T17 Spectrophotometer

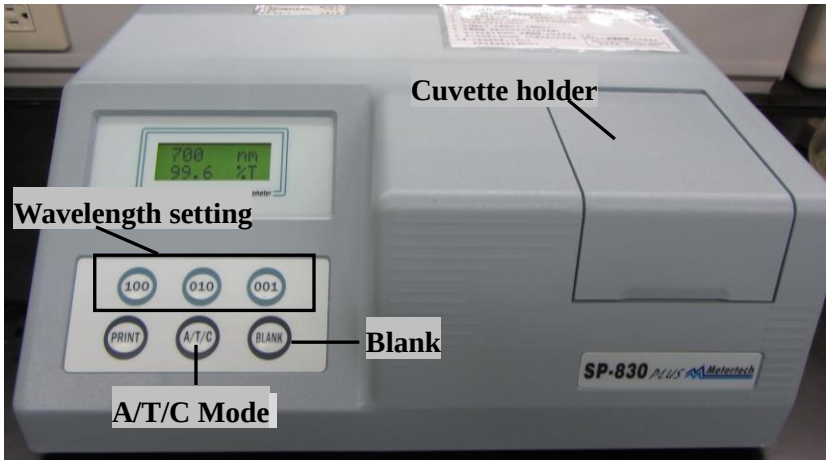

Figure T17-1 SP-830 PLUS/SH-U830 frontward control keys of spectrophotometer

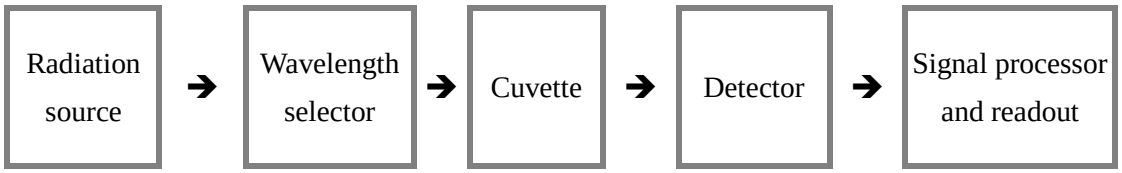

Figure T17-2 Illustration showing the basic components of spectrophotometer

The spectrophotometer (Fig. T17-1) is used to measure radiation absorption. Its basic components are shown as Fig. T17-2. Absorption spectra are produced when ions or molecules absorb visible or ultraviolet electromagnetic radiations. Studies of these spectra are valuable laboratory tools. In practice, the wavelength that is selected for measurements of absorbance at different concentrations of the same material is the wavelength at which maximum absorbance takes place.

Operation

I. Calibration of spectrophotometer:

1. Turn on power and warm up for 15~20 min.
2. Check the cuvette holder is empty and no cuvette in it.
3. Press «**A/T/C**» Mode key and set to A (Absorbance).
4. Set the analytical wavelength (i.e. 620 nm).
5. Press «**BLANK**» key to zero set.

II. Blank adjust:

1. Rinse cuvette twice with small amount of blank solution.
2. Add solution to 1/2 height and wipe it clean with lens cloth. Never touch the lower part of the tubes with your fingers. Fingerprints absorb and scatter light.
3. Insert the solvent-blank cuvette into cuvette holder, align cuvette in same direction to control the path of the light, and close the lid.
4. Press «**BLANK**» key to blank adjust.
5. Remove the blank cuvette, and recycle the blank.

III. Measurement of absorbance:

1. Use a small amount of sample solution to rinse the cuvette twice, and refill to 1/2 height, then wipe it clean.
2. Insert the sample cuvette, align cuvette in same direction, close the lid, and read the absorbance.

IV. Note:

1. Do not brush and oven dry the cuvette. Never use a test tube to replace the cuvette.
2. Hold top of cuvette while operating.
3. Wipe the cuvette clean with lens cloth and never use tissue or paper towel.
4. Use the same cuvette, and align cuvette in same direction to accomplish all the measurements.
5. When measuring a series of standard solution, always start testing **from low concentration to high.**
6. When changing the wavelength, you should redo blank adjust again.

V. After experiment:

1. Turn off the spectrophotometer.
2. Do not leave cuvette in the holder.
3. Rinse the cuvette with DI water and return it to lab instructor.
4. Put dust cover on spectrometer.
5. Discard waste liquids into recycling bin.

References

1. Shugar, G. J.; Shugar, R. A.; Bauman, L.; Bauman, R. S. *Chemical Technicians' Ready Reference Handbook*; 2nd ed.; McGraw-Hill Book Co.: New York, 1981.
2. Manual of SP-830 PLUS v.2010.