

# Different Techniques of Analysis



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# Analytical Chemistry

## ■ What is it?

# What is Analytical Chemistry?

- Application of a process or series of processes in order to indentify and/or quantify a substance, the components of a solution or mixture, or the determination of the structure of chemical compounds.

# Types on basis of analyte size

1. Macro Analysis-0.1g
2. Meso (Semimicro) Analysis-0.01 to 0.1g
3. Micro Analysis-0.001g to 0.01g
4. Submicro Analysis-0.0001g to 0.001g
5. Ultramicro Analysis-0.0001g

# Classification of Analytical Chemistry

## ■ Qualitative Analysis

- It gives information about atomic and molecular species or the functional group in sample.
- Mp,bp,specific gravity, RI,Absorbance, Optical rotation, Viscosity, particle size,etc.

## ■ Quantitative Analysis

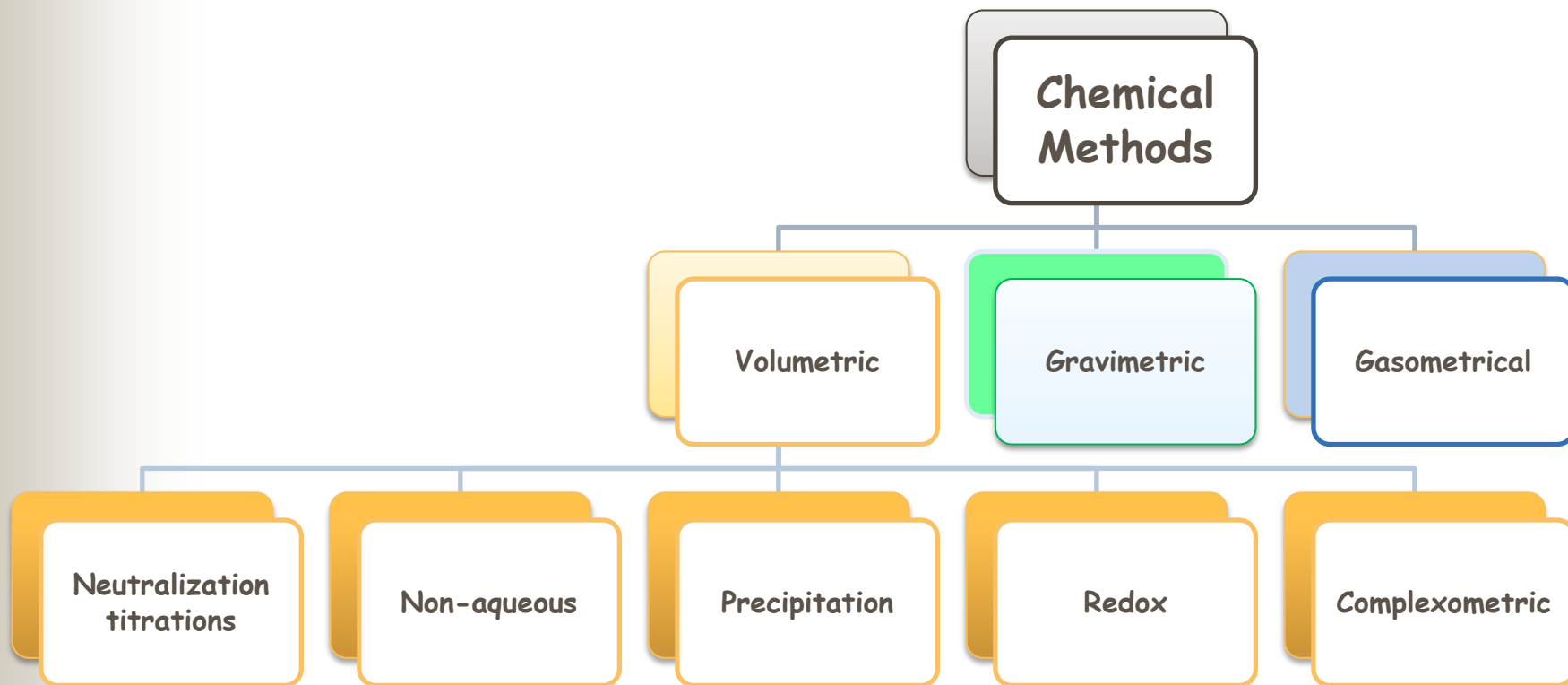
- It gives relative amount of one or more of the analyte in numerical terms.



