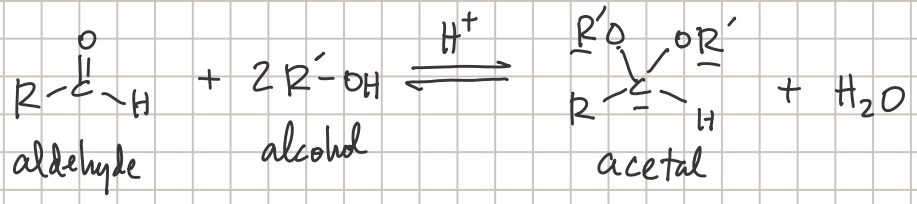
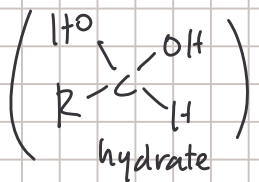
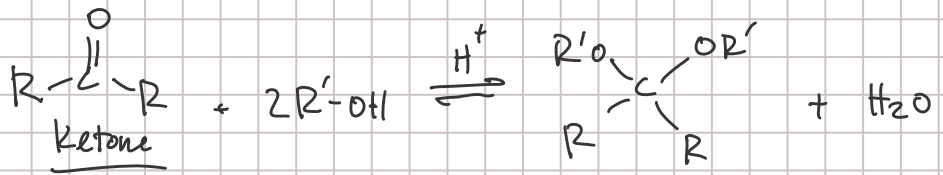
Ch 18

Note Title 3/24/2006

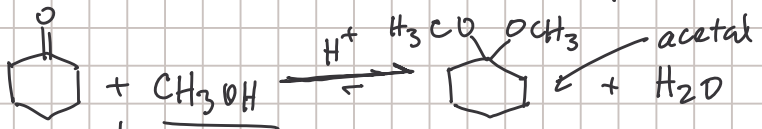
Acetals

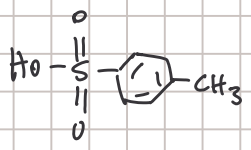






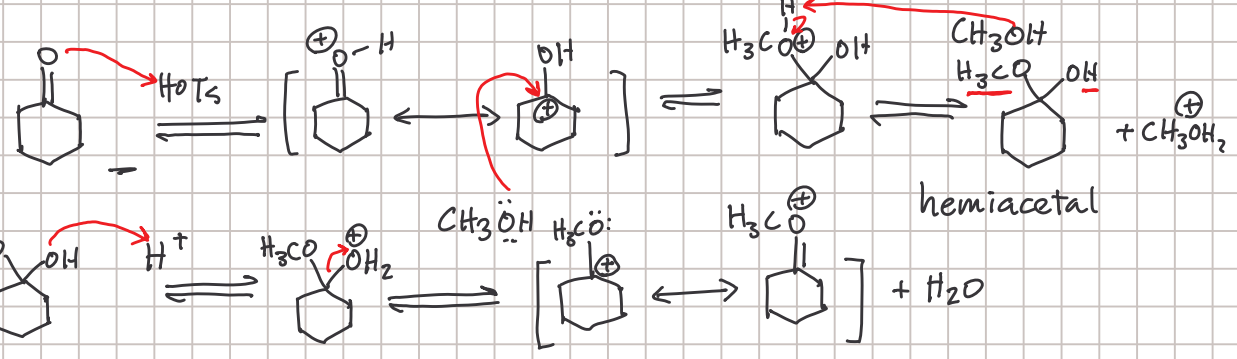
- acetal formation must be acid catalyzed
  (hydration can be acid or base catalyzed)

