Parent compound: full double bond بيكون فيه
Maximum double bond=parent compp

مثال على بيرنت كمباوند:

Oxirene

*يحتوي الاوكسرين على اكبر عدد ممكن من الدبل بوند لهذا يعتبر بيرنت كمباوند

التسميه للاوكسرين :

من الاوكسجين:Oxa

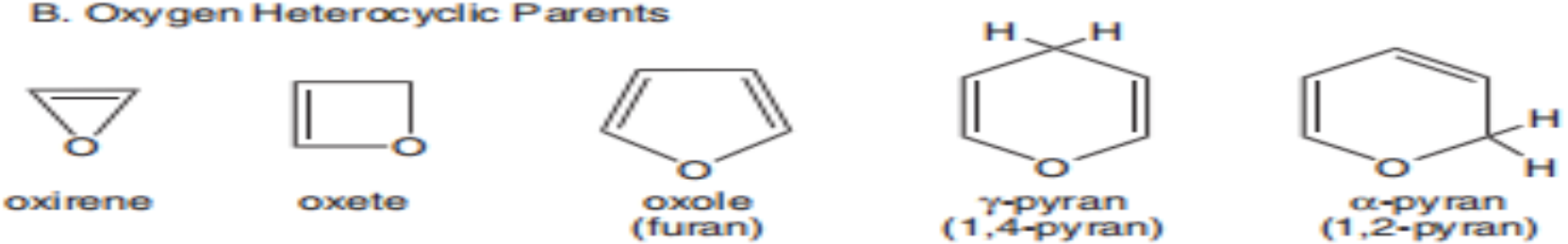
Ir: ring size 3

ene: unsaturated

Table 2.2. IUPAC and Common Names for Monocyclic Heterocycles

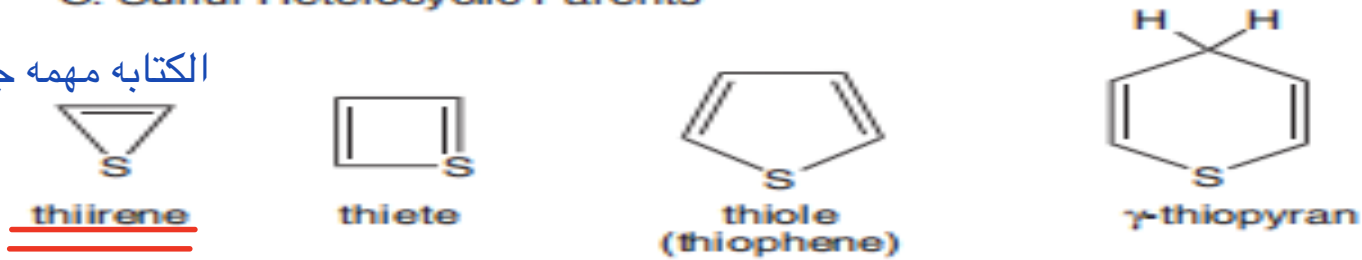
A. Nitrogen Heterocyclic Parents جميع الامثله بيرنت

