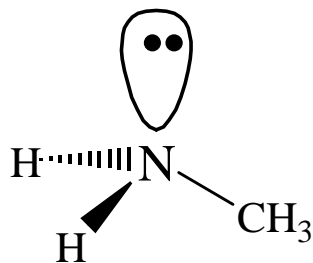
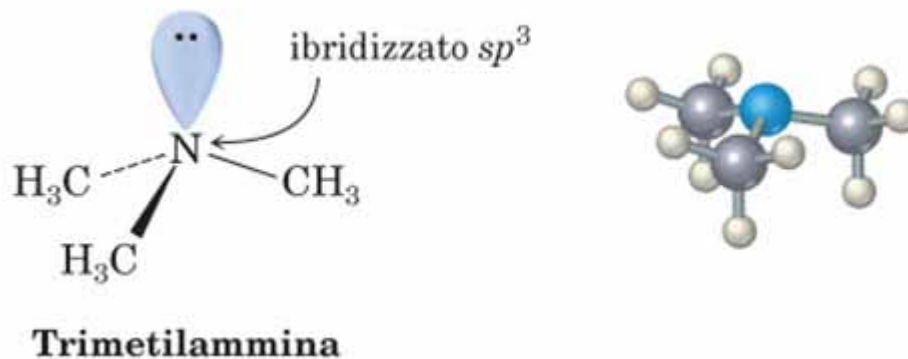
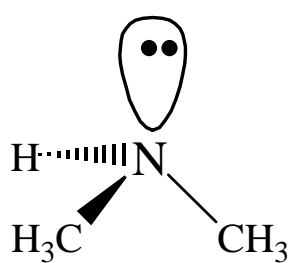


Acidi carbossilici e derivati

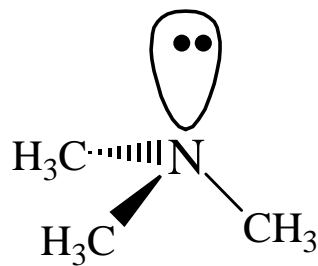
Composti organici che contengono il gruppo NR_3



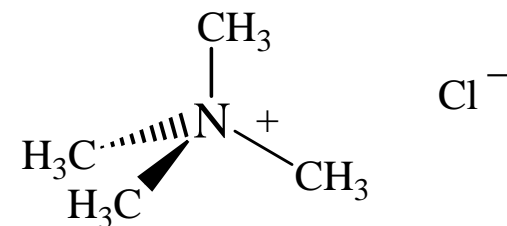
Metilammina
(un' ammina primaria)



Dimetilammina
(un' ammina secondaria)



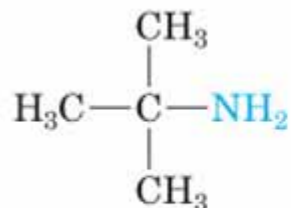
Trimetilammina
(un' ammina terziaria)



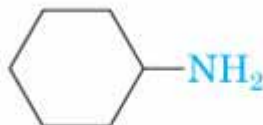
Cloruro di Tetrametilammonio
(un sale di ammonio quaternario)

Nomenclatura delle ammine

Le ammine primarie prendono il nome aggiungendo la desinenza **-ammina** al nome dei sostituenti organici.



tert-Butil**ammina**

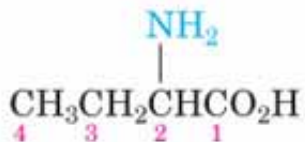


Cicloesil**ammina**

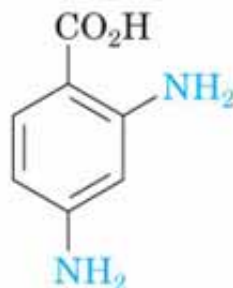


1,4-Butan**diammina**

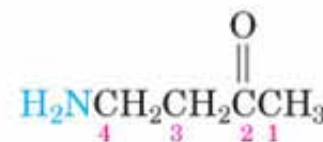
Se nella struttura compaiono **altri** gruppi funzionali, il gruppo amminico si considera un sostituito, a cui si dà il nome di **ammino**, legato alla molecola di riferimento:



Acido 2-**ammino**butanoico



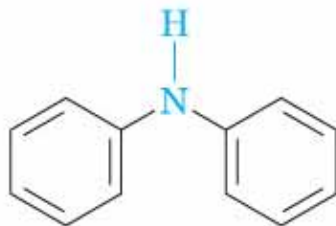
Acido 2,4-**diammino**benzoico



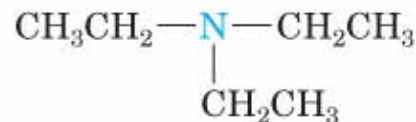
4-**Ammino**-2-butanone

Nomenclatura delle ammine

Le ammine secondarie e terziarie simmetriche si denominano utilizzando i prefissi *di-* o *tri-* nei nomi dei gruppi alchilici.

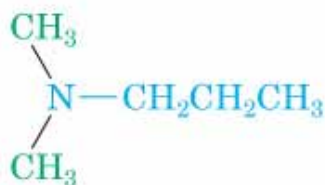


Difenilammina

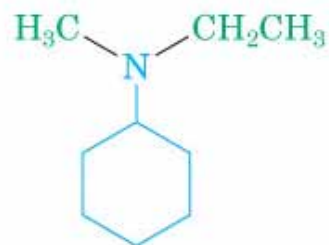


Trietilammina

Le ammine secondarie e terziarie sostituite asimmetricamente vengono considerate ammine primarie **N-sostituite**. Come ammina primaria di riferimento si sceglie quella col gruppo più grande.



