EMPA Instructions for Geological Samples

Modified after Johnson Lab Thin Film Instructions

Carbon Coating Procedures

For Edwards Coating System E306A

1. Clean polished samples with ethanol and wipe clean.
2. Put samples in oven for ~ 1 minute to dry (optional).
3. Put a fresh piece of filter paper and clean brass stud on plate.
4. If necessary, take out carbon rods and sharpen. (Left-side needs to be flat on the end and the right-side needs to be sharpened ~2-3 mm back and then flattened on end.)
5. Put carbon rods back and tighten. (When tightening the right-side, push the spring back and push the carbon rod in, tighten while the spring is loaded so that it will push the carbon rods together.)
6. Place samples on filter paper.
7. Put bell jar in place over samples.
8. Place implosion guard over top of bell jar.
9. Turn off airflow by pushing AIR ADMIT button (light turns off)
10. Turn handle on front of coater counterclockwise to the ROUGHING position.
11. The pressure dial (found at the top-right of the instrument panel) will go up and then will slowly go back down.
12. Once the pressure dial reaches the red arrow, rotate the handle clockwise to the BACKING position, then pull the handle out towards you and continue rotating it clockwise (go slowly so that the needle does not rise above the red arrow) until it is in the OPEN position.
13. Let sit for ~20 minutes.
14. After 20 minutes, SLOWLY turn the rotator knob (top left on instrument panel) until the plate is spinning.
15. Press the LT button.
16. Turn the POWER CONTROL knob (bottom left on panel) until the carbon starts sputtering. (You want to do this slowly to keep it from sputtering too fast.)
17. Let it sputter until the brass stud turns purple (corresponding to a carbon coat 22±1 nm). The brass stud will first turn orange, then red and then purple.
18. As soon as the stud turns purple, turn the POWER CONTROL knob back to zero.
19. Turn the rotator knob back to zero to stop the plate from spinning.
20. Turn off LT.
21. Turn handle to BACKING position (counterclockwise).
22. Push AIR ADMIT button to allow air back into the chamber.
23. Remove implosion guard and bell jar.

SX-100 Insert/Exchange Samples

1. Make sure specimen is clean and dry (place sample in oven for ~ 1 minute).
2. Using the KVM switch (located under the monitors) make sure computer 1 (Cameca computer) is selected. (If the KVM switch is "stuck", press the spacebar on the computer).
3. In the SX CONTROL window click the "Vacuum" tab.
4. Click the "Sample Exchange" button and then click "Yes" to confirm sample exchange.
5. In the SX CONTROL window it will give you a series of directions to follow:
    a. "Turn gun valve to position 1": Turn valve clockwise to position 1. (The gun valve is found on top of the instrument toward the back. You will need to pass position 3 to get to position 1). Wait until it says "Airlock Backup Completed".
    b. "Open airlock gate valve": The handle is located just to the left of the viewing window. Push it in, lift it up, and release.
    c. "Move in/out shuttle": Make sure the correct direction is selected using the switch on the outside of the shuttle. Move the shuttle all the way in and then all the way out. Depending on which direction is selected, it will either grab or release your sample.
    d. "Close airlock gate valve": Turn handle clockwise, push down, and release.
6. Click CONTINUE when the airlock gate valve is closed.
7. To remove your sample, open the airlock door by de-pressing the black button on the side latch.
8. After about 1 minute it will continue to prompt you with directions:
    a. "Turn gun valve to position 2": Turn valve counterclockwise to position 2 (You will need to pass position 3).
9. In the SX CONTROL window it will indicate that the vacuum is ready after about a minute or so.

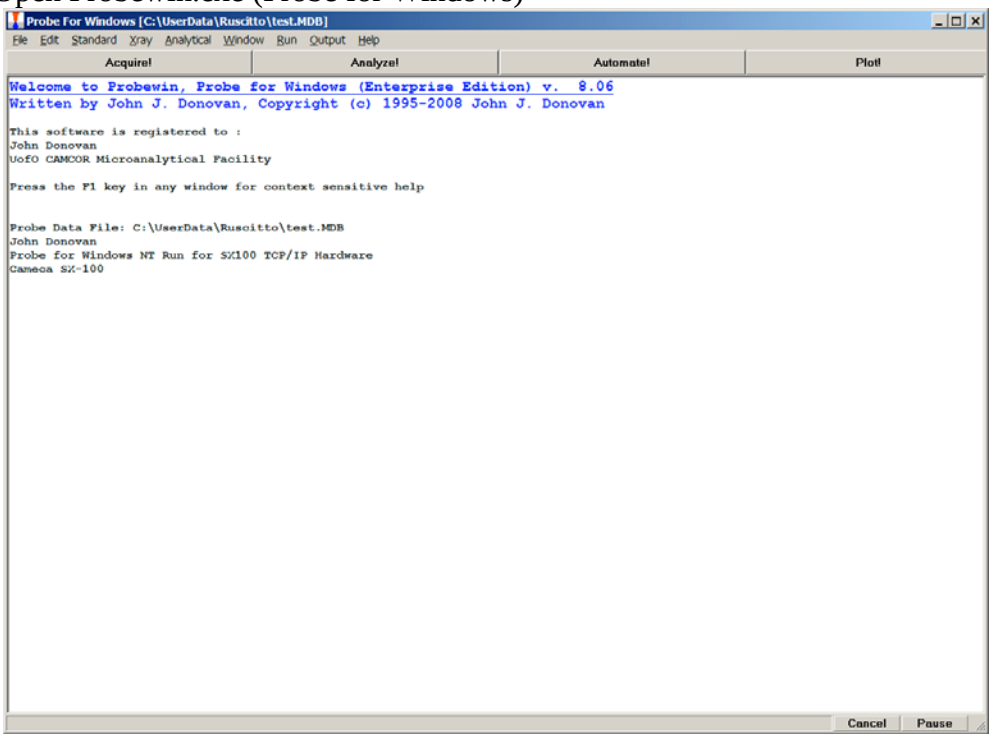
Resetting Stage Reference Point:

1. Switch to the CAMECA computer using the KVM.
2. Right-click on the "Position" window (lower left of display) and choose "Move to Reference". This will move the stage to what the computer thinks is the reference point.
3. Use the joystick and Z-button to focus on the bright spot near the center of the cross etched into the sample holder. Right-click on the "Position" window and choose "Update Reference", then "OK".

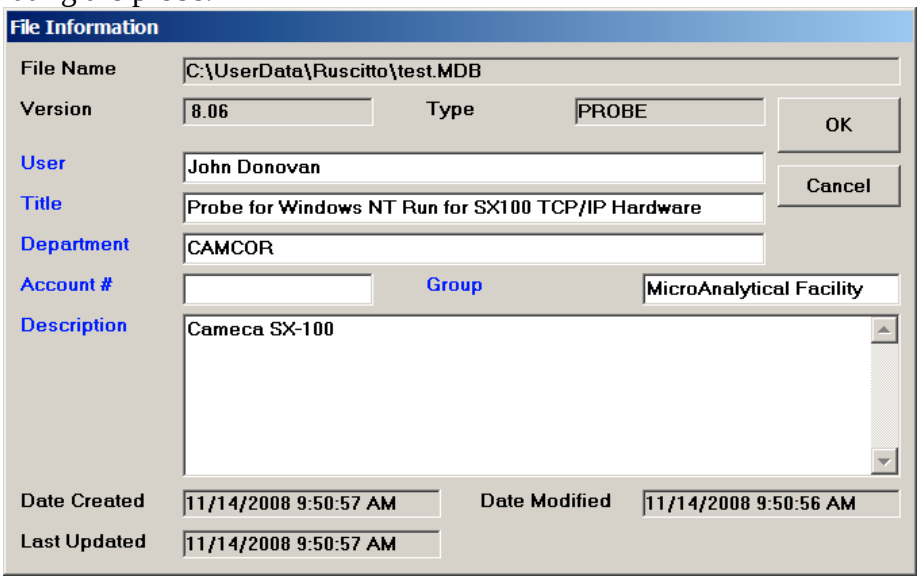
Setting up the Probe for a Run:

This guide is intended for a quick-start and assumes that a setup has already been created and just needs to be loaded.

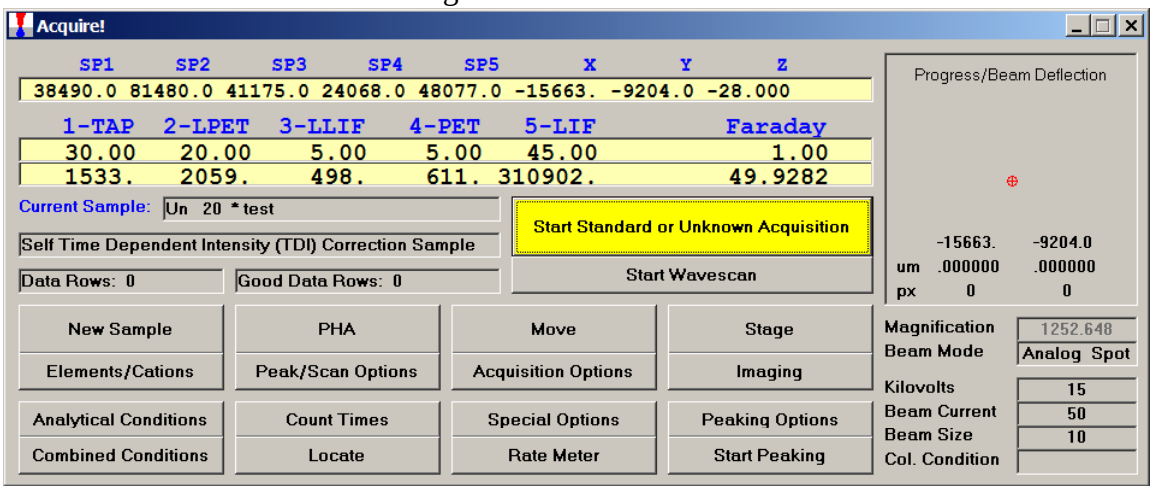
1. Open Probewin.exe (Probe for Windows)

