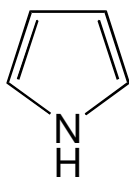


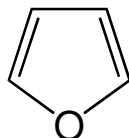
HETEROAROMÁS VEGYÜLETEK

Konstitúció és elnevezés

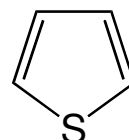
egy heteroatom, ötagú gyűrű



pirrol

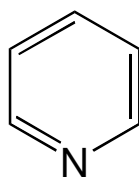


furán



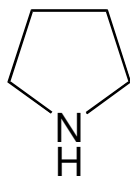
tiofén

egy heteroatom, hattagú gyűrű

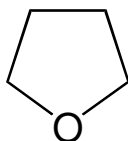


piridin

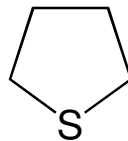
telített (nem aromás) származékok



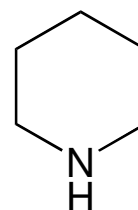
pirrolidin



tetrahidrofurán

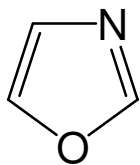


tetrahidrotiofén

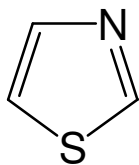


piperidin

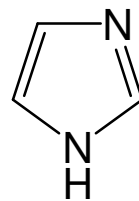
több heteroatomos gyűrűk



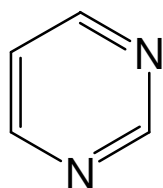
oxazol



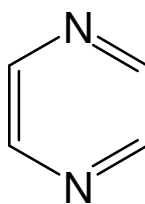
tiazol



imidazol

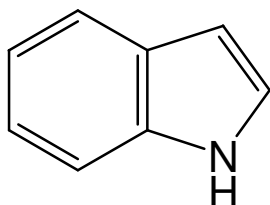


pirimidin

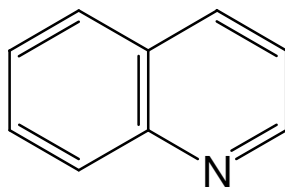


pirazin

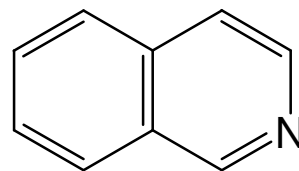
kondenzált gyűrűs származékok



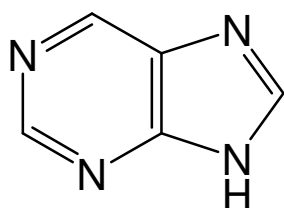
indol



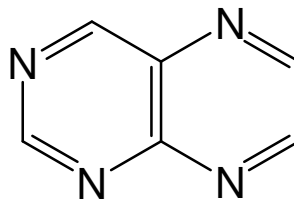
kinolin



izokinolin



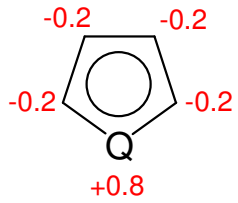
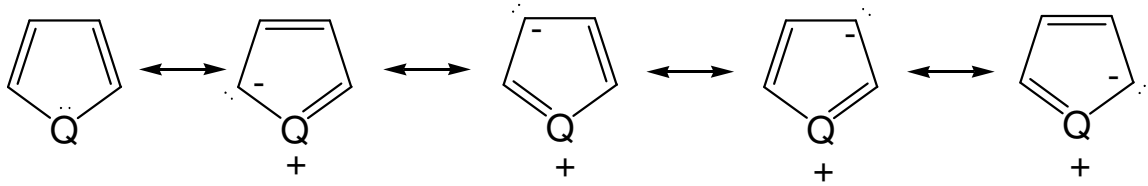
purin



