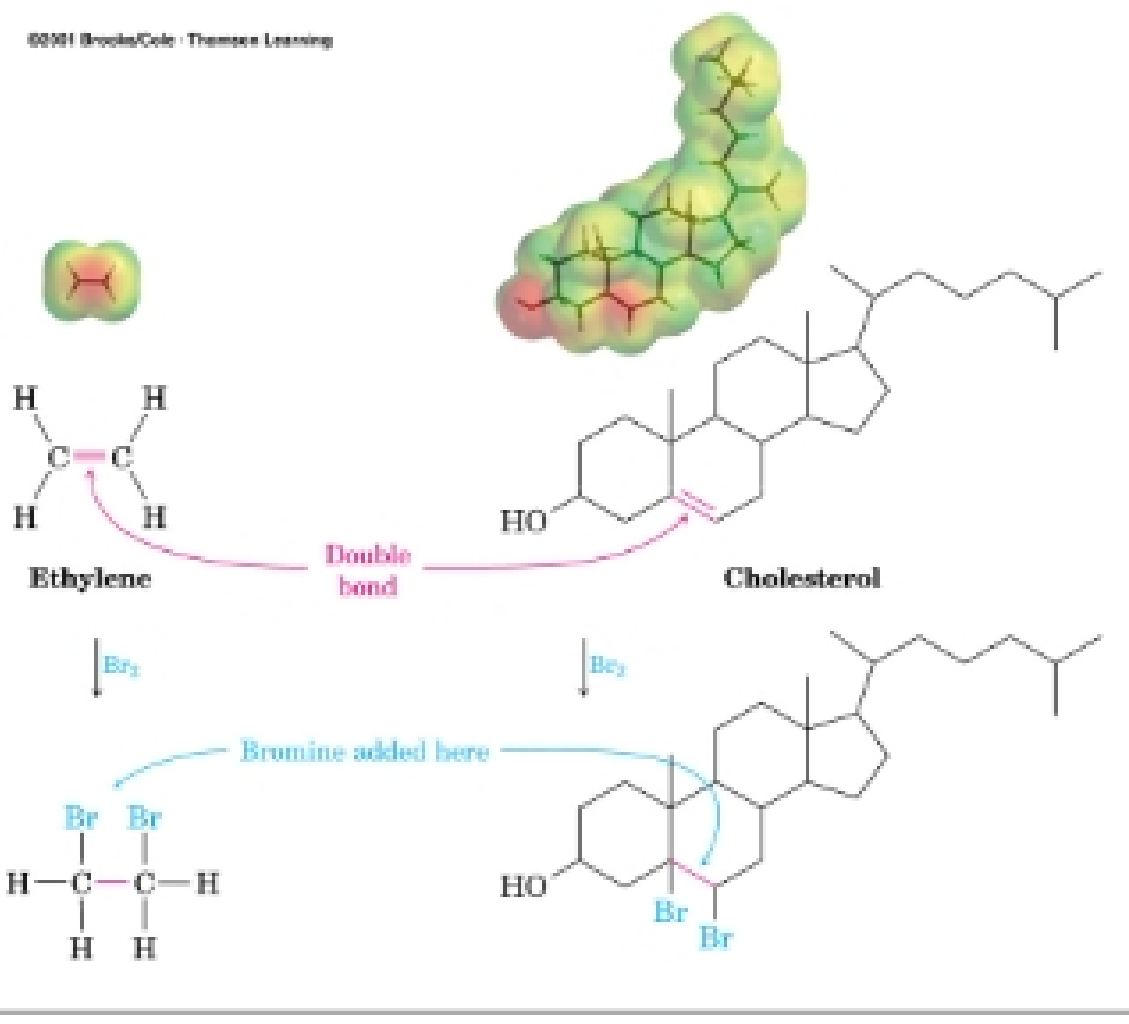
Chapter 3: Organic Compounds: Alkanes and Cycloalkanes

>11 million organic compounds which are classified into families according to structure and reactivity

Functional Group (FG): group of atoms which are part of a large molecule that have characteristic chemical behavior. FG's behave similarly in every molecule they are part of.

