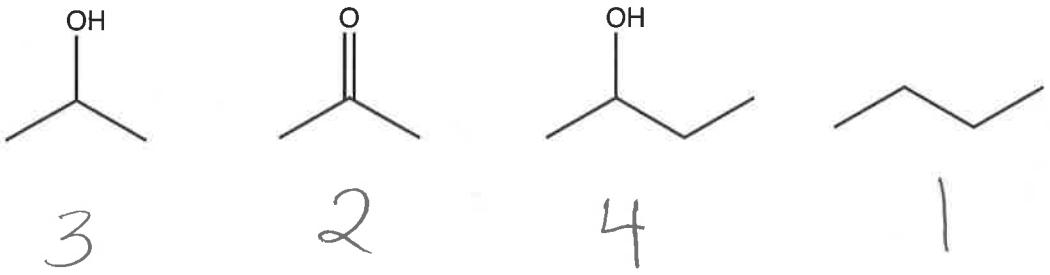
Alcohols #1: Physical Properties & Basic Synthesis of Alcohols

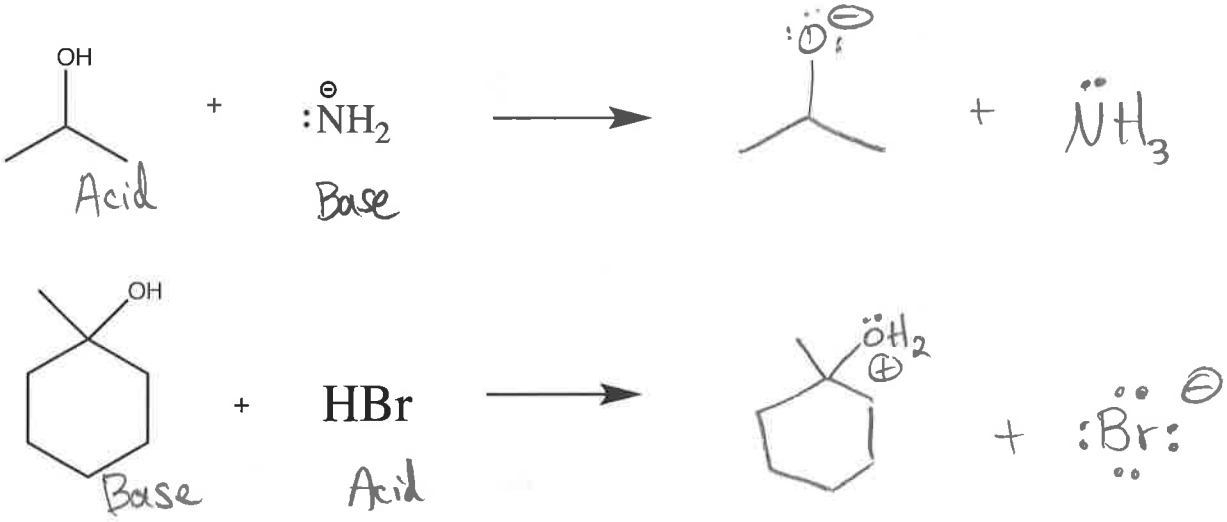
Welcome back, guys and gals. Now that we've nailed down many important fundamentals of organic chemistry (namely substitution and elimination), it's time to start exploring functional groups and the chemistry we can do with them. We are going to tackle alcohols first. Just to warn you all, things are going to pick up a *little* bit. But no worries—we're going to handle anything that comes our way and have fun doing it. This is where O Chem, in my opinion, starts to get really fun and interesting, so let's get after it ☺.

1.) Let's start off with physical properties of alcohols.

a.) Given the molecules below, rank them 1, 2, 3, or 4, assigning 4 to the molecule with the **highest** boiling point (remember what we've discussed regarding intermolecular forces, molecular weight, and branching).



b.) Complete the following acid-base reactions by providing the correct products. In addition, identify both the acid and base in the reactant molecules.



