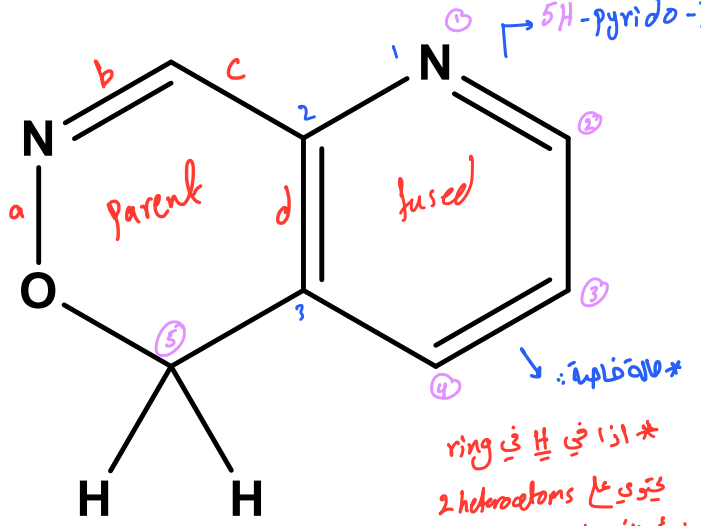
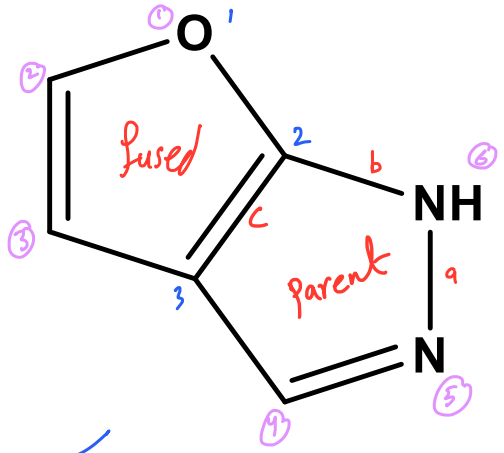


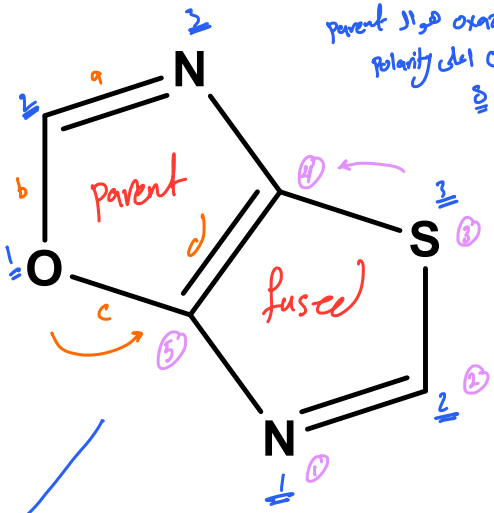
5H-pyrido-[2,3-d]-1,2-oxazine

* الهيدروجين: على أي ذرة

* اذا في H في ring يحتوي على 2 heteroatoms نبدأ العد من ال ring الثاني.