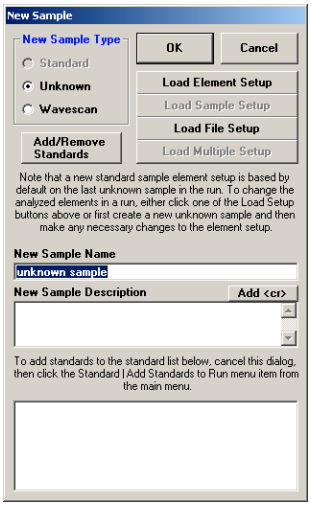


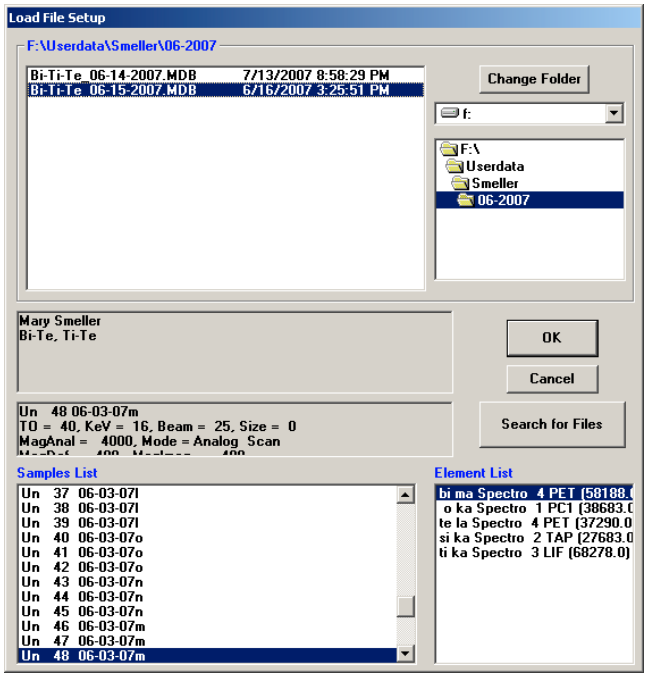
2. When prompted “Do you want to interface to the microprobe” click ‘YES’
3. Create a new probe run by selecting File >> New.
4. Name the file appropriately for your activity and put the file in a folder that makes sense to you. You may also wish to change the sample identifications and who is operating the probe.



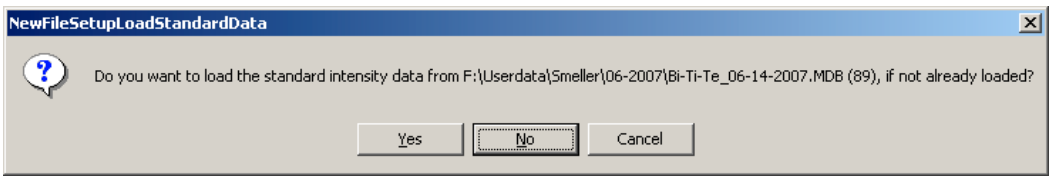
5. Next, load an old file setup for the same elemental standards you wish to run by pushing □Acquire! In the new 'Acquire!' window go to □New Sample, □Load File Set-up, then navigate to the old file (use the most recent file with your standards) and click □OK. This will establish the sample setup and standards you wish to run. Then click □OK again.







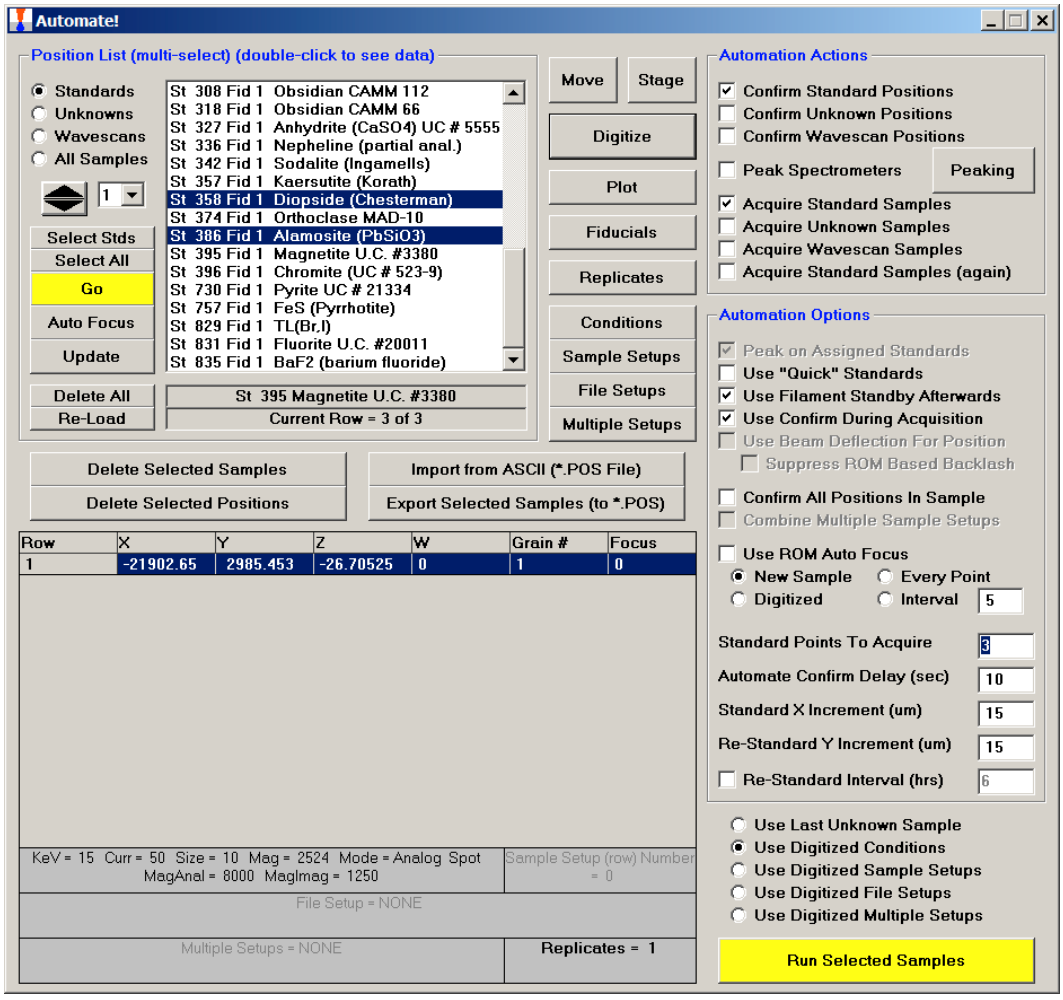
6. When prompted "Do you want to use the old standard intensities," DO NOT USE THE STANDARD INTENSITIES FROM LAST TIME.



7. Load the column conditions using the ‘Probewin’ log window menu and choosing Window >> Load Column Conditions. Sort the files by DATE and choose the most recent one. Change the analytical conditions by selecting Window >> Analytical Conditions, set your values and save.

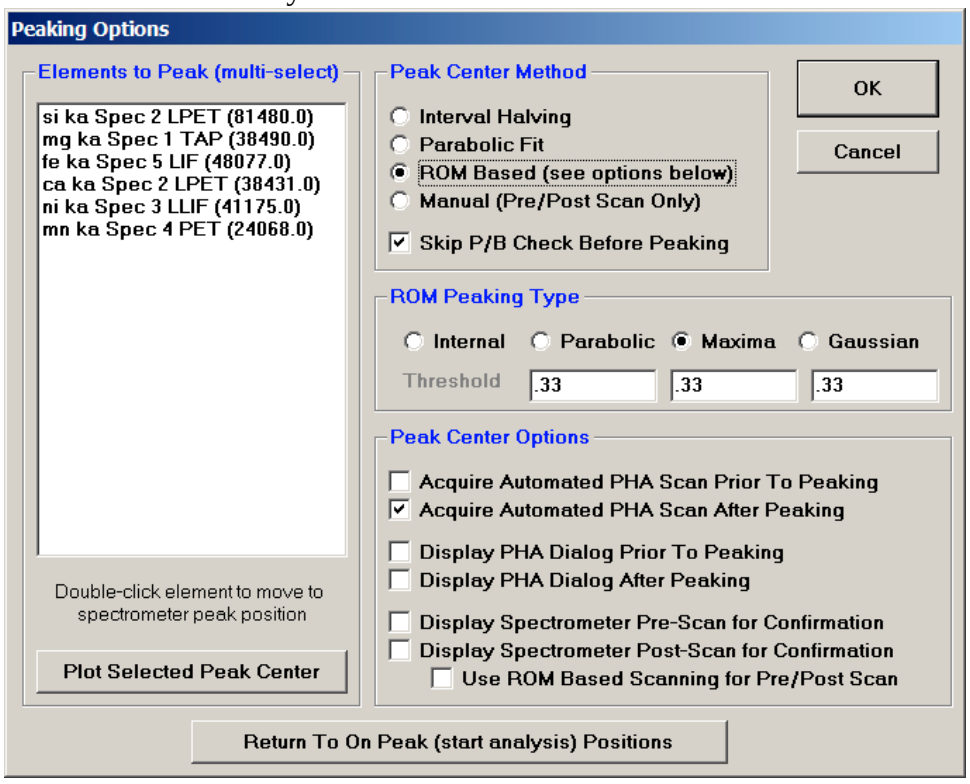
8. Check the electron beam position and focus before running any standards:
    a. Use the KVM switch to access the CAMECA computer.
    b. In the SX100 CONTROL Window, set beam size to 0 µm. Return to the regular computer using the KVM switch.
    c. Move stage to MgO Standard (so that you can see a fluorescing dot).
    d. Use screwdrivers to align fluorescing dot within circle on Optical Scope monitor (make sure you are qualified to do this or ask John).
    e. Focus with reflected light on sample surface
    f. Focus with SEM onto sample surface
    g. Select Window >> Save Column Conditions to File.