B. Oxygen Heterocyclic Parents

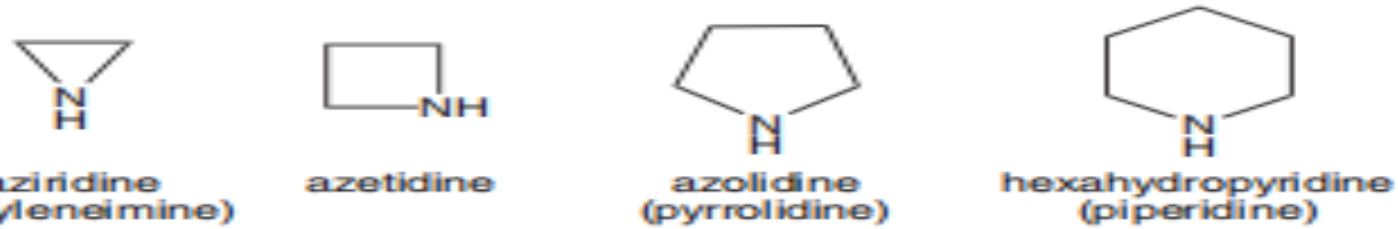


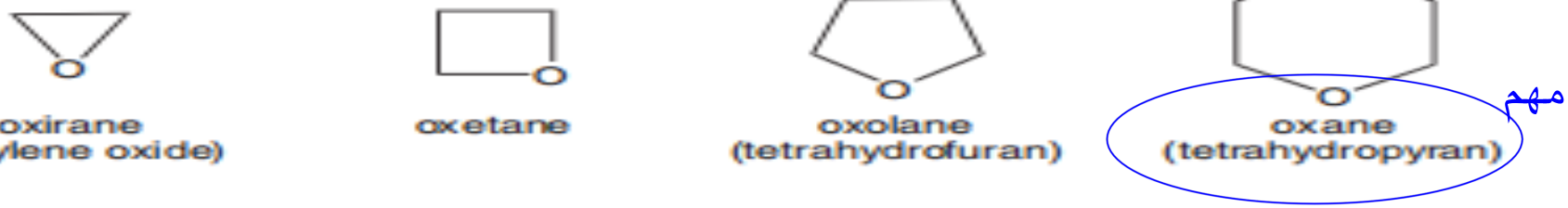
C. Sulfur Heterocyclic Parents

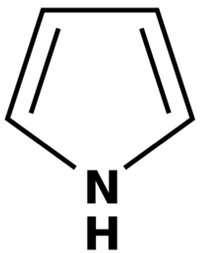
الكتابه مهمه جدا



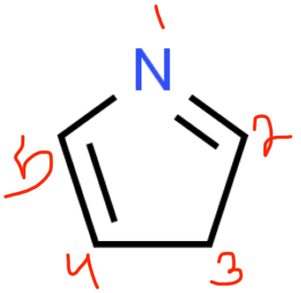
D. Some Saturated Rings



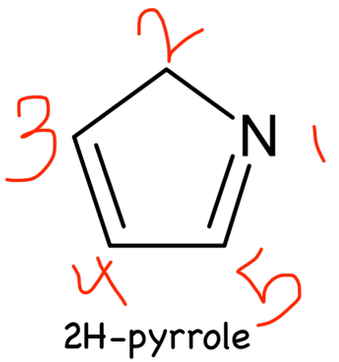




1H-pyrrole



3H-pyrrole



2H-pyrrole

التسمية بناء على الهيدروجين

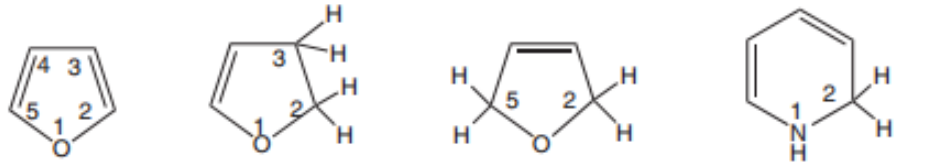
الاولويه دائما لل hetereo atom

من ثم نرقم بحيث نكون اقرب الى ال H

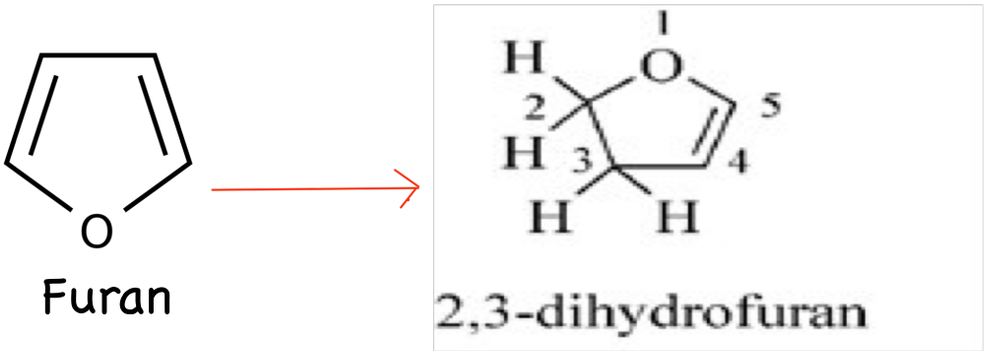
*ملاحظه : ال H دائما تكون امام الاسم

موضوع التسميه حسب ال double bond غير مطلوب بشكل واسع

- saturation of the double bonds by designating with numbers the positions on the ring where hydrogen has been added.
- For this purpose,the heteroatom is designated position 1 on the ring, and the numbering proceeds through the site of hydrogenation.
- If one double bond is removed, the prefix dihydro- is used;
- with two double bonds removed,it is tetrahydro-.