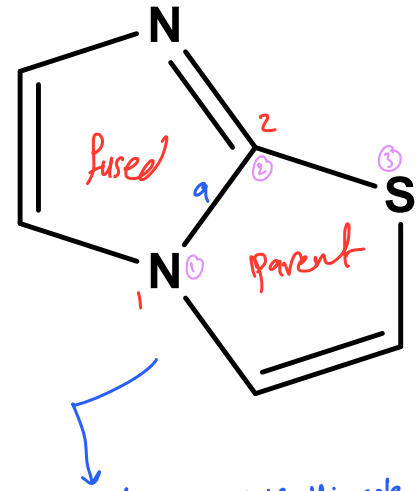


6H-furo-[2,3-c]-pyrazole

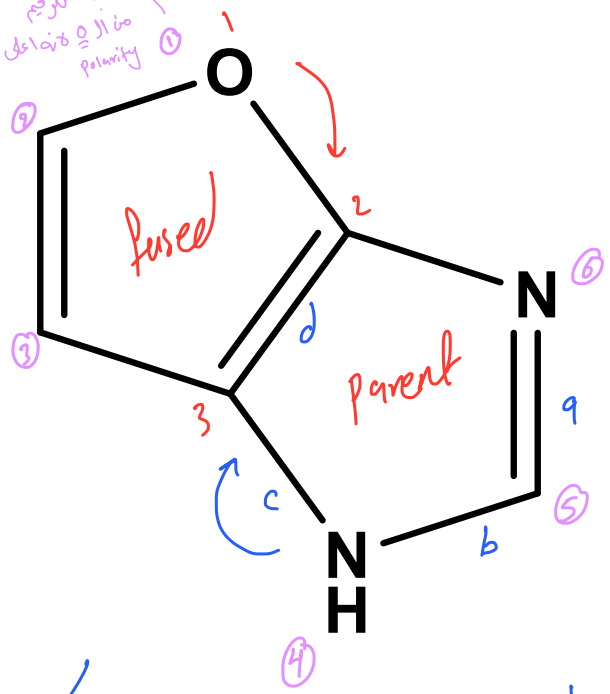


* الـ parent هو الـ oxazole بسبب الـ polarity على الـ O أولاً ثم الـ S

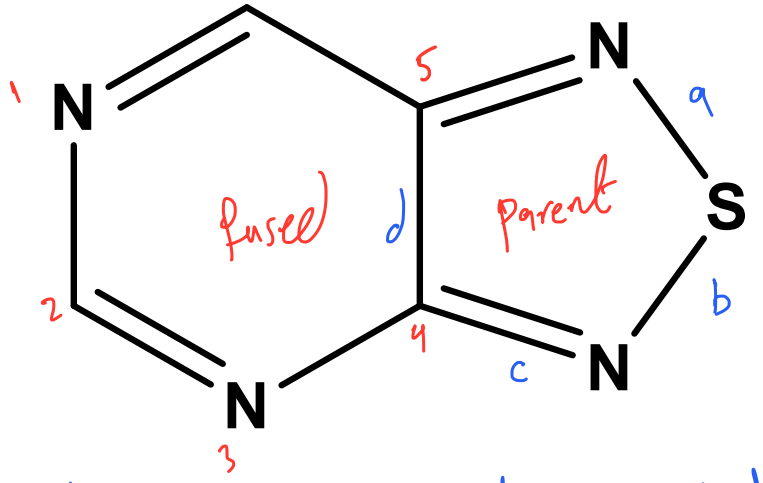
(1,3)-thiazolo-[5,4-d]-(1,3)-oxazole



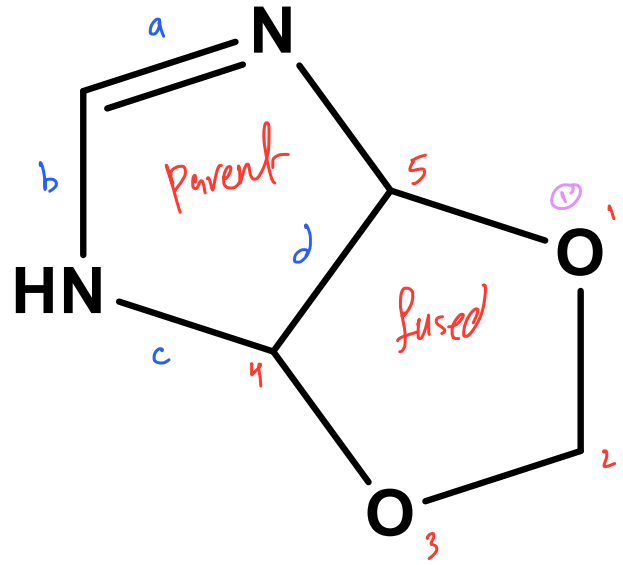
imidazo-[1,2-a]-1,3-thiazole



4H-furo-[3,2-d]-imidazole

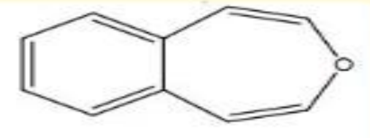


pyrimidino-[4,5-d]-1,2,5-thiadiazole



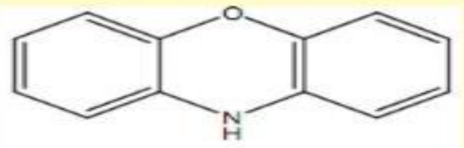
Nomenclature of Benzofused systems:

- If a benzene is fused to the heterocyclic ring, the compound is named by placing number(s) indicating position(s) of the heteroatom(s) before the prefix benzo- (from benzene) followed by the name of the heterocyclic component.



3-Benzoxepin

However, the heterocyclic system in which two benzene rings are orthofused to a six-membered 1,4-diheteromonocycle containing the same heteroatoms are named by adding the replacement prefix for the heteroatom to the term '-anthrene' replacing 'a'.

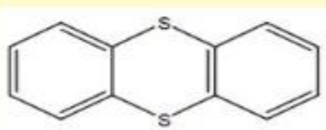


10*H*-Phenoxazine

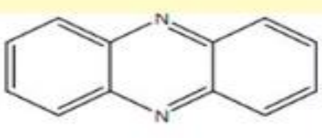
* عند التسمية لما يكون في 2 benzene rings بينهم ring تحتوي على heteroatoms من نفس النوع
← فنكتب اسم الـ heterocycle بالأول بدون نضيف كلمة -anthrene ، مثل:

* لكن لما ترتبط بـ ring فيها more than one heteroatom مش من نفس النوع
فنكتب كلمة pheno- بالأول بدين اسم الـ heterocycle ring

- If two benzene rings are ortho-fused to a six membered 1,4-dihetero monocyclic ring containing different atoms, then it is named by adding the prefix 'pheno-' to the H-W name of heterocycle.



Thianthrene



Phenazine
(exception to the rule) ← حالة شاذة

Naming of fused ring systems

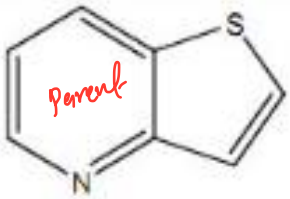
- The fused heterocyclic system is considered to be constructed by the combination of two or more cyclic structural units.
- The cyclic structural units contain maximum number of non-cumulative double bonds and are fused in such a way that each structural unit has one bond common with other.

07:00

- If two heterocyclic rings are fused, additional rules are required.
- A parent ring is selected,
- and the other ring is considered fused on, aswas observed for benzene fusion.
- Some rules are as follows:
- If one ring contains N, it is considered the parent, and its name is placed last in the compound's name.
- If both rings contain N, the larger ring is the parent.
- If both rings are of the same size, that with the most N atoms is the parent, or if the same number of N atoms is present, thatfusion of the rings that gives the smallest numbers for N when the bicycle is numbered is chosen.

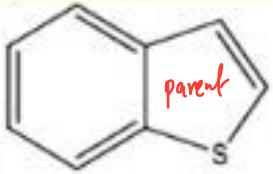
Selection of base component: (parent)

- Nitrogen containing component: a nitrogen containing component is selected as base component.

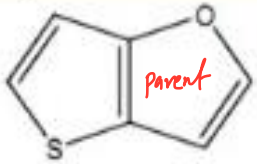


Base component : Pyridine

- If nitrogen is absent, then ring with other heteroatom(s) is selected as base component (order of preference as in the table)

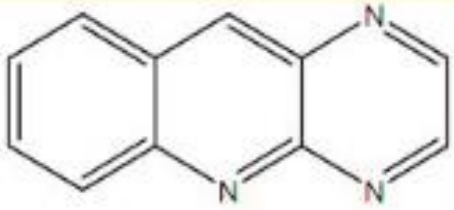


Base component : Thiphene



Base component : Furan

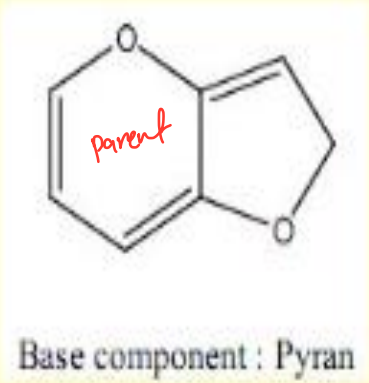
Component with greatest number of rings is selected and named with recognized trivial name if possible.



