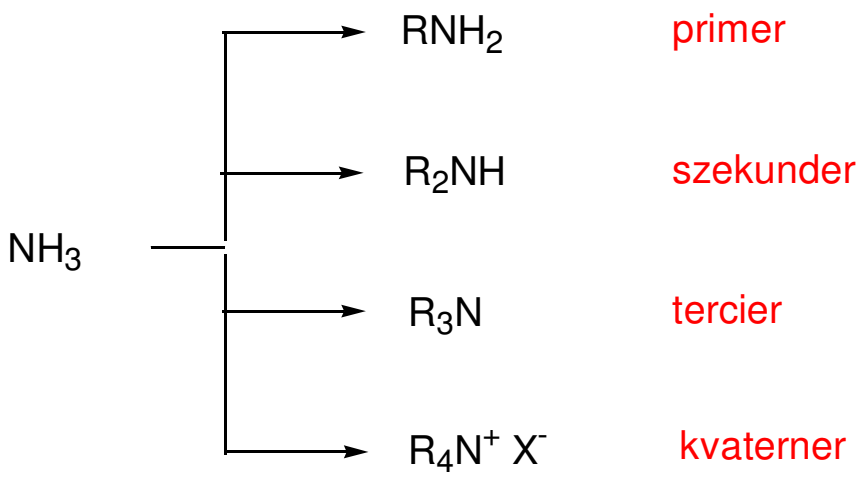
AMINOK

Levezetés



Elnevezés

CH_3NH_2
metil-amin

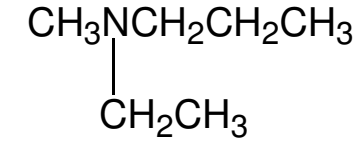
$CH_3CH_2NH_2$
etil-amin

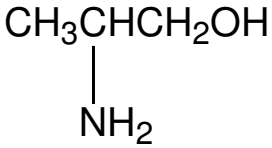
$CH_3CH_2CH_2NH_2$
propil-amin

$(CH_3)_2NH$
dimetil-amin

$(C_2H_5)_3N$
trietil-amin

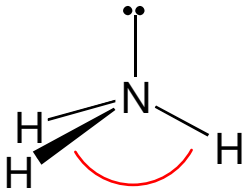
$CH_3\text{-}NH\text{-}C_2H_5$
etil-metil-amin


etil-metil-propil-amin

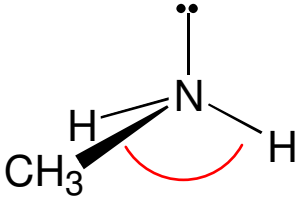

2-amino-propán-1-ol

$NH_2CH_2CH_2COOH$
3-aminopropionsav

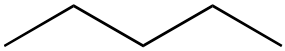
Elektron- és térszerkezet

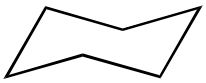


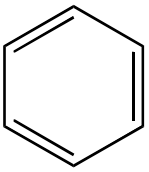
107°

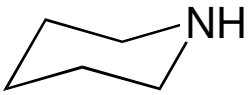


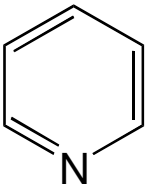
112°

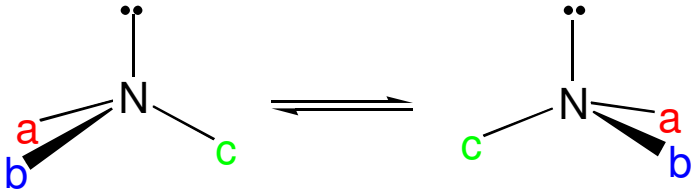












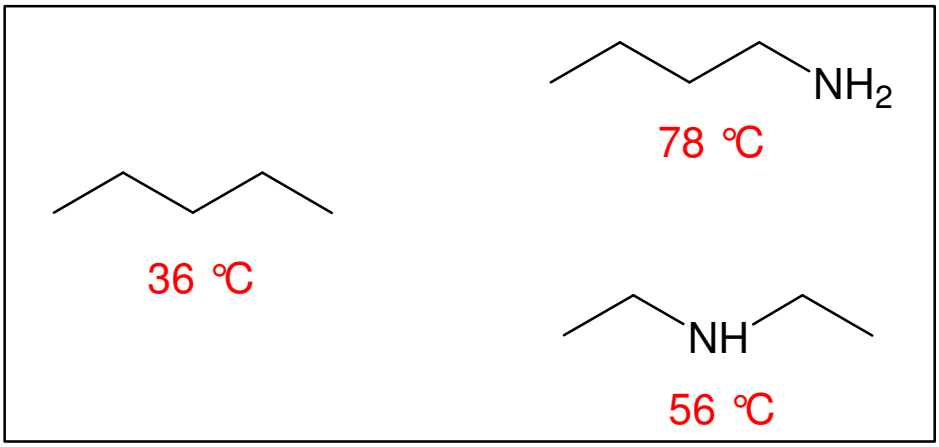
gyors racemizáció

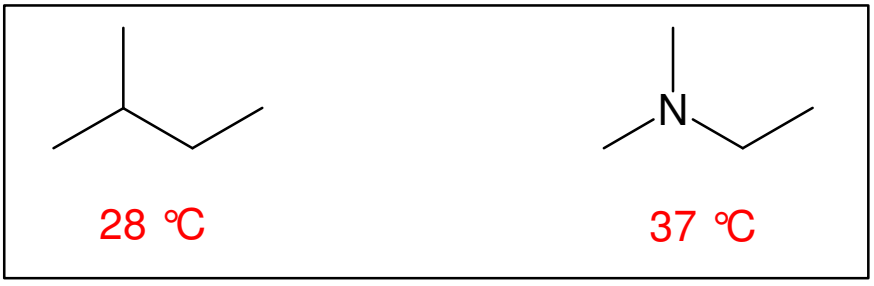
rezolválható

Fizikai tulajdonságok

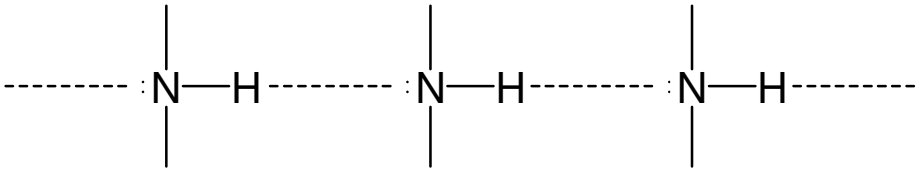
Forráspont

CH_3NH_2	$(CH_3)_2NH$	$(CH_3)_3N$
-6 °C	7 °C	3 °C





Hidrogénkötés



Sav-bázis tulajdonságok

$$K_b = \frac{[R\text{-}NH_3^+]\,[OH^-]}{[R\text{-}NH_2]} \qquad pK_b = -\lg K_b$$

