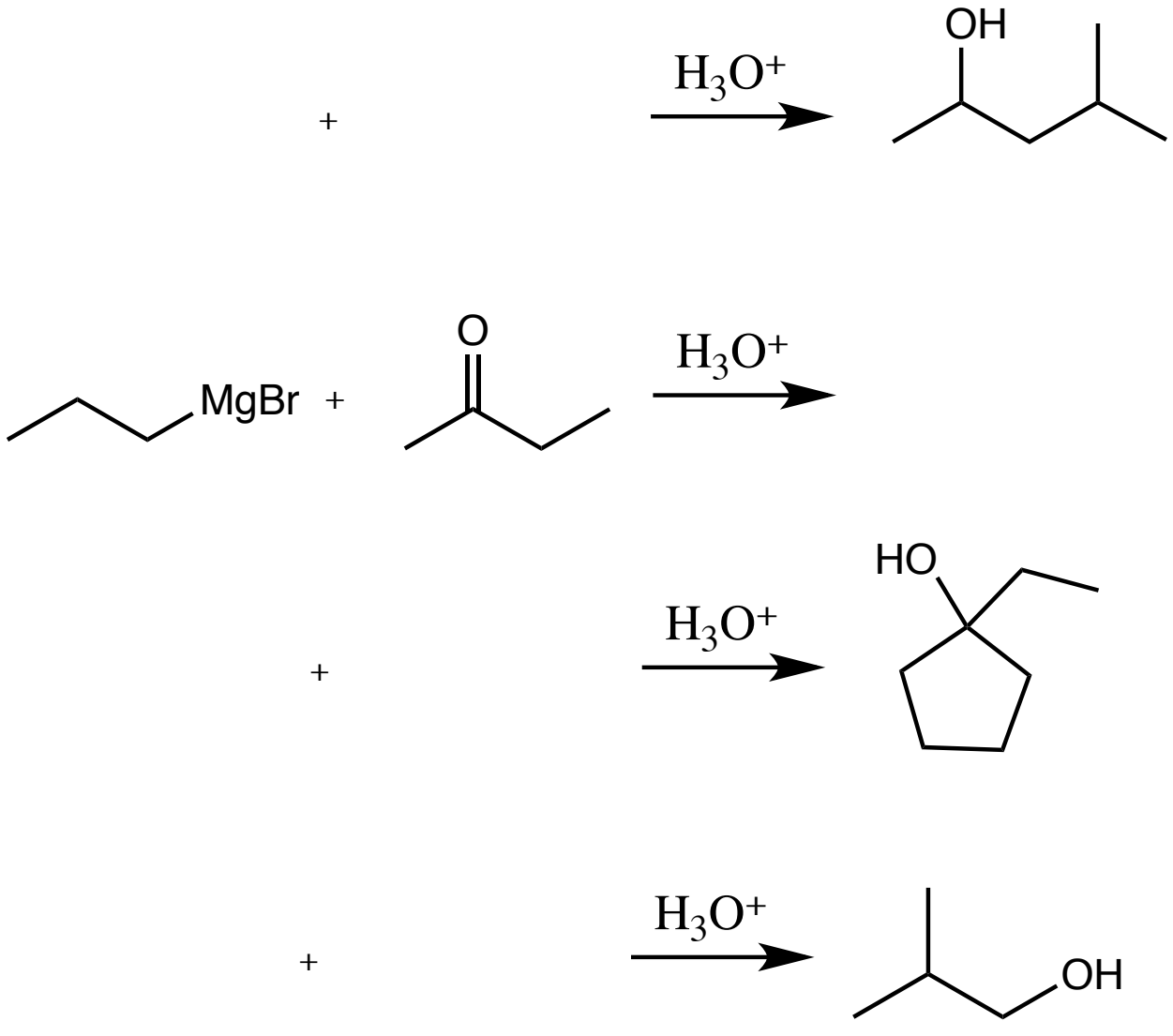
Alcohols #3: Grignard Practice and Synthesis

So from the last video, maybe you guys and gals can see why I'm stressing the importance of nailing down the Grignard Reaction. Synthesis problems will never go away, and they usually involve sticking carbon pieces together—a function that the Grignard Reaction is perfect for. This worksheet will include some more Complete the Reaction practice with the Grignard Reaction, as well as Synthesis Problems.

1.) You got this: Complete the Reaction below by either predicting the major organic product or providing the 2 starting molecules (Grignard and substrate).