9. In the ‘Probewin’ window go to □Automate!. Then choose •Unknowns and if there are samples left from a previous run choose □Delete Selected Samples and □Yes to All.

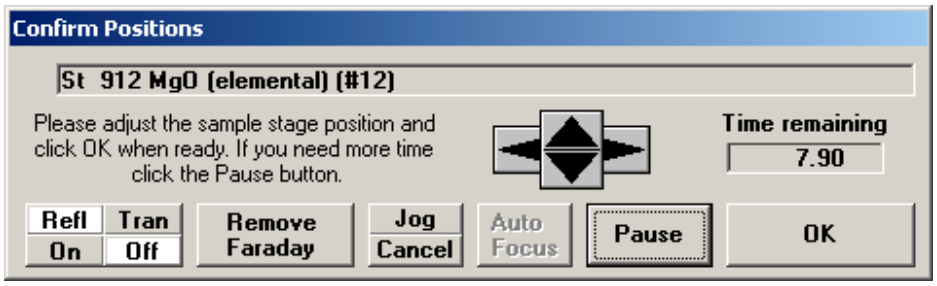


10. In the ‘Automate!’ window, click on •Standards to make sure you have the correct standard block files in the computer. If it does not include your standards, get John to show you how to find the correct standards file to load.

11. Now select the standards you will be using for your experiments (hold the ctrl key while clicking on each one) and look to the right hand column where you will choose •Confirm Standard Positions and •Peak Spectrometers. Then click the □Peaking button. This will bring up another window, click on •ROM based and •Acquire Automated PHA Scan After Peaking. Once these options are selected click □OK followed by □Yes.



12. In the ‘Automate!’ Window, click on □Run Selected Samples followed by □Yes. This will run a series of scans that will allow you to confirm (and refocus) the location of the standard on the block you are using, find the maximum intensity of the peak, take a scan of the peak itself, and compare what your intensity value was before and after you peaked the spectrometer. The focus and location can be changed using the dials labeled X, Y, and Z to the right of the keyboard. Once the position on the standard is established click on □OK in the Confirm window that comes up when it goes to the standard.

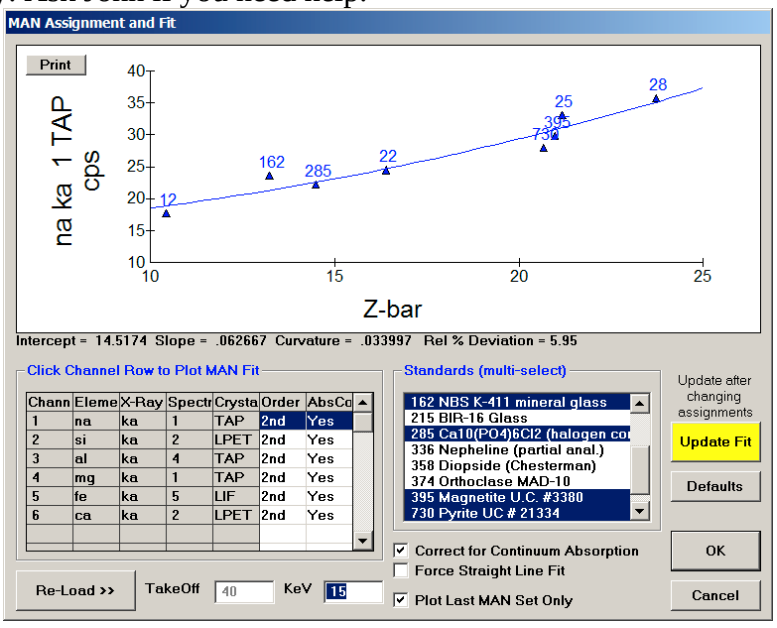


Information about the peak intensities will be located in the 'Probewin' log window. If there are any major changes in your peaked values, both on or off peak, you should get help from John. Also check to make sure you only have one peak in the PHA scan when you peak the spectrometer. If there is more than one get John. This should be done before every run.

13. Ask John to come in and review your spectrometer conditions (count times on each of the spectrometers and count times on and off peak) before moving forward. If you want to make changes at this point it will be easier than if you proceed to the next step.

Running Selected Standards

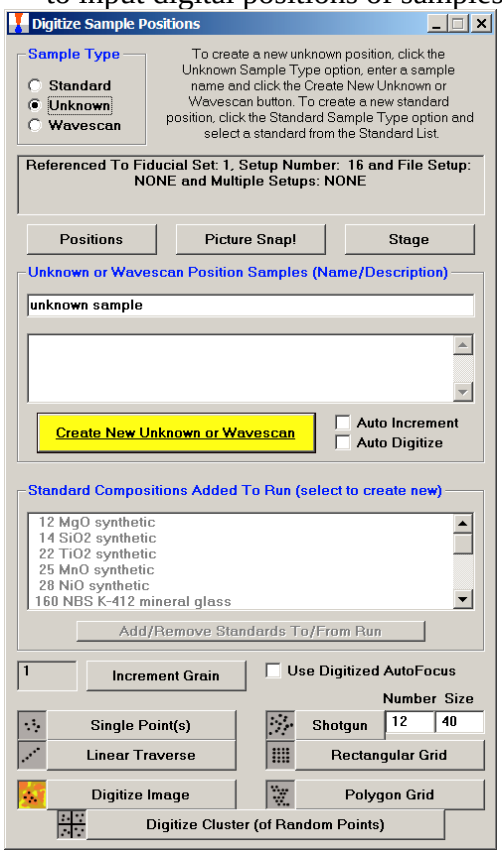
1. In the 'Automate!' window, click on •Standards and □Select Stds. You have previously confirmed standard positions during peaking but you can check that button again if you would like. Check •Acquire Standard Samples and then click on □Run Selected Samples.
2. Once standards have been run, you can check MAN assignments and adjust as necessary. Ask John if you need help.

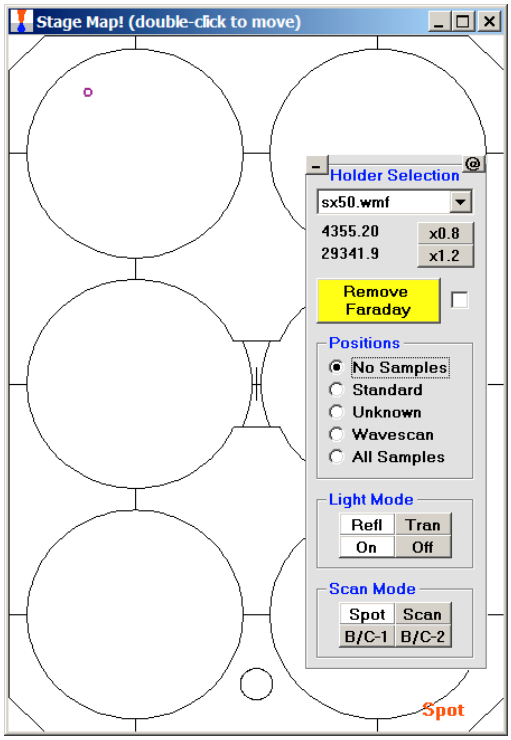


3. It is useful to run some standards that contain none of the elements you are analyzing for in order (and samples that are not used as the standard for a particular element!) to check that you are getting accurate measurements.
4. Also Run a standard (like BIR-16 glass) or something else as an unknown and make sure that the measurements agree with what the true values are.
5. Again, ask John if you have any trouble.

Digitizing Samples & Running

1. Go back to the 'Automate!' window and click on □Digitize. You will now be able to input digital positions of samples to analyze:





2. In the 'Digitize Sample Positions' window choose •Unknowns and put a sample name in where you see -Unknown Sample- or a previous sample name you typed in and click □Create a new Unknown or Wavescan then click on the □Stage button to bring up the 'Stage Map' window.

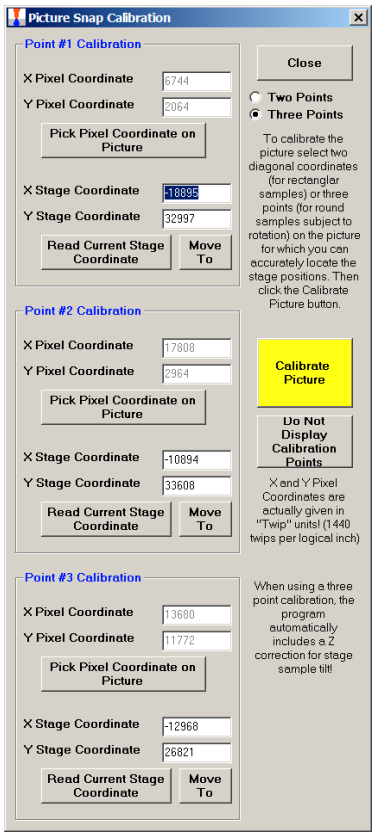
3. In the 'Stage Map!' window, double-click on where you think your sample is. Use the stage controls located to the right of the keyboard and locate a good spot. Once you find a good spot, focus on the sample surface (easiest in reflected light), using the Z adjustment knob.

4. In the ‘Digitize Sample Positions’ window, click on □Single Point(s) (or whatever you want) and click □OK once you have established the places you wish to analyze.

5. Repeat steps 14-16 until all of your unknown samples have been digitized.

6. In the ‘Stage Map’ window, choose to show locations of the unknowns to double check that you are not looking at the same sample twice or missing one.

