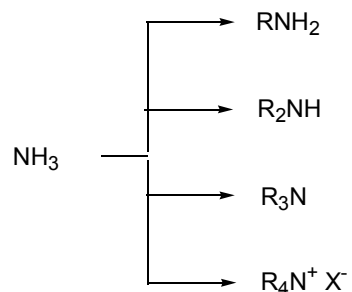


AMINOK

Levezetés



primer

szekunder

tercier

kvaterner

Elnevezés

CH_3NH_2
metil-amin

$\text{CH}_3\text{CH}_2\text{NH}_2$
etil-amin

$\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$
propil-amin

$(\text{CH}_3)_2\text{NH}$
dimetil-amin

$(\text{C}_2\text{H}_5)_3\text{N}$
triethyl-amin

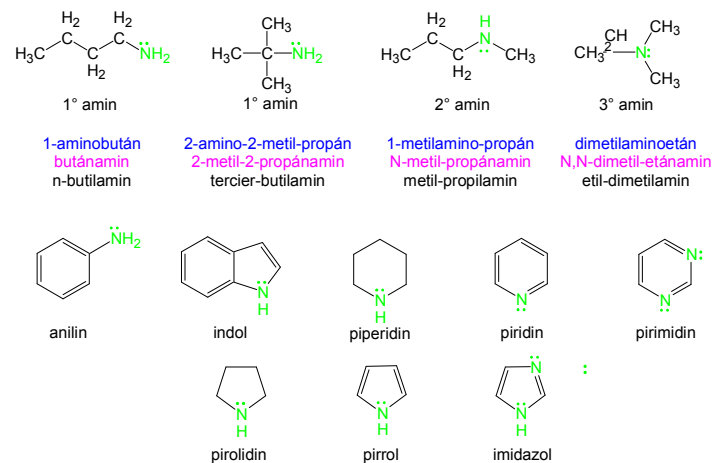
$\text{CH}_3\text{-NH-C}_2\text{H}_5$
etil-metil-amin

$\text{CH}_3\text{NCH}_2\text{CH}_2\text{CH}_3$
 CH_2CH_3
etil-metil-propil-amin

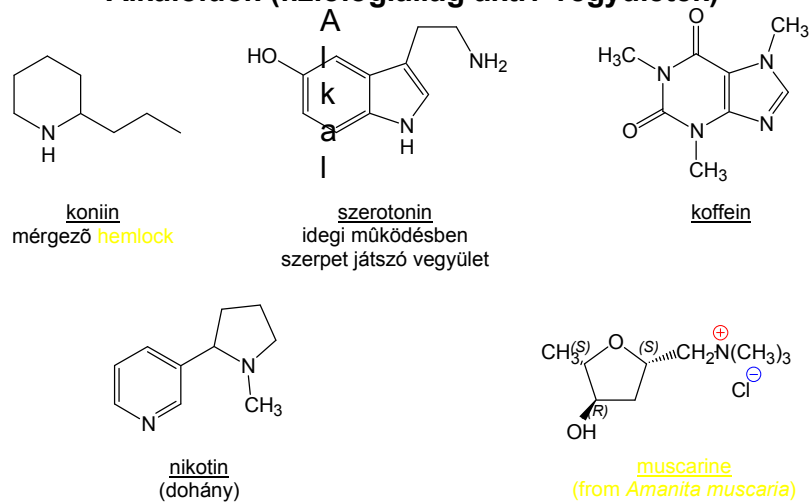
$\text{CH}_3\text{CHCH}_2\text{OH}$
 NH_2
2-amino-propán-1-ol

$\text{NH}_2\text{CH}_2\text{CH}_2\text{COOH}$
3-aminopropionsav

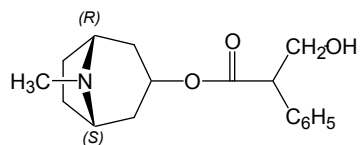
Aminok rendűsége és típusai



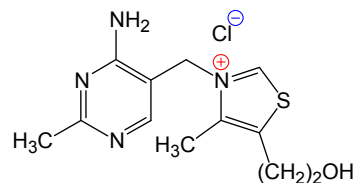
Alkaloidok (fiziológiailag aktív vegyületek)