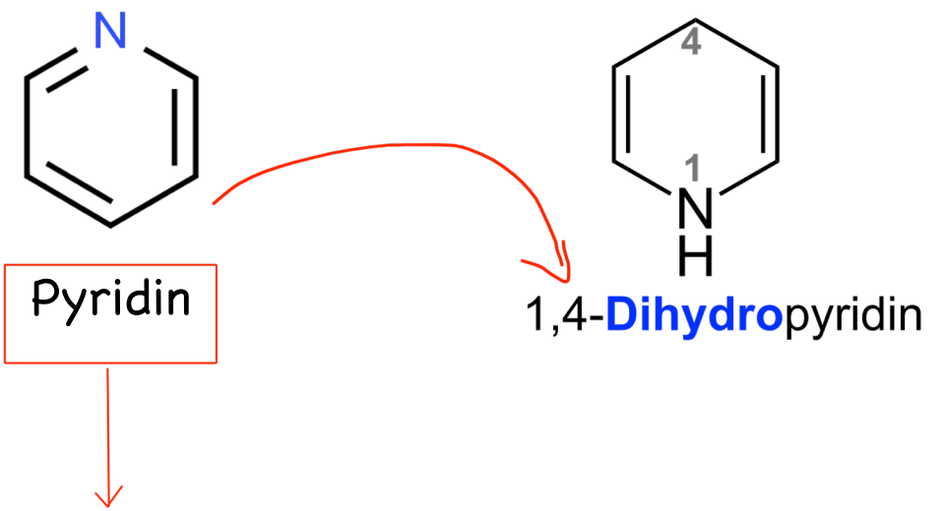


نرقم بحيث نكون
اقرب الى ال H



عند ازالة دبل بوند واحده نضيف dihydro الى الاسم

ال (furan) اصبحت (dihydrofuran) بسبب ازالة رابطه ثنائيه منها



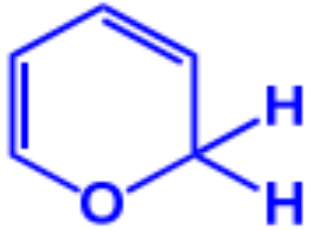
عند ازالة رابطه ثنائيه اصبح اسمها dihydropyridin

Handling the “Extra Hydrogen”

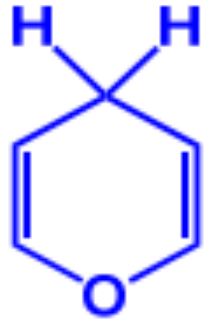
Heterocycles with maximum number of double bonds which can be arranged in more than one way.

Examples

Pyrans



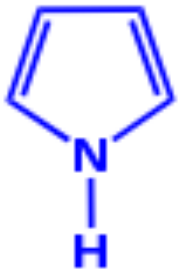
Double bonds @ 2 and 4

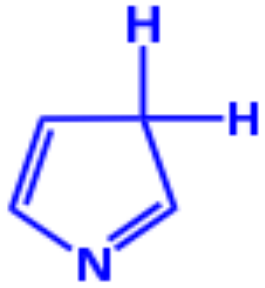


Double bonds @ 2 and 5

Pyrroles

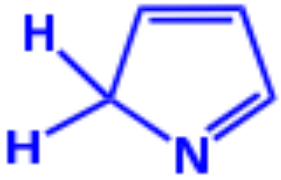
Double bonds @ 2 and 4





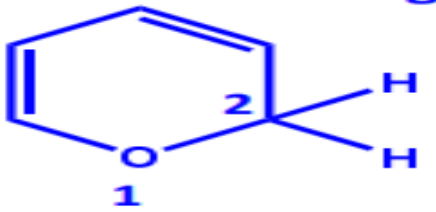
Double bonds @ 1 and 4

Double bonds @ 1 and 3

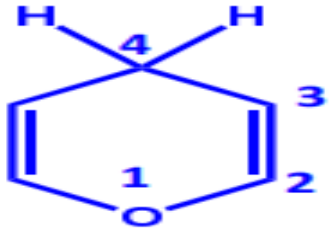


Therefore, should have different names.

This is a special problem resulting from isomerism in the position of the double bonds which is sometimes referred to as "extra-hydrogen" and this can be addressed by simply adding a prefix that indicates the number of the ring atom that possesses the hydrogen using *italic capital '1H' '2H' '3H', etc. The* numerals indicate the position of these atoms having the extra hydrogen atom.

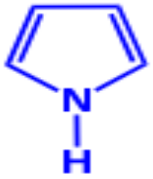


2*H*-Pyran

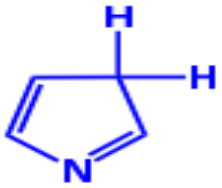


4*H*-Pyran

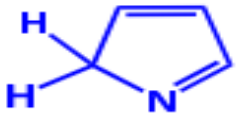
The saturated position takes priority in numbering.



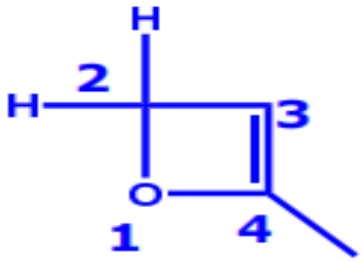
1*H*-Pyrrole (Pyrrole)



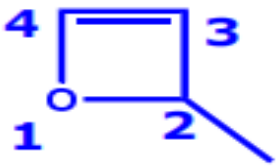
3*H*-Pyrrole



2*H*-Pyrrole



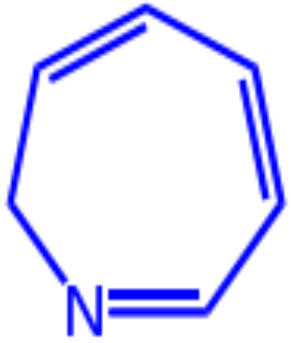
4-Methyl-*2H*-oxete



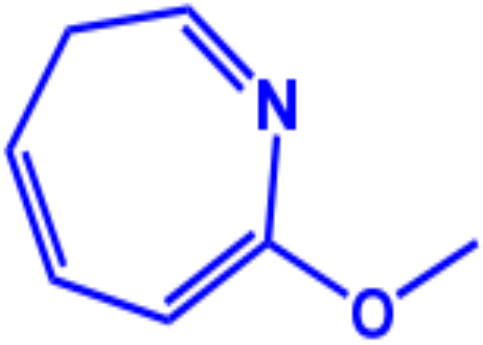
2-Methyl-*2H*-oxete

في بداية التسميه نضع اسم الفرع و رقم التفرع
ثم نضع رقم ال h
في النهايه نضع اسم ال heterocyclic compound

