Diffuse Reflection Accessory User Manual

For information about the theory of the DRA see the Shared Instruments Website>Cary UV/Vis/NIR> DRA Theory.

Step 1) Insert the Diffuse Reflection Accessory (DRA)

Before turning the instrument on insert the DRA accessory. Below the sample cell holder, move the lever to the right to unlock the current accessory. Remove the current accessory and insert the DRA. Note the three pins at the bottom for placing the DRA into the Cary instrument. The lone pin should face towards you and the two other pins should face the back of the instrument and point down. Once the DRA is in place, lock the apparatus in place by moving the accessory lever to the left. Plug the DRA detector in by plugging the multipin plug in above the accessory Place the front back on the instrument and close the top of the apparatus.

Step 2) Turn the Cary instrument on and Log in to Windows
See the Cary UV-Vis User Guide: Getting Started with the Cary UV/Vis/NIR to turn the instrument on (do this **AFTER** inserting the accessory.)

Step 3) Open up the "Scan" application in the CaryWin UV/Vis/NIR software folder

Step 4) Wait for instrument to initialize. This takes a minute or so with the DRA.

Step 5) Click setup. You should see the following window pop up. In "Cary Options" on the right, go to "X-mode" and select the units for the X-axis, and select the start and stop range. The cary scans from long wavelength to short wavelength. In "Y-Mode", select % R for measuring % reflectance. You can set the default y-min and y-max for the display here.
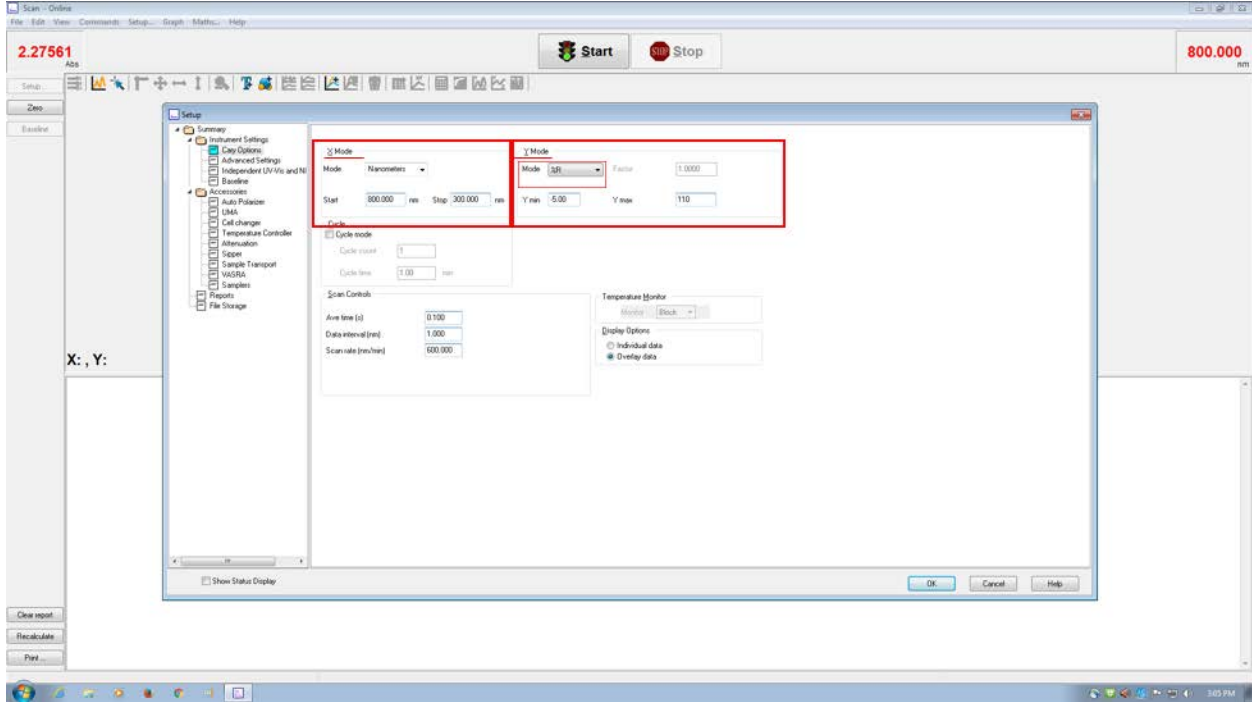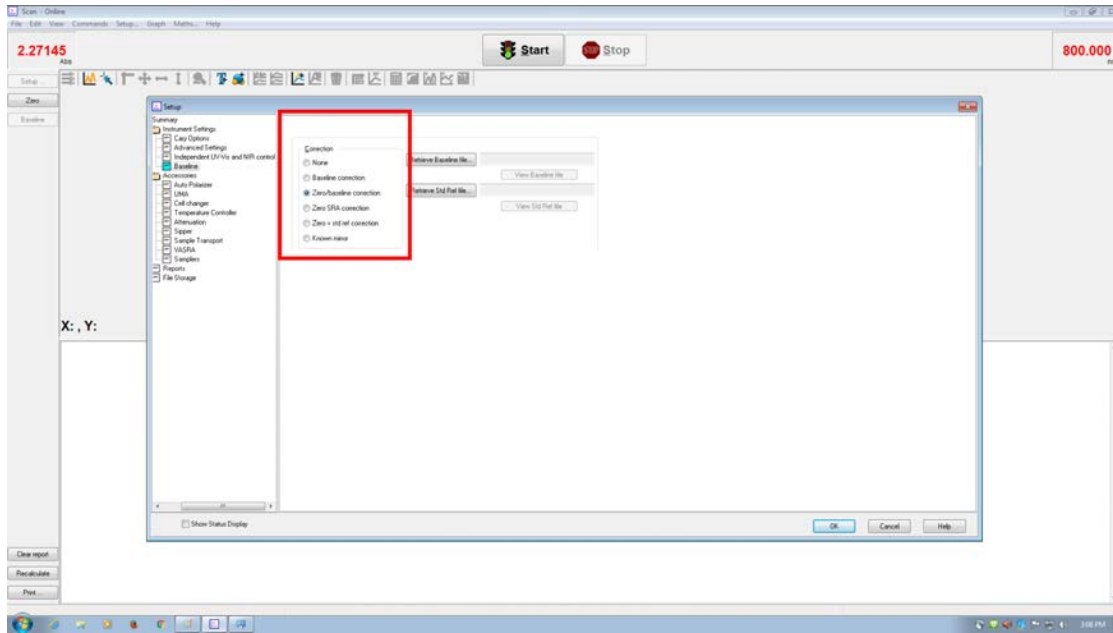
Step 6) In "Advanced Settings" set the beam mode to "double" and SB light to "Reduced"
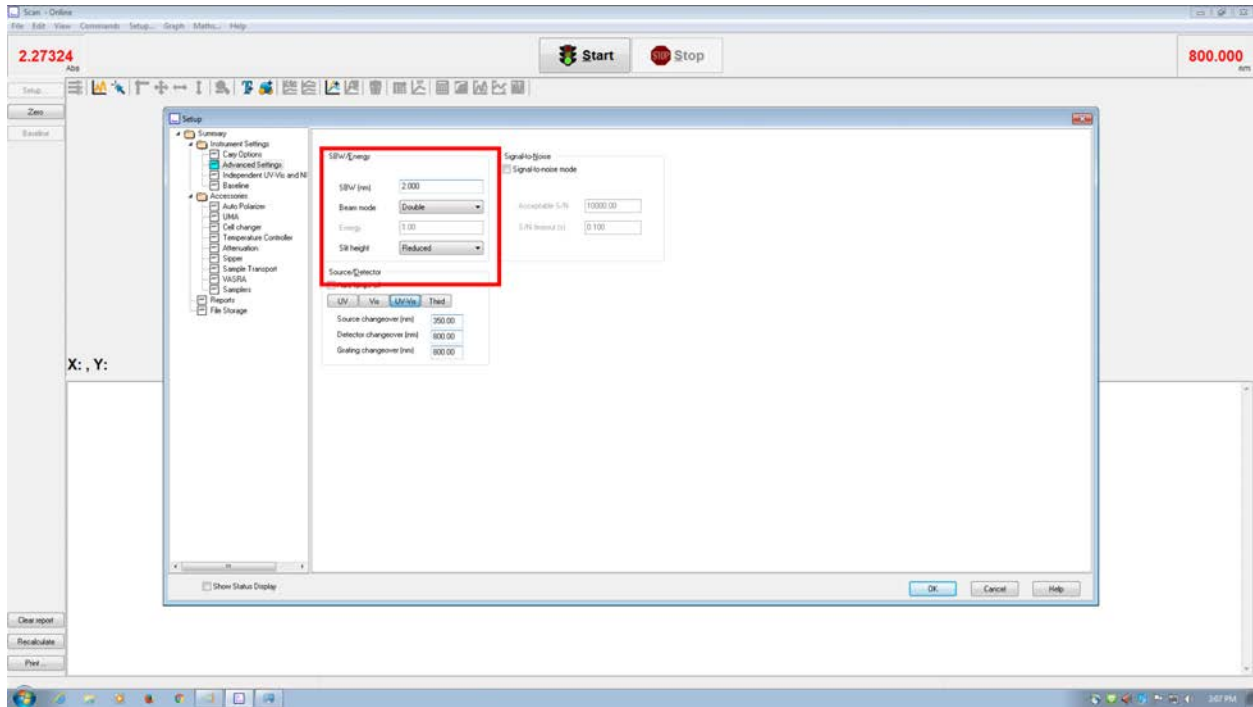
Step 7) In "Independent Control" make sure "Auto" is checked in "Independent Control"
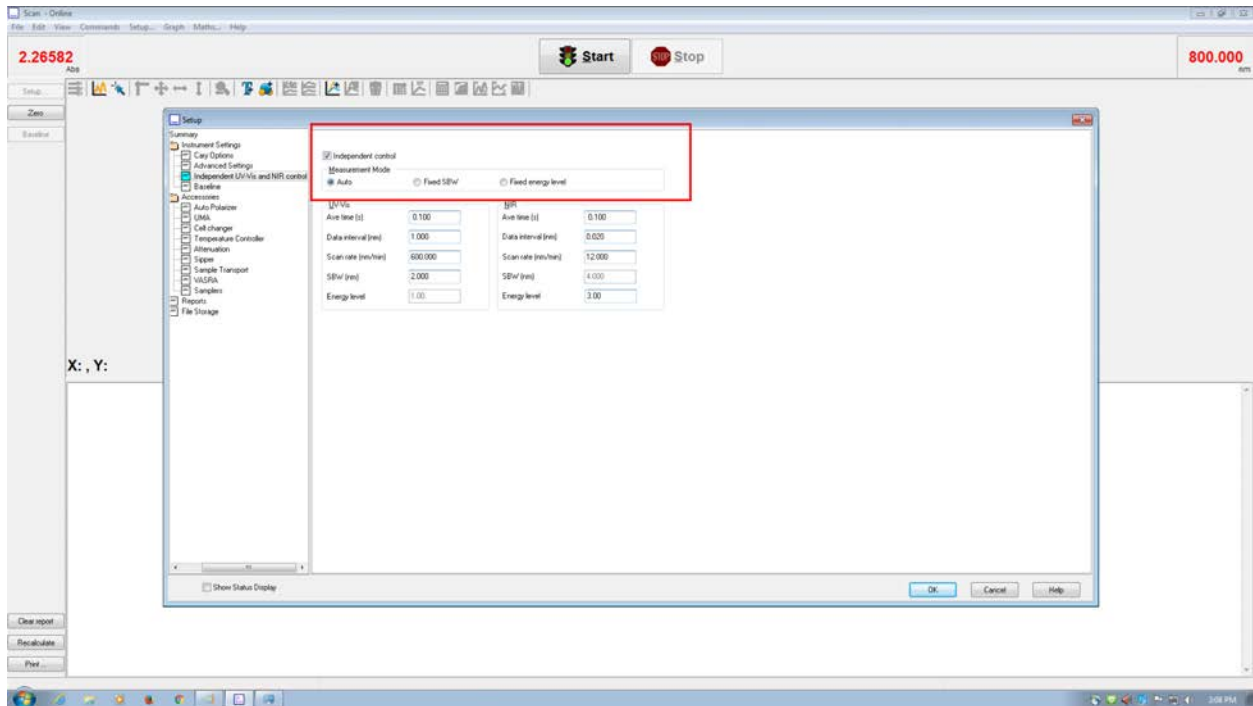
Step 8) In "Baseline" select "Zero/Baseline correction." You can now press "OK"

