

Good Morning!

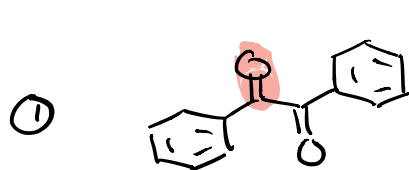
Welcome to our new virtual space.

Microphones have been turned off to start.

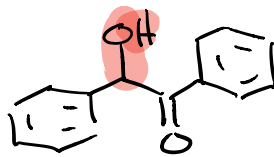
We'll check in and go over some basics before we start lecture.

# TLC - Chromatography

## Part B - Choosing the right Solvent



Benzoin

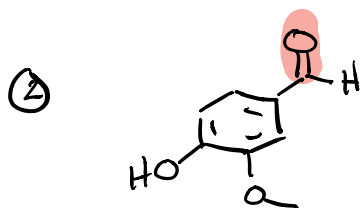


Benzil

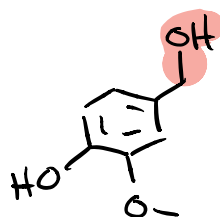


acetone  
polar

$\text{CH}_2\text{Cl}_2$  med polar  
hexane non-polar



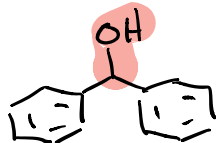
Vanillin



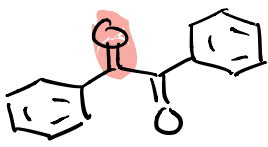
Vanillyl alcohol



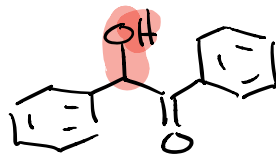
Benzophenone



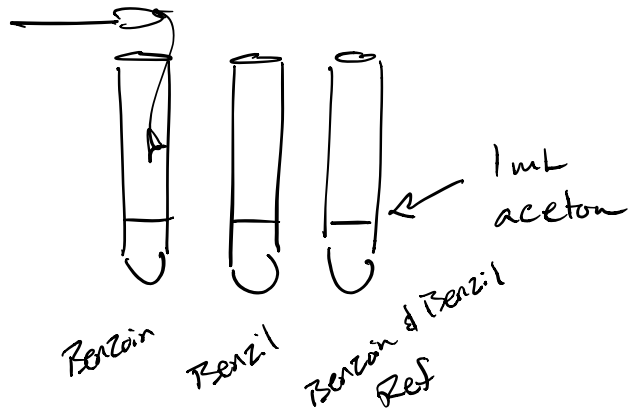
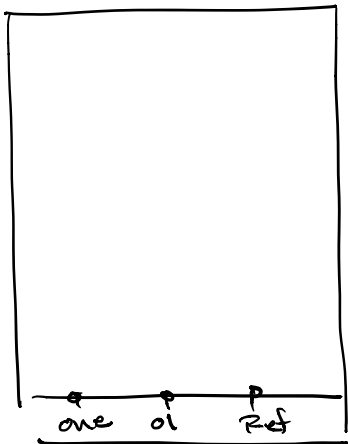
Diphenylmethanol



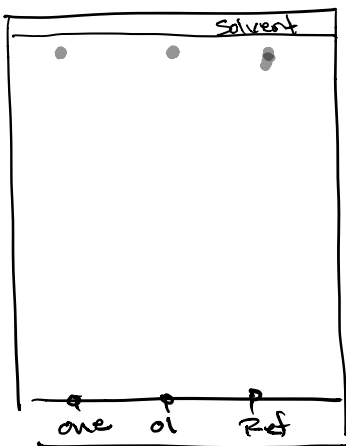
Benzoin



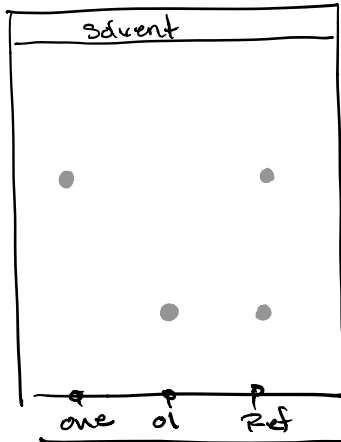
Benzil



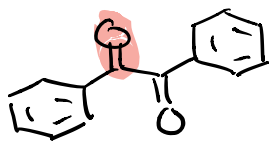
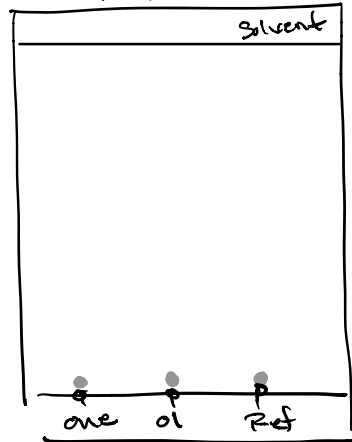
acetone



