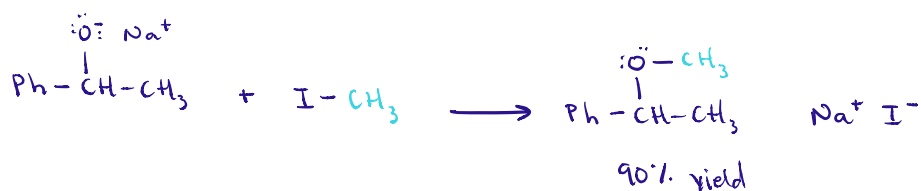


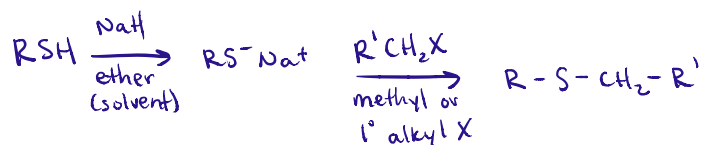
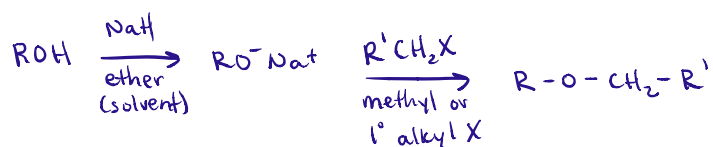
# Ethers, Grignards, and Organolithium Reagents

## Ether Synthesis

### (1) Williamson Ether Synthesis



General:

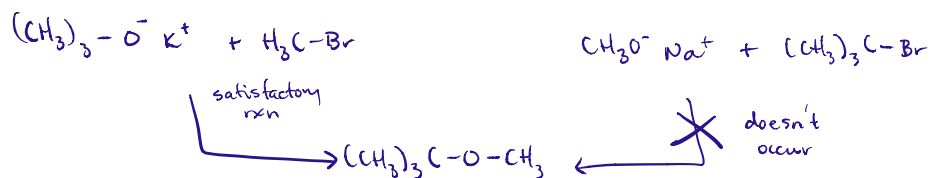


$S_N2$  mechanism

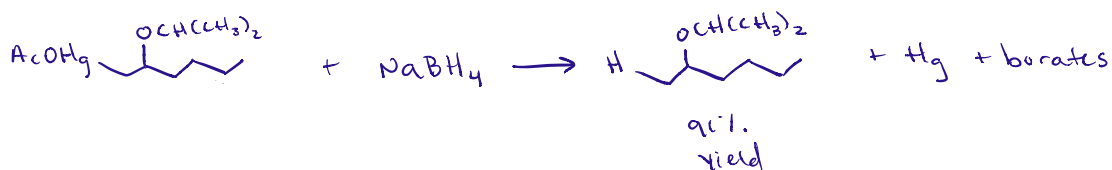
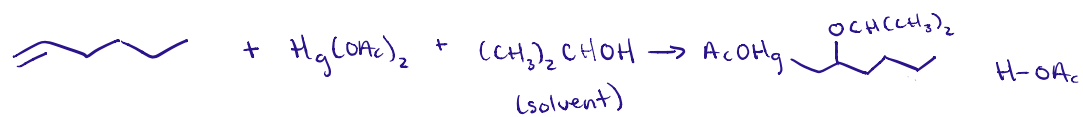


\* Alkyl halide with greater  $S_N2$  reactivity preferred \*

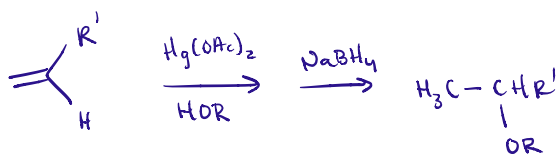
Ex:



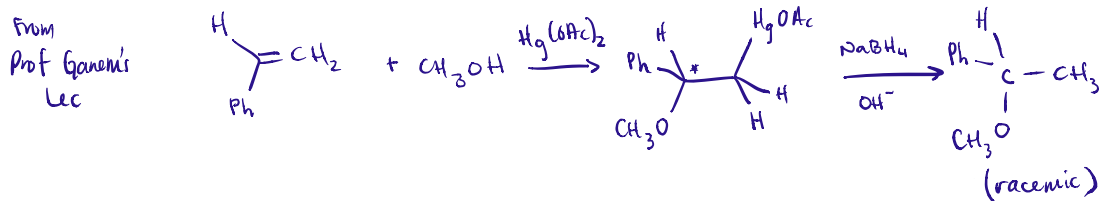
## (2) Alkoxymercuration - Reduction of Alkenes



General:

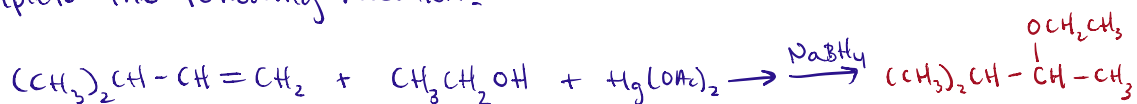


Example:



Practice Problem

complete the following reaction.



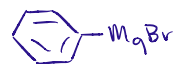
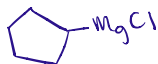
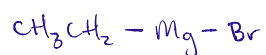
Reactions reversible in strong acids with heat (for ethers containing only primary alkyl groups)

Reactions reversible in strong but more dilute acid and lower heat (if it contains tertiary alkyl groups)

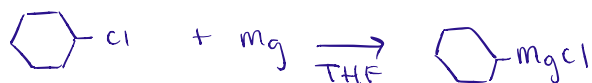
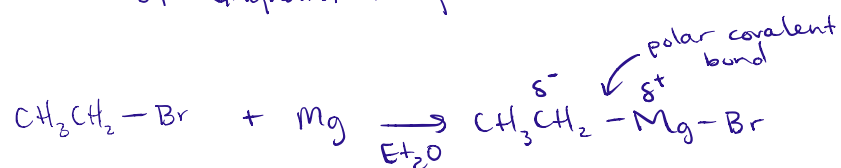
## Grignard Reagents

A grignard reagent is a compound of the form  $R-Mg-X$ ;  
 $X = Cl, Br, I$

Examples:



## Formation of Grignard Reagents



\*solvent: aprotic & dry; ether, THF

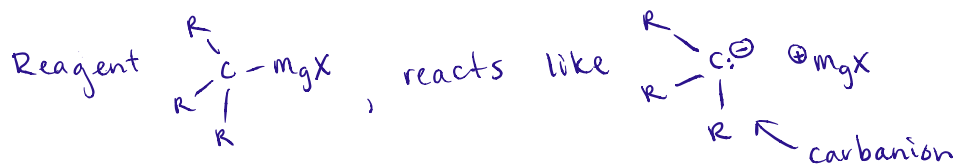
General



## Organolithium Reagents



\* BOTH grignards and organolithium reagents are strong bases and potent nucleophiles



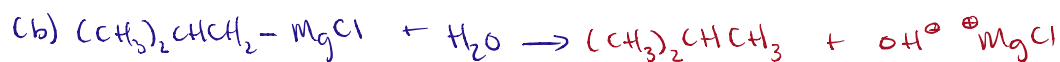
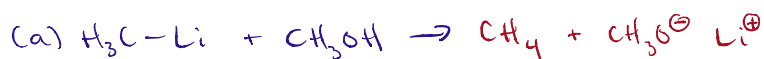
Reactions with grignards/organolithium reagents



\* important in preparation of hydrocarbons

Practice Problem

Give the products of the reactions.



Other uses

Reactions with Epoxides