Base component : Quinoline

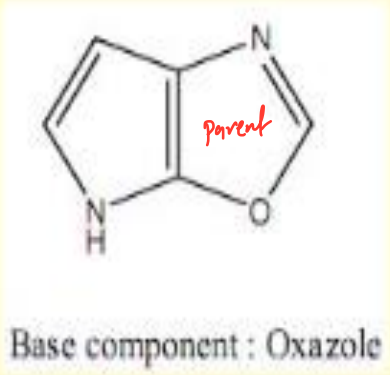
- If rings of unequal size are present, then the one with largest size of the ring is selecte

Membered ring أكبر *



Base component : Pyran

- If rings or equal size with different number of heteroatoms are present, then the ring with greater number of heteroatoms of any kind is considered as a base component.

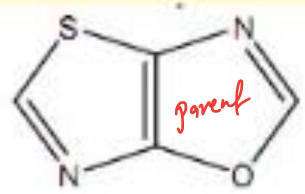


Base component : Oxazole

→ different heteroatoms

- If rings of equal size with equal number of different heteroatoms are present, then the component containing ring with greatest variety of heteroatoms is selected.

- If two heteroatoms of the same group are present, then components containing heteroatoms appearing first in table is preferred.

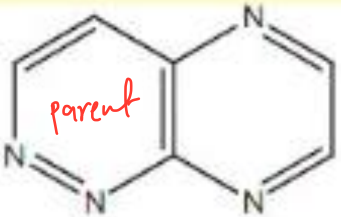


→ polarity أعلى O لأنو ال

Base component : Oxazole

- If rings of same size with same numbers and same kinds of heteroatoms are present, then the component containing the ring with heteroatoms which have lowest locant numbers is preferred.

ال N الاقرب للبعض ←



Base component : Pyridazine

- The attached component is added as a prefix to the name of the base component. The terminal 'e' is replaced by 'o'.

- The bonds of the base component are alphabetalized with consecutive italic letters starting with '*a*' for 1,2-bond…..

- The atoms are other component are numbered in the normal way 1,2,3….in the principle of lowest possible numbering.

- If a position of fusion is occupied by a heteroatom, both the components (ring systems) are considered to posses that heteroatom.

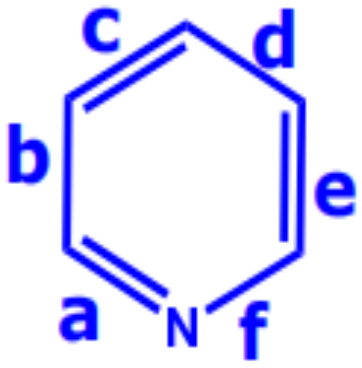
different heteroatom

- If no N is present, O has priority over S over P, and then the above rules are applied.
- The ring fused onto the parent has the suffix “o”; common namesare used (with modification) where possible to simplify the name.

Some examples are pyrido for pyridine, pyrrolo for pyrrole, thieno for thiophene, furo for furan, imidazo for imidazole, pyrimido for pyrimidine, pyrazino for pyrazine, among others.

Naming Hetrocycles with fused rings

When naming such compounds the side of the heterocyclic ring is labeled by the letters a, b, c, etc., starting from the atom numbered 1. Therefore side *'a' being between atoms 1 and 2, side 'b' between atoms 2 and* 3, and so on as shown below for pyridine.



Pyridine

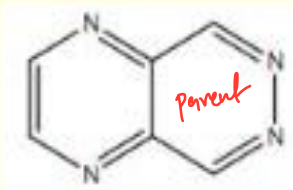
The face letter of the parent ring where the fusion occurs is placed in brackets preceding the name of that ring.

The position numbers of the fused ring are placed inside the brackets before the face letter of the parent ring, separated by a comma.