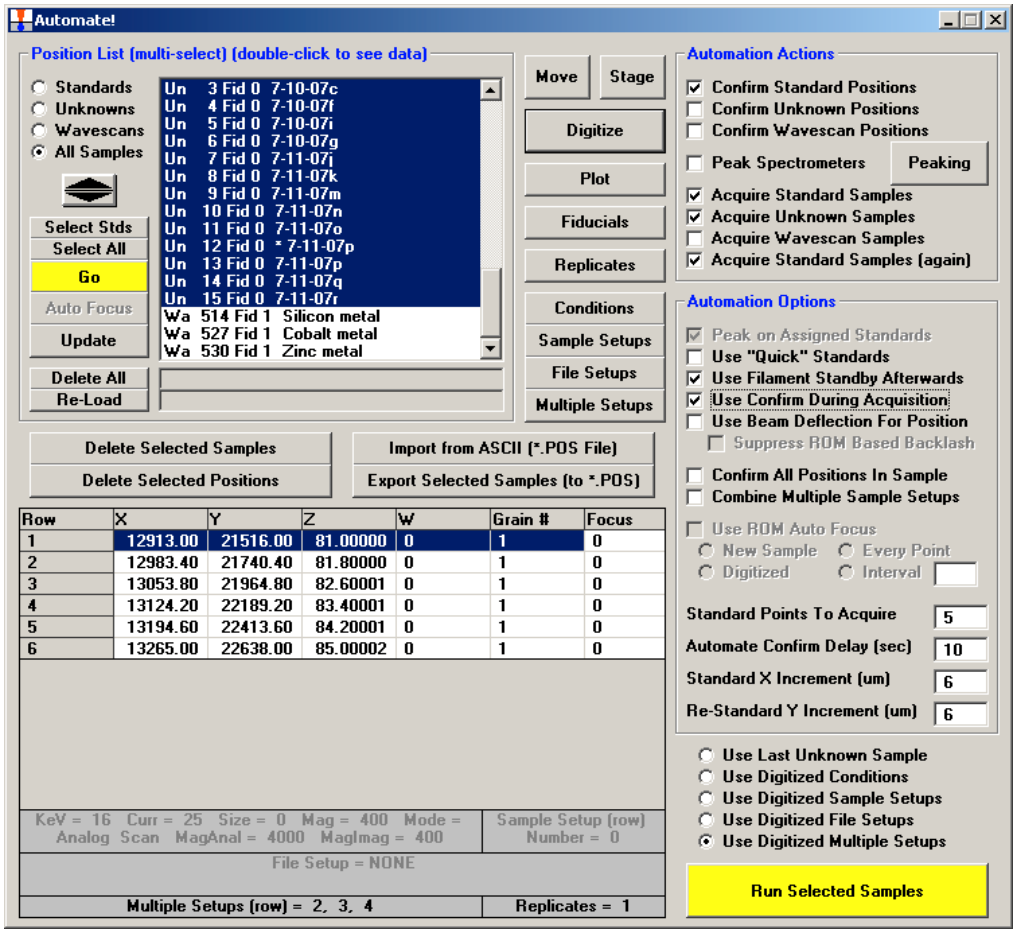
7. Tip: Picture Snap! is a great tool included in the Probe for Windows software. It simply requires an image file (jpeg, bmp, or gif?) of your mount. Access Picture Snap! from the ‘Probewin’ window by selecting ____ >> Picture Snap! Load your image file and then choose “Calibrate”. In the ‘Picture Snap Calibration’ window, select either •Two Points (for square samples) or •Three Points (for round samples). Use the stage controls and navigate to 2 or 3 points that you can recognize on the image and click □ Read Current Stage Coordinate. When finished choosing reference points click □ Calibrate Picture. Now you should be able to navigate anywhere on your image by double-clicking there, also your digitized positions show up.



8. In the ‘Automate!’ window choose the •All Samples flag. Then hit the □Select Stds button and establish that you picked the correct standards for your samples.

Then holding down the <control> button choose the unknowns you wish to measure.

9. Now click the following: •Confirm Standard Positions, •Acquire Standard Samples (optional since you may have just done this), •Acquire Unknown Samples, •Acquire Standards Again, and •Use Filament Standby Mode Afterwards (IMPORTANT if you do not want to get charged for beam time after your samples are done!), •Use Confirm During Acquisition, and •Use Digitized Multiple Setups. See picture below for confirmation.



10. Double-check everything and click □Run Selected Samples. This will bring up a time estimate. Click □YES and the run will start. The standard positions will be checked again. Make sure they are still in focus.

Accessing your Data

1. Go through and make sure you like what you see….

2. In the 'Probewin' window, select Output >> (H.W.)… and then select Yes for unknowns. This should export your data to Excel.

Tips & Common Problems

Establishing a new file setup

If you are not running an old file setup because you are using a new set of standards for your new compound, you will need to do the following with John's help:

1. Wavescans to check for interferences between the elements in your sample. This will also help establish where you will be measuring on and off peak intensities.
2. This is especially important for trace elements. Note that by acquiring intensity data for all the elements in each standard you can examine the complete analysis of each and see that you should be able to get close to zero concentrations on standards that do not contain the element of interest. If the concentration is significantly negative then it is likely that one or more off-peak positions is being interfered by a secondary x-ray peak.
3. Do a simulation of the samples you will be running in Stratagem to pick the best operating voltages. Low voltages will give small excitation volumes but poor sensitivity.
4. Establish which spectrometers should be used for which standards. You will want to avoid crystal flipping within a single sample. Put in proper count times for what you are doing. Check that the count times are approximately balanced for all spectometers to avoid a spectrometer sitting idle (you might as well be counting photons).
5. New file setups should be saved once you have finally made them.

Common Problems

The filament is not on when you go to do a scan. This is most common when the probe has been idle for a long period of time with the filament off.
SX50 Only:

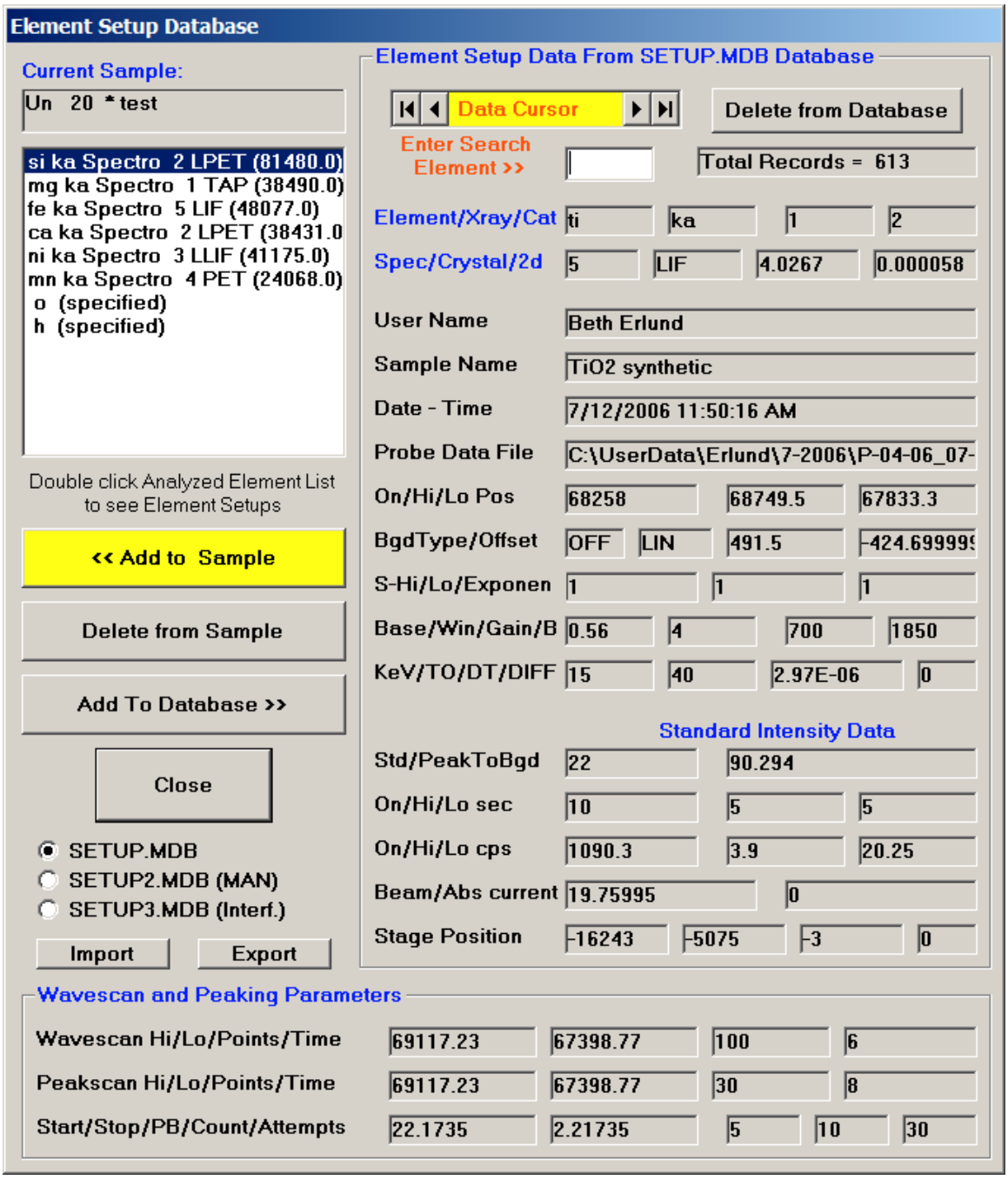
   a. Go to the 'Crosstalk' window and find the 'QuickPad' window above it that comes has a teal background. Use the □HV15 button. 'Crosstalk' should tell you that the Igun is ready.
   b. If this does not turn the filament on and start sending information to the 'Crosstalk' window then get John to help.

