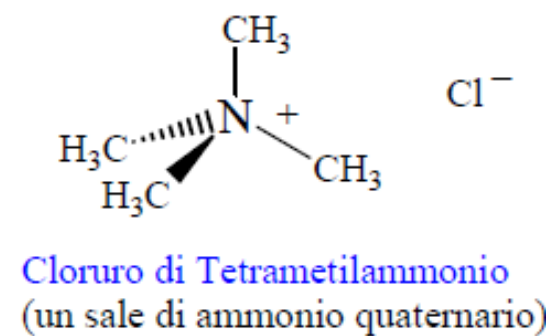
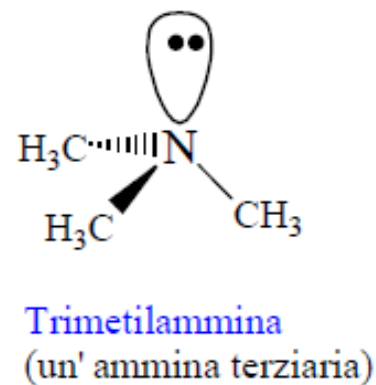
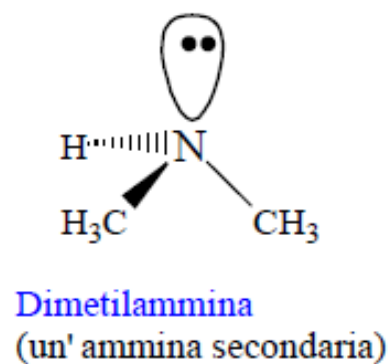
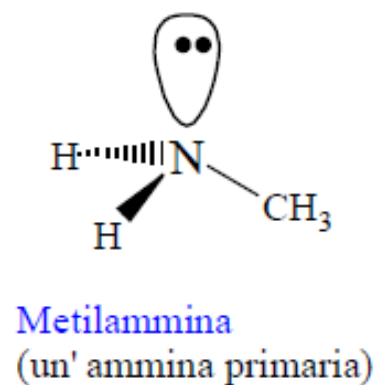
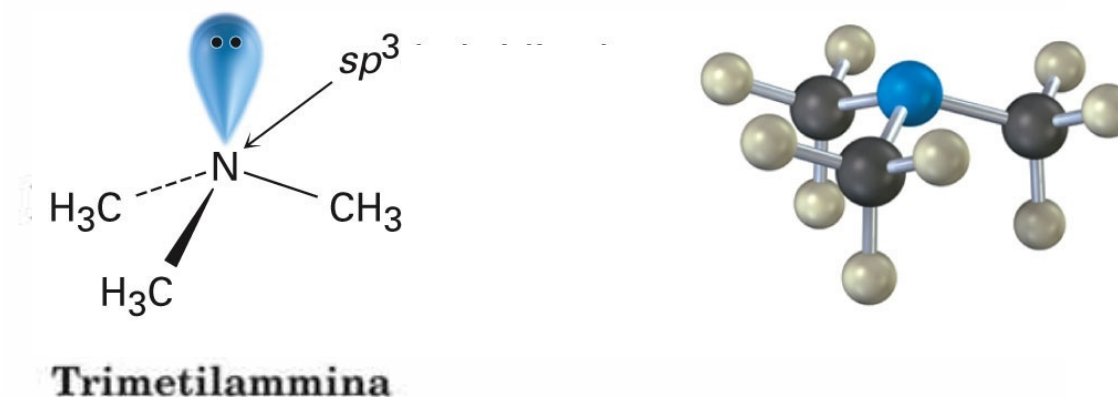


Chimica Organica

Ammine

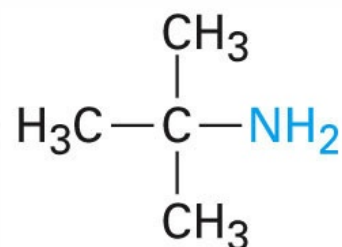
Struttura delle ammine

Composti organici che contengono il gruppo NR_3

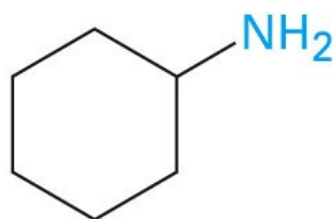


Nomenclatura delle ammine

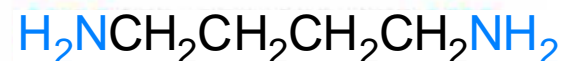
Le ammine primarie prendono il nome aggiungendo la desinenza **-ammina** al nome dei sostituenti organici.



tert-Butilammina

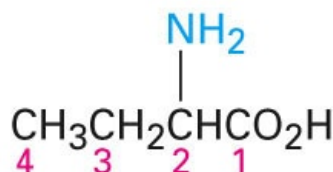


Cicloesilammina

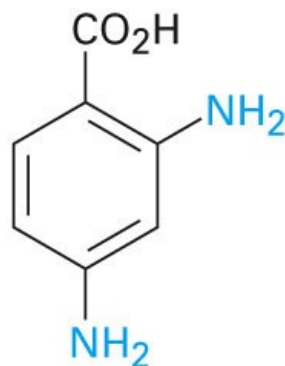


1,4-Butandiammina

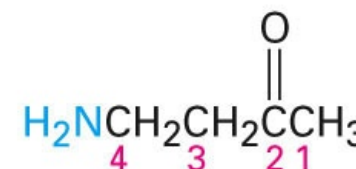
Se nella struttura compaiono **altri** gruppi funzionali, il gruppo amminico si considera un sostituito, a cui si dà il nome di **ammino**, legato alla molecola di riferimento:



Acido 2-amminobutanoico



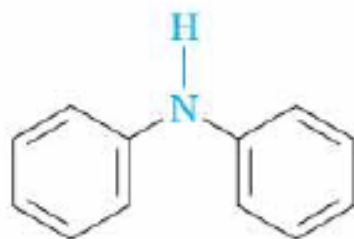
Acido 2,4-diamminobenzoico



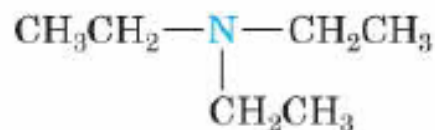
4-Ammino-2-butanone

Nomenclatura delle ammine

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

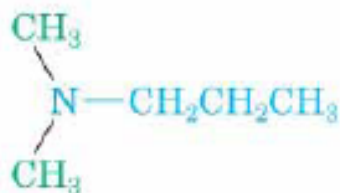


Difenilammina

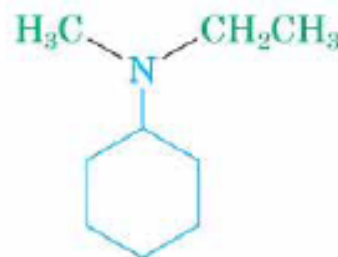


Trietilammina

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)

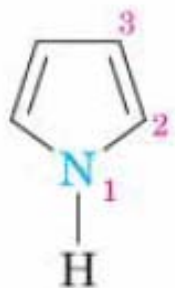


***N*-Etil-*N*-metilcicloesilammina**
(cicloesilammina è il nome di base;
l'etile e il metile sono
sostituenti sull'azoto)

