

Hewlett Packard 8453 Diode Array Spectrometer

Turn power on at the spectrometer lower left side and on the temperature control unit (even if not using it.) The light on the front of the spectrometer should be green (not red). Left double-click on the UV-VIS icon. When the program starts, type your name as the operator (you must enter something) and press return. Program initialization takes several minutes.

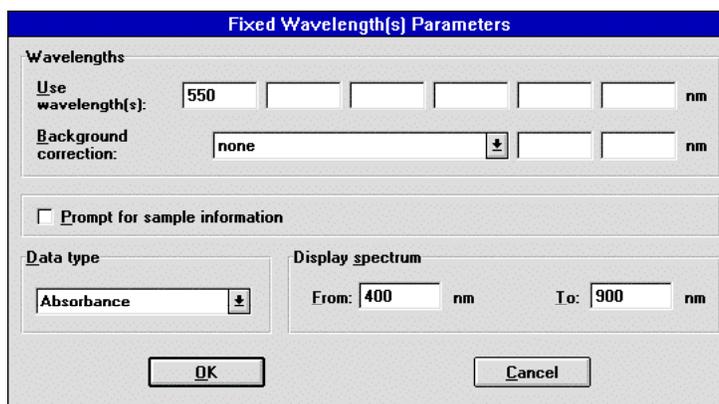
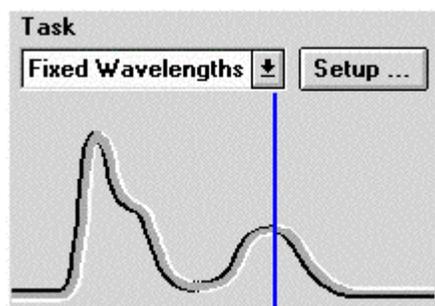
Choose Light Source

The lower left portion of the screen animates the spectrometer activities. The deuterium lamp is used as a source for the ultraviolet region from 200 to 325 nm. The tungsten lamp is used from 325 to 700 nm to 1100 nm. If you require

both, turn on both lamps. To turn a lamp on or off, **left drag on the lamp picture** to see its menu. Best results are obtained after the lamps have been on for 30 minutes.



Choose Task



The diode array always collects the full spectrum since it contains a separate detector for every nanometer from 200 to 1100 nm. The upper left portion of the screen (shown above left) controls the display of the data. Selecting fixed wavelengths gives the dialog shown at right. As well as displaying the spectrum for the selected range, absorbance values will be tabulated for the selected wavelengths. Click on the setup button to return to the dialog box.

Choose Sample Cells

Use quartz cell for ultraviolet and glass, plastic, or quartz cell for visible. The sample concentration required is generally fairly dilute, and colored solutions should be pale. Mark the cell so the same orientation can be used each time. Any frosted sides of the cell should be left and right. *A minimum of 2 mL of solution is needed.* It is important that the same cell be used for both blank and sample if quantitative measurements are to be made.

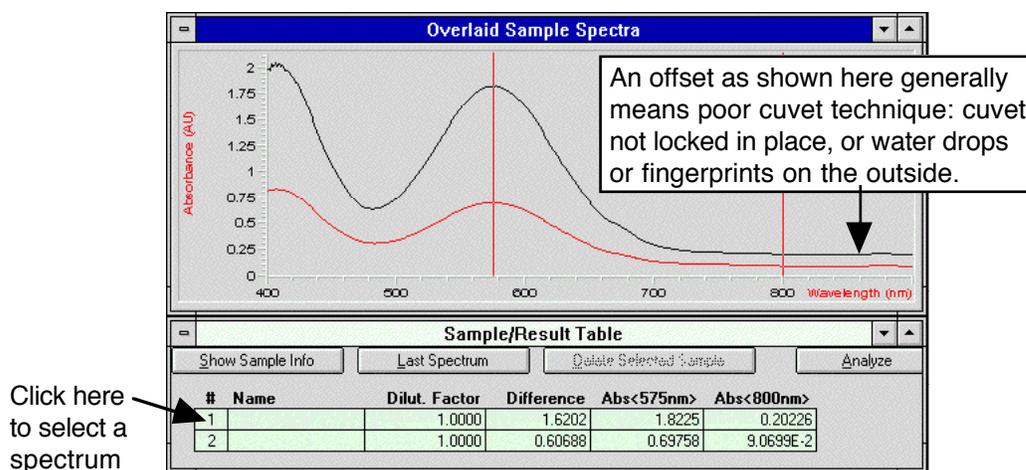
If you are not sure of the cuvet material, use air as a blank and obtain the spectrum of the cuvet. There should not be significant absorption in the spectral areas of interest.

Run Blank

Place the blank solution in the sample compartment and lock the cuvet in place. If you are not making quantitative absorbance measurements (your sample was not prepared using a volumetric flask), you can use air as the blank. Otherwise the blank should contain everything but the species being studied. You should run the blank frequently until the spectrometer has been on for more than 45 minutes. After that you should rerun the blank every hour or so. To record the blank spectrum, either **push the button labeled BLANK** on the spectrometer or left-click on the blank button in the lower left portion of the screen.

Run Spectra

Put the sample in the cuvet and discard sample. Put sample in cuvet, wipe with a Kimwipe, and lock the cuvet in place. Either **push the button labeled SAMPLE** on the spectrometer or left-click on the sample button in the lower left portion of the screen.



Left-drag an area to zoom in on a portion of the spectrum; left double-click to unzoom. Select a spectrum by left clicking on it or its number. A selected spectrum can be deleted by clicking on the Delete Selected Sample button. To delete all spectra, drag on the  and choose samples. If you right-click on a spectrum you can move the mouse or use the keyboard arrows to drive along the spectrum and see the coord-inates at the bottom of the screen. You can manipulate spectra; the example shown above uses the ratio/equation task where difference was defined to be $WL1 - WL2$.

Use **Print Selected Window** from the menu for large spectra. Left click on the  for small spectra and a data table.