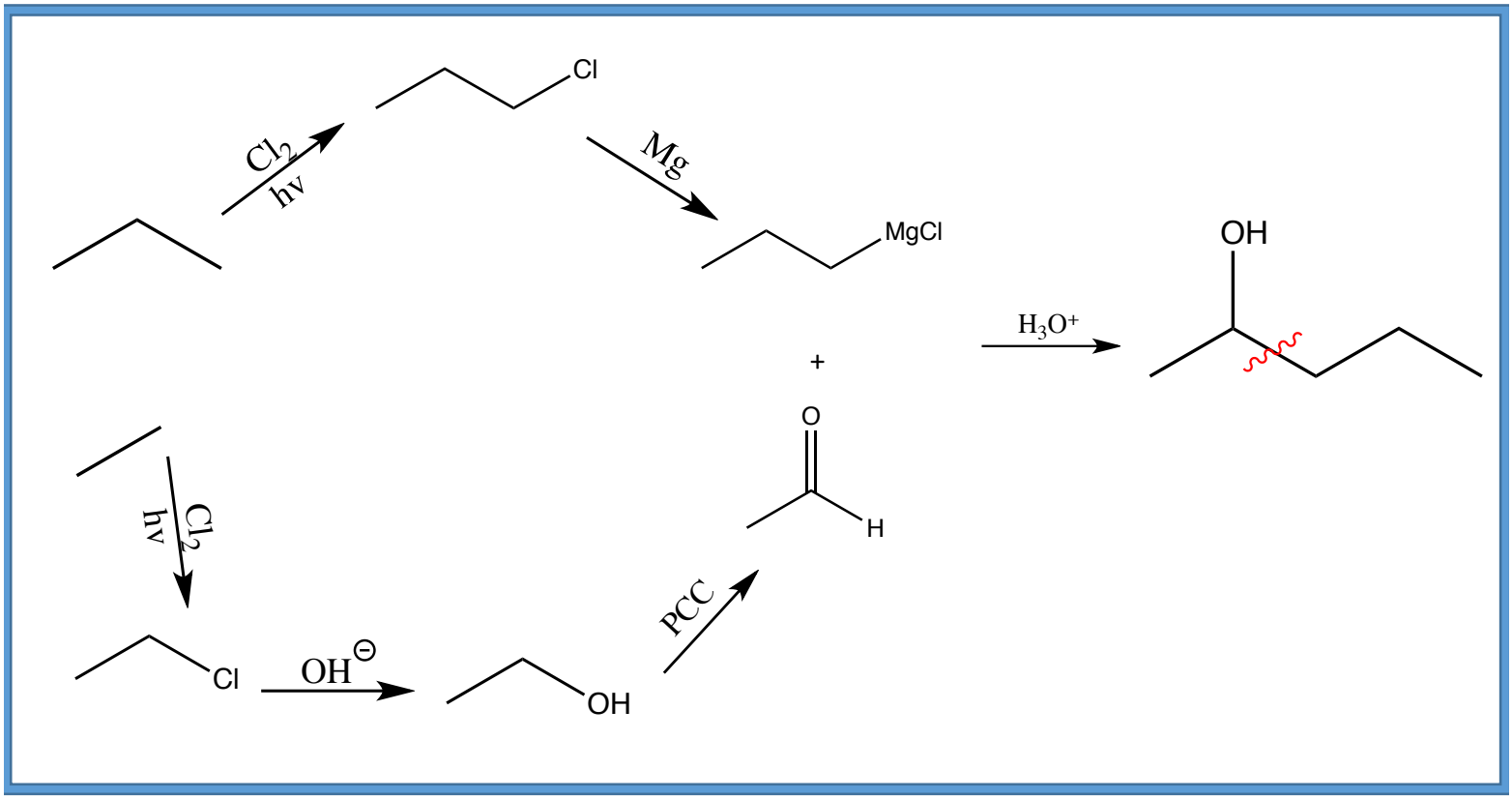


Okay, hopefully that was old hat. **IF IT WASN'T**, please go back, watch the first Grignard video and redo the first worksheet. Your attempts at Synthesis Problems will go SO much better if you're solid with this reaction.