The chemistry of the organic molecule is defined by the function groups it contains

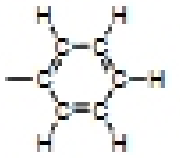


Alkanes

Carbon - Carbon Multiple Bonds

Alkenes

Alkynes



Arenes

Carbon-heteroatom single bonds

X= F, Cl, Br, I
Alkyl Halide

amines

alcohols

ethers

thiols

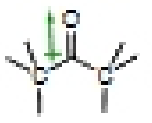
sulfides
(disulfides)

Carbonyl-oxygen double bonds (carbonyls)

aldehyde

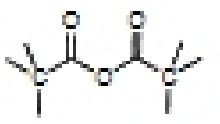
carboxylic acid

acid chloride



ketones

ester



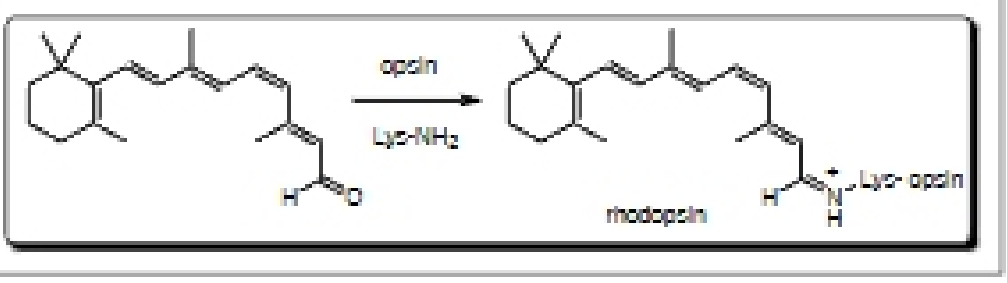
anhydrides

Carbon-nitrogen multiple bonds

imine
(Schiff base)

nitrile
(cyano group)

amide



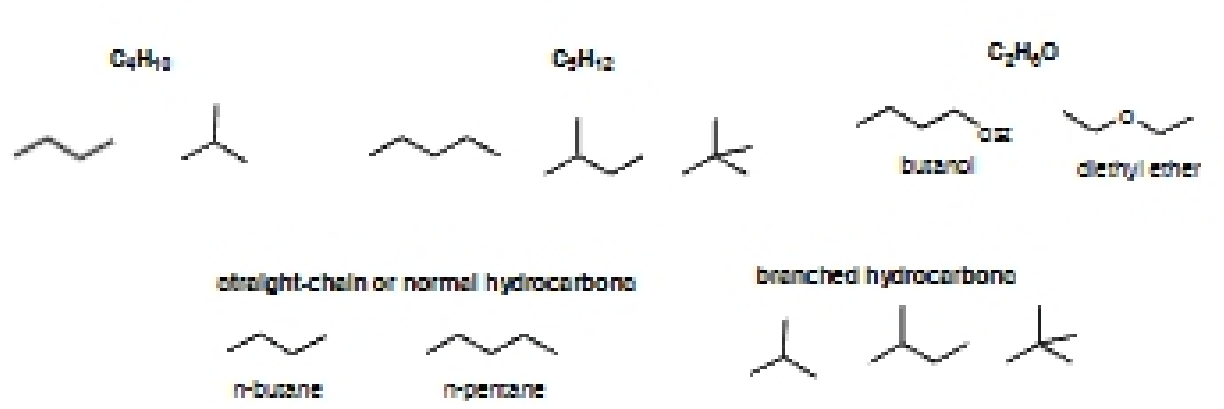
Alkanes and Alkane Isomers

Alkanes: organic compounds with only C-C and C-H single (σ) bonds.
general formula for alkanes: $C_nH_{(2n+2)}$

Saturated hydrocarbons
Hydrocarbons: contains only carbon and hydrogen
Saturated= contains only single bonds

Isomers: compounds with the same chemical formula, but different arrangement of atoms

Constitutional isomer: have different connectivities (not limited to alkanes)



Systematic Nomenclature (IUPAC System)

Prefix-Parent-Suffix

Parent- number of carbons
Prefix- substituents
Suffix- functional groups