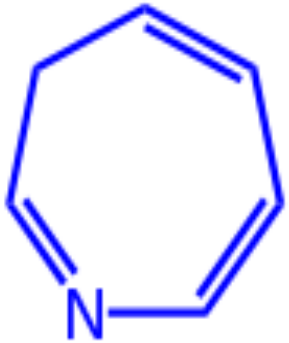
Azepine



2*H*-Azepine



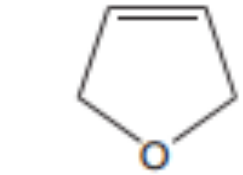
7-Methoxy-3*H*-azepine



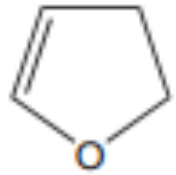
3*H*-Azepine

4*H*-Azepine

There is an alternative system, sometimes useful in complex structures, where the position of the remaining double bond in a partially hydrogenated compound is indicated by a Greek "delta" with a superscript of the ring positions bearing the double bond. Using the dihydro furans as examples, we have the following:



$\Delta^{3,4}$-dihydrofuran

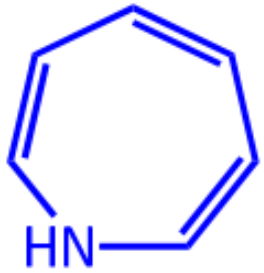


$\Delta^{2,3}$-dihydrofuran

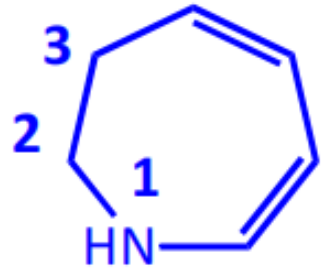
عند التسميه حسب الدبل بوند نعد حسب الاقرب الى
الدبل بوند و نضع اشارة دلتا عند التسميه

Partial Unsaturation

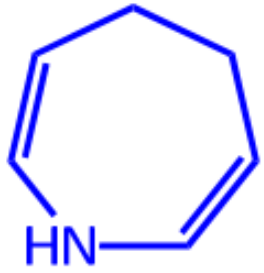
Use fully unsaturated name with dihydro, tetrahydro, etc



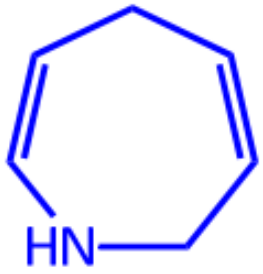
Azepine



2,3-Dihydroazepine

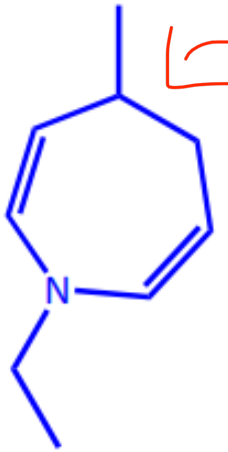


4,5-Dihydroazepine



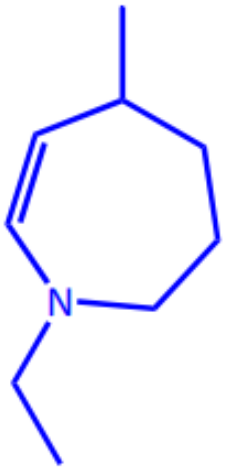
2,5-Dihydroazepine

When numbering give priority to saturated atoms.