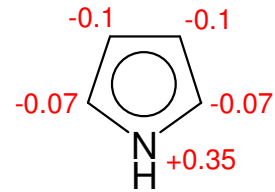
pteridin

Elektronszerkezet

pirrol, furán, tiofén

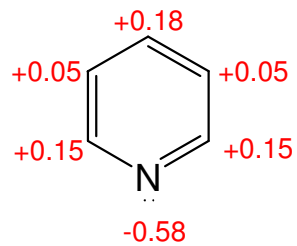
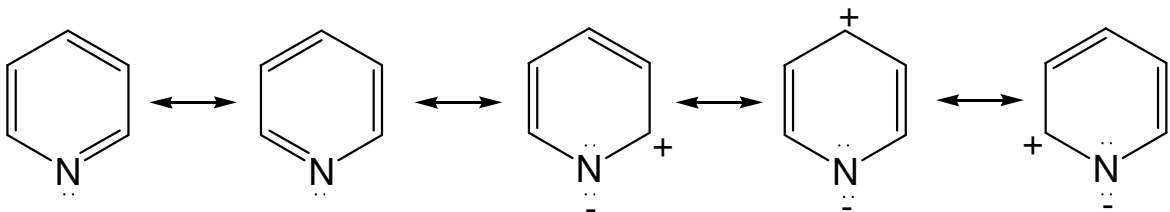


"egyenletes" elektroneloszlás



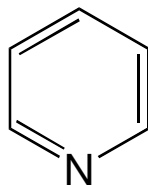
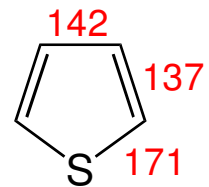
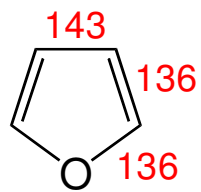
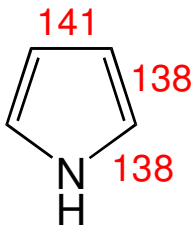
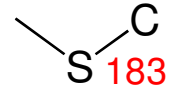
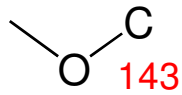
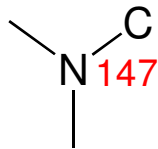
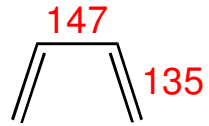
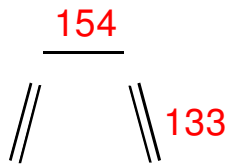
valóságos elektroneloszlás

piridin



Térszerkezet

kötéshosszak (pm)



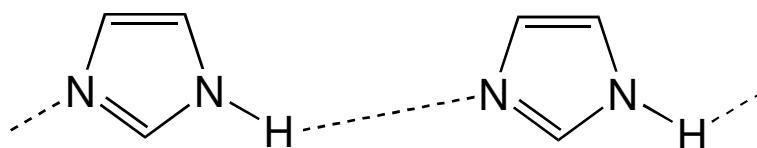
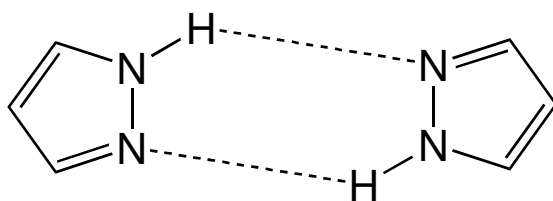
$C\equiv C$ (C_6H_6) 139

$C-N$ 147

$C=N$ 130

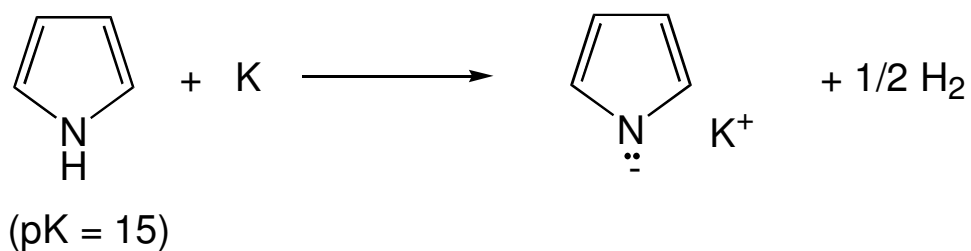
Fizikai tulajdonságok

	fp. (°C)	H-kötés
benzol	80	-
tiofén	84	-
piridin	115	-
pirrol	131	+
pirazol	187	+ (dimer)
imidazol	256 (op. 90 °C)	+ (polimer)