N,N-Dimetilpropilammina
(propilammina è il nome di base;
i due gruppi metilici sono
sostituenti sull'azoto)

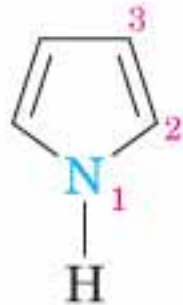


N-Etil-N-metilcicloesilammina
(cicloesilammina è il nome di base;
l'etile e il metile sono
sostituenti sull'azoto)

Nomi comuni di alcune ammine aromatiche



Piridina



Pirrolo



Chinolina



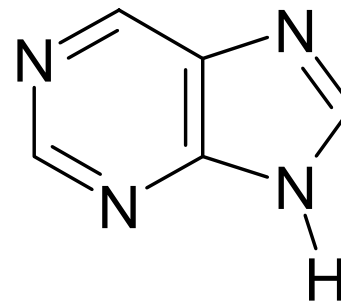
Imidazolo



Indolo

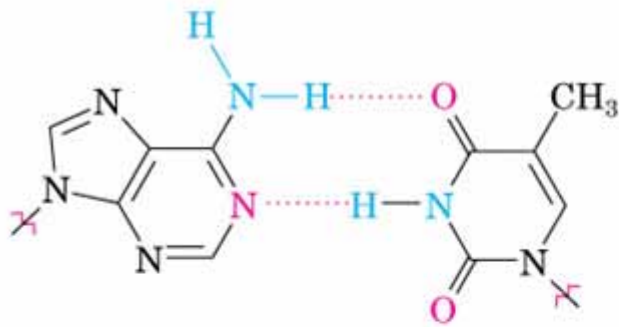
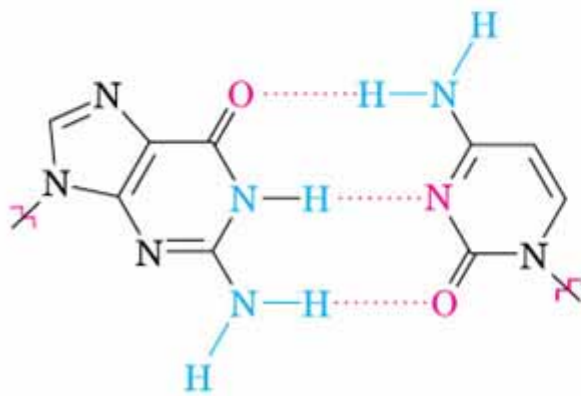
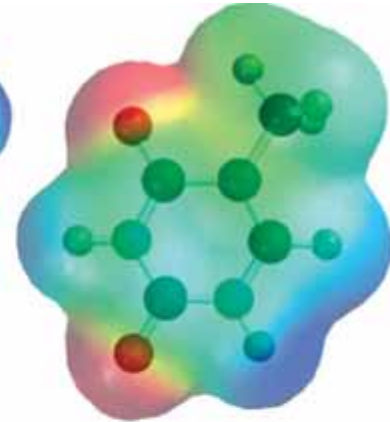
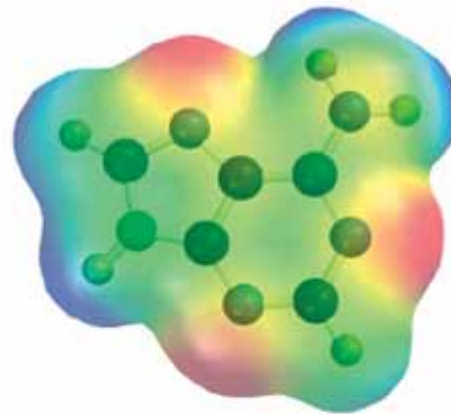
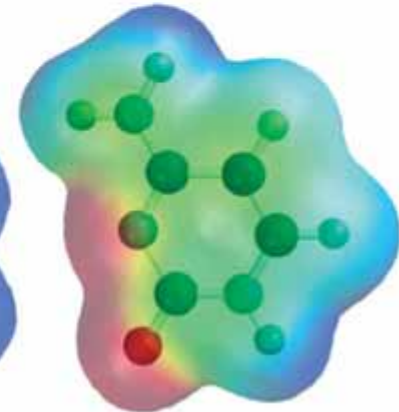
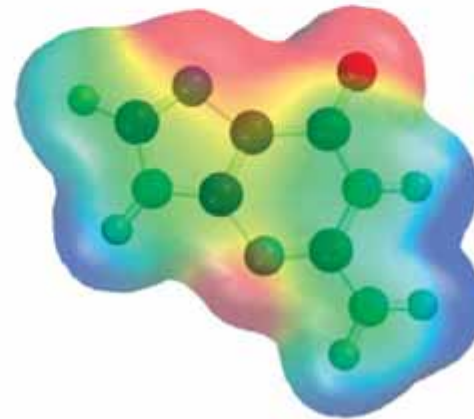