Step 9) On the left side of the screen select "baseline." You will be prompted to block the sample beam and measure the 100% T spectrum. In absorbance mode you would physically block the sample beam, but this is not necessary here. You only need to insure that there is no sample in the DRA and collect the 100% T spectrum. You will then be prompted to collect the 0% T spectrum.   Next, insert the reference sample cell containing barium sulfate. Collect the 0% T spectrum. You should see two traces on the graph corresponding to these two measurements.
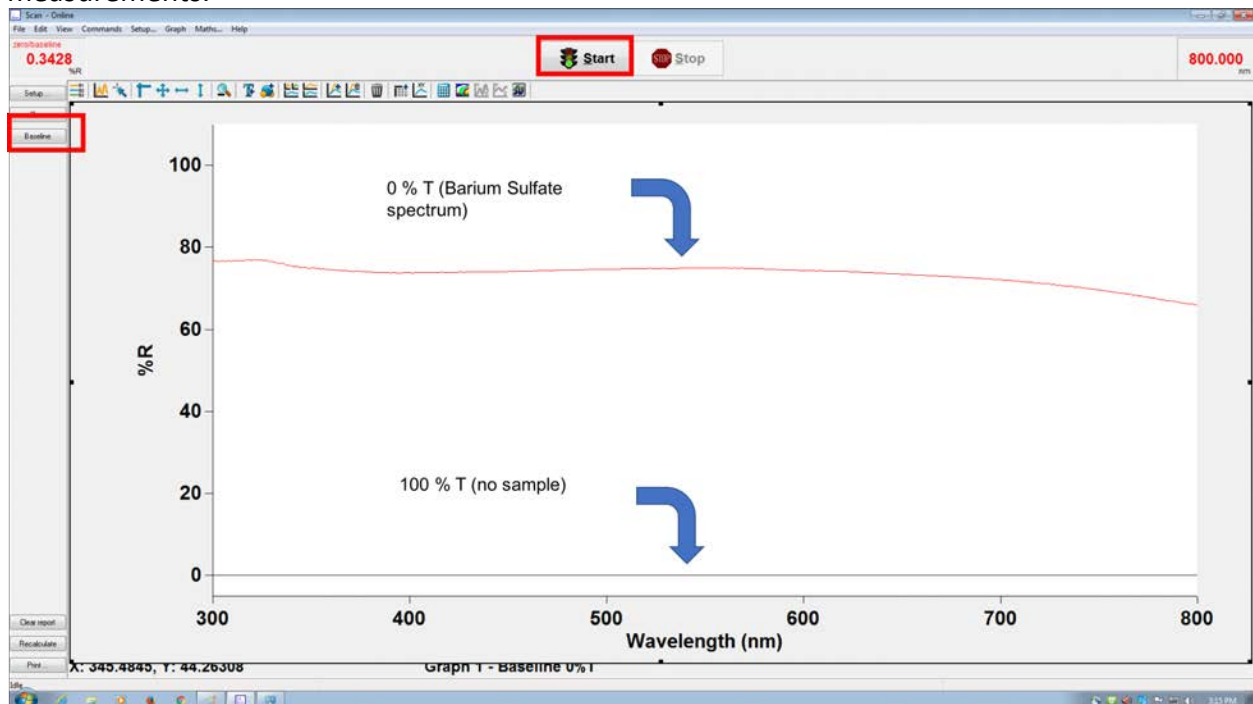
Barium sulfate reference cell (left) and a sample that was dry deposited in a sample cell for DRA.