# Analytical Methods

1. Chemical Methods
2. Physico-chemical Methods
3. Microbiological Methods
4. Biological Methods

# 1. Chemical Methods

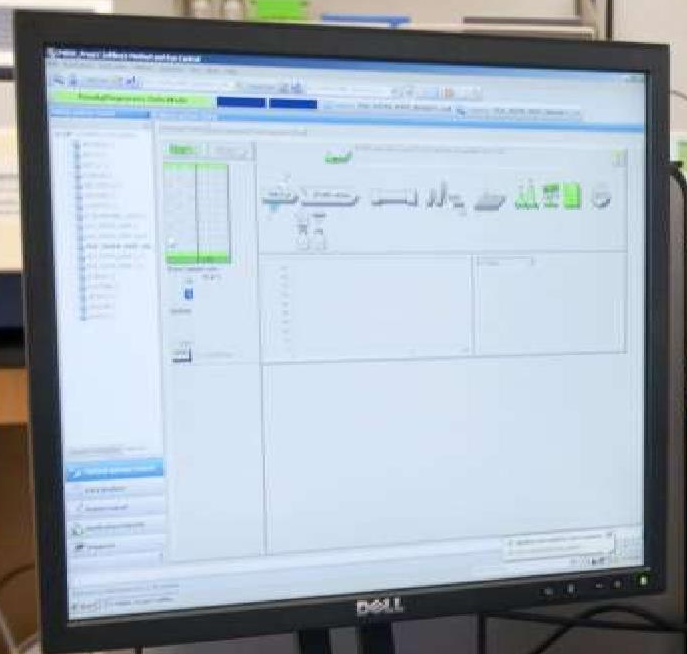


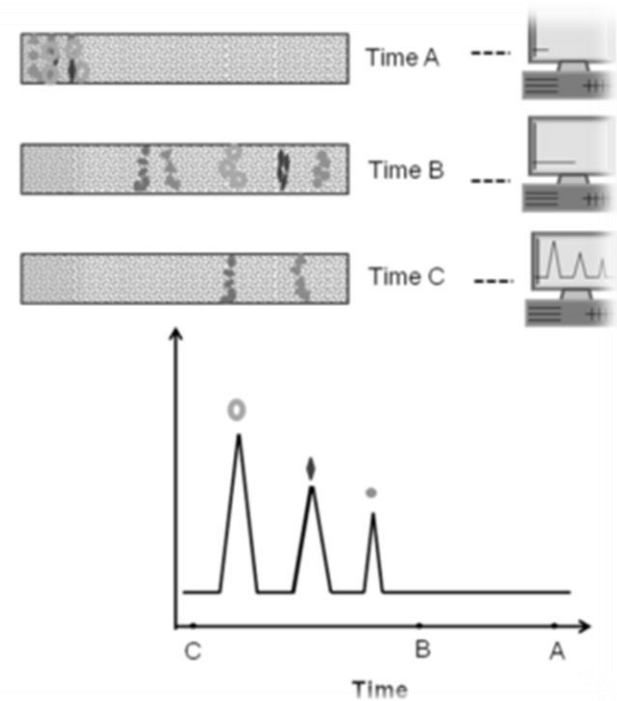
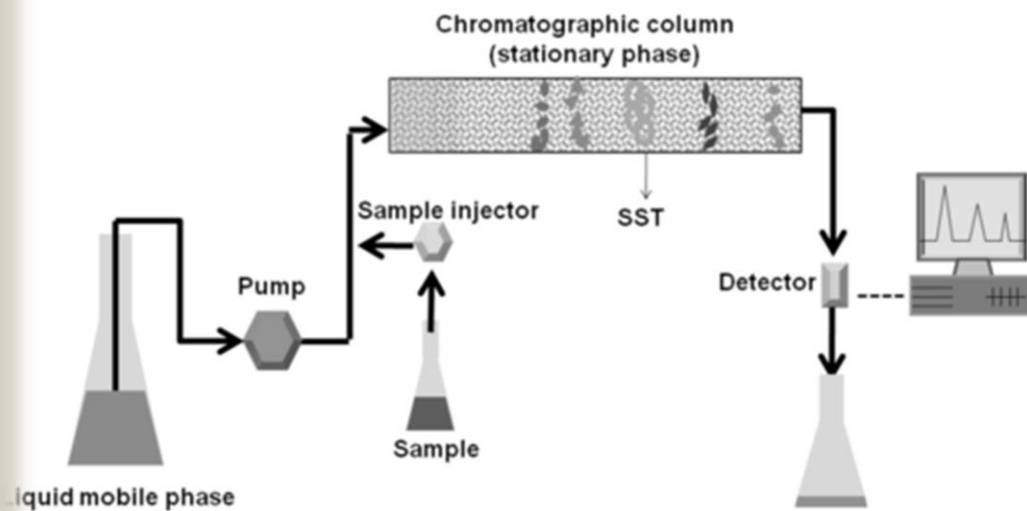