1-Ethyl-4-methyl-4,5-dihydroazepine

الاولولة حسب الترتيب
الابجدي للحروف عند
وجود تفرعين



1-Ethyl-5-methyl-2,3,4,5-tetrahydroazepine

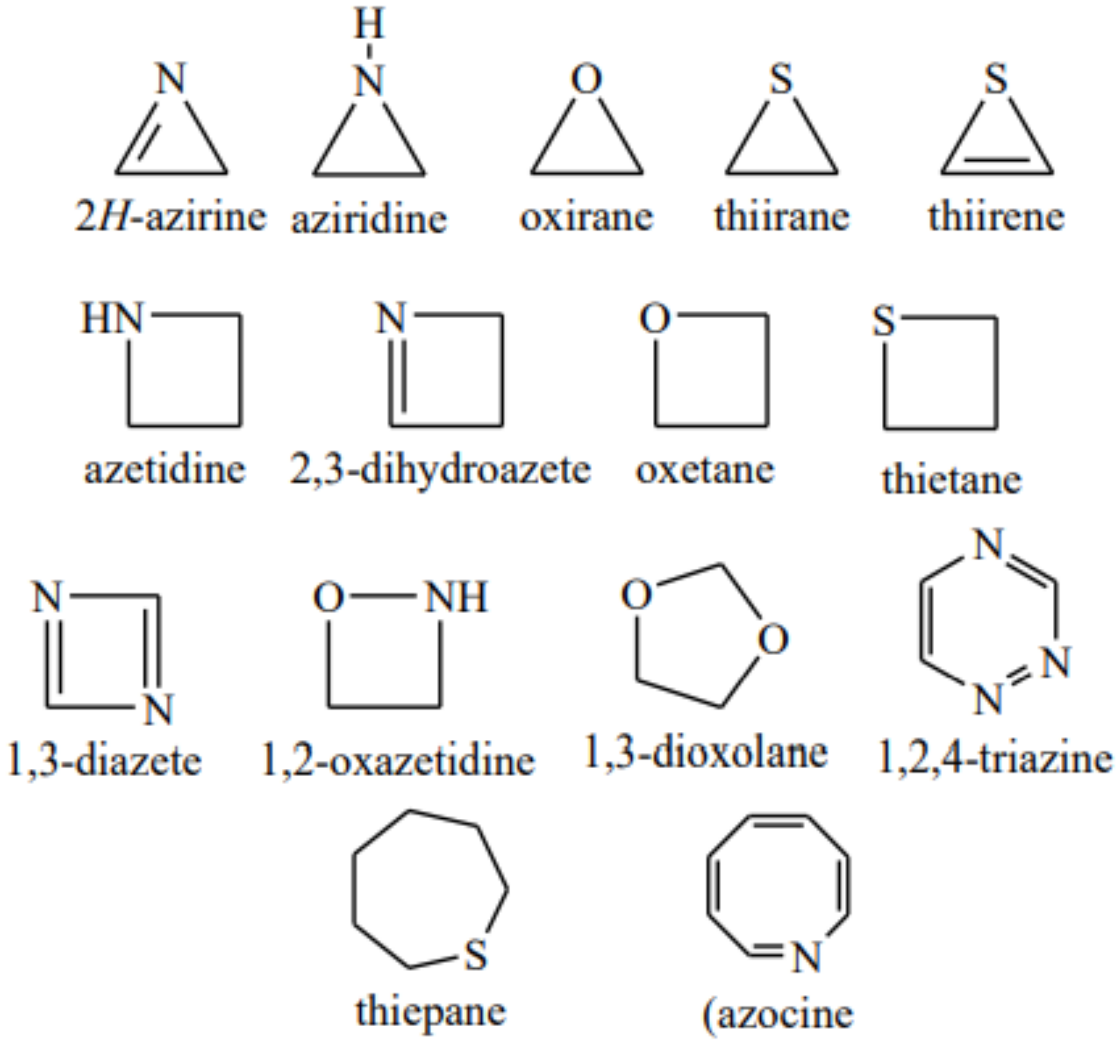
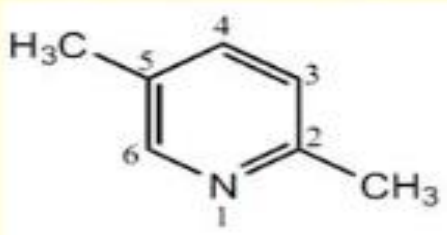


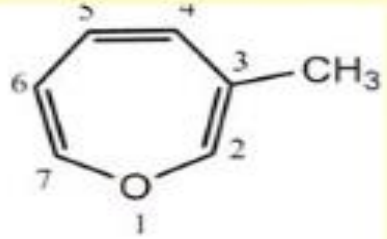
Figure 9. Examples of some heterocyclic compounds with systematic names

Numbering

With one heteroatom: The numbering starts from the heteroatom giving the position-1 and proceeds in such a way as to give the lowest possible locant to the substituent if present.

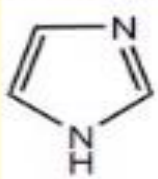


2,5-Dimethylpyridine

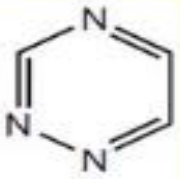


3-Methyloxepine

With two or more identical heteroatoms: The ring is numbered in such a way that the heteroatoms are assigned the lowest possible set of number of locants.

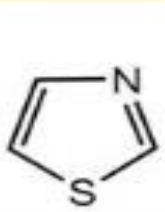


1,3

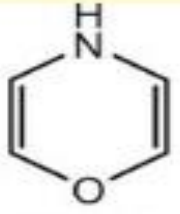


1,2,4

With two or more different heteroatoms: The numbering starts from the heteroatom with the highest preference as in the table (O>S>N…). The remaining heteroatoms are given lowest number locants.



