

PHARMACEUTICAL CHEMISTRY

Pharmaceutical (or Medicinal) chemistry is a branch of chemistry which deals with drug design and synthesis of biologically active molecules, known as pharmaceutical chemistry. It also involves the study of drug, drug discovery, drug absorbance, etc.

Objective/Importance/Aim/Significance of Pharmaceutical chemistry

- a) To enhance the knowledge of pharmacy student in the synthesis of raw chemicals.
- b) To enhance the knowledge of isolation, purification, etc.
- c) To increase the skills of students for handling of various chemicals, glassware and analytical instruments.

- d) To enhance the students in dealings with their job opportunities as chemical analyst in chemical industries.
- e) To enhance the skill of students regarding the levelling of various pharmaceuticals products.



□ Scope of Pharmaceutical Chemistry

- a) Student can go through with the manufacturing, packaging, etc.
- b) Student can understand research and development.
- c) Student can learn to perform formulation and development of drugs.

- d) In hospital as a pharmacist,
- e) As clinical pharmacist.
- f) As Assistant Professor in colleges (if you have done in masters in particulars subjects).
- g) Student can become the drug inspector.



~~❑~~ ERRORS

Error is defined as the difference between the actual value and the calculated value of any physical quantity or in other words it is the difference between the measured value to the true value.

It is impossible to completely eliminate or remove errors while making measurements, doing experiments, etc. In order to get nearest result to the true value we obtain the mean value or avg. value.

Sources of errors

- a) Air or balance material could react with substance.
- b) Glassware used in experiment may contains impurity of chemicals.
- c) Glassware may react with the chemical to cause errors.
- d) Moisture from wet items evaporates while weighing.



Types of Errors

- a) **Determinate errors:** These are the **systemic error** which can be prevented or minimized by identifying the error.
- b) **Indeterminate(random) errors:** These are the **Non-systemic error** which are unpredictable and difficult to find or identify.

Accuracy and Precision

- a) Accuracy is the agreement of a particular value to the true value of the result. In other word it is the ability of an instrument to measure the accurate value.
- b) Precision is the result of proximity to reproducibility or repeatability of measurement. It refers to the closeness of various measurements for the same quantity.



Significant Figures

The significant figures of any number are the digits that add up to the precision of a number.

Rules for determining significant figures:

Rule1: All non-zero digits are significant figure.

E.g.: 312,32 there are 3 and 2 significant figures

Rule2: All zeroes between two non- zero digits are significant.

E.g.: 4.03 in this there are 3 significant.

Rule3: Zero preceding to first non-zero digit are not significant. Such zero indicates the position of decimal point.

E.g.: 0.03 has only one significant figure.

Rule4: The trailing zeroes in a number without a decimal point are not significant.

E.g.: 123, 12300 has 3 and 3 significant.

Rule5: The trailing zeroes in a number with a decimal point are significant.

E.g.: 3.400 has 4 significant.

1) 514

2) 5.062

3) 0.000642

4) 4.6000

5) 46000

Organic chemistry:

Studies the structure, properties, composition, reactions, and preparation of carbon-containing compounds.

Inorganic chemistry:

Focuses on the synthesis and behavior of inorganic compounds, including metals, minerals, and organometallic compounds.

Physical chemistry:

Applies physics principles to study the properties and behavior of matter, including thermodynamics, kinetics, and quantum mechanics.

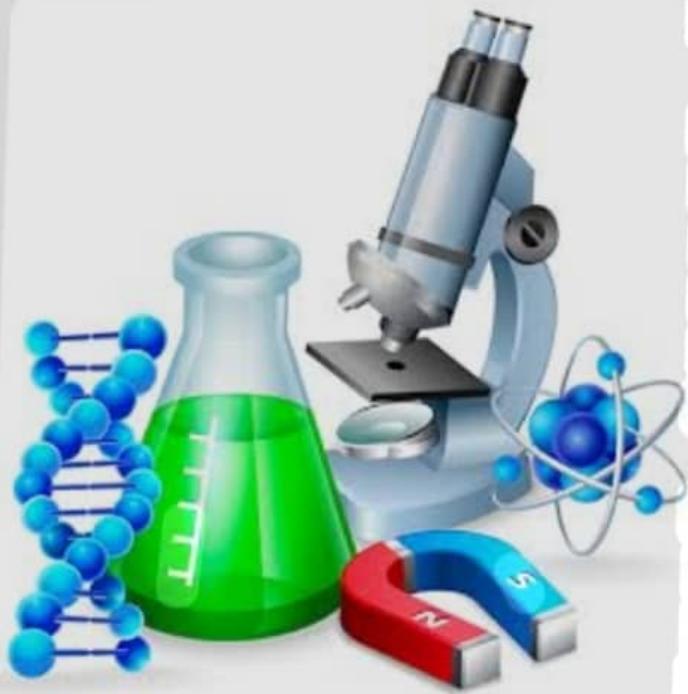
Analytical chemistry:

Develops and uses methods to identify, separate, and quantify the components of a sample of matter.

Biochemistry:

Explores the chemical processes within and relating to living organisms, including the structure and function of biomolecules.

WHAT IS CHEMISTRY?



Chemistry is the branch of science that deals with the identification of the substances of which matter is composed; the investigation of their properties and the ways in which they interact, combine, and change; and the use of these processes to form new substances.

The main branches of chemistry are: *organic chemistry, inorganic chemistry, physical chemistry, analytical chemistry, and biochemistry.*