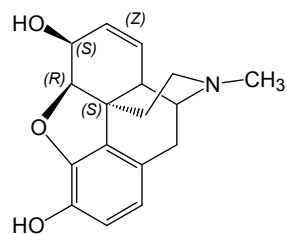
Alkaloidok és vitaminok



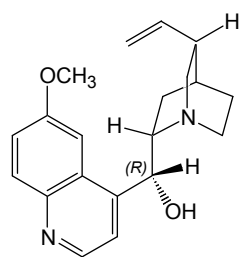
atropin



tiamin
B₁-vitamin

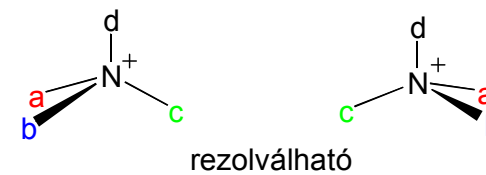
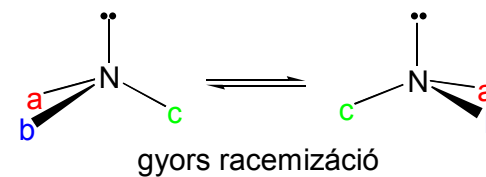
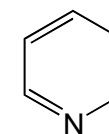
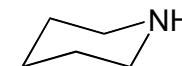
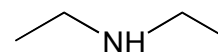
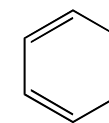
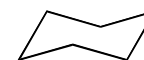
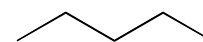
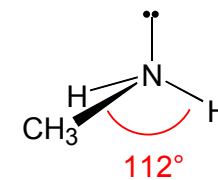
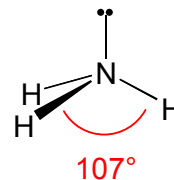


morfin (ópium)
analgesic

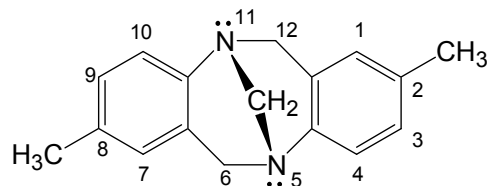


kinin
maláriaellenes szer

Elektron- és térszerkezet



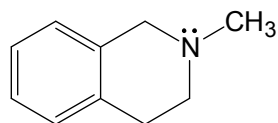
Gátolt piramidális inverzió: rezolválható 3° amin



Tröger-bázis

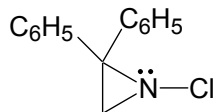
{2,8-Dimethyl-6*H*,12*H*-5,11-methano-dibenzo[*b,f*][1,5]diazocine }

rezolválható



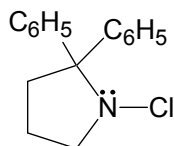
2-Methyl-1,2,3,4-tetrahydro-isoquinoline

nem rezolválható



1-Chloro-2,2-diphenyl-aziridine

rezolválható
0 °C-on stabil



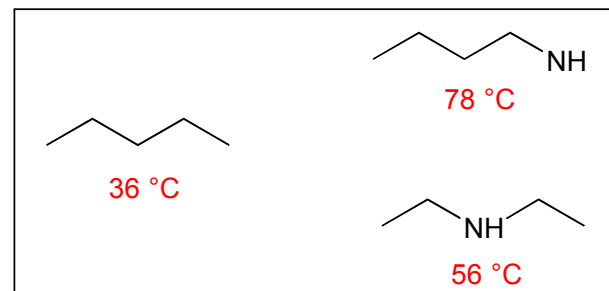
1-Chloro-2,2-diphenyl-pyrrolidi

ne
nem rezolválható

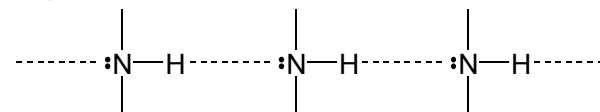
Fizikai tulajdonságok

Forráspont

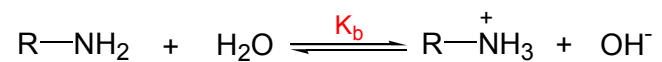
CH ₃ NH ₂	(CH ₃) ₂ NH	(CH ₃) ₃ N
-6 °C	7 °C	3 °C



Hidrogénkötés



Sav-bázis tulajdonságok

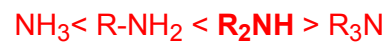


$$K_b = \frac{[\text{R-NH}_3^+][\text{OH}^-]}{[\text{R-NH}_2]} \quad \text{p}K_b = -\lg K_b$$

	pK _b
NH ₃	4.70
MeNH ₂	3.36
Me ₂ NH	3.25
Me ₃ N	4.28

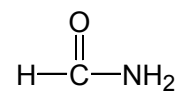
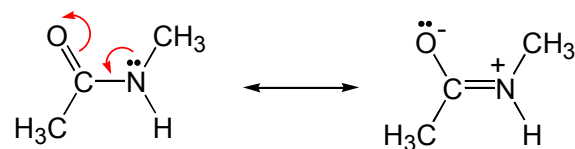
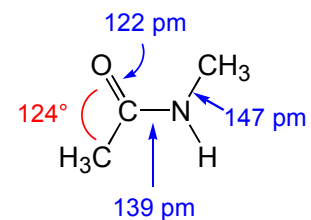
Báziserősség

+I effektus \longrightarrow



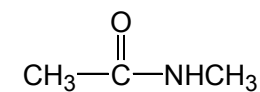
kationok solvatációs készsége \longleftarrow

Az amidok szerkezete

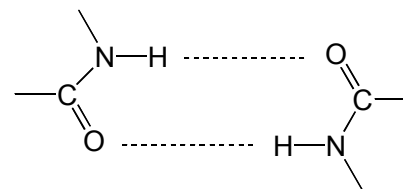


forráspont

193°

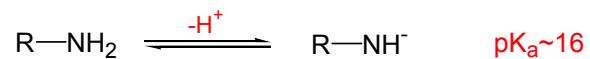
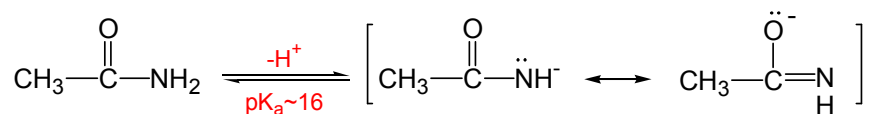