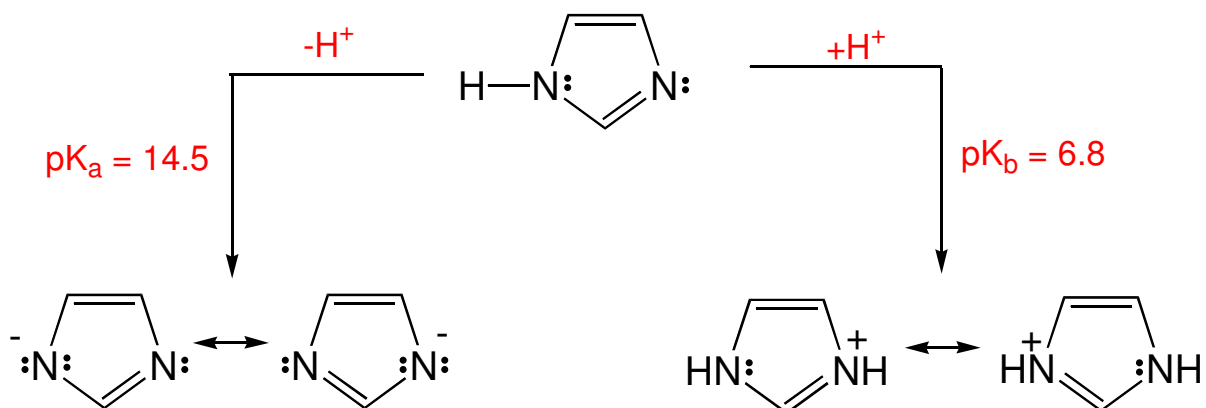
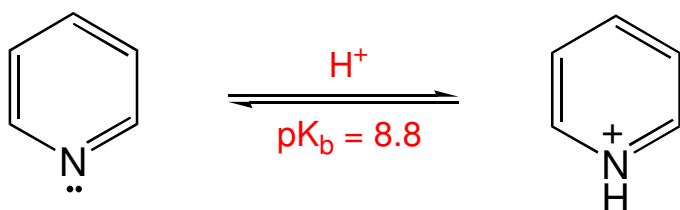
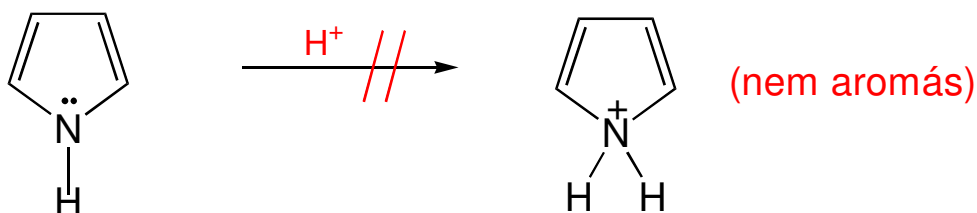


