

Chapter 1

Introduction:

Compounds isolated from natural sources or present in it e.g. plant, animal and human bodies and are classified into three types according to their structures and their sources into :

- 1-Terpenes
- 2-Steroids
- 3-Alkaloids

The work in this field classified into :

a-Extraction and Isolation of these compounds from their natural sources, followed by structure elucidation (establishment) of the newly isolated compounds by:

I)Elemental analysis ;II)Spectroscopic methods ;III)e.g.I.R.,¹-HNMR ,¹³C-NMR,and Mass spectra.

III)*Structural elucidation* by chemical reactions based on their function groups (it is the reactive part of the molecules), for example, a-Oxo compounds e.g.RCOOH by esterification and acidity ,RCHO and RCOR by condensation with NH_2NH_2 or NH_2OH ROH by esterification or oxidation

ArOH by FeCl_3 or diazotization and oxidation,at which there are a differences between aliphatic and aromatic (phenolic)hydroxyl groups.

There are saturated compounds as alkanes which reacting by substitutions ,no addition takes

place;while ,unsaturated compounds e,g.alkenes reacting by additions.

c-Compounds containing double bonds :There are aromatic and aliphatic double bonds ,and

aliphatic double bonds may be with conjugated or separated double bonds

Conjugated double bonds can be detected by Diels Alder Reaction (D.A.R.) by forming an adducts with maleic anhydride ,each two double bonds react with one molecule of maleic .

Separated double bonds (no D.A.R.) and can be detected by H_2 / Ni ,halogenations or by Each *one* double bond absorb *one* molecule of hydrogen and *one* molecule of halogen, thus, the number of double bonds can be determined .

Each *one* double bond absorb *one* molecule of hydrogen during catalytic hydrogenation and *one* molecule of halogen during halogenation, thus, the number of double bonds and the shape of the molecule can be determined .

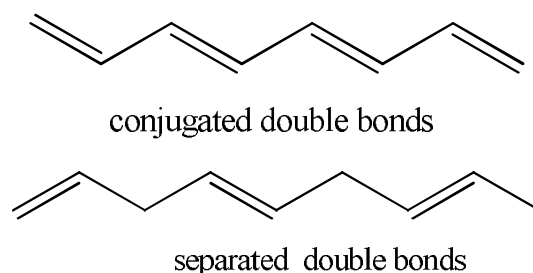
Also, compounds with M.F. C_nH_{2n+2} for alkane (acyclic compounds) ;

M.F. C_nH_{2n} for alkene and *monocyclic* compounds ;

M.F. C_nH_{2n-2} for alkyne and *bicyclic* compounds ;

M.F. C_nH_{2n-4} for *tricyclic* compounds ;

M.F. C_nH_{2n-6} for *tetracyclic* compounds .



Degradative oxidation : Using oxidizing agents such as $O_3, CrO_3, NaOBr$ ($Br_2 / NaOH$) , $KMnO_4$ and *total synthesis* can also be used for structure elucidation of the naturally occurring compounds.

Degradative oxidation for the double bonds using Ozonolysis , $KMnO_4$; in each case the final products depends on the substituents attached to the two carbons of the double bonds.

IV)Total synthesis

