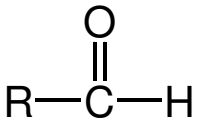
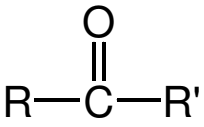
OXOVEGYÜLETEK

Levezetés



aldehid

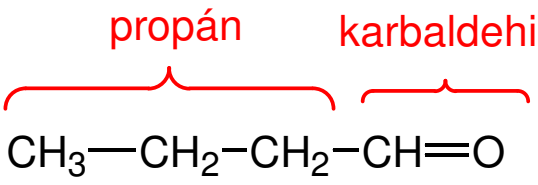


keton

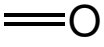
Elnevezés

Aldehidek

propán karbaldehid



butánal
butiraldehid



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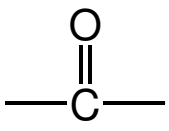
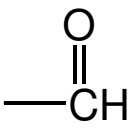


karbonil



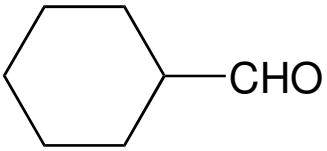
formil

Példák

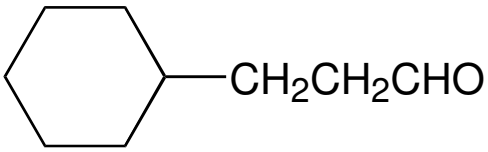
HCHO
metanal
formaldehid

CH_3CHO
etanal
acetaldehid

CH_3CH_2CHO
propanal
propionaldehid



ciklohexánkarbaldehid



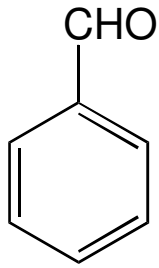
3-ciklohexil-propionaldehid

$CH_2=CH–CHO$

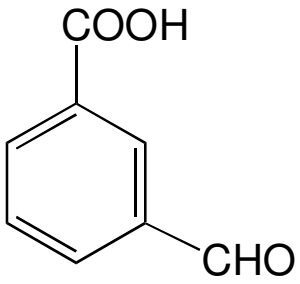
propénal
akrilaldehid

$CH_2=CH–CH_2–CHO$

but-3-énal



benzaldehid



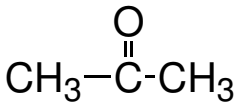
3-formil-benzoesav

OHC–CHO

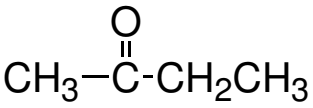
etándial
glioxál

$OHC–CH_2–CHO$

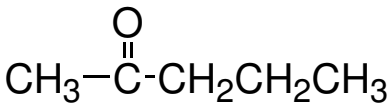
propándial
malondialdehid



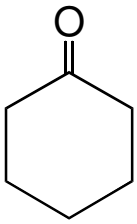
propanon
dimetil-keton
aceton



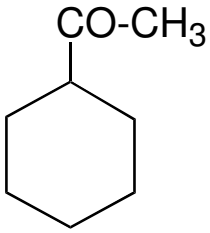
butanon
etil-metil-keton



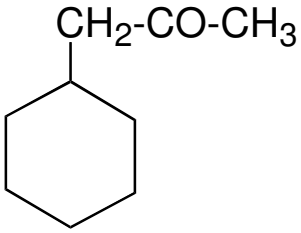
pentán-2-on
metil-propil-keton



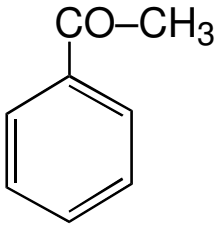
ciklohexanon



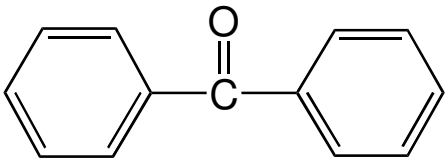
ciklohexil-metil-keton



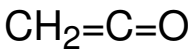
ciklohexil-aceton



fenil-metil-keton
acetofenon



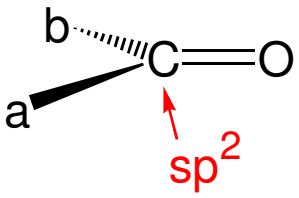
difenil-keton
benzofenon

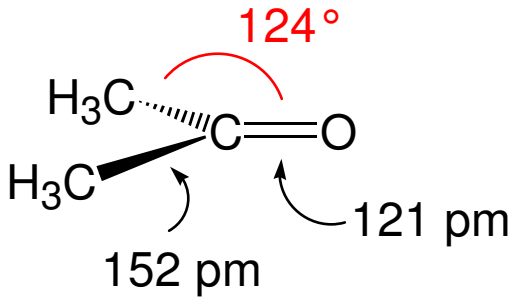


ketén

AZ OXOVEGYÜLETEK SZERKEZETE

Térszerkezet





Kötési energia

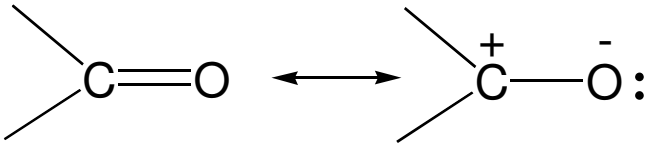
C—O

357 kJ/ mol

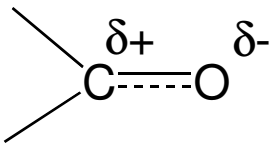
C═O

748 kJ/mol

Polaritás



40-50%



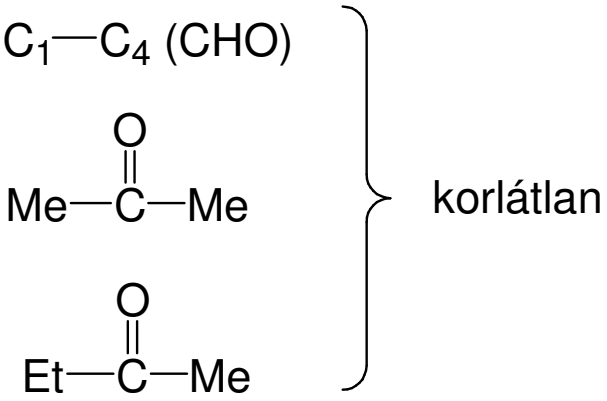
$\mu \sim 9 \times 10^{-30}$ Cm

FIZIKAI TULAJDONSÁGOK

Forráspont

	molekulatömeg	forráspont (°C)
C_2H_6	30	–89
HCHO	30	–21
CH_3OH	32	65
C_4H_{10}	58	–1
C_2H_5CHO	58	49
$CH_3–CO–CH_3$	58	56
n-C_3H_7OH	60	97

