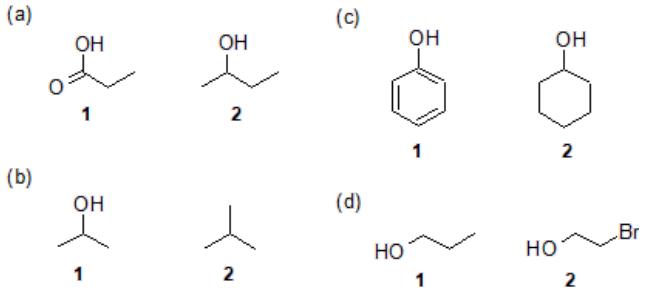
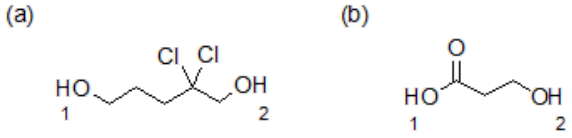
13.12: 13.12 ADDITIONAL EXERCISES

PHYSICAL PROPERTIES OF ALCOHOLS

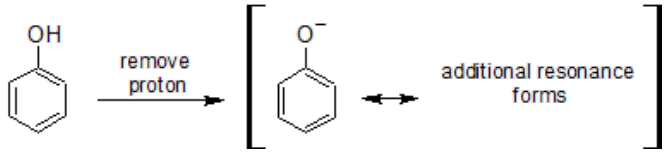
13-1 Identify which compound is more acidic. Explain your reasoning for each choice.



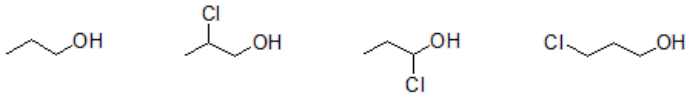
13-2 Identify which is the most acidic proton in the following compounds. Explain your reasoning for each choice.



13-3 Draw all possible resonance forms of the conjugate base of phenol.



13-4 List the following compounds in order from most to least acidic.



13-5 Predict which compound of each pair is more soluble in water and explain your reasoning.

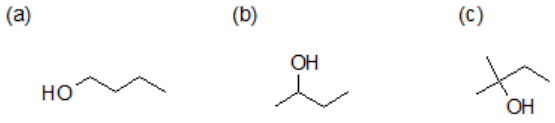
1. butan-1-ol or pentan-1-ol
2. phenol or cyclohexanol
3. octan-1,3-diol or octan-1-ol
4. 1-chlorohexane or hexan-1-ol

13-6 Predict which compound has the higher boiling point and explain your reasoning.

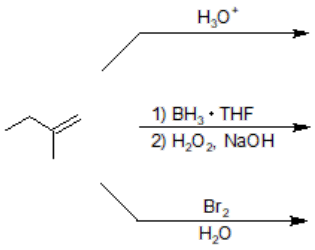
1. water or ethanol
2. butan-1-ol or octan-1-ol
3. hexan-2-ol or hexan-2-one

SYNTHESIS OF ALCOHOLS

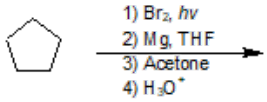
13-7 Show a possible way to synthesize the following alcohols.

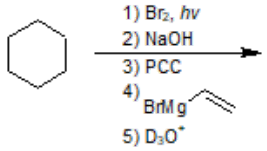


13-8 Give the product of each reaction.

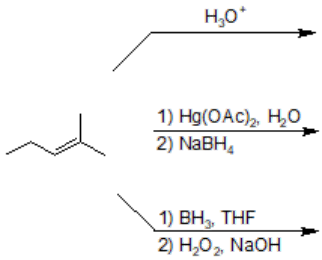


13-9 Give the product of each reaction.

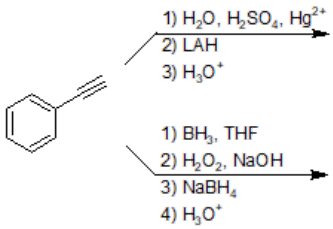




13-10 Give the product of each reaction.

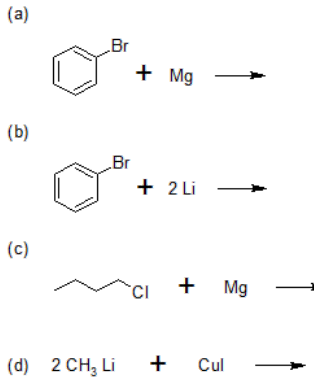


13-11 Give the product of each reaction.



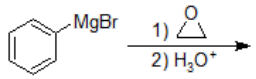
ORGANOMETALLIC REAGENTS FOR ALCOHOL SYNTHESIS

13-12 Draw the products of the following reactions.

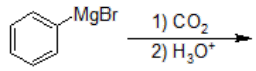


13-13 Draw the products of the following reactions.

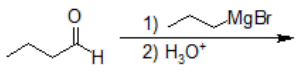
(a)



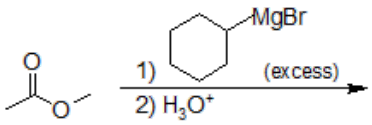
(b)



(c)

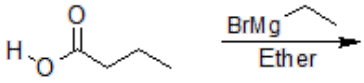


13-14 What is the final product of the following reaction.



13-15 Draw the mechanism for question **13-14**.

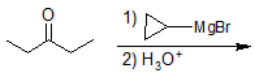
13-16 Identify the product of the following reaction and explain why that is the correct answer.



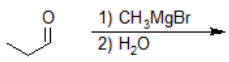
ADDITION OF ORGANOMETALLIC REAGENTS TO CARBONYL COMPOUNDS

13-17 Give the product(s) of the following reactions. Include stereochemistry when necessary.

(a)

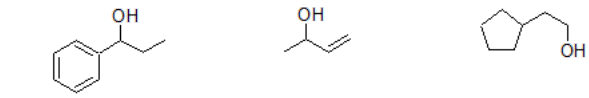


(b)



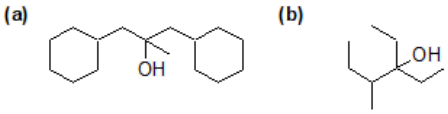
13-18 Show a possible carbonyl compound that was used to make the following alcohols through a Grignard reaction.

(a) **(b)** **(c)**

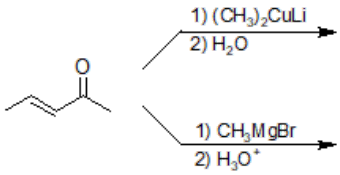


13-19 For the following compounds, identify the Grignard reagent used and the initial methyl ester compound.

(a) **(b)**



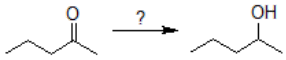
13-20 Give the products of the following reactions.



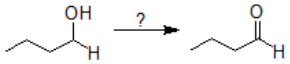
REDUCTION OF THE CARBONYL GROUP

13-21 Identify whether the initial compound is undergoing oxidation or reduction.

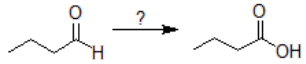
(a)



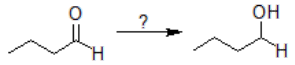
(b)



(c)

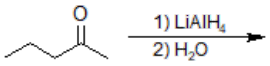


(d)

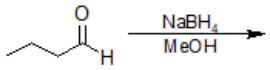


13-22 Give the product of each reaction.

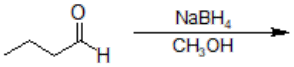
(a)

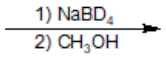


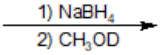
(b)



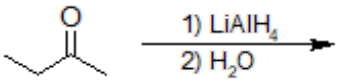
13-23 Give the product of each reaction (same starting molecule), making sure to specify where each proton ends up in the final product.



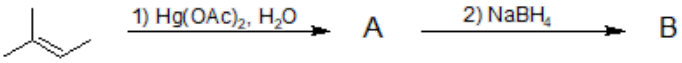




13-24 Give the mechanism for the following hydride reduction reaction.



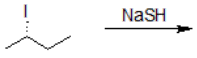
13-25 Draw the structures for A and B.

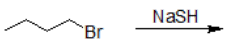


THIOLS (MERCAPTANS)

13-26 Name the following compounds following IUPAC nomenclature.

13-27 Identify the product of the following reaction. Include stereochemistry if appropriate.





13-28 Identify the product of the following reaction.