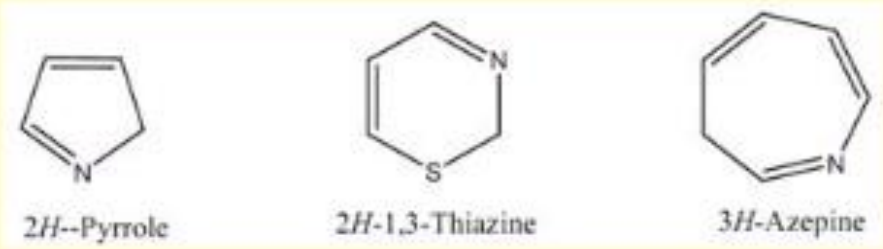
1,3-Thiazole



1,4-Oxazine

Presence of saturated atom (indicated hydrogen)

- When heterocyclic ring with maximum number of noncumulative double bonds contains a saturated atom, its position is given the lowest possible locant and is numerically indicated by an italic capital *H* before the name of heterocyclic ring system.

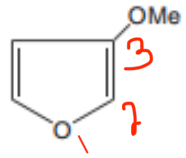


2*H*--Pyrrole 2*H*-1,3-Thiazine 3*H*-Azepine

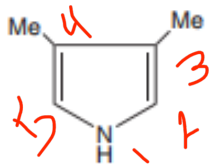
•However, the heterocyclic system in which a carbon atom of the ring is involved in the carbonyl group, the indicated hydrogen is normally cited as an italic capital *H* in parenthesis after the locant of the additional structural features.

Pyridin-2(1*H*)-one Pyrazin-2(3*H*)-one

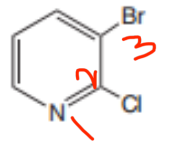
- 2.4. SUBSTITUTED MONOCYCLIC COMPOUNDS
- With the rules discussed previously, we can name any parent mono cyclic heterocycle with a single heteroatom, in any state of unsaturation.
- Compounds in which ring hydrogen is replaced by one or more of thecommon functional groups of organic chemistry also are readily named,by assigning numbers to the ring atom(s) bearing the substituents,
- RINGS WITH MORE THAN ONE HETEROATOM starting with the heteroatom as number 1. The functional groups areplaced alphabetically in the name. Some examples are as follows:



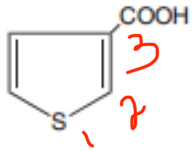
3-methoxyfuran



3,4-dimethyl-1H-pyrrole



3-bromo-2-chloropyridine

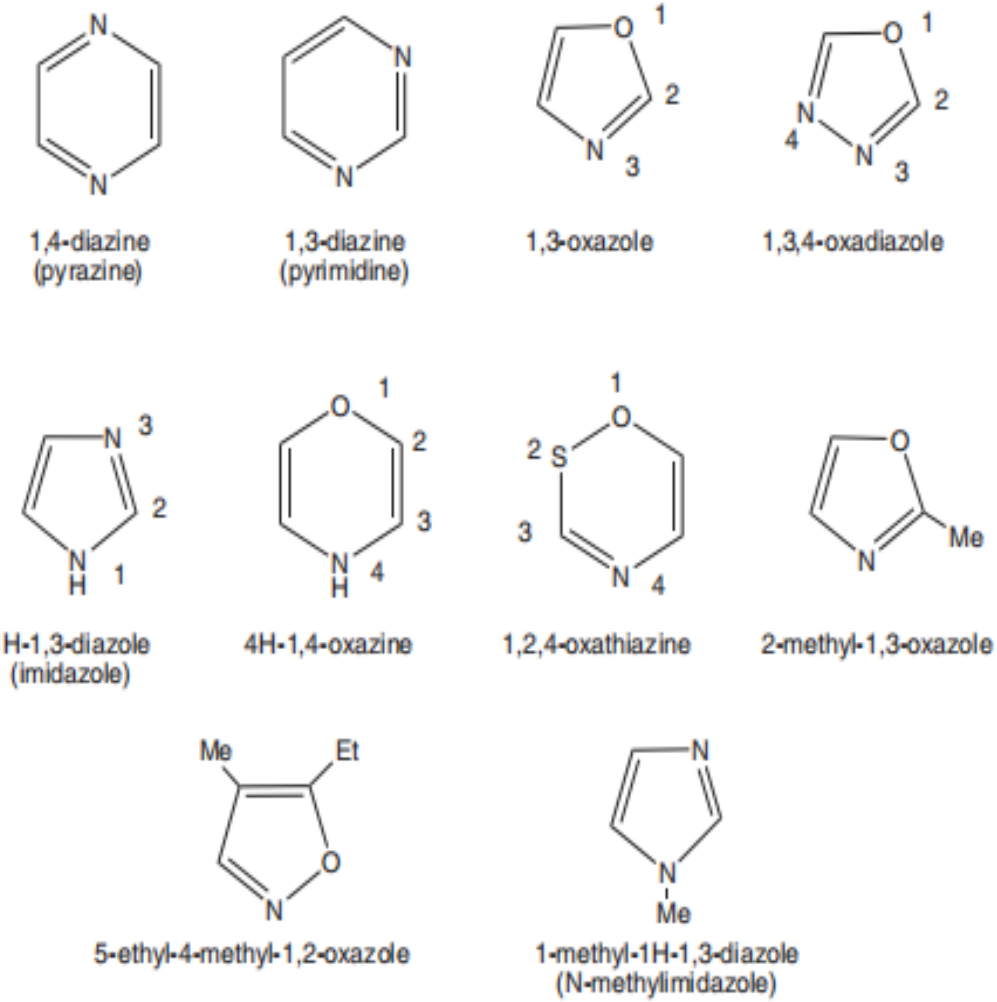


thiophene-3-carboxylic acid

- Each heteroatom is then given a number as found in the ring, with that of highest priority given position 1
- A saturated heteroatom with an extra-hydrogen attached is given priority over an unsaturated form of the same atom, as in 1H-1,3-diazole (see the following discussion).
- The numbers are grouped together in front of the heteroatom listings (thus, 1,3-oxazole, not 1-oxa-3-azole).
- The heteroatom prefixes follow the numbers in the priorities given previously
- Punctuation is important; in the examples to follow, a comma separates the numbers and a dash separates the numbers from the heteroatom prefixes.

- A slight modification is used when two vowels adjoin; one is deleted, as in the listing for “oxaaza,” which becomes simply “oxaza.”
- As for monohetero systems, substituents on the ring are listed alphabetically with a ring atom number for each (not grouped together).

Table 2.3. Some Multiheteroatom Systems



*لما بدي اسمي دايما ببلش من عند الهيتيرو اتوم و اذا عندي اكثر من هيترو اتوم ببلش من الاعلى بريورتي الى الاقل

O>S>N>P

*التفرعات دايما برتبها حسب الابجديه اذا كان عندي اكثر من تفرع يعني اذا عندي ميثان و ايثان بحط الايثان بعدين الميثان و بفصل بينهم يعنس كل تفرع بحط رقمه معه و بفصله عن التفرع الثاني

* ال H دايما بحطها ملاصقه لاسم الهيتروسايكلك و دايما بتكون قبل الاسم مباشره

* الارقام بيفصل بينهم فاصله(،)و بيفصل بين الرقم و الاسم داش (-)

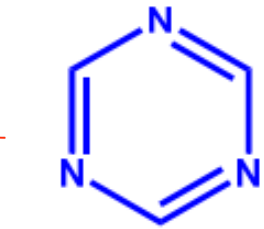
*دايما بحط التفرعات في بداية التسميه

*اذا كان عندي اكثر من هيتيرو اتوم بالتسميه بحط رقم الهيترو اتوم الاقوى و بعدين الاقل و بتكتبهم متلاصقين و اسم الهيتيرو اتوم الاقوى بالاول

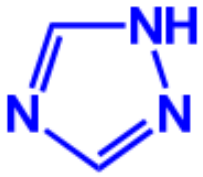
*اذا تكرر عندي هيتيرو اتوم اكثر من مره بعد بحيث اعطيهم اصغر ارقام و بحط di قبل الاسم اذا كانو ٢ و tri اذا٣ و هكذا

Two or more similar atoms contained in a ring are indicated by the prefixes '*di-*', '*tri*', *etc.*

المقطع tri اجا بسبب وجود ٣ذرات N



1,3,5-Triazine

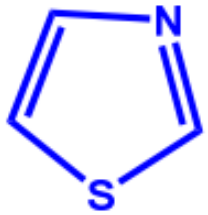


1,2,4 - Triazole

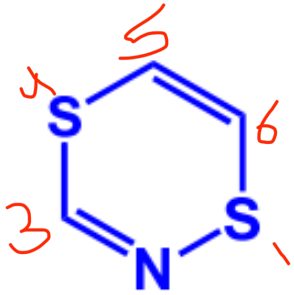
كان ممكن التسميه تكون 1,3,4triazole لكن بالتسميه بحرص اختار اصغر ارقام

If more than one hetero atom occur in the ring, then the heterocycle is named by combining the appropriate prefixes with the ending in Table I in order of their preference, O > S > N.

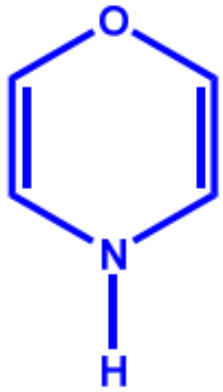
Oxaziridine



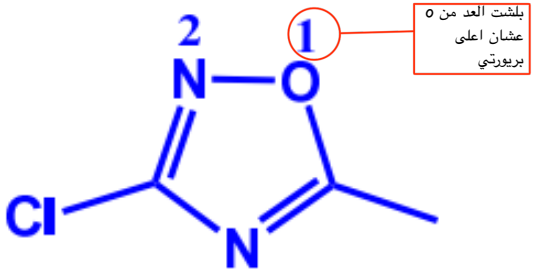
1,3-Thiazole
(Thiazole)