2. The sample holder is difficult to get out of the instrument when you go to exchange for your new sample holder.
   a. The holder has a clicking mechanism that locks it into place on the exchange device. If you push in too far you disengage the hold of the mechanism. When you go to pull the sample out don't put the exchange

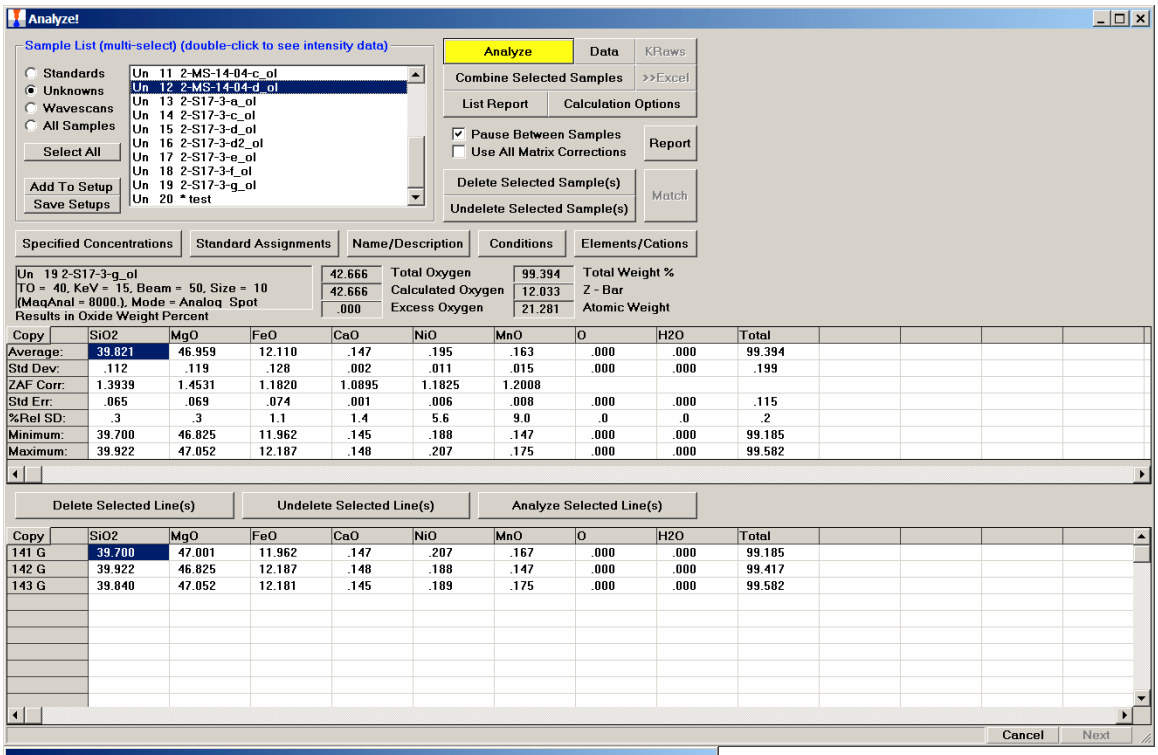
rod in the entire way. Just go until you feel resistance. This should click the mechanism so you can pull the sample holder out.

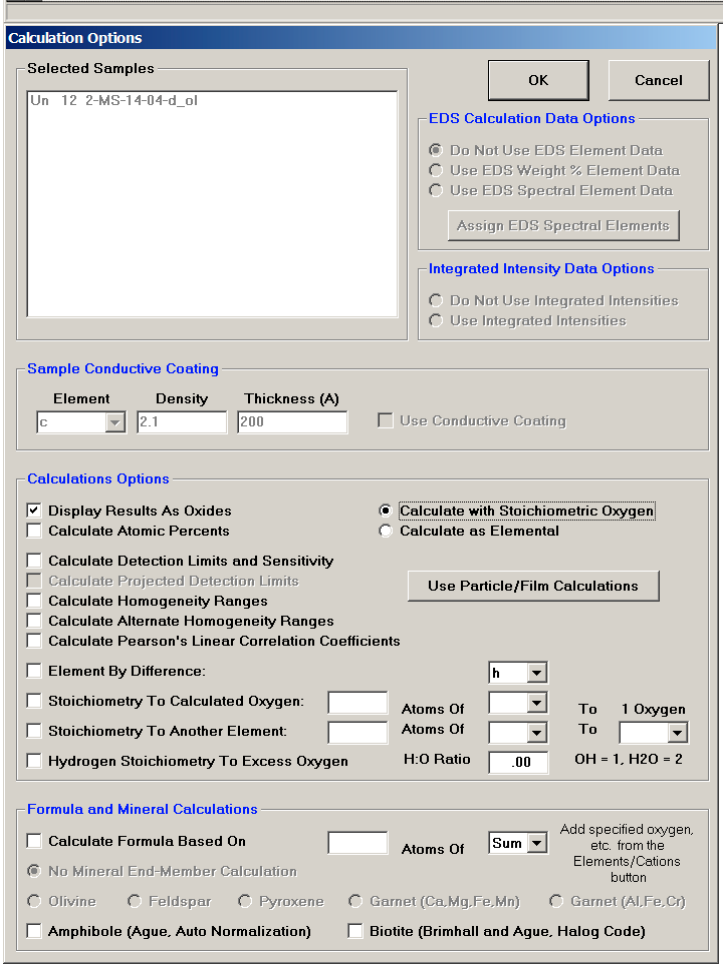
b. Do not force this process. If you are having trouble, get John to help.

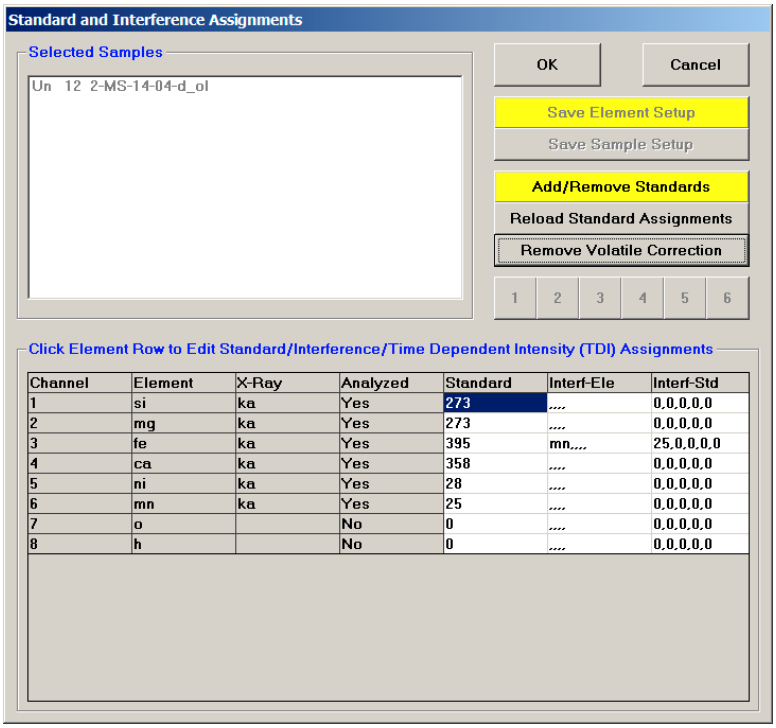
3. You accidentally put two linear traverses on the same unknown sample or skipped a sample you meant to run.
    a. Use the 'Stage Map' window displaying the unknowns to show where all of your linear traverses are. Figure out which numbers correspond to the unknowns you want.
    b. Go to the 'Automate!' window and double click on the sample you need to alter. The linear positions you have digitized should come up in the box below the sample position list. Choose the duplicates and click on □Delete Selected Points then □OK.
    c. If you have skipped one go to the 'Automate!' window and choose the sample you wish to alter then go back to the 'Digitize Sample Positions' window and choose □Linear Traverse. You can now go about business as normal and add the points you want.


Element Setup Database
Current Sample:
Un 20 * test
si ka Spectro 2 LPET (81480.0)
mg ka Spectro 1 TAP (38490.0)
fe ka Spectro 5 LIF (48077.0)
ca ka Spectro 2 LPET (38431.0
ni ka Spectro 3 LLIF (41175.0)
mn ka Spectro 4 PET (24068.0)
o (specified)
h (specified)
Double click Analyzed Element List to see Element Setups
<< Add to Sample
Delete from Sample
Add To Database >>
Close
SETUP.MDB
SETUP2.MDB (MAN)
SETUP3.MDB (Interf.)
Import
Export
Element Setup Data From SETUP.MDB Database
Data Cursor
Delete from Database
Enter Search Element >>
Total Records = 613
Element/Xray/Cat ti ka 1 2
Spec/Crystal/2d 5 LIF 4.0267 0.000058
User Name Beth Erlund
Sample Name TiO2 synthetic
Date - Time 7/12/2006 11:50:16 AM
Probe Data File C:\UserData\Erlund\7-2006\P-04-06_07-
On/Hi/Lo Pos 68258 68749.5 67833.3
BgdType/Offset OFF LIN 491.5 -424.69999
S-Hi/Lo/Exponen 1 1 1
Base/Win/Gain/B 0.56 4 700 1850
KeV/TO/DT/DIFF 15 40 2.97E-06 0
Standard Intensity Data
Std/PeakToBgd 22 90.294
On/Hi/Lo sec 10 5 5
On/Hi/Lo cps 1090.3 3.9 20.25
Beam/Abs current 19.75995 0
Stage Position -16243 -5075 -3 0
Wavescan and Peaking Parameters
Wavescan Hi/Lo/Points/Time 69117.23 67398.77 100 6
Peakscan Hi/Lo/Points/Time 69117.23 67398.77 30 8
Start/Stop/PB/Count/Attempts 22.1735 2.21735 5 10 30