Nomi comuni di alcune ammine



Piridina



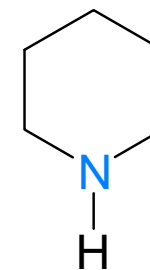
Pirrolo



Chinolina



Imidazolo



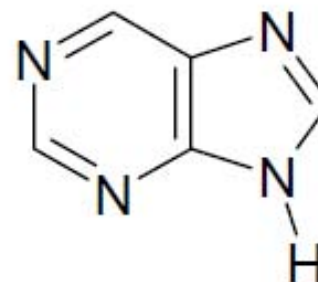
Piperidina



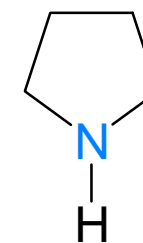
Indolo



Pirimidina

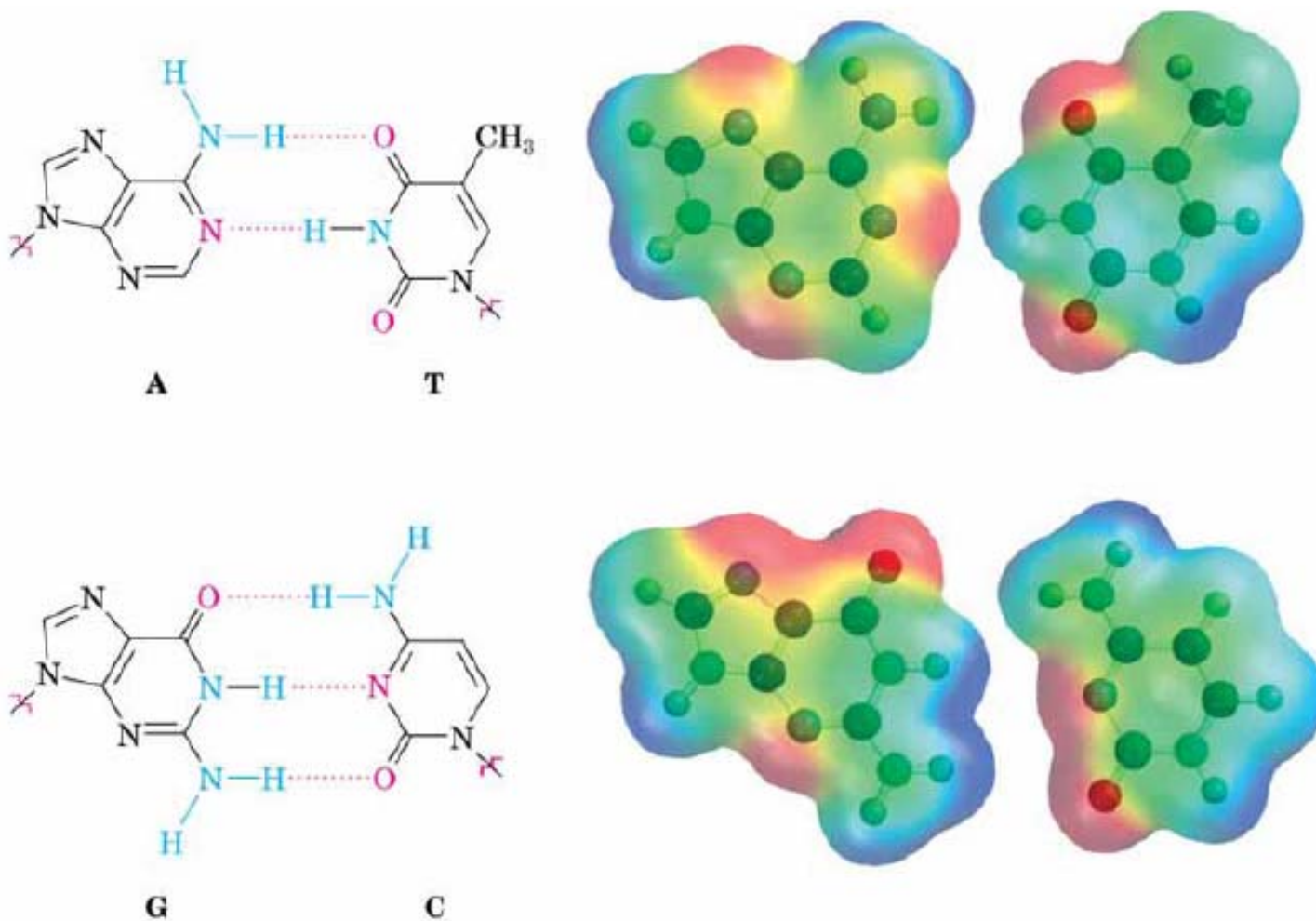


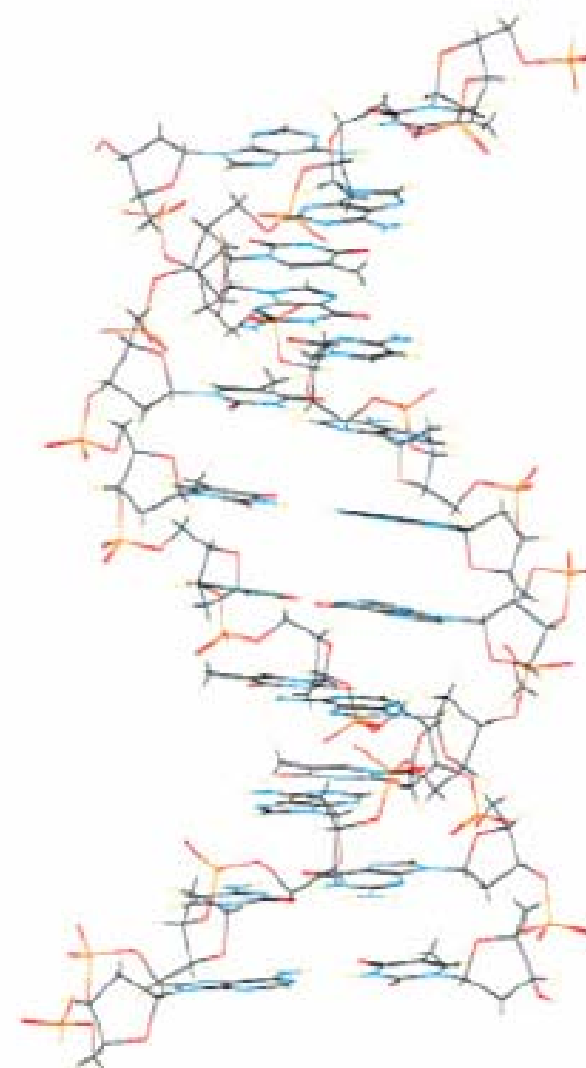
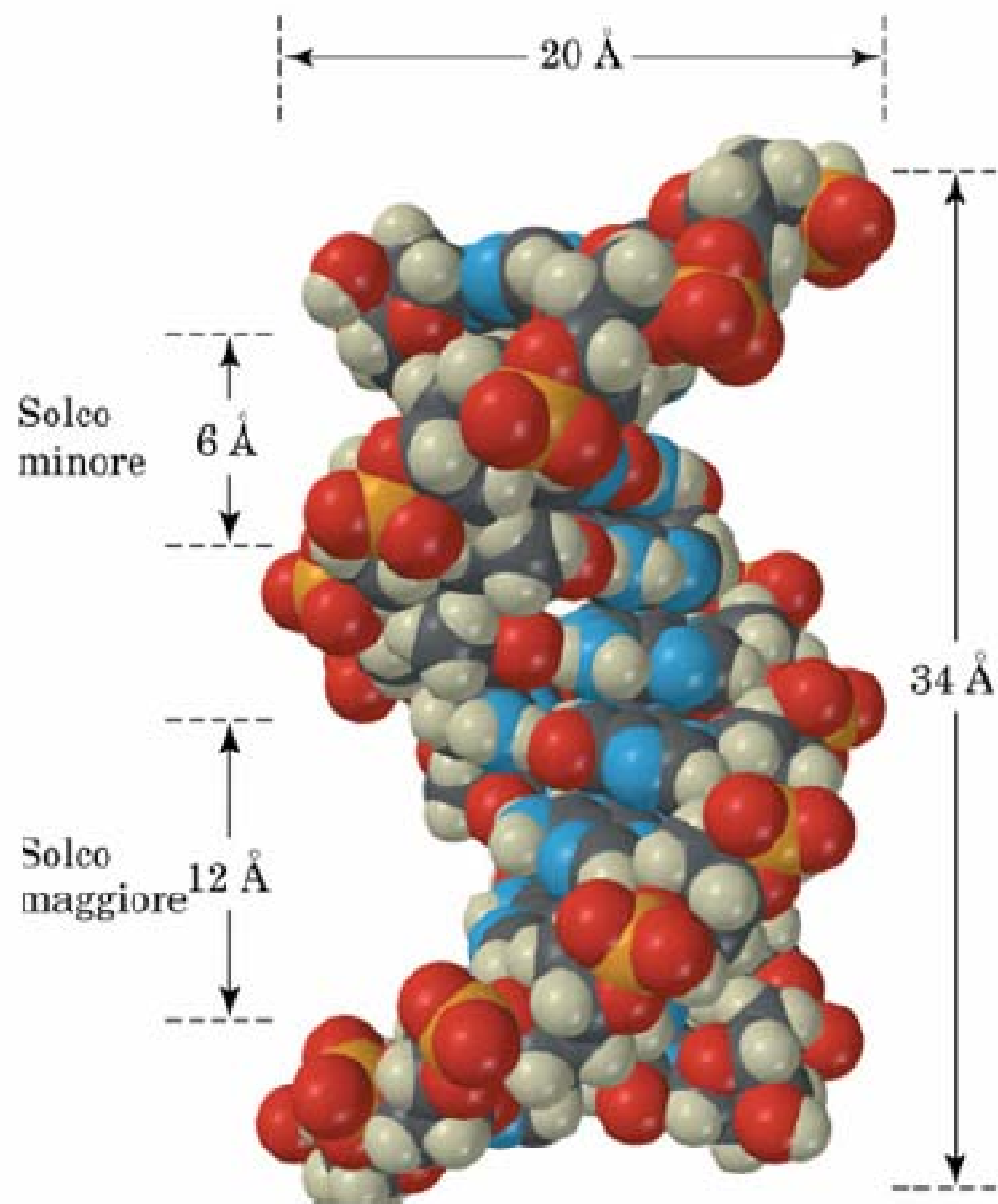
Purina



