Al-Mustaqbal University College

Department of Medical Physics

First Class

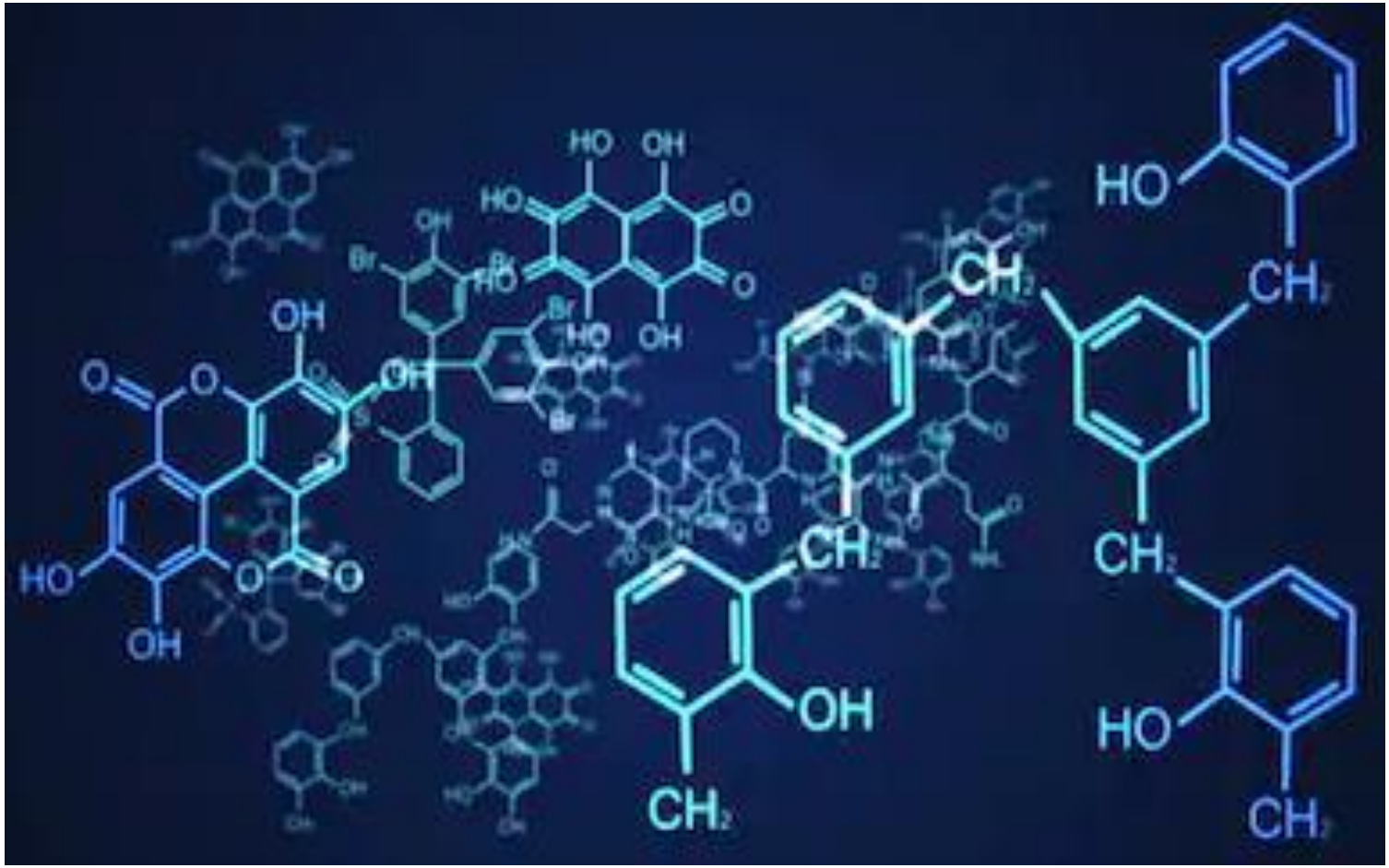
Organic Chemistry

Lec 9 Aromatic Hydrocarbon

MSc .Doaa Nassr

MSc .Issa Farahan

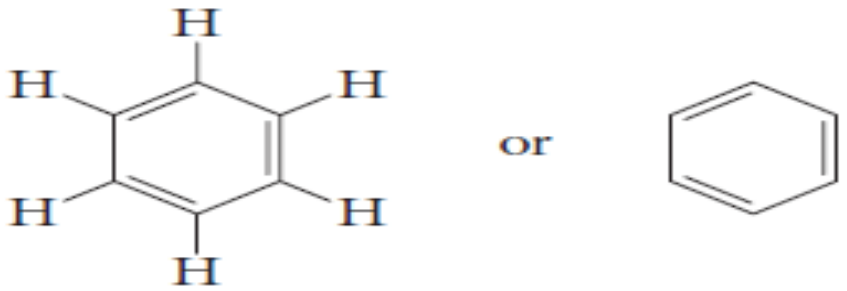
Aromatic hydrocarbons



Aromatic hydrocarbons also called Arenes are the third class of unsaturated hydrocarbons; the alkenes and alkynes (previously considered) are the other two classes.