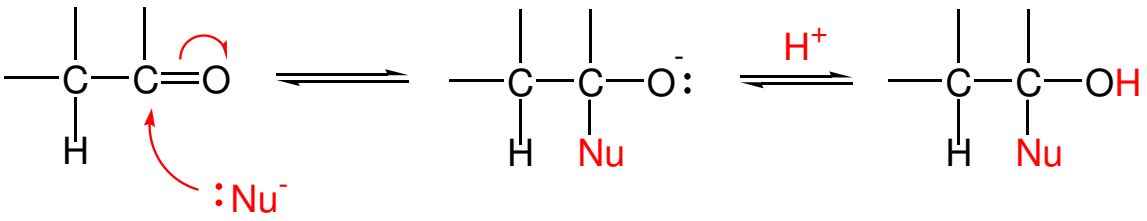
Vízoldhatóság



KÉMIAI TULAJDONSÁGOK

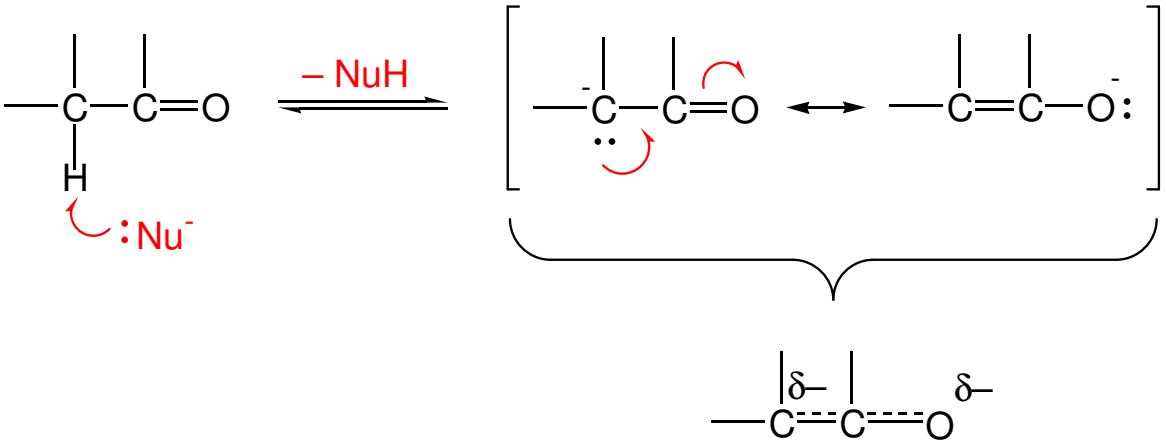
Reakciótípusok

1. Reakció karbonil-szénatomon



nukleofil addíció (Ad_N)