206°

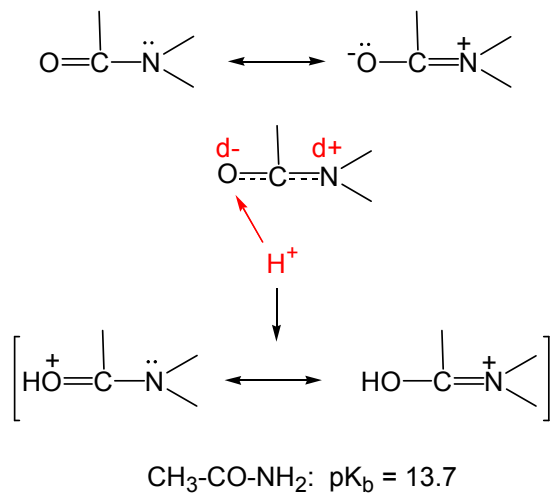


Az amidok sav-bázis tulajdonságai

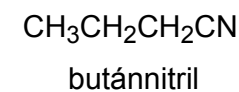
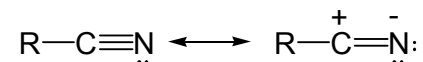
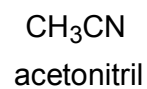
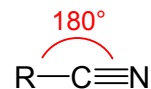
Savasság



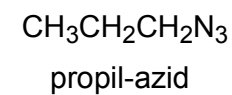
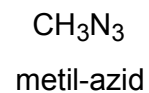
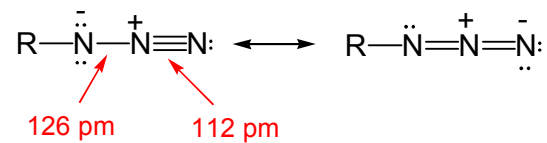
Bázicitás



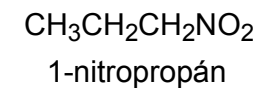
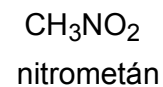
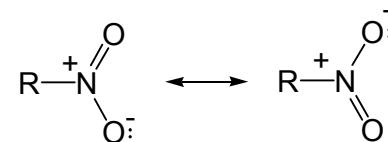
Nitrilek (R-CN)



Azidok (R-N₃)

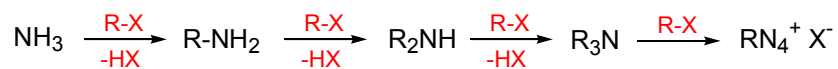


Nitrovegyületek (R-NO₂)

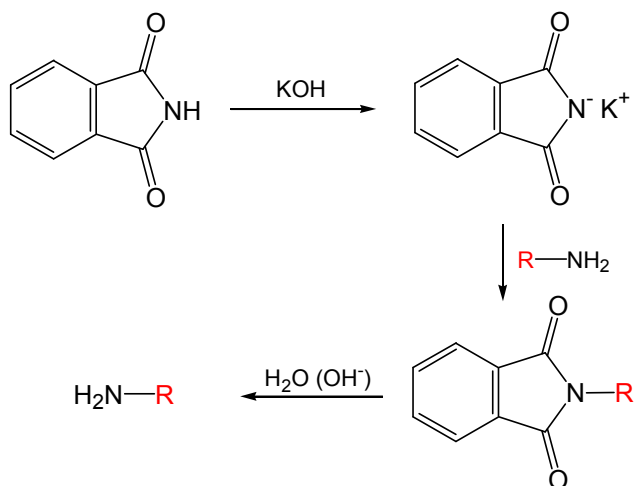


Az aminok előállítása

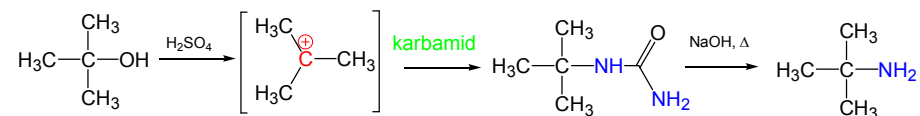
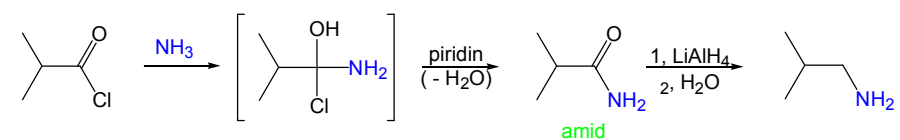
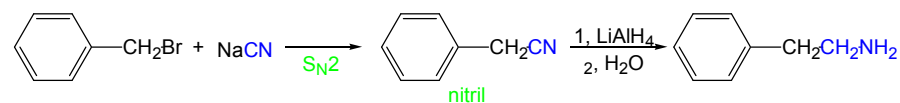
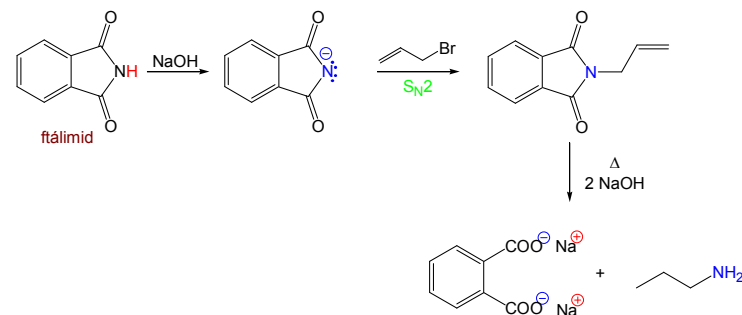
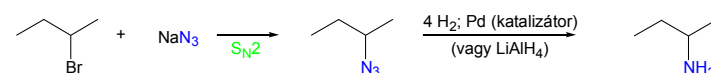
Az ammónia alkilezése