	pK_b
NH_3	4.70
$MeNH_2$	3.36
Me_2NH	3.25
Me_3N	4.28

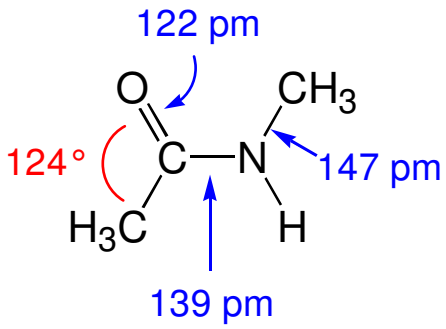
Báziserősség

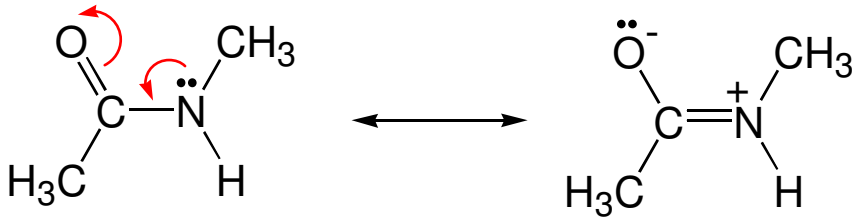
+I effektus ⟶

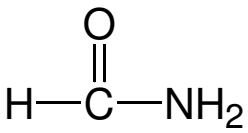
$NH_3 < R\text{-}NH_2 < \mathbf{R_2NH} > R_3N$

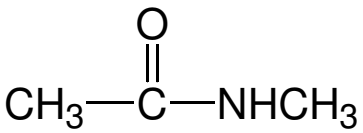
kationok szolvatációs készsége ⟵

Az amidok szerkezete

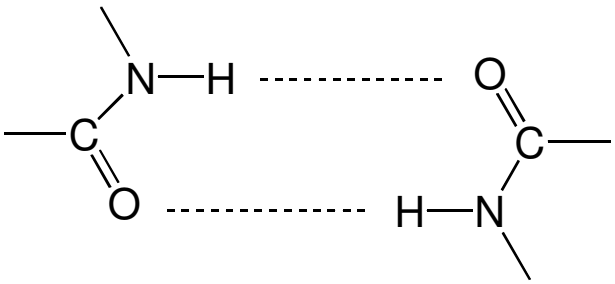






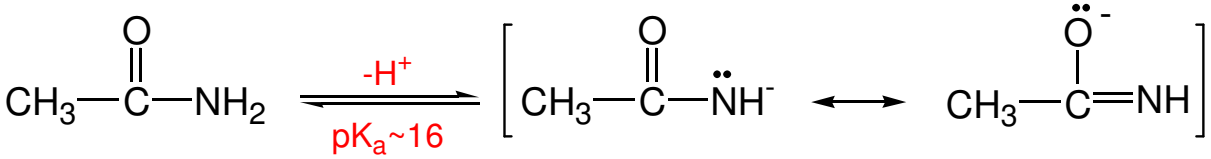


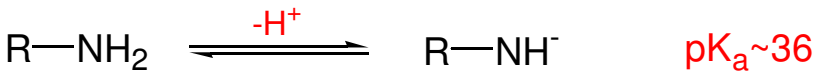
forráspont 193° 206°



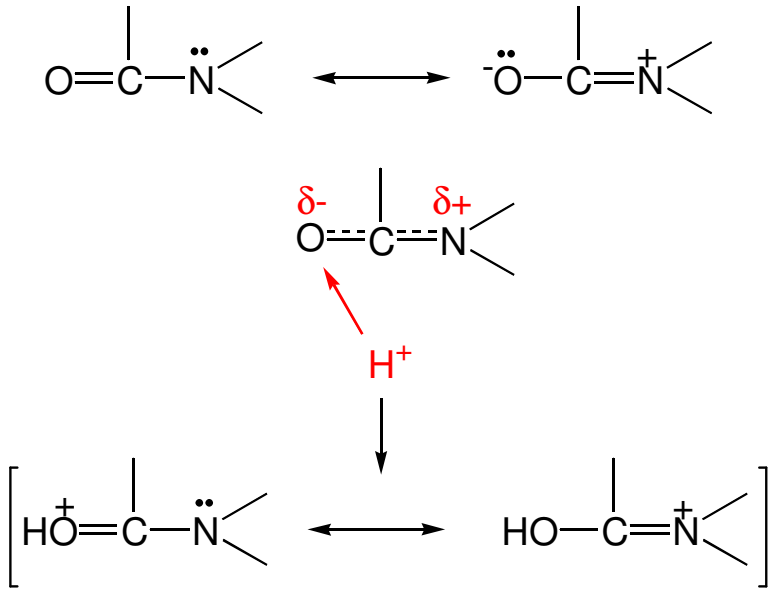
Az amidok sav-bázis tulajdonságai

Savasság



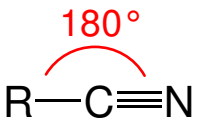


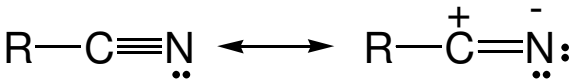
Bázicitás



CH_3-CO-NH_2: pK_b = 13.7

Nitrilek (R-CN)