2. Reakció α-helyzetű szénatomon

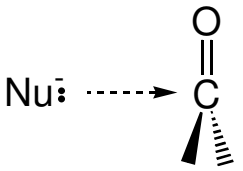


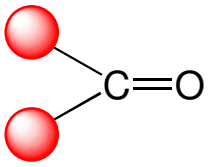
enolát anion

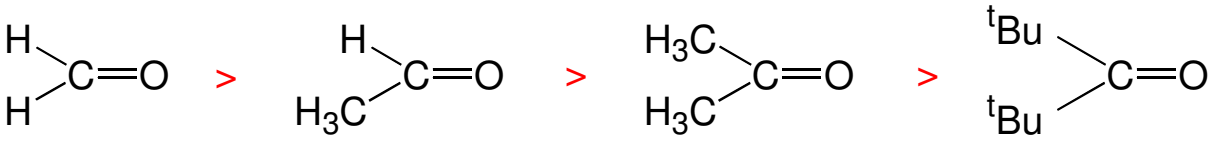
NUKLEOFIL ADDÍCIÓ

Reaktivitást befolyásoló tényezők

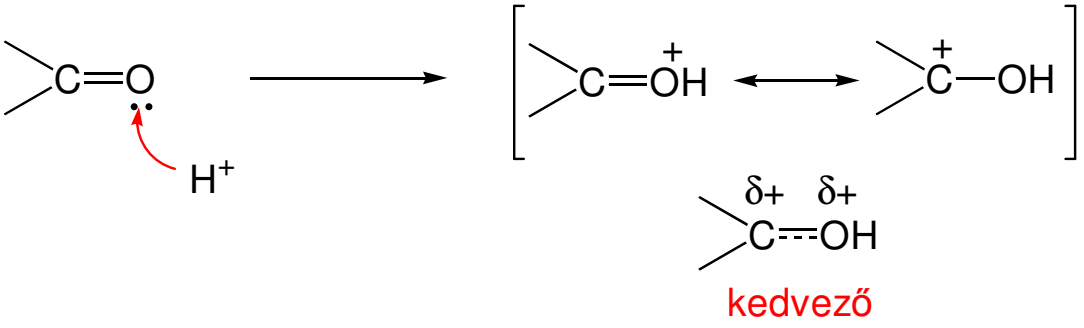
Térszerkezet



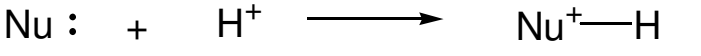




Sav-katalízis



kedvező



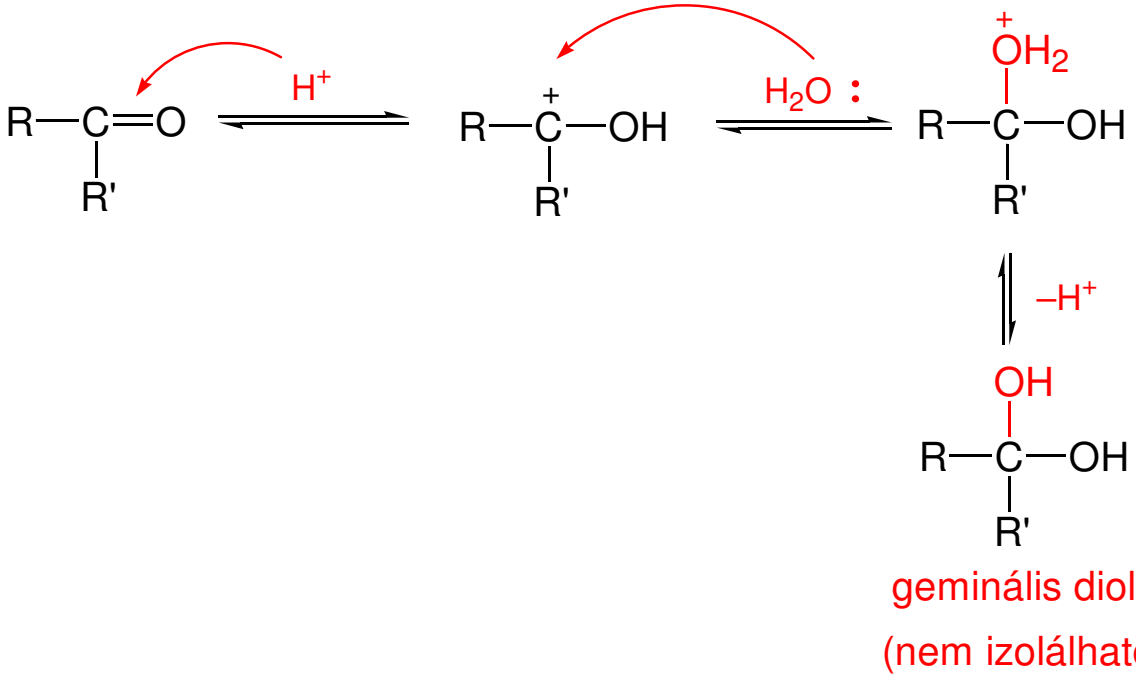
kedvezőtlen

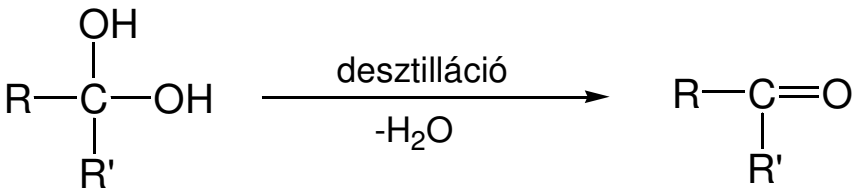
optimális pH: gyengén savas

NUKLEOFIL ADDÍCIÓS REAKCIÓK

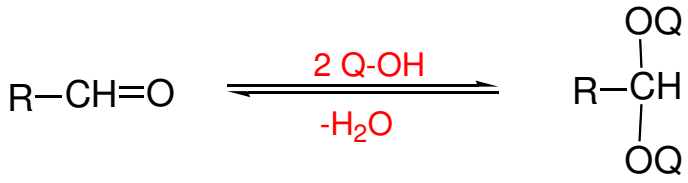
Reakció oxigén-nukleofilekkel

Hidratáció

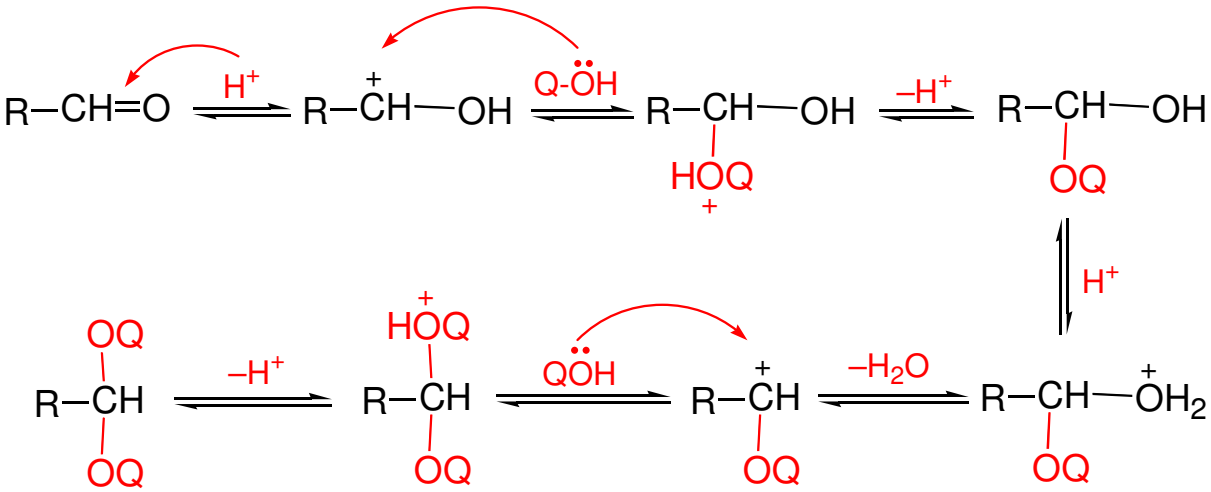


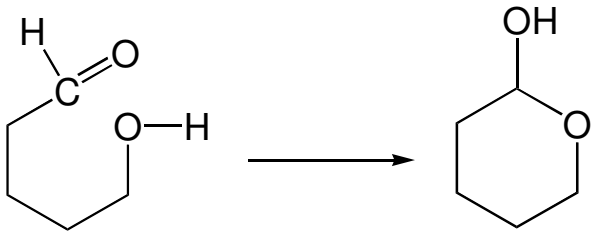


Acetálképzés (aldehidekből)