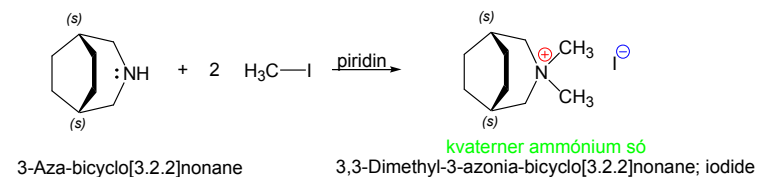
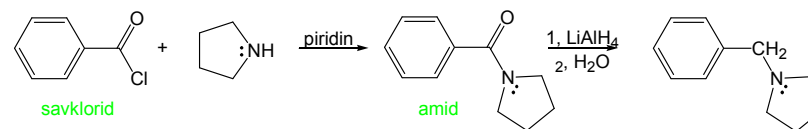
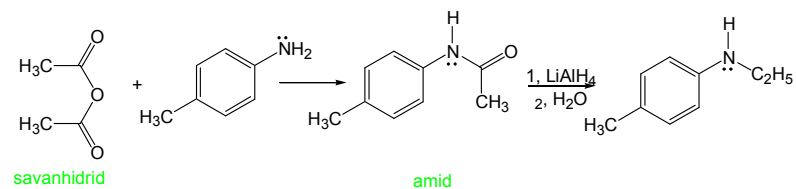
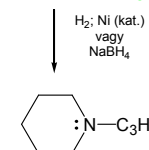
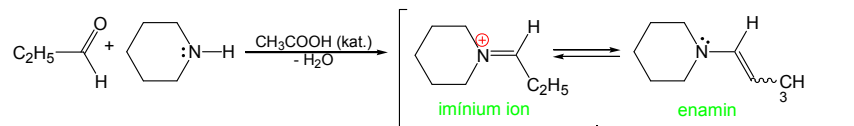
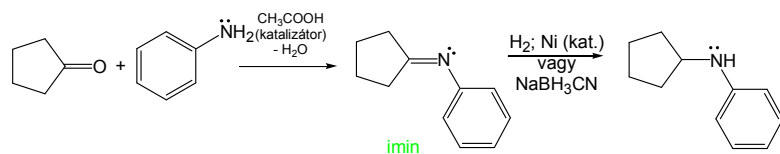
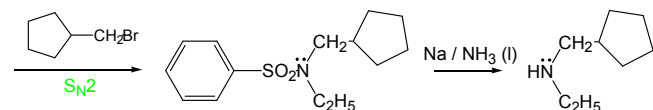
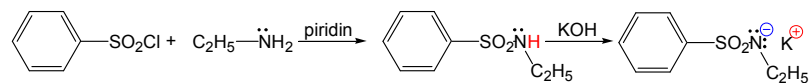
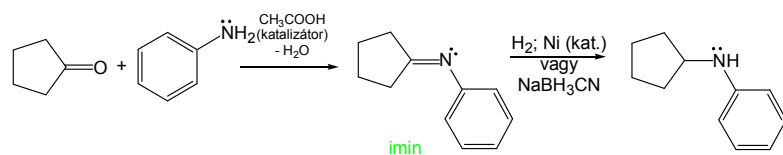
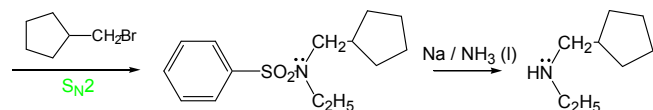
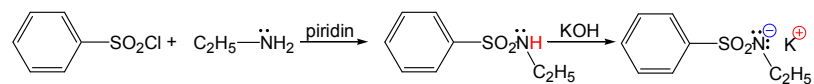


Primer aminok előállítása (Gabriel szintézis)