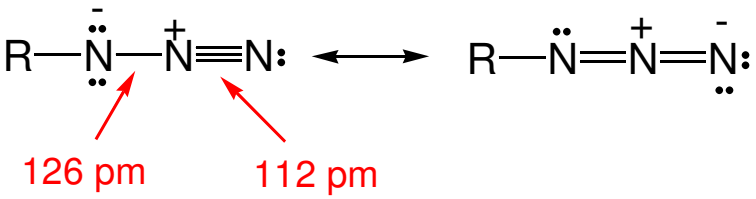
CH_3CN

acetonitril

$CH_3CH_2CH_2CN$

butánnitril

Azidok ($R\text{-}N_3$)



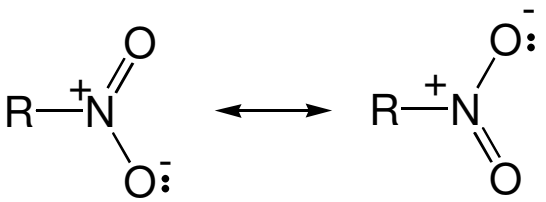
CH_3N_3

metil-azid

$CH_3CH_2CH_2N_3$

propil-azid

Nitrovegyületek ($R\text{-}NO_2$)



CH_3NO_2

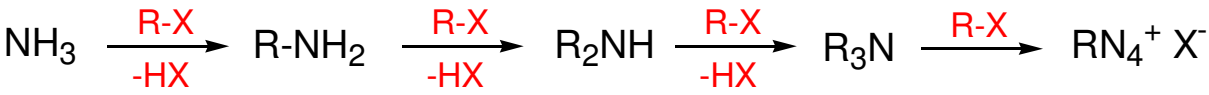
nitrometán

$CH_3CH_2CH_2NO_2$

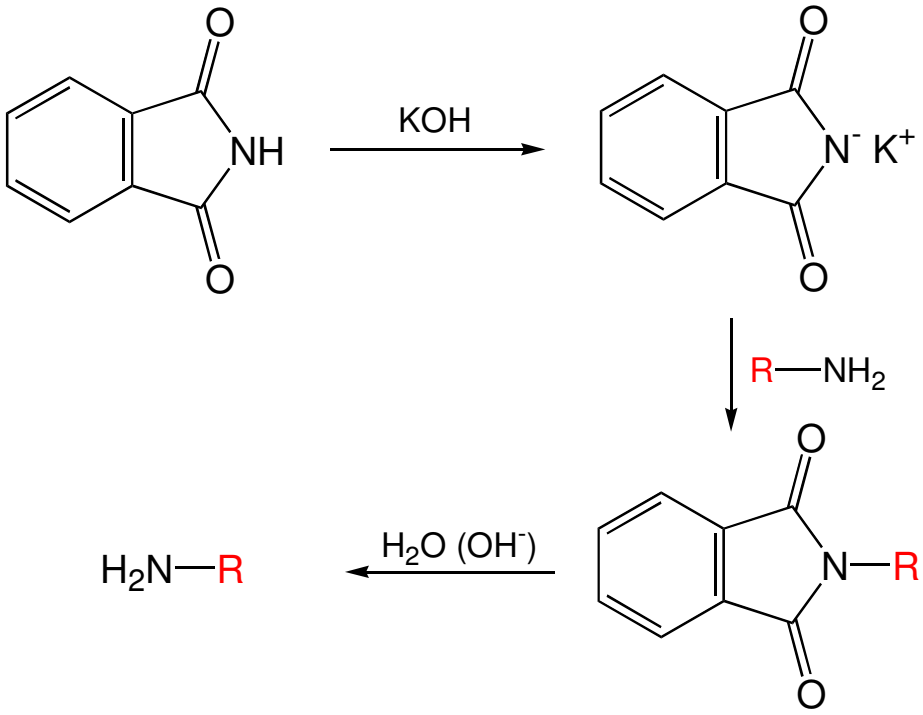
1-nitropropán

Az aminok előállítása

Az ammónia alkilezése

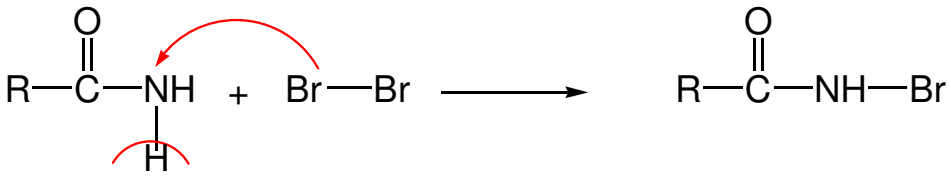


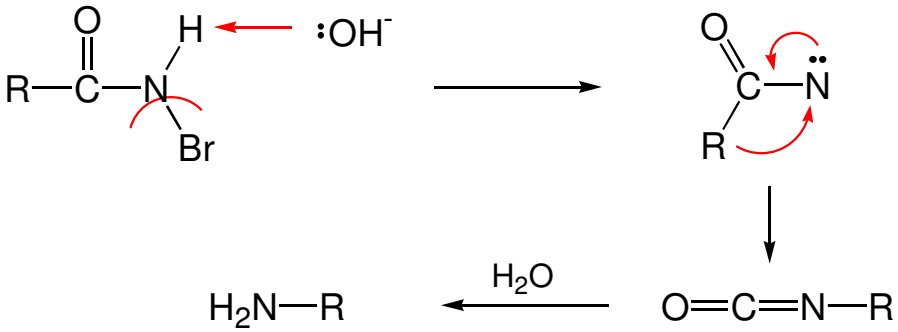
Primer aminok előállítása (Gabriel szintézis)