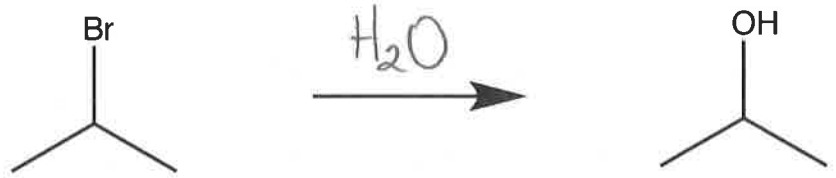
c.) Since alcohols can accept and donate a proton (as seen above), they are said to be:

Amphoteric

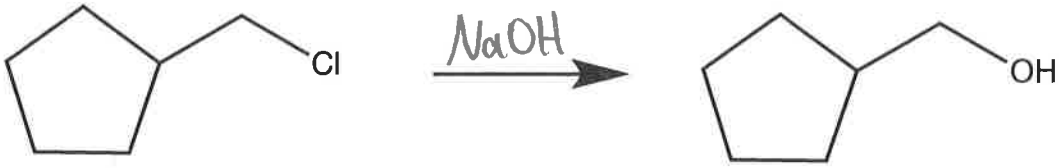
2.) Now that we've played around with alcohols' physical properties, let's look into how we can efficiently make them with the reactions/techniques we already know.

Remembering the strategies, we've discussed, complete the reaction to best produce the resulting alcohol, either using an S_N1 or S_N2 pathway (use H_2O or NaOH as nucleophiles). ***Provide either the reagents or the reactant.**

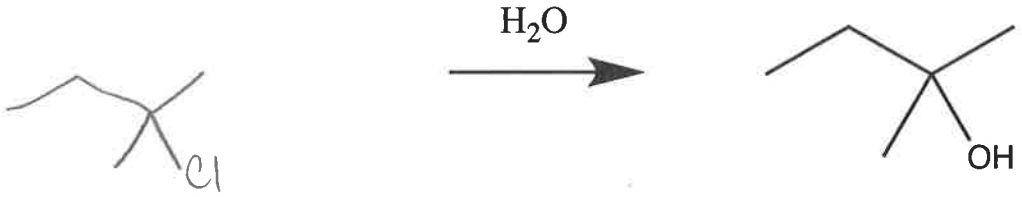
SN1



SN2



SN1



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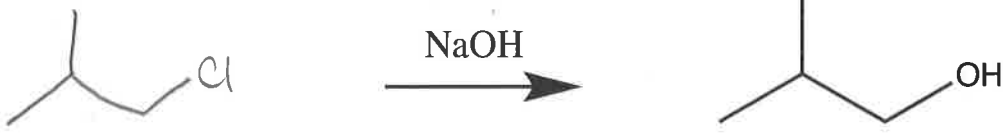
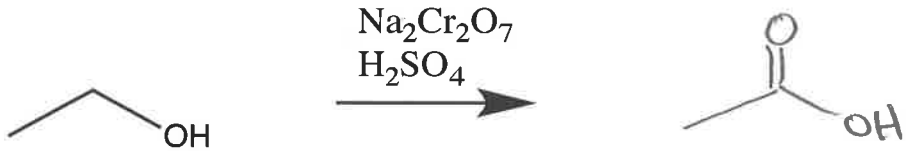
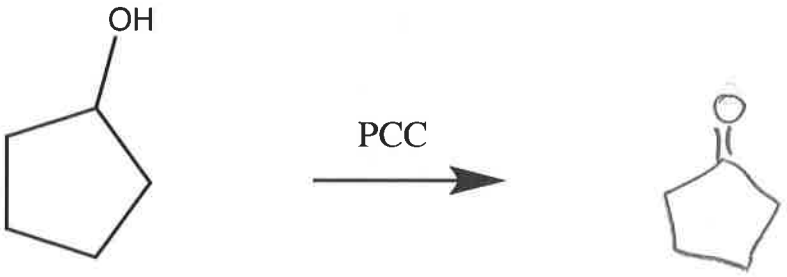
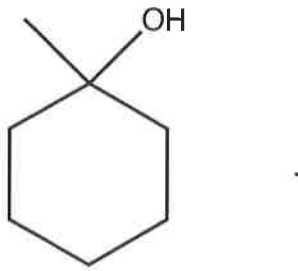


3.) Okay, good job. We're going to hit one more topic on this worksheet: Oxidation/Reduction reactions.

