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# Organic Chemistry II Drill (CHEM2220D). Module 2. Sample Problems

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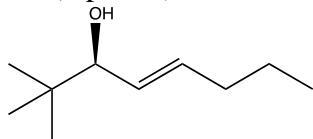
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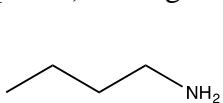
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## 2220D – Drill test 2 – Sample Problems

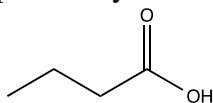
1. (4 points) Provide the IUPAC name for this compound. Use R and S where appropriate.



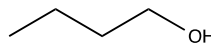
2. (4 points) Arrange these compounds by acidic strength, with the most acidic = 1.



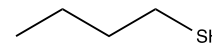
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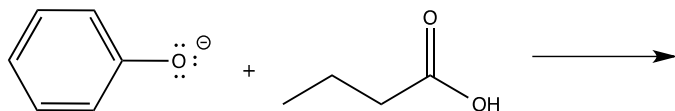
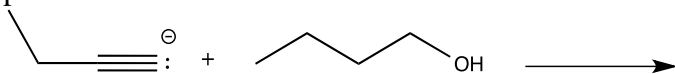


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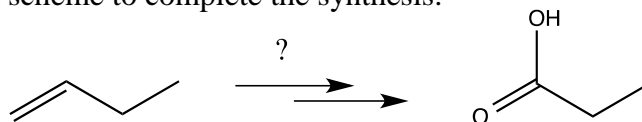
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3. (6 points) If the acid/base reaction does not happen, write “No RXN”. If the reaction occurs, draw the products of the reaction.

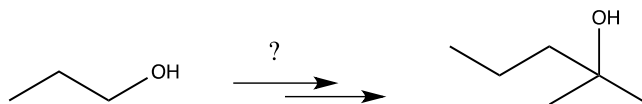


4. Provide the correct reagents and intermediate structure(s) to complete the reaction schemes. There may be more than one correct scheme to complete the synthesis.

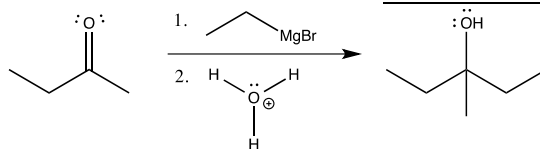
(4 points)



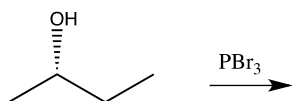
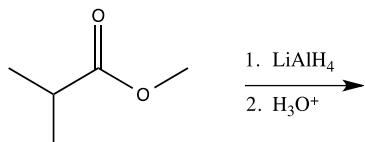
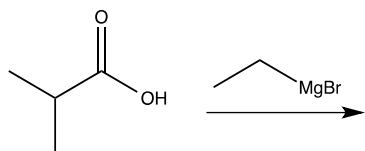
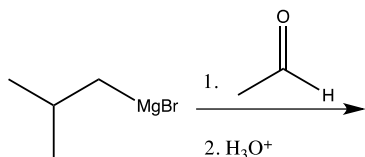
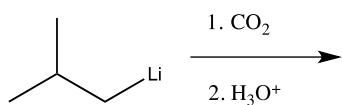
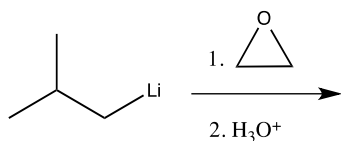
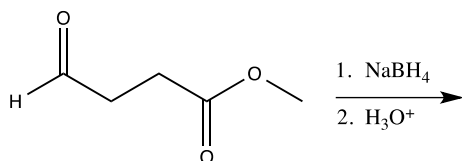
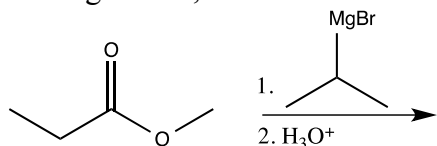
(7 points)



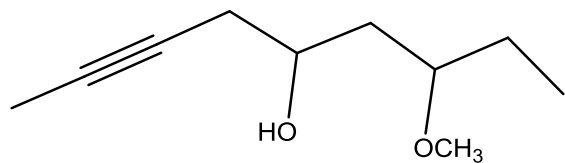
5. (5 points) Draw a mechanism for this transformation. Use arrows to show the flow of electrons.