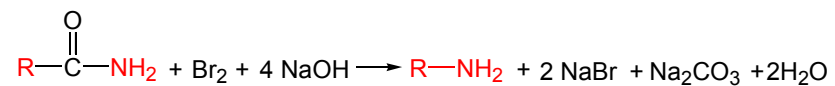


Példák 1°, 2° és 3° aminok előállítására

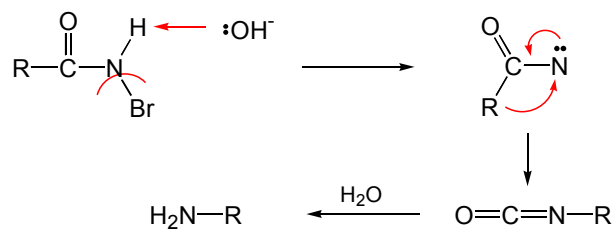
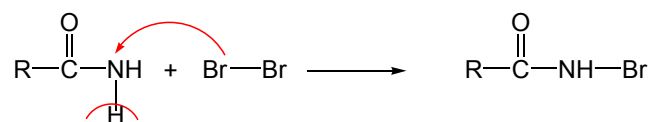




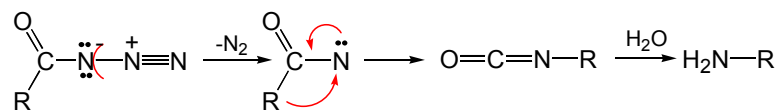
Hofmann lebontás



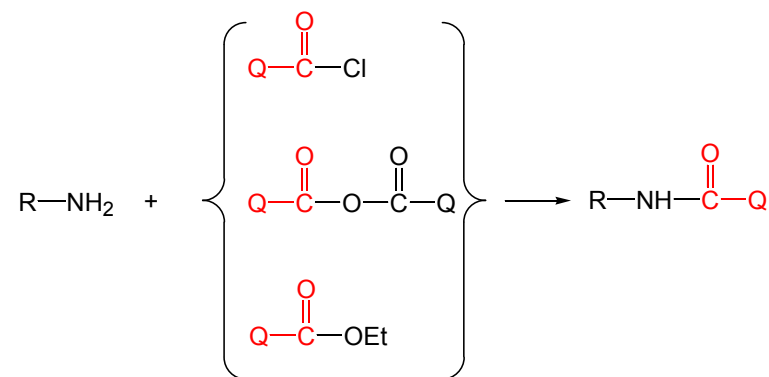
Mechanizmus



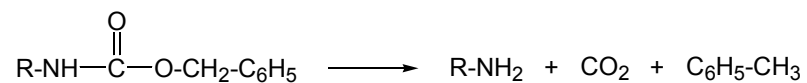
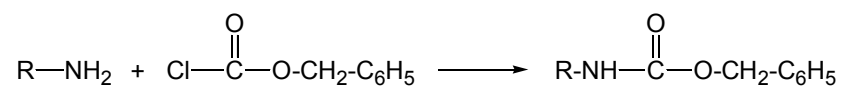
Curtius lebontás



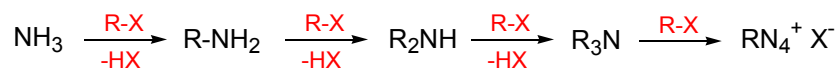
Az aminosok acilezése



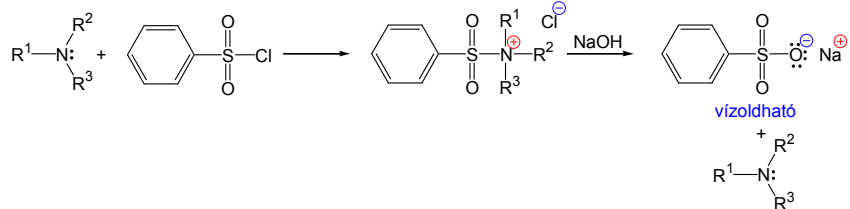
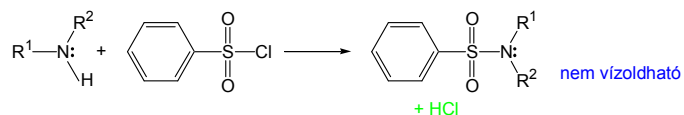
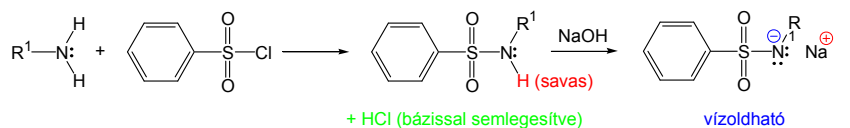
Az aminocsoport védelése



