

Turbidimetry and Colorimetry

Turbidimetry

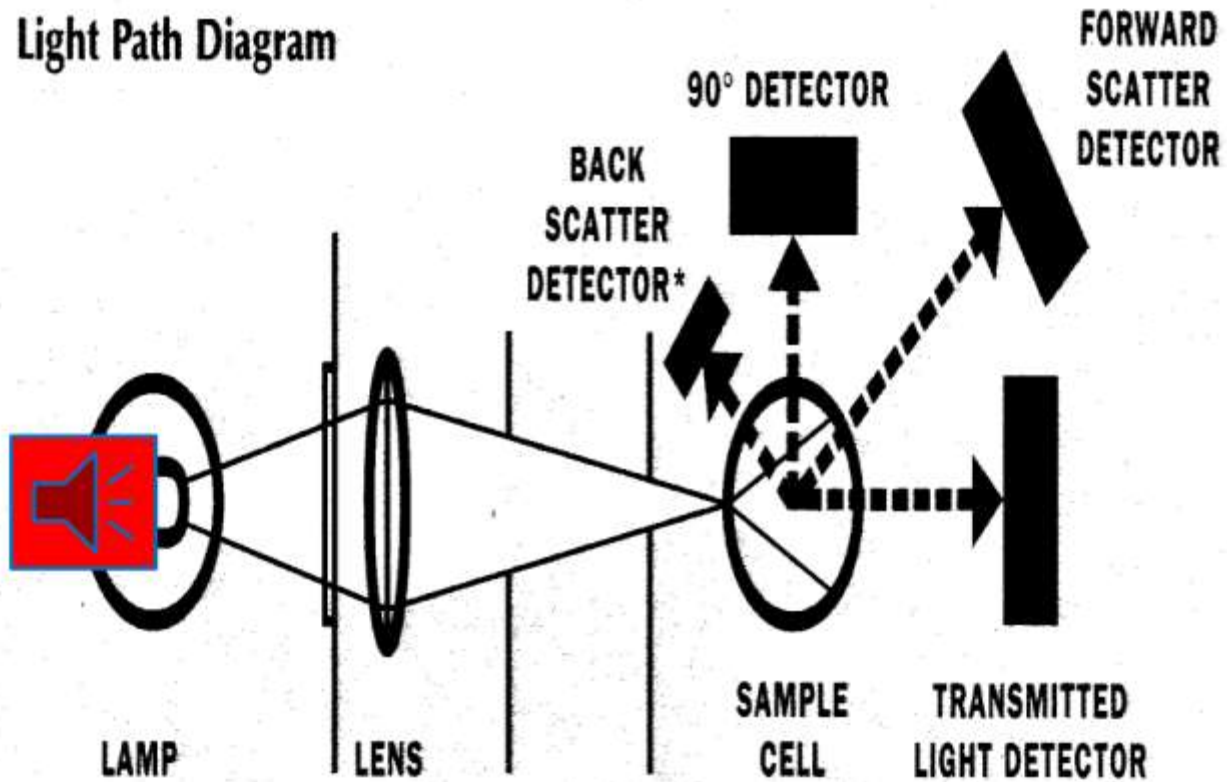
- Turbidity, measured in Nephelometric Turbidity Units (NTU), refers to the concentration of undissolved, suspended particles present in a liquid.
- It is a measure of sample clarity, not colour.
- cloudier a sample, the higher the turbidity reading. High turbidity is caused by particles such as silt, clay, microorganisms and organic matter.
- By definition, turbidity is not a direct measure of these particles, but how these particles scatter light.
- Scattering of light may be measured by:
 - Turbidimetry
 - Nephelometry
- Turbidity is an important parameter in many manufacturing operations, such as food and beverage and potable water treatment plants.
- In drinking water applications, the turbidity of water may indicate the presence of bacteria, pathogens or particles that can shelter harmful organisms from the disinfectant process; in industrial processes, turbidity is a parameter to measure the effectiveness of treatment of manufacturing processes.

Nephelometry

- It deals with analysis of colloidal system. It is based on the scattering of light by particles suspended in a liquid.
- **Principle :-**
- Nephelometry is concerned with the measure of the intensity of **scattered light** as a function of the concentration of the suspended particles in a suspension.
- Intensity of scattered light is directly proportional to the concentration of the suspended particles.
- Hence, greater concentration of particles results in higher intensity of light.
- The intensity of the scattered light is usually measured at 90° to the incident light.