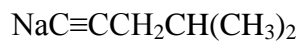
6. (20 points) Predict the product(s) of these reactions, including stereochemistry where appropriate. If nothing occurs, write "No RXN".



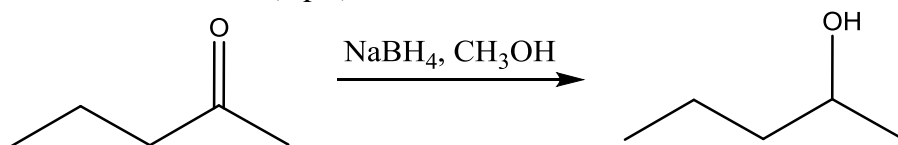
7. What is the IUPAC name of: (4 pts)



8. Which of these bases can deprotonate ethyl alcohol? Circle them. (4 pts)

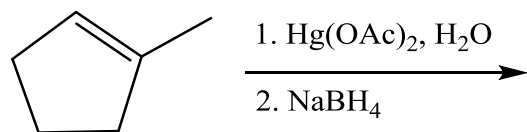


9. Propose a mechanism for this transformation. Be sure to include all reactive intermediates and mechanistic arrows. (4 pts)

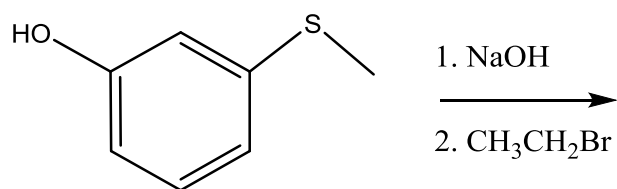


10. Complete these reactions. (24 points)

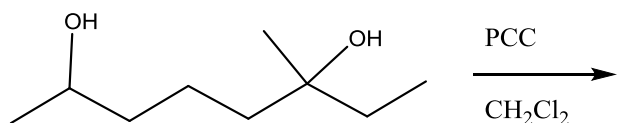
a.

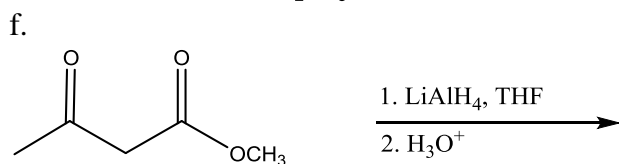
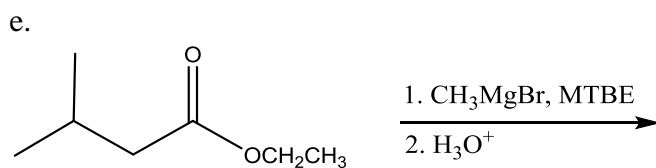
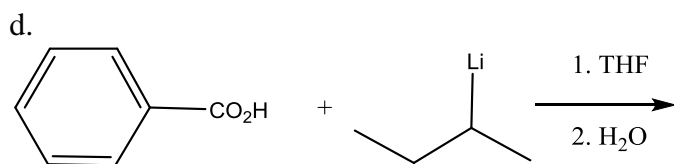


b.

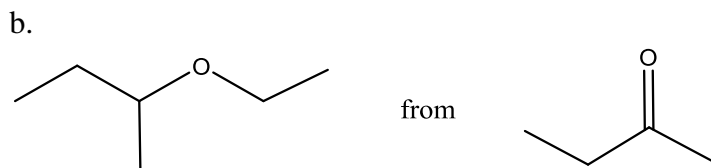
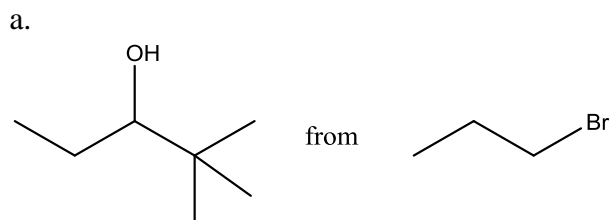


c.





