

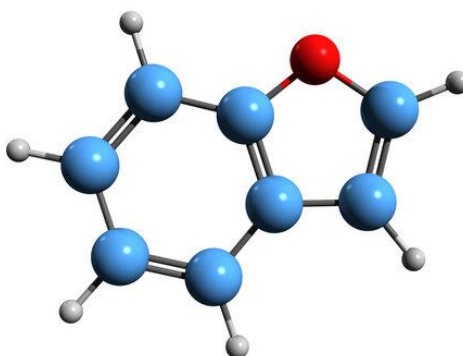
Organic Chemistry

2nd stage

Asst. Lect. Zahraa Hazim Hamid

Lecture 2: Heterocyclic compounds

Department of Biochemistry



✚ Heterocyclic compounds

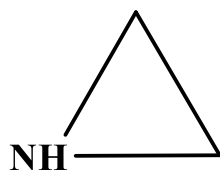
Almost all of the cyclic molecules that we have discussed so far have had rings composed of carbon atoms. However, in many cyclic compounds an element other than carbon is present in the ring. A heterocyclic compound is one that contains a ring made up of *more than one kind of atom which is known as **heteroatom***.

In most of the cyclic compounds that we have studied the rings are made up only of carbon atoms; such compounds are called **homocyclic** compounds. But there are also rings containing, in addition to carbon, other kinds of atoms, most commonly **nitrogen, oxygen, or sulfur**.

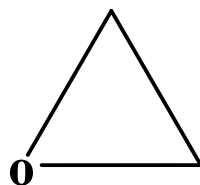
✚ Classification of heterocyclic compounds:

Depending upon the size of heterocyclic ring, they are classified into different types:

1. Three membered heterocyclic compounds:

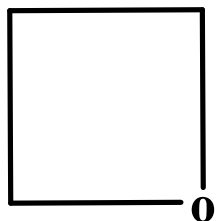


aziridine



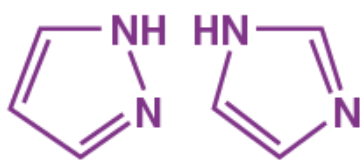
oxirane

2. Four membered heterocyclic compounds:



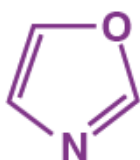
oxetane

3. Five membered heterocyclic compounds:

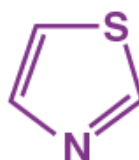


Pyrazole

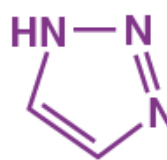
Imidazole



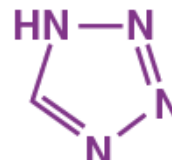
Oxazole



Thiazole



Traizole



Tetrazole

Five member heterocyclic compounds with two hetero atom

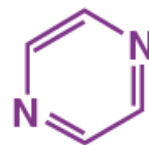
4. Six membered heterocyclic compounds:



Pyridazine



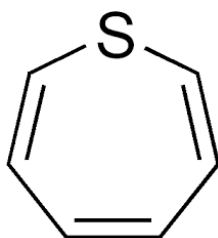
Pyrimidine



Pyrazine

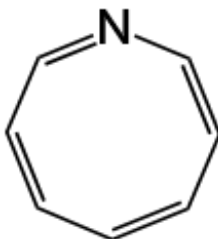
Six member heterocyclic compounds with more than hetero atom

5. Seven membered heterocyclic compounds:



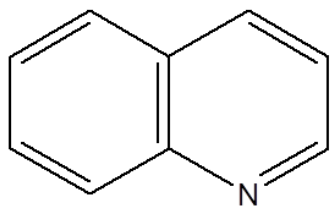
thiepine

6. Eight membered heterocyclic compounds

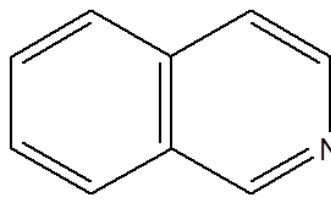


azocine

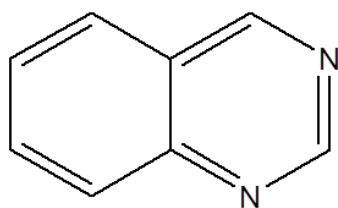
7. Fused heterocyclic compounds:



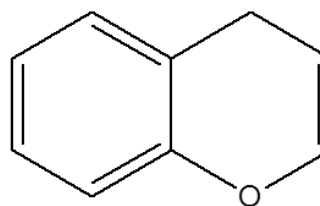
Quinoline



Isoquinoline



Quinazoline



Benzopyran

+ Applications of Heterocyclic Compound

- ❖ used in agrochemicals and pharmaceuticals industries.



- ❖ used as starting materials in the synthesis of organic compounds.



- ❖ used in corrosion inhibitors, sanitisers, anti-ordinates, and developers.



- ❖ Heterocyclic compounds are used in pesticides, dyes and plastics.