Pirimidina

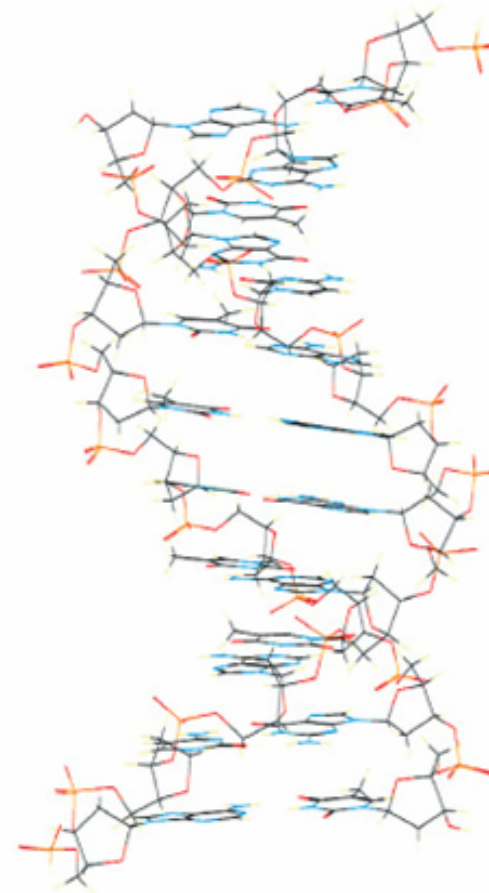
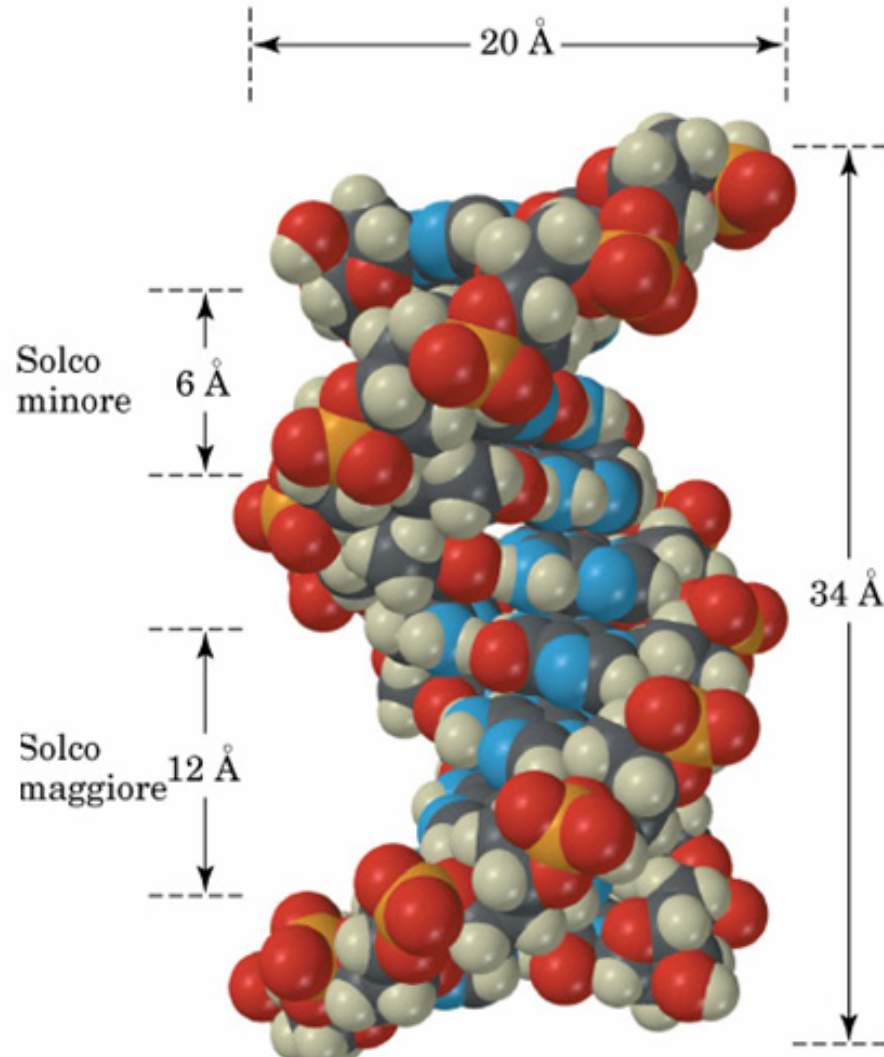