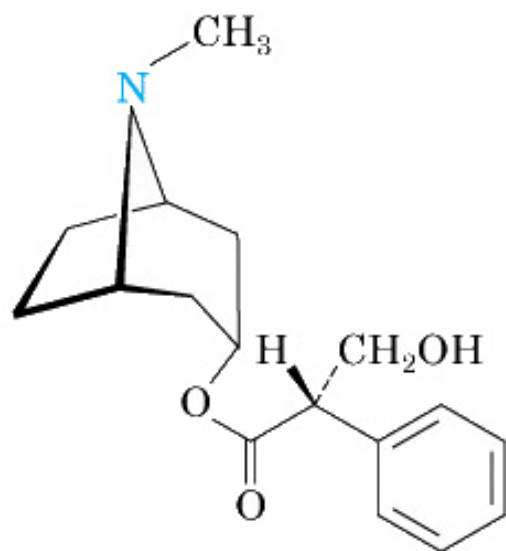
Pirrolidina

DNA: basi puriniche e pirimidiniche

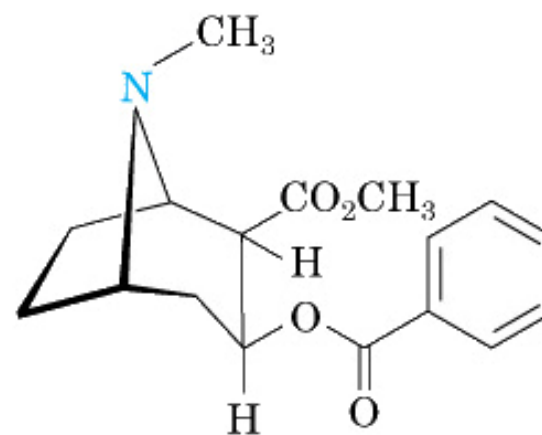




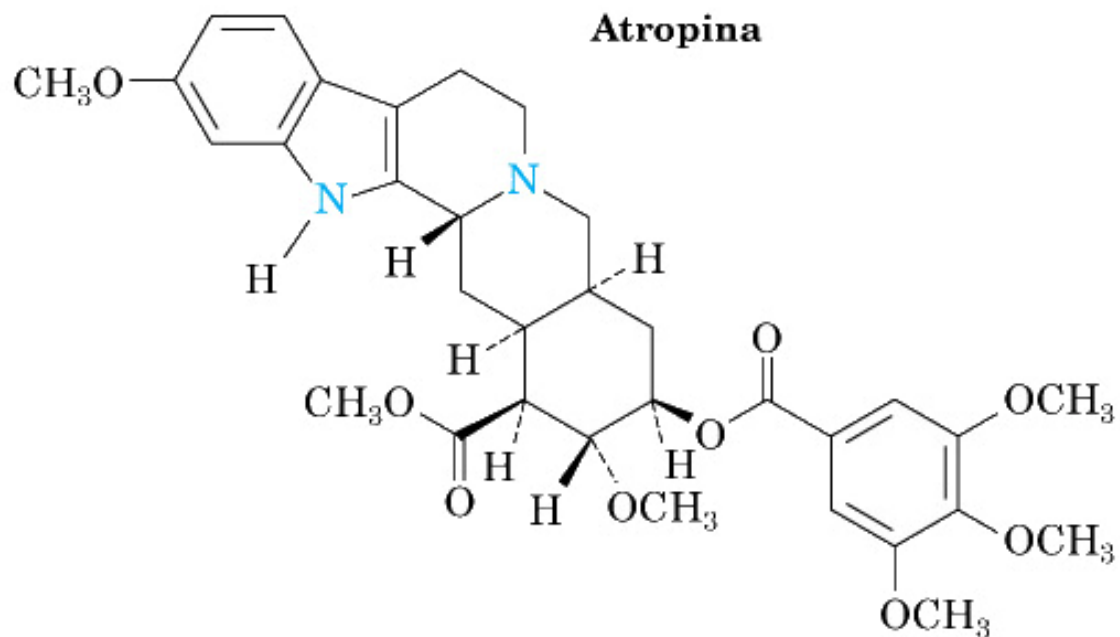
Alcaloidi naturali



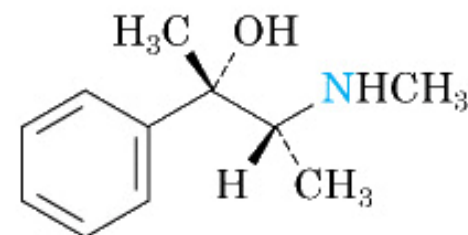
Atropina



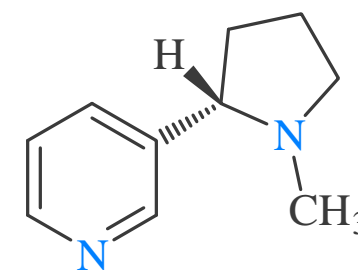
Cocaina



Reserpina

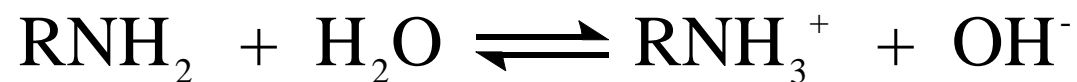
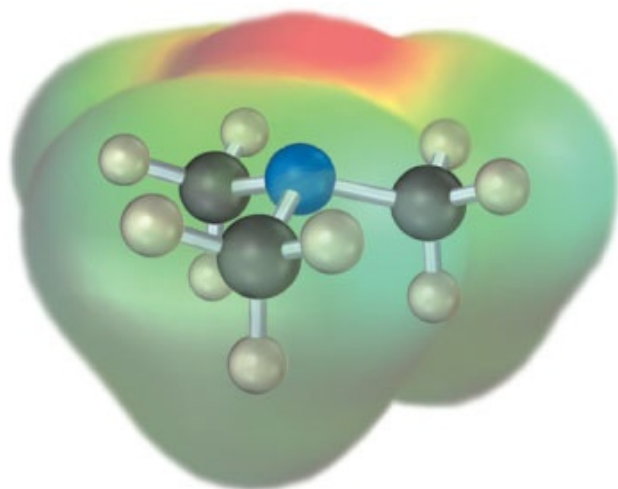