As we talked about in the previous video, we can oxidize alcohols to other functional groups like ketones, aldehydes, and carboxylic acids. In addition, we can also reduce the aforementioned carbonyl functional groups to alcohols. So complete these next few reactions, and we'll call it a day.

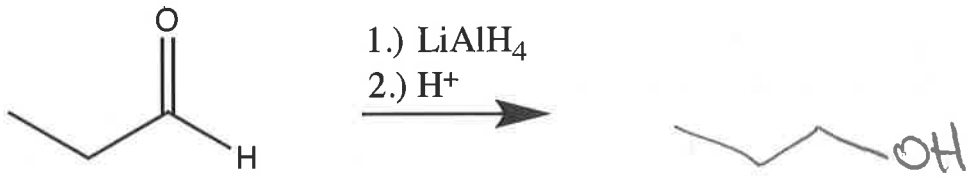


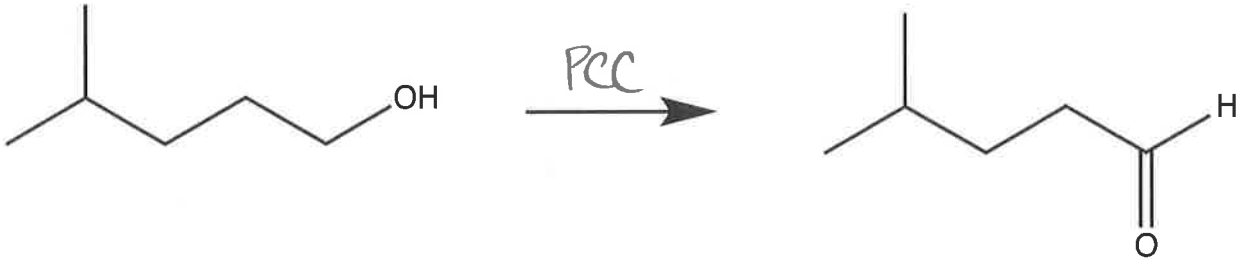


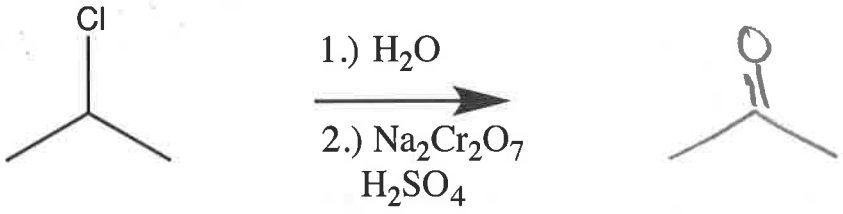


NR

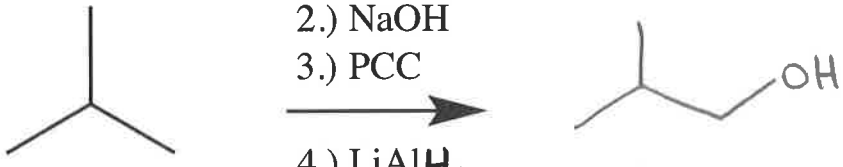
- Can't oxidize a 3° alcohol — would break the octet rule

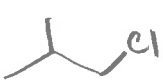






Okay, so this last one looks stupid scary, but take each reagent set one-at-a-time and work to the end.



1.) 

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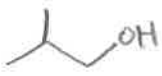
2.) 

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