Purina

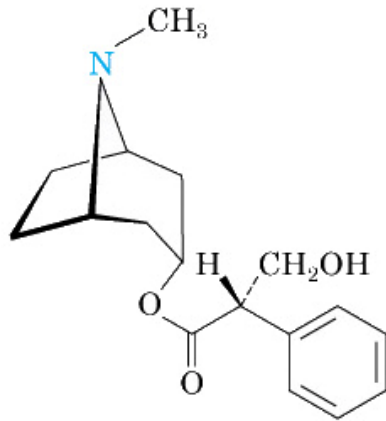
DNA: basi puriniche e pirimidiniche

**A****T****G****C**

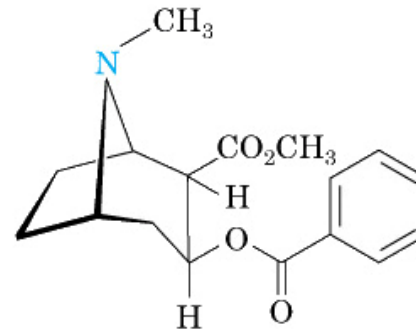
DNA: basi puriniche e pirimidiniche



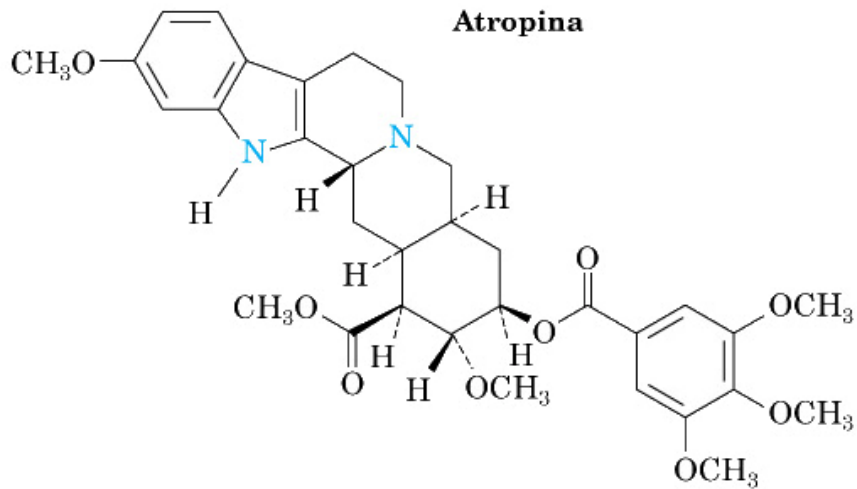
Alcaloidi naturali



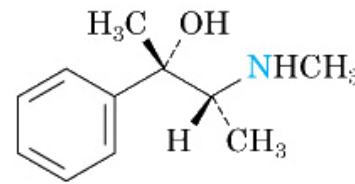
Atropina



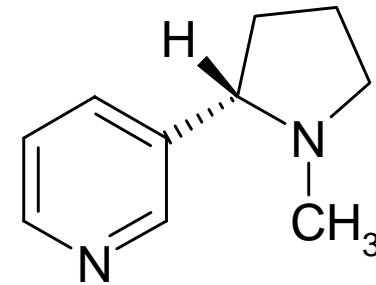
Cocaina



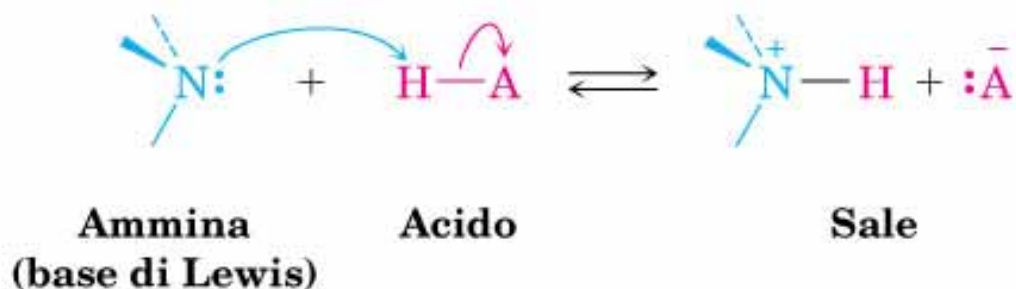
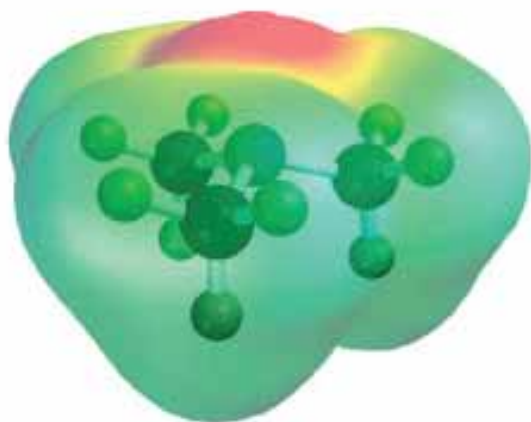
Reserpina



Efedrina



Proprietà delle ammine



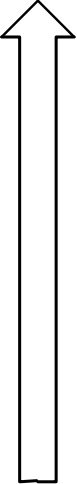
$$K_{\text{eq.}} = \frac{[\text{RNH}_3^+][\text{OH}^-]}{[\text{RNH}_2][\text{H}_2\text{O}]}$$

$$K_{\text{b}} = \frac{[\text{RNH}_3^+][\text{OH}^-]}{[\text{RNH}_2]}$$

