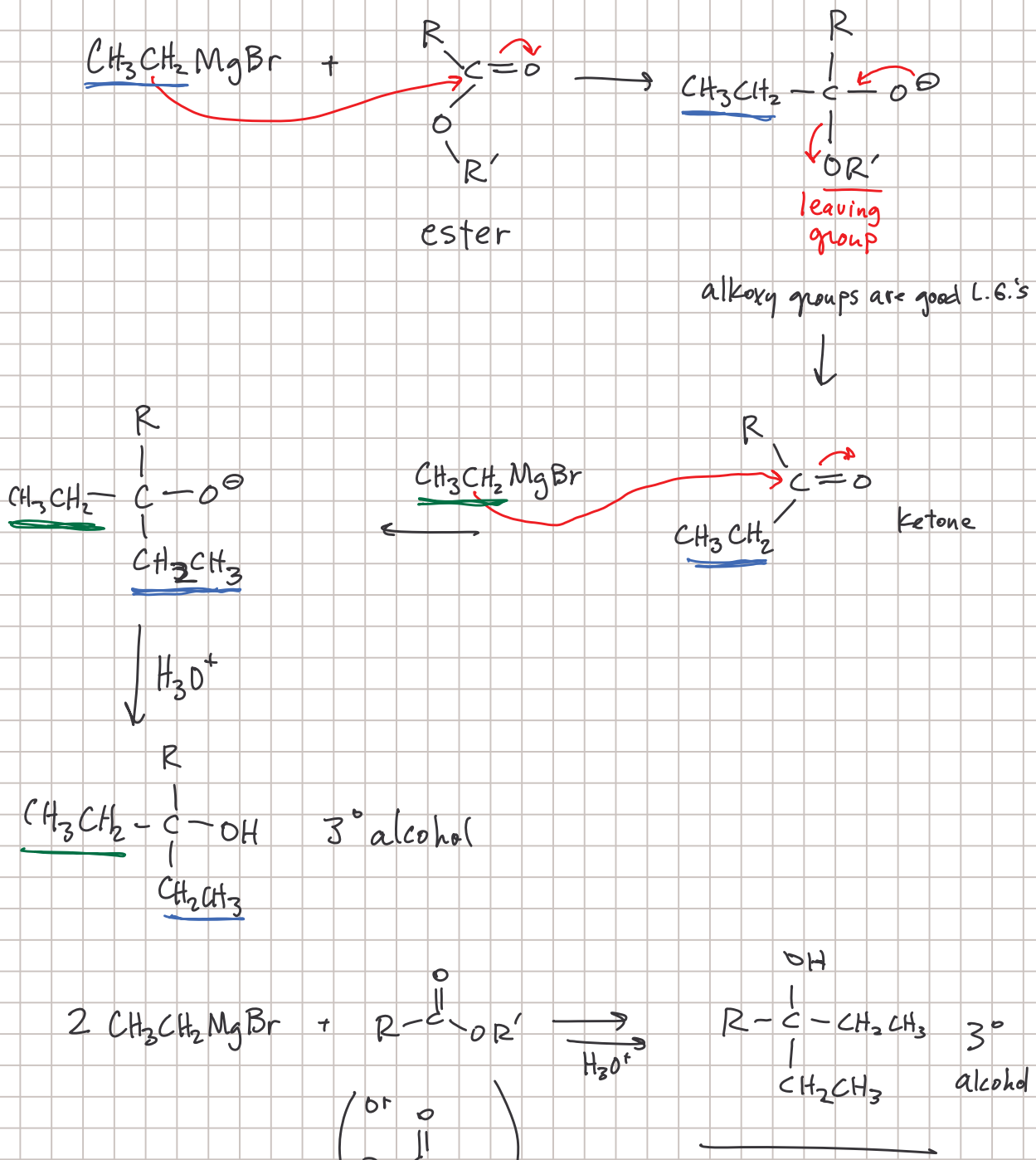
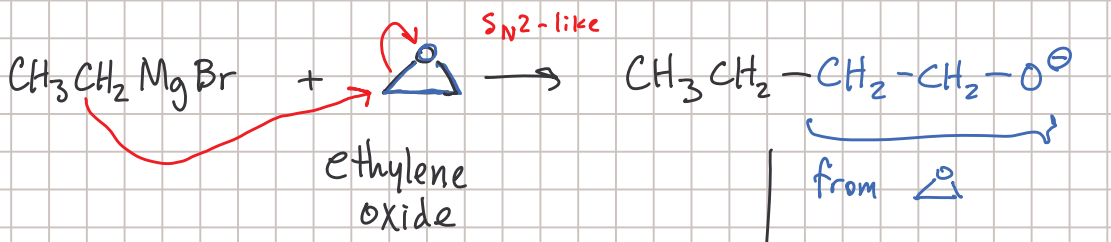
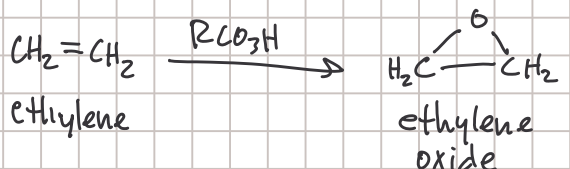
Ch 10

