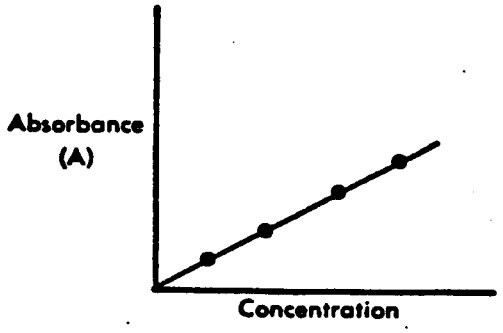
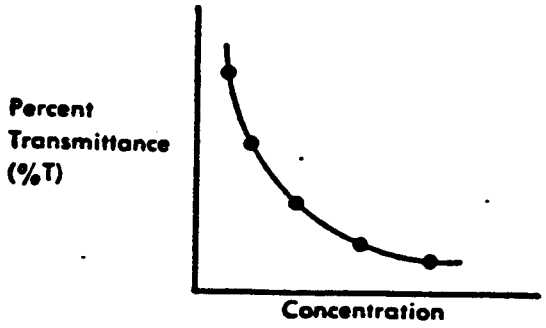
# Use of the Spectrophotometer

The spectrophotometer ("colorimeter") is an instrument used in physiology research and in clinical laboratories to measure the concentration of substances in solutions. Use of the spectrophotometer is based on a principle called Beer's Law. Beer's Law states that the concentration of a substance in a solution is directly proportional to the amount of light absorbed by that solution (and inversely proportional to the logarithm of the amount of light transmitted through the solution).




Concentration $\alpha$ light absorbed by a substance

Concentration $\alpha$ $\log \frac{1}{\text{light transmitted by through solution}}$

However, Beer's Law applies only if the "incident light" (the light which enters the solution) is monochromatic, that is, composed of light of a single wavelength ($\lambda$). White light is actually a mixture of all the different wavelengths of electromagnetic radiation between 380 and 750 nanometers (nm). Our brain interprets these wavelengths of electromagnetic radiation as different colors.