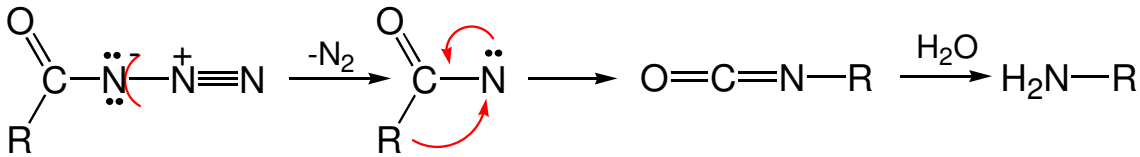
Hofmann lebontás

Mechanizmus

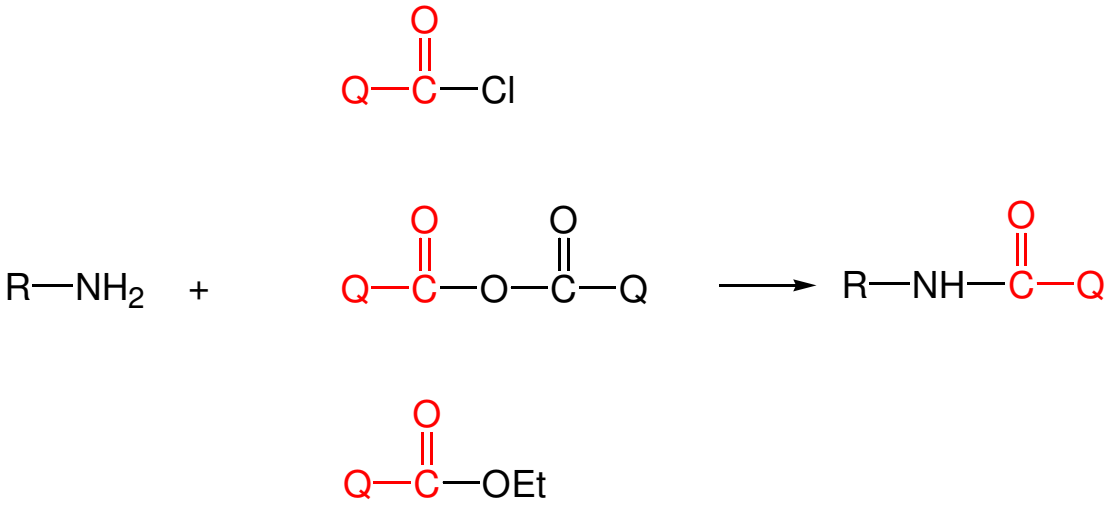




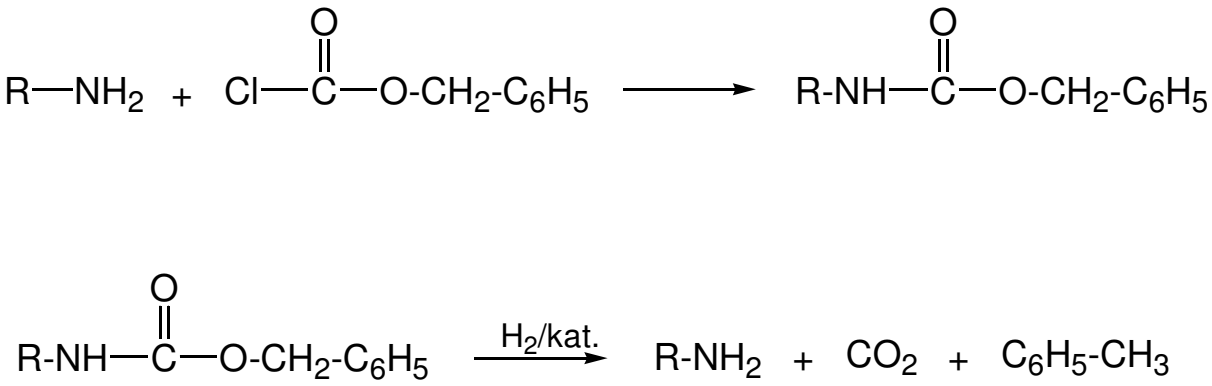
Curtius lebontás



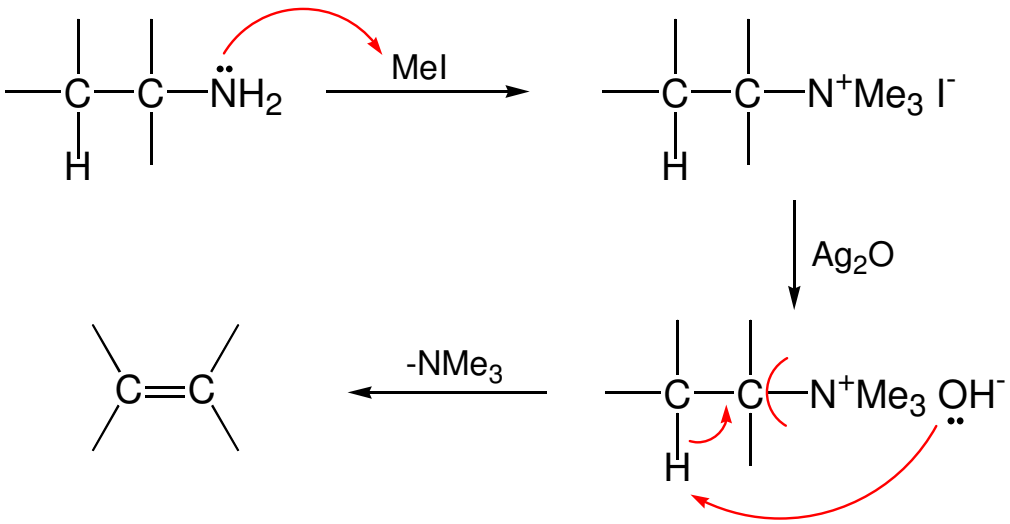
Az aminok acilezése

