UV/VIS ANALYST

SOFTWARE MANUAL

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1. Functions

This section introduces the functions of the UV-Vis Analyst.

1.1 Main Functions

Single wavelength photometric measurement

- Go to a desired wavelength quickly and conveniently.
- Photometric value display mode can be changed (%Transmittance or Absorbance).

Fixed Points Measurement

Multi-wavelength Photometric Measurement

- Up to 20 wavelength points can be set up.
- Results will be grouped into a table format automatically.

Concentration Measurement

- 2 methods to set up the regression curve.
  Up to 20 standards to set up the regression curve. The UV-Vis Analyst will calculate the working curve using a linear equation that fits the data. Enter factor values to generate regression curve.
- 3 methods for curve fit.
  Linear fit, Quadratic fit and Cubic fit.

Wavelength Scanning

- Allow user to set scan step (0.1, 0.2, 0.5, 1.0 and 5.0nm).
- Spectrum display mode can be changed (Wavelength-%Transmittance or Wavelength-Absorbance).
- Peaks and valleys will be automatically detected after scanning (User can define the peak threshold).
- Powerful spectrum processing functions are provided.

Time Scanning

- Allow user to set scan Interval (0.5, 1.0, 2.0, 5.0, 10, 30 and 60s).
- Spectrum display mode can be changed (Time-%Transmittance or Time-Absorbance).
- Peaks and valleys will be automatically detected after scanning (User can define the peak threshold).
- Powerful spectrum processing functions are provided.

DNA/Protein Measurement

- Wavelength points and ratios can be set up.
- Results will be grouped into a table format automatically.

1.2 Spectrum Processing Function

Trace a Spectrum

The cursor can be moved to a desired point in the spectrum displayed on the screen and the photometric data at this point is displayed.

Automatic Peak Detection

After a scanning is complete, peaks and valleys can be automatically detected and listed in a table format. They will also be labeled on the spectrum.

Scale Expansion

Simultaneous expansion of the X and Y axes are provided with the "Zoom" function. Display range can also be changed though the "Display Setup" function.

Differentiation

You can calculate and display the first through to the fourth derivative spectrum for a given spectrum. Derivative spectrum is useful for enhancing spectrum data that are not readily apparent in an absorbance spectrum.

Calculate Spectrum
You can calculate addition, subtraction, multiplication and division between two spectrum with the resulting data displayed on the screen.

1.3 System Check and Calibration Function
Instrument Validity Check
Up to 10 wavelength points can be set up in the instrument validity mode. Two methods can be selected (Photometric Validity measurement and Wavelength Validity measurement) and tolerance can be entered. Results will be grouped into a table format automatically.

Dark Current Check
You can resample the dark current of the instrument.

Spectrum Slitwidth Check
A special scan for checking spectrum slitwidth and it will calculate the spectrum slitwidth value automatically.

Energy of Light Sources Check
It allows scan the energy of light sources with a fixed amplifier (0-10).

Reset Wavelength
It affords to relocate the 656.1nm.

2. Setup

This section introduces how to setup the UV-Vis Analyst to PC.

2.1 System Requirements for the UV-Vis Analyst

- 486 or Pentium processor-based personal computer
- CD-ROM driver
- USB port
- 8 MB of RAM (16 MB or more recommended)
- 6 MB of available hard disk space
- Microsoft Windows 95, Windows 98/Me, Windows 2000, Windows XP or Win 7 32/64-bit.

2.2 Setup the UV-Vis Analyst to PC

1. Insert the CD-ROM of the UV-Vis Analyst into CD-ROM driver.
2. Open the directory of CD-ROM.
3. Double-click the icon **Setup.exe** to start to setup (Fig. 2-1). Click **Next**.
4. Input user's information (Fig. 2-2). Click **Next**.

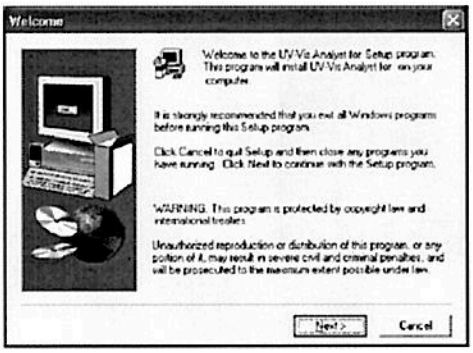

Fig. 2-1

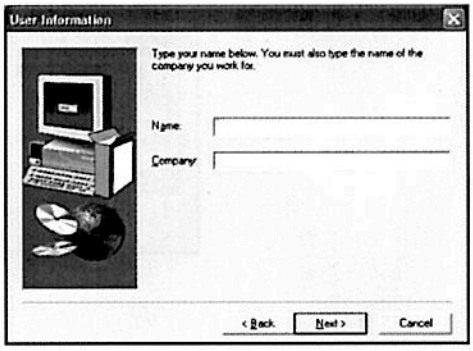

Fig. 2-2

5. Select setup directory (Fig. 2-3). Click **Next**.
6. Select setup type (Fig. 2-4). Click **Next**.

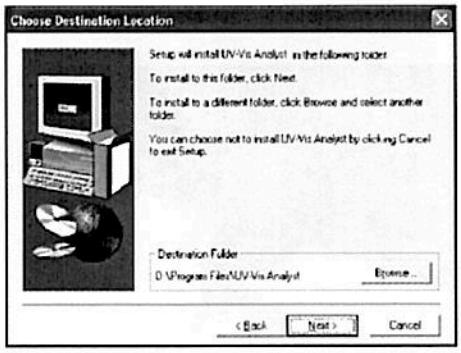

Fig. 2-3

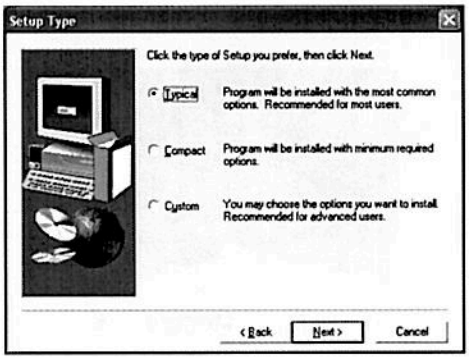

Fig. 2-4

7. Select program fold (Fig. 2-5). Click **Next** to copy files to PC (Fig. 2-6).

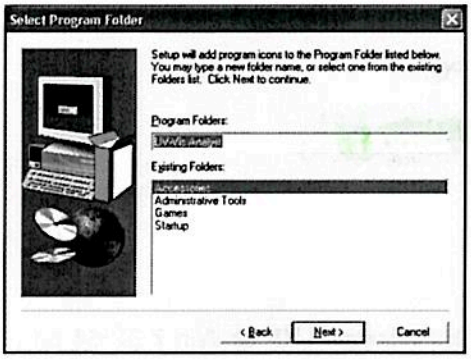

Fig. 2-5

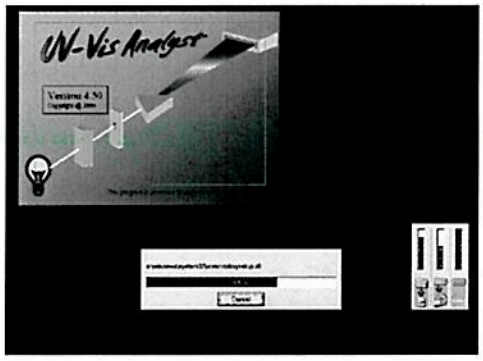

Fig. 2-6

8. Click **Finish** to complete and exit setup (Fig. 2-7).

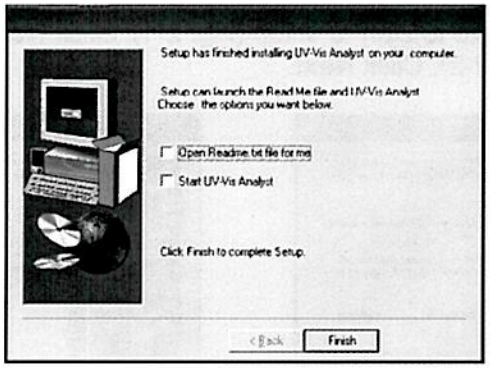

Fig. 2-7

2.3 Remove the UV-Vis Analyst from PC

Start→Control Panel→Add or Remove Programs→Select **UV-Vis Analyst**→Change/Remove.

2.4 Install the dongle

Plug the dongle into the USB port on PC (Fig. 2-8).

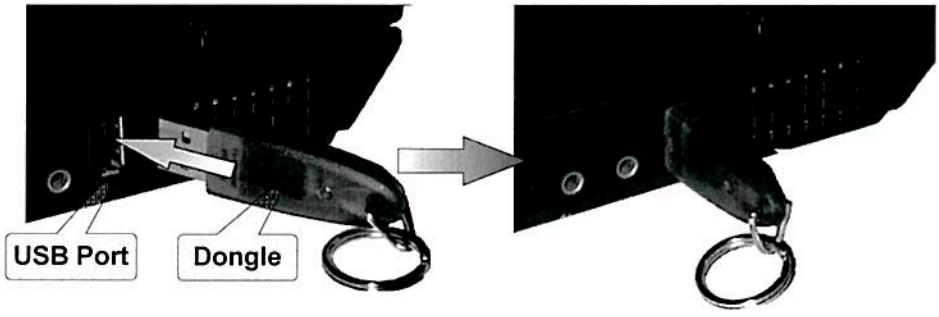

Fig. 2-8

2.5 Run the UV-Vis Analyst

There are two ways to start the UV-Vis Analyst:

1. Double-click shortcut icon on the desktop.
2. Start→All Program→UV-Vis Analyst→UV-Vis Analyst.

2.6 Set Comm. Port

Start the UV-Vis Analyst, on the **UV-Photometer** menu, click **Comm. Port Setup** appears the following box (Fig. 2-9), select the Comm. Port (based connection of the USB cable) and Baud Rate (38400), click **OK**.

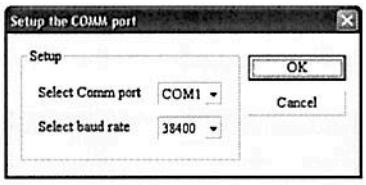

Fig. 2-9

The UV-Vis Analyst can not control the Instrument before plugged the dongle into USB port and set the Comm. Port.

3. Introduction

This chapter introduces the interface of the UV-Vis Analyst.

3.1 Main Interface

After running the UV-Vis Analyst, the Main Form appears on the display (Fig. 3-1).

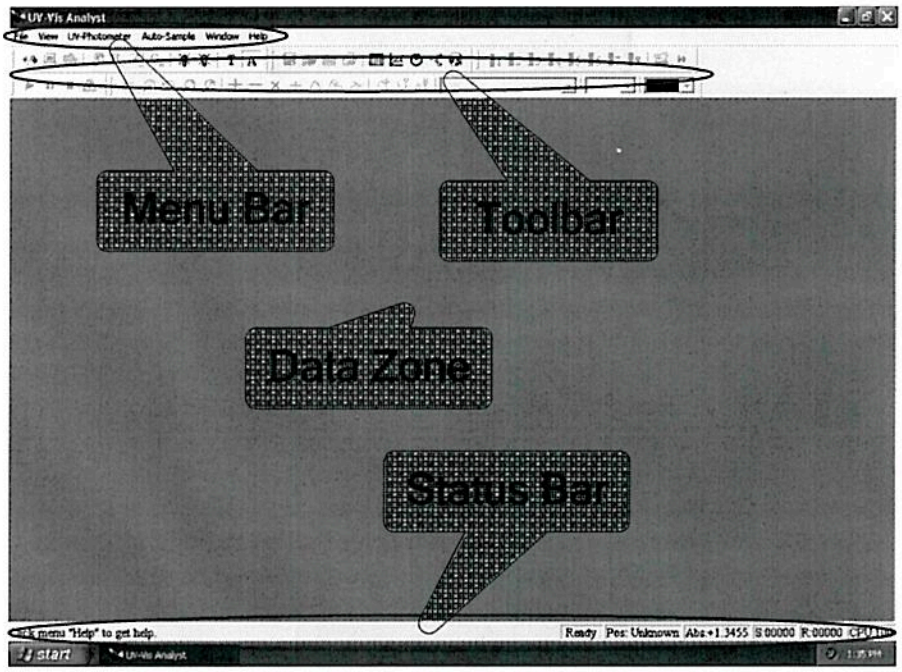

Fig. 3-1

3.2 Menu Bar and Toolbar

Menu bar and **Toolbar** are both provided in the software offering you two ways to select a desired function.

- On the menu bar, use your keypad or mouse to select the desired function.
- Almost all the functions listed in the menu bar can be reached by clicking a corresponding button in the toolbar.