## 2. Physico-chemical Methods

Physical Properties	Instrumental Methods
1. Electrical potential	Potentiometer
2. Electrical conductance	Conductometry
3. Electrical current	Paleography, voltametry
4. Absorption of radiation	Spectrophotometry
	Colorimetry,
	Atomic absorption spectroscopy
5. Emission of radiation	Emission spectroscopy
	Flame photometry
	Fluorimetry
6. Scattering of radiation	Turbidimetric, Nephelometry
7. Refraction of radiation	Refractometry
8. Rotation of plane	Polarimetry
Polarized light	Optical rotatory dispersion
9. Thermal properties	Thermal method
10 Mass to charge ratio	Mass spectrometry







Block Diagram of HPLC

# Present day Instrumental Analysis

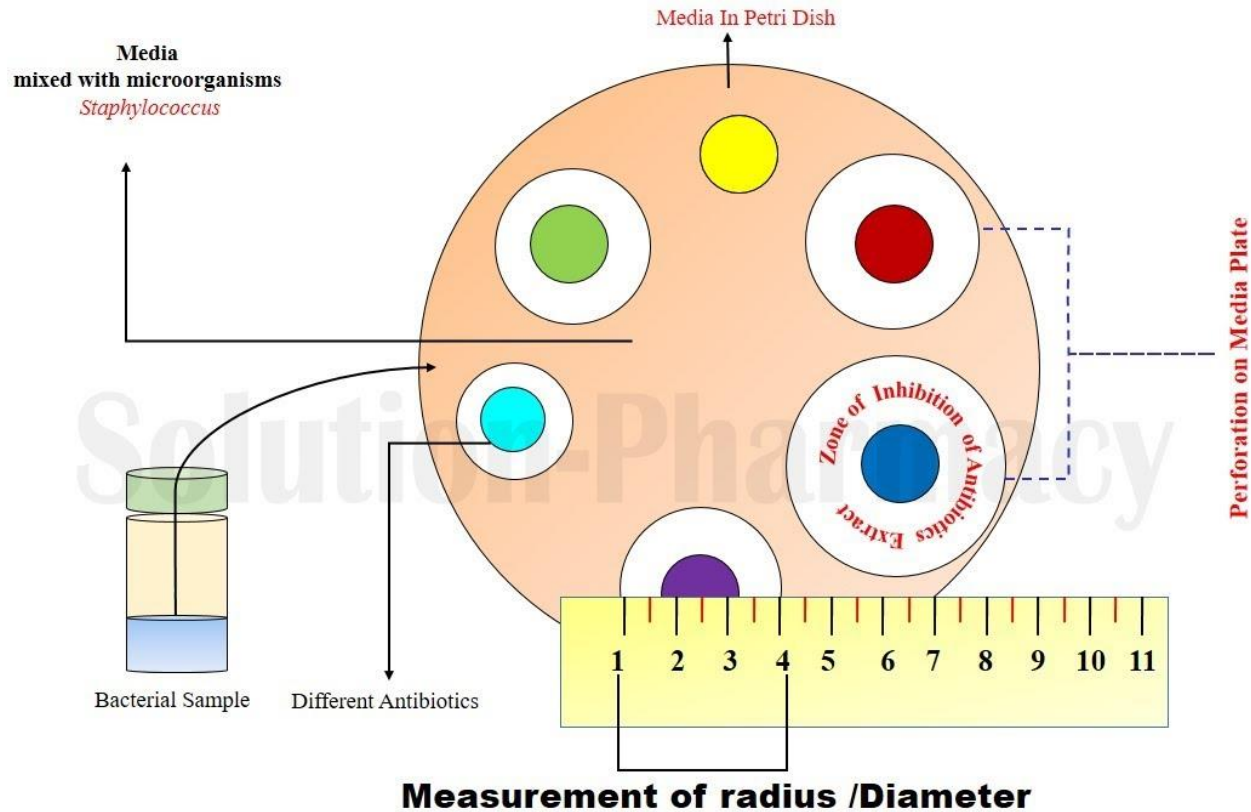
- Better and Faster
- More Data (Images)
- Miniaturization
- Better data processing methods - Chemo  
metrics