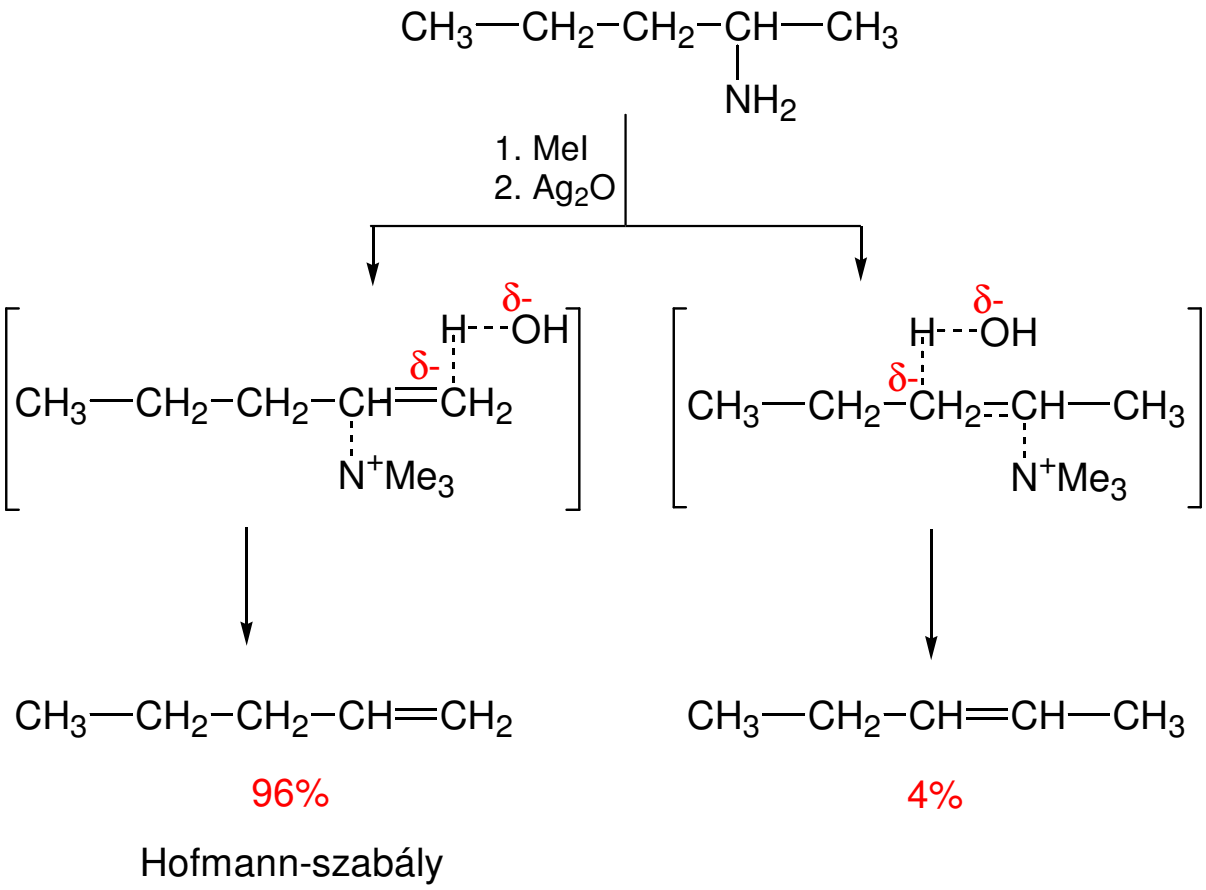


Az aminocsoport védése



Hofmann-elimináció





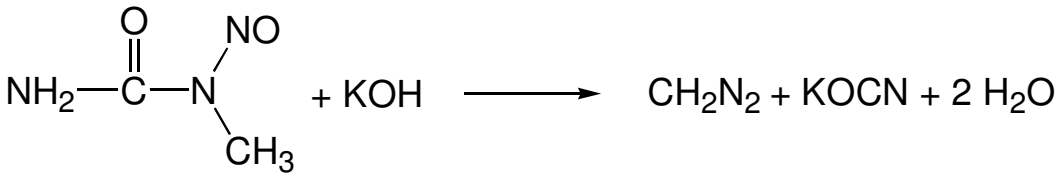
96%

4%

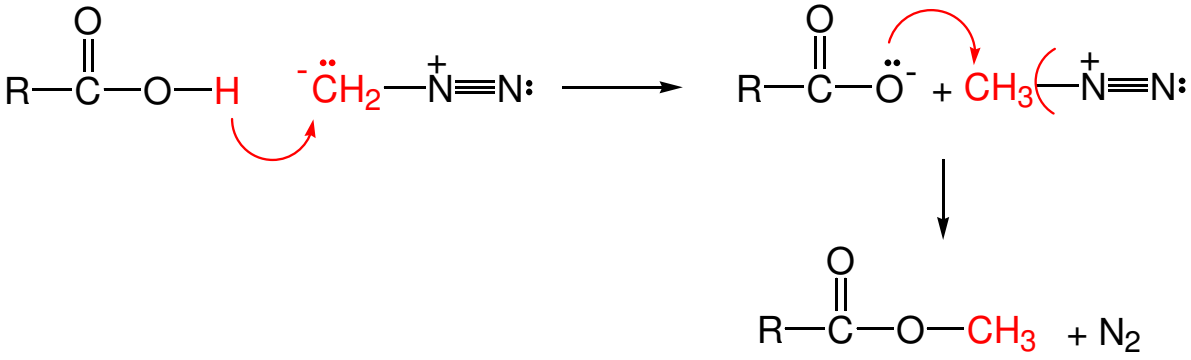
Hofmann-szabály

Diazometán (CH_2N_2)