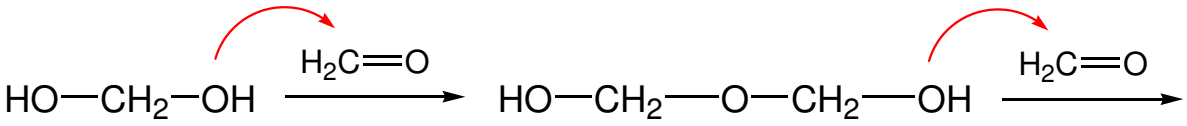
Mechanizmus

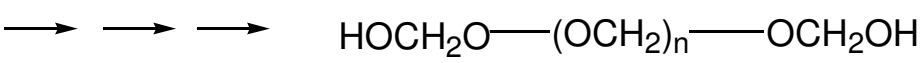




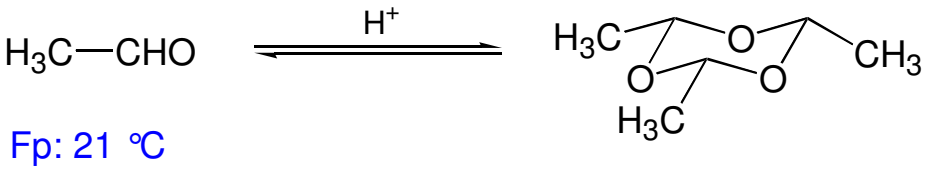
ciklofélacetál

Polimerizációs reakciók



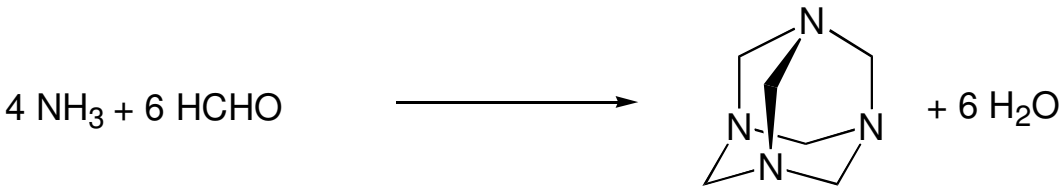


paraformaldehid

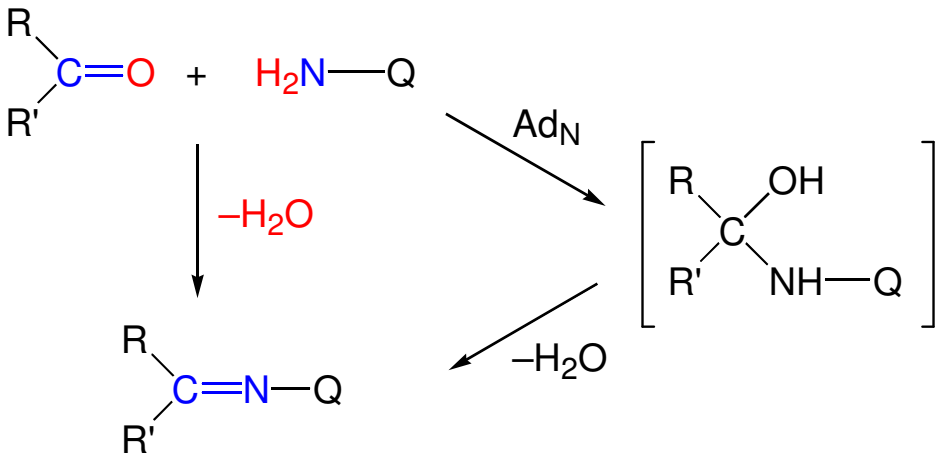


Fp: 21 °C

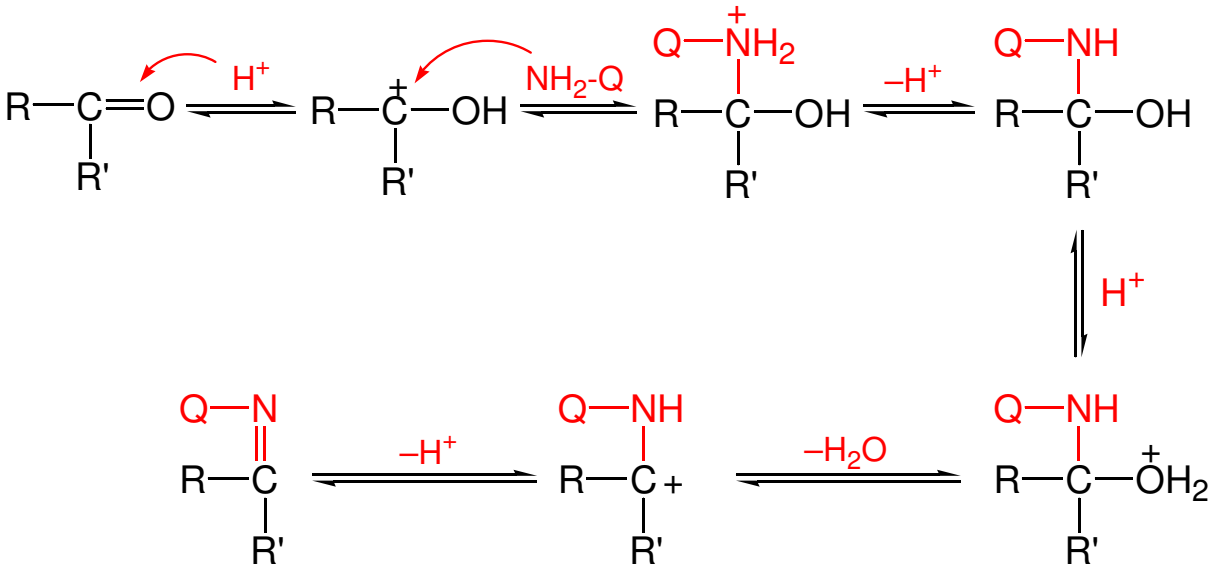
paraldehid
Fp: 124 °C

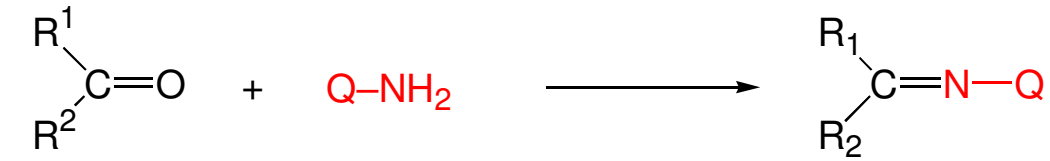


Reakció nitrogén-nukleofilekkel



Mechanizmus

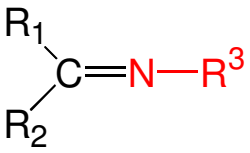




oxovegyület reagens termék

$R^3—NH_2$

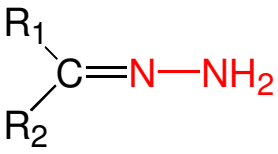
amin



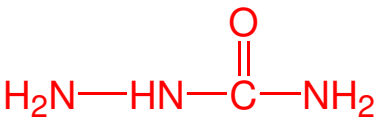
Schiff-bázis

$H_2N—NH_2$

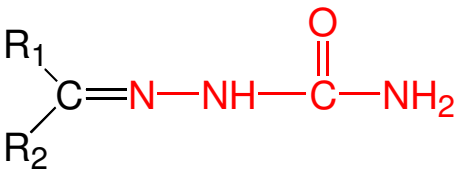
hidrazin



hidrazon



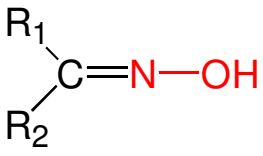
szemikarbazid



szemikarbazon

$HO—NH_2$

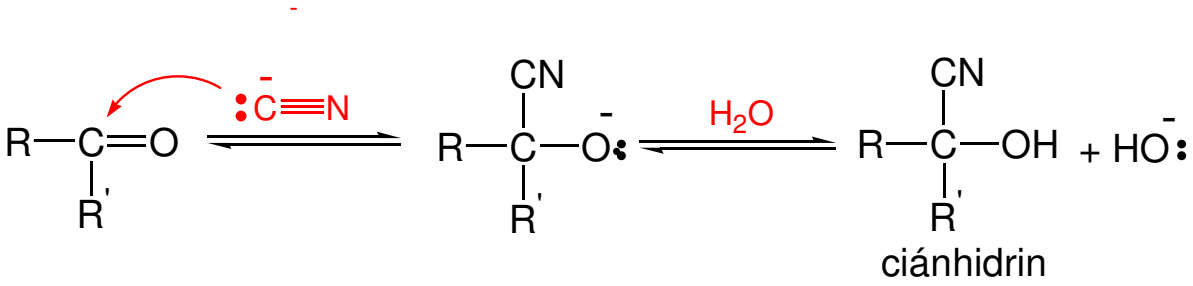
hidroxil-amin



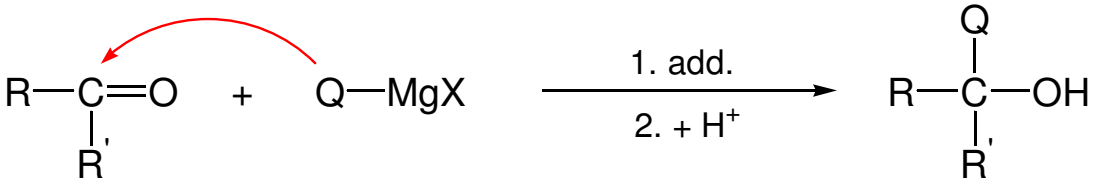
oxim

Reakció szén-nukleofilekkel

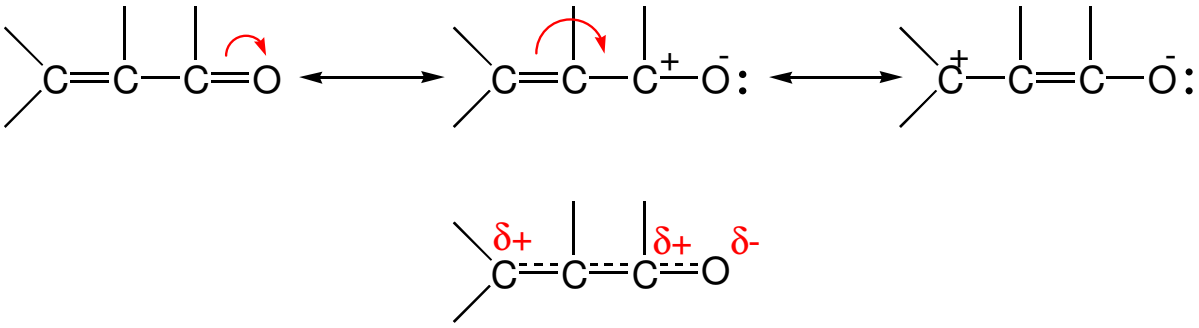
a) HCN addíció



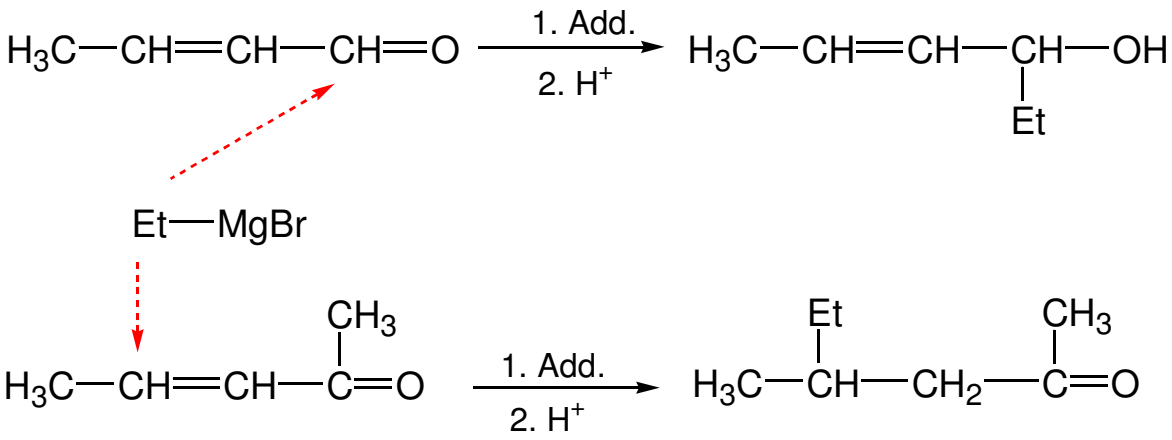
b) Grignard-reagens addíciója



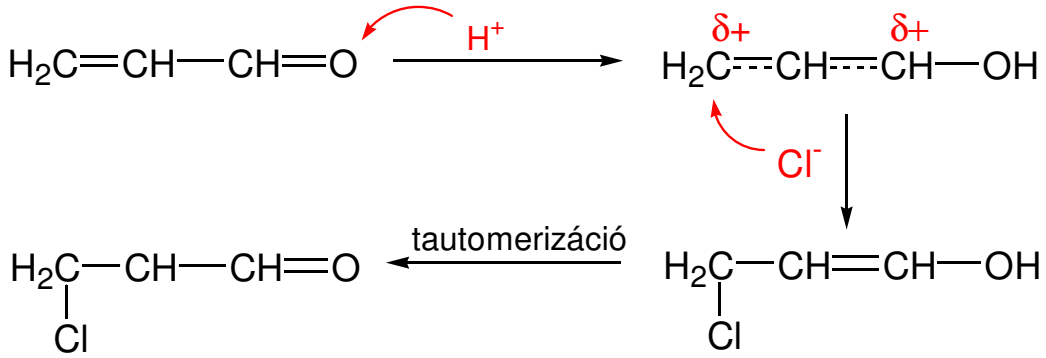
ADDÍCIÓ α,β-TELÍTETLEN OXOVEGYÜLETEKEN



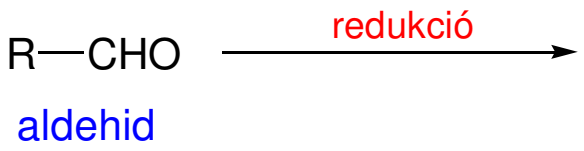
a) Reakció Grignard-reagenssel



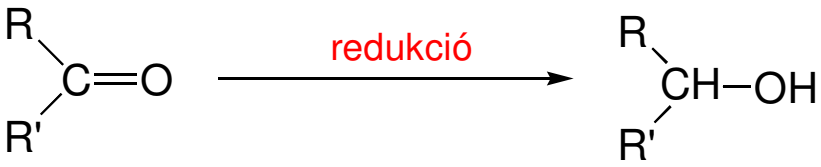
b) HCl addíció



AZ OXOVEGYÜLETEK REDUKCIÓJA

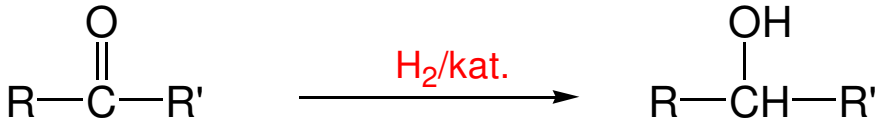


