

Union College

Agilent 8900 ICP-MS

Laser Ablation instructions for service visit, Dec 2019

- Check to see that the instrument is in standby mode. If so, the indicator light at the extreme right side of the ICP-MS will be orange.
- Turn chiller on

In order to prevent overheating of the instrument resulting in fatal damage it must be water cooled. This is done by pressing the power button located on the chiller which is located on the floor to the right of the ICP-MS table.

- Startup Computer username/pw Agilent8900 / Agilent8900
- Open Mass Hunter Software (desktop shortcut "ICP-MS Instrument Control")
- Select "Instrument Control" from the window that pops up, be sure the radio button for "Standard Tune" is selected. Press "Close"

Laser Set up

Myron may have already done some of these steps

- Turn on the laser. (red button in the back)
- Turn on the laser chiller. (turn the key on the chiller at the front, on the bottom)
- Turn on the laser computer.
- Open the He gas tank (large metal knob on top of the tank), and make sure the flow is to the laser (turn the red valve so it is parallel with the tube).
- On laser computer: launch software "DigiLazIII".

Purge the gas lines

You need to purge the gas lines from the ICP with Argon (the makeup gas) and in the Laser chamber with He.

Beware: when I clicked on the big Hardware button today, the Masshunter software crashed. This is an issue we need to get resolved with them (some other time). I was able to purge the makeup gas line using one of the selections from the hardware drop down menu at the very top of the software (not the big button).

- On the ICP computer: click the hardware drop down menu, and open up a window that allows you to set the makeup gas to 1 L / min (this might be in maintenance, I can't quite recall).
- While the makeup gas is on, on the laser computer: purge the different gas lines in the laser with the incoming Ar (from the makeup gas):
 - Go to Gas Management
 - Set He to 700 mL / min
 - Run this for ~2 minutes
 - Select Purge a few times
 - Turn on Bypass for a few minutes
 - Set He back to 0 before you turn the plasma on.

Start the Plasma

Note: the ignition sequence will turn off the makeup gas, so make sure to purge the line before you do this step.

- Click on the large Plasma button.
- Look at the Ignition Sequence, and uncheck all the radio buttons you can (this should already be done).
- Click "Plasma On" in the dropdown menu on the Plasma button, or by double clicking the button. Make sure the "run ignition sequence" check box is UNchecked.

Typically, before the tuning starts (once the plasma is on) the instrument goes through a warmup time to reach thermal equilibrium. This will take a while. MassHunter lists a total of ~1220 seconds (20 minutes). I am not sure this will happen without the ignition sequence, so maybe just wait half an hour before running anything.

- Click "Batch" and open the most recently created batch file (I saved it today (Dec 17, 2019), I think it's in the folder "ManonLaser")

Turn up the gases

- Once the plasma is on, in the Batch window, go to the tune tab.
- Make sure the makeup gas flow is low (~0.2 mL/min) so you don't add 1 L/min all at once and blow the plasma out.
- Send the plasma parameters from the tuning method to the ICP with the button "send to ICP"
- Turn on the real time signal monitor
- Slowly turn the makeup gas flow up from 0.2 to 1 mL/min.
- On the Laser computer: slowly turn the He gas up to 700 mL/min. (I usually increase by 50 mL/min every 15 seconds until I get to 400 mL/min and then increase a bit faster, maybe 100 mL/min every 10 seconds). The plasma will hopefully still be lit after this step.

Create points on the laser ablation computer to test signal:

Just watch the real time signal monitor (which is probably already running) to check the signal of various ablations.

- To set up lines or points, use the laser computer.
- In the laser software click, "Launch Sequence Editor"
- A new window (the sequence editor will pop up).
- Click the tab at the top of this window, and select the radio button to ensure "run only highlighted methods" is selected
- To the right of the main window (not the sequence editor), select your spot size (25-50), laser repetition rate (10 Hz), power (100%) and either scan speed (25 μ m/min) or bursts (100-300). The He gas should already be on.
- Using the radio buttons at the top of the window, switch from "Target" (which moves the stage wherever you click) to "add point" (I don't think it says exactly that, but I can't remember). Add either a set of lines, or points, or both. If you need to extend a line to be longer, you must use the "edit point" radio button, and select the end point (with a right click) and drag it to a new end point.
- When you're ready to run a line or a series of points, switch back to the sequence editor window, highlight the rows you want to run (by clicking the row names, holding down the mouse button and dragging down), then hit the "run sequence" button at the top of the window (it might say something slightly different).
- After that, I usually switch back to the main window to watch the ablations happen on the camera.

Good luck!

Shutdown Instructions

ICP-MS

- Turn the plasma off. The instrument will go to standby mode.
- Wait until the instrument is in full standby, signified by a solid orange color on the system light (as opposed to flashing green/orange).
- Turn off chiller.

Laser System

- Turn off laser software
- Turn off laser computer
- Remove Samples
- Turn off Laser (in back, red button)
- Turn off the chiller (key)
- Shut He Gas (at tank itself, large screw on top is critical, it's OK to turn red handle, perpendicular to tubing).