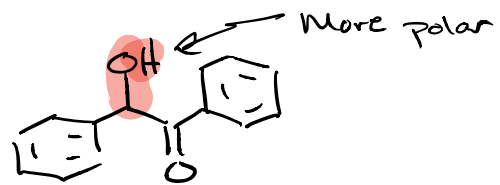
$CH_2Cl_2$



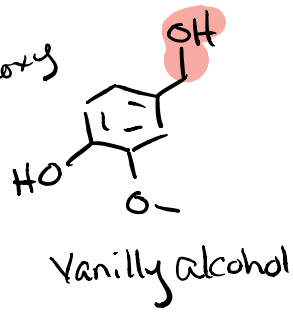
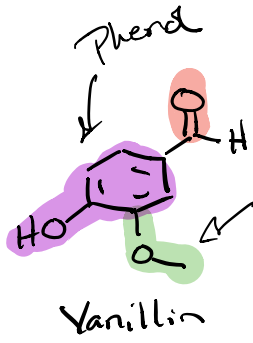
Hexane



Benzoin



Benzil

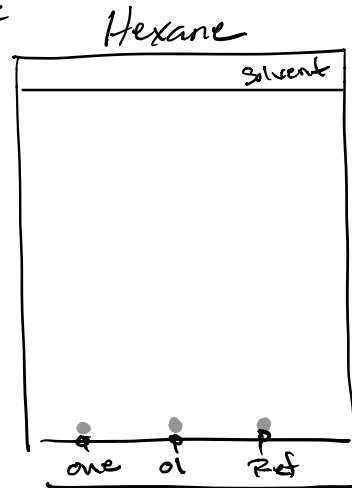
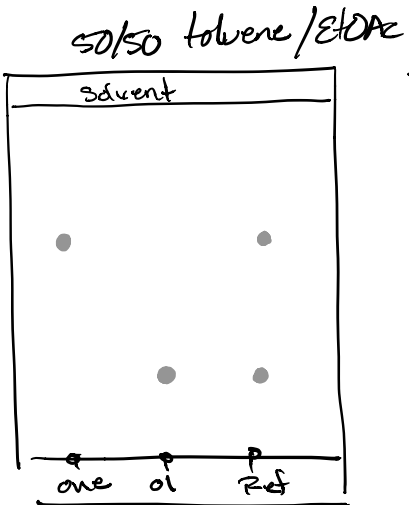
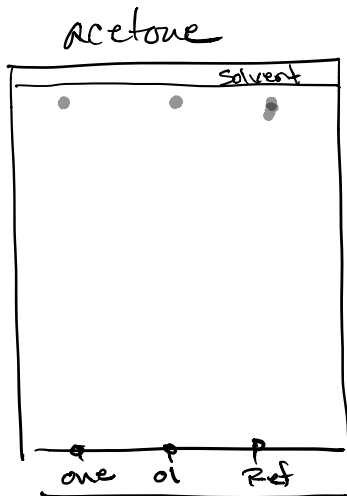
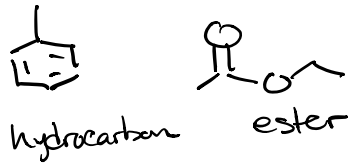