### 3. Microbiological Methods

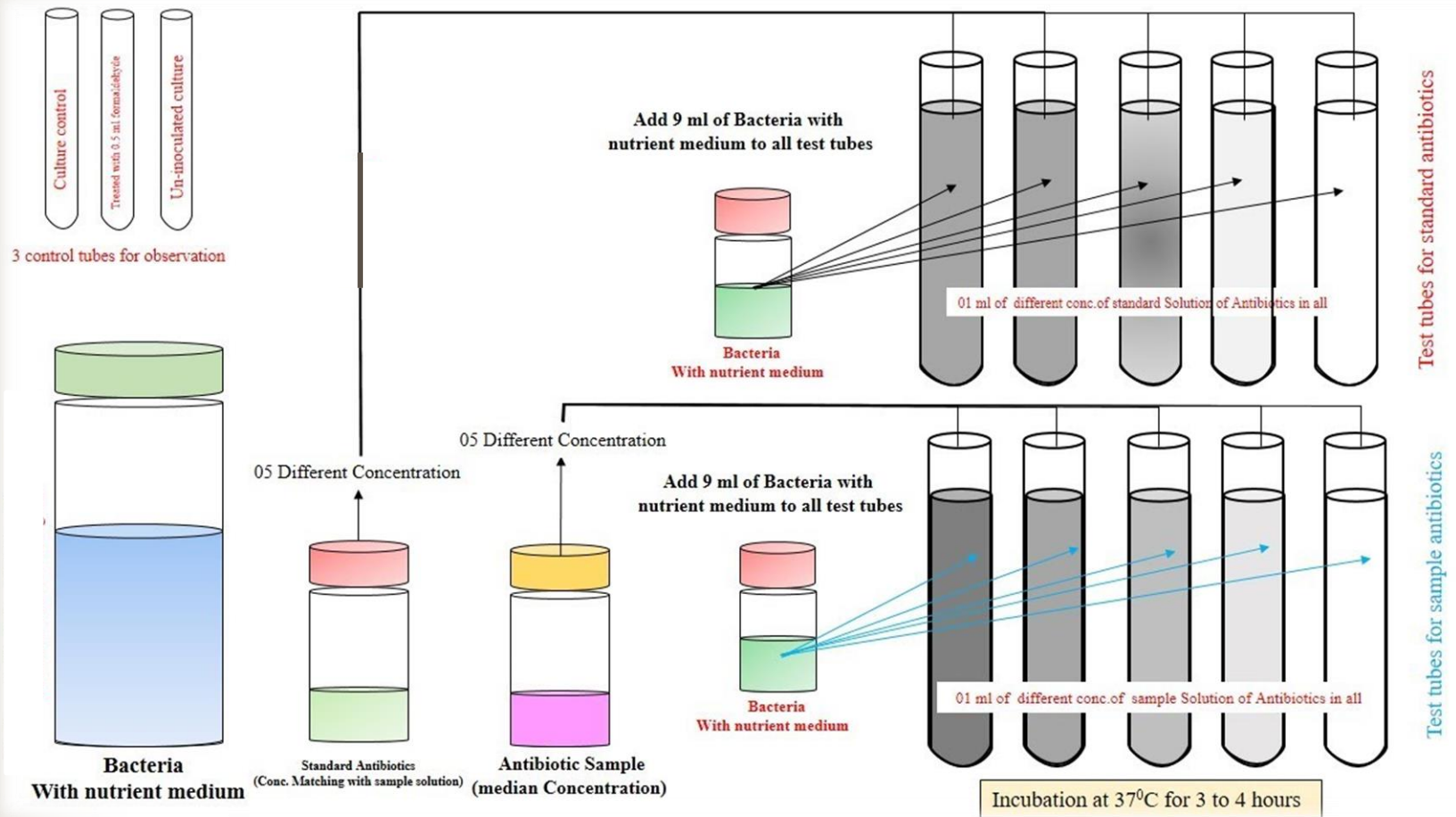
Diagram is Made by- Solution-Pharmacy

Facebook-YouTube-Instagram



Cylindrical Plate (or Cup Plate) Method

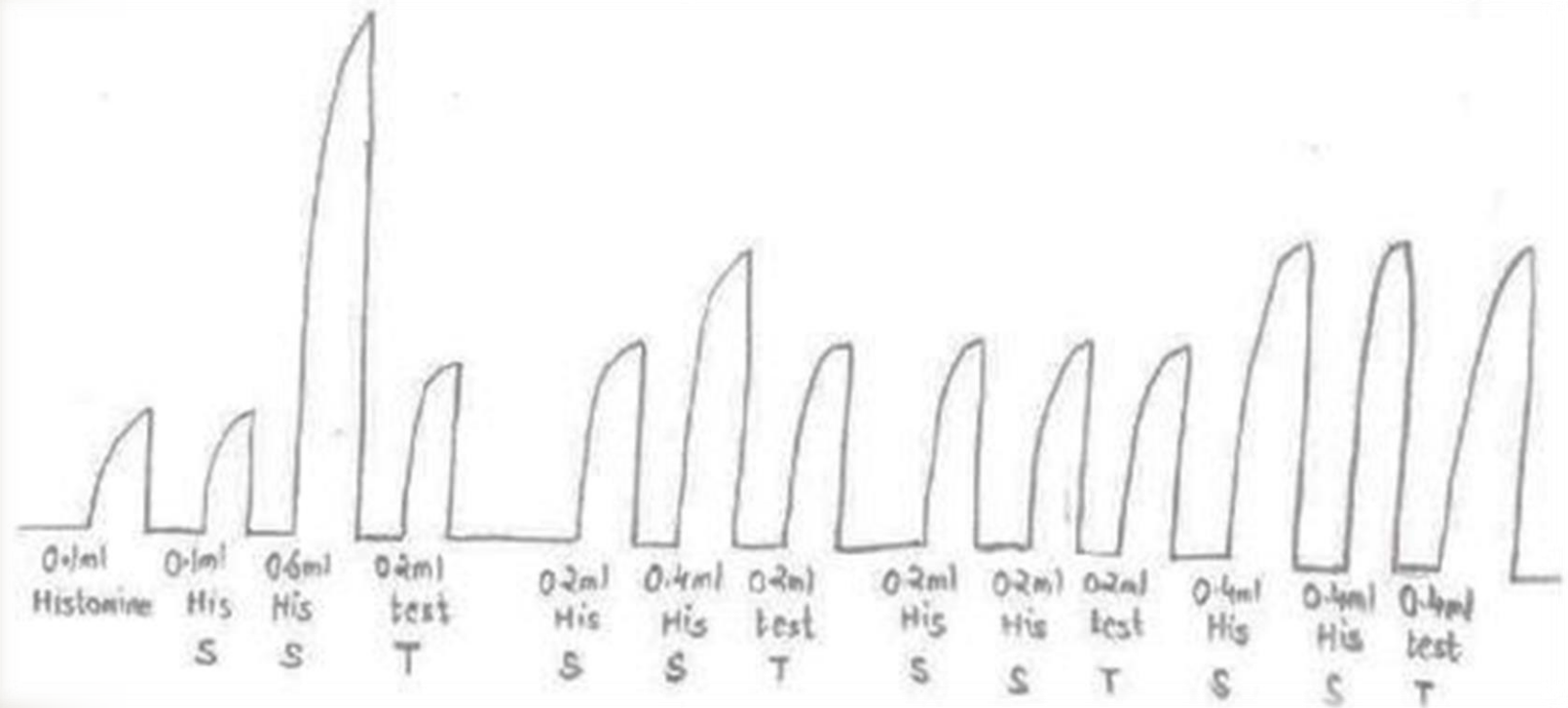
### 3. Microbiological Methods



Turbidimetric (or Tube assay) Method

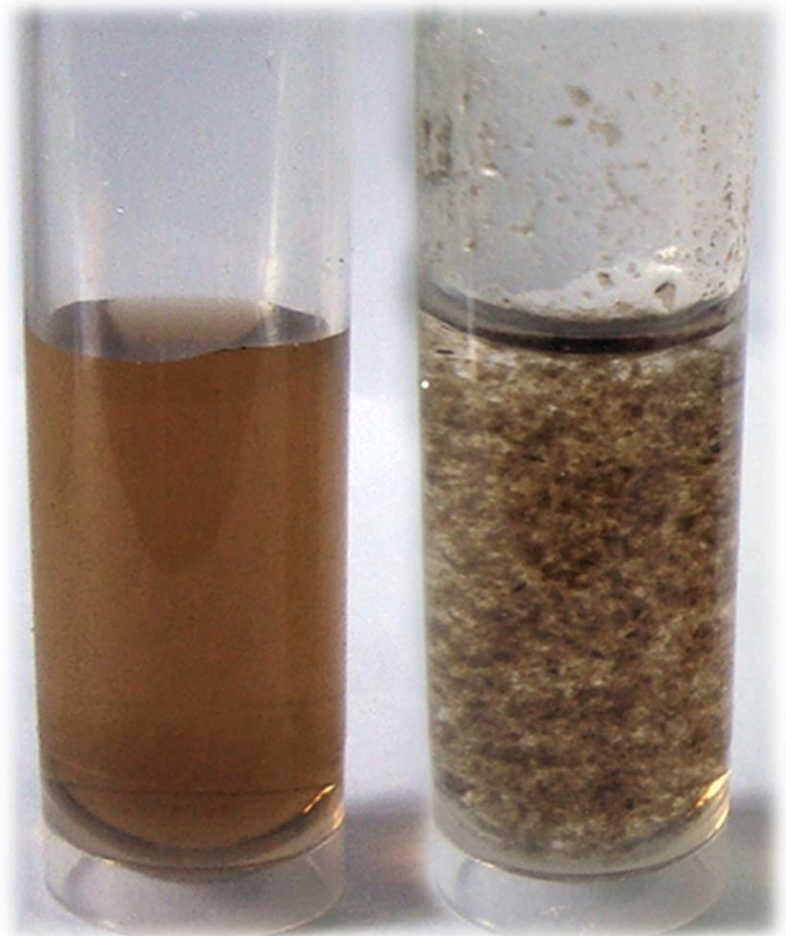


## 4. Biological Methods



Matching Point or Bracketing Method

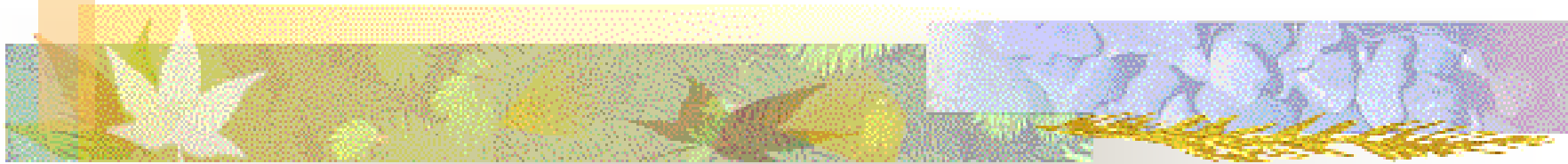
## Semiquantitative method- Limit test



# Importance of Pharmaceutical Analysis


- Identification of raw materials (in-process and finished product).
- Determination of additional impurities.
- Stability of the drug.
- Strength and concentration of the chemical compound.
- Determine molecular weight of the chemical compound.
- Structure elucidation of synthetic compound.
- Concentrations of drug in plasma or biological fluids.
- Determine  $pK_a$  values, partition coefficients, solubilities, and stability of drug under development.

# Test Your Knowledge



MCQs






1. Which one of the following is Quantitative Analytical Method?

1. Viscosity determination
2. pH measurement
3. Refractive index
4. Titrations



# Correct Answer: Titrations



2. All of the following are electrochemical methods of analysis EXCEPT..

1. Conductometry
2. Potentiometry
3. Amperometry
4. Refractometry

# Correct Answer: Refractometry



### 3. Quantitative determination principle in titrimetric methods are based...

1. On the basis of measurement of Volume
2. On the basis of absorbance of sample
3. On the basis of pharmacological response
4. On the basis of measurement of conductance



**Correct Answer:**  
On the basis of measurement of Volume



A red pen with a silver tip is shown writing the words "Thank you" in a black, cursive script on a white background. The pen is positioned at the end of the word "you", with its tip touching the final stroke.

Thank you