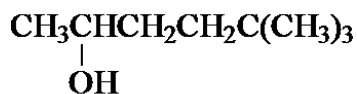


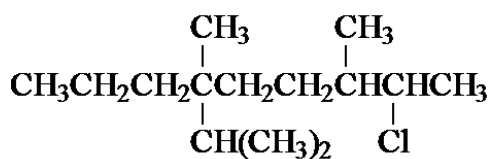
Chemistry 210 - Chapter 4 - Quiz 1

Student: _____

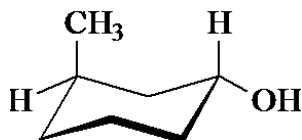
1. What is the IUPAC name of the compound below?



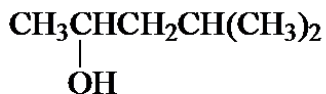
- A. 5,5-dimethyl-2-hexanol
 B. 2,2-dimethyl-5-hexanol
 C. 5,5-dimethyl-2-pentanol
 D. 2,2-dimethyl-5-pentanol
2. What is the IUPAC name of the compound below?



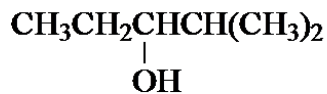
- A. 8-chloro-4-isopropyl-4,7-dimethylnonane
 B. 2-chloro-6-isopropyl-3,6-dimethylnonane
 C. 2-chloro-3,6,7-trimethyl-6-propyloctane
 D. 6-*sec*-butyl-2-chloro-3,6-dimethyloctane
3. What is the IUPAC name of the following compound?



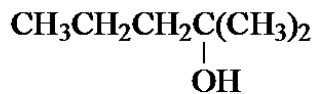
- A. *cis*-3-methylcyclohexanol
 B. *trans*-3-methylcyclohexanol
 C. *cis*-5-methylcyclohexanol
 D. *trans*-5-methylcyclohexanol
4. Identify the tertiary alcohol(s).



I



II

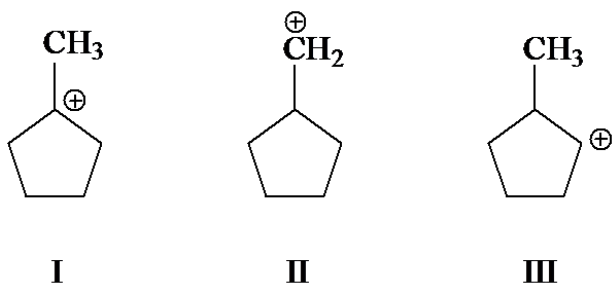


III

- A. only I
 B. only II
 C. only III
 D. both I and III

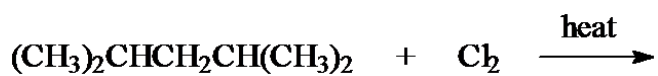
5. What is the hybridization of the oxygen atom in alcohols?
- sp
 - sp₂
 - sp₃
 - sp
6. The C-O-H bond angle in alcohols is closest to:
- 90°
 - 109.5°
 - 120°
 - 180°
7. Chlorination of pentane gives a mixture of isomers having the molecular formula C₅H₁₁Cl. The percentage of 1-chloropentane is 22%. Assuming the secondary hydrogens in pentane are equally reactive to monochlorination, what is the percentage of 3-chloropentane in the mixture?
- 48%
 - 26%
 - 22%
 - 14%
8. Which of the following hydrocarbons has the slowest reaction rate with Br₂ and light?
- CH₄
 - CH₃CH₂CH₃
 - CH₃CH₂CH₂CH₃
 - (CH₃)₃CH
9. What are the products of the following reaction?
- $$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH} + \text{HBr} \longrightarrow$$
- 1-bromobutane and water
 - 1-bromobutane and hydrogen
 - butane and HOBr
 - CH₃CH₂CH₂CH₂OBr + hydrogen
10. Which of the following is most reactive with HBr?
- CH₃OH
 - CH₃CH₂OH
 - (CH₃)₂CHOH
 - (CH₃)₃COH

11. Arrange the following carbocations in order of their decreasing stabilities (most stable first).



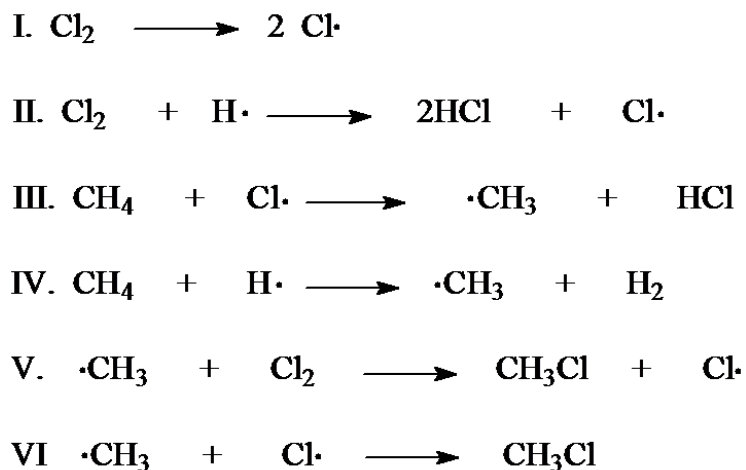
- A. I > II > III
B. III > II > I
C. I > III > II
D. II > III > I