$$\text{p}K_{\text{b}} = -\log K_{\text{b}}$$

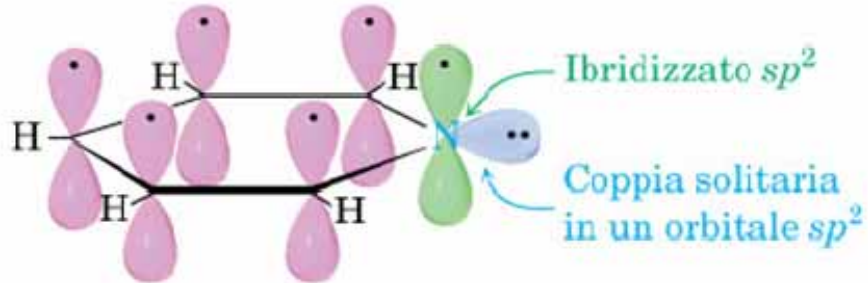
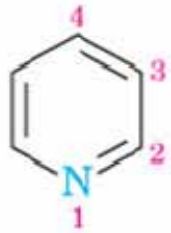
$$\text{p}K_{\text{b}} + \text{p}K_{\text{a}} = 14$$

Proprietà delle ammine

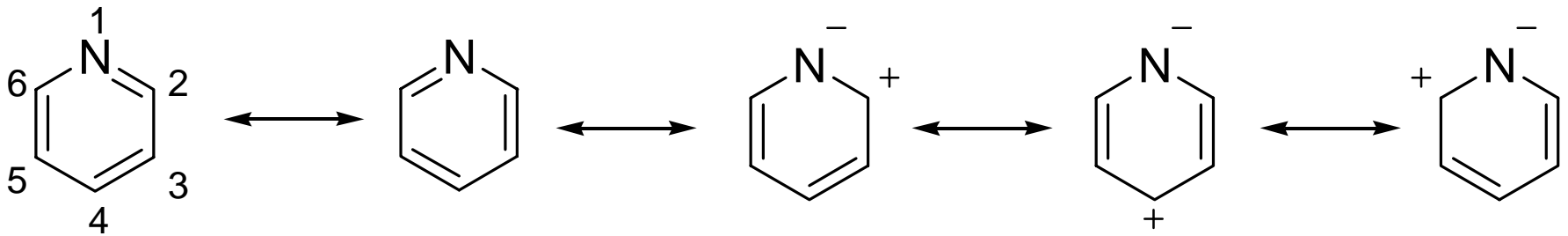
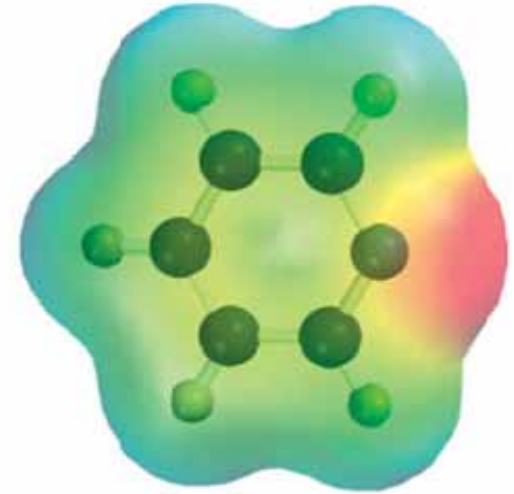
Ammina	Struttura	pK _b	pK _a (acido coniugato)		
Dietilammina	(CH ₃ CH ₂) ₂ NH	3.06	10.94	Base più Forte	
Trietilammina	(CH ₃ CH ₂) ₃ N	3.21	10.79		
Etilammina	(CH ₃ CH ₂)NH ₂	3.25	10.75		
Dimetilammina	(CH ₃) ₂ NH	3.27	10.73		
Trimetilammina	(CH ₃) ₃ N	3.36	10.64		
Metilammina	CH ₃ NH ₂	4.21	9.79		
Ammoniaca	NH ₃	4.74	9.26		
Anilina	PhNH ₂	9.37	4.63		Base meno Forte
p-NO ₂ -Anilina	p-NO ₂ -PhNH ₂	13.0	1.0		

