

Week 13

CHE 3331- Organic Chemistry

This week is **Week 13 of class**, and typically in this week of the semester, your professors are covering these topics below. If you do not see the topics your particular section of class is learning this week, please take a look at other weekly resources listed on our website for additional topics throughout of the semester.

We also invite you to **look at the group tutoring chart on our website to see if this course has a group tutoring session offered this semester.**

If you have any questions about these study guides, group tutoring sessions, private 30 minute tutoring appointments, the Baylor Tutoring YouTube channel or any tutoring services we offer, please visit our website www.baylor.edu/tutoring or call our drop in center during open business hours. M-Th 9am-8pm on class days 254-710-4135.

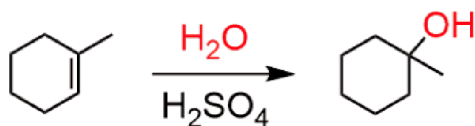
Keywords: Alcohols, Nomenclature of Alcohols, Grignard's Reagent, Protection of Alcohols

TOPIC OF THE WEEK: SYNTHESIS OF ALCOHOLS

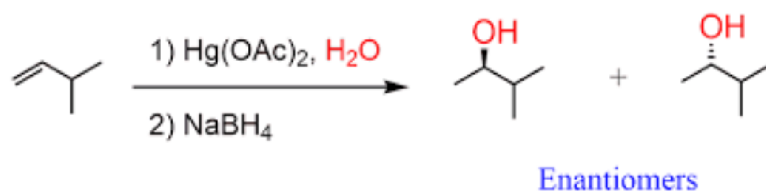
What is an alcohol? **An alcohol is a compound with a hydroxyl group**

- **Preparation from alkenes** : We can prepare alcohols from alkenes using some familiar reactions