Step 10) If the zero/baseline corrections look reasonable you are ready to measure your own sample. Next insert your sample. Hit "Start" at the top center of the screen to begin collecting your data. You will be prompted to save your experiment in a file folder somewhere on your H drive. This file will contain all of the spectra you are about to collect.

Inserting the reference or sample into the DRA:

Step 11) You will see your data displayed as seen below. You will be prompted to measure another sample with a new name. If you have more samples to measure you can reload the DRA and hit "OK" to collect more spectra to be saved in the same file. It is sometimes necessary to rotate the DRA cell 90 degrees and take several measurements to avoid noise that may result from imperfections at the sample.
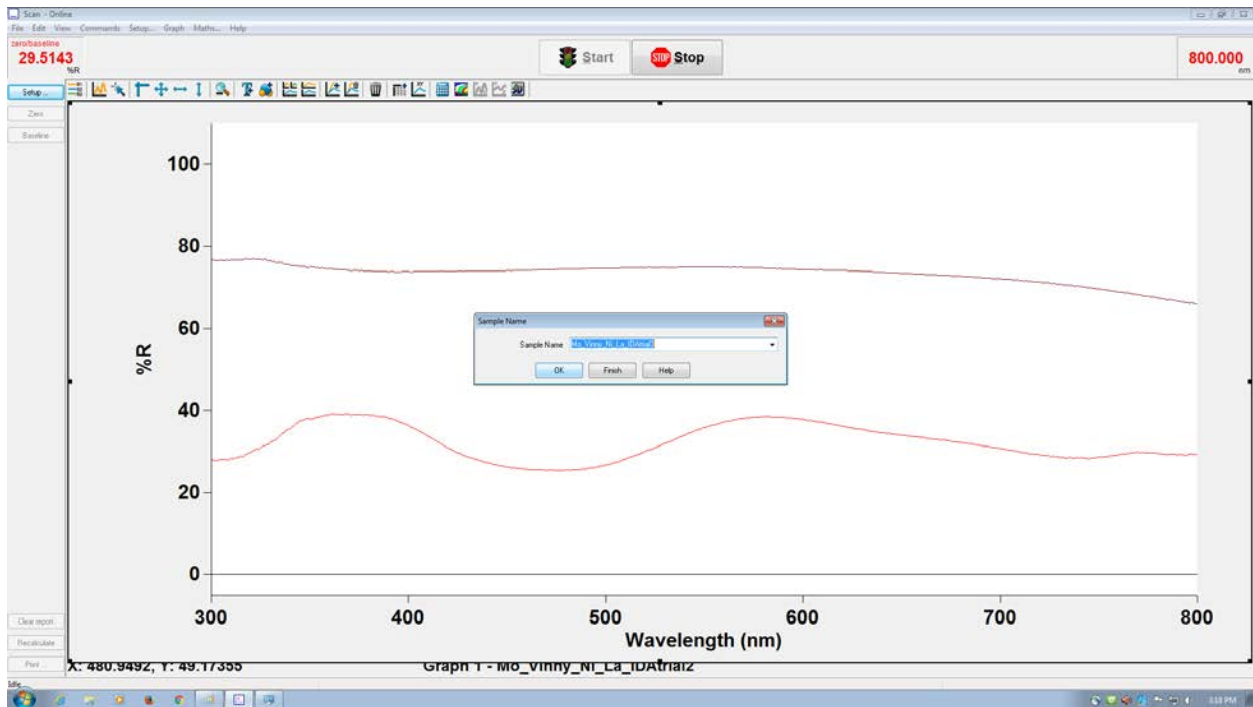
Once you are done collecting spectra, hit "Finish"

Converting %R to F(R)

Step 1: select the calculator at the top of the screen
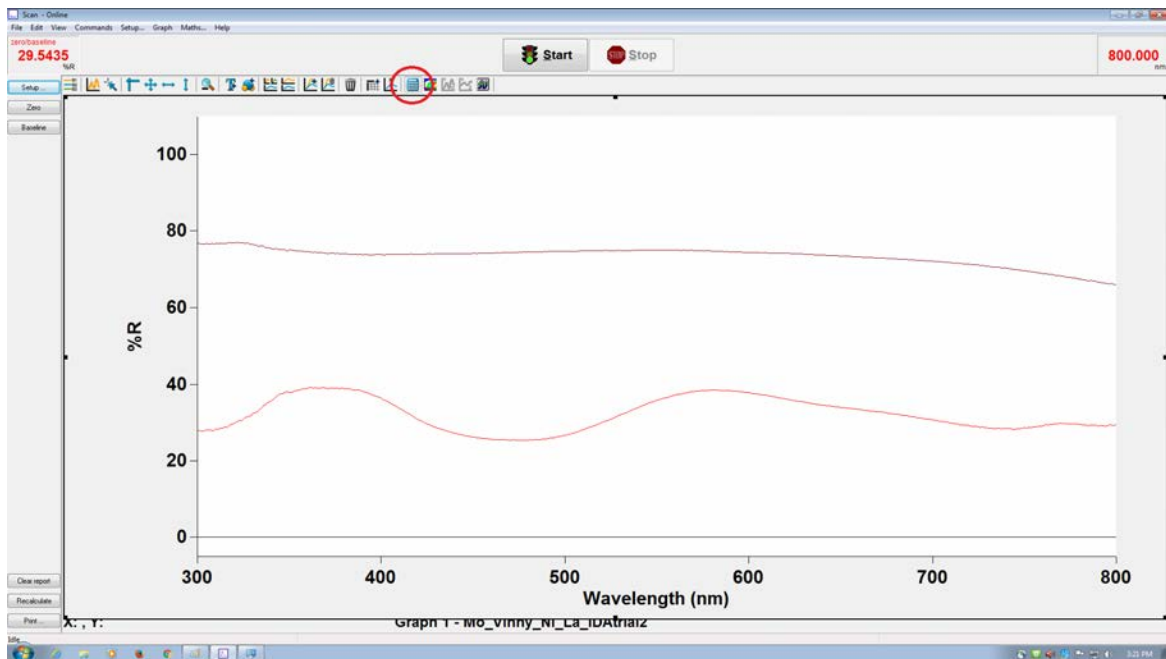
Step 2: In the window that pops up select the trace that you wish to apply the transformation to by pressing "Select Trace." Under "Operation" select "Convert to F(R). Then select apply and hit the "=" button. This will display the calculated F(R) spectrum.