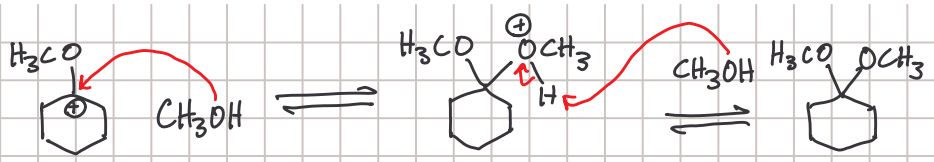




p-toluene sulfonic acid = tosic acid = TsOH

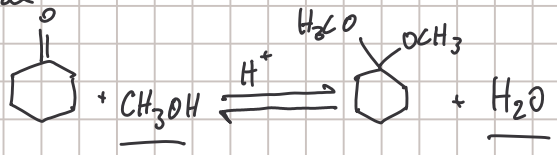
alcohol-soluble solid acid



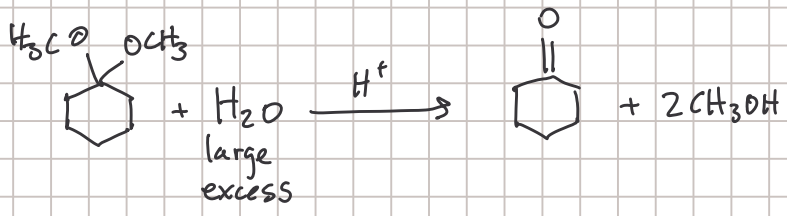


acetal

* 1) protonation
2) addition of ROH
* 3) deprotonation → hemiacetal
* 4) protonation
5) loss of H_2O
6) addition of ROH
* 7) deprotonation

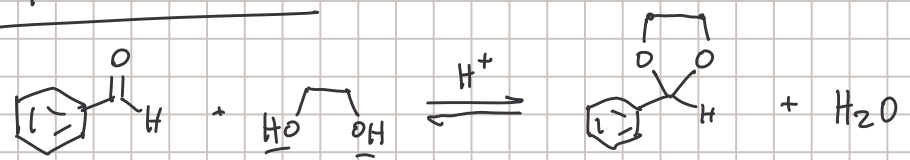


* excess ROH promotes acetal formation
* excess H_2O promotes hydrolysis back to ketone/aldehyde

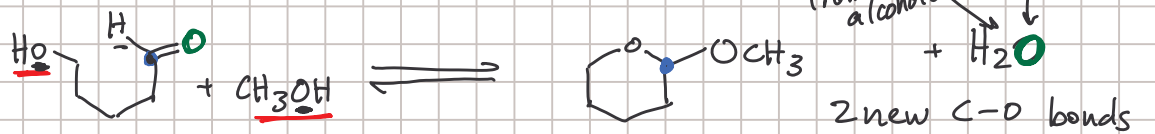


large excess

Cyclic acetals



benzaldehyde — ethylene glycol — benzaldehyde ethylene acetal

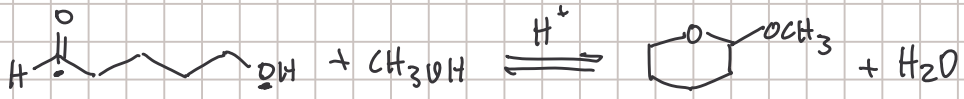


from alcohols

from ald O

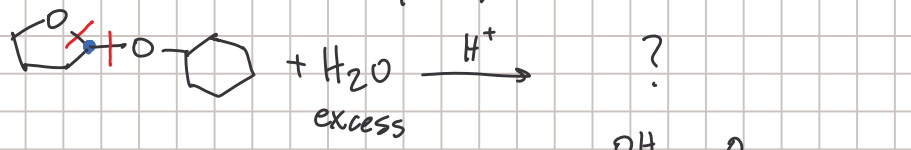
2 new C–O bonds formed

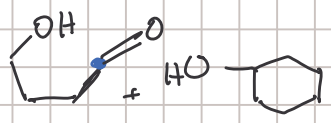
Please draw this mechanism!



(same reaction)

