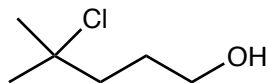


CHM 224
Test 2
Chapters 13,14, organometallics & 20

NAME:

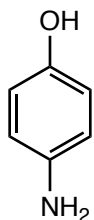
1. Provide the IUPAC name for the following compound:



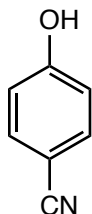
2. Phenols are more acidic than saturated alcohols because because of the:

- A. the atom effect
- B. the resonance effect
- C. the inductive effect
- D. the orbital effect

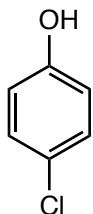
3. Of the following compounds, which one is most acidic and which one is least acidic?



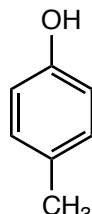
A



B



C

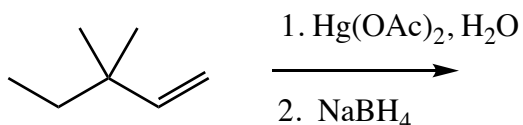


D

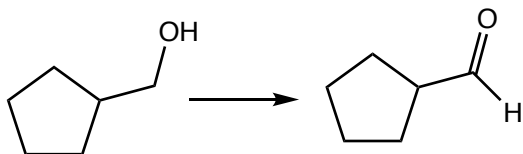
most acidic:

least acidic:

4. What is the expected product from the following hydration reaction?

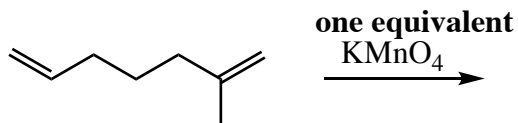


5. Which one of the following is the most suitable reagent to carry out the transformation below?

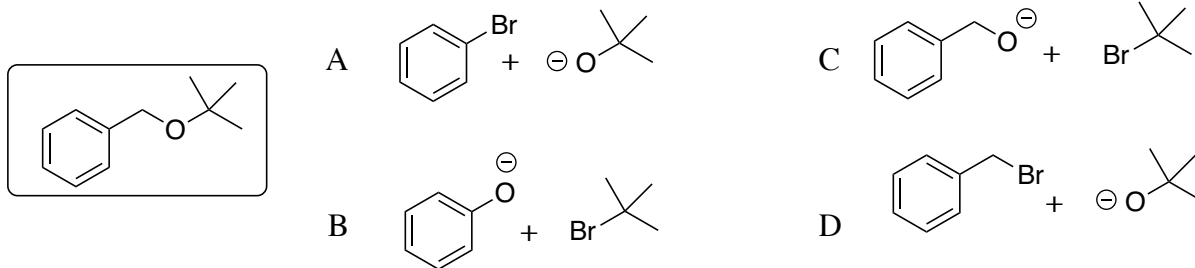


- A. KMnO_4
- B. PCC
- C. NaH
- D. $\text{H}_2\text{SO}_4, \text{H}_2\text{O}$
- E. mCPBA

8. What would be the major product of the following reaction?



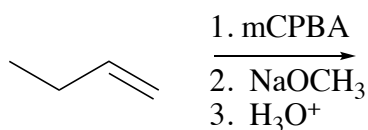
7. Which of the following combinations would be suitable to form the ether below via the Williamson ether synthesis (may be more than one answer)?



8. Which of the following are characteristics of ethers (may be more than one answer)?

- A. can form explosive peroxides with H_2O
- B. highly flammable
- C. reactive with strong acids
- D. reactive with strong bases

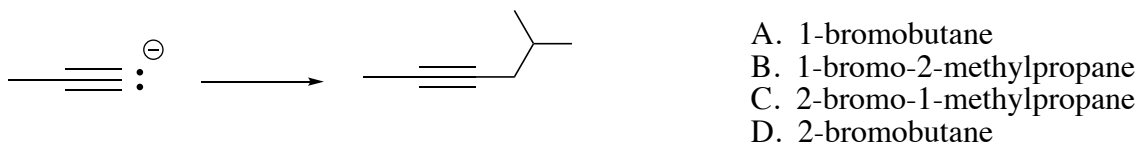
9. Predict the product of the following sequence of reactions:



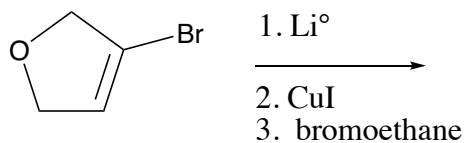
10. Which one of the following compounds was first used as an anesthetic?

- A. propofol
- B. propanol
- C. diethyl ether
- D. MTBE
- E. chloroform

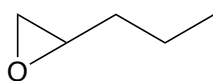
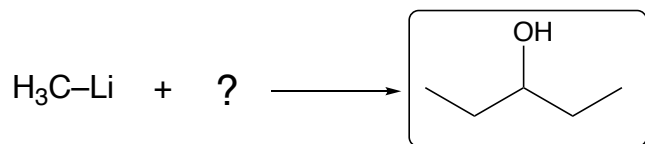
11. Which compound should be added to the nucleophile below to form the desired compound?



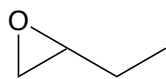
12. Predict the product of the following reaction:



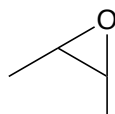
13. Which epoxide, when added to methyllithium, will provide the desired product after neutralization?



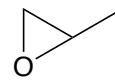
A



B



C



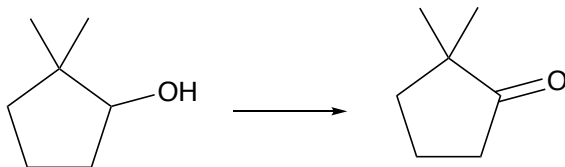
D

14. Alkylolithiums and Grignard reagents will not participate in $\text{S}_{\text{N}}2$ reactions with alkyl halides other than methyl substrates because:

- alkyl halides are unreactive with nucleophiles
- alkylolithiums and Grignard reagents are not strong enough nucleophiles
- E2 elimination reactions tend to predominate over $\text{S}_{\text{N}}2$ reactions
- alkylolithiums and Grignards only react with epoxides

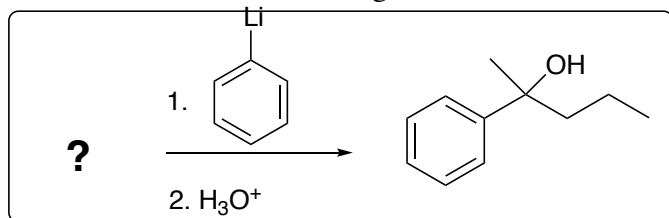
15. Draw the structure of 4,4-dimethylhexanal

16. Which of the reagents is suitable for the following reaction (may be more than one):



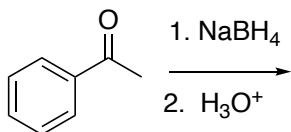
- Zn(Hg), HCl
- H_2 , Pt
- KMnO_4
- N_2H_4 , KOH, heat
- $\text{K}_2\text{Cr}_2\text{O}_7$, H_2SO_4 , H_2O

17. Which one of the following is the structure of the starting material for the reaction below?

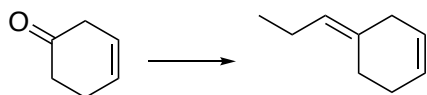


- butanal
- 2-butanone
- pentanal
- 2-pentanone
- 3-pentanone

18. Provide the structure for the product of the following reaction:



19. Which one of the following reagents is required to complete the reaction shown?



- A. $\text{CH}_3\text{CH}_2\text{Li}$
- B. i. $\text{Hg}(\text{OAc})_2, \text{H}_2\text{O}$ ii. NaBH_4
- C. $\text{CH}_3\text{CH}_2\text{CH}_2\text{Li}$
- D. $(\text{Ph})_3\text{P}=\text{CHCH}_2\text{CH}_3$
- E. $\text{CH}_3\text{CH}_2\text{NH}_2$

20. Predict the final product from the following sequence of reactions:

