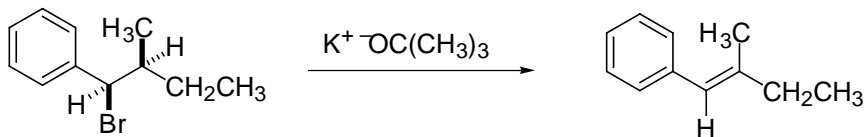
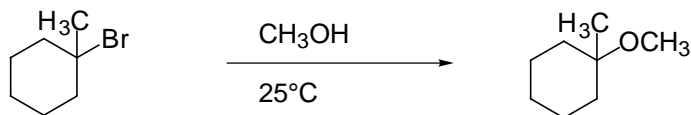


- I. Reactions: Predict the major organic product of the following reactions. If more than one product is formed give both and indicate the **major** product. Indicate stereochemistry where necessary. (4 points each)

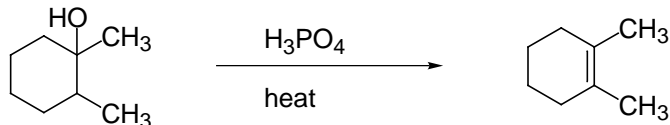
1.



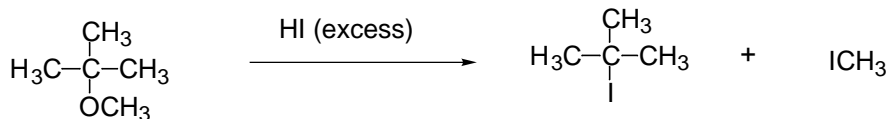
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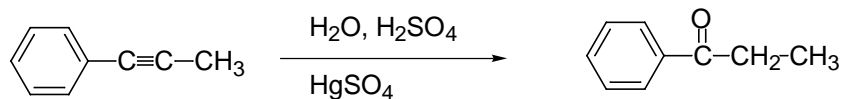
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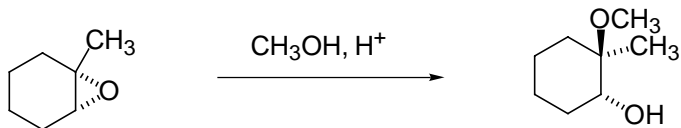
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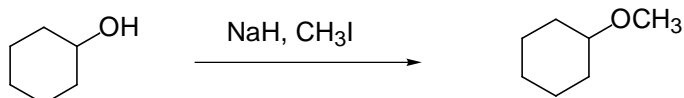
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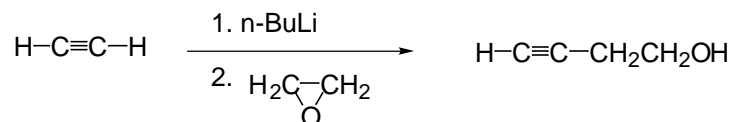
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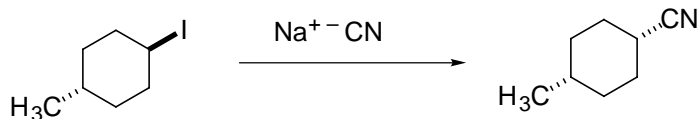
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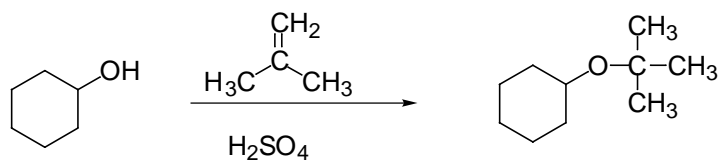
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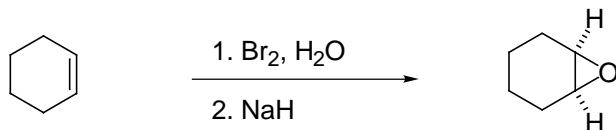
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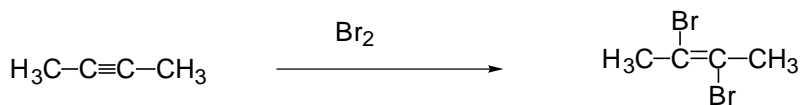
10.