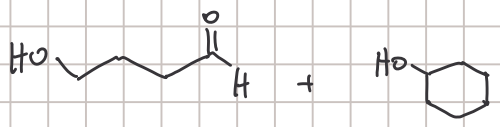
acetal hydrolysis



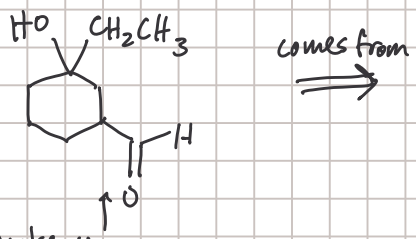


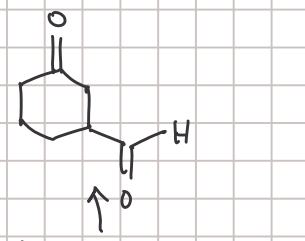
reverse of acetal formation mechanism

ex. p. 849



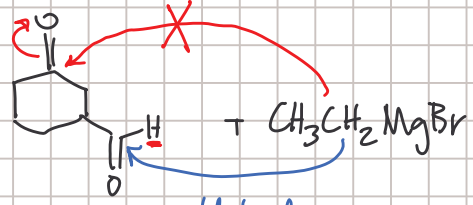
Acetals as protecting groups



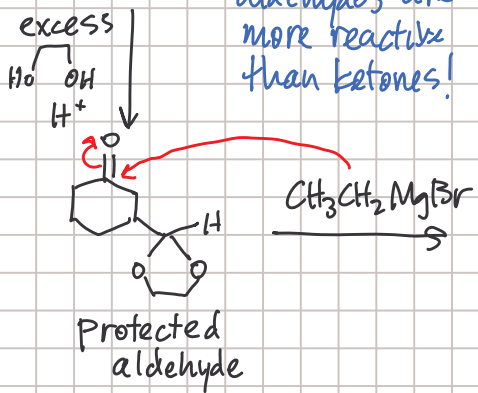


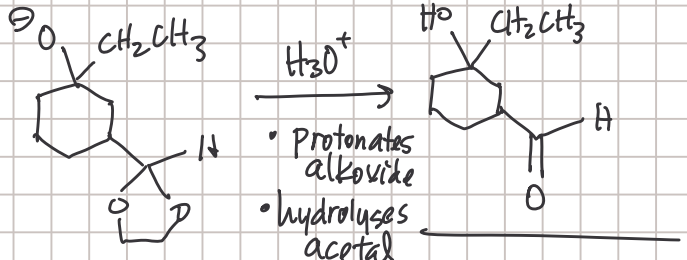
from this compound

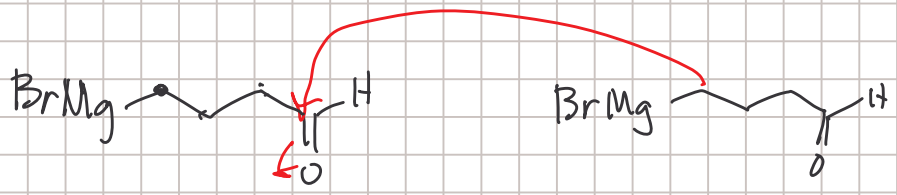
use a grignard reaction!



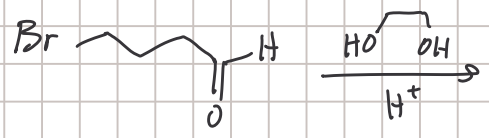
aldehydes are more reactive than ketones!

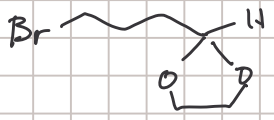




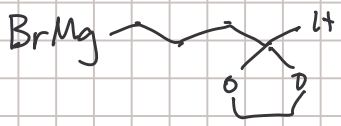


impossible reagent will react w/ other molecules of same compound

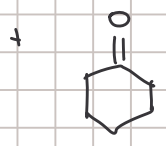


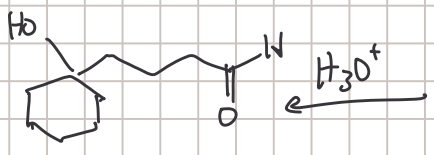


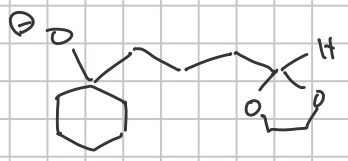
↓ Mg^0, ether

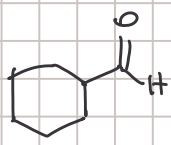


stable compound







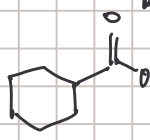


no direct route

$Na_2Cr_2O_7$, H_2SO_4

$NaBH_4$, CH_3CH_2OH

PCC or Swern [O]



1) $LiAlH_4$ 2) H_3O^+

$Na_2Cr_2O_7$, H_2SO_4