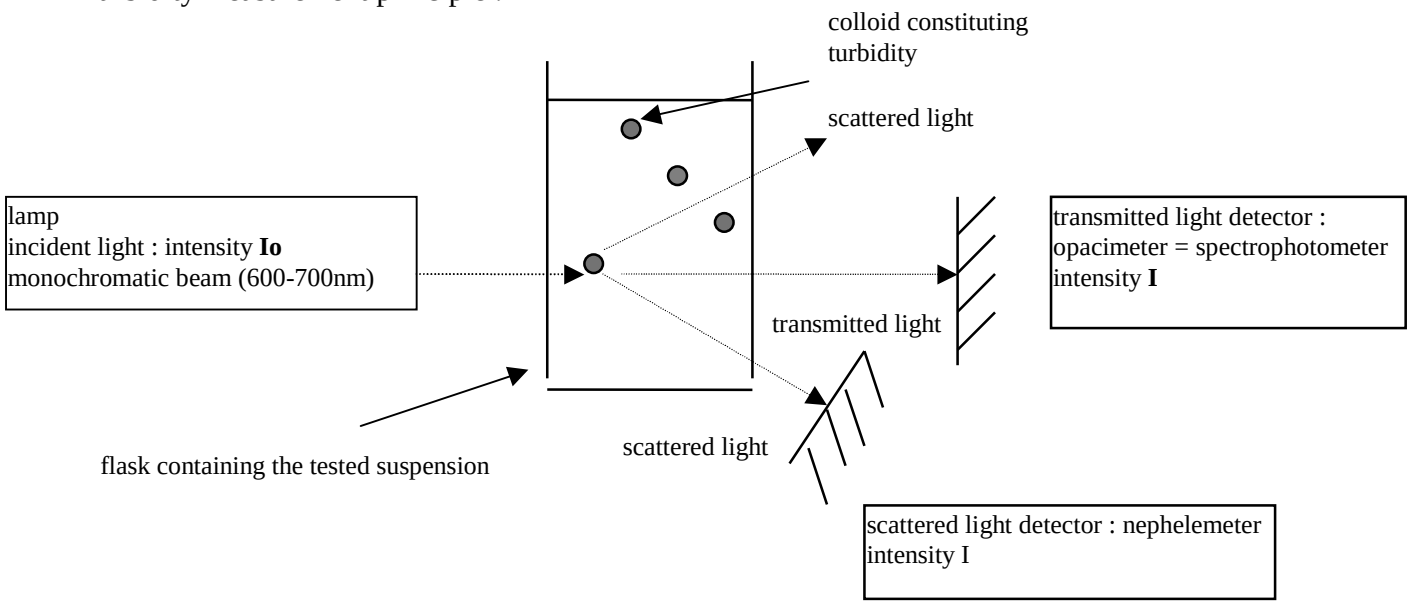
C14 - Turbidity and Turbidimeter

Principle :

Turbidity is a measure of water suspended solids (SS) concentration ; these SS are represented by large substances (fine sand…) and by microscopic matters (colloids). All these matters constitute an heterogeneous medium : a suspension (on the contrary, a solution contains dissolved molecules and ions, is not turbid but can be coloured).

Colloids are matters which constitute water turbidity once all large SS have settled.

Turbidity measurement principle :



In fact, there are opacimters and nephelometers, measuring respectively, transmitted light intensity and scattered light intensity. For an opacimeter :

T = I / Io is transmittance
$A = Log_{10} (Io / I)$ is absorbance

these 2 data will be useful in molecular absorption spectrophotometry theory

Here, A = constant * [SS]
Turbidity is proportional to the suspension SS concentration.

Some turbidimeters measure both of transmitted and scattered light intensity, and indicate a medium value : turbidity is also proportional to [SS]

The word "turbidimeter" means the whole range of photometers measuring turbidity.

Main unit : **NTU** : Nephelometric Turbidity Unit

Calibration :
Two ways :
- rapid calibration with standard gel : it must be done regularly in order to observe a difference with the precedent measure
-annual calibration with formazin suspension standard.

Field of application : drinking waters (< 1 to 5 NTU), industrial waters