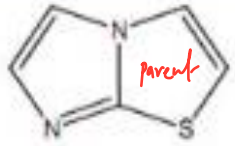
The proper numbers forthe fused ring are those that are encountered as one goes around the ring in the same direction as going alphabetically around the faces of the parent

Numbering of fused systems:

- Fused heterocyclic system is numbered independently of combining components. The numbering is started from the atom adjacent to the bridgehead position with the lowest possible locant(s) to the heteroatom(s). If there is choice, priority is given according to the table.

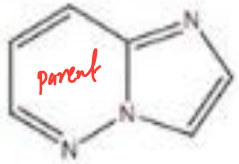


Pyrazino[2,3-*d*]pyridazine



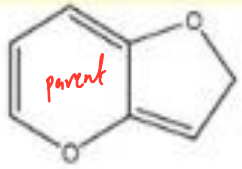
Imidazo[2,1-*b*]thiazole

Carbon atom common to two rings is given the lowest possible position, both not numbered. However, the common heteroatom is numbered.

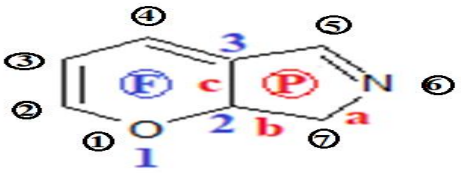


Imidazo[1,2-*b*]pyridazine

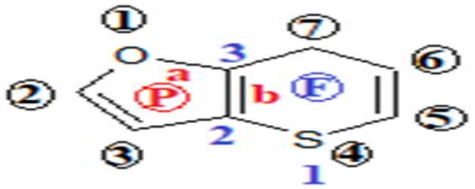
The position of a saturated atom is indicated by an italic hydrogen and is given the lowest possible number locant.



2*H*-Furo[3,2-*b*]pyran



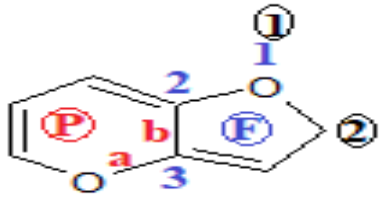
7H- Pyrano[2,3-c]pyrrole



7H-thiopyrano[2,3-b]furan

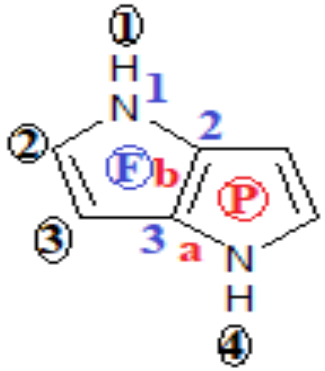
[3,2-b]

1H-pyrrolo[2,3-b]pyridine

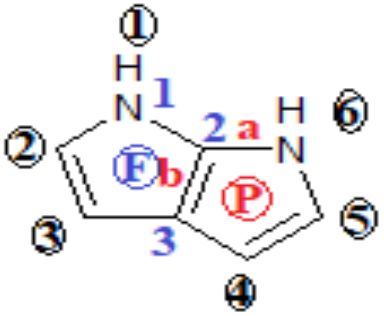


2H-furo[2,3-b]pyran

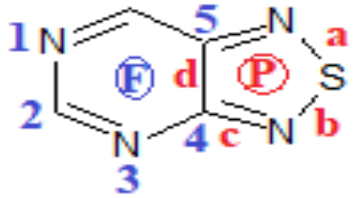
[3,2-b]



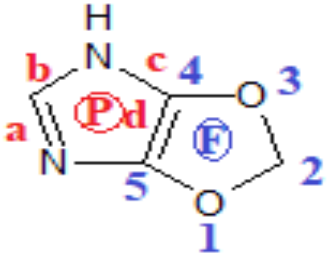
1H,4H-pyrrolo[3,2-b]pyrrole



1H,6H-pyrrolo[2,3-b]pyrrole



Pyrimido[4,5-d][1,2,5]thiadiazole



2H,4H-1,3-dioxolo[4,5-d]imidazole