Efedrina



Nicotina

Basicità delle ammine

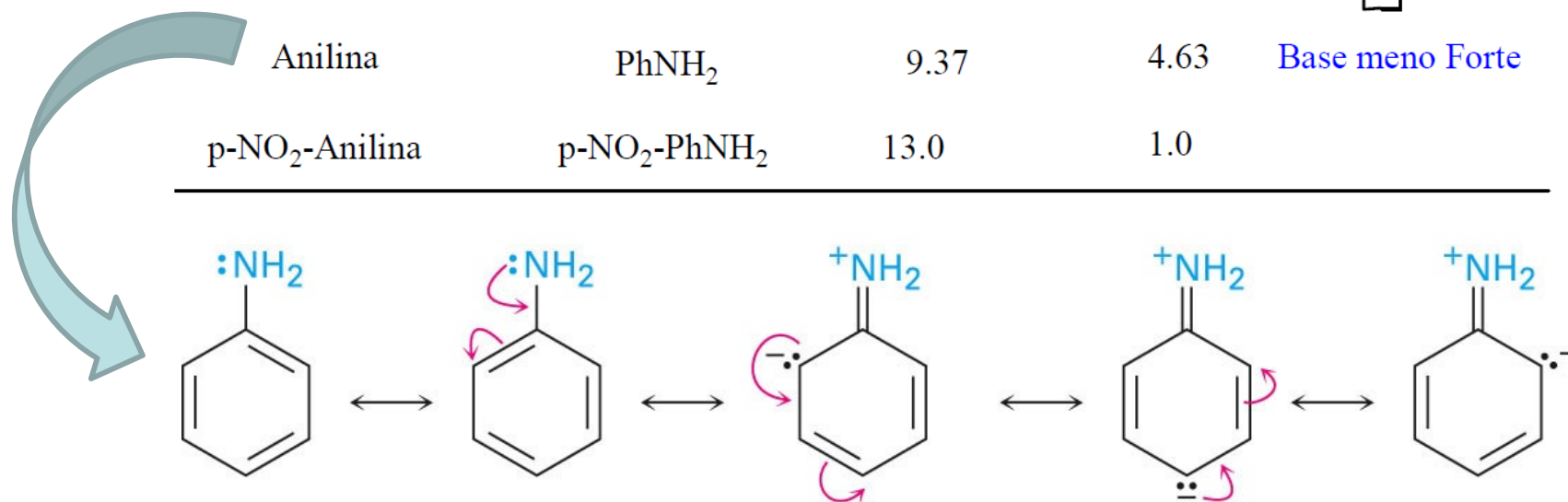


$$K_b = \frac{[\text{RNH}_3^+][\text{OH}^-]}{[\text{RNH}_2]}$$

$$\text{p}K_b = -\log K_b$$

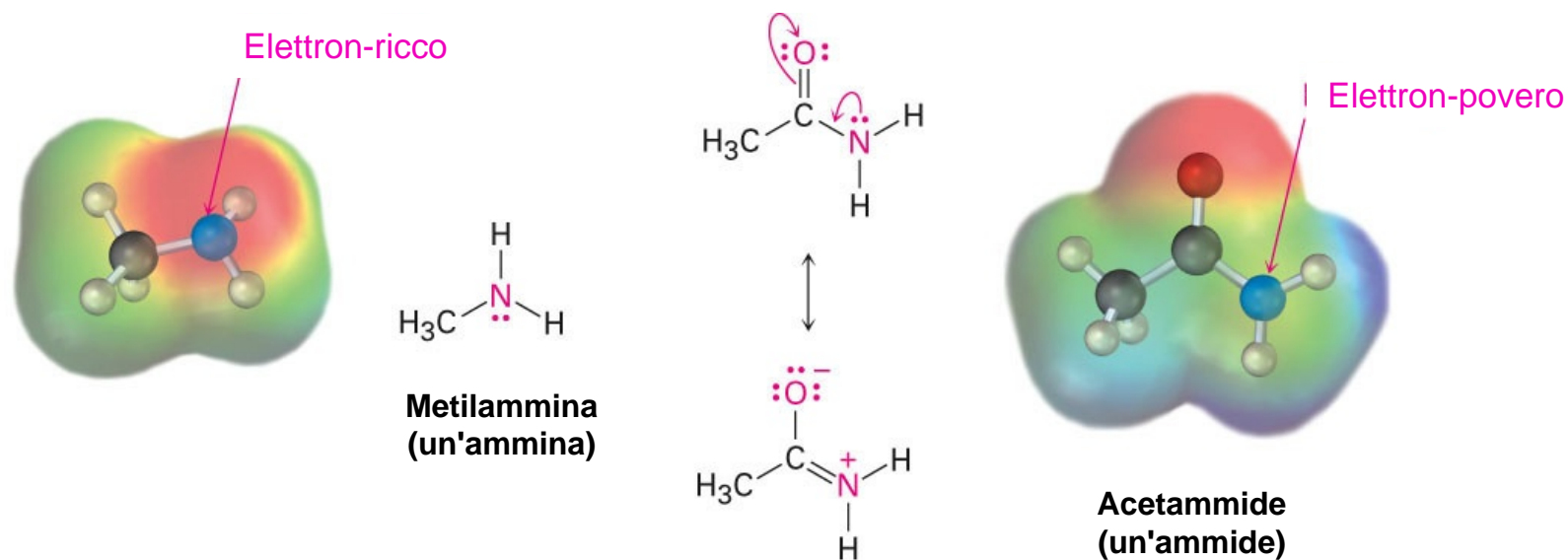
basicità delle ammine

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	