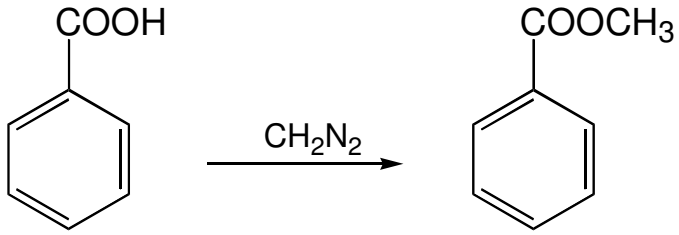
Előállítás



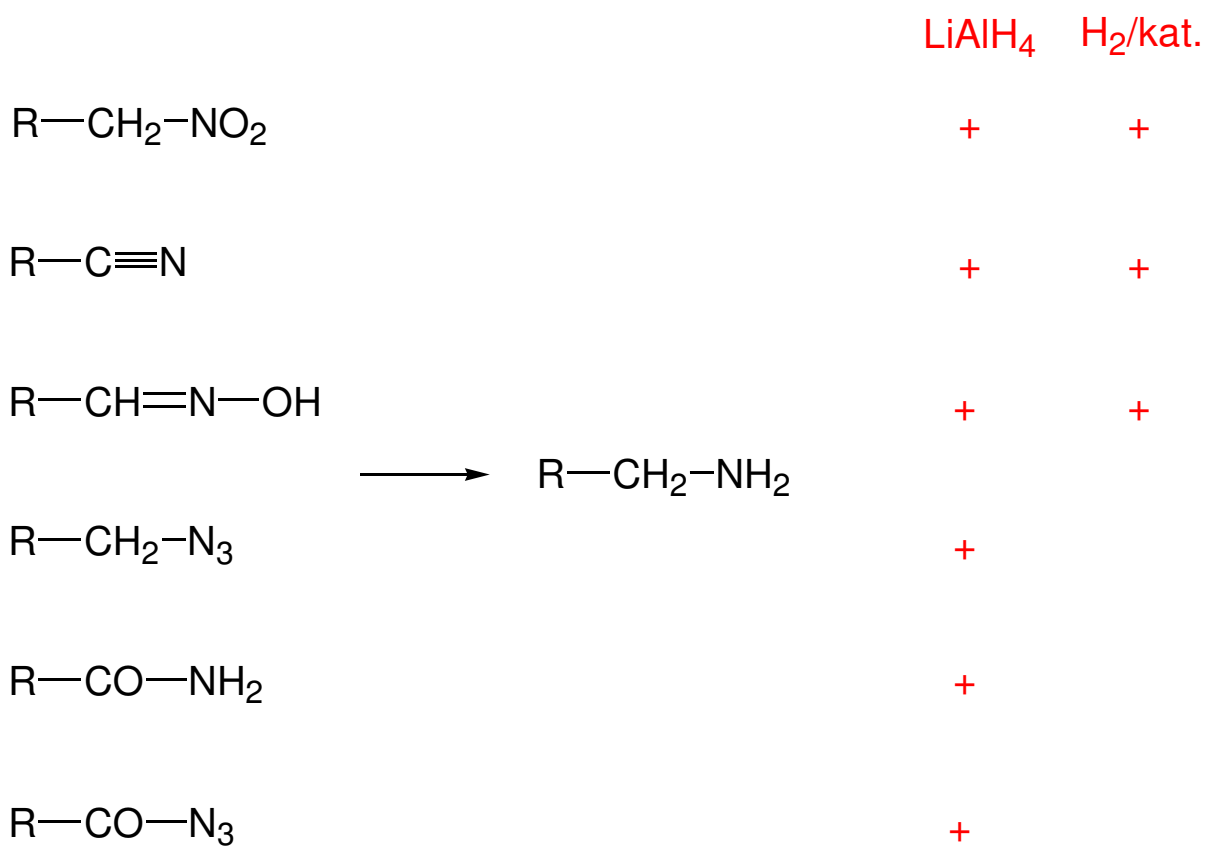
Felhasználás



Példa

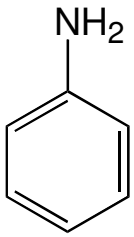


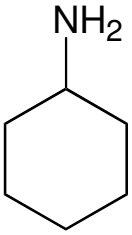
A nitrogéntartalmú vegyületek redukciója



