

Chapter 4 Nomenclature (命名)

4.1 Trivial names of common ring systems

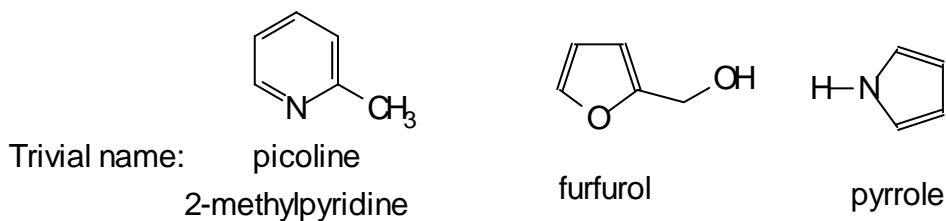
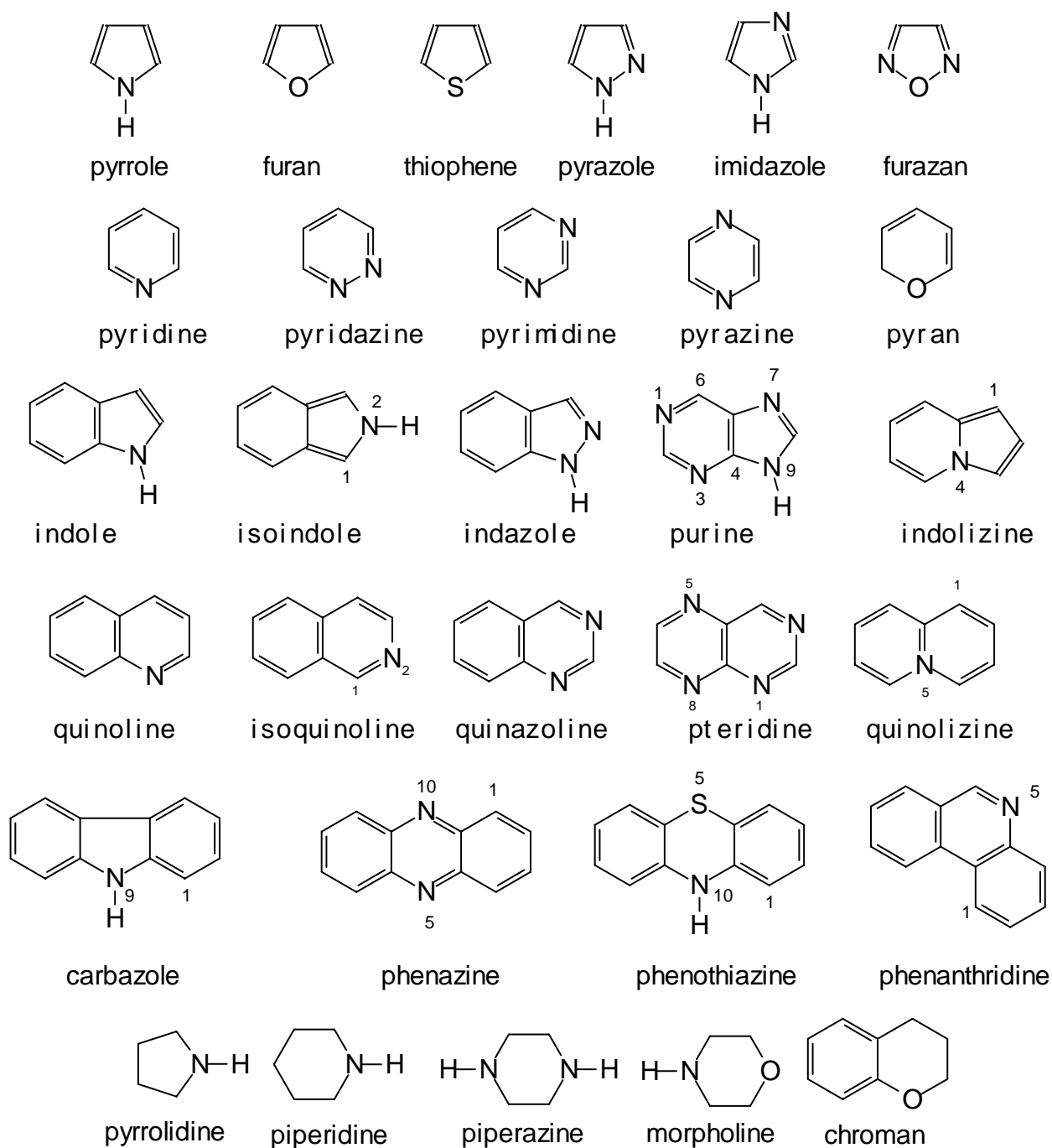