Sav-bázis tulajdonságok

savi jelleg

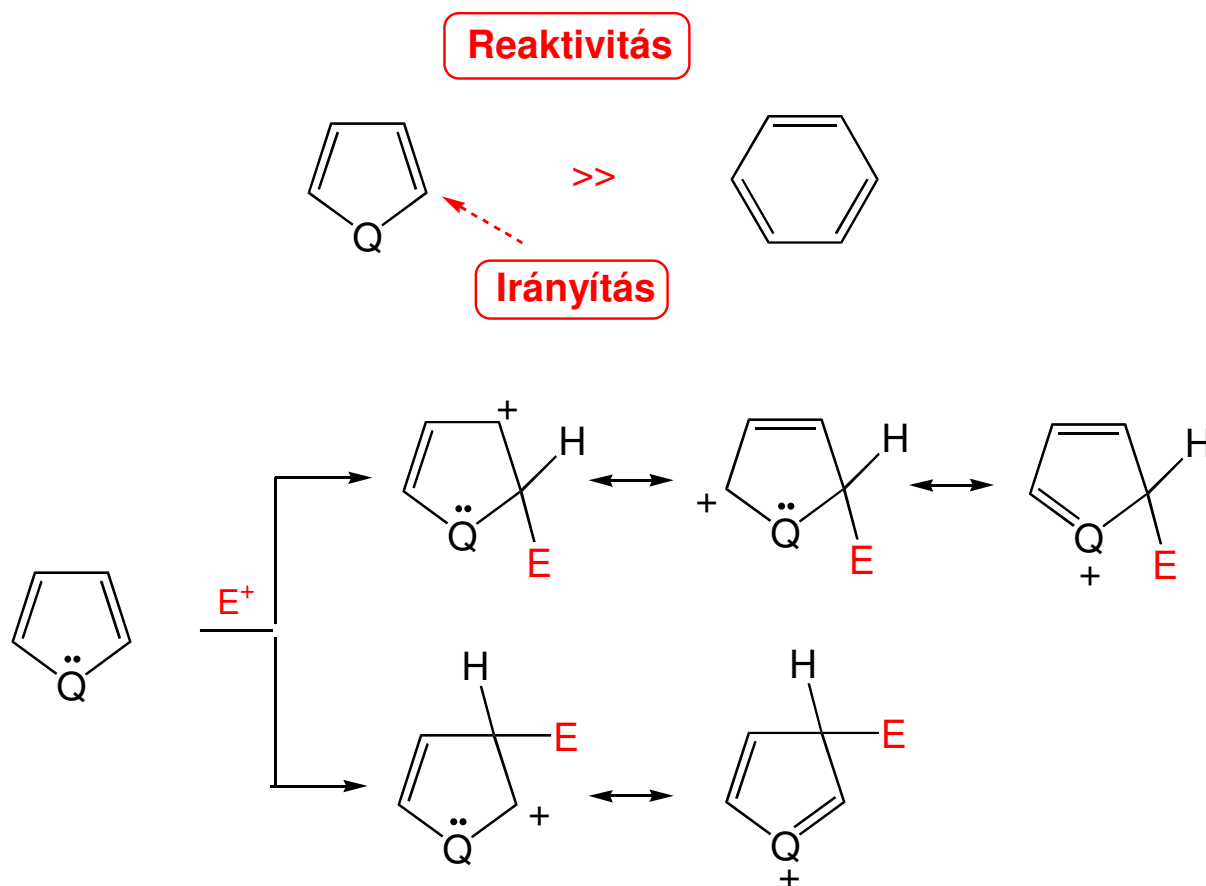


bázicitás

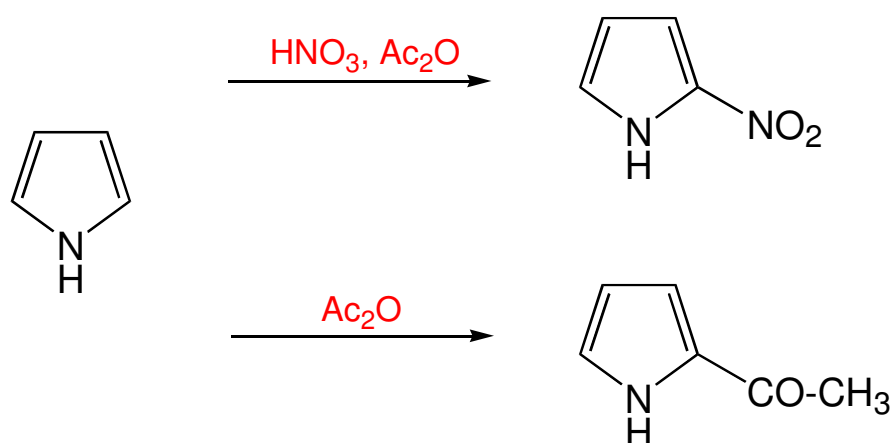


Kémiai tulajdonságok

A pirrol, furán és tiofén elektrofil szubsztitúciós reakciója

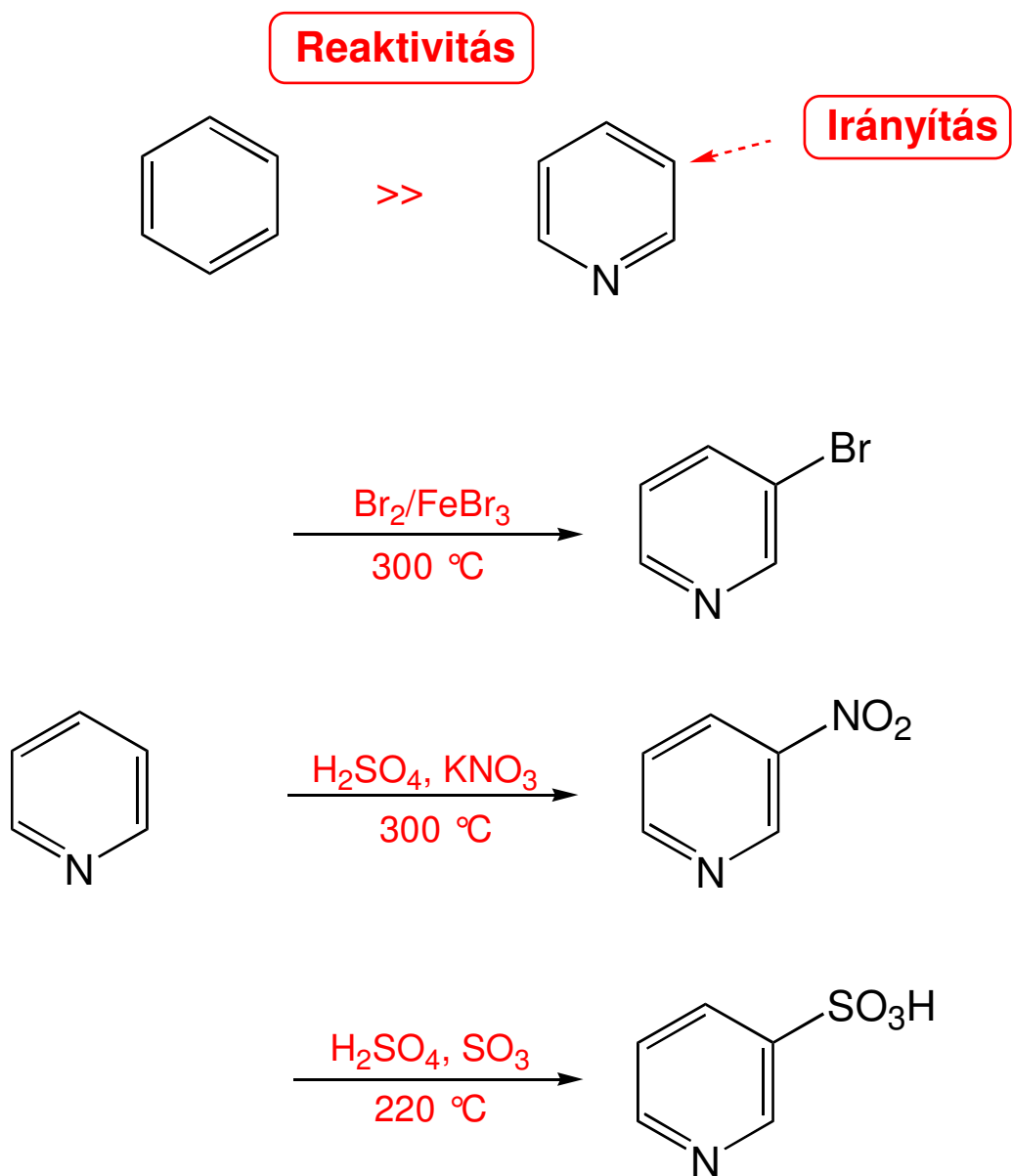


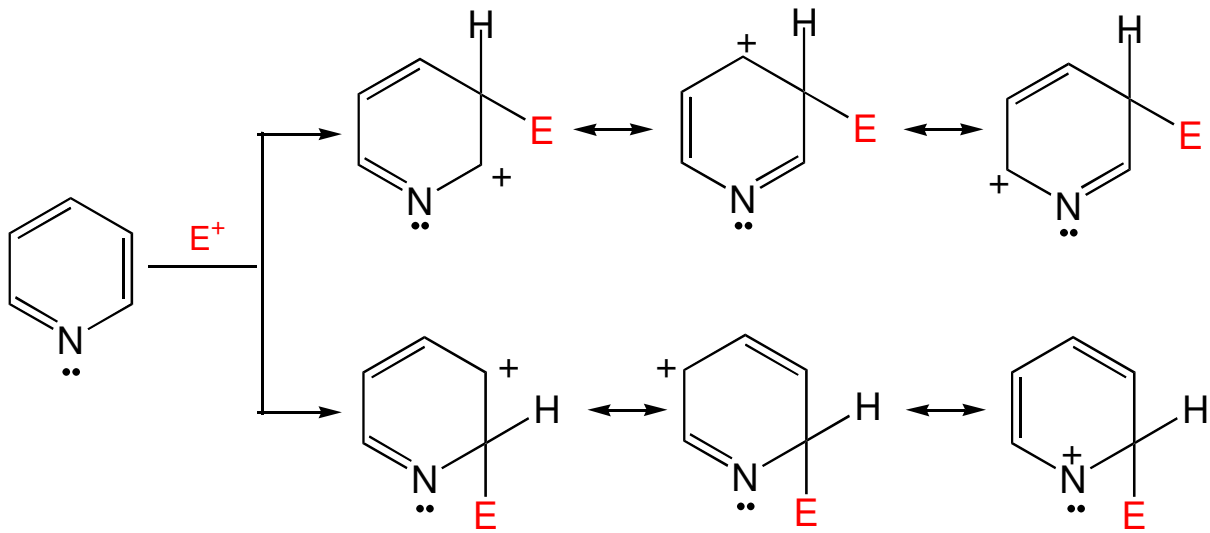
Példa



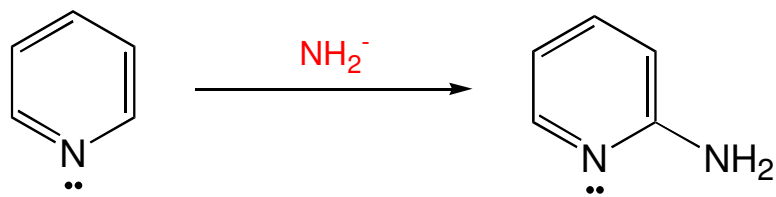