12. How many monochlorination products do you expect in the following reaction?



- A. two
B. three
C. four
D. five

13. Which of the following are the chain propagating steps in the free radical chlorination of methane?

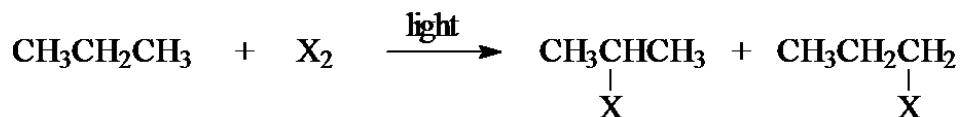


- A. I and III
B. II and VI
C. III and IV
D. III and V

14. Calculate ΔH° of reaction for the free radical bromination of cyclopentane to give bromocyclopentane.

| Bond | Bond Dissociation Energy (kJ/mol) |
|-------|-----------------------------------|
| C-H | 395 |
| C-Br | 284 |
| Br-Br | 192 |
| H-Br | 366 |

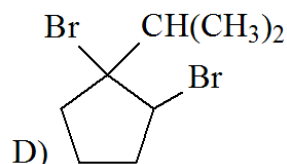
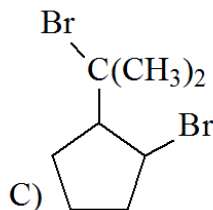
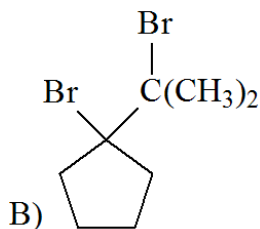
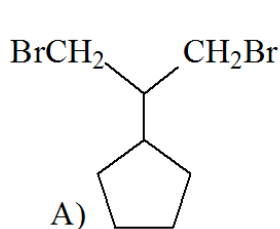
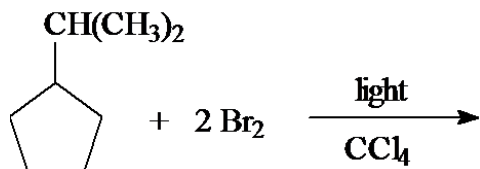
- A. -121 kJ/mol
 B. -63 kJ/mol
 C. +121 kJ/mol
 D. +63 kJ/mol
15. Consider the following reaction (X = Cl or Br).



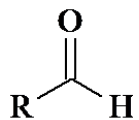
Which statement(s) is(are) correct?

- I. Statistically the 1-halopropane should be the major isomer.
 II. The 2-halopropane to 1-halopropane ratio is largest when X=Br.
 III. The 2-halopropane to 1-halopropane ratio is the largest when X=Cl.
- A. only II
 B. only III
 C. I and II
 D. I and III
16. What are the C-C-C bond angles in the *tert*-butyl carbocation, $(\text{CH}_3)_3\text{C}^+$?
- A. 60°
 B. 90°
 C. 109.5°
 D. 120°

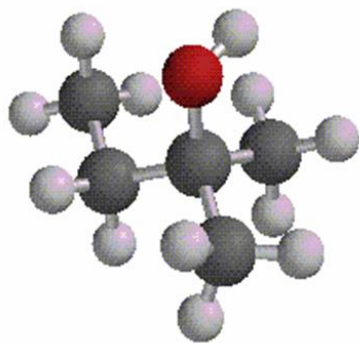
17. Dibromination of isopropylcyclopentane gives a product which can be isolated in good yields. Which of the following would you predict to be this product?



- A. A
 B. B
 C. C
 D. D
18. The structure below is a generalized abbreviation for which class of compounds?

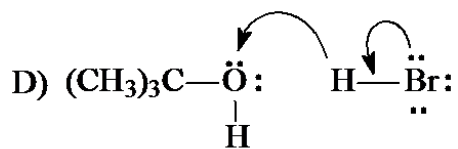
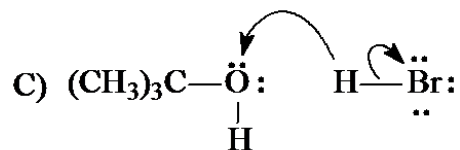
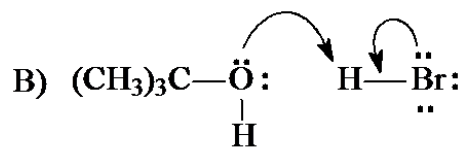
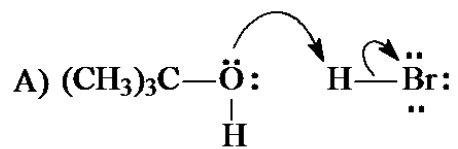


- A. ketones
 B. aldehydes
 C. carboxylic acids
 D. esters
19. What is the IUPAC name of the following compound?



- A. 3-methyl-2-butanol
 B. 3-methyl-3-butanol
 C. 2-methyl-2-butanol
 D. 2,2-dimethyl-1-butanol

20. Which of the following mechanistically depicts the protonation of *tert*-butyl alcohol by hydrogen bromide?



- A. A
- B. B
- C. C
- D. D

Chemistry 210 - Chapter 4 - Quiz 1 Key

1. A
2. B
3. B
4. C
5. D
6. B
7. B
8. A
9. A
10. D
11. C
12. C
13. D
14. B
15. C
16. D
17. B
18. B
19. C
20. A

Chemistry 210 - Chapter 4 - Quiz 1 **Summary**

| <i>Category</i> | <i># of Questions</i> |
|-------------------------|-----------------------|
| Carey - 004 Alcohols... | 20 |