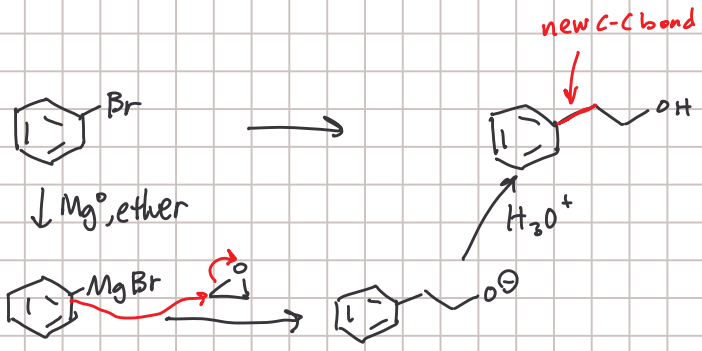
Note Title 12/7/2005

Final exam Thu Dec 15 4:10 pm S235



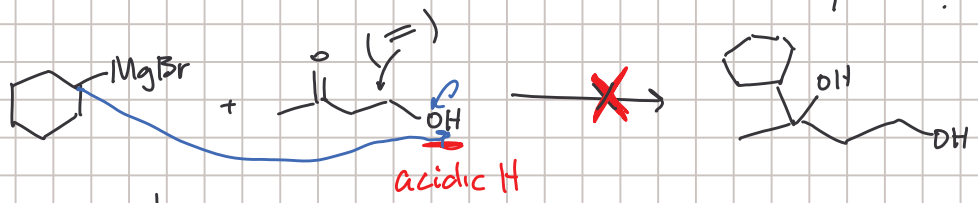




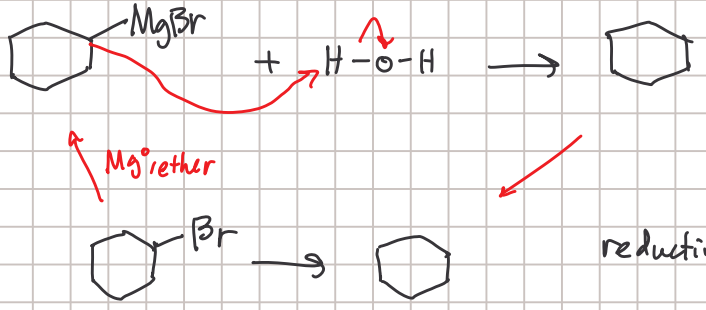


Limitations of Grignard reagents

- R-MgX is basic so no acidic H^+'s allowed anywhere!



↓ Grignard protonated



reduction of RMgX → RH

Reductions of carbonyl compounds

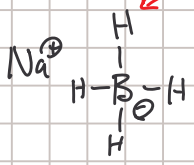
reduction: addition of hydrogen (H_2)

hydride reagents

$H:^{\ominus}$ hydride $\quad \left(H^{\oplus}_{\text{proton}}, \; H\cdot_{\text{H atom}} \right)$

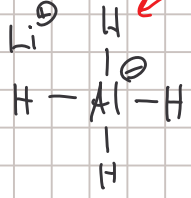
NaH sodium hydride : very strong base

$Na^{\oplus}\ H^{\ominus}$ ← less e⁻ dens on H



sodium borohydride

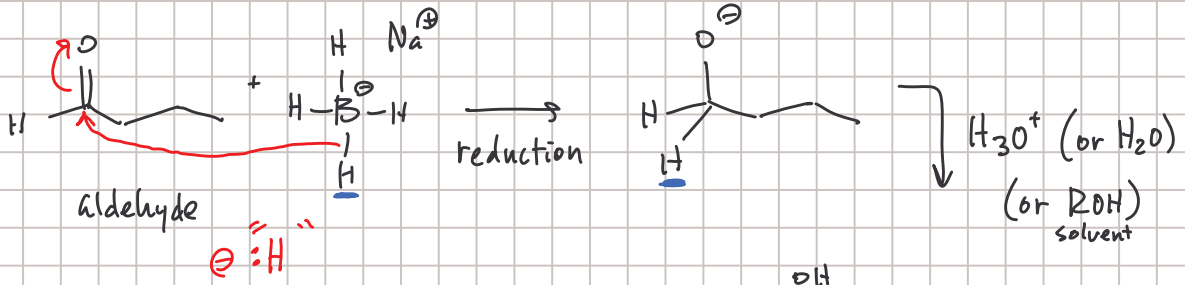
$Li^{\oplus}$ ← more e⁻ dens on H

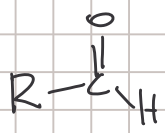


lithium aluminum hydride

→ stronger, more reactive hydride reagent

Boron is more electronegative than Al





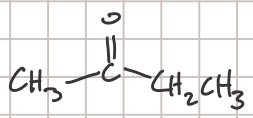
aldehyde

$\xrightarrow{NaBH_4}$

$R-CH_2OH$

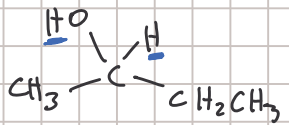
1° alcohol

reduction



Ketone

$\xrightarrow{NaBH_4}$



2° alcohol

$LiAlH_4$ will also reduce aldehydes & ketones