Table 4.1 Recognized trivial names



4.2 Systemmatic (Hantzsch-Widman) nomenclature for monocyclic compounds

Table 4.2 Hantzsch-Widman system: common prefixes

Element	Valences	Prefix
Oxygen	II	Oxa
Sulfur	II	Thia
Selenium	II	Selena
Tellurium	II	Tellura
Nitrogen	III	Aza
Phosphorus	III	Phospha
Arsenic	III	Arsa
Antimony		Stiba
Bismuth		Bisma
Silicon	IV	Sila
Germanium	IV	Germa
Tin		Stanna
Lead		Plumba
Boron	III	Bora
Mercury		Mercuria

Table 4.3 Stems for the Hantzsch-Widman system

Ring size	Unsaturation	Saturated ring
3	irene	irane
4	ete	etane
5	ole	olane
6A	ine	ane
6B	ine	inane
6C	inine	inane
7	epine	epane
8	ocine	ocane
9	onine	onane
10	ecine	ecane

6A: O, S, Se, Te, Bi, Hg

6B: N, Si, Ge, Sn, Pb

6C: B, P, As, Sb

Examples of systematically named heterocycles



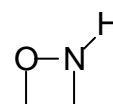
thiirene



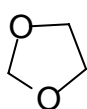
oxirane



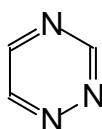
1,3-diazete



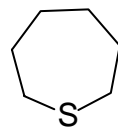
1,2-oxazetidene



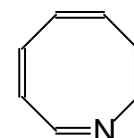
1,3-dioxolane



1,2,4-triazine



thiepane



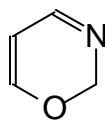
azocine



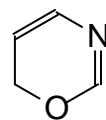
1H-azirine



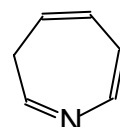
2H-azirine



2H-1,3-oxazine

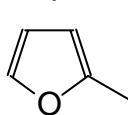


6H-1,3-oxazine

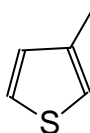


3H-azepine

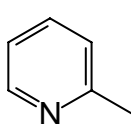
Examples of names of radicals, cations and anions.



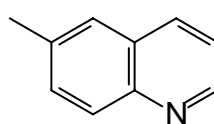
2-furyl
(furan-2-yl)



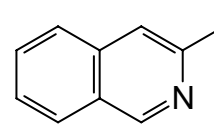
3-thienyl
(thiophen-3-yl)



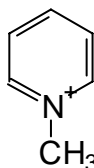
2-pyridyl
(pyridin-2-yl)



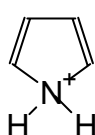
6-quinolyl
(quinolin-6-yl)



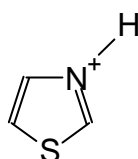
3-isoquinolyl
(isoquinolin-3-yl)



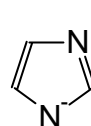
1-methylpyridinium



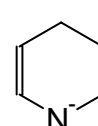
pyrrol-1-ium



thiazolium

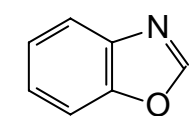


imidazolide



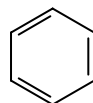
1,4-dihydropyridin-1-ide

4.3 The naming of fused ring systems



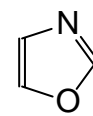
benzoxazole

=

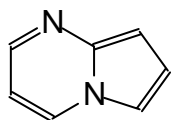


benzene

+

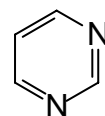


oxazole



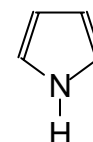
pyrrolo[1,5-a]pyrimidine

=



pyrimidine

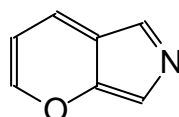
+



pyrrole

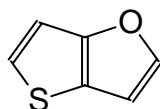
Fused ring constructed rules:

1. Fused ring 中之每一單元環之名稱，從 recognized trivial names (Table 4.1) 之中挑選，若在 recognized trivial names 中有，則選最大的單元；若沒有則以 systematic name 命名 (Table 4.2 & 4.3)。
2. 若 fused ring system 由二個或二個以上之命名單元組成，選擇其一為 base component，如上圖中選 pyrimidine 當 base component。
選擇 base component 的規則如下：
 - (1) 若只有一個 component 含氮，則選此環為 base component。