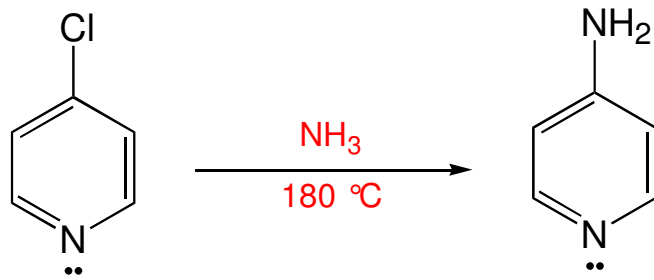
A piridin reaktivitása

Elektrofil szubsztitúció

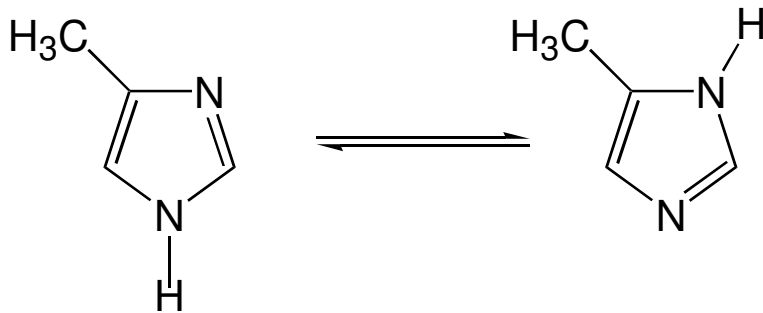
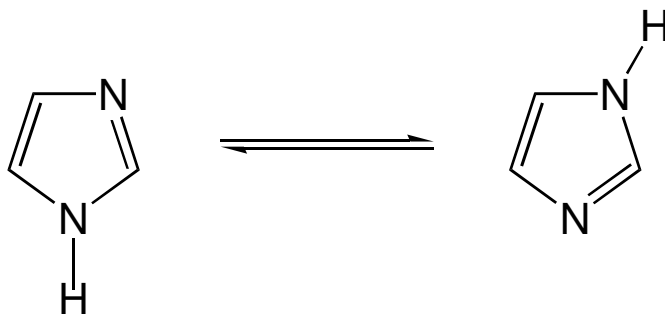




