40,000 mono XPS spectra
- Highest S/N and S/BG

LIMITS OF XPS

- Detection limit: ~0.01 atom % (4% for B)
- Sample size: 60 x 60 x 20 mm
- Depth of information: 1-12 nm
- Profile limit: 1000 nm (1 μ)
- No volatile liquids
- Can not measure H or He

CONTENT OF REPORTS

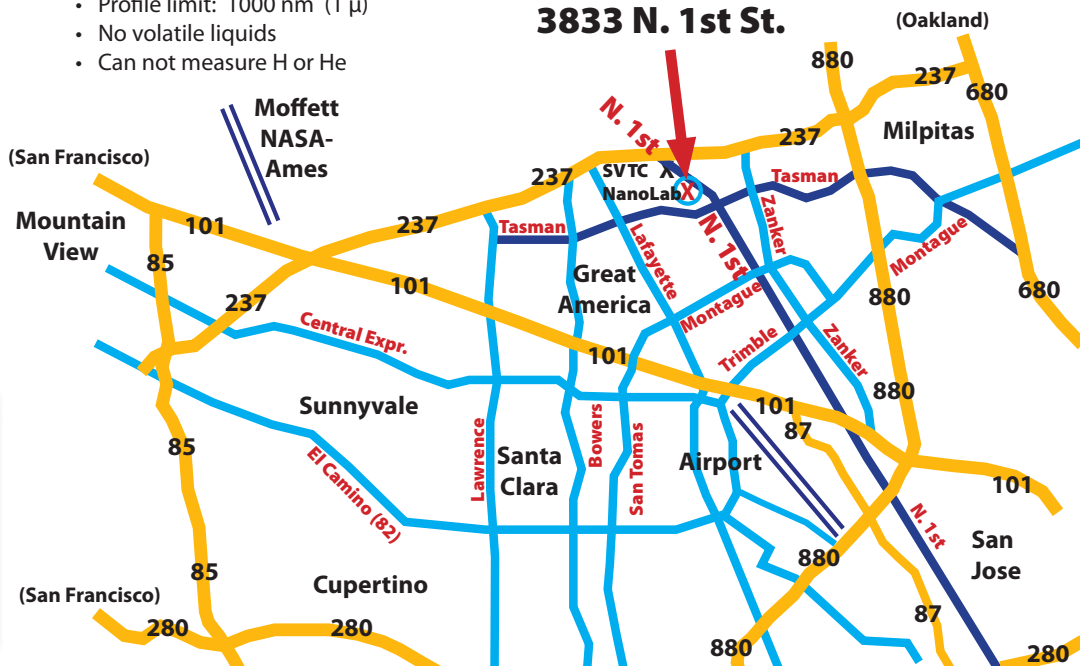
- Summary of results - meaningful Info
- All spectra & plots (raw & processed)
- Elemental composition table(s)
- Chemical state assignments
- Image(s) of samples
- Data in ASCII format
- Analysis strategy agreed on
- Description of samples
- History of samples
- Description of the analysis
- Reference spectra as needed
- Suggestions for next steps

K-ALPHA XPS ADVANTAGES

- 128 channel detector (not 32)
- Superfast profiles/maps
- Snapshot spectra (50 eV wide)
- 1 Mcps at 400 um beam
- 50 Kcps at 30 um beam
- Monochromatic X-rays
- Live optical views
- Mesh and Ar+ / e- charge control
- No BE errors from rastered X-rays
- Continuous spot sizes (30.....400 μ)
- Continuous step sizes (0.01.....4 eV/step)
- Auto-calibration

NanoLab

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