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INTRODUCTION

Pharmaceutical chemistry is the chemistry of substances used as drugs. The term 'organic' means plant or animal organisms. Organic chemistry is the chemistry of hydrocarbons and their derivatives or more widely the chemistry of compounds of carbon. Pharmaceutical organic chemistry is concerned with the selected aspects of medicines of organic nature.

The organic medicines can be obtained from natural sources and by synthetic processes. The natural soures are of four types:

1. **Plant kingdom :** Several alkaloids, glycosides, and antibiotics are obtained from plants.
2. **Animal kingdom :** Vitamins and hormones are derived from animals.
3. **Mineral kingdom :** Coal and petroleum are two most important substances obtained from mineral kingdom. These substances are the source of 90% of the synthetic drugs.
4. **Fungi and micro-organism :** These are responsible for production of drugs by fermentation processes and for the antibiotics.

Most of the drugs are obtained by synthetic or semi-synthetic means. By altering the structures of the natural drugs and following leads, many new analgesics, local anaesthetics, sympathomimetics and antispasmodics have been obtained. The drugs like barbiturates, antihistamines, some antihypertensives, diuretics, antimalarials, sulphonamides, disinfectants and antiseptics are the synthetic compounds.

Organic compounds are mostly nonionic and are readily differentiated by physical properties from typical inorganic compounds. They are usually liquids or low-melting solids which can be distilled or crystallized. They are not readily soluble in water, except their salts, but are soluble in organic solvents. The tetracovalency of carbon and its unique property of forming long open and closed carbon chains give a wide range of organic compounds. Organic compounds have been classifed into many classes on the basis of functional groups or pharmacological properties. Many organic compounds have large molecules involving thousands of atom as in case of proteins. Some organic compounds contain one or more asymmetric carbons and represent different stereoisomers. Only a particular isomeric form shows biological activity and is used as drug. Reactions of organic compounds are non-ionic and reversible and, therefore, proceed slowly. On slight modification of conditions, the reactions of organic compounds change their course giving rise side-reaction products.

Pharmaceutical organic chemistry involves various methods of isolation, purification and characterization of drugs from natural sources; various synthetic procedures of medicinal agents which could not be obtained from natural sources or the synthetic duplication due to reasons of economy, purity or adequate supply of substances obtained from natural sources. The branch includes conversion of natural substances into products with more favourable therapeutic properties and formation of derivatives which show optimum medicinal activity. It involves determination of chemical and biological incompatibilities among various ingredients of a preparation and helps to establish safe and more active practical standards with respect to both dosages and quality. It helps in the improvement and promotion of uses of chemical agents for treatment of diseases.

Pharmacopoeia

A pharmacopoeia is a book of standards applicable to drug substances and their dosage forms of common usage in a country or region, which accepts it as such.

Each country has legislation on pharmaceutical preparations which contains standards and quality indices used in the manufactures or drugs. These regulations are published in the form of a book called pharmacopoeia (Greek : pharmakon meaning a drug or medicine, poieo means to make).

The first British Pharmacopoeia (B.P) was published in 1864 which was quickly followed by a second in 1867. It included monographs on benzoic acid, gallic acid, tannic acid, tarnnic acid, camphor, lactose, sucrose and seven alkaloids. The first United States Pharmacopoeia (U.S.P.) was released in 1820. The first edition of the Indian Pharmacopoeia (I.P.) was published in 1955 followed by supplements in 1960, 1966 and 1975. It contained a large number of crude drugs and their preparations. Third editions of I.P. appeared in 1985 and addendum was published in 1989.

A pharmacopoeia includes introductory sections which summarizes the changes in the current edition and provides a useful pointer to pharmaceutical progress and the general notice; monographs of official drugs, preparations, and substances; and appendixes. The monographs give information about titles, chemical formulae, descriptions, solubilities, identification, tests for purity, methods of assay, methods of storage and labelling, preparation, action, uses and doses. Appendixes give details of general tests and methods of quantitative analysis, biological assays and other processes to which reference is made in the monographs of the main text, and prescribing standards, for materials and solutions employed in tests or quantitative determinations.