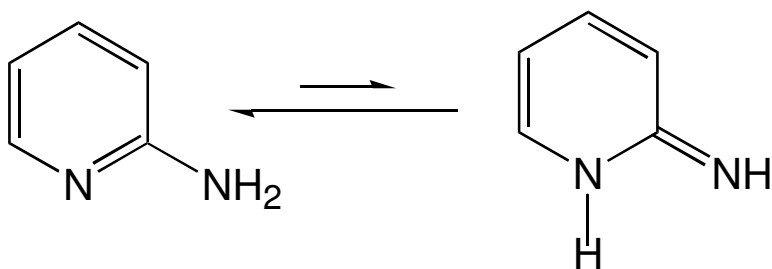
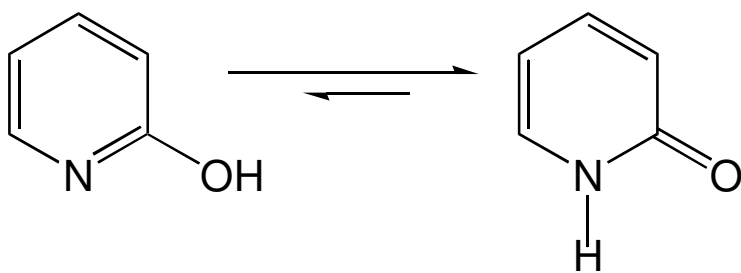
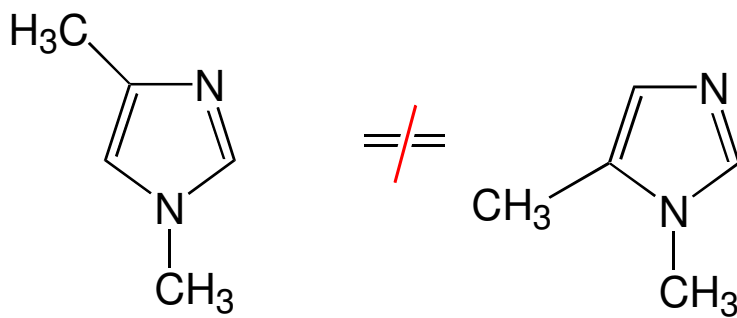
Nukleofil szubsztitúció



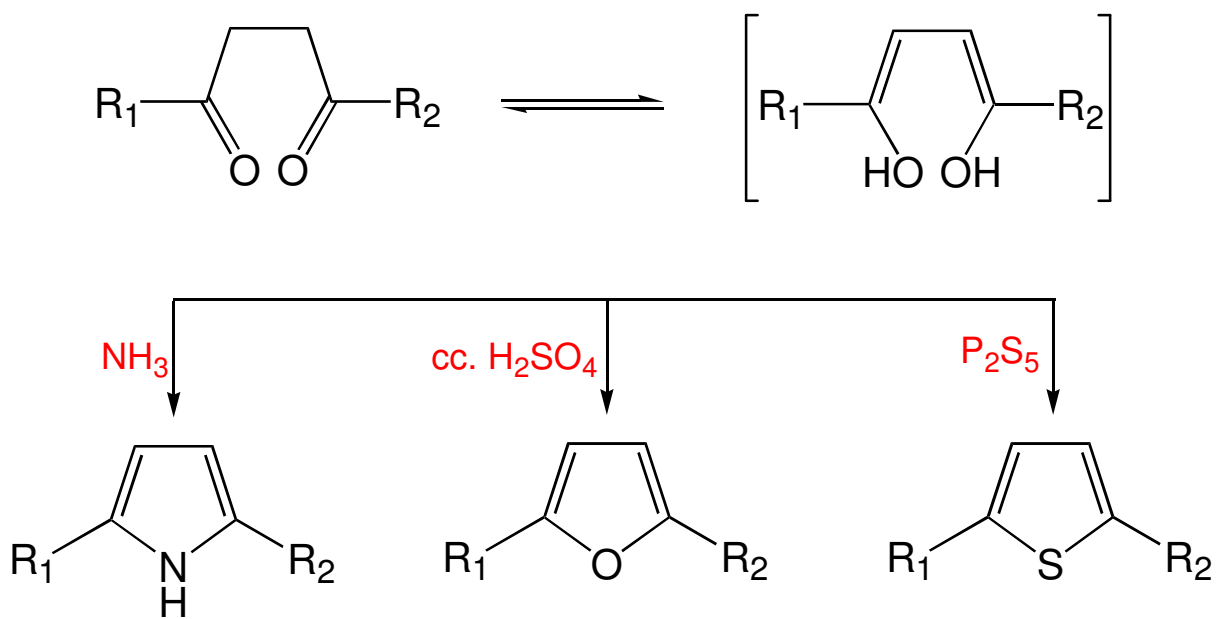
Tautoméria



(4,5)-metilimidazol



Heterociklusos vegyületek előállítása



Példák