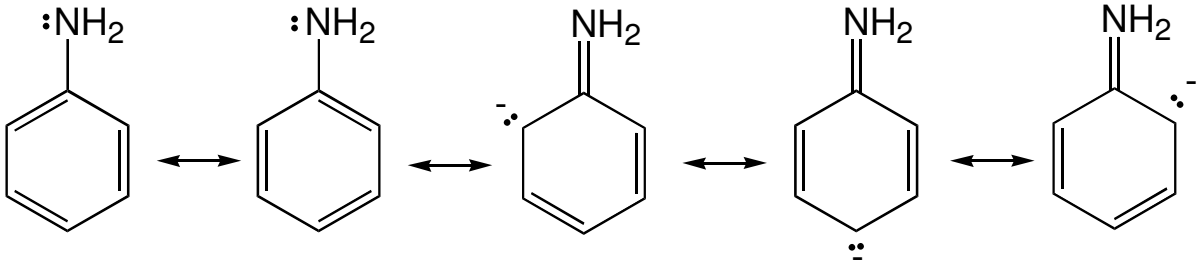
Aromás aminok

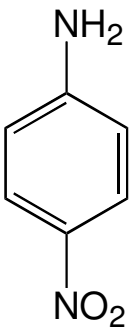
Bázicitás

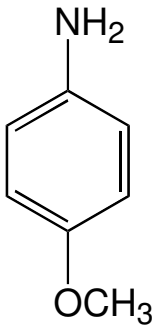




pK_b 9.4 3.3

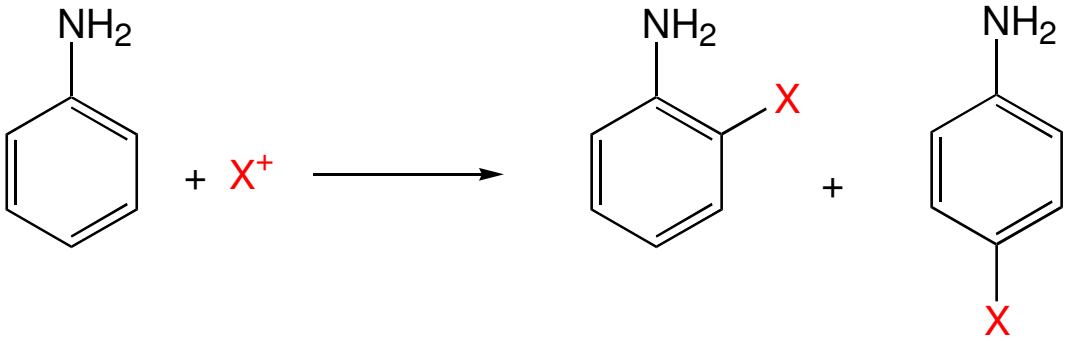


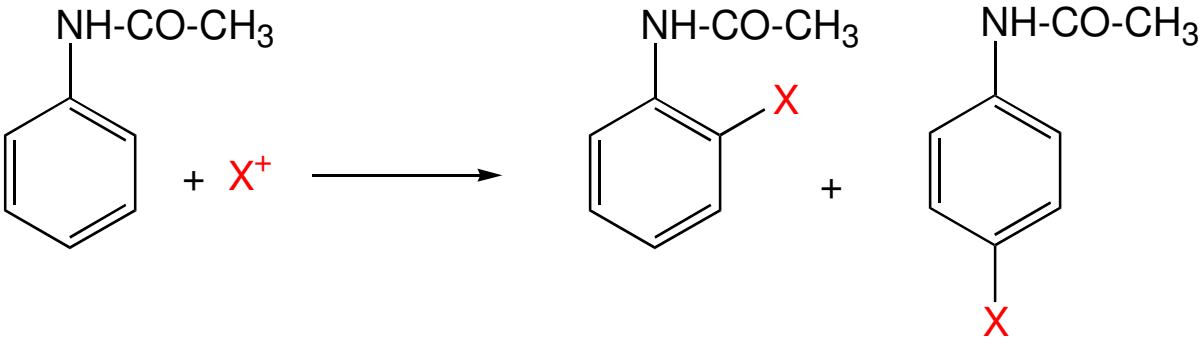




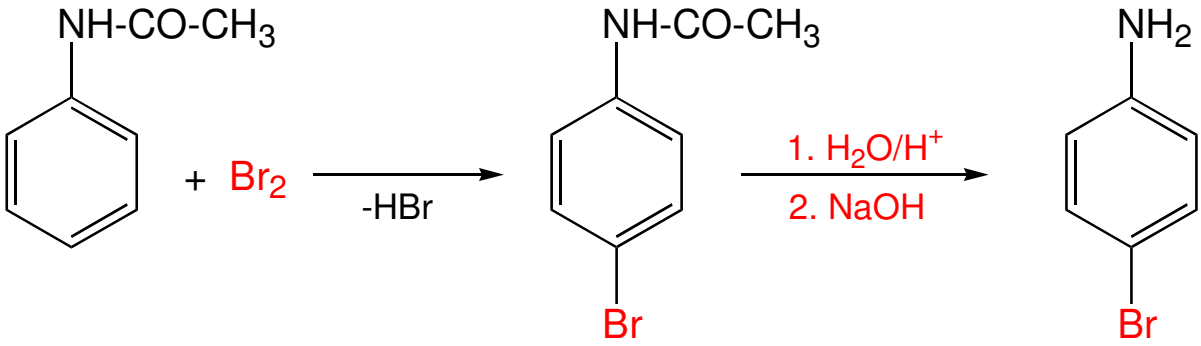
pK_b 12.9 8.7

Elektrofil szubsztitúciós reakciók

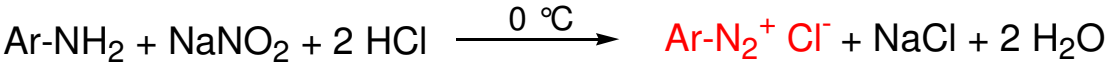


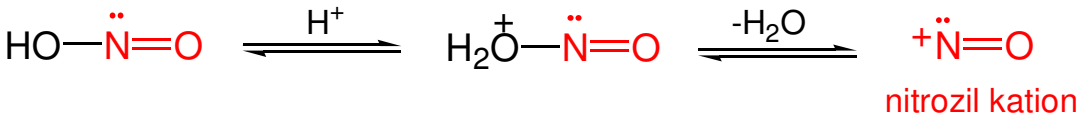


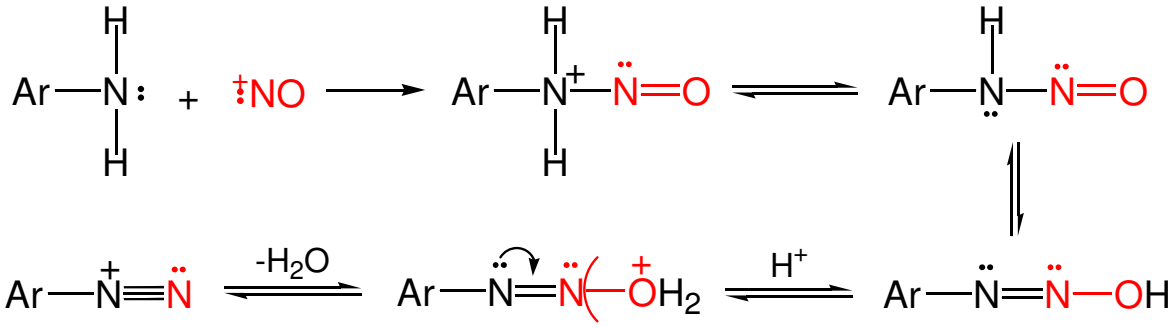
Példa



Diazotálás

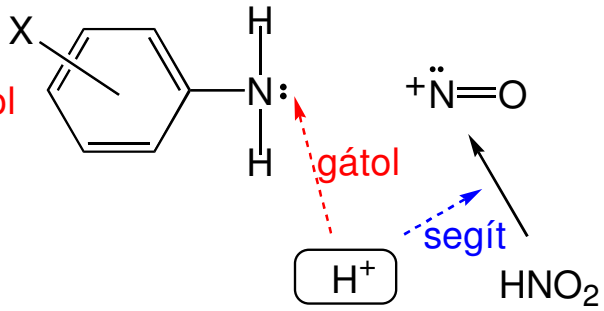




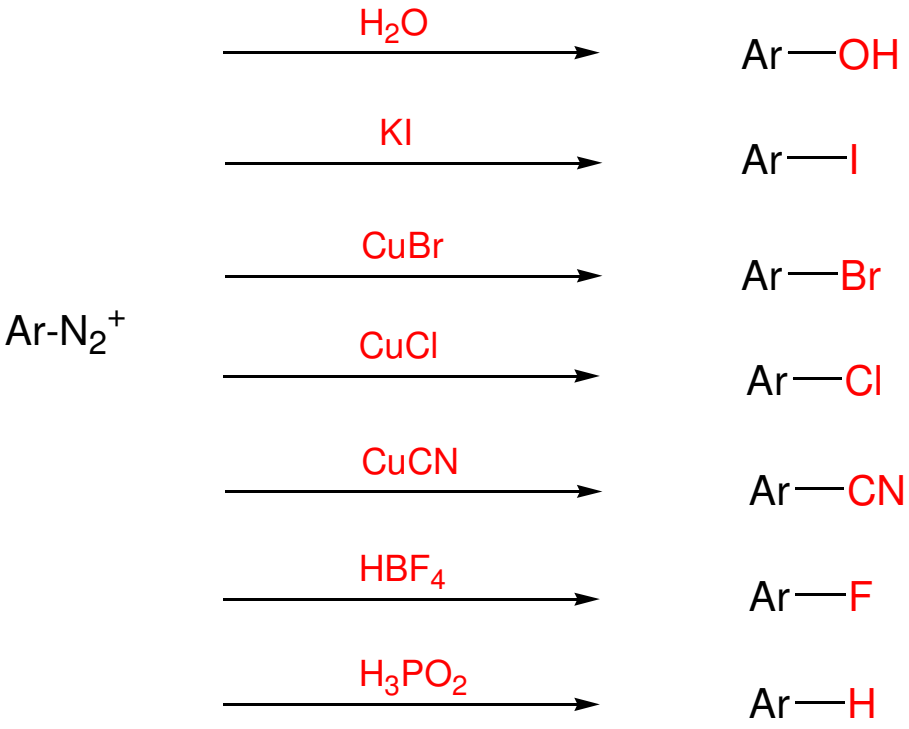


elektronküldő X: segít

elektronvonzó X: gátol

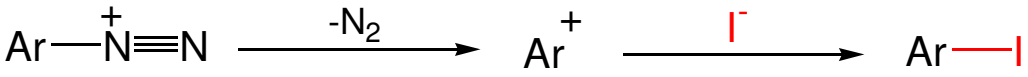


Diazóniumsók szubsztitúciós reakciói