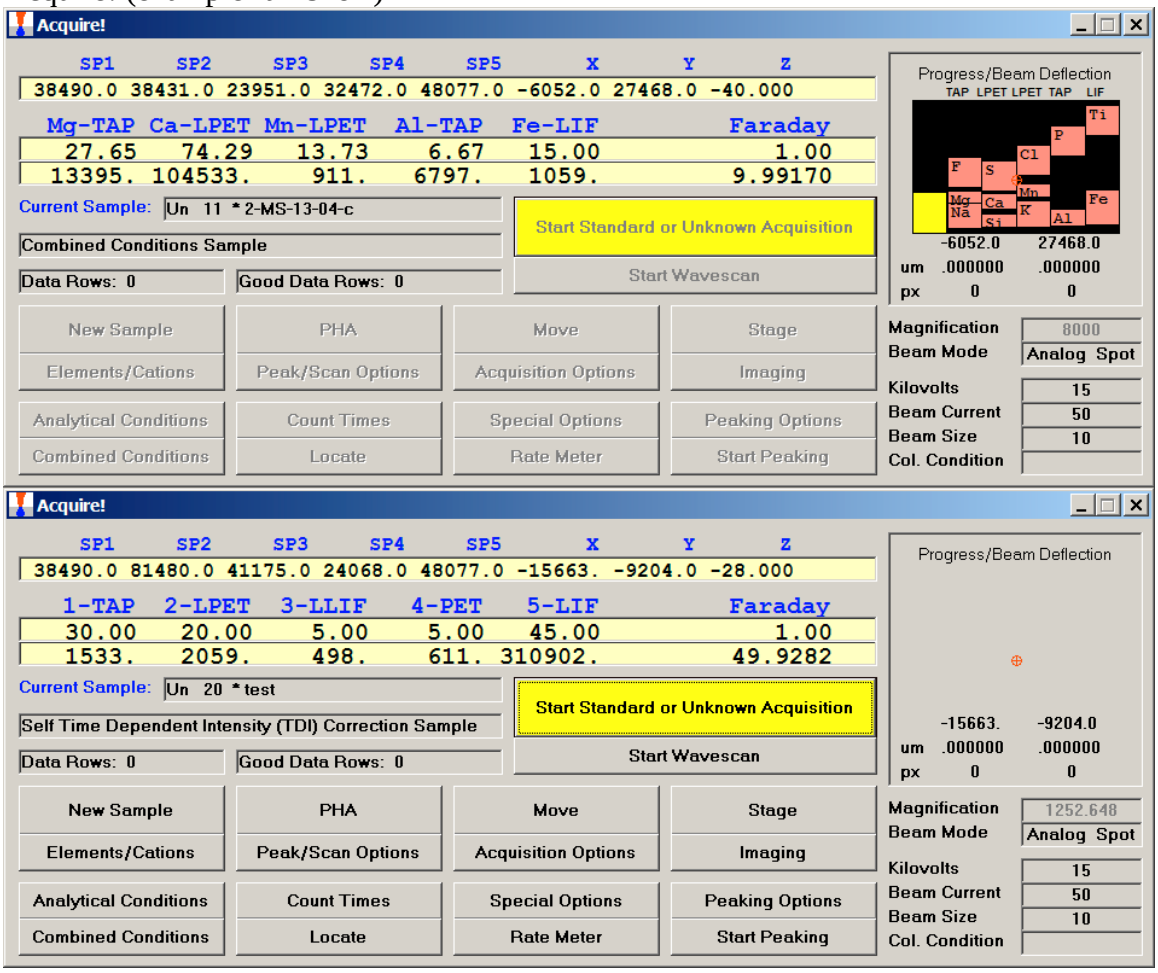
Analyze!

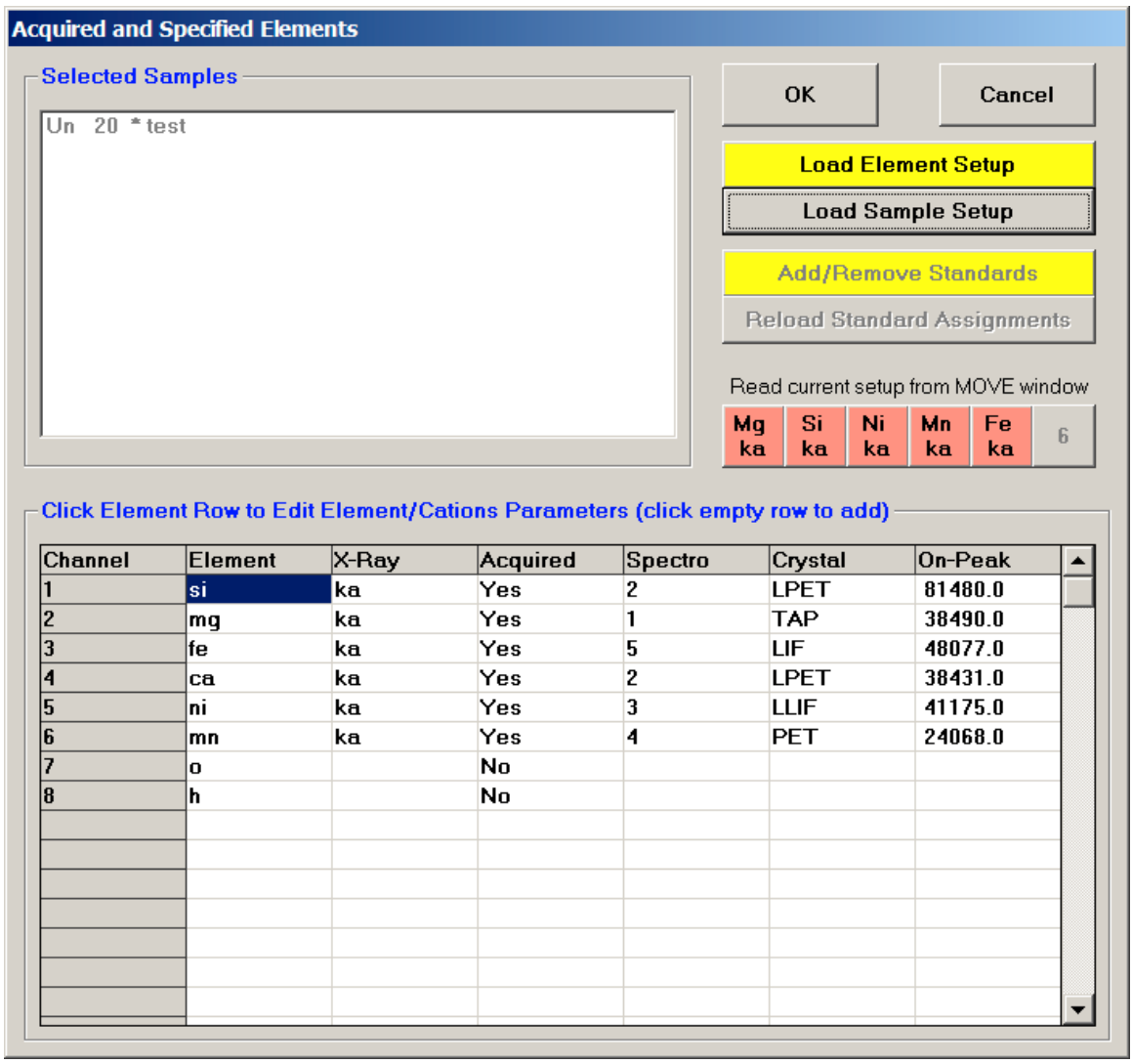

Analyze!
Sample List (multi-select) (double-click to see intensity data)
Standards
Unknowns
Wavescans
All Samples
Select All
Add To Setup
Save Setups
Un 11 2-MS-14-04-c_ol
Un 12 2-MS-14-04-d_ol
Un 13 2-S17-3-a_ol
Un 14 2-S17-3-c_ol
Un 15 2-S17-3-d_ol
Un 16 2-S17-3-d2_ol
Un 17 2-S17-3-e_ol
Un 18 2-S17-3-f_ol
Un 19 2-S17-3-g_ol
Un 20 *test
Analyze
Data
KRaws
Combine Selected Samples
>>Excel
List Report
Calculation Options
Pause Between Samples
Use All Matrix Corrections
Report
Delete Selected Sample(s)
Undelete Selected Sample(s)
Match
Specified Concentrations
Standard Assignments
Name/Description
Conditions
Elements/Cations
Un 19 2-S17-3-g_ol
TO = 40, KeV = 15, Beam = 50, Size = 10
(MagAnal = 8000.), Mode = Analog Spot
Results in Oxide Weight Percent
42.666
42.666
.000
Total Oxygen
Calculated Oxygen
Excess Oxygen
99.394
12.033
21.281
Total Weight %
Z - Bar
Atomic Weight
Copy
SiO2 MgO FeO CaO NiO MnO O H2O Total
Average: 39.821 46.959 12.110 .147 .195 .163 .000 .000 99.394
Std Dev: .112 .119 .128 .002 .011 .015 .000 .000 .199
ZAF Corr: 1.3939 1.4531 1.1820 1.0895 1.1825 1.2008
Std Err: .065 .069 .074 .001 .006 .008 .000 .000 .115
%Rel SD: .3 .3 1.1 1.4 5.6 9.0 .0 .0 .2
Minimum: 39.700 46.825 11.962 .145 .188 .147 .000 .000 99.185
Maximum: 39.922 47.052 12.187 .148 .207 .175 .000 .000 99.582
Delete Selected Line(s)
Undelete Selected Line(s)
Analyze Selected Line(s)
Copy
SiO2 MgO FeO CaO NiO MnO O H2O Total
141 G 39.700 47.001 11.962 .147 .207 .167 .000 .000 99.185
142 G 39.922 46.825 12.187 .148 .188 .147 .000 .000 99.417
143 G 39.840 47.052 12.181 .145 .189 .175 .000 .000 99.582
Cancel
Next