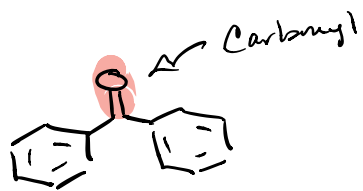
Solvents

acetone

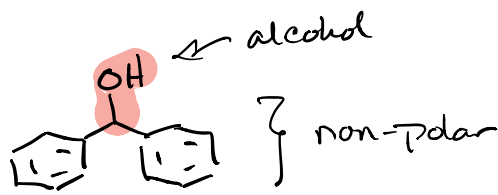
50/50 v/v  
Toluene / Ethylacetate

hexane





Benzophenone



Diphenylmethanol

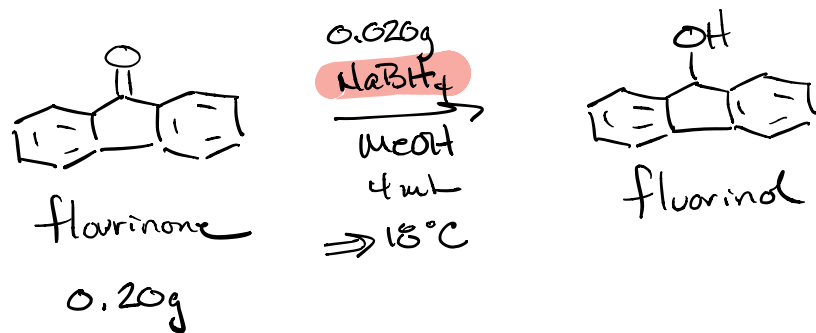
Solvents

acetone

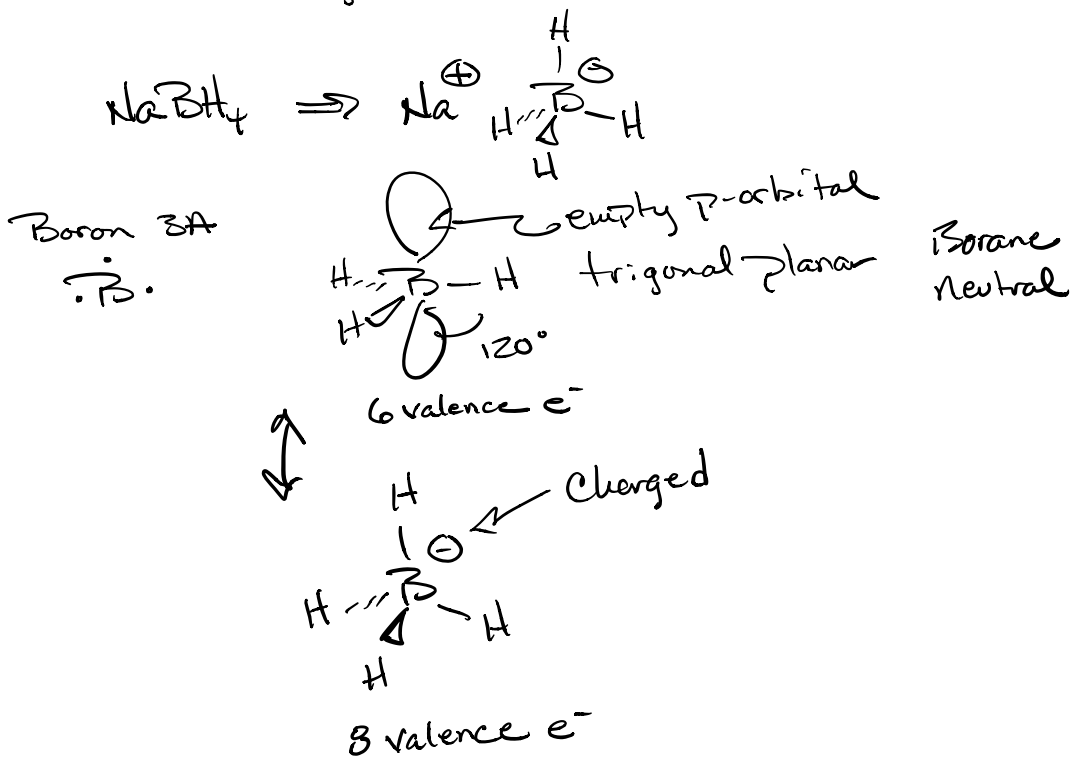
70/30 v/v  
acetone/hexane

hexane

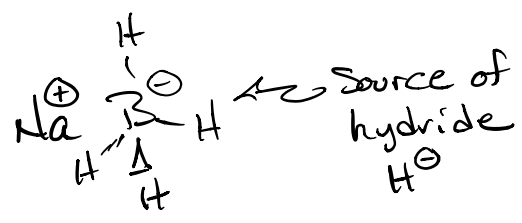
# Part C - Monitoring a Chemical Rxn w/ TLC



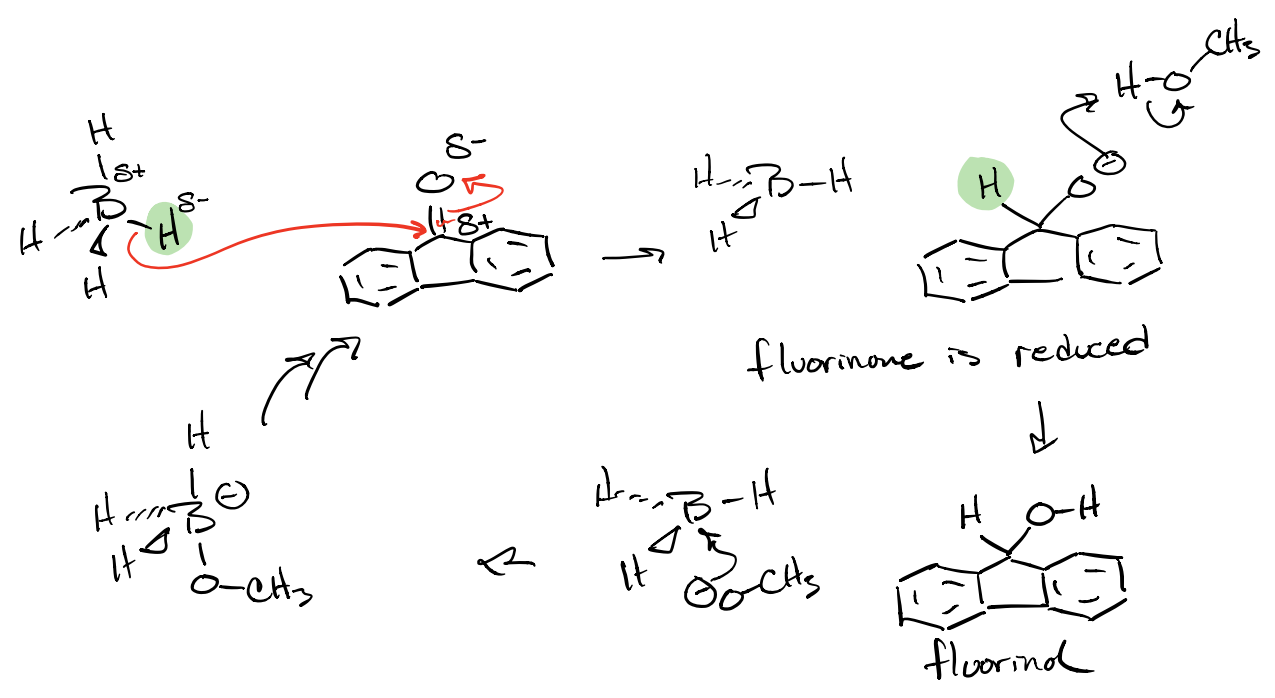
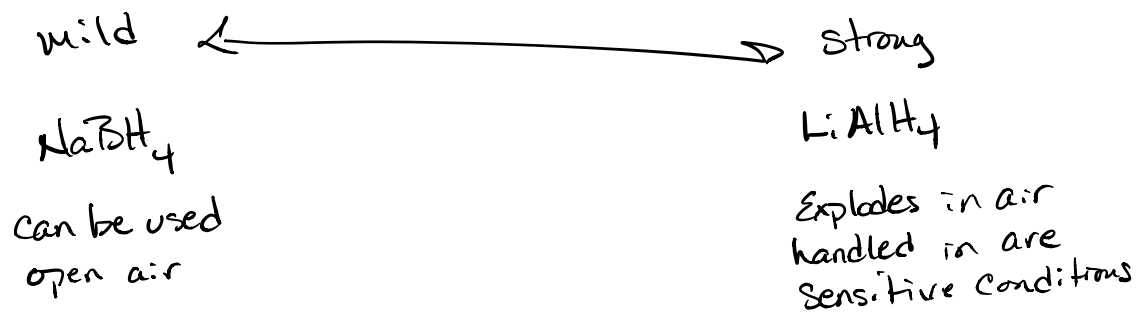
## Sodium Borohydride