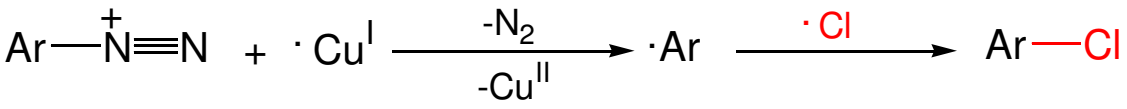


Mechanizmus

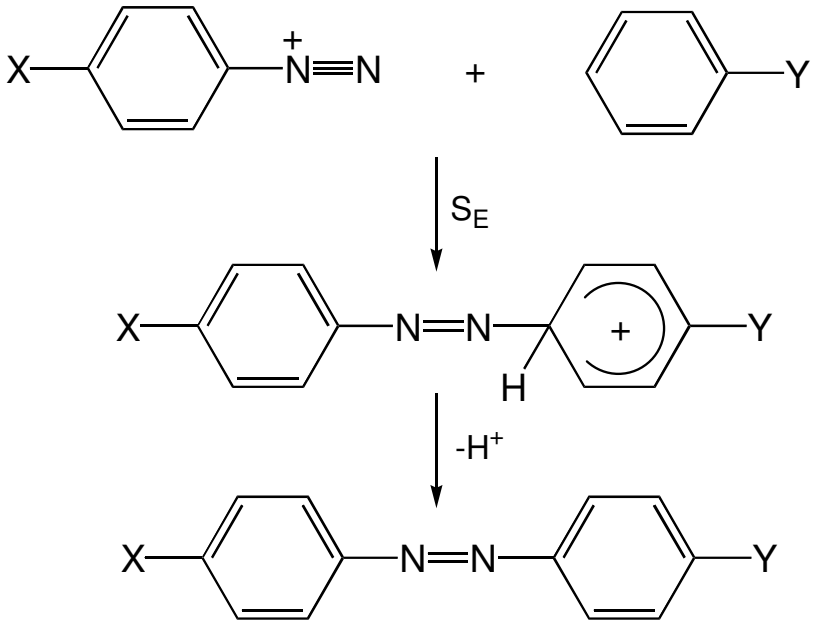
ionos (H_2O, KI)



gyökös (Sandmeyer reakció, CuBr, CuCl, CuCN



A diazóniusók kapcsolási reakciói

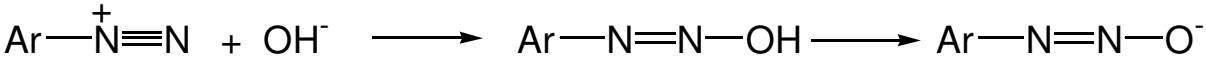


elektronvonzó X

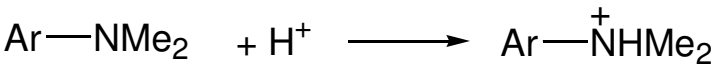
elektronküldő Y (pl. OH, NMe_2) } segít

pH függés

lúgos közeg



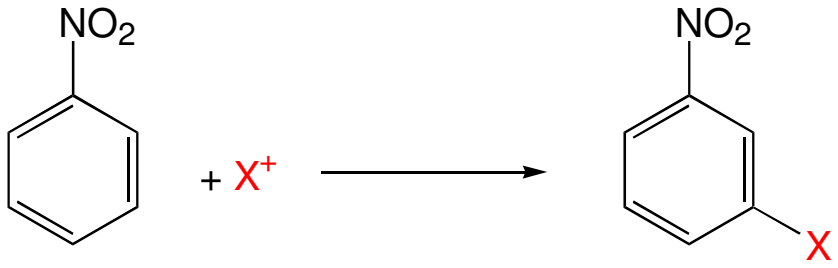
savas közeg



pH optimum: 5-7

Aromás nitrovegyületek

Elektrofil szubsztitúciós reakciók



meta irányítás

dezaktiválás

Redukció aminná

$$Ar{-}NO_2 \longrightarrow Ar{-}NO \longrightarrow Ar{-}NH\text{-}OH \longrightarrow Ar{-}NH_2$$

redukálószerek: H_2/kat.

fém + sav (Sn, Zn, Fe)