Main Menu	Sub Menu	Tool	Function
File	New		New a Fixed Points Measurement
			New a Wavelength Scan Measurement
			New a Time Scan Measurement
			New a DNA/Protein Measurement
			New a Instrument Validity

	Open…		Open a spectrum/data file
	Close		Close current measurement
	Save		Save current measurement
	Save As…		Save current measurement as a new file name
	Open file from UV-Photometer		Open a file saved in instrument
	Export		Export data or method
	Print…		Print test report
	Print Setup…		Setup printer
	Exit		Exit UV-Vis analyst
View	Status Bar		Display/Hide status bar
	Status of Spectrophotometer		Display status of spectrophotometer
	Status font		Setup font of status bar
	Customize		Define the information of display and print
	Peaks		Mark peak value
	Valleys		Mark valley value
	Magnify		Magnify the area selected
	Restore		Restore the default parameters for display
	Search		Search peak/valley one by one

UV-Photometer	Link Spectrophotometer		Connect to the Instrument
	Reset Spectrophotometer		Reset parameters of instrument
	Escape		Stop current measurement
	View dark Current		Retest the dark current
	Set Amplifier		Reset amplifier
	Locate 656.1nm		Relocate 656.1nm
	Calibrate System Baseline		Scan system baseline
	Automatic Blank Calibration		Do blank
	Slit Bandwidth *		Set slit bandwidth (0.5, 1.0, 2.0, 4.0)
	Set Unit		Set unit
	Turn on/off W lamp		Turn on/off W lamp
	Turn on/off D2 lamp		Turn on/off D2 lamp
	D2/W Switch Point		Set switch point of D2/W
	Comm. Port Setup		Setup comm. port
	Change Password		Set/Change login password
Auto-sample	Locate Cell **		Locate cell (1-8) to light path
	Setup Multicell **		Setup Multicell
	Autorun **		Measure multi samples automatically

Scan	Start		Start a measurement
	Stop		Stop a measurement
	Service		Measure spectrum and scan energy
Settings	Display Range		Setup scan display parameters
	Peak Height		Define peak/valley threshold
Compute	Add		Add two spectrum
	Sub		Subtract one spectrum from another
	Multiply		Multiply two spectrum
	Divide		Divide one spectrum from another
	Moving Window Averaging		Smooth a spectrum with the method Moving Window Averaging
	Savitzky-Golay Smoothing Filter		Smooth a spectrum with the method Savitzky-Golay Smoothing Filter
	Derivate		Derivative of a spectrum
	Resample		Resample a spectrum
Window	New Window		New a measurement window as current
	Cascade		Multi windows display in a cascade
	Tile		Multi windows display in a tile
	Arrange Icons		Arrange all icons minimized
	Split		Split display area

Help	About UV-Vis Analyst		Display the information about the UV-Vis Analyst
			Setup measurement parameters
			Modify a measurement result
			Delete results selected
			Set and Goto one wavelength
			Display Instrument CPU information
			Delete current Spectrum
			Display result as mode %T
			Display result as mode Abs
			Undo Scale

" * " **Only for variable bandwidth models.**
" ** " **These buttons only available when 6 x 1 (or 8 x 1) Auto cell holder is fitted.**

4. Operation

This chapter introduces the operation of the UV-Vis Analyst.

4.1 Single Wavelength Photometric Measurement

The UV-Vis Analyst provides a convenient method to measure photometric value at a fixed wavelength.

1. Click  on the toolbar, appears **Goto specified wavelength** form (Fig. 4-1).

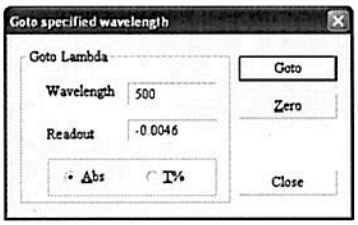

Fig. 4-1

2. Key in the desired wavelength position, click **Goto**. The minimum wavelength step is 0.1nm in a range from 190-1100nm.
3. Place a reference in the sample compartment, click **Zero**.
4. Place a sample in the sample compartment. The wavelength position and photometric value will be displayed in the **Readout** box.

4.2 Fixed Point Measurement

This UV-Vis Analyst performs fixed wavelength measurement at 1-20 points and how to analyze unknown compounds against calibration standards.

4.2.1 Multi-wavelength Photometric Measurement

1. Click  on the toolbar, appears follow form (Fig. 4-2).

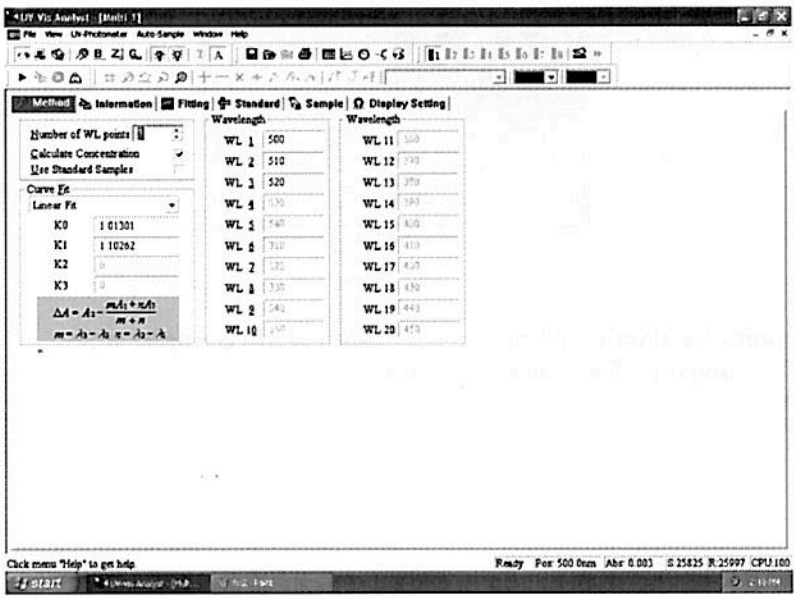

Fig. 4-2

2. Click the **Method** tab.
3. Type the number of wavelength points in the **Number of WL Points** box, or click the **up/down** arrows next to the box set the wavelength points. Leave the two boxes **Calculate Concentration** and **Use Standard Samples**.
4. Key in the wavelength in the **Wavelength** box.
5. Place a reference in the sample compartment. Click  to do blank.
6. Click the **Sample** tab. It will display the following (Fig. 4-3). The control menu contains six buttons: **Start**, **Delete**, **Modify**, **Recalculate**, **Data Font and Print**.

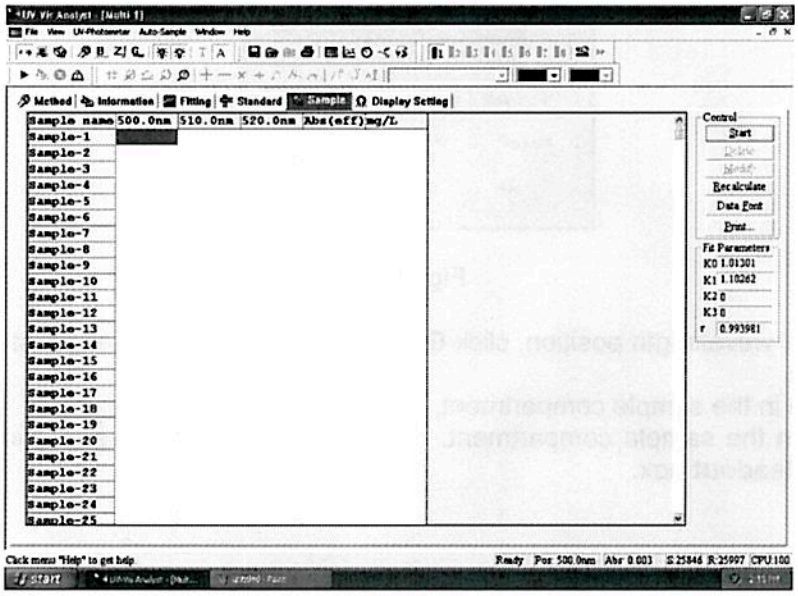

Fig. 4-3

7. Place a sample in the sample compartment. Click **Start** or  to run a new measurement. The display will change to the following (Fig. 4-4). Key in the sample name in the **Name** box.

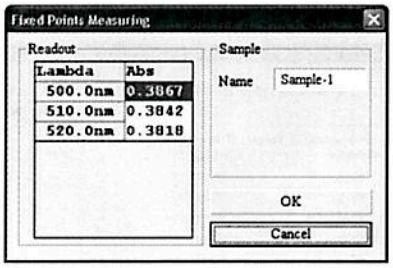

Fig. 4-4

8. Click **OK**. The photometric data for sample will be listed in the **Sample** table.
9. Repeat steps 7-8 to measure all samples (Fig. 4-5).

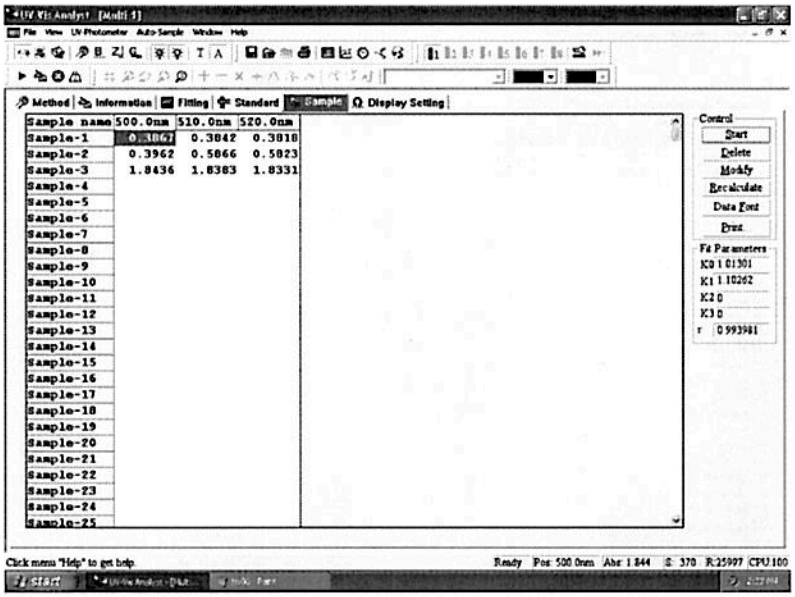

Fig. 4-5

4.2.2 Concentration Measurement

4.2.2.1 Set Up Linear Regression Curve

There are two methods available to set up the linear regression curve. You can use standards to set up the regression curve or just key in the parameters manually. Use the following steps to select the method you wish to use.

1. Click  on the toolbar.
2. Click the **Method** tab.
3. Enter the number of wavelength points in the **Number of Points** box, or click the **up/down** arrow next to this box. With 2 wavelengths, the absorbance at the second reference wavelength is subtracted from the first to correct for background absorbance. With 3 wavelengths, the baseline between the first and third wavelengths is calculated and its value at the second wavelength is subtracted from the absorbance at the second wavelength to give the peak height.
4. Key in the wavelengths in the **Wavelength** boxes.
5. Tick the **Calculate Concentration** check box to activate concentration calculation.
6. Set up the linear regression curve.

   Method 1: Set up the linear regression curve with prepared standards.

   *(1) Tick the **Use Standard Samples** check box.*

   (2) Place the reference into the sample holder. Click  *to do blank.*

   *(3) Click the **Standard** tab.*

   *(4) Place Standard 1 in the sample compartment. Click **Start** to run a measurement.*

   *(5) Key in the concentration value of Standard 1 in the **Conc.** box.*

   *(6) Key in the sample name for the standard in the **Name** box.*

   *(7) Click **OK**. The photometric data, △A and concentration will be shown in the standard table.*

   (8) Repeat steps 4-7 to measure all the prepared standards (Fig. 4-6).

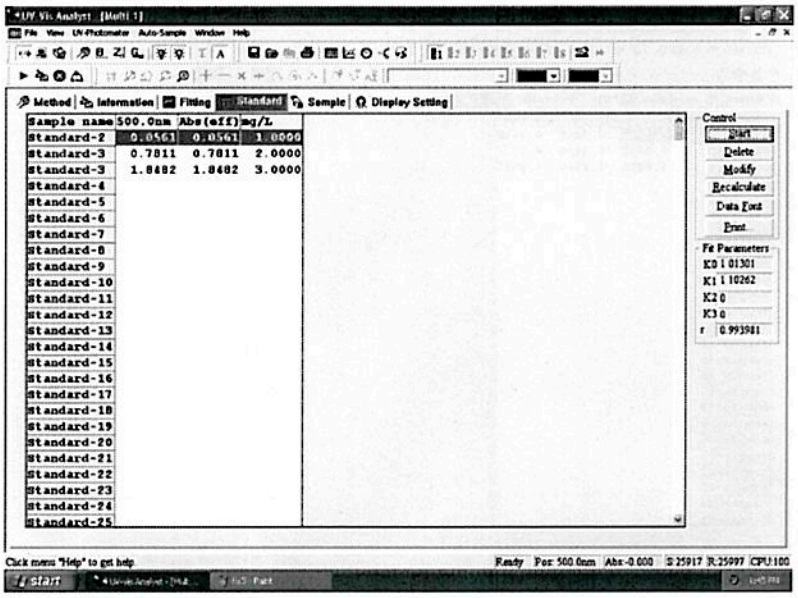

Fig. 4-6

(9) Click ***down*** *arrow in* ***Curve Fit*** *box to select curve fit method.*

Method 2: Input the factor of the linear regression curve.

(1) Leave the ***Use Standard Samples*** *check box.*

(2) Click ***down*** *arrow in* ***Curve Fit*** *box to select curve fit method.*

(3) Input the factor of the linear regression curve.

7. Click **Fitting** tab to view the ***linear regression curve*** *(Fig. 4-7)*. Click **Display Setting** tab to set the display parameters and unit of concentration *(Fig. 4-8)*.

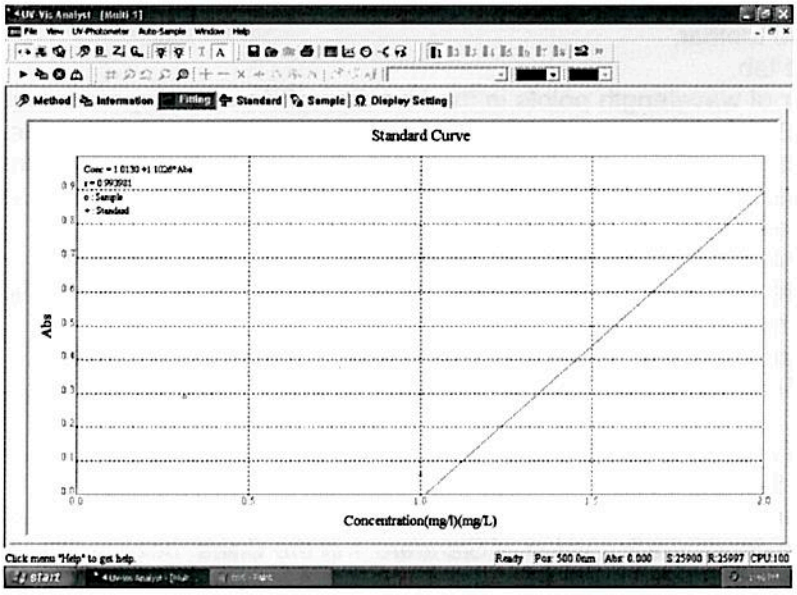

Fig. 4-7

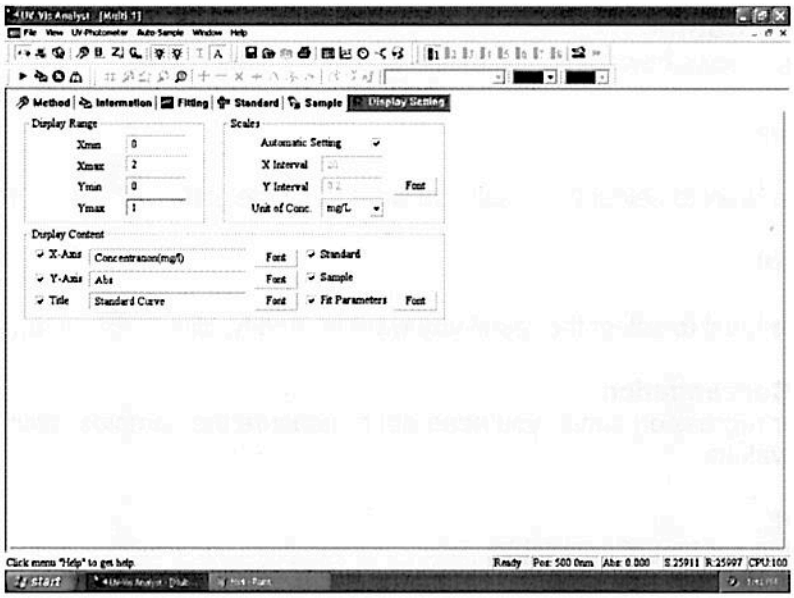

Fig. 4-8

4.2.2.2 Measure Concentration by Using The Linear Regression Curve

The following procedure shows how to measure concentration of samples.

1. Set up linear regression curve (Refer 2.2.1) or click  to open a file of linear regression curve (*.QUA).
2. Place reference into the sample holder. Click  to do blank.
3. Click the **Sample** tab.
4. Place Sample 1 into the sample holder.
5. Click **Start** to run a measurement.
6. UV-Vis Application Software will display the photometric value of Sample 1 at the fixed wavelength positions automatically. Type the sample name in the **Name** box. The default is **Sample-1**.
7. Click **OK**. The photometric result for Sample-1 will be listed in the sample data. Delta Abs. and concentration value of Sample-1 will also be displayed in columns 3 and 4.
8. Repeat steps 4-7 to measure remaining samples (Fig. 4-9).

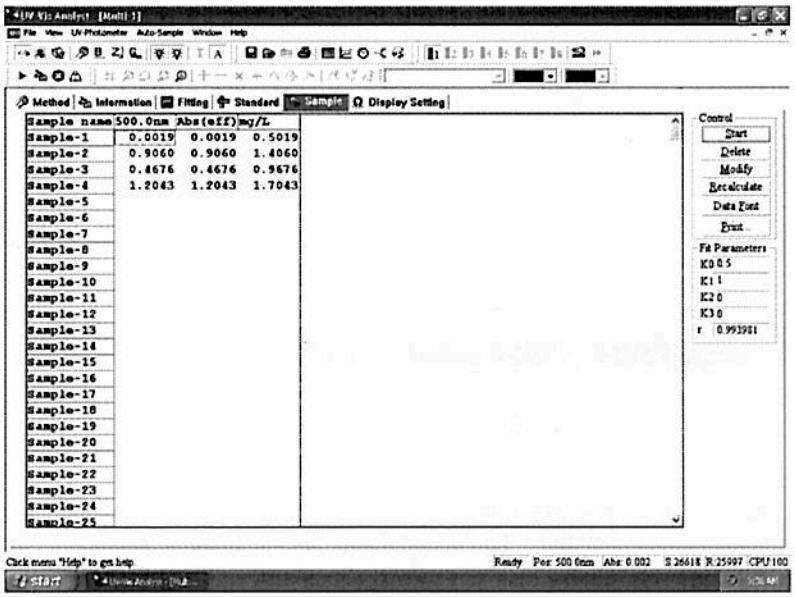

Fig. 4-9

4.2.3 Assistant Functions

The following procedure shows how to modify, delete and recalculate results.

4.2.3.1 Delete a Result

Click the **Sample name** label to select the result you want to delete, click  or button **Delete**.

4.2.3.2 Modify a Result

Click the **Sample name** label to select the result you want to modify, click  or button **Modify**.

4.2.3.3 Recalculate Concentration

If you change the linear regression curve, you need not remeasure the samples, click button **Recalculate** to get new concentration values.

4.2.3.4 Set Data Font

Click button **Data Font** to set font of data table.

4.2.3.5 Edit Measurement Information

Click tab **Information**, type the information that will print out with measurement report.

4.3 Wavelength Scanning

This chapter describes how to collect a spectrum while using Wavelength Scan function.

4.3.1 Scan Sample

1. Click  on the toolbar to new a sample scan measurement, appears the following form (Fig. 4-10).

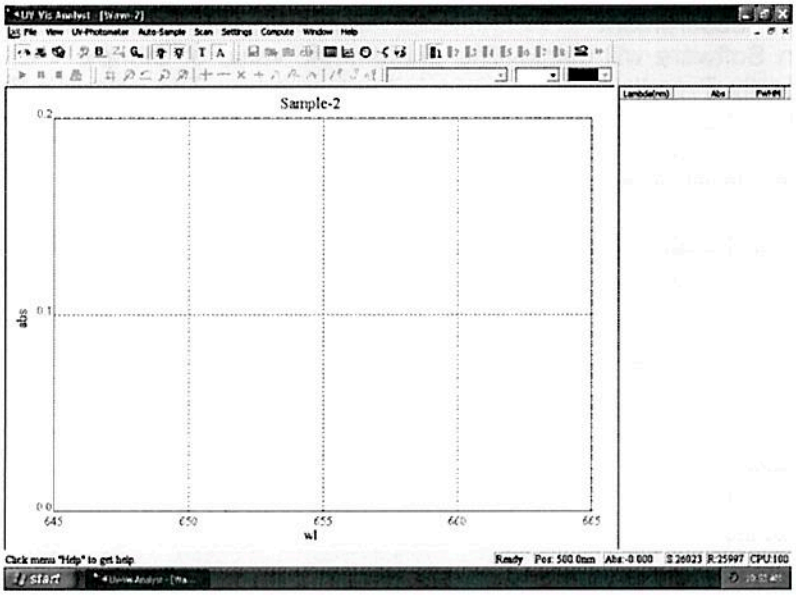

Fig. 4-10

2. Click  on the toolbar, appears the following form (Fig. 4-11). Input start wavelength in **From** box (range: 190-1100nm), end wavelength in **To** box (range: 190-1100nm), select scan interval (0.1, 0.2, 0.5, 1.0, 2.0 or 5.0nm) and Filter times (1, 3, 5, 10 or 30), click **OK**.

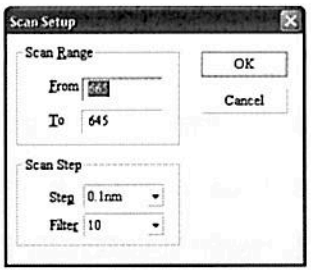

Fig. 4-11

3. Click T on the toolbar to select %Transmittance mode or click A to select Absorbance mode.
4. Click ⌗ on the toolbar to set display parameters (Fig. 4-12).

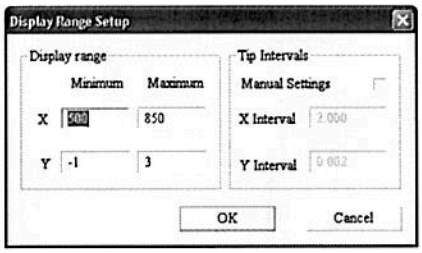

Fig. 4-12

5. Place reference into the sample holder. Click ZI to scan baseline.
6. Place sample into the sample holder. Click ▶ to scan sample, the real time spectrum will be displayed (Fig. 4-13). Click ■ to cancel while scanning.

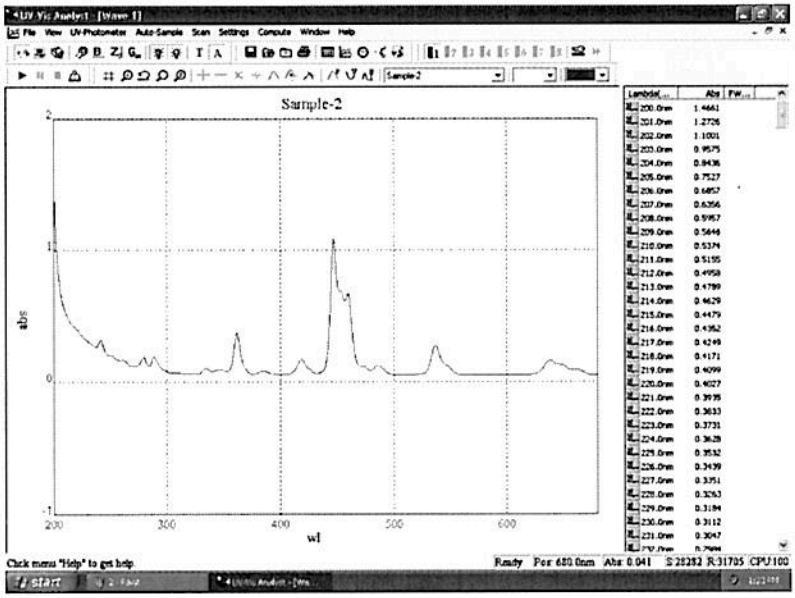

Fig. 4-13

4.3.2 Spectrum Processing

After you have acquired a spectrum, the spectrum processing options are available.

4.3.2.1 Auto List Peaks and Valleys

Click  on the toolbar to set the peak/Valley threshold (range: 0 to 1.000, step: 0.001, Fig. 4-14), Input the threshold value, click **OK**. Click  to list peaks and click  to list valleys (Fig. 4-15).