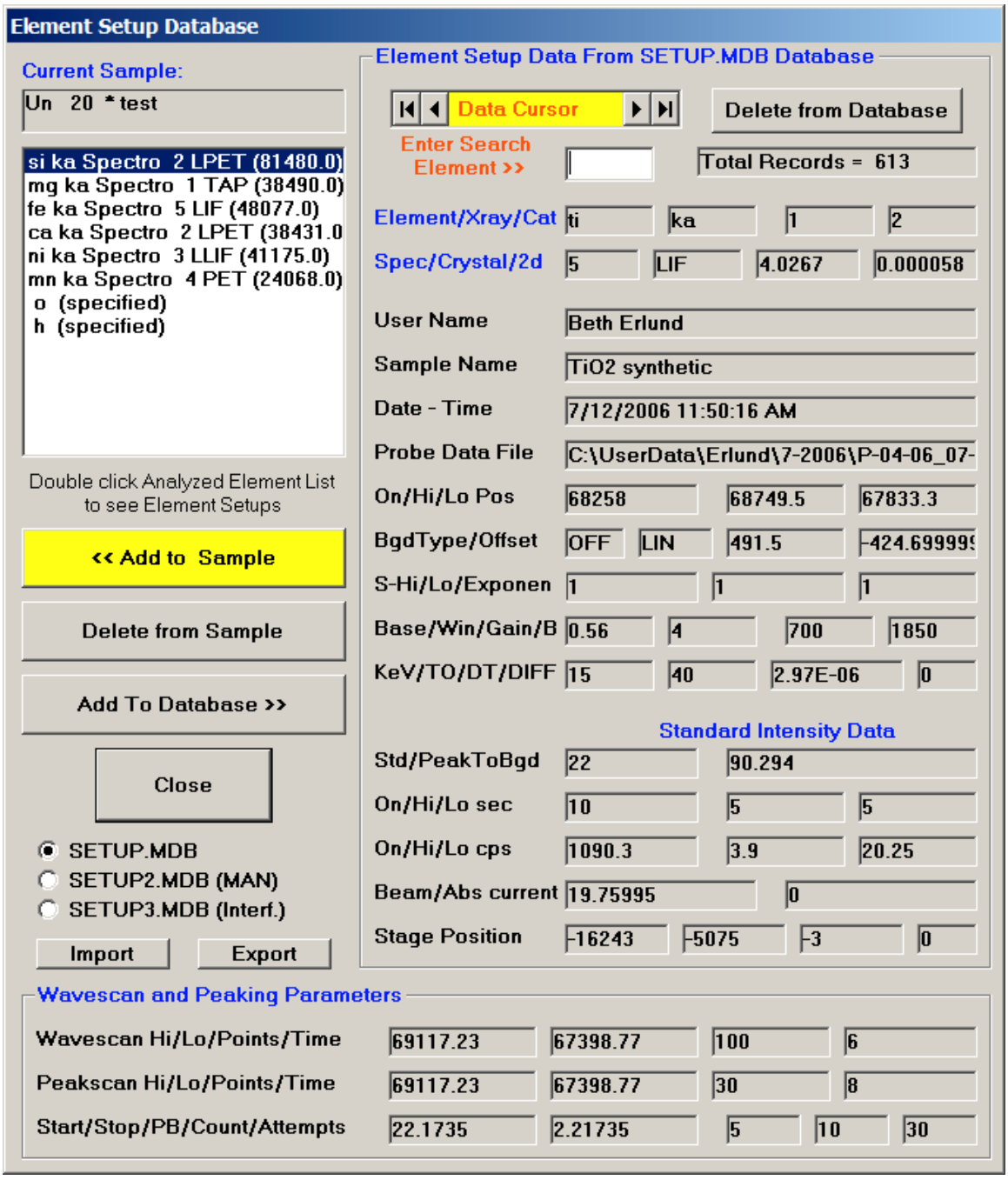

Calculation Options
Selected Samples
Un 12 2-MS-14-04-d_ol
OK
Cancel
EDS Calculation Data Options
Do Not Use EDS Element Data
Use EDS Weight % Element Data
Use EDS Spectral Element Data
Assign EDS Spectral Elements
Integrated Intensity Data Options
Do Not Use Integrated Intensities
Use Integrated Intensities
Sample Conductive Coating
Element
Density
Thickness (A)
c
2.1
200
Use Conductive Coating
Calculations Options
Display Results As Oxides
Calculate Atomic Percents
Calculate with Stoichiometric Oxygen
Calculate as Elemental
Calculate Detection Limits and Sensitivity
Calculate Projected Detection Limits
Calculate Homogeneity Ranges
Calculate Alternate Homogeneity Ranges
Calculate Pearson's Linear Correlation Coefficients
Use Particle/Film Calculations
Element By Difference:
h
Stoichiometry To Calculated Oxygen:
Atoms Of
To
1 Oxygen
Stoichiometry To Another Element:
Atoms Of
To
Hydrogen Stoichiometry To Excess Oxygen
H:O Ratio
.00
OH = 1, H2O = 2
Formula and Mineral Calculations
Calculate Formula Based On
Atoms Of
Sum
Add specified oxygen, etc. from the Elements/Cations button
No Mineral End-Member Calculation
Olivine
Feldspar
Pyroxene
Garnet (Ca,Mg,Fe,Mn)
Garnet (Al,Fe,Cr)
Amphibole (Ague, Auto Normalization)
Biotite (Brimhall and Ague, Halog Code)

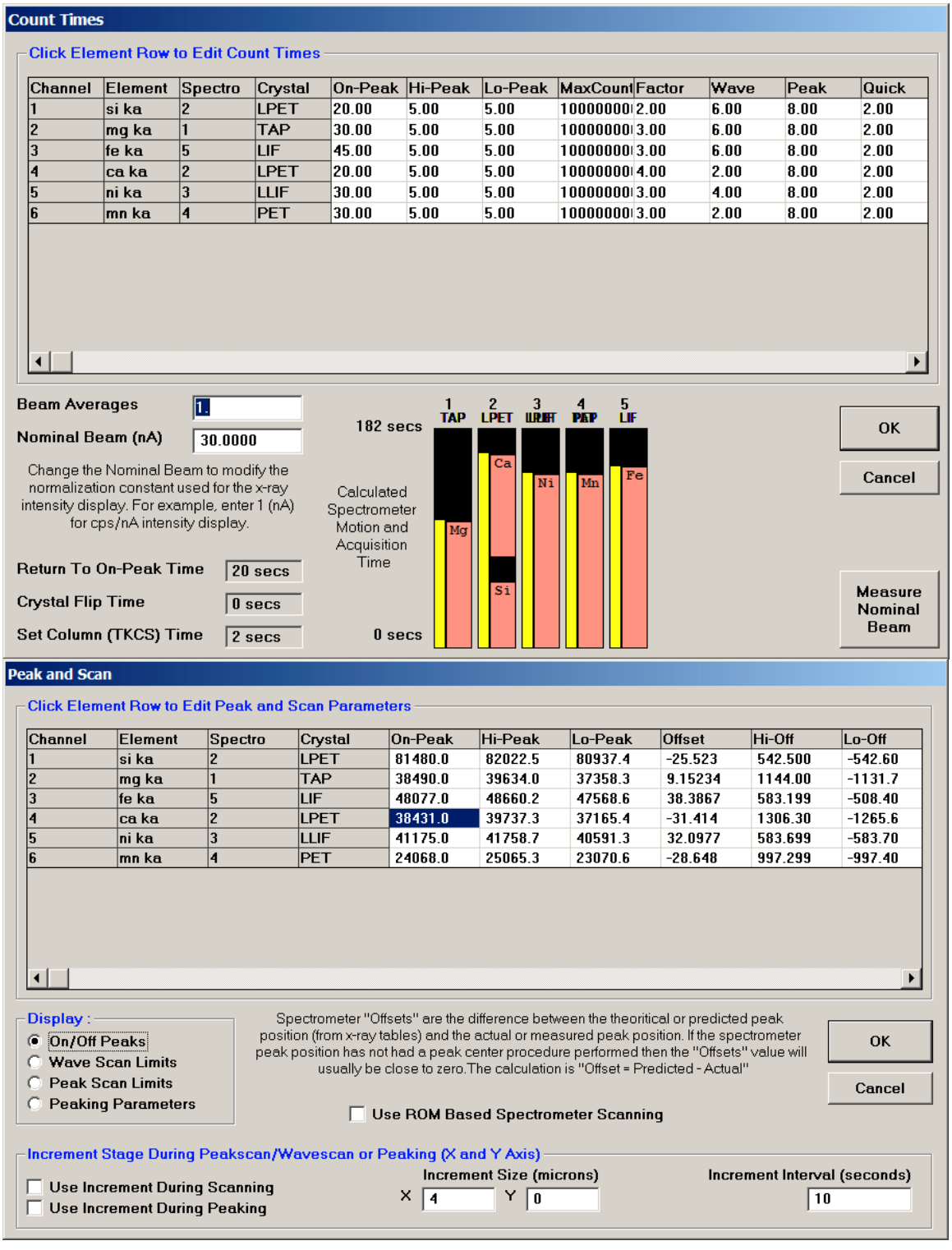


Acquire! (example run & off)