NEPHELOMETER

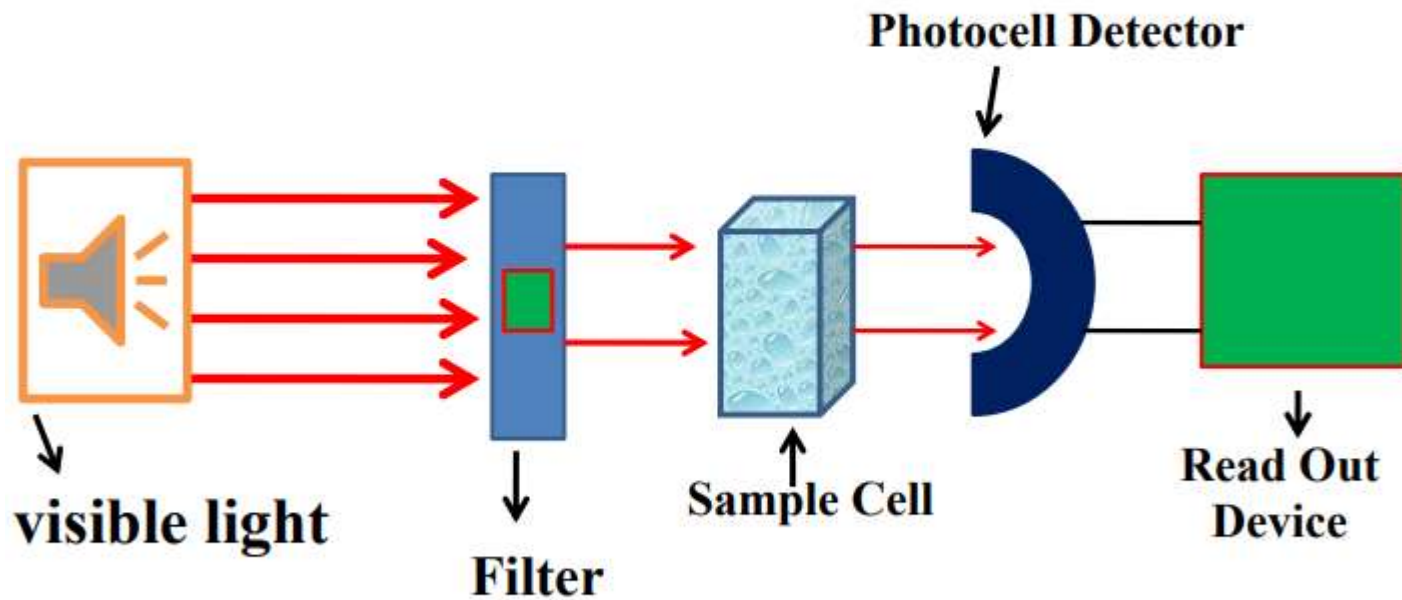
Light Path Diagram



Turbidimetry

- It deal with analysis of colloidal system and the technique is based on transmission of light by particle suspended in a liquid.
- **Principal :-**
- Turbidimetry is concerned with the measure of the intensity of the transmitted light as a function of concentration of the suspended particle in a suspension.
- The intensity of transmitted light is measured in a line i.e 180° to the incident light.
- Intensity of transmitted light is inversely proportional to the concentration of the suspended particle
- Hence concentration is more transmission is less.

Turbidimeter



THEORY

- Turbidimetry deals with measurement of Intensity of **transmitted light** .
- Nephelometry deals with measurement of Intensity of **scattered light**.
- Turbidometric measurements are made at 180° from the incident light beam.
- In Nephelometry, the intensity of the scattered light is measured, usually at *right angles to the incident light beam*.

Colorimetry

- **Colorimeter refers to a device used in colorimetry that aids in the absorption of a particular wavelength of light by a specific sample solution.**
- Louis J. Duboscq invented it in the year 1870.
- It is employed to measure how much light transmits and absorbs as it passes through a liquid.
- These are used to identify the color and establish the concentration of a solution.
- By comparing a solute's color intensity in a solution to that of a reference solution with a known solute concentration, one can estimate the concentration of colored solute in that solution.
- The source of light should produce energy with enough intensity to cover the entire visible spectrum (380-780 nm).
- Commonly, Tungsten lamps are used as a light source for measurement in the visible spectrum and near-infrared ranges.



Colorimetry vs Spectrophotometry

More Information Online: WWW.DIFFERENCEBETWEEN.COM

	Colorimetry	Spectrophotometry
DEFINITION	The technique we use to determine the concentration of a solution having color	The technique of measuring how much light a chemical substance absorbs by measuring the intensity of light as a beam of light passes through a sample
WAVELENGTH	Uses fixed wavelengths, which are in the visible range	Can use wavelengths in a wider range (UV and IR also)
SAMPLE COLOR	Need to use colorful samples	Need to use colorless samples
QUANTIFICATION	Quantifies color by measuring three primary color components of light (red, green, blue)	Measures the precise color in the UV-visible light wavelengths
MEASUREMENT	Measures the absorbance of light	Measures the amount of light that passes through the sample