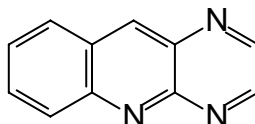
選 pyrrole 爲 base component 。

- (2) 若環上不含氮，則選 Table 4.2 中含雜原子次序最上面的爲 base component 。



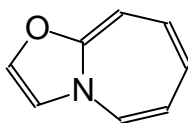
選 furan 爲 base component 。

- (3) 若含二個以上的環，則選含較多環爲 base component 。



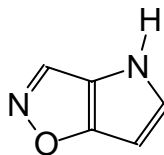
選 quinoline 爲 base component 。

- (4) 若含二個環大小不同，則選較大環爲 base component 。



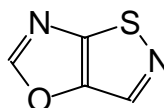
選 azepine 爲 base component 。

- (5) 若環含不同數目的雜原子，則選較多雜原子的環爲 base component 。



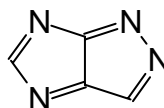
選 isoxazole 爲 base component 。

- (6) 若二個環含有相同數目但不同種類的雜原子，則選原子次序在 Table 4.2 中較優先的環爲 base component 。



選 oxazole 爲 base component 。

- (7) 若雜原子的種類和數目相同，則選雜原子位序較小的爲 base component 。



選 pyrazole 爲 base component 。

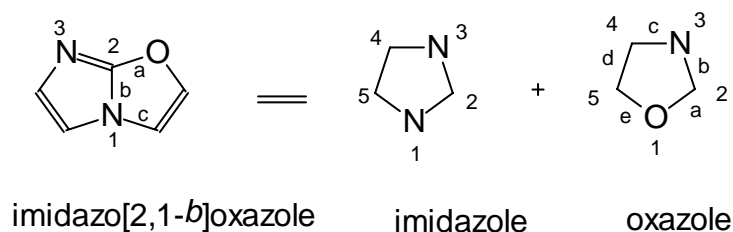
3. 第二個單元環則以字首置於 base component 之前，此字首之最後一個字母“e”改爲“o”，如“pyrazine”改爲“pyrazino”，有一些例外則列於 Table 4.4 中。

Table 4.4 Non-standard prefixes in fusion names.

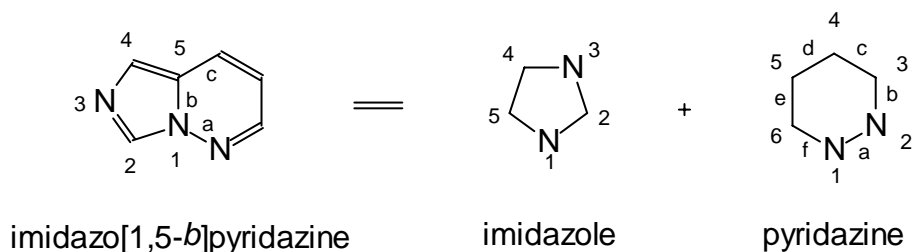
Heterocycle	Name as prefix
Furan	Furo
Imidazole	Imidazo
Isoquinoline	Isoquino
Pyridine	Pyrido
Quinoline	Quino
Thiophene	Thieno

4. Base component 環上的鍵標示 a, b, c, etc. 次序，由次序 1, 2 的邊起算，second component 的原子以 1, 2, 3, ... 編號。融合(fusion)的部位，以 base component 的標示 a, b, c, ... 和以 second component 的 1, 2, 3, ... 標示，second component 的標示次序以 base component 的優先次序起算。

例一、

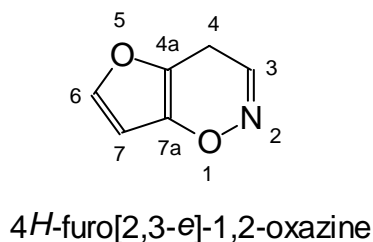


例二、



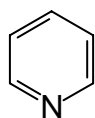
5. Fused ring system 的編號，由靠近 bridgehead 的位子起算，並使雜原子的編號儘量最小，在 Table 4.2 中次序較優先的給予較小的編號，"Indicated hydrogen" 的標示如單環系統。

例

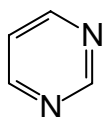


4.4 Replacement nomenclature

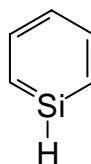
Carbon ring 以 IUPAC rules 命名，雜原子以 Table 4.2 之字首代替。



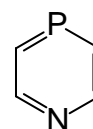
azabenzene



1,3-diazabenzene



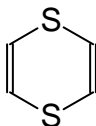
silabenzene



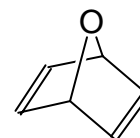
1,4-diazaphosphabenzene



oxacyclopentane



1,4-dithiacyclohexa-2,5-diene



7-oxabicyclo[2.2.1]hepta-2,5-diene