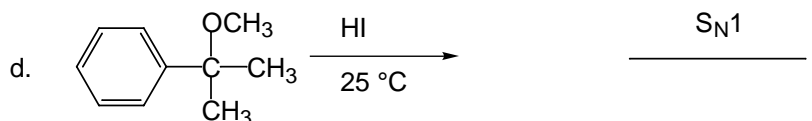
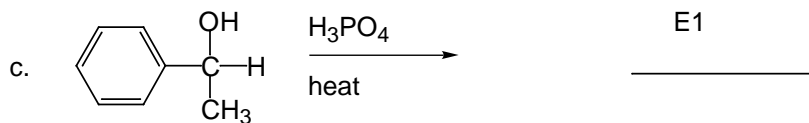
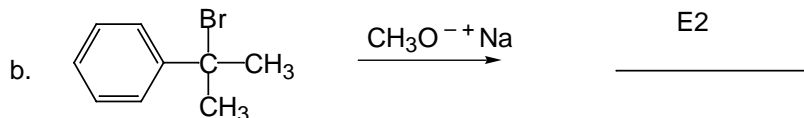
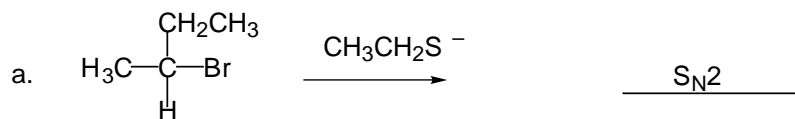
11.



12.

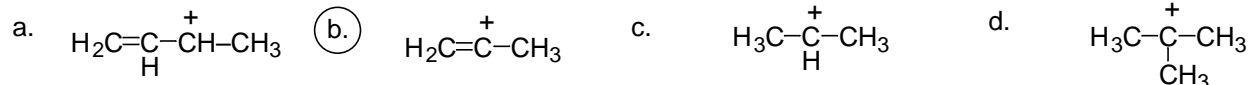


13. Indicate whether the following reactions are more likely to proceed by an E1, E2, SN1 or SN2 mechanism. (2 points each)

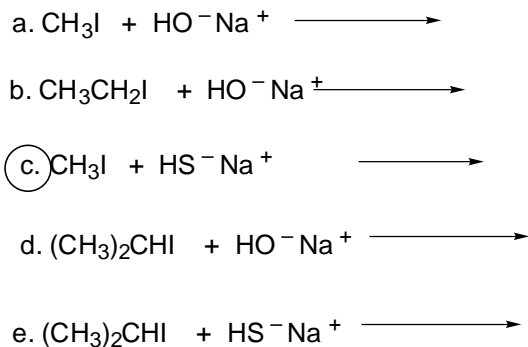


II. Multiple Choice: Circle the best answer (**only one**). (3 points each)

14. Which of the following would be the least stable carbocation? **B**



15. Which of the following would undergo SN2 reaction the fastest? **C**



16. Which of the following alcohols would undergo dehydration the fastest? **A**

- a. 2-phenyl-2-butanol
- b. 2-methyl-2-butanol
- c. 2-butanol
- d. 1-butanol

17. Which of the following is a **not** stereospecific reaction? **C**

- a. epoxidation of cyclohexene with m-CPBA
- b. elimination of HBr from 2-bromo-2-methylpropane by sodium ethoxide?
- c. dehydration of 1-methylcyclohexanol by heating with  $\text{H}_2\text{SO}_4$ .**
- d. reaction of 2-bromobutane with NaOH.

18. Reaction of a secondary alkyl halide with a weak base would likely result in **D**

- a. SN1 reaction
- b. SN2 reaction
- c. E1 Reaction
- d. mixture of SN1 and E1**
- e. E2 elimination
- f. mixture of SN2 and E2

19. Which of the following is the stronger acid? **B**

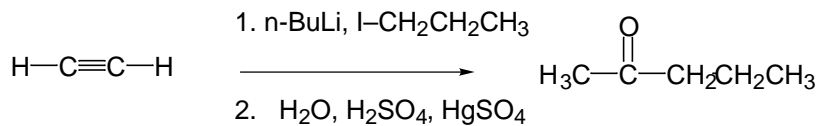
- a. ethanol
- b. ethanethiol**
- c. acetylene
- d. butane

20. Which of the following would be the most soluble in water? **B**

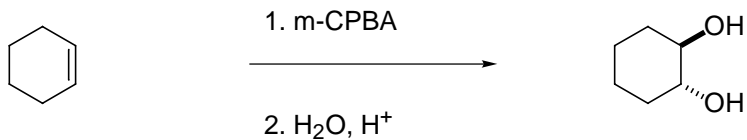
- a. diethyl ether
- b. methanol**
- c. 1-butanol
- d. dimethylsulfide

Syntheses. Give reagents to show how to synthesize the compounds on the right from the compounds on the left. They may require more than one step. (4 pts each)

21.

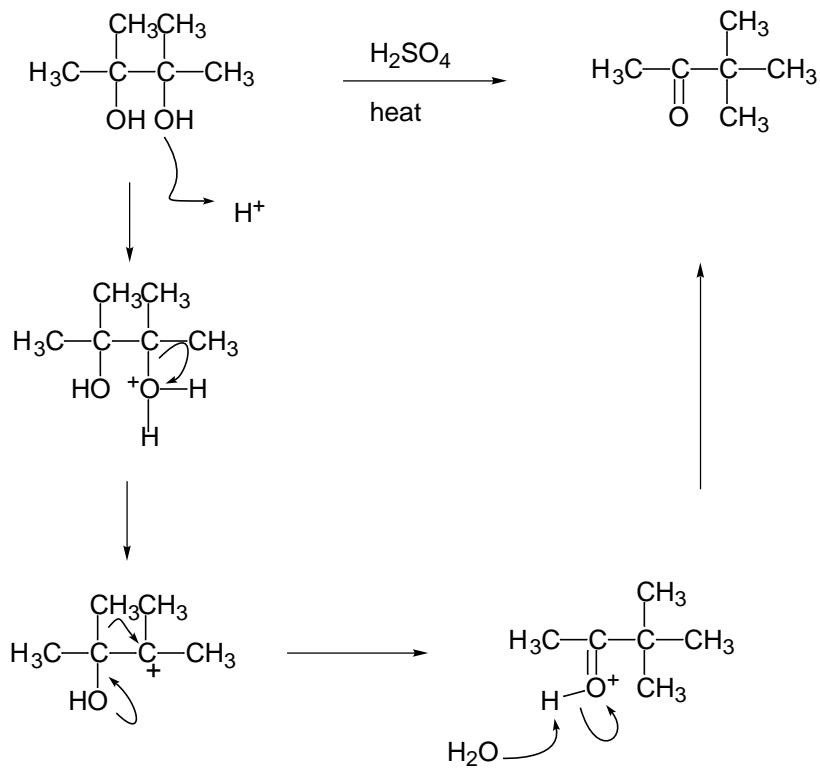


22.

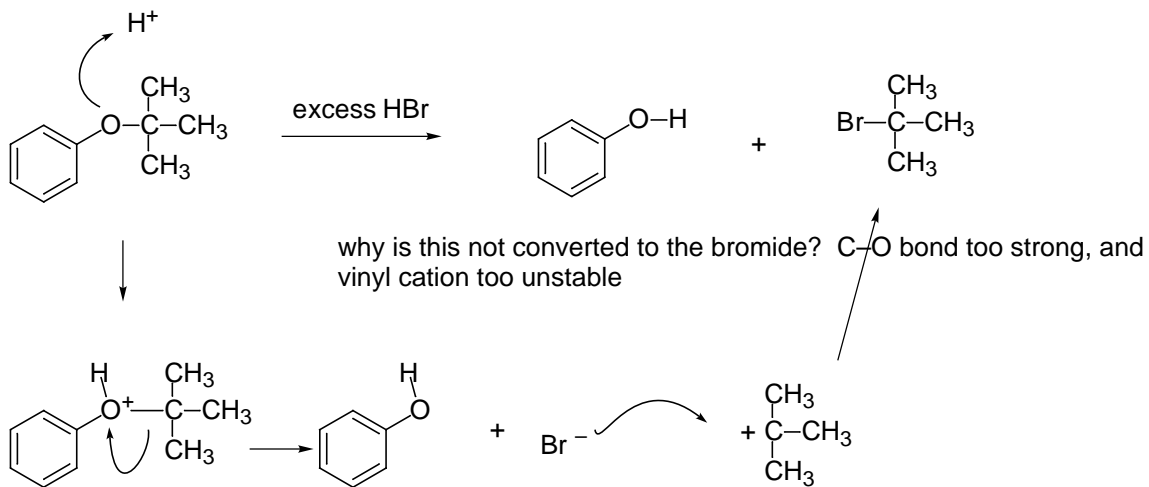


V. Mechanisms. Give a stepwise, detailed mechanism with arrows and intermediates for the following reactions. (5 points each)

23.



24.



25.

