

Class - P.U. Semester - III

Subject - Chemistry

Paper - C-C-XIII

Unit - 1

Topic - Nomenclature and classification of enzymes

Nomenclature and classification of Enzymes ! — When enzymes were first discovered, they were given various unsystematic names by their discoverers, like pepsin, trypsin, ptyalin and zymase. Later on enzymes were named by adding suffix 'ase' to the name of the substrate like esterases which act on esters, amylase which act on amyllum (starch), lactase which act on lactose, etc. Furthermore, the name of some enzymes also denotes the type of reaction along with the substrate, e.g. lactic acid dehydrogenase indicates that the enzyme catalyses the dehydrogenation of lactic acid. However some enzymes were named before these general rules were formulated and such enzymes have retained their trivial names like Pepsin, emulsin, trypsin etc.

Because of the lack of consistency in the nomenclature, it became apparent as the list of known enzymes rapidly grew that there was a need for a systematic way of naming and classifying enzymes. A commission was appointed by the international union of Biochemistry (I.U.B.) (later re-named the international union of biochemistry and molecular biology) (IUBMB) and its report published in 1964, forms the basis of the currently accepted system.

The Enzyme commission divided enzymes into six main classes on the basis of the total reaction catalysed. Each enzyme was assigned a code number, consisting of four elements, separated by dots. The first digit shows to which of the main classes the enzyme belongs which are given below!

First digit	Enzyme class	Type of reaction catalysed
1	oxidoreductases	oxidation / Reduction reaction
2	Transferases	Transfer of an atom or gr. between two molecules

First digit	Enzyme class	Type of reaction catalysed
3	Hydrolases	Hydrolysis reactions
4	Lyases	Removal of a group from substrate. (not by hydrolysis)
5	Isomerases	Isomerization reaction
6	Ligases	The synthetic joining of two molecules, coupled with the breakdown of the pyrophosphate bond in a nucleoside triphosphate

The second and third digits in the code further describe the kind of reaction being catalysed. There is no general rule, because the meanings of these digits are defined separately for each of the main classes.

Although the I.U.B. system is complex, it is precise, descriptive, and informative. However, since these systematic names are frequently too long for ordinary use, the trivial names are commonly used. The trivial names are derived from the

Date \_\_\_\_\_

Page \_\_\_\_\_

name of the substrate, the type of reaction catalysed and the suffix use, e.g. alcohol dehydrogenase whose systematic name is alcohol: NAD oxidoreductase and enzyme commission (EC) number is 1.1.1.1.