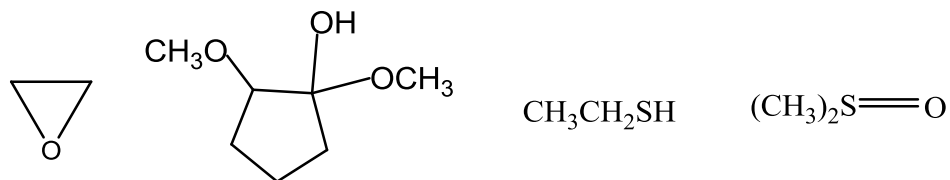
11. Propose syntheses. (12 points)



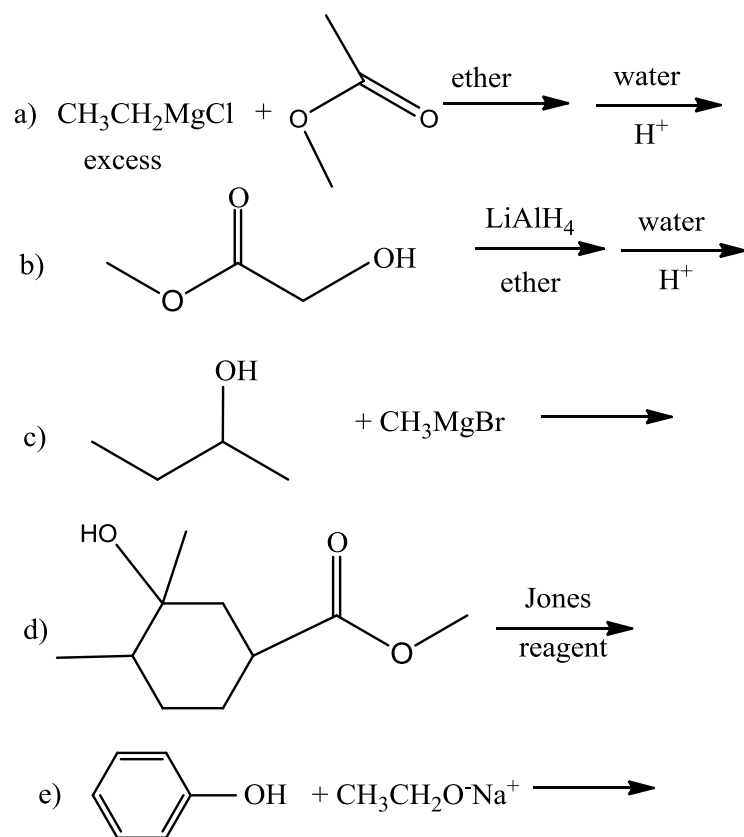
12. Draw the structure of a compound having the formula C<sub>5</sub>H<sub>10</sub>O that does NOT decolorize (react with) Br<sub>2</sub>/CCl<sub>4</sub> and does not produce a blue-green ppt with H<sub>2</sub>CrO<sub>4</sub>. The compound also has this <sup>1</sup>H NMR spectrum: 2.2 ppm, m, 1H; 2.1 ppm, s, 3H; 0.9 ppm, d, 6H. (2 pts)

13. Draw the most stable chair conformation of *cis*-2-isopropoxycyclohexanol (2 points).

14. Name the following compounds (4 points):



15. Give the structure of the major organic product or products expected from the following reactions. Show the stereochemistry of the products if applicable. No reaction may be an appropriate answer in some cases. (4 points each)

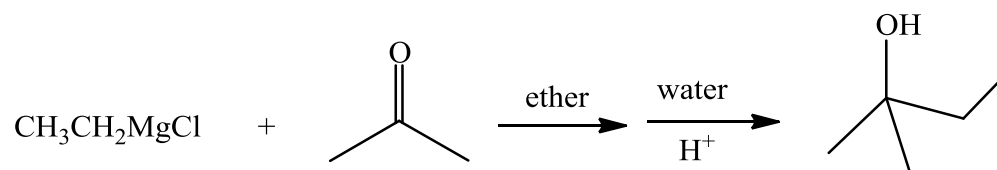


16. Propose an efficient synthesis of each of the following compounds from the given starting material and any needed reagents and/or solvents (8 points each):

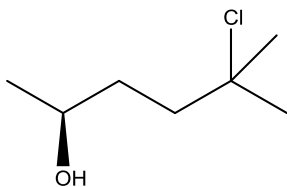


b) *Tert*-butyl methyl ether from *tert*-butanol and methanol

17. Propose a reasonable mechanism for the following reaction (8 points):

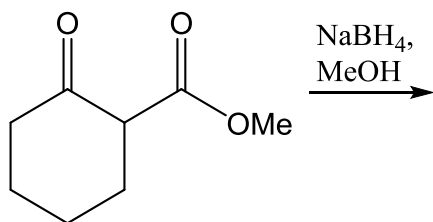


18. Provide the IUPAC name for this compound. (4 pts)      2. Draw an epoxide. (2 pts)

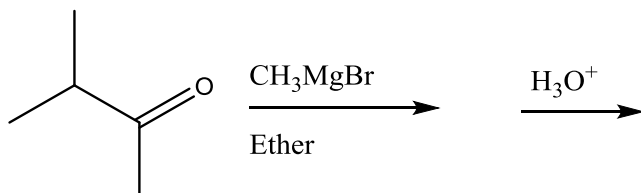


19. Predict the product(s) of these reactions. (24 points)

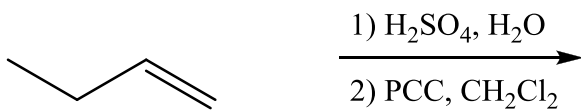
a.



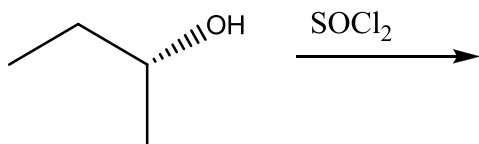
b.



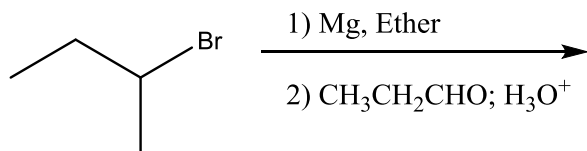
c.



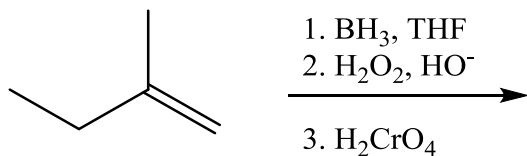
d.



e.



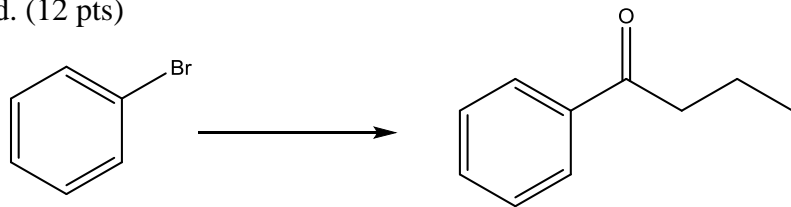
f.



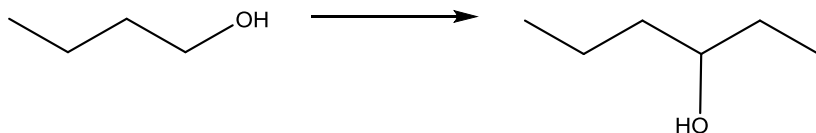


20. Provide a synthesis of the desired product using the starting material provided, and any other reagents you need. (12 pts)

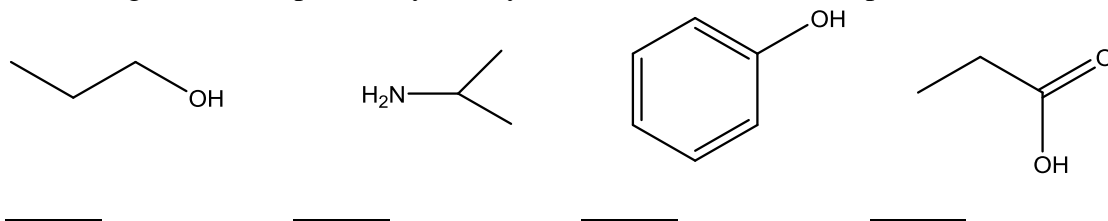
a.



b.



21. Arrange these compounds by acidity, with most acidic = #1. (4 points)



22. Propose a mechanism for this transformation. Be sure to include all intermediate structures and mechanistic arrows. (4 pts)