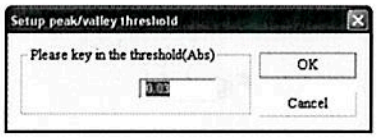

Fig. 4-14

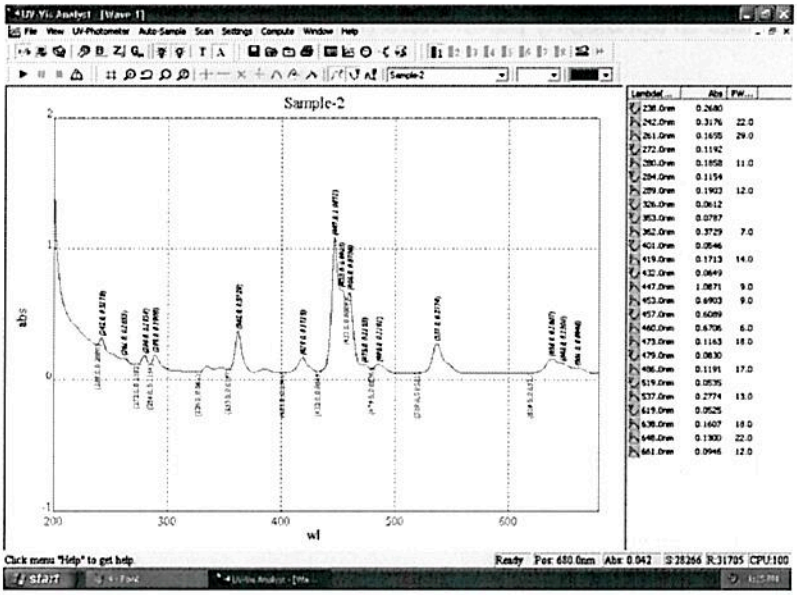

Fig. 4-15

4.3.2.2 Rescale

Click  on the toolbar to set the new parameters for display.

4.3.2.3 Original Scales

Click  on the toolbar to restore the default display settings.

4.3.2.4 Zoom Selected Area

Click  on the toolbar to activate zoom function. Position the cursor in the upper-left corner of the area you want to select. Hold the left mouse button to drag the cursor to outline the spectrum area you want to enlarge (Fig. 4-16). Release the mouse button. The part of the spectrum which is displayed within the outlined area will be enlarged (Fig. 4-17). Click  to undo scale. To cancel zoom to click  again.

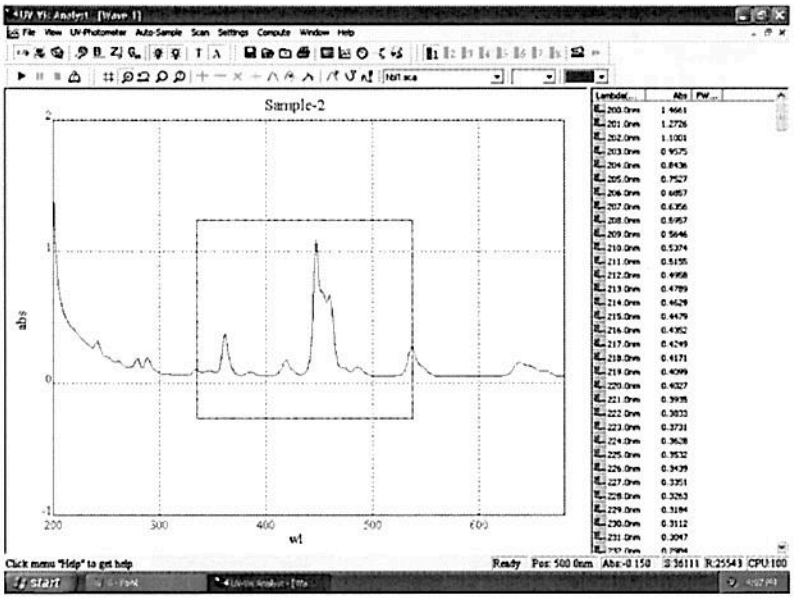

Fig. 4-16

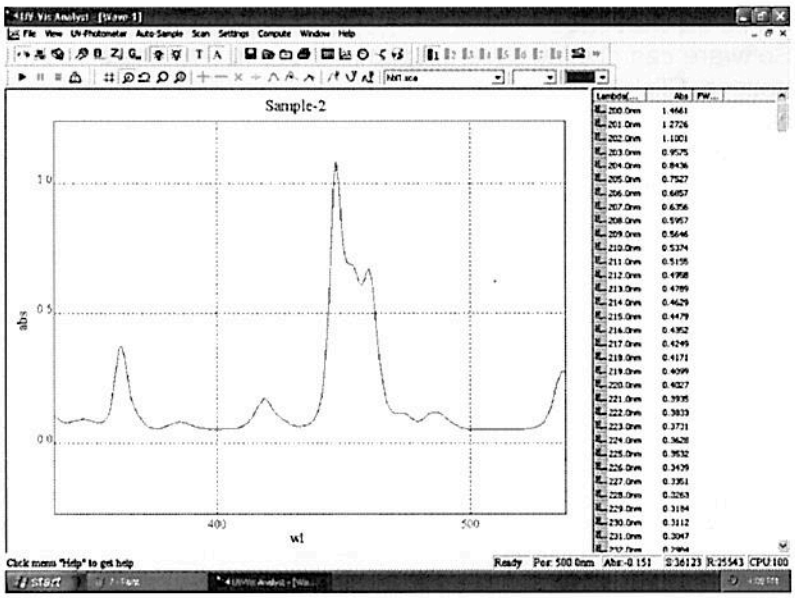

Fig. 4-17

4.3.2.5 Trace a Spectrum

Click  on the toolbar, A crosshair cursor appears, move the cursor on the spectrum. Move the crosshair cursor left or right on the spectrum. The data in the cursor window indicate the X-axis and Y-axis values for the current cursor location (Fig. 4-18). Double click the left mouse button to release the crosshair cursor.

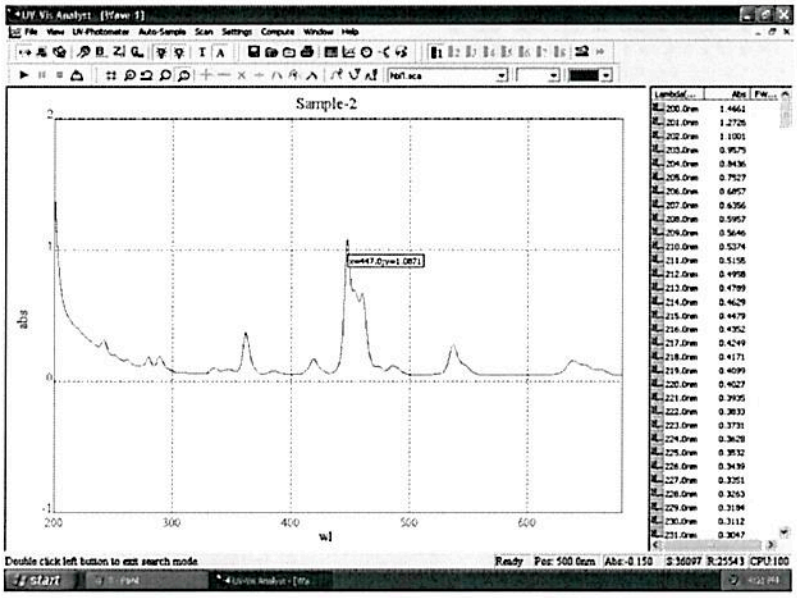

Fig. 4-18

4.3.2.6 Select a Spectrum as Current

As UV-Vis Application Software can display several spectrum overlaid on the screen, you should specify the spectrum you wish to process. Click the **down** arrow on the toolbar (Fig. 4-19). All spectrums will be listed in the pull-down menu. Click the spectrum you want to select. Its name will be listed in the Name Box and it will be referred to as **Current Spectrum**.

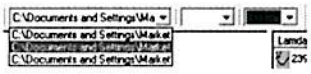

Fig. 4-19

4.3.2.7 Derivative

Click  on the toolbar. The following dialogue box appears (Fig. 4-20). Key in the class of derivative (1-10, depending on whether 1st, 2nd, … 10th derivative is required) and type a name for the result spectrum, then click **OK**. The result spectrum will be displayed overlaid with the original one (Fig. 4-21).

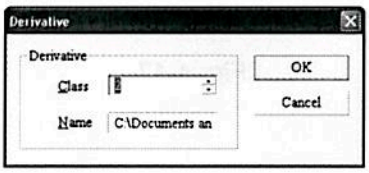

Fig. 4-20

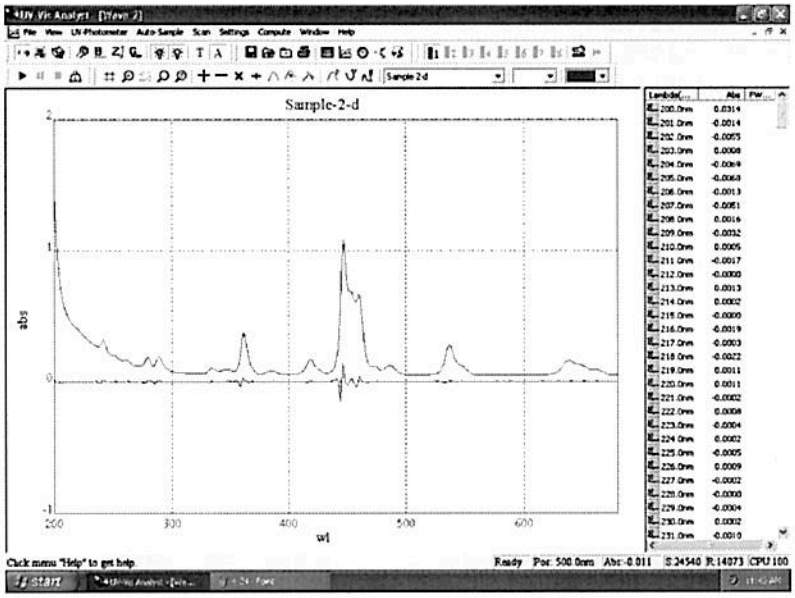

Fig. 4-21

4.3.2.8 Moving Window Averaging

Click  on the toolbar. Appears following form (Fig. 4-22). Click **up/down** arrow of the **Range** box to select range value, key a file name in the **Name** box, click **OK**. The result spectrum will be displayed overlaid with the original one (Fig. 4-23).

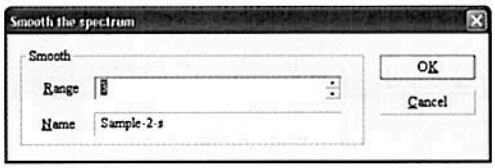

Fig. 4-22

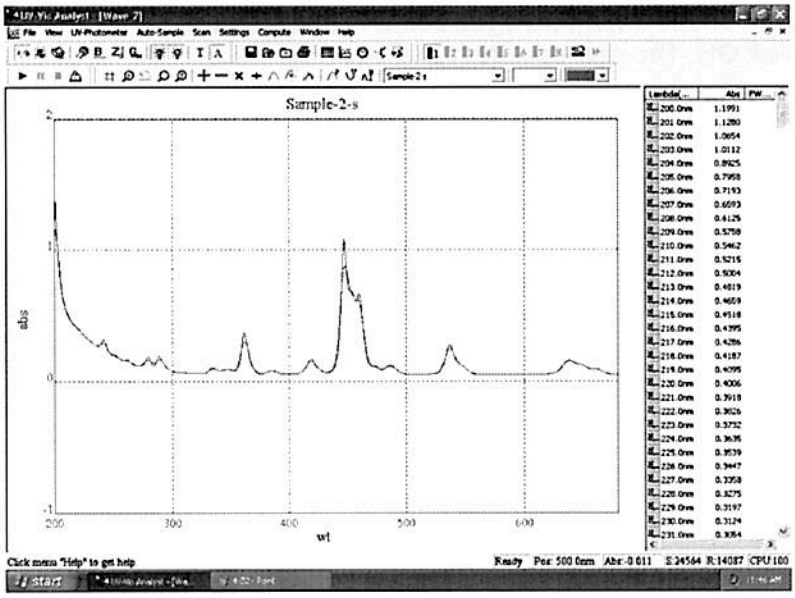

Fig. 4-23

4.3.2.9 Savitzky-Golay Smoothing Filter

On the **Computer** menu, click **Savitzky-Golay Smoothing Filter**. Appears following form (Fig. 4-24). Click **up/down** arrow to select the parameters, key a file name in the Name of Result box, click **OK**. The result spectrum will be displayed overlaid with the original one (Fig. 4-25).