An **aromatic hydrocarbon** is an unsaturated cyclic hydrocarbon that does not readily undergo addition reactions.

The simplest aromatic hydrocarbon is benzene, C_6H_6 , whose six carbons form a ring:



The unsaturated ring system of benzene, called the **benzene ring** or **benzene system,** exists not only in benzene, but also in a wide variety of other compounds. Organic compounds whose structures contain a benzene ring are called **aromatic compounds**

Aromatic conditions

In order for the compound to be called an aromatic, it must fulfill the following conditions :

1 .the compound contains a ring with conjugated single and double bonds (resonance).

2 .The compound must be planar .

3 .The compound is not easily subject to addition reactions .

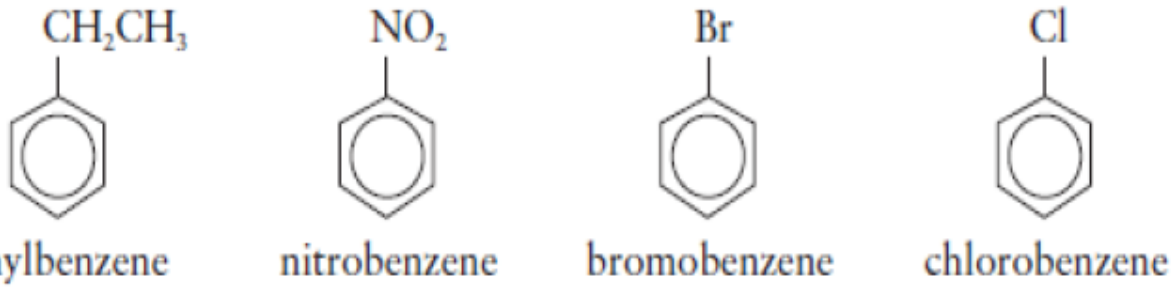
4. react through electrophile replacement

5. Huckle's rule must be applied to the compound

The Nomenclature of Benzene Derivatives

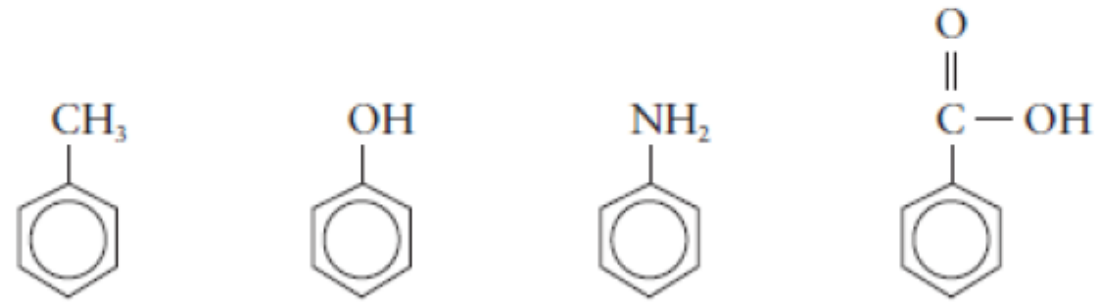
The following guidelines are all based on the IUPAC aromatic nomenclature system

Guideline 1. When a single hydrogen of the benzene ring is replaced, the compound can be named as a derivative of benzene:



ethylbenzene nitrobenzene bromobenzene chlorobenzene

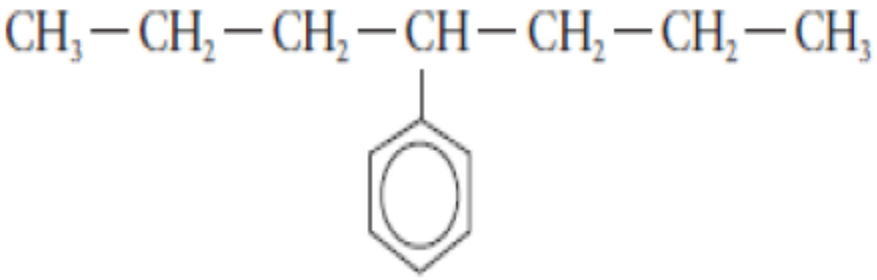
Guideline 2. A number of benzene derivatives are known by common names that are also IUPAC-accepted. Thus, toluene is favored over methylbenzene, and aniline is used rather than aminobenzene:



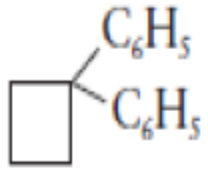
toluene phenol aniline benzoic acid

Guideline 3. Compounds formed by replacing a hydrogen of benzene with a more complex hydrocarbon group can be named by designating the benzene ring as the group. This is shown as the benzene ring, C_6H_5-, which is also called a phenyl group:

(**phenyl group**: A benzene ring with one hydrogen absent, C_6H_5-) 



4-phenylheptane



1,1-diphenylcyclobutane