2.) Alrighty. Without further delay, let's tackle a whole slew of Synthesis Problems. Like we discussed in the last video, these will be frustrating at first—but they will get easier, and you **will** get better at them if you put the work in. Stay calm and cool, and remember the big points we talked about:

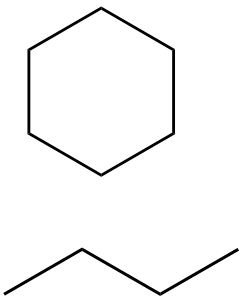
a. Count your carbons in the product and in the reactants, and figure out how much of each piece you need
b. Make a "cut" in your product, and assign roles to the reactants—Grignard Reagent and Substrate
c. Work backwards. It seems stupid, but it really is easier than going forwards
d. Make sure your reactions are the most "efficient" way to make all your intermediate molecules. If you need to make a **primary alcohol, use S_N2** and if you need a **secondary or tertiary alcohol, use S_N1**. Remember when you should do radical chlorination versus radical bromination when you're tacking a Leaving Group on. Remember when to use PCC or Na_2CrO_7/H_2SO_4 to make an aldehyde or ketone.

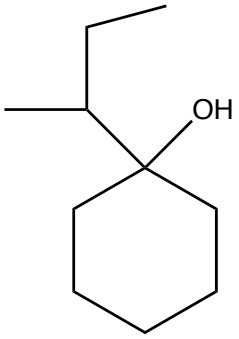
Here's an example for reference:



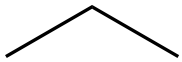
I'm going to throw 6 problems your way. Give them your best try. If you're struggling, look at the answer, try to understand where you went wrong, and give it a fresh try **without looking at the answer**. I was awful at Synthesis Problems at first, but I kept at it and corrected my mistakes.

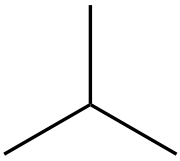
a.) Given the following organic reagents, provide an efficient organic synthesis of the product depicted below. You may use any inorganic reagents you require *(this is the fancy talk you'd see on a real exam)*.

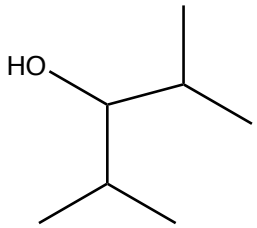




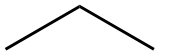
b.) Given the following organic reagents, provide an efficient organic synthesis of the product depicted below. You may use any inorganic reagents you require.

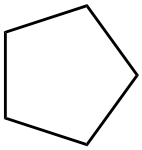


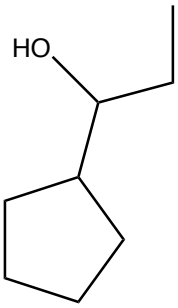




c.) Given the following organic reagents, provide an efficient organic synthesis of the product depicted below. You may use any inorganic reagents you require.

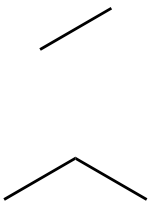


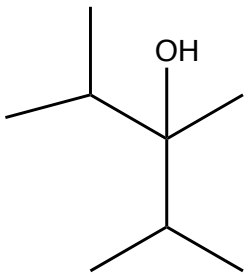




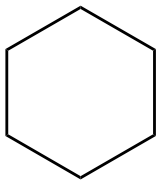
d.) Given the following organic reagents, provide an efficient organic synthesis of the product depicted below. You may use any inorganic reagents you require.

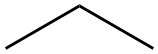
(Hint hint: **Count your carbons, and if they don't match up, figure out how many pieces of each you'll need. Try and make a logical "cut", step it back one reaction from the product, and see if what you did makes sense.)





e.) Given the following organic reagents, provide an efficient organic synthesis of the product depicted below. You may use any inorganic reagents you require.





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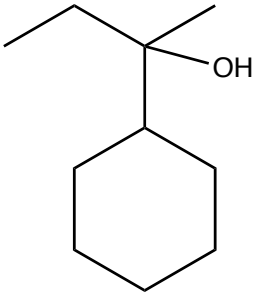
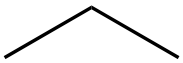


f.) Given the following organic reagents, provide an efficient organic synthesis of the product depicted below. You may use any inorganic reagents you require. Remember you can use any amount of the reactant(s) necessary.

**(Hint hint: Okay, this one is a hard—and a little absurd—so don't feel bad if you don't get it on the first try. I know this problem may seem evil and dumb, but my mindset is, if you have good fundamentals, and you can apply those fundamentals to solve stupid-crazy problems, then you'll be able to tackle any question on a test or exam so…..GOOD LUCK ☺).



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