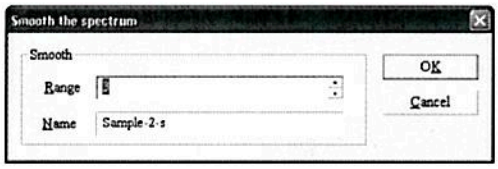

Fig. 4-24

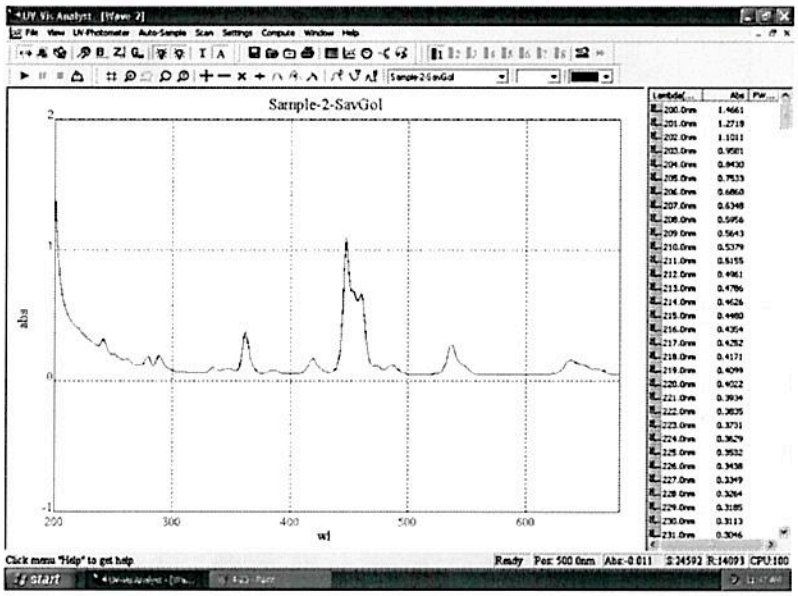

Fig. 4-25

4.3.2.10 Resample

Click  on the toolbar. The following dialogue box will be displayed (Fig. 4-26). Click **Up/Down** arrow to select Sample times. Click **OK**. The new spectrum displays (Fig. 4-27).

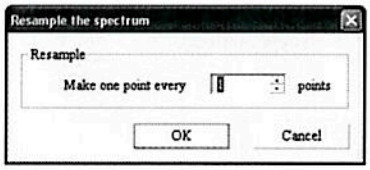

Fig. 4-26

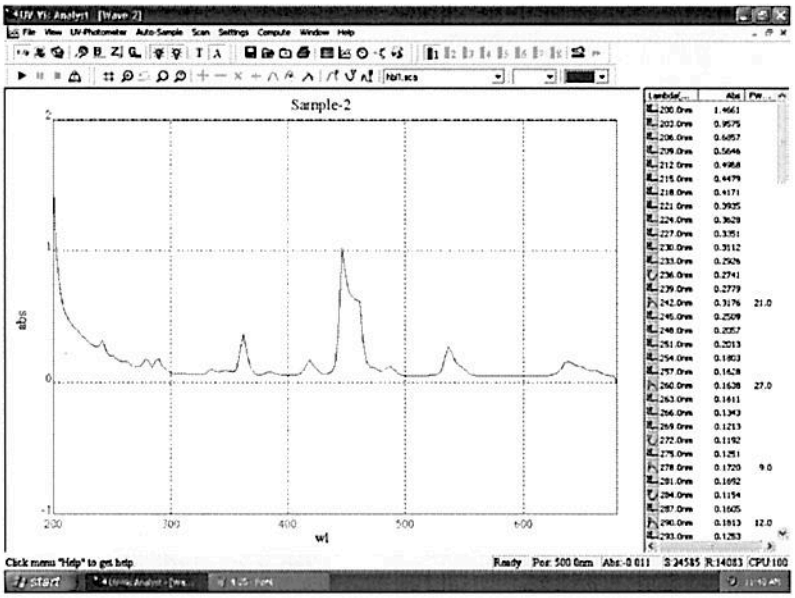

Fig. 4-27

4.3.2.11 Spectrum Addition

Spectrum addition can assist in the development of artificial spectrum in multi-component mixtures.

Click + on the toolbar. The following dialogue box will be displayed (Fig. 4-28). Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen (Fig. 4-29).

UV-Vis Analyst will only add, subtract, multiply and divide two spectrums that are already displayed on the screen. Before arithmetic processing, load or collect two spectrums from memory.

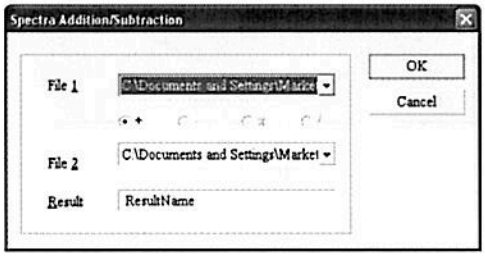

Fig. 4-28

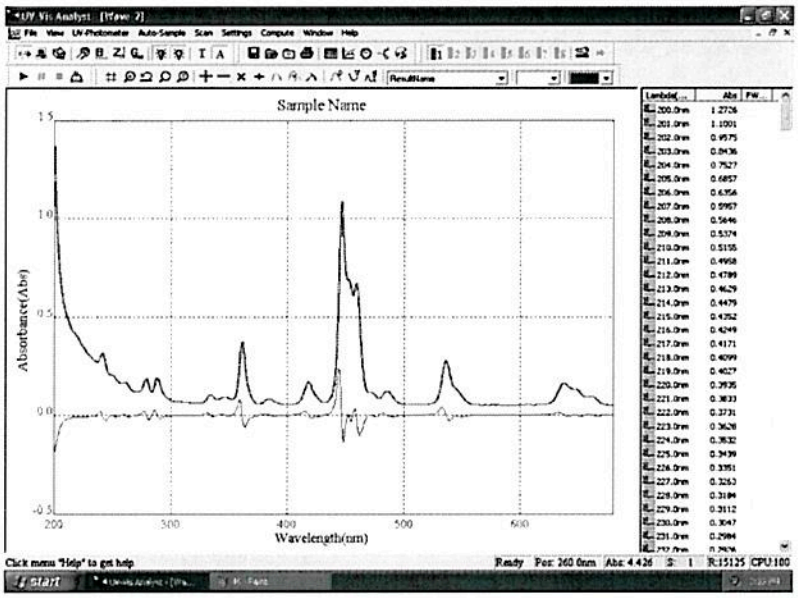

Fig. 4-29

4.3.2.12 Spectrum Subtraction

Subtracting one spectrum from another has been a classical technique to offset spectrum interference from the spectrum of interest.

Click — on the toolbar. The following dialogue box will be displayed (Fig. 4-30). Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen (Fig. 4-31).

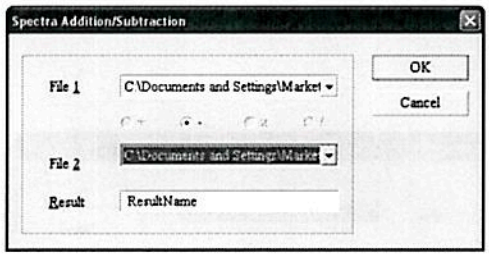

Fig. 4-30

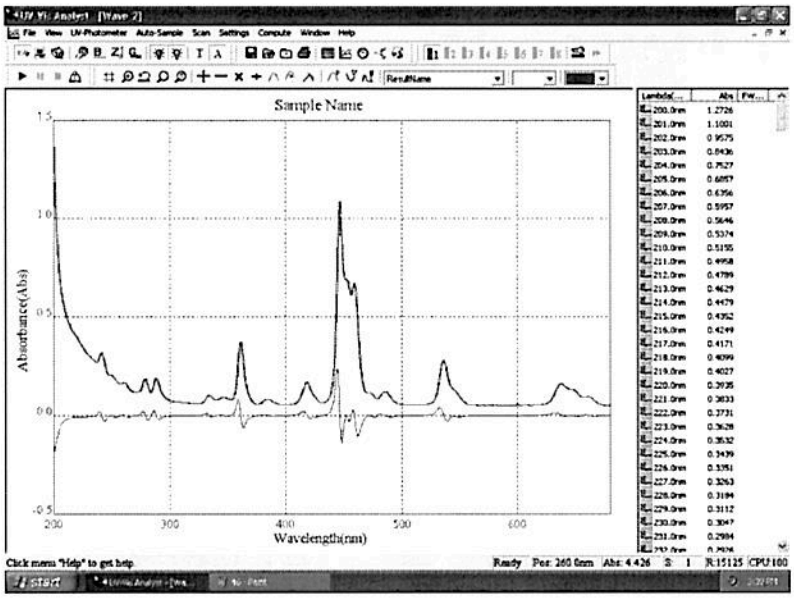

Fig. 4-31

4.3.2.13 Spectrum Multiplication

Multiplying spectrum can assist in the development of artificial structure of spectrum in multi-component mixtures.

Click ✕ on the toolbar. The following dialogue box will be displayed (Fig. 4-32). Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen (Fig. 4-33).

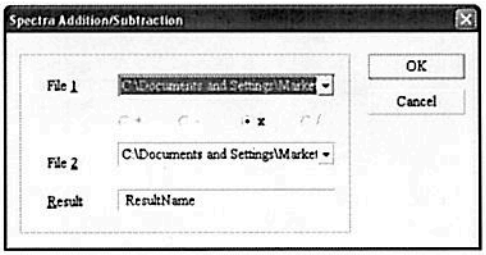

Fig. 4-32

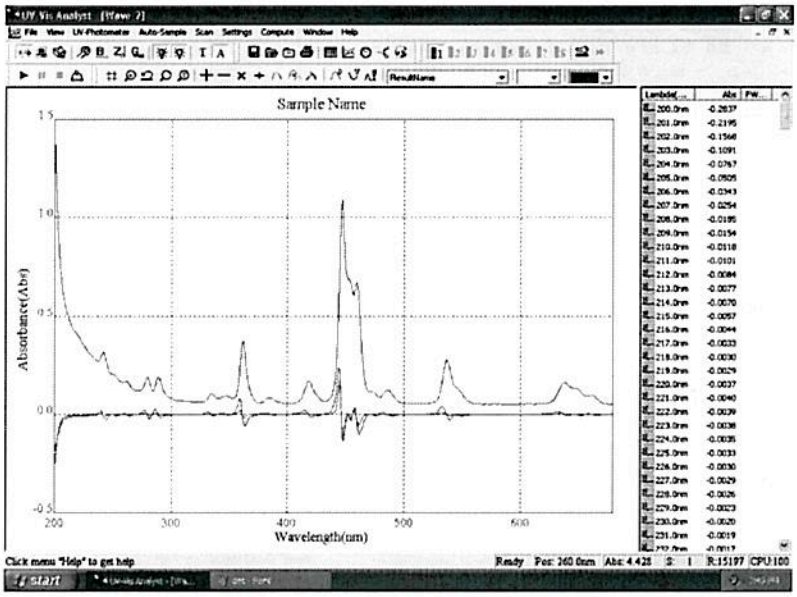

Fig. 4-33

4.3.2.14 Spectrum Division

Dividing one spectrum from another has been a classical technique to offset spectrum interference from the spectrum of interest.

Click ÷ on the toolbar. The following dialogue box will be displayed (Fig. 4-34). Click the **down** arrow next to **File 1** to select a spectrum and define it as source 1. Select a spectrum for **File 2** in the same way. It will not allow you to select the same spectrum twice. Key in a name for the **Result** spectrum and click **OK**. The result spectrum will be displayed on the screen (Fig. 4-35).

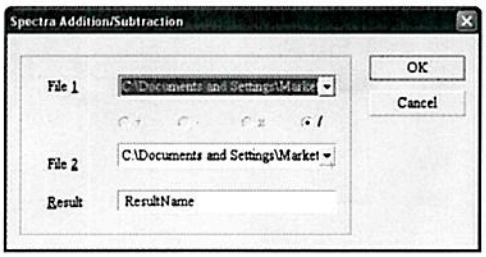

Fig. 4-34

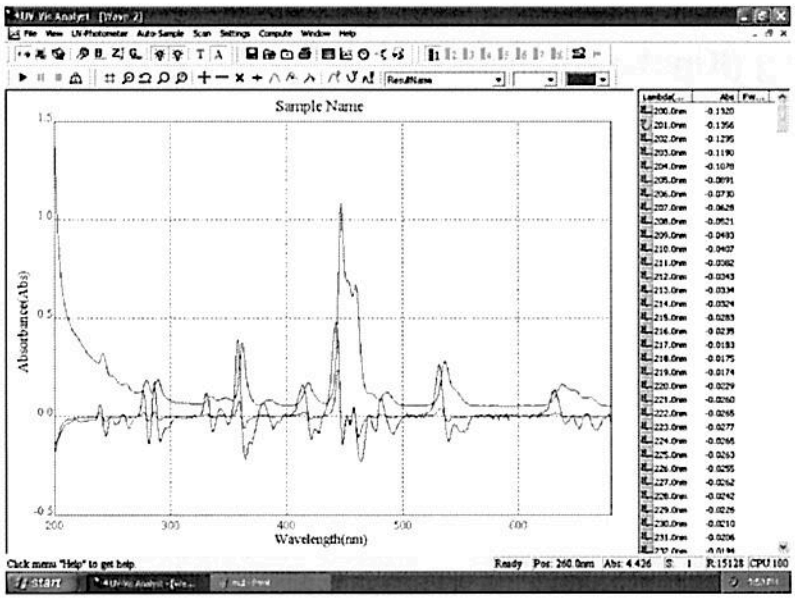

Fig. 4-35

4.3.2.15 Unload a Spectrum

Select the spectrum you want to unload as the **Current Spectrum,** Click on the toolbar to remove the spectrum from the display.

4.3.3 Assistant Functions

4.3.3.1 Define Display Information

Click on the toolbar, appears the **Settings to display and print the spectra** form, click the **Legend** tab (Fig. 4-36), type the information for display.

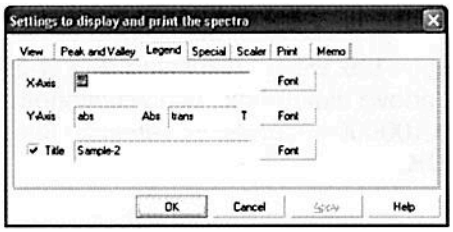

Fig. 4-36

4.3.3.2 Edit Print Information

Click on the toolbar, appears the **Settings to display and print the spectra** form, click the **Print** tab (Fig. 4-37), type the information for print out.

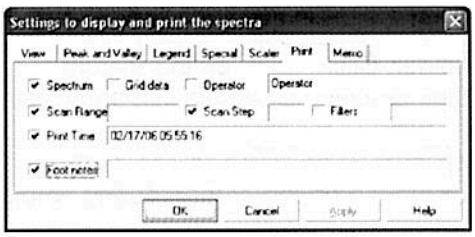

Fig. 4-37

4.4 Time Scanning (Kinetic Analysis)

This chapter tells you how to obtain the absorbance or transmittance value for a sample as a function of time at a given wavelength.

4.4.1 Scan Sample

1. Click  on the toolbar, the following dialog box will appear (Fig. 4-38).

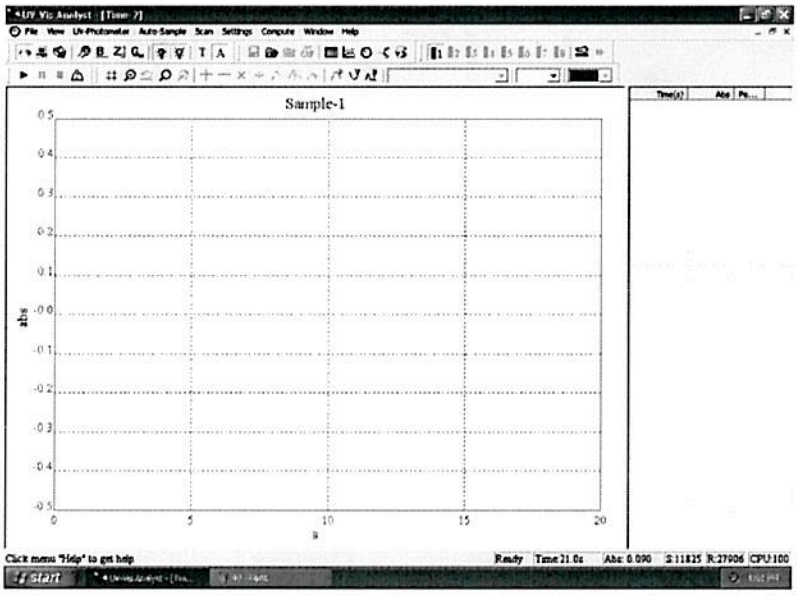

Fig. 4-38

2. Click  on the toolbar to select the %transmittance mode or click  to select the absorbance mode.

3. Click  on the toolbar. A dialogue box will be displayed (Fig. 4-39). Key in the wavelength, total time (in seconds) and scan step in the above dialog box. The wavelength range should be within 190 to 1100 nm. The upper limit for total time is 100000 seconds. Seven scan intervals can be selected from 0.5S, 1S, 2S, 5S, 10S, 30S and 60S. Click **OK**.

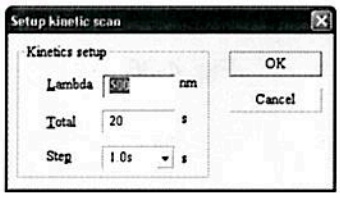

Fig. 4-39

4. Place a reference in the sample holder. Click  on the toolbar.
5. Take out the blank in the sample holder, place a sample in it and close the cover.
6. Place a sample in the sample holder. Click  on the toolbar. The instrument will start scanning automatically. The graph will be displayed on the screen during time scanning (Fig. 4-40). You can stop scanning by clicking  .

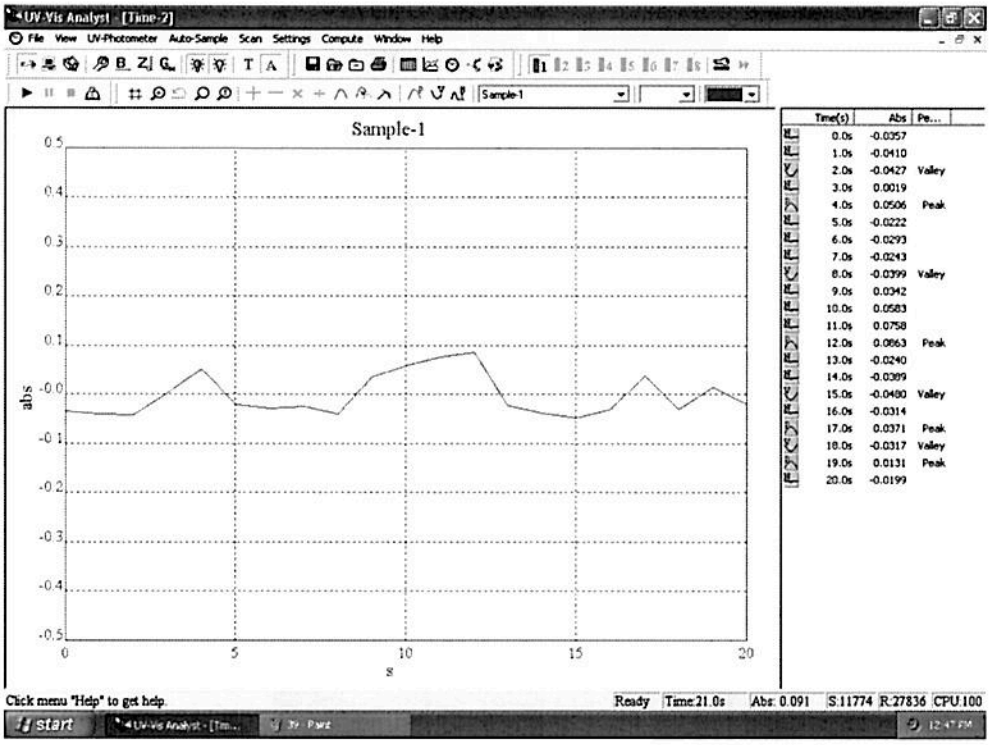

Fig. 4-40

4.4.2 Graph Processing

Please refer 4.3.2.

4.4.3 Assistant Functions

4.4.3.1 Calculate Rate

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Dynamic Analysis** tab (Fig. 4-41), type the begin time in **Time Begin** box, type the end time in **Time End** box, and type the K factor in **K Factor** box, click **Calculate**, the result will be displayed.

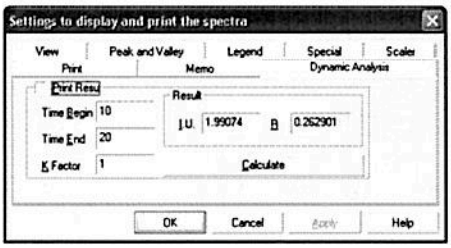

Fig. 4-41

4.4.3.2 Define Display Information

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Legend** tab (Fig. 4-42), type the information for display.

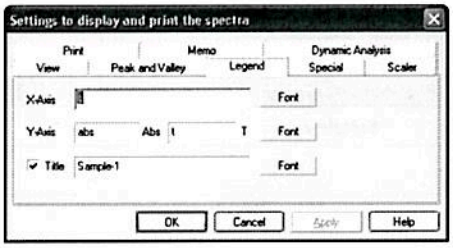

Fig. 4-42

4.4.3.3 Edit Print Information

Click  on the toolbar, appears the **Settings to display and print the spectra** form, click the **Legend** tab (Fig. 4-43), type the information for display.

Fig. 4-43

4.5 DNA/Protein Measurement

This chapter describes how to perform DNA/Protein measurement.

4.5.1 DNA/Protein Measurement

1. Click  on the toolbar, the following dialog box will appear (Fig. 4-44).

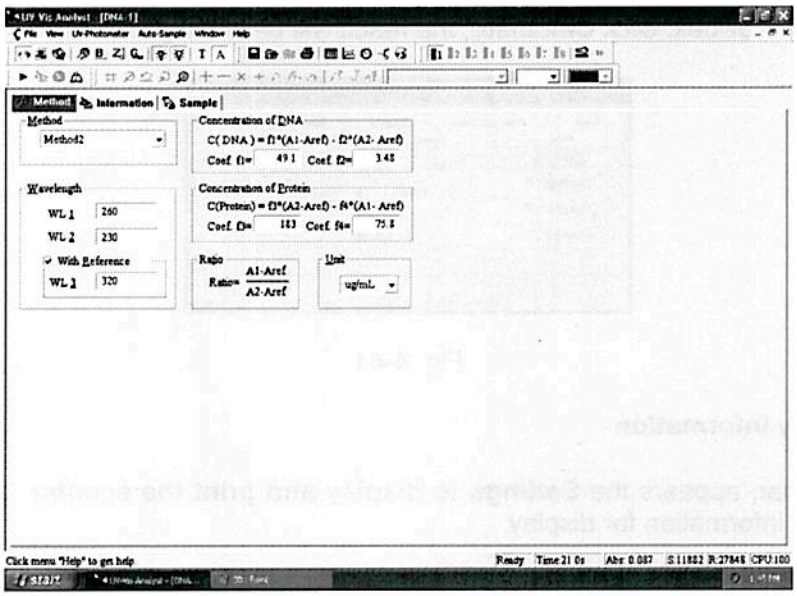

Fig. 4-44

2. Click the **down** arrows of the **method** to select the **test method**. Key in the wavelength position in the **Wavelength** box. Key in the value of **DNA/Protein Conc**.

3. Place a reference in the sample holder. Click  on the toolbar to do blank.
4. Click the **Sample** tab. It will display the following (Fig. 4-45). The control menu contains six buttons: **Start**, **Delete**, **Modify**, **Recalculate**, **Font** and **Print**.

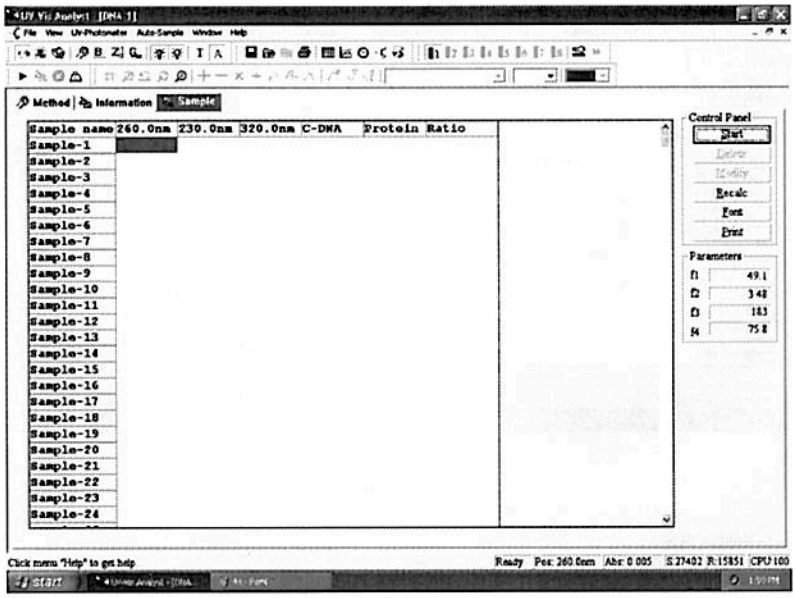

Fig. 4-45

5. Place a sample in the sample holder. Click **Start** or  to run a new measurement. The display will change to the following (Fig. 4-46).

