Standard Operating Procedures For the Renishaw Raman Spectrometer

Introduction

This instrument is a dispersive micro-Raman spectrometer. It utilizes one of two laser systems to operate, either the smaller Ar-ion laser which runs at 488nm or the large Ar-Kr ion laser which is a multiline system which can be used at 413nm, 476nm, 647nm, and 752nm. If you wish to use the large laser or use a different wavelength let the trained personal know so that they can set it up. The instrument uses a CCD detector which requires about 20 min after turning on the instrument before it is ready to be used. The first spectra is always bad as it is just resetting the CCD charge. The objectives available for the microscope are 5x, 20x, 50x and a long working distance 50x. The later is often the best choice for many of our group's samples. Do NOT touch the lens and be careful to make sure that your sample does not contact the lens either (especially important when not using the long working distance objective).

When the instrument is idle

The Renishaw spectrometer does not require any cooling water or air purge when operating. The lasers should be off and also the white light source in the software should also be off when the instrument is not in use. If the spectrometer is not going to be used in the next day or two it should also be turned off.

Operation

- A. Sign the log book for the Raman, including your name, date, samples, and laser settings used
- B. Turning on the laser
 - 1. Small Argon laser
 - a.) Switch on power supply
 - b.) Turn key to on position,
 - c.) When ready flip toggle switch to run from standby
 - 2. Large Argon-Krypton laser
 - a.) Turn on the cooling water by opening both valves
 - b.) Plug in the circulating pump
 - c.) Turn power supply key (under bench) to standby position
 - d.) Check water flow on keypad (>2.5 gal/min) then turn on

C. Open the WIRE2 software on the computer next to the raman

- 1. Check the bottom panel to make sure the grating and laser that you are using is set correctly. If not check with a trained student.
- 2. Place your sample in the microscope and switch the lens to the one you want
- 3. Click on the view sample button in the lower panel and make sure the white light button is clicked (on).
- 4. Focus on your sample, the big knob is course adjustment while the other is the fine adjustment. The knob on the joystick does the same as the fine knob.
- 5. You can also view under laser and white light by turning down laser power on the bottom panel (uses neutral density filters) and then clicking view under white light and laser

D. Collecting a Measurement

- 1. Go to Measurement -> New -> Spectral Acquistion
- 2. Choose static or extended scan, and the center of the range or total range
- 3. On Acquisition Tab choose the exposure time, # of acquisitions, power %, title for the measurement
- 4. On the File Tab click the autosave box then choose the directory (usually Z:\DisRaman...etc). Also click the auto increment box if wanted. Hit okay.
- 5. This brings up a new window. To start the acquisition either click the round green button (Go) or left click the title in navigation and then right click on measurement and either setup or run measurement
- 6. Repeat 2-5 as needed
- 7. To record a picture click Live Video -> Snap -> Single

E. Finishing

- 1. Make sure the white light is off
- 2. If using the small laser, set to standby and turn key to off O. Let fan run for 5-10 mins and then turn off the power supply

- 3. If you were using the large laser, shut off the laser and turn the key to the off position. Then let the water run for 5 minutes, after that turn off the water pump and close the valves.
- 4. SIGN THE BILLING SHEET on the wall next to the doors