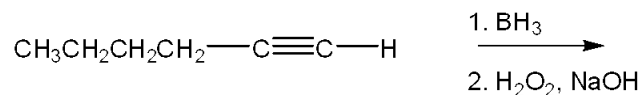


HW Set #3

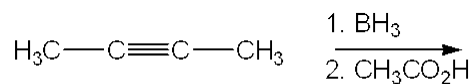
Multiple Choice

Identify the choice that best completes the statement or answers the question. There is only one correct response for each question. Carefully record your answers on the Scantron sheets provided in class. (4 pts each)

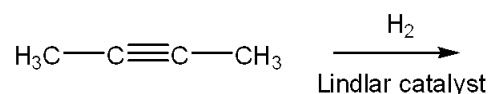
1. What is the major organic product obtained from the following reaction?



- a. 2-hexanone
b. hexanal
c. 2-hexanol
d. *cis*-2-hexene
2. What is the major organic product obtained from the following reaction?



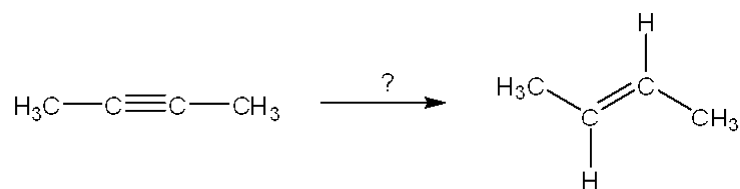
- a. butane
b. 1-butene
c. *cis*-2-butene
d. *trans*-2-butene
3. What is the major organic product obtained from the following reaction?



- a. butane
b. 1-butene
c. *cis*-2-butene
d. *trans*-2-butene

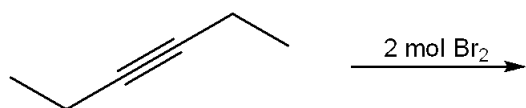
Due 4/4/2014 (5PM)

4. What is the best choice of reagent(s) to perform the following transformation?

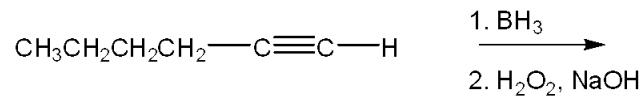


- H_2/Pt
 - $\text{H}_2/\text{Lindlar catalyst}$
 - Na/NH_3
 - BH_3 ; followed by H_2O_2 , NaOH
5. Which of the following has the lowest $\text{p}K_a$?
- butane
 - 1-butene
 - 1-butyne
 - 2-butyne

6. What is the major organic product obtained from the following reaction?