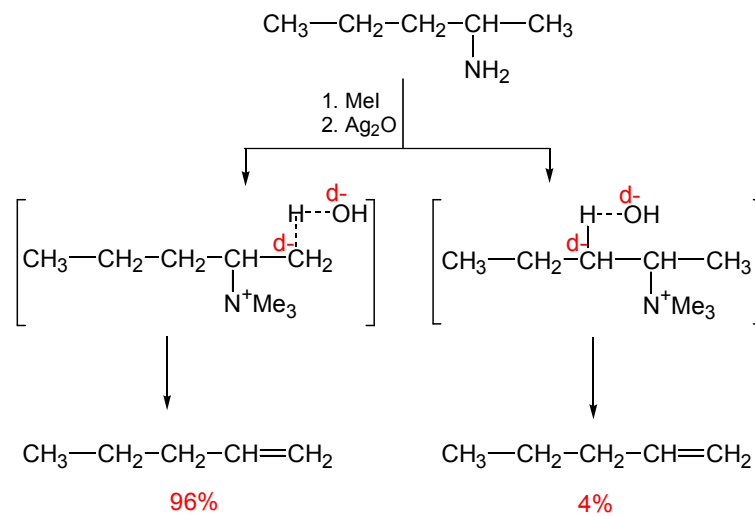
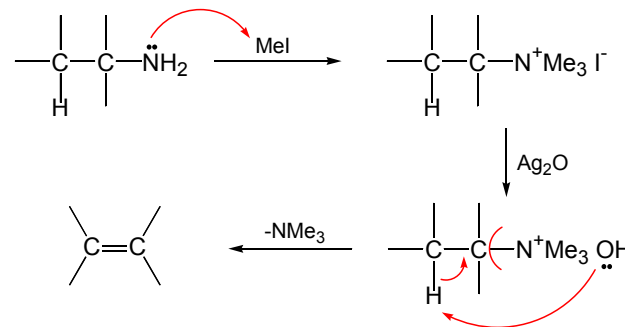
Az ammónia alkilezése



Különböző rendűségű aminok elválasztása

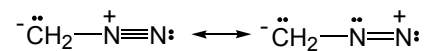


Hofmann-elimináció

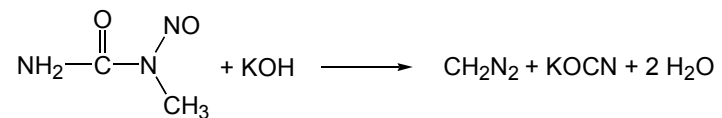


Hofmann-szabály

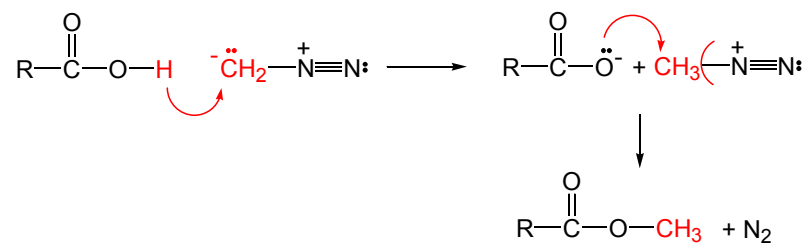
Diazometán (CH₂N₂)



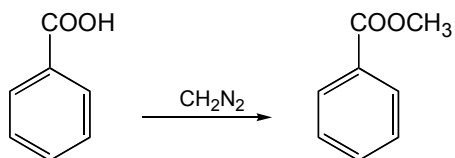
Előállítás



Felhasználás

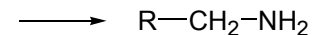


Példa



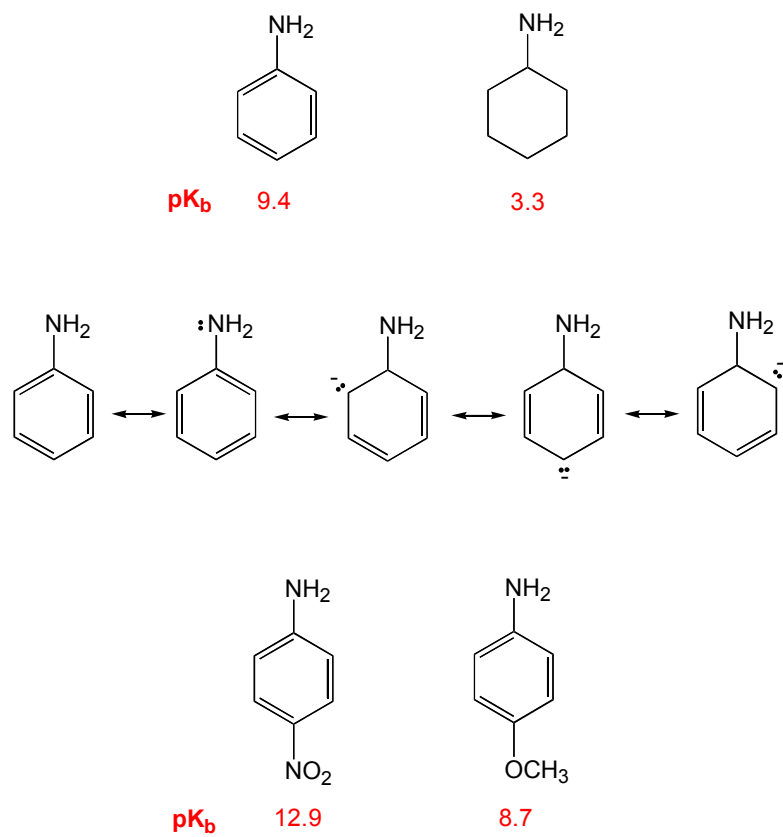
A nitrogéntartalmú vegyületek redukciója