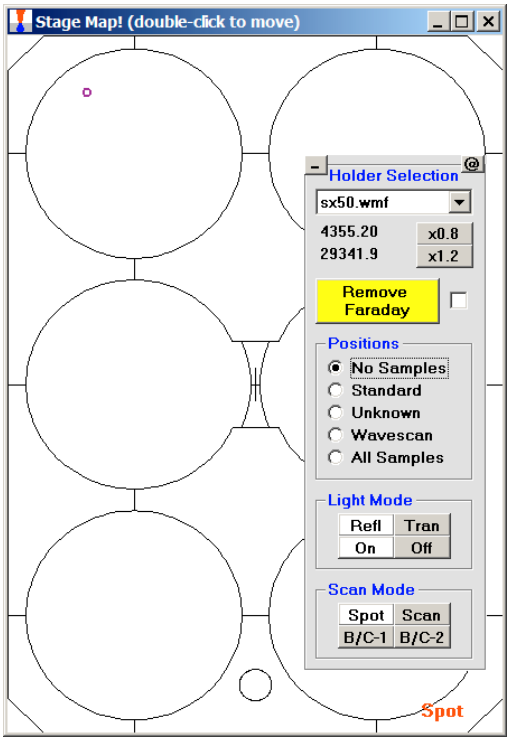



Acquired and Specified Elements
Selected Samples
Un 20 * test
OK
Cancel
Load Element Setup
Load Sample Setup
Add/Remove Standards
Reload Standard Assignments
Read current setup from MOVE window
Mg ka
Si ka
Ni ka
Mn ka
Fe ka
6
Click Element Row to Edit Element/Cations Parameters (click empty row to add)
Channel Element X-Ray Acquired Spectro Crystal On-Peak
1 si ka Yes 2 LPET 81480.0
2 mg ka Yes 1 TAP 38490.0
3 fe ka Yes 5 LIF 48077.0
4 ca ka Yes 2 LPET 38431.0
5 ni ka Yes 3 LLIF 41175.0
6 mn ka Yes 4 PET 24068.0
7 o No
8 h No

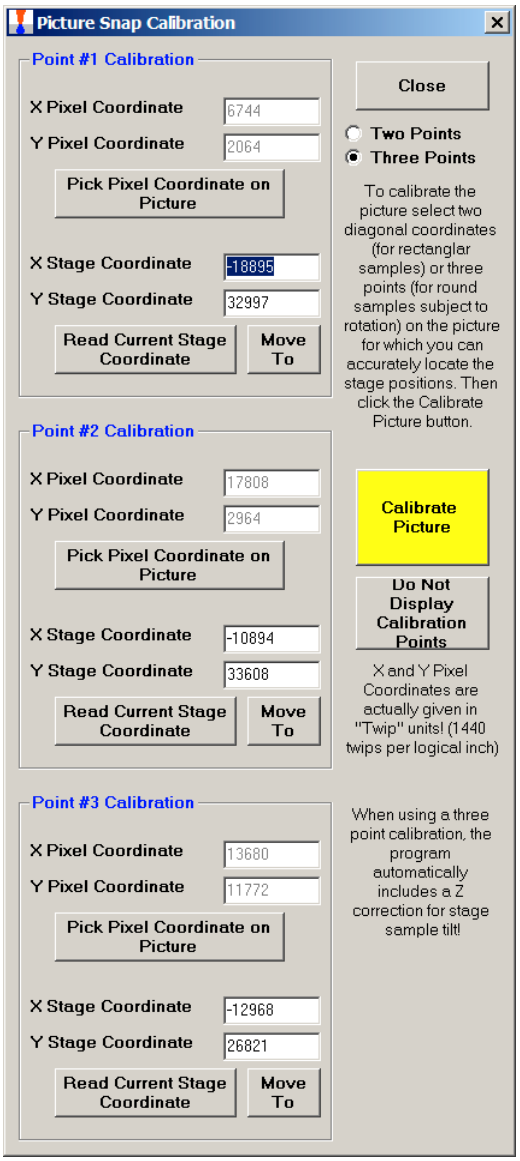

Element Setup Database
Current Sample:
Un 20 * test
si ka Spectro 2 LPET (81480.0)
mg ka Spectro 1 TAP (38490.0)
fe ka Spectro 5 LIF (48077.0)
ca ka Spectro 2 LPET (38431.0
ni ka Spectro 3 LLIF (41175.0)
mn ka Spectro 4 PET (24068.0)
o (specified)
h (specified)
Double click Analyzed Element List to see Element Setups
<< Add to Sample
Delete from Sample
Add To Database >>
Close
SETUP.MDB
SETUP2.MDB (MAN)
SETUP3.MDB (Interf.)
Import
Export
Element Setup Data From SETUP.MDB Database
Data Cursor
Delete from Database
Enter Search Element >>
Total Records = 613
Element/Xray/Cat ti ka 1 2
Spec/Crystal/2d 5 LIF 4.0267 0.000058
User Name Beth Erlund
Sample Name TiO2 synthetic
Date - Time 7/12/2006 11:50:16 AM
Probe Data File C:\UserData\Erlund\7-2006\P-04-06_07-
On/Hi/Lo Pos 68258 68749.5 67833.3
BgdType/Offset OFF LIN 491.5 -424.69999
S-Hi/Lo/Exponen 1 1 1
Base/Win/Gain/B 0.56 4 700 1850
KeV/TO/DT/DIFF 15 40 2.97E-06 0
Standard Intensity Data
Std/PeakToBgd 22 90.294
On/Hi/Lo sec 10 5 5
On/Hi/Lo cps 1090.3 3.9 20.25
Beam/Abs current 19.75995 0
Stage Position -16243 -5075 -3 0
Wavescan and Peaking Parameters
Wavescan Hi/Lo/Points/Time 69117.23 67398.77 100 6
Peakscan Hi/Lo/Points/Time 69117.23 67398.77 30 8
Start/Stop/PB/Count/Attempts 22.1735 2.21735 5 10 30


Count Times
Click Element Row to Edit Count Times
Channel Element Spectro Crystal On-Peak Hi-Peak Lo-Peak MaxCount Factor Wave Peak Quick
1 si ka 2 LPET 20.00 5.00 5.00 10000000 2.00 6.00 8.00 2.00
2 mg ka 1 TAP 30.00 5.00 5.00 10000000 3.00 6.00 8.00 2.00
3 fe ka 5 LIF 45.00 5.00 5.00 10000000 3.00 6.00 8.00 2.00
4 ca ka 2 LPET 20.00 5.00 5.00 10000000 4.00 2.00 8.00 2.00
5 ni ka 3 LLIF 30.00 5.00 5.00 10000000 3.00 4.00 8.00 2.00
6 mn ka 4 PET 30.00 5.00 5.00 10000000 3.00 2.00 8.00 2.00
Beam Averages
1.
Nominal Beam (nA)
30.0000
Change the Nominal Beam to modify the normalization constant used for the x-ray intensity display. For example, enter 1 (nA) for cps/nA intensity display.
Return To On-Peak Time
20 secs
Crystal Flip Time
0 secs
Set Column (TKCS) Time
2 secs
182 secs
Calculated Spectrometer Motion and Acquisition Time
0 secs
1 TAP
2 LPET
3
4
5 LIF
Mg
Ca
Si
Ni
Mn
Fe
OK
Cancel
Measure Nominal Beam
Peak and Scan
Click Element Row to Edit Peak and Scan Parameters
Channel Element Spectro Crystal On-Peak Hi-Peak Lo-Peak Offset Hi-Off Lo-Off
1 si ka 2 LPET 81480.0 82022.5 80937.4 -25.523 542.500 -542.60
2 mg ka 1 TAP 38490.0 39634.0 37358.3 9.15234 1144.00 -1131.7
3 fe ka 5 LIF 48077.0 48660.2 47568.6 38.3867 583.199 -508.40
4 ca ka 2 LPET 38431.0 39737.3 37165.4 -31.414 1306.30 -1265.6
5 ni ka 3 LLIF 41175.0 41758.7 40591.3 32.0977 583.699 -583.70
6 mn ka 4 PET 24068.0 25065.3 23070.6 -28.648 997.299 -997.40
Display :
On/Off Peaks
Wave Scan Limits
Peak Scan Limits
Peaking Parameters
Spectrometer "Offsets" are the difference between the theoritical or predicted peak position (from x-ray tables) and the actual or measured peak position. If the spectrometer peak position has not had a peak center procedure performed then the "Offsets" value will usually be close to zero.The calculation is "Offset = Predicted - Actual"
Use ROM Based Spectrometer Scanning
OK
Cancel
Increment Stage During Peakscan/Wavescan or Peaking (X and Y Axis)
Use Increment During Scanning
Use Increment During Peaking
Increment Size (microns)
X 4
Y 0
Increment Interval (seconds)
10

Stage Map!



Picture Snap! Calibration Window


Picture Snap Calibration
Point #1 Calibration
X Pixel Coordinate
6744
Y Pixel Coordinate
2064
Pick Pixel Coordinate on Picture
X Stage Coordinate
-18895
Y Stage Coordinate
32997
Read Current Stage Coordinate
Move To
Point #2 Calibration
X Pixel Coordinate
17808
Y Pixel Coordinate
2964
Pick Pixel Coordinate on Picture
X Stage Coordinate
-10894
Y Stage Coordinate
33608
Read Current Stage Coordinate
Move To
Point #3 Calibration
X Pixel Coordinate
13680
Y Pixel Coordinate
11772
Pick Pixel Coordinate on Picture
X Stage Coordinate
-12968
Y Stage Coordinate
26821
Read Current Stage Coordinate
Move To
Close
Two Points
Three Points
To calibrate the picture select two diagonal coordinates (for rectanglar samples) or three points (for round samples subject to rotation) on the picture for which you can accurately locate the stage positions. Then click the Calibrate Picture button.
Calibrate Picture
Do Not Display Calibration Points
X and Y Pixel Coordinates are actually given in "Twip" units! (1440 twips per logical inch)
When using a three point calibration, the program automatically includes a Z correction for stage sample tilt!