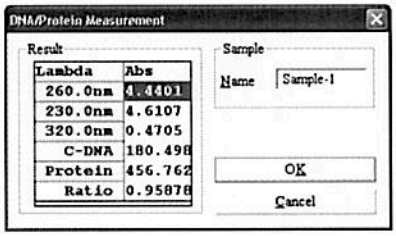

Fig. 4-46

6. The UV-Vis Analyst will read the photometric value of **sample 1** at the fixed wavelength automatically. Key in the sample name in the **Name** box. Click **OK** after the measurement is complete. The photometric data for **sample 1** will be listed in the sample table.
7. Repeat steps 5-6 to test all samples (Fig. 4-47).

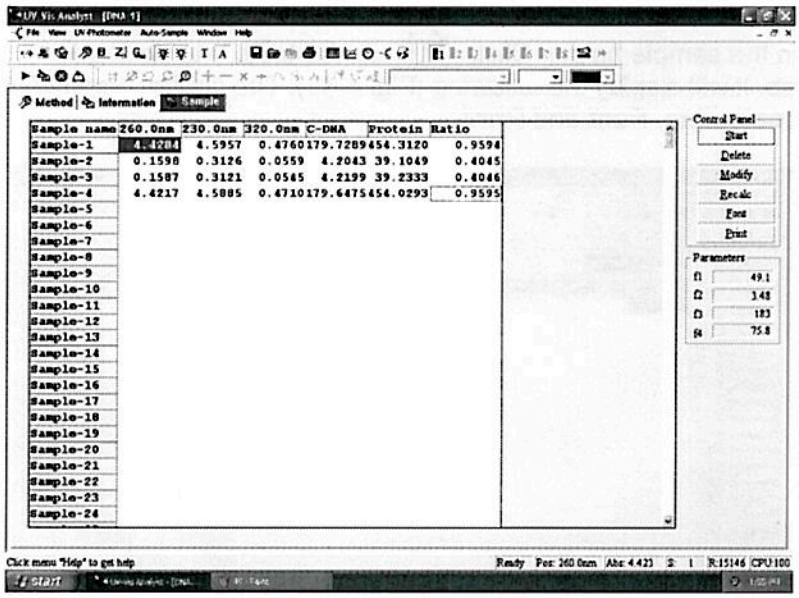

Fig. 4-47

4.5.2 Assistant Functions

Please refer 4.2.3.

5. Instrument Validity

This chapter describes how to perform Instrument Validity.

5.1 Validity Measurement

5.1.1 Photometric Validity Measurement

1. Click  on the toolbar. The following form appears (Fig. 5-1).

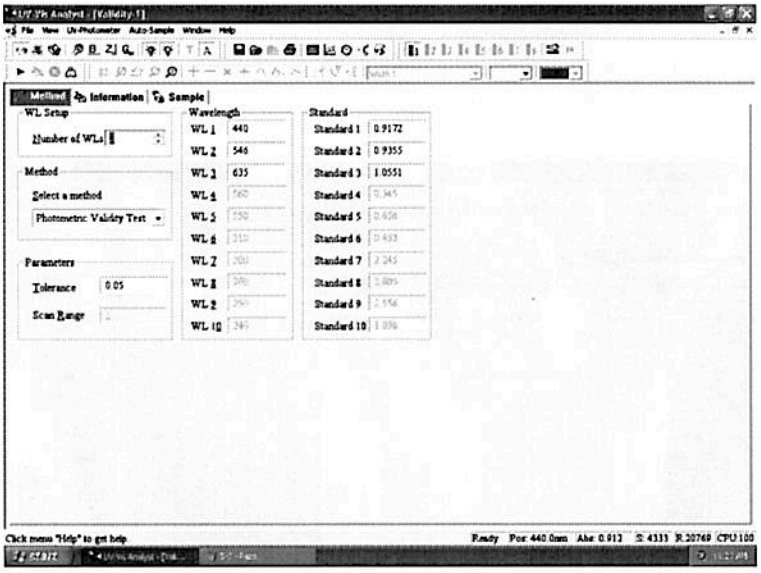

Fig. 5-1

2. Click the **down** arrows of the **method** to select **Photometric Validity Test**.
3. Type the number of wavelength points in the **Number of Points** box, or click the **up/down** arrows next to the box set the wavelength points. Key in the wavelength position in the **Wavelength** box and key in the standard value in the **Standard** box. Key in the tolerance in the **Parameters** box.
4. Place a blank or air in sample holder. Click  on the toolbar to do blank.
5. Click the **Sample** tab. Appears following form (Fig. 5-2).

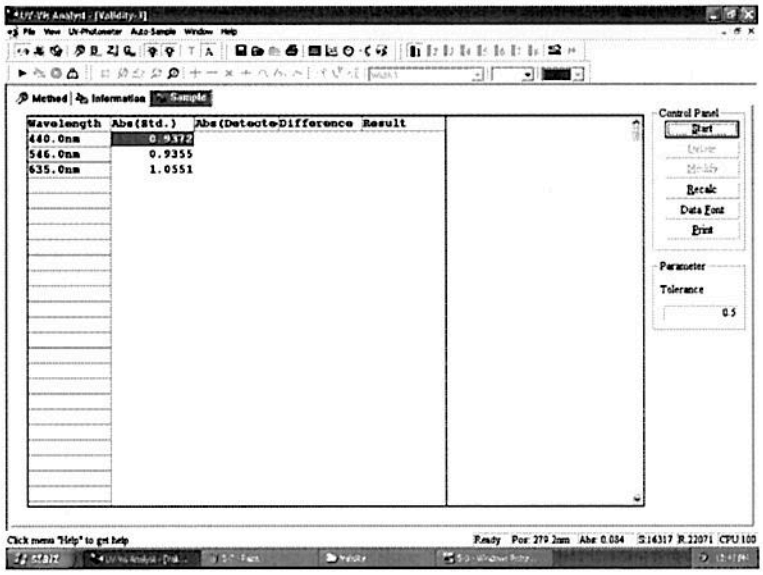

Fig. 5-2

6. Place the **Photometric Standard Filter** in sample holder, click ▶ to run a new measurement, appears following form (Fig. 5-3). Click OK to list the data in the table (Fig. 5-4).

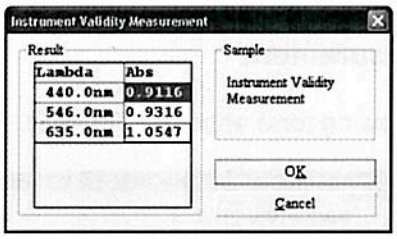

Fig. 5-3

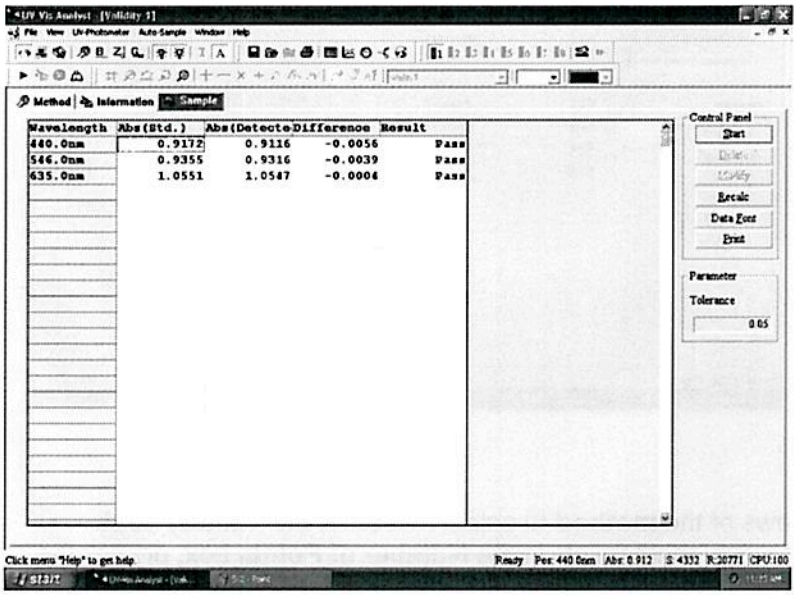

Fig. 5-4

5.1.2 Wavelength Validity Measurement

1. Click  on the toolbar. The following form appears (Fig. 5-5).

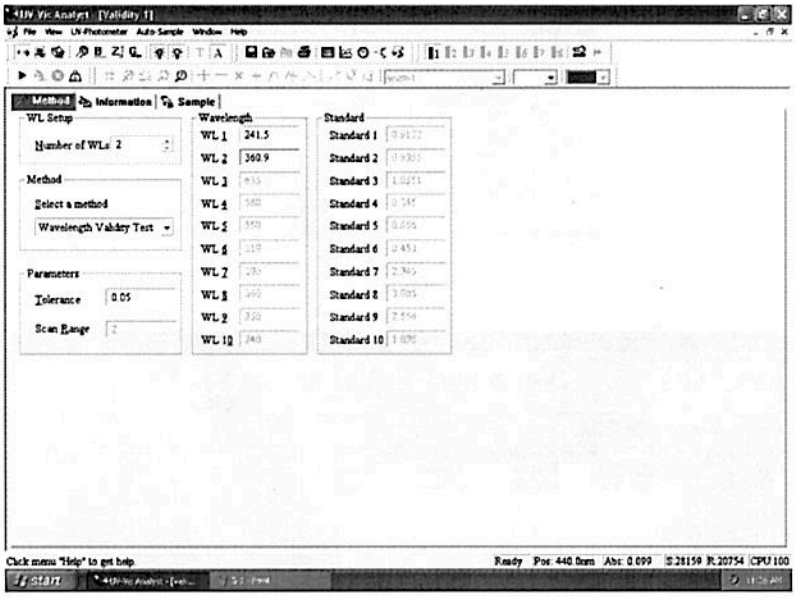

Fig. 5-5

2. Click the **down** arrows of the **method** to select **Wavelength Validity Test**.
3. Type the number of wavelength points in the **Number of Points** box, or click the **up/down** arrows next to the box set the wavelength points. Key in the wavelength position in the **Wavelength** box. Key in the tolerance in the **Parameters** box.
4. Place a blank or air in sample holder. Click  on the toolbar to do blank.
5. Click the **Sample** tab. Appears following form (Fig. 5-6).

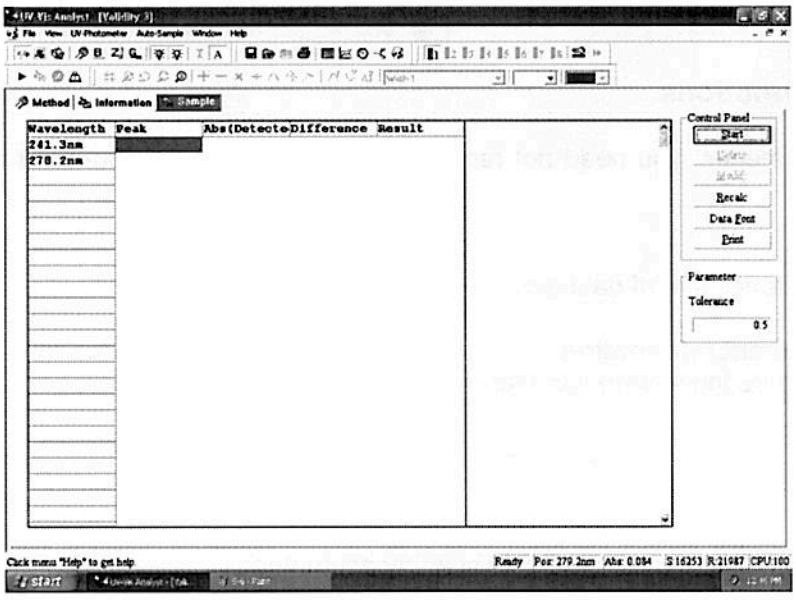

Fig. 5-6

6. Place the **Wavelength Standard Filter** in sample holder, click  to run a new measurement, appears following form (Fig. 5-7). Click OK to list the data in the table (Fig. 5-8).

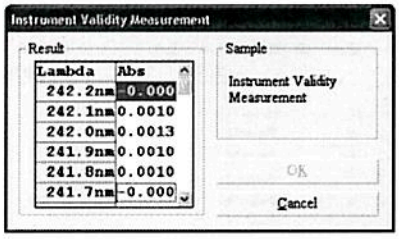

Fig. 5-7

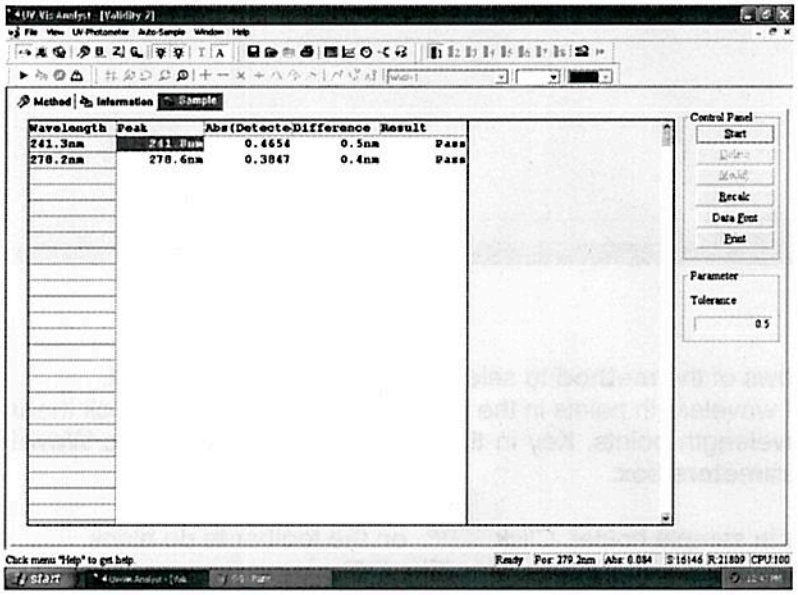

Fig. 5-8

5.1.3 Assistant Functions

5.1.3.1 Recalculate

If you change the parameters, you need not remeasure the samples, click button **Recalculate** to get new values.

5.1.3.2 Set Data Font

Click button **Data Font** to set font of data table.

5.1.3.3 Edit Measurement Information

Click tab **Information**, type the information that will print out with measurement report.

5.2 Energy Scan

1. Click  on the toolbar to new a sample scan measurement.
2. Click  to select Absorbance mode.
3. Click  on the toolbar to set display parameters (Xmin=200, Xmax=1000,Ymin=0,Ymax=6).
4. Click **Scan→Service→Energy Scan** on the Menu, appears following form (Fig. 5-9), select the amplifier, click **OK** to scan (Fig. 5-10). Click  to cancel while scanning.

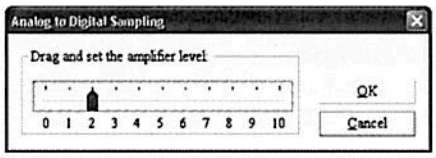

Fig. 5-9

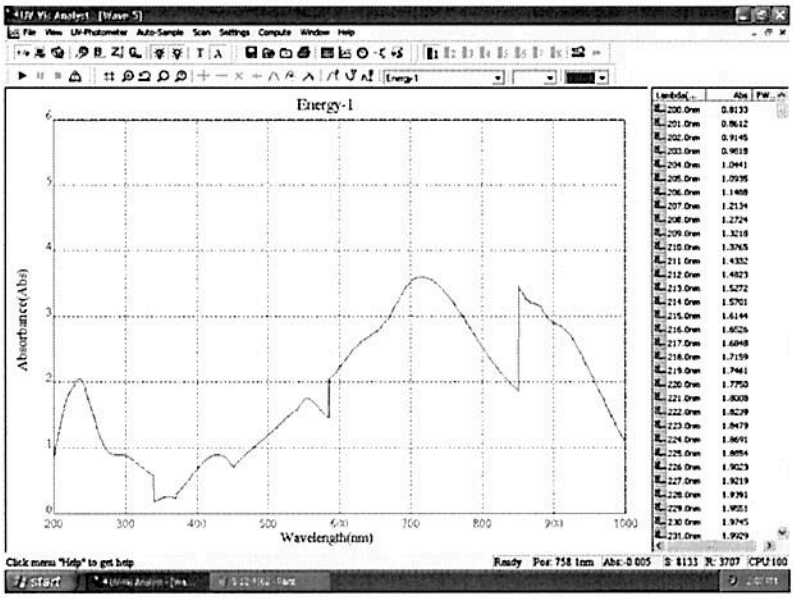

Fig. 5-10

5. The value of every point multiply 10000 is the energy value.

5.3 Spectrum Slitwidth

1. Click  on the toolbar to new a sample scan measurement.
2. Click  to select Absorbance mode.
3. Click  on the toolbar to set display parameters (Xmin.=645, Xmax.=665,Ymin.=0,Ymax.=0.5).
4. Click **Scan→Service→Spectrum Slitwidth** on the Menu, it will scan from 665nm to 645nm. Click  the peak and the spectrum slitwidth value list in the data table (Fig. 5-11).

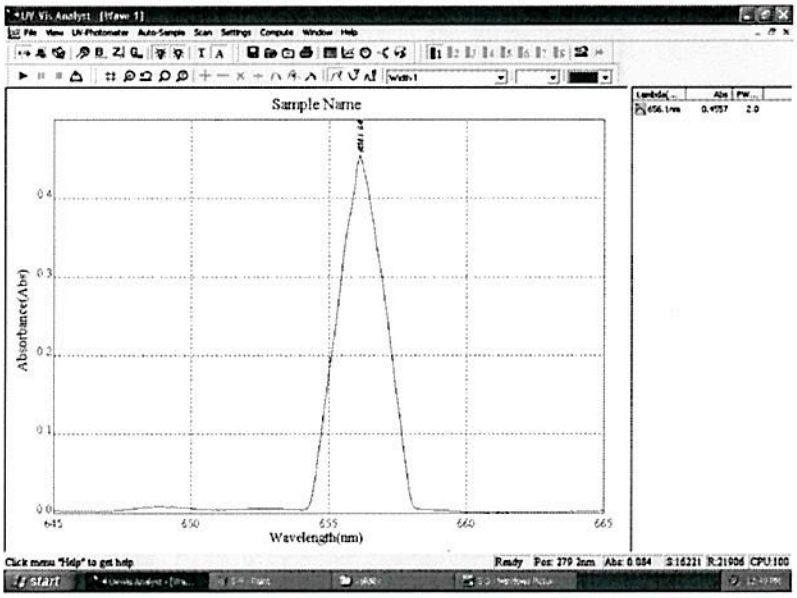

Fig. 5-11

5.4 View Dark Current

Click **UV-Photometer→View Dark Current** on the Menu, it will appears following form (Fig. 5-12), and the dark current value will list in the table.

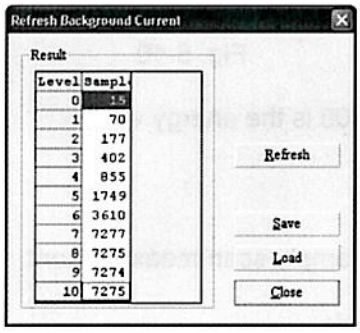

Fig. 5-12

6. Assistant Function

6.1 Control the Instrument

6.1.1 Connect / Disconnect to Spectrophotometer

Click  to connect to spectrophotometer, and appears the following form (Fig. 6-1) if connected successfully. Click again to disconnect.

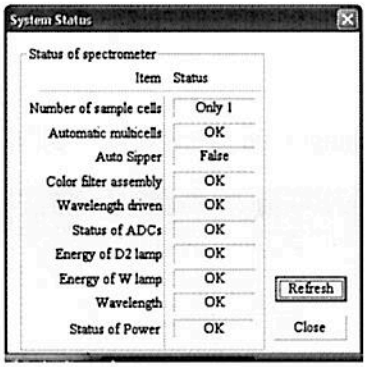

Fig. 6-1

6.1.2 Scan System Baseline

Click  to scan a system baseline.

6.1.3 Switch On/Off W Lamp

Click  to switch off the W lamp, click it again to switch on.

You must warm up the W lamp about 10 minutes before measure samples.

6.1.4 Switch On/Off D_2 Lamp

Click  to switch off the D_2 lamp, click it again to switch on.

You must warm up the D2 lamp for about 20 minutes before measure samples.

6.1.5 Setting the Lamp Switching Wavelength Position

Click **UV-Photometer→D2/W Switch Point** on the menu, appears following form (Fig. 6-2), Key in the lamp switching wavelength position in the **New point** box. It should be within the range 339 nm to 370 nm. Click **Setup** return to the wavelength scan sub-menu.

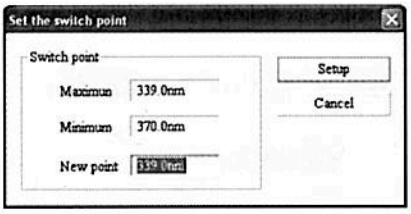

Fig. 6-2

If the switching point of the lamps is changed, a new baseline correction must be performed.

6.1.6 Locate 656.1nm

Keep the light clear. Click **UV-Photometer→Locate 656.1nm** on the menu, the Spectrophotometer will search the 656.1nm.

6.1.7 Change Slitwidth (Only for Variable Bandwidth Models)

Click **UV-Photometer→Change Slitwidth** on the Menu, then select the slitwidth (0.5nm, 1.0nm, 2.0nm or 4.0nm).

6.2 File Operation

6.2.1 Save a File

Click  , a new dialog box will be displayed as follow (Fig. 6-3). Type in a file name, click **Save**.

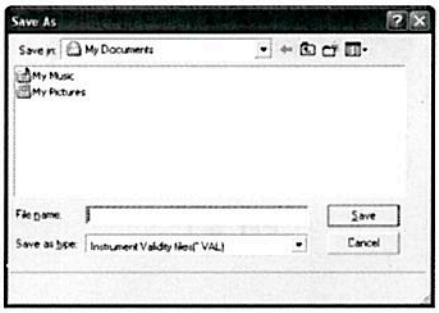

Fig. 6-3

6.2.2 Load a File

Click  , the display will change to the following (Fig. 6-4). Select a folder and filename. Click **Open** to open the selected file.

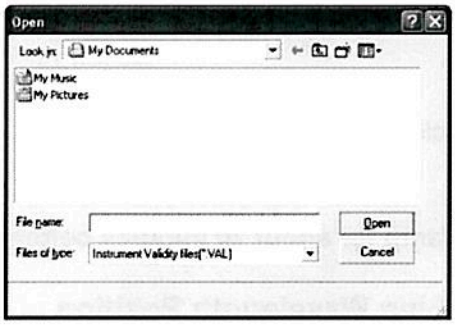

Fig. 6-4

6.2.3 Open a File From Instrument

Click  , the display will change to the following (Fig. 6-5). Select a file type and filename. Click **Open** to open the selected file.

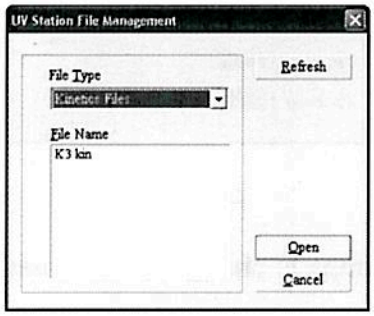

Fig. 6-5

6.3 Password Protection

6.3.1 Setting a Password

Click **UV-Photometer→Change Password** on the menu. The following prompt appears (Fig. 6-6). Enter up to 8 characters in the New Password field. Re-enter exactly the same characters in the Confirm it field.

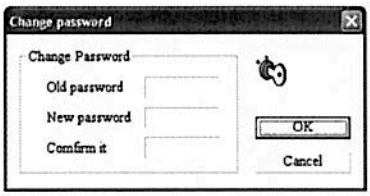

Fig. 6-6

Any characters can be used, but the password is case-sensitive. Ensure you use the same case when entering characters in both fields. If exactly the same characters are not entered in both fields, you will be prompted to try again. If you wish to abort setting a password, clear both fields by deleting all characters there in. Once a password is selected, the next time you start the UV-Vis Analyst, the following prompt will appear (Fig. 6-7) Input your password and click Login.

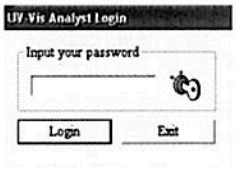

Fig. 6-7

6.3.2 Changing a Password

Once a password has been set, the **New Password** and **Confirm it** fields are greyed out although the **Change Password** field is active. To change the current password, Type the current password in the **Old Password** field. Only if the old password is correct will the **New Password** and **Confirm it** fields become active. Proceed as per "Setting a New Password" and enter the new password in both the **New Password** and **Confirm it** fields.

6.4 Auto sampling (Needs 8-Cell Automatic Cell Changer)

Click  on the toolbar, the following prompt will appear (Fig. 6-8). Tick the numbers of the cells and key the name in the **Name** box. Click **OK**. Click  on the toolbar, it will complete measuring automatically.

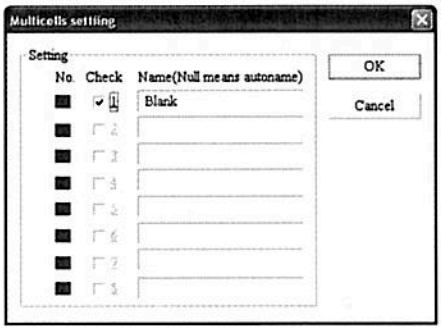

Fig. 6-8