	LiAlH ₄	H ₂ /kat.
R-CH ₂ -NO ₂	+	+
R-C≡N	+	+
R-CH=N-OH	+	+
R-CH ₂ -N ₃	+	
R-CO-NH ₂	+	
R-CO-N ₃	+	



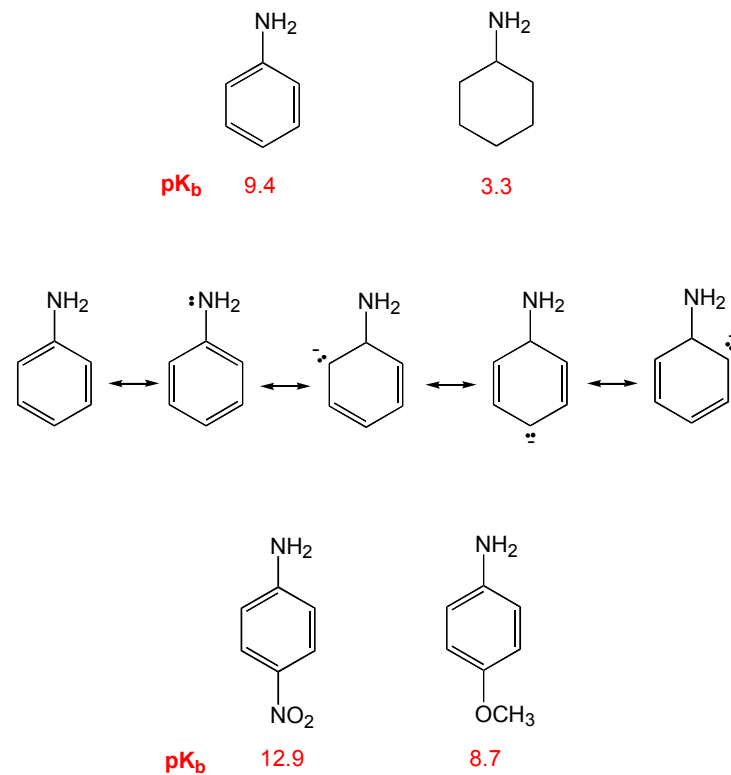
Aromás aminok

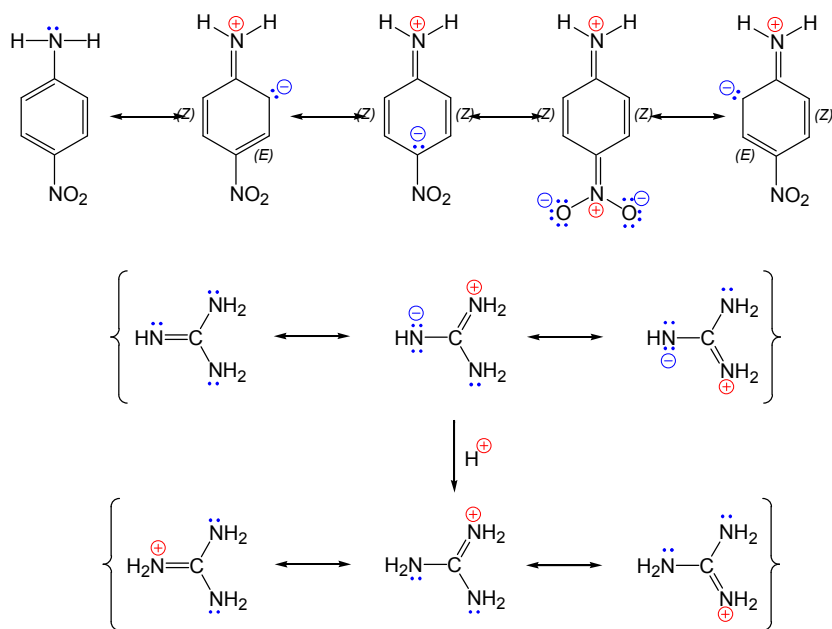
Bázicitás



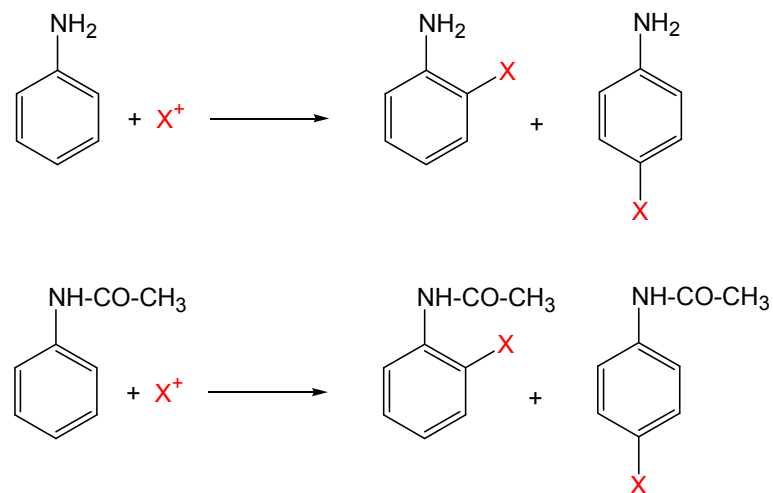
Aromás aminok

Bázicitás

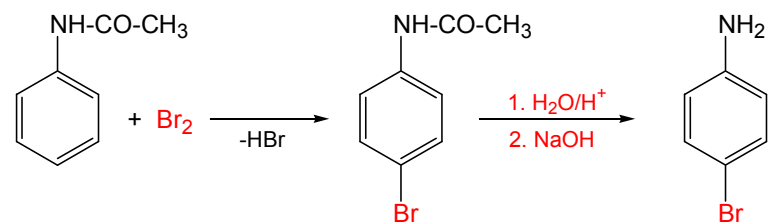




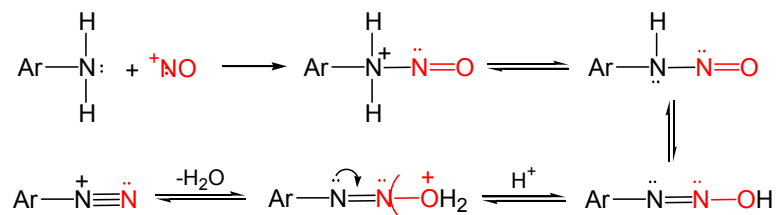
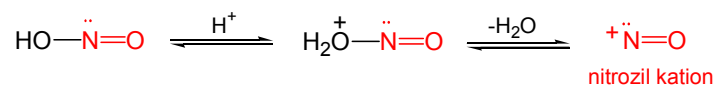
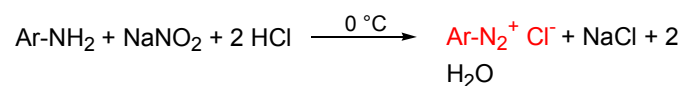
Elektrofil szubsztitúciós reakciók



Példa

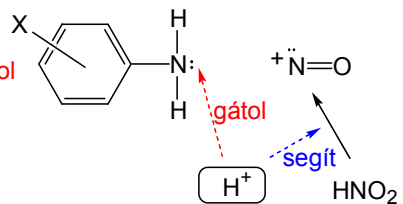


Diazotálás

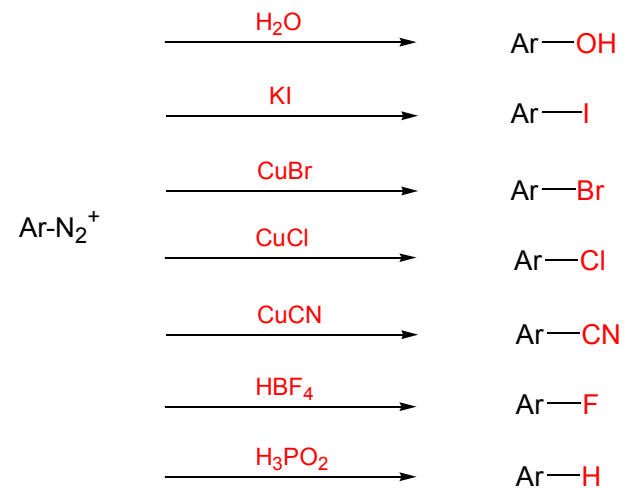


elektronküldő X: **segít**

elektronvonzó X: **gátol**

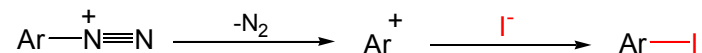