1,4,2 - Dithiazine

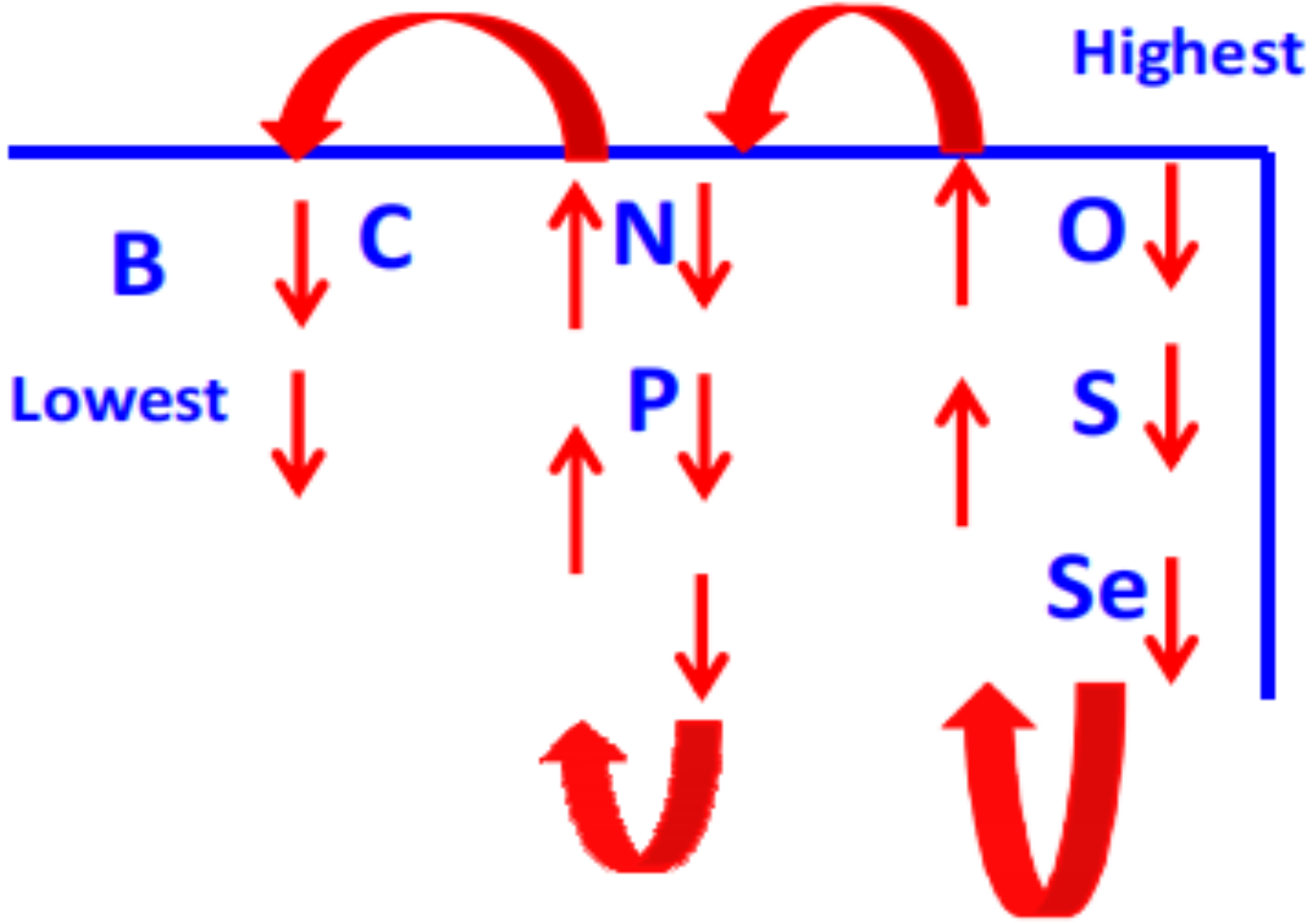


1,4-Oxazine

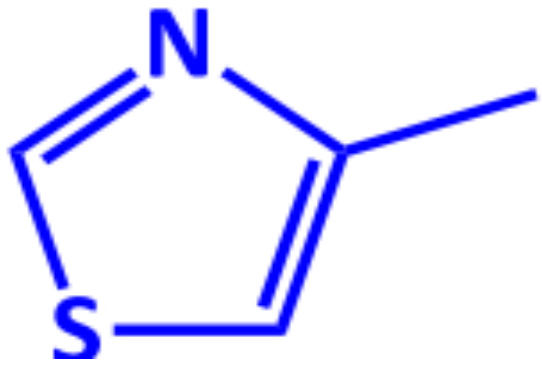


3-chloro-5-methyl-1,2,4-oxadiazole

Priority of heteroatoms for numbering purposes:



The ring is numbered from the atom of preference in such a way so as to give the smallest possible number to the other hetero atoms in the ring. As a result the position of the substituent plays no part in determining how the ring is numbered in such compounds.



4-Methyl-1,3-thiazole