aldehid — primer alkohol



keton — szekunder alkohol

Katalitikus hidrogénezés



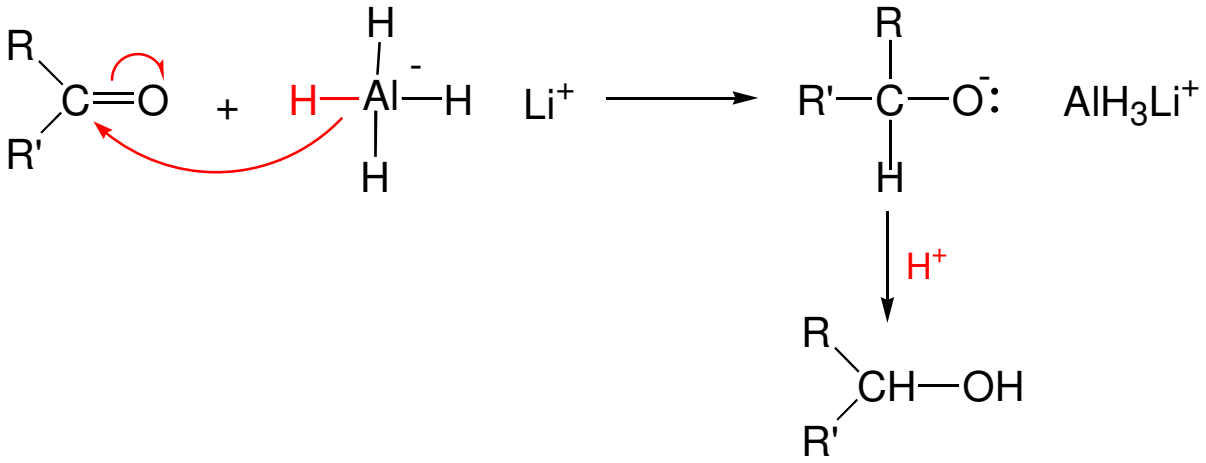
katalizátor: Pt, Pd/C, Raney-Ni

Redukció komplex fém-hidridekkel

Litium-aluminium-hidrid; $LiAlH_4$

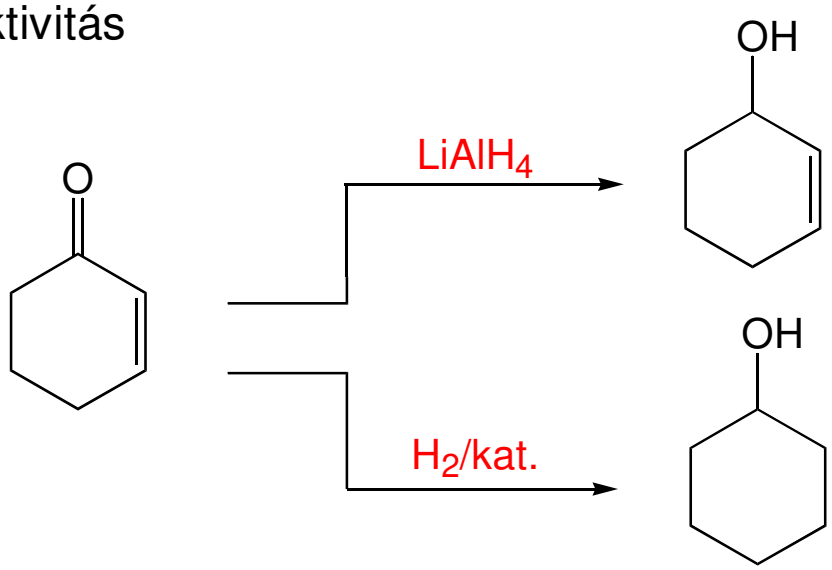
Nátrium-borohidrid; $NaBH_4$

Mechanizmus



$$4\ R_2CO + LiAlH_4 \xrightarrow[2.\ H^+]{1.\ \text{red.}} 4\ R_2CH\text{–}OH$$

Szelektivitás

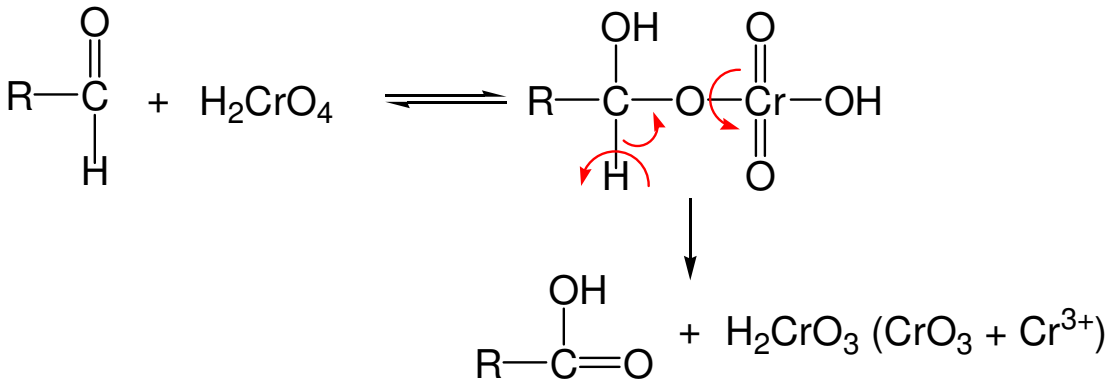


AZ OXOVEGYÜLETEK OXIDÁCIÓJA

Aldehidek

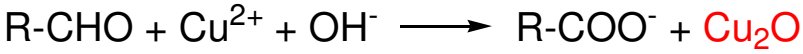
oxidálószerek: pl. $KMnO_4$, H_2CrO_4

Mechanizmus

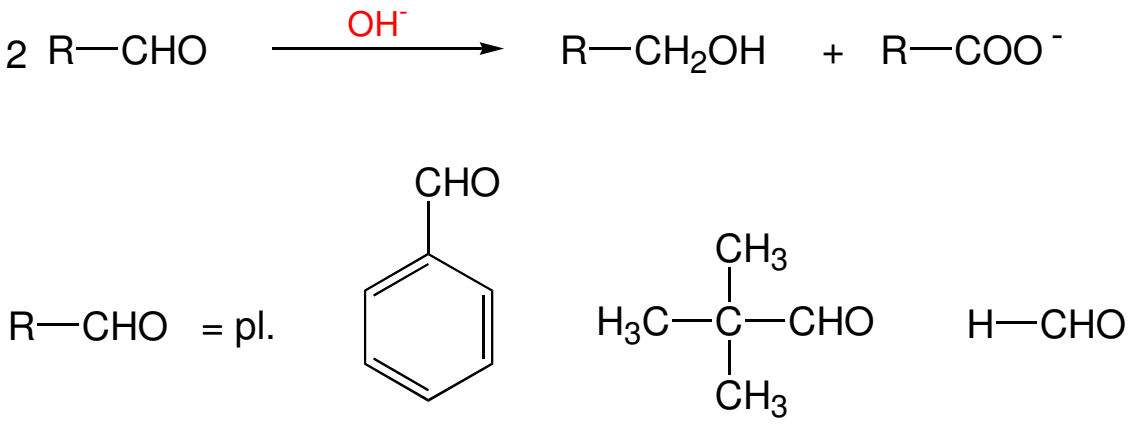


Tollens próba (ezüsttükör próba)

