

OPERATION OF THE BECKMAN DU-64 UV/VISIBLE SPECTROPHOTOMETER

The operation of the Beckman DU-64 UV/visible spectrophotometers is illustrated by the following example. A sample is scanned from 700 to 250 nm at 500 nm/min, in absorbance mode from 0.0 to 1.5 absorbance units.

<u>Keystroke</u>	<u>Explanation</u>
VIS	Turns on the visible lamp. "VIS" is displayed.
UV	Turns on the ultraviolet lamp. The letter, "u," is displayed, which changes to "U" when the lamp is ignited. If both the visible and ultraviolet lamps are turned on, "V/u," will be displayed initially, and will change to "V/U," when the ultraviolet lamp is ignited. Allow approximately a 30-minute warm-up period.
ABS	Instructs the instrument to take readings in absorbance units.
SCAN	Selects wavelength scanning mode.
7 0 0 ENTR	Selects the starting wavelength.
2 5 0 ENTR	Selects the ending wavelength.
STEP	Steps through several scanning speeds. Display the preferred speed, 500 nm/min.
ENTR	Selects the chosen scanning speed.
1 . 5 ENTR	Selects the upper absorbance limit. Values up to 2.0 are acceptable.
0 . 0 ENTR	Selects the lower absorbance limit.

Open the sample-chamber cover and make certain that there is no sample in the sample path of the instrument. Then reclose the sample-chamber cover.

CALB	Calibrates the instrument with air as the standard. "Bkg" will appear on the liquid crystal display afterwards.
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Open the sample-chamber cover and insert a UV/visible cuvette containing the background sample, often just pure solvent. **Hold the cuvette by the frosted sides, not the clear sides! Be certain that there are no fingerprints or other impurities on the clear sides, that the clear sides of the cuvette are in the light path and that the frosted sides of the cuvette are not in the light path.** Then reclose the sample-chamber cover.

READ

Scans and stores the background spectrum.

"Scan" will appear on the liquid crystal display afterwards.

Open the sample-chamber cover, replace the background sample with a UV/visible cuvette containing the sample of interest and reclose the sample-chamber cover.

READ

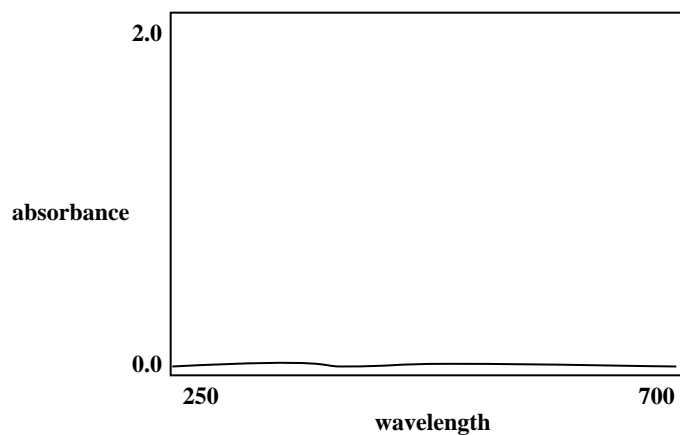
Scans the sample and automatically subtracts the background spectrum. Sends the corrected (subtracted) spectrum to the printer automatically. Be certain that the printer is turned on and is on-line.

Watch the absorbance readings display during the scan to see that the absorbance values do not exceed the upper limit. Values are shown in the upper middle portion of the liquid crystal display. If the upper limit is exceeded, the scan will need to be repeated with a larger upper absorbance limit and/or a more dilute solution. The background scan is still stored in memory and need not be reobtained. After an acceptable spectrum has been printed, open the sample-chamber cover, remove the sample from the instrument and close the sample-chamber cover. Clean the cuvette.

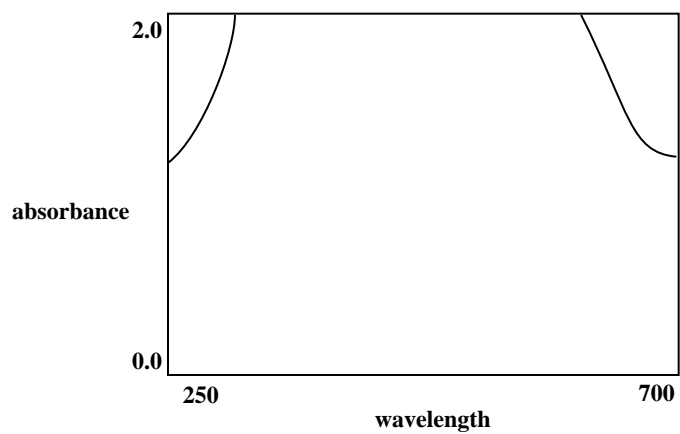
Three spectra are shown in Figure 29 on page 162 to illustrate the preferred appearance of a spectrum:

1. Too dilute a sample. The spectrum is barely visible from the baseline. Unacceptable.
2. Too concentrated a sample. The spectrum goes off-scale. Also unacceptable.
3. Proper sample concentration. Just right!

a. Too dilute a sample. The spectrum is barely visible from the baseline. Unacceptable.



b. Too concentrated a sample. The spectrum goes off-scale. Also unacceptable.



c. Proper sample concentration. Just right!

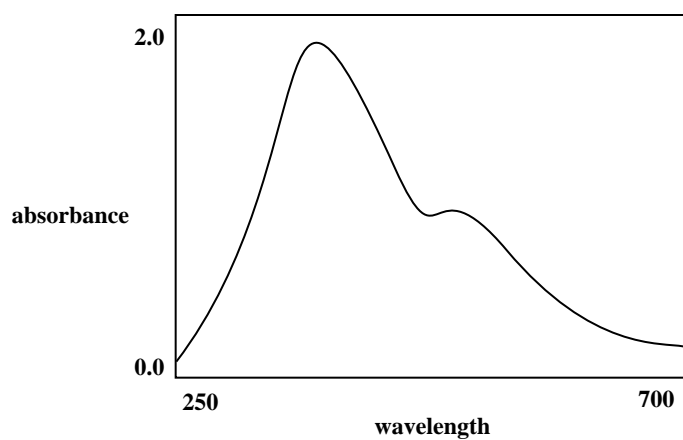


Figure 29. Appearance of an ultraviolet/visible spectrum.