Diazóniumsók szubsztitúciós reakciói

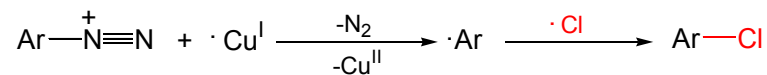


Mechanizmus

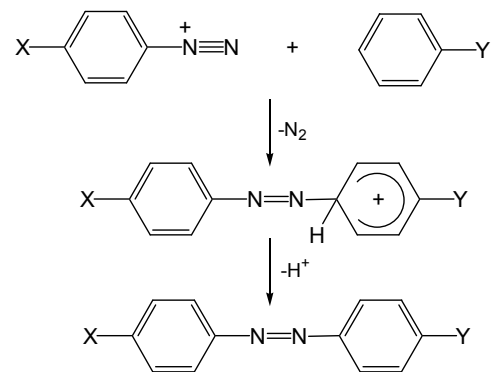
ionos (H_2O , KI)



gyökös (Sandmeyer reakció, CuBr , CuCl , CuCN)



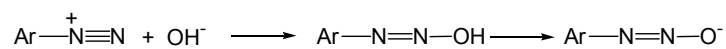
A diazóniusók kapcsolási reakciói



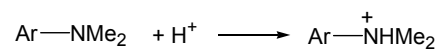
elektronvonzó X
elektronküldő Y (pl. OH, NMe₂) } segít

pH függés

lúgos közeg



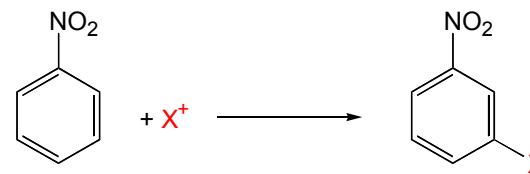
savas közeg



pH optimum: 5-7

Aromás nitrovegyületek

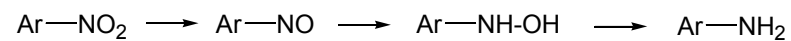
Elektrofil szubsztitúciós reakciók



meta irányítás

dezaktiválás

Redukció aminná



redukálószer: H₂/kat.

fém + sav (Sn, Zn, Fe)