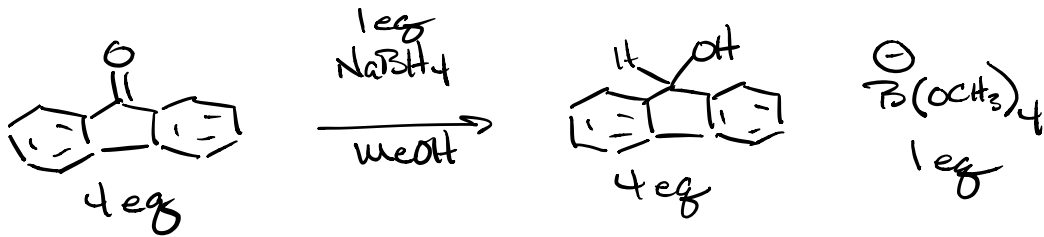


molecular hydrogen  $H_2$   
proton (hydrogen ion)  $H^+$   
 hydride?  $H^-$   
oxide  $O^{2-}$   
bromide  $Br^-$   
iodide  $I^-$   
nitride  $N^{3-}$



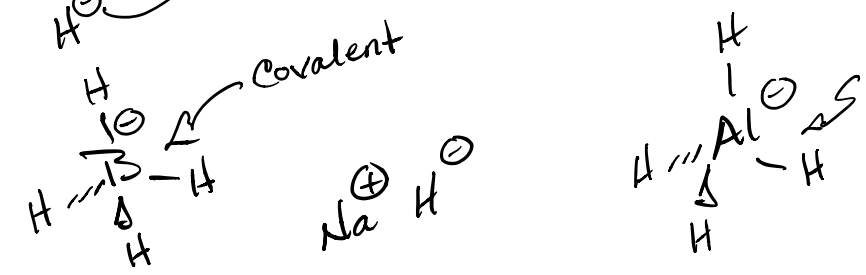
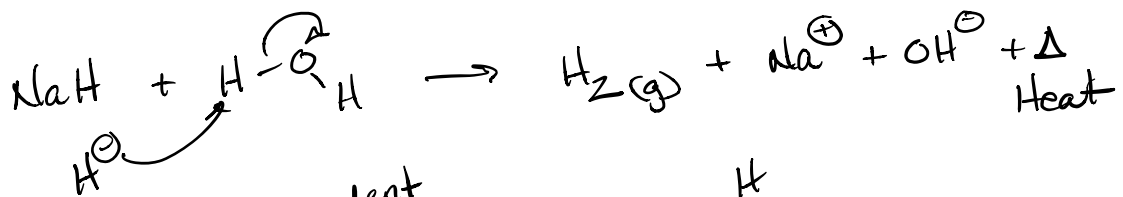
### Hydride Reagents



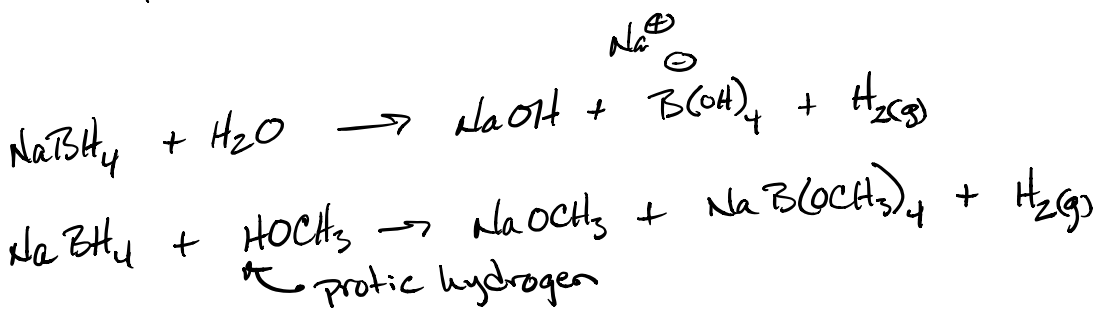
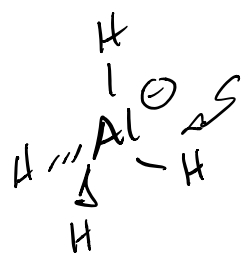


NaH Sodium hydride  
 CaH<sub>2</sub> Calcium hydride  
 KH Potassium hydride

} never use metal  
 ⇒ plastic only

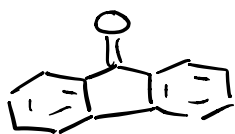
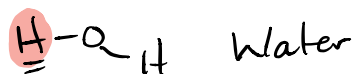