Nonostante la somiglianza strutturale, le ammidi non sono basi. La spiegazione è data dalle formule di risonanza.

Ammine aromatiche: piridina

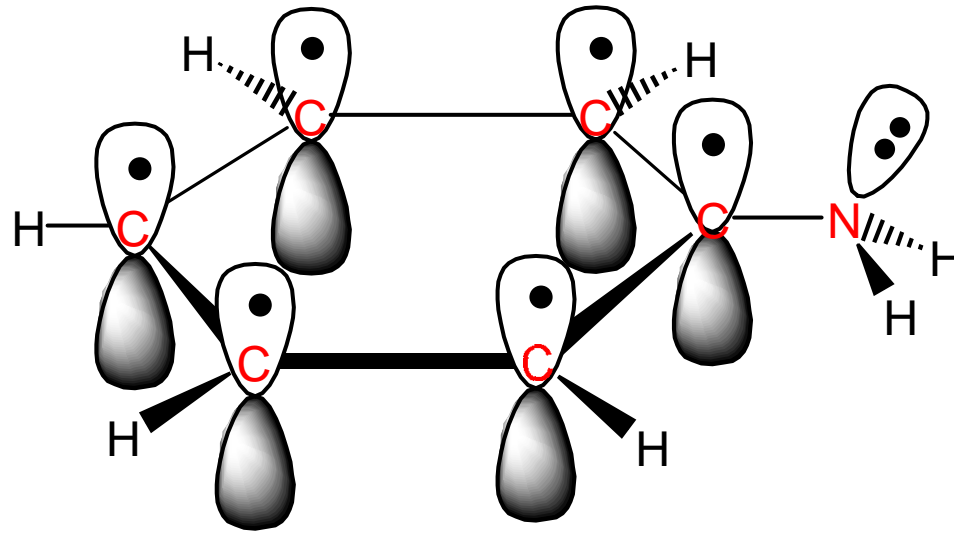


Sei elettroni π

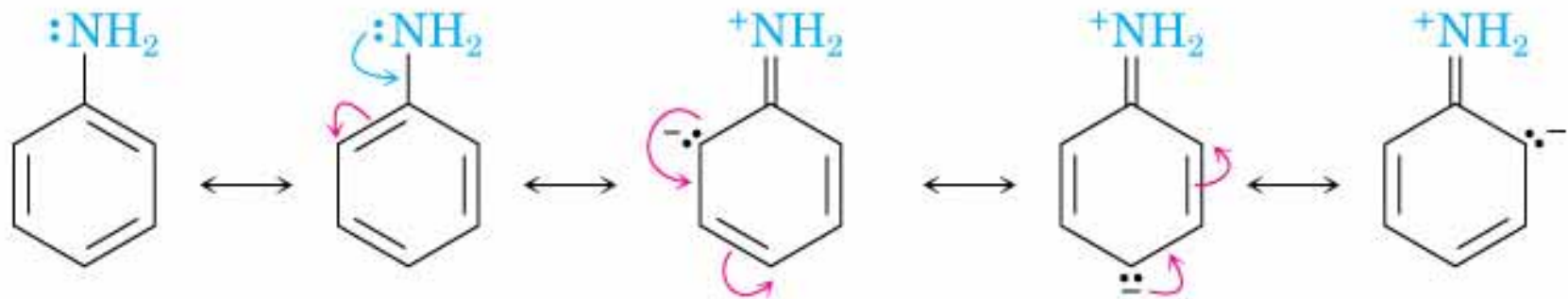


$pK_b = 8.7$

Ammine aromatiche: anilina

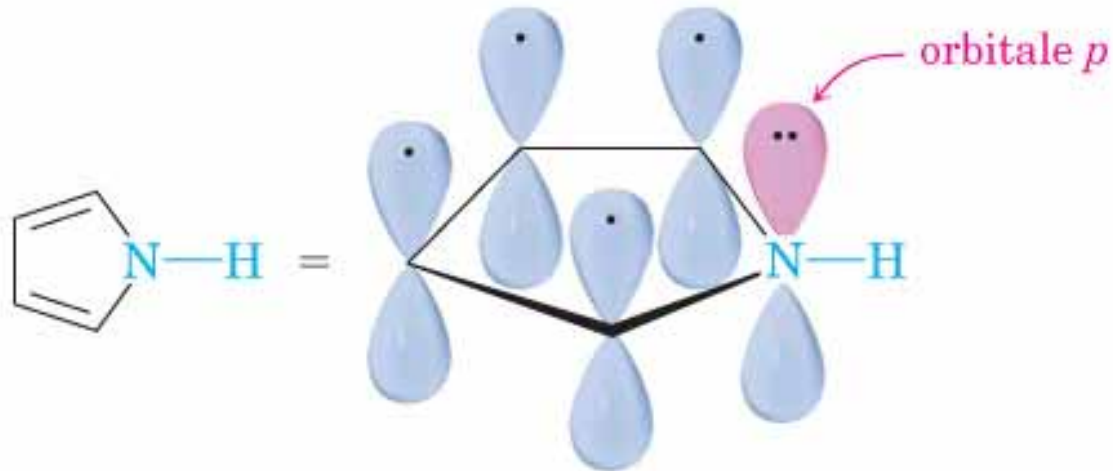


Anilina

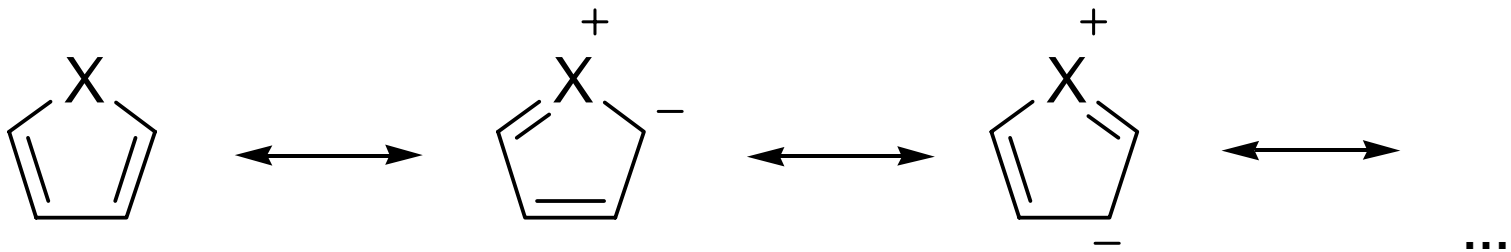


$\text{pK}_b = 9.4$

Ammine aromatiche: pirrolo



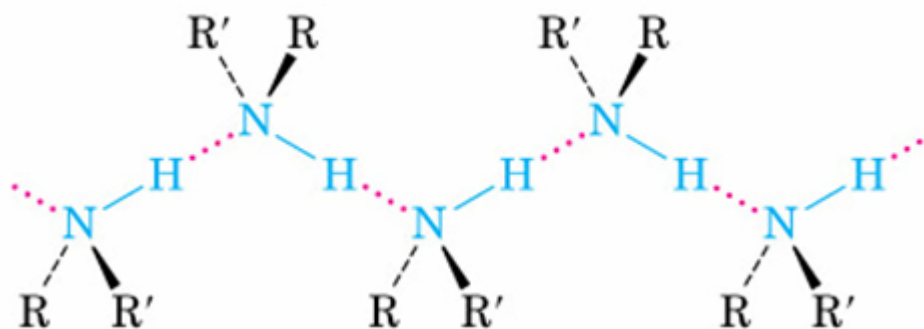
Pirrolo



$$\text{p}K_{\text{b}} = 14$$

Proprietà delle ammine: legami a idrogeno

Composto	CH_3CH_3	CH_3OH	CH_3NH_2	$\text{CH}_3\text{CH}_2\text{CH}_3$	$\text{CH}_3\text{CH}_2\text{OH}$	$\text{CH}_3\text{CH}_2\text{NH}_2$
Peso Molecolare	30	32	31	44	46	45
Punto di ebollizione, °C	-88.6°	65°	-6.0°	-42°	78.5°	16.6°



Preparazione delle ammine

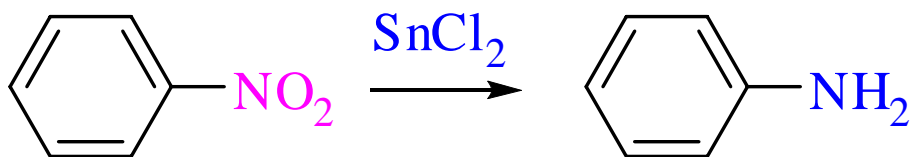
Riduzione di nitrili



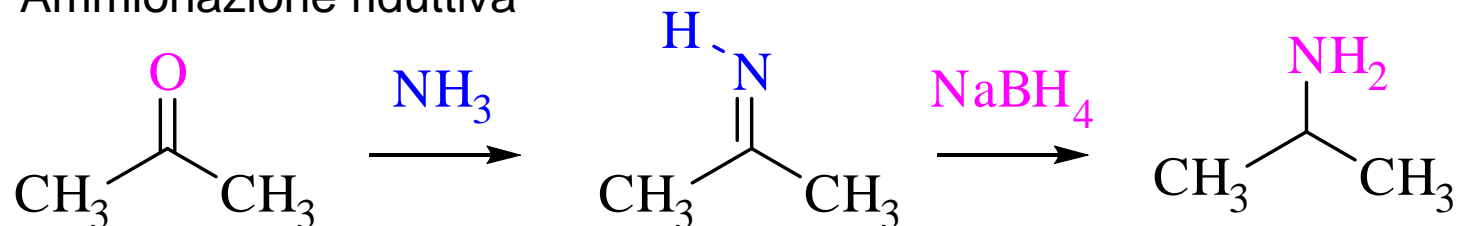
Riduzione di ammidi



Riduzione di nitrobenzeni



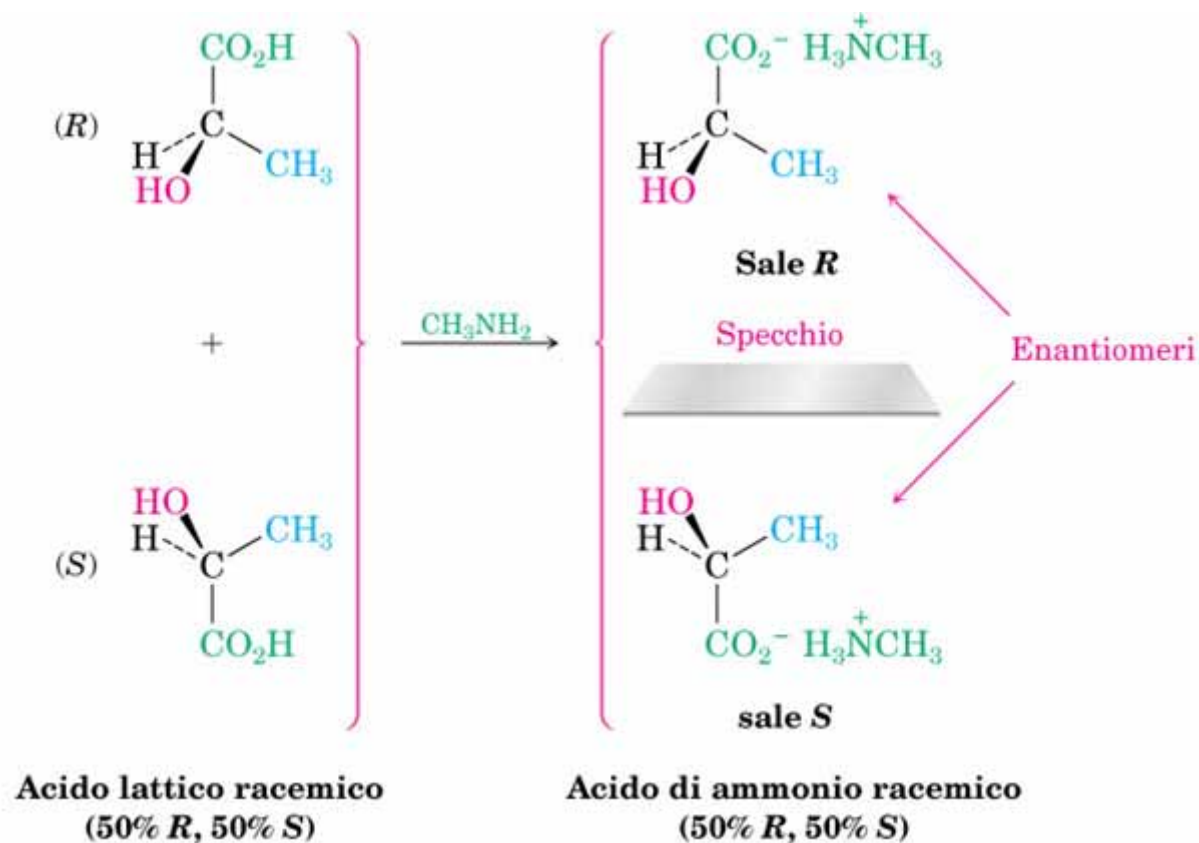
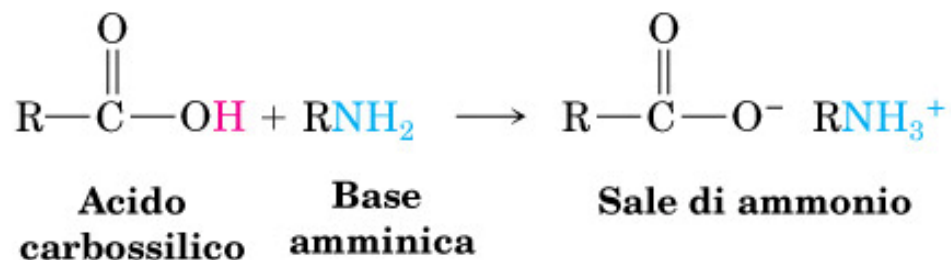
Ammionazione riduttiva



Alchilazione di alogenuri (lucidi successivi)

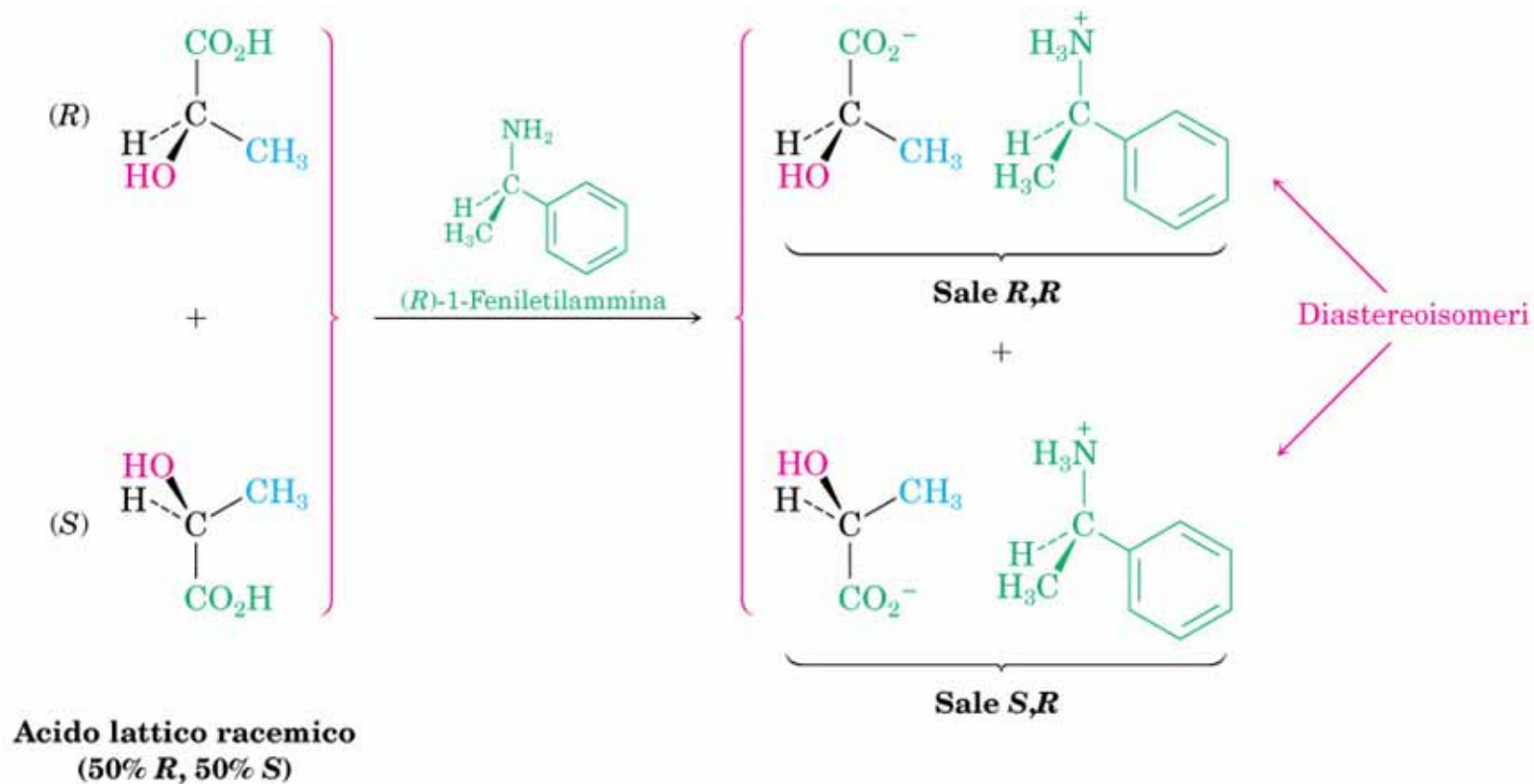
Reazioni delle ammine

Formazione di sali



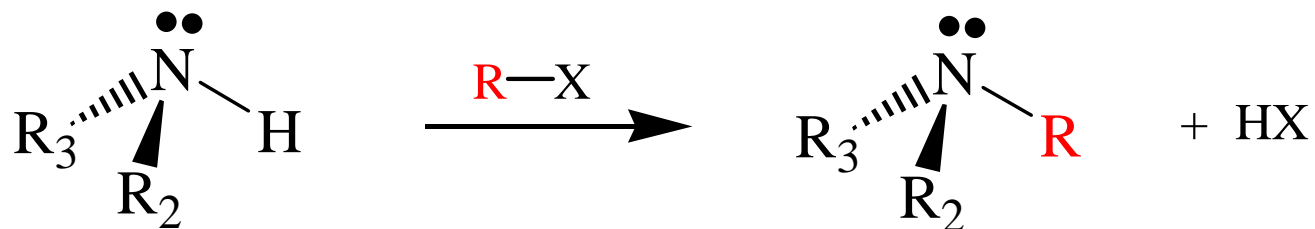
Reazioni delle ammine

Formazione di sali distreomerici

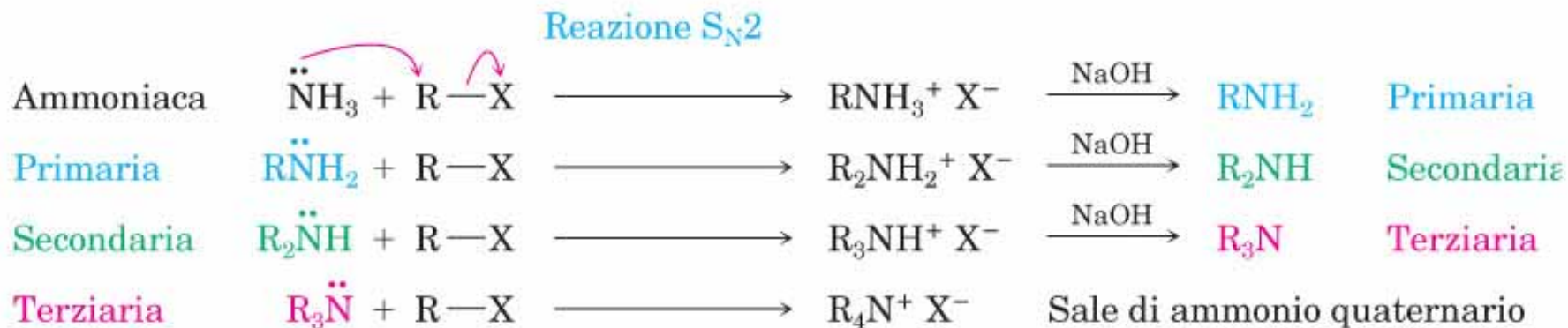


Reazioni delle ammine

Sostituzione nucleofila: alchilazione



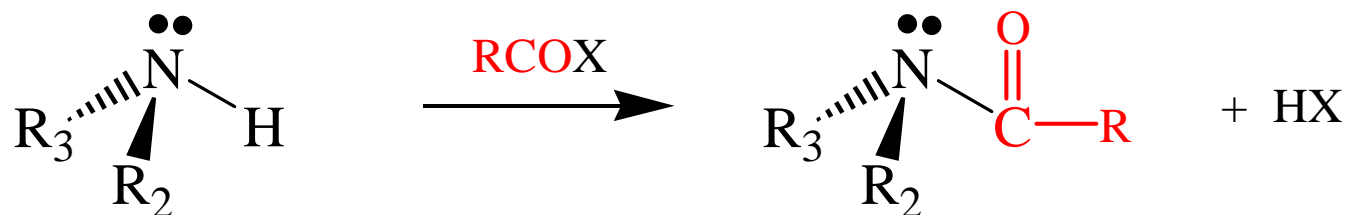
Riguarda tutte le ammine, dall'ammoniaca alle ammine terziarie



E' sempre possibile la polialchilazione: la ammine sostituite sono più reattive di quelle meno sostituite

Reazioni delle ammine

Sostituzione nucleofila: acilazione



un'ammide

Riguarda l'ammoniaca e le ammine primarie e secondarie ma non le terziarie