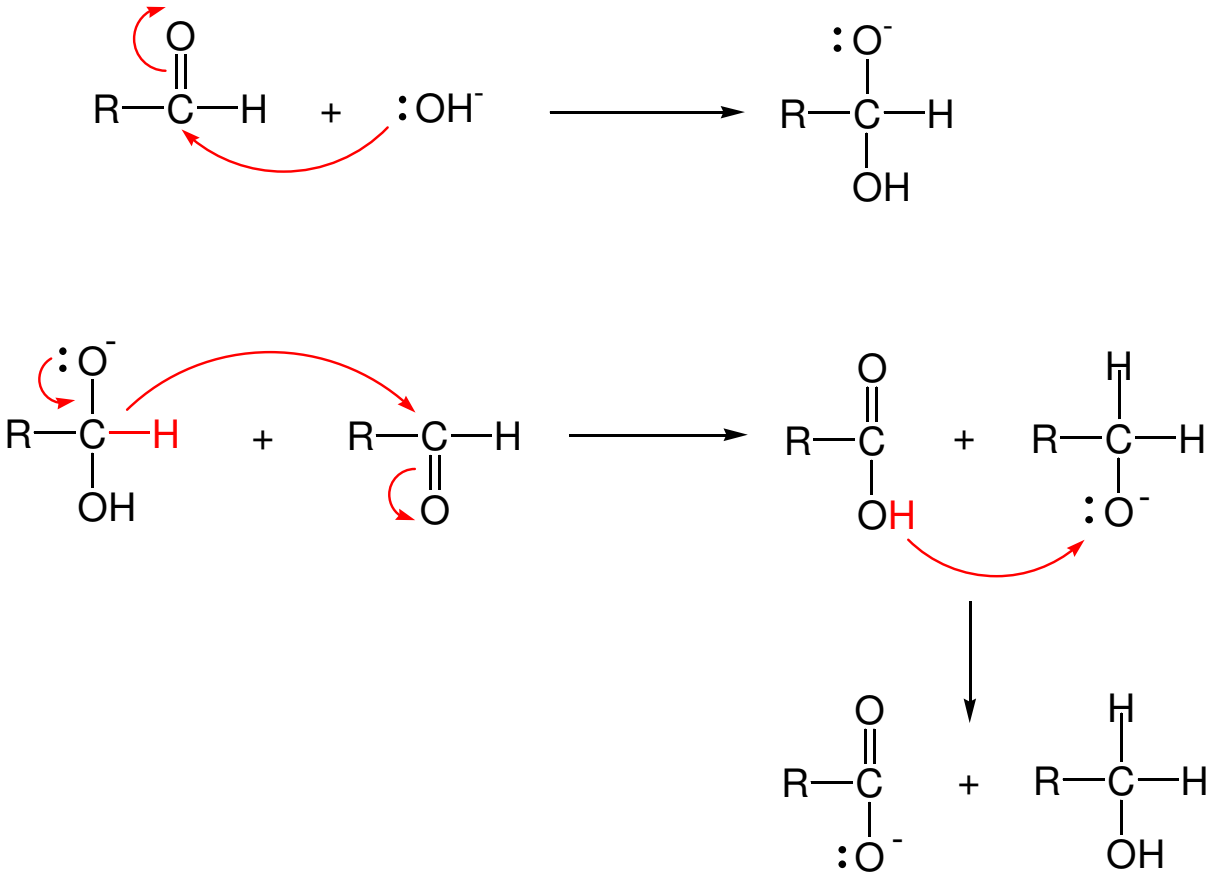
Fehling próba



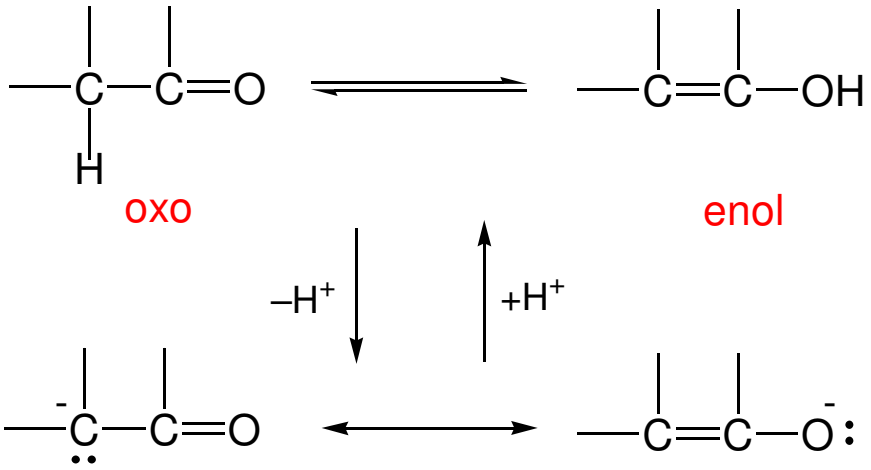
Cannizzaro reakció

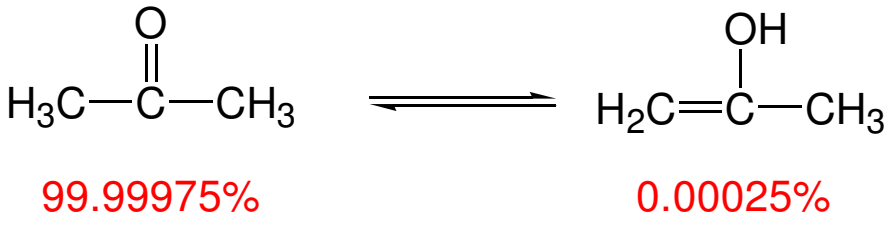


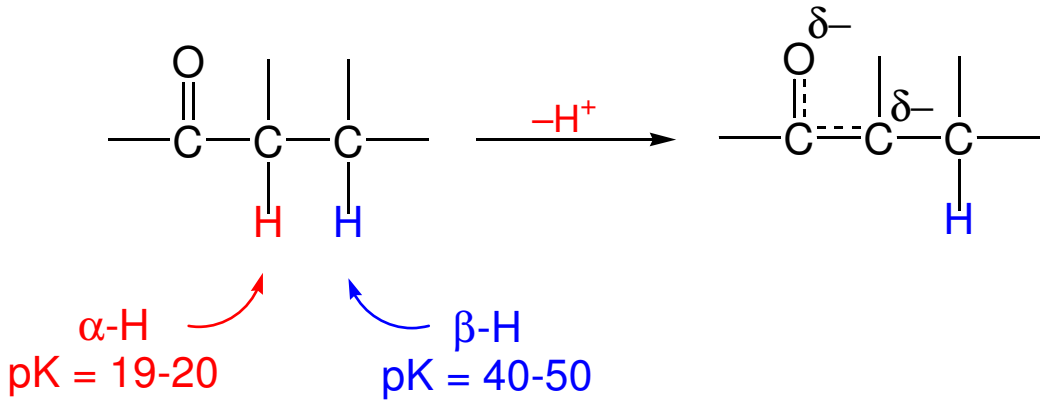
Mechanizmus

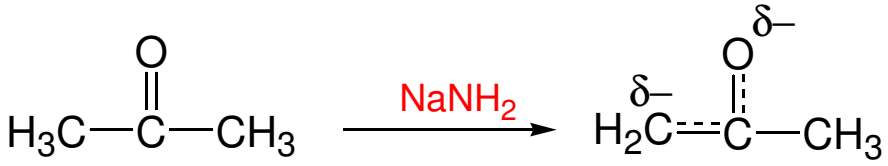


ENOL-OXO TAUTOMÉRIA

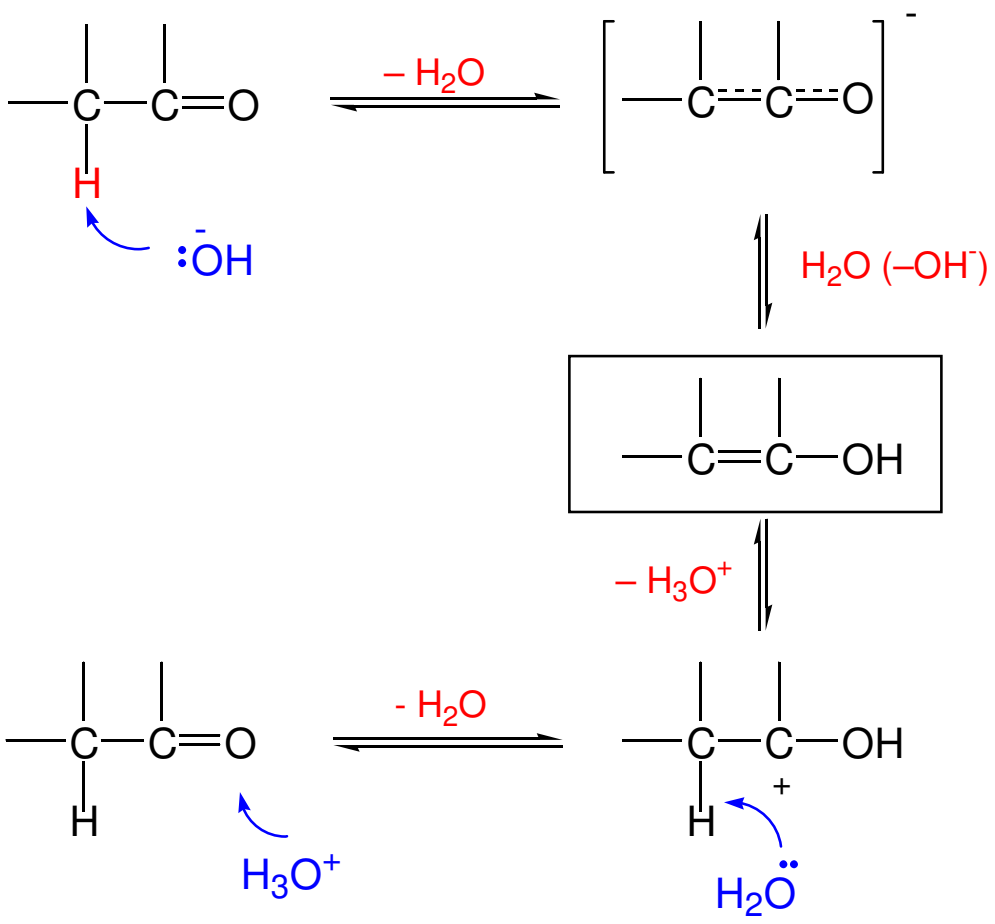




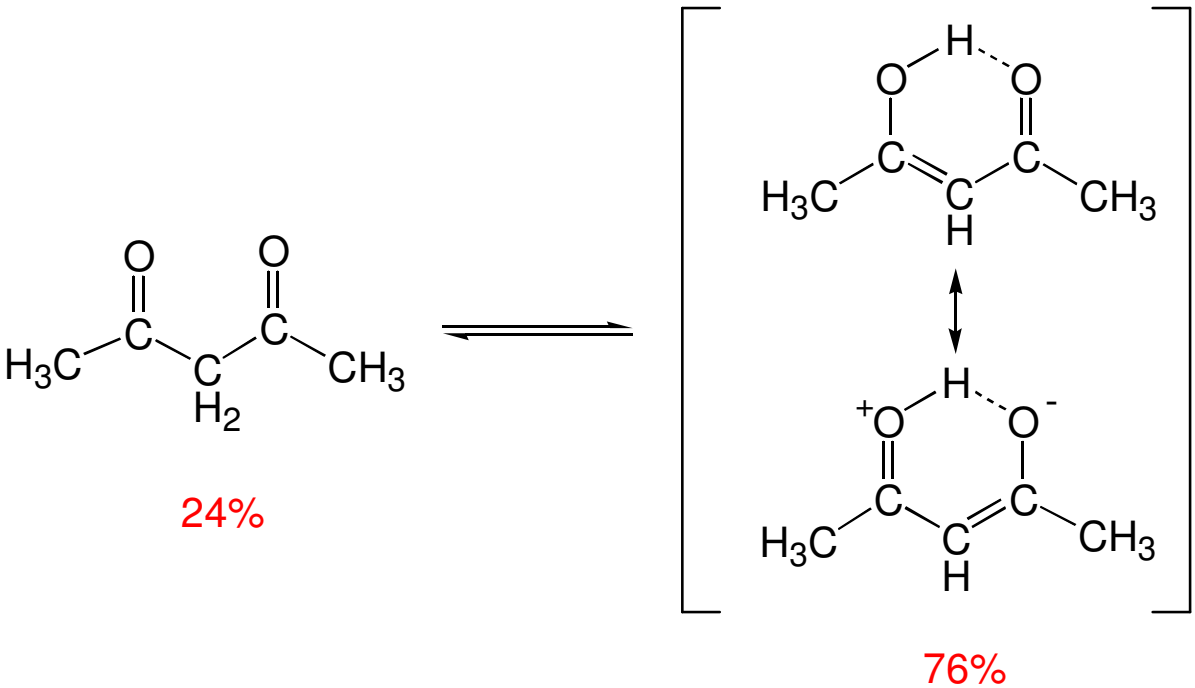




