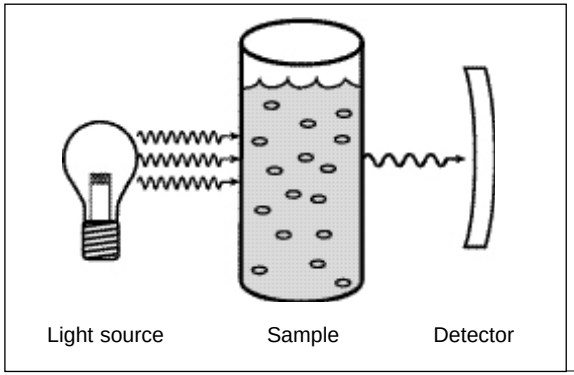
Optical Measurement

Light

When light passes through a liquid, the amount of particles and color in solution will affect the light. Optical techniques measure solution characteristics by using a defined light source, passing the light through a sample, and then measuring the light that passes through the sample. Turbidimetric and colorimetric methods both involve measuring the resulting light intensity. They differ in that the light is attenuated by scattering in turbidimetry and by absorption in colorimetery.

Both determinations may use similar instrumentation. By employing different wavelengths of light and different optical configurations, we can optimize the system for determining the transmitted light of interest for a given analytical method.



Turbidimetry

The cloudiness in a liquid caused by the presence of finely divided, suspended material is called “turbidity.” Turbidity meters provide a means of quantifying this “cloudiness” by determining the reduction of light passing through
a turbid solution and then comparing the results against a standard.
In some applications the clarity of solution is critical. In other applications the appearance of particles indicates bacterial growth. In either case the turbidimeter provides process numerical data on the sample solution.

Colorimetry

The colorimetric method of chemical analysis involves the measurement of light absorption by colored solutions. While the differences an color development are visible to the human eye, visual determination is subject to user interpretation. Colorimeters eliminate the differences encountered with color comparitors to produce an exact numerical value—with greater resolution that can be achieved through comparitors. Colorimeters use the well-understood principals of wet chemistry to provide precise, repeatable analysis methods. For example, the standard DPD method for determining free and total chlorine is well accepted and approved by the US EPA.