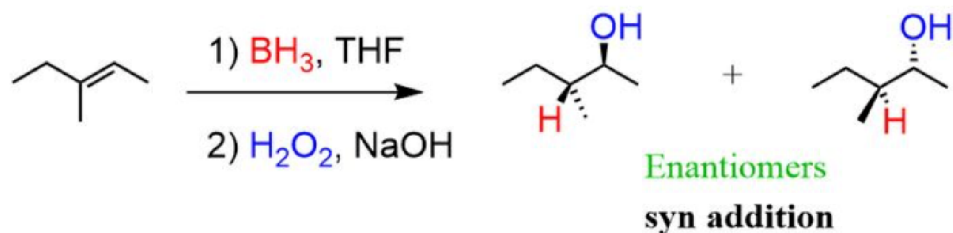
- Acid Catalyzed hydration



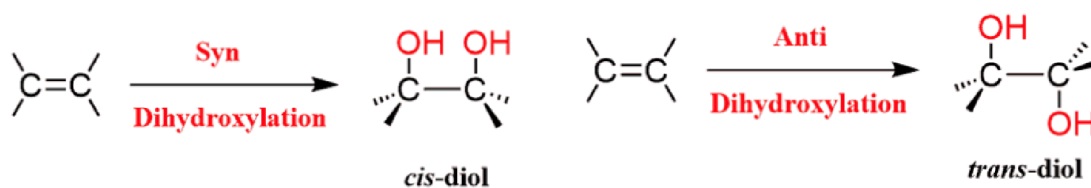
- Oxymercuration-Demercuration



- Hydroboration oxidation



- Syn or Anti Dihydroxylation



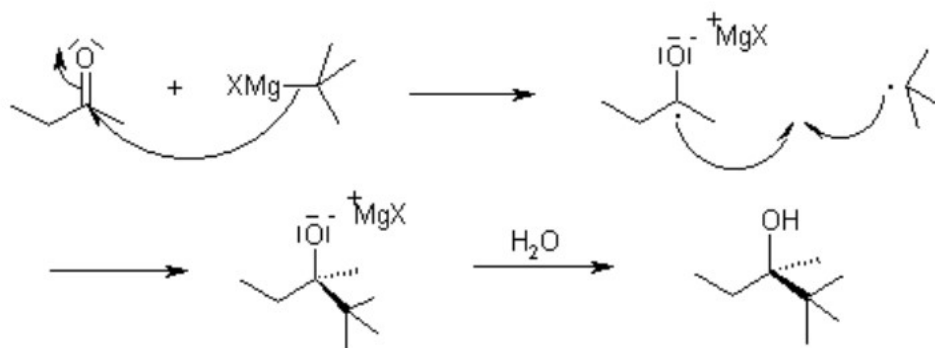
- **Grignards Reagent**: This is a new way to create alcohols that you have not seen yet! In this process you create an alcohol and add an R group to the molecule. The idea of a Grignard is that you have a negatively charged carbon group that acts as a nucleophile on a carbonyl carbon (carbon of ketone or aldehyde). There are two major steps to this reaction:

- Creation of Grignard
- Using Grignard to create the alcohol

- Creation of Grignard

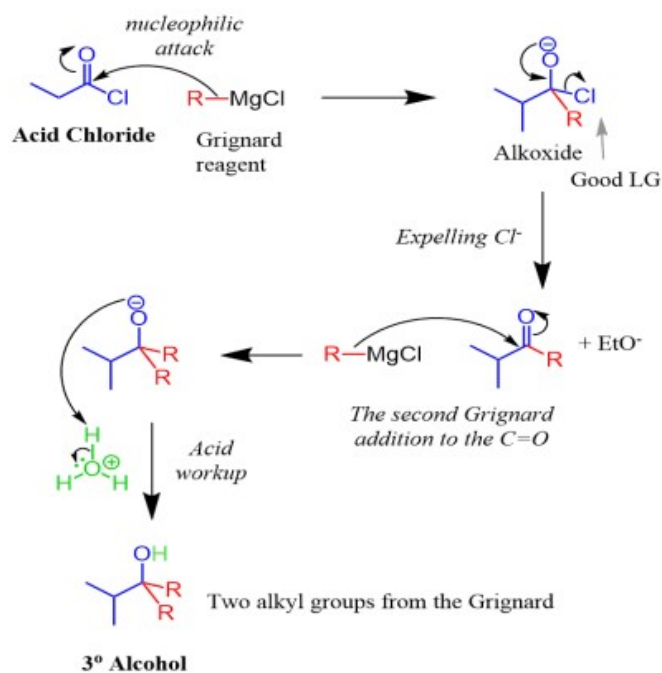


- Use of Grignard as nucleophile

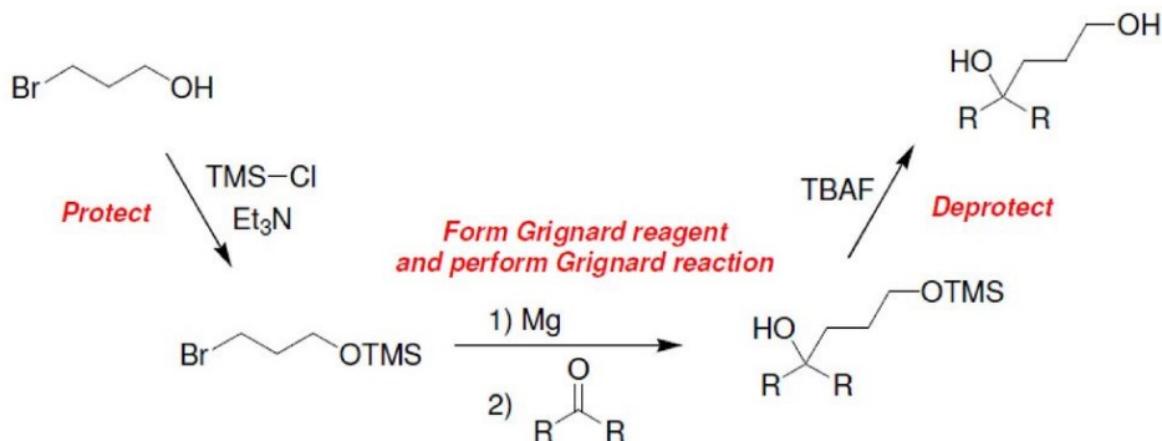


- Grignard's reagent with acid chlorides and esters: This is a similar process, except it happens twice to create tertiary alcohols

The Mechanism of Grignard reaction with Acid Chlorides



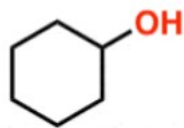
- Protection of Alcohols: You cannot have an OH group on a Grignard UNLESS you “protect” it. In this process, you cover up the OH with a specific group called TMS, create your Grignard, perform the reaction, then you take off the TMS. This results in the creation of a diol



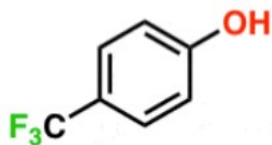
HIGHLIGHT #1: Acidity of the Alcohol and Phenol Protons

- Alcohols are WEAKLY acidic
- You need to be able to compare acidity of alcohols. Thowback to ARIO!
- Ex:

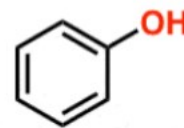
Rank in order of increasing acidity



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1

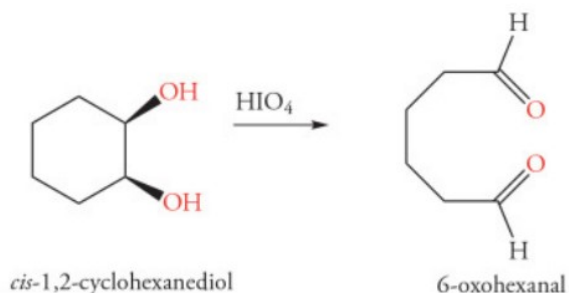
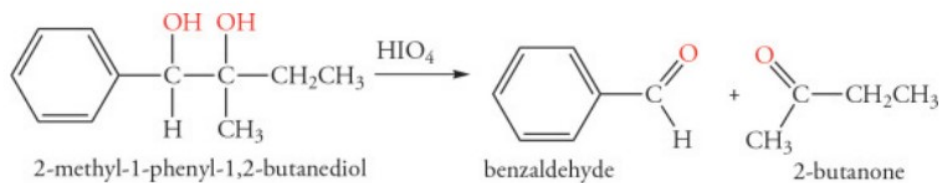


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HIGHLIGHT #2: Cleavage of Alcohols using Periodic Acid

- This reaction cleaves a diol ○ Reagent: HIO₄

- In a ring, the alcohols must be next to each other and on the same side!

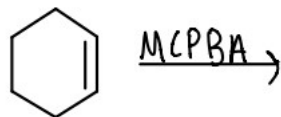


Notice that every resonance structure involves using the double bond as a source to “quench” the radical, creating a new bond. The other electron from the double bond will then go on to make a new radical!

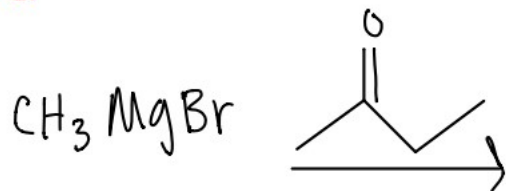
One thing to memorize for this chapter is that radicals that are allylic and benzylic will be stabilized by resonance, but vinylic radicals will not be.

CHECK YOUR LEARNING:

- Draw the product:



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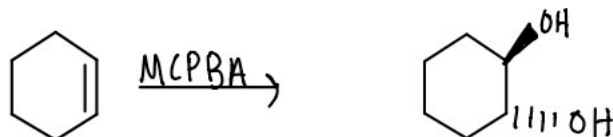
THINGS YOU MAY STRUGGLE WITH:

This chapter has a lot of information! Organizing each reaction based on its function will help a lot. Grignard's reagent is always something that can be confusing but just remember that it is the creation of an alcohol and the addition of an R group at the same time.

Thanks for checking out these weekly resources!
Don't forget to check out our website for group tutoring times, video tutorials and lots of other resources: www.baylor.edu/tutoring ! Answers to check your learning questions are below!

ANSWERS TO CHECK YOUR LEARNING:

1.



2.