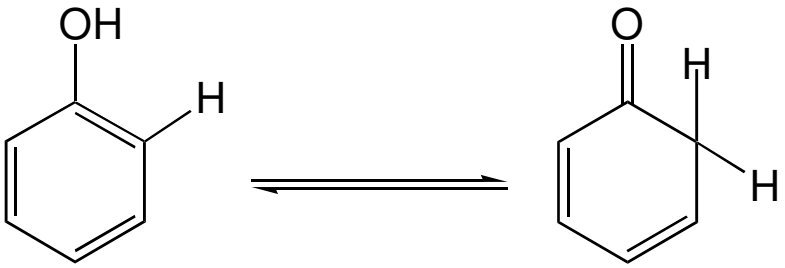
Sav-bázis katalízis



1,3-dioxovegyületek enolizációja



A fenolok tautomériája



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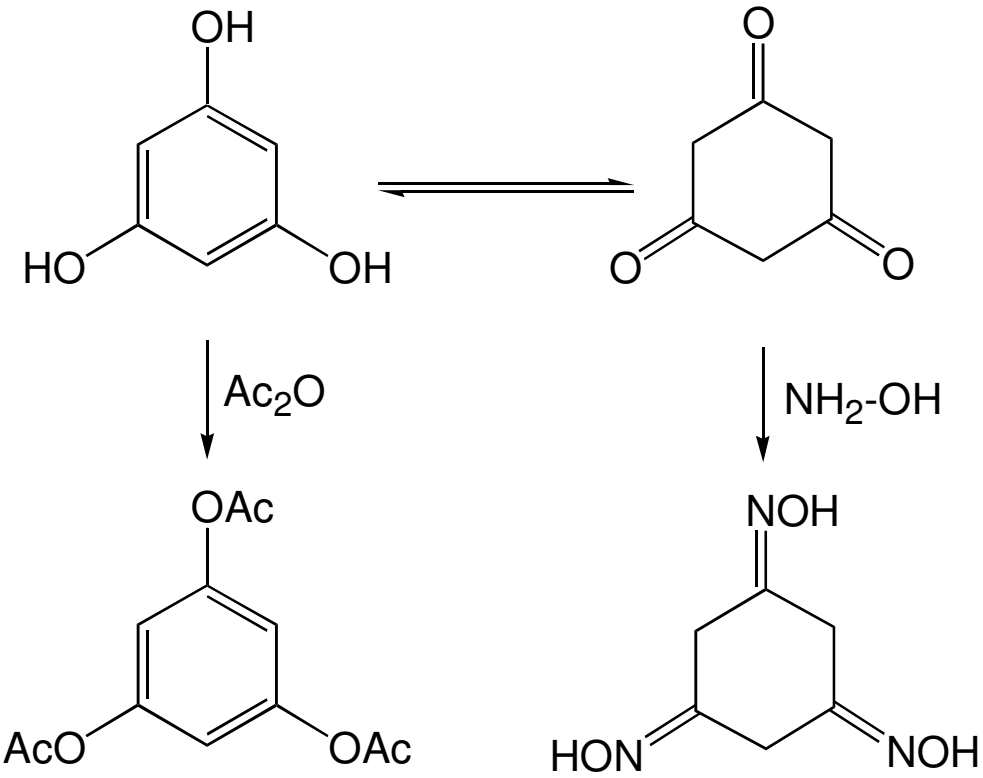
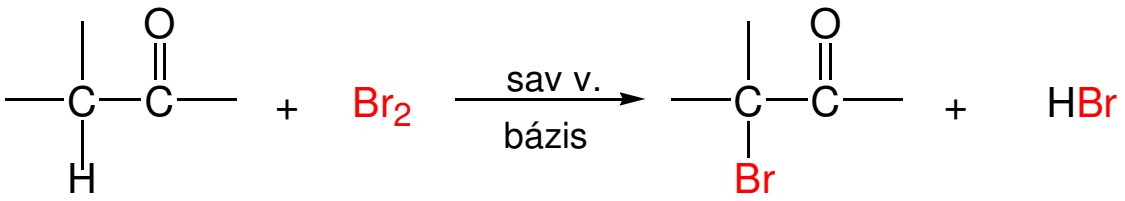
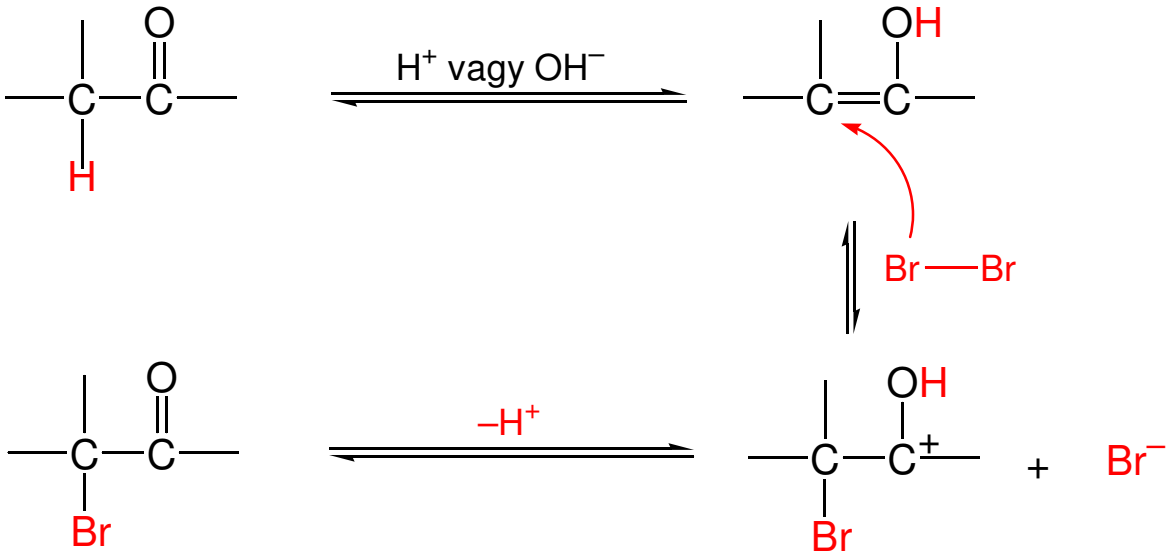


AZ OXOVEGYÜLETEK HALOGÉNEZÉSE



Mechanizmus



Példák