

**B.Sc. Semester-IV
Core Course-IX (CC-IX)
Organic Chemistry-III**



**III. Heterocyclic Compounds
16. Conventional Names**



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Heterocyclic Compounds

22 Lectures

Classification and nomenclature, Structure, aromaticity in 5-membered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan, Pyrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Pyrimidine, Structure elucidation of indole, Fischer indole synthesis and Madelung synthesis), Structure elucidation of quinoline and isoquinoline, Skraup synthesis, Friedlander's synthesis, Knorr quinoline synthesis, Doebner- Miller synthesis, Bischler-Napieralski reaction, Pictet-Spengler reaction, Pomeranz-Fritsch reaction
Derivatives of furan: Furfural and furoic acid.

Coverage:

1. Conventional Names

Heterocyclic Compounds

There are two systems for naming heterocyclic compounds:

1- Conventional or Common Names

which convey little or no structural information but it still widely used.

2- Systematic (IUPAC)

A)The Hantzsch-Widman (IUPAC or Systematic) method which in contrast is designed so that one may deduce from it the structure of the compound

B) The replacement method

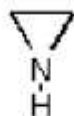
Heterocyclic Compounds

Conventional or Common Names

- Trivial names are still preferred. Some monocyclic compounds of this kind are shown with the common (trivial) name in bold and a systematic name



ethylene oxide
oxirane



ethylenimine
aziridine



trimethylene oxide
oxetane



furan
oxole



tetrahydrofuran
oxolane



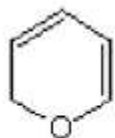
thiophene
thiole



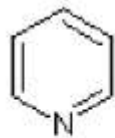
pyrrole
1*H*-azole



pyrrolidine
azolidine

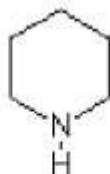


pyran
2*H*-pyran

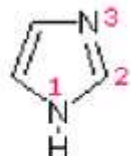


pyridine

perhydropyridine

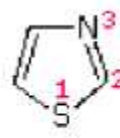


piperidine



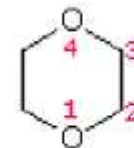
imidazole

1,3-diazole



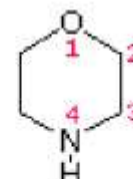
thiazole

1,3-thiazole



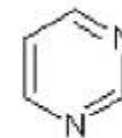
dioxane

1,4-dioxane



morpholine

tetrahydro-1,4-oxazine



pyrimidine

1,3-diazine

Heterocyclic Compounds

Conventional or Common Names

1) 5-membered heterocycles with one or two hetero-atoms

common azoles - five-membered aromatic nitrogen heterocycles



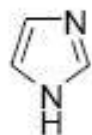
furan



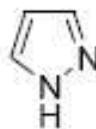
thiophene



pyrrole



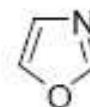
imidazole



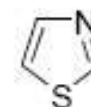
pyrazole



isoxazole



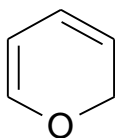
oxazole



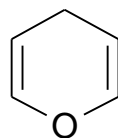
thiazole

2) 6-membered heterocycles with one or two hetero-atoms

Common azines-six-membered aromatic nitrogen heterocycles

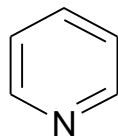


2H-Pyran

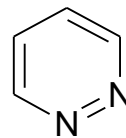


4H-Pyran

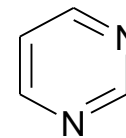
These are tautomers
Both are not aromatic



Pyridine

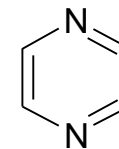


Pyridazine



Pyrimidine

DNA/RNA bases



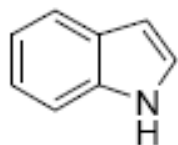
Pyrazine

Heterocyclic Compounds

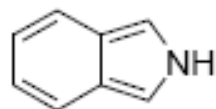
Conventional or Common Names

3) Fused heterocycles

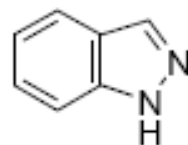
common ring-fused azoles



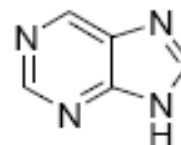
indole
(found in the amino acid tryptophan)



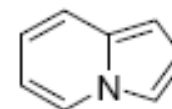
isoindole



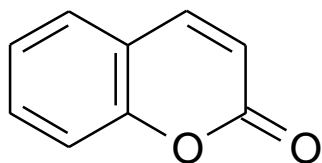
indazole



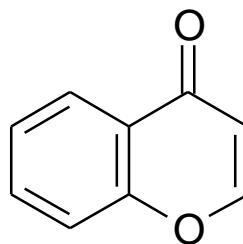
purine
(DNA/RNA base)



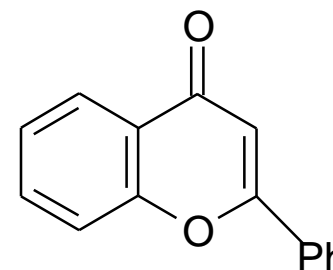
indolizidine



Coumarine
Chromen-2-one



Chromen-4-one



Flavone

Heterocyclic Compounds

Conventional or Common Names

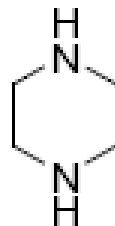
4) Saturated heterocycles



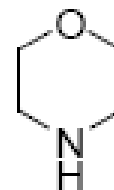
pyrrolidine



piperidine



piperazine



morpholine

Thank You



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