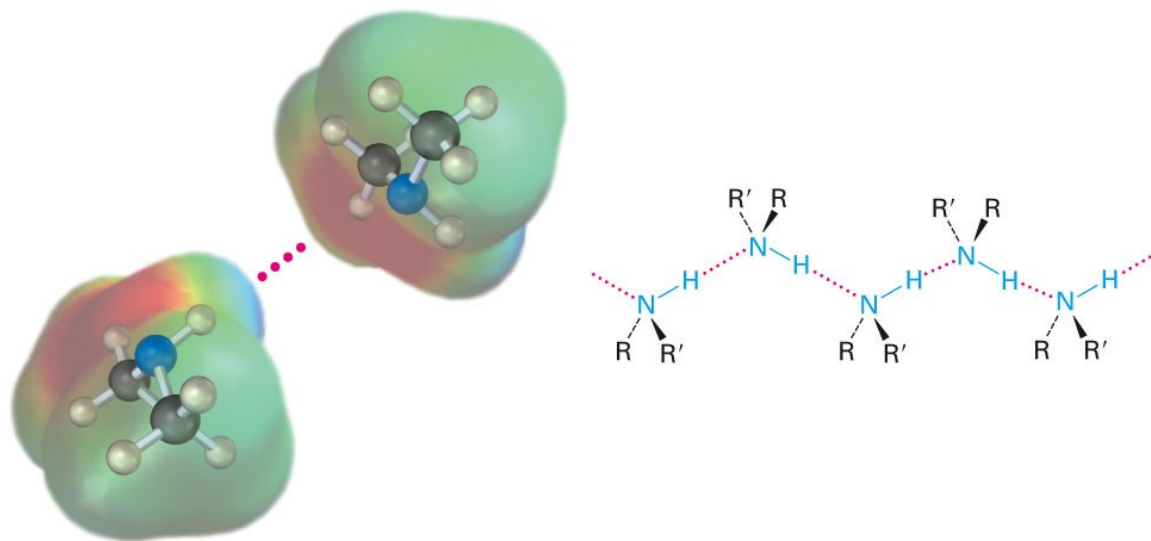
ammine e ammidi

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



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

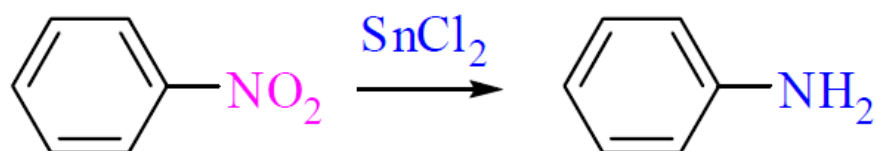
- Riduzione di nitrili



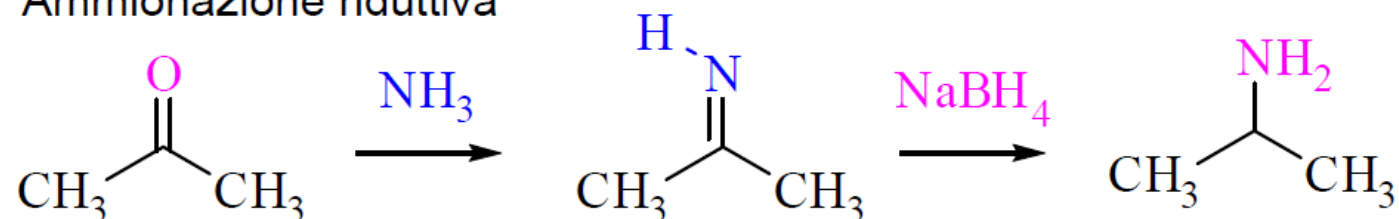
- Riduzione di ammidi



- Riduzione di nitrobenzeni



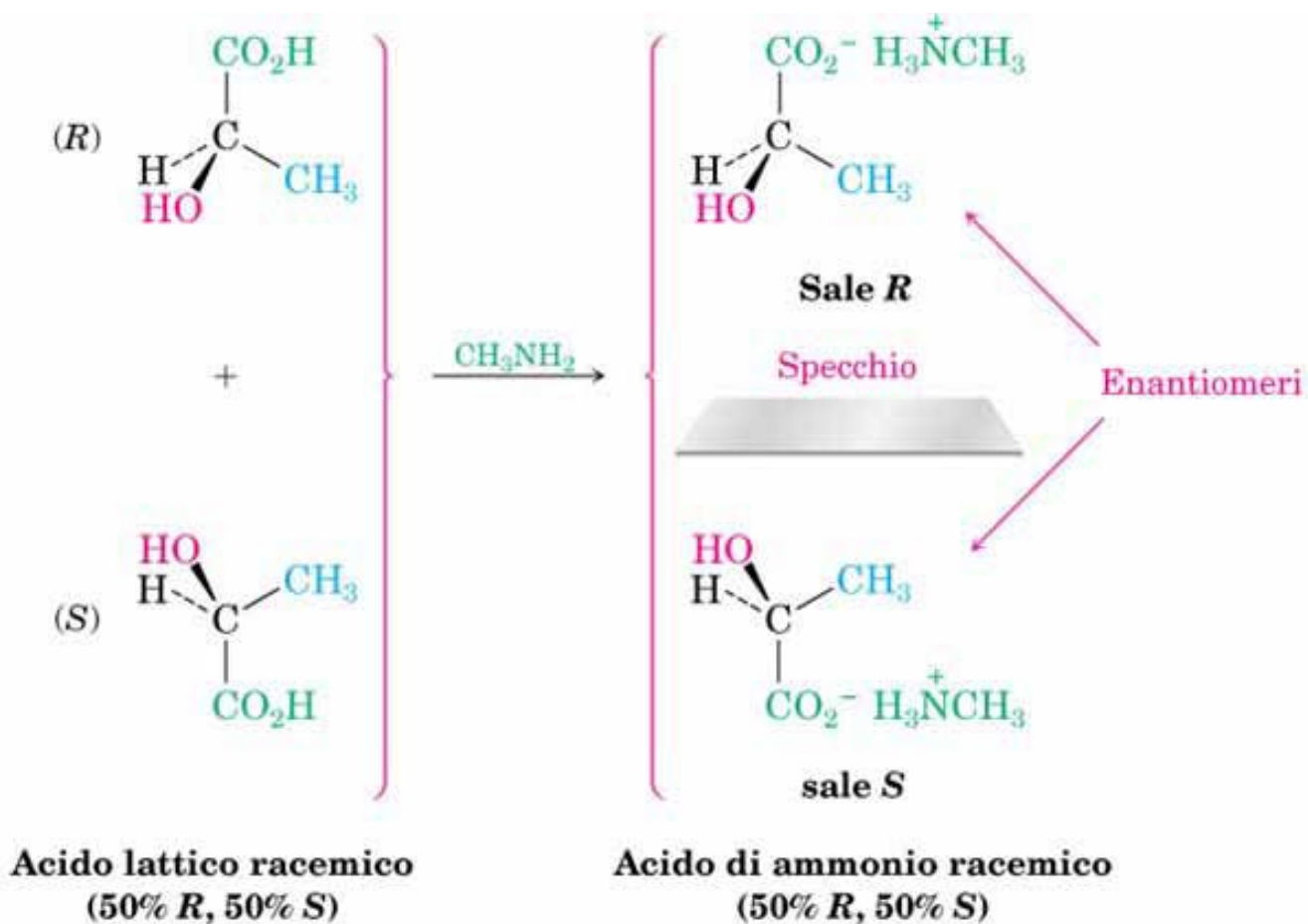
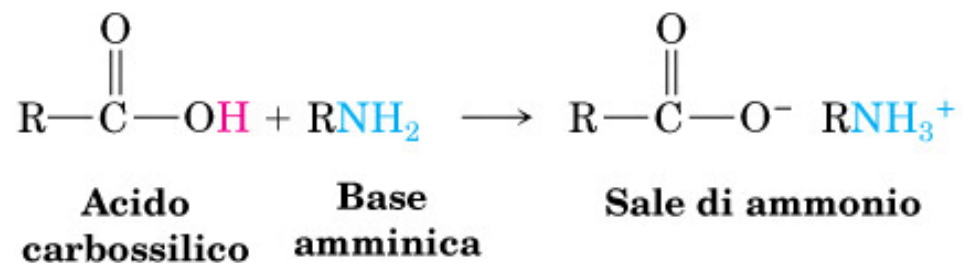
- Ammionazione riduttiva



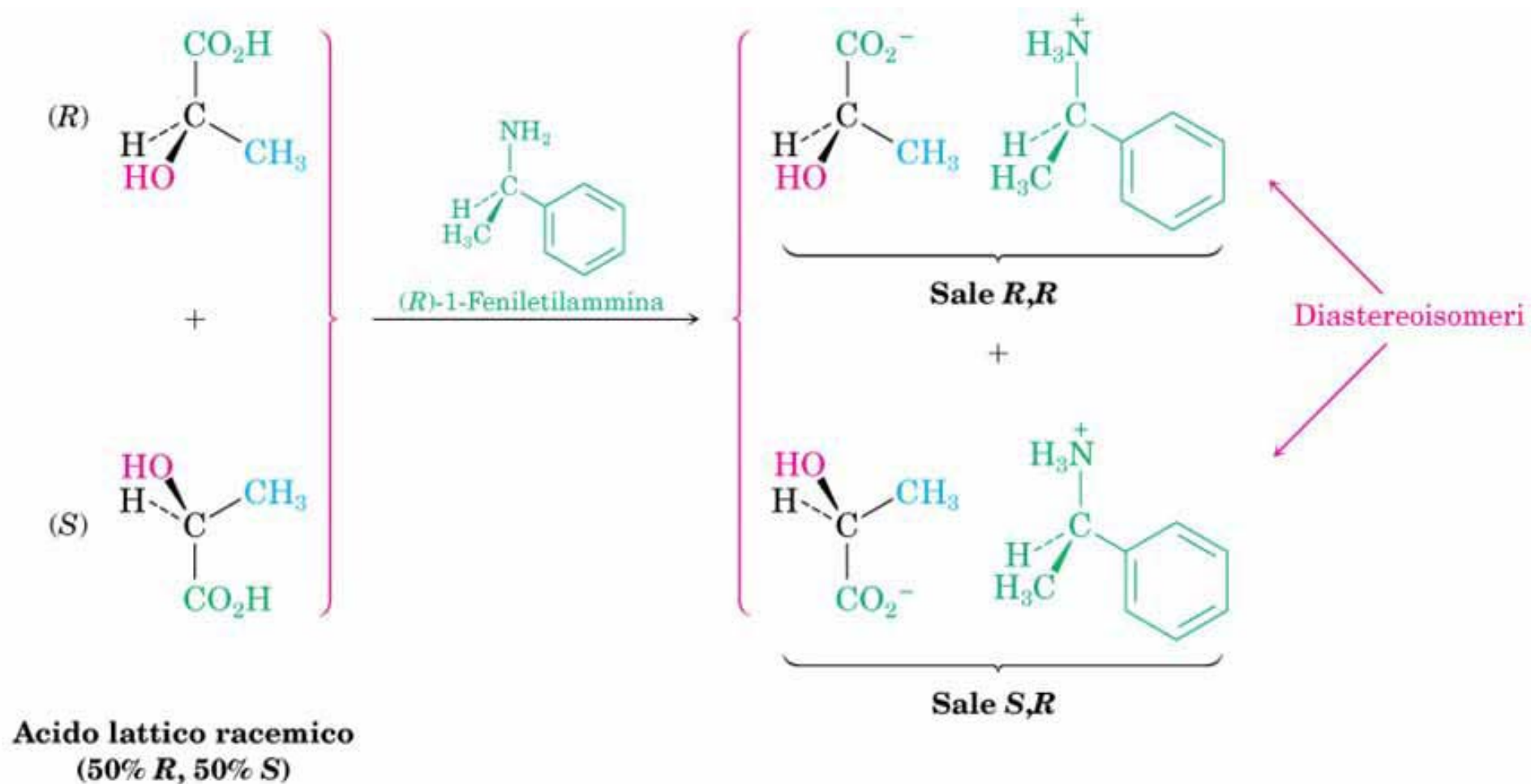
- (Alchilazione di alogenuri: trasformazione di ammine)

Reazioni delle ammine

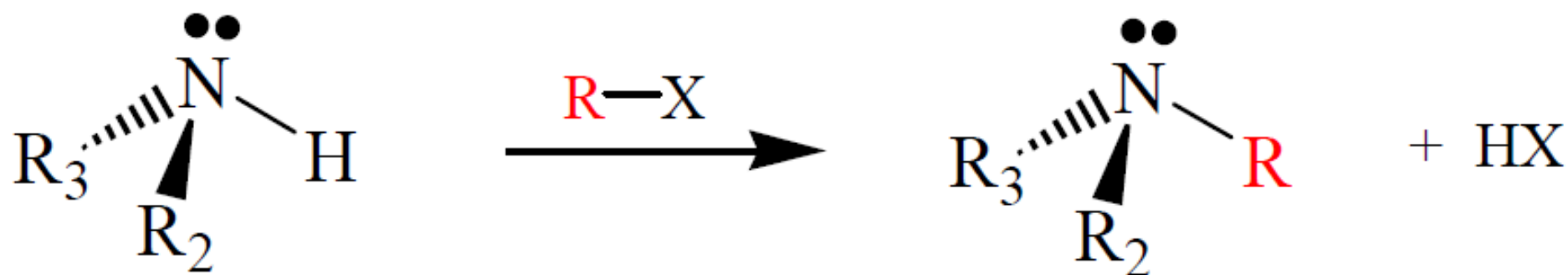
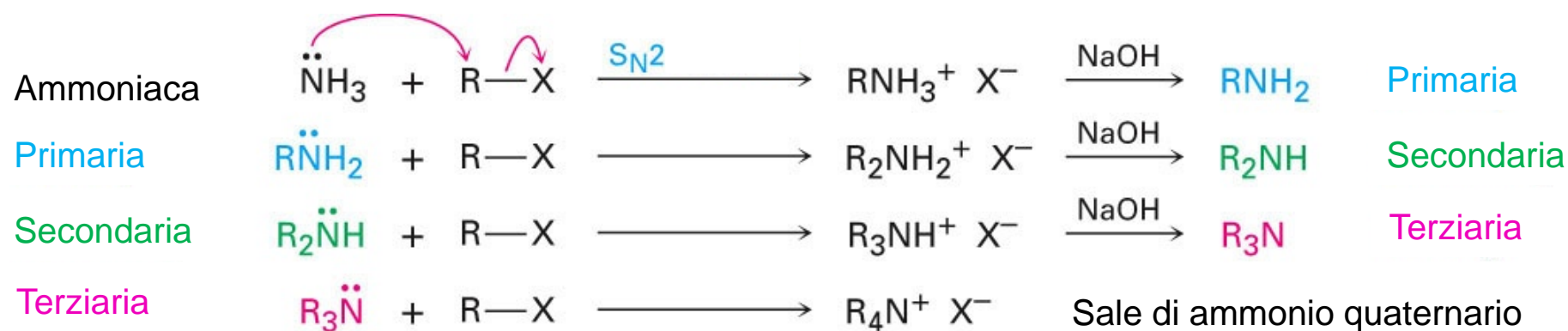
Formazione di sali



Formazione di sali diastereomerici

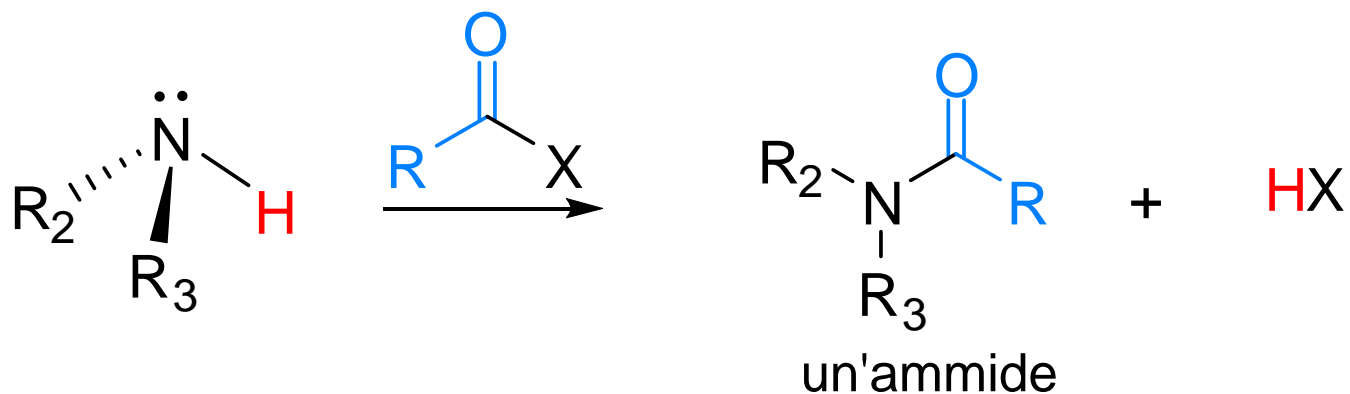


Sostituzione nucleofila: alchilazione



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

Sostituzione nucleofila: acilazione



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

