



आईएफटीएम विश्वविद्यालय, मुरादाबाद, उत्तर प्रदेश  
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**Content creator name:** Dr. Neetu Sachan

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## Introduction to Pharmaceutical Analysis

- ❖ Chemistry is deals with the study of matter, including its-
  - Composition
  - Structure
  - Physical Properties
  - Reactivity
- ❖ Other fields of Chemistry-
  - ❖ Organic Chemistry- *Study of carbon*
  - ❖ Inorganic Chemistry- *Study of elements*
  - ❖ Biochemistry- *Study of science of atoms & molecules in living organisms*
  - ❖ Physical Chemistry- *Physicochemical characteristics of substance without changing its composition*
  - ❖ Analytical Chemistry- *The science of chemical characterization and measurement*

## **Analytical Chemistry**

- a) Determination of chemical composition of sample(s)
- b) Useful tool in nearly all aspects of chemistry
  - Agricultural
  - Clinical
  - Environment
  - Forensic
  - Manufacturing
  - Metallurgical
  - Pharmaceutical chemistry

## Definition of Pharmaceutical Analysis

It is a technique to identify or quantify any sample, compound or substance by using various methods like manual methods, chemical methods, and instrumental analysis.

## Types of Pharmaceutical analysis

### 1. Qualitative Analysis-

- ✓ Completely unknown sample is taken or analyzed and qualitative properties determined
- ✓ Determine presence & absence of compound
- ✓ Colors, odors, BP, MP, limit test etc

### 2. Quantitative Analysis-

- ✓ Measures the concentration or amount of each substance in a sample
- ✓ Is of Three types
  - Gravimetric Analysis
  - Volumetric Analysis
  - Instrumental Methods

### Gravimetric Analysis

- Analysis is based on the mass of a solid
- Sample → Insoluble precipitate → collect → weigh

### Volumetric analysis

To determine the exact volume of the solution of known concentration required to react completely with solution of substance to be analyzed.

Also, called as titrimetric analysis

### **Types of Volumetric Analysis**

- *Neutralization Acid Base Titration*
- *Nonaqueous Acid Base Titration*
- *Complexometric Titration*
- *Precipitation Titration*
- *Oxidation-Reduction Titration*

### **Instrumental Methods**

There are number of instruments to analyze the compounds Like UV, FT-IR, MASS, NMR etc.

## Scope of Pharmaceutical Analysis

Some specific uses of analysis are as follows-

- *Examination of Raw materials*
- *Development of new products*
- *Examination of various drug products*
- *Qualitative and quantitative analysis of various samples*
- *Diagnosis of disease by various chemical analysis*
- *Determination or examination of soil & rock*
- *Analysis of different samples of water*
- *Determination of radioactive compounds*
- *Determination of naturally occurring Phytoconstituents*

## Reference

Beckett AH, Stenlake JB (1988). Practical Pharmaceutical Chemistry. 4<sup>th</sup> Edition , A&C Black, London.