B 2.0 H 2.3  
 C 2.55 H 2.3  
 Al 1.0 H 2.3



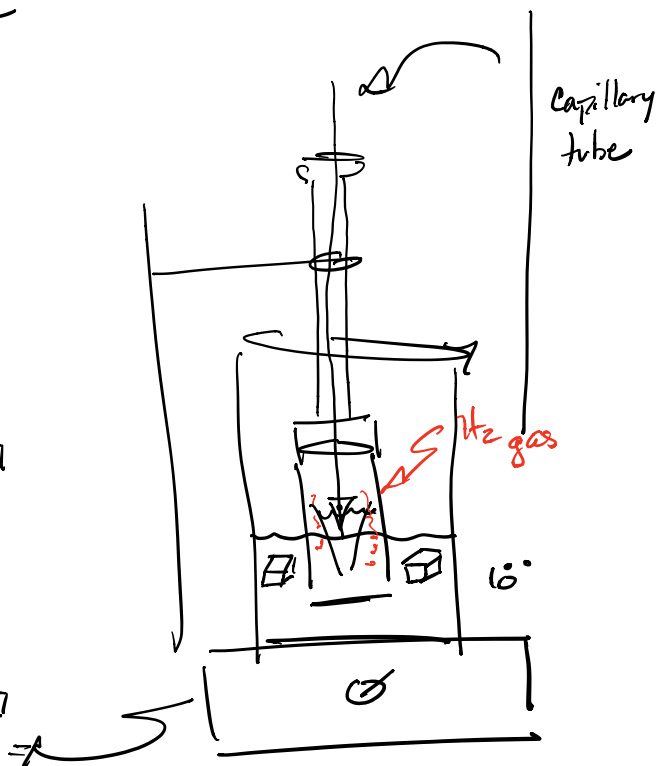
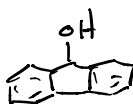
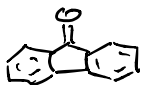
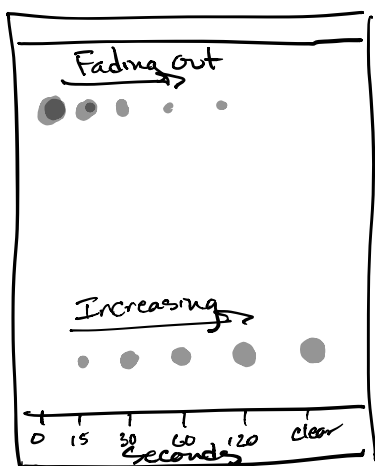
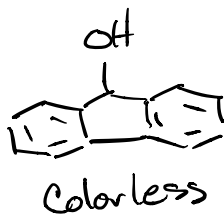


# Protic hydrogens (Hydrogen bonding protons)

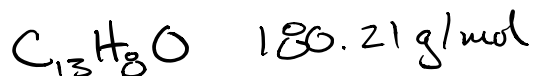
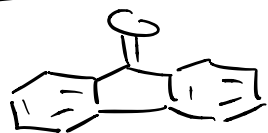


0.20 g  
yellow

0.020 g  
 $\text{NaBH}_4$   
MeOH  
4 mL  
18°C

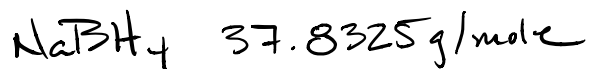


# Stoichiometry



$$0.20 \text{ g } C_{13}H_{20}O \times \frac{1 \text{ mole}}{180.21 \text{ g}} = 0.00111 \text{ mole}$$

$$0.00111 \text{ mole} \times \frac{1000 \text{ mmol}}{1 \text{ mole}} = \underline{\underline{1.1 \text{ mmol}}}$$

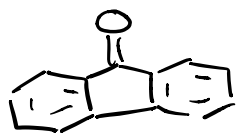


$$0.020 \text{ g } NaBH_4 \times \frac{1 \text{ mole}}{37.8325 \text{ g}} \times \frac{1000 \text{ mmol}}{1 \text{ mole}} = 0.5 \text{ mmol}$$

$$0.5 \text{ mmol of } NaBH_4 \times \frac{4 \text{ mmol } H^{\ominus}}{1 \text{ mmol } NaBH_4} = \underbrace{2.11 \text{ mmol } H^{\ominus}}_{2 \times \text{hydride}}$$

*2 eq why?*

*2.11 mmol  $H^{\ominus}$*



*1.11 mmol*

*1 eq*

$NaBH_4$

$\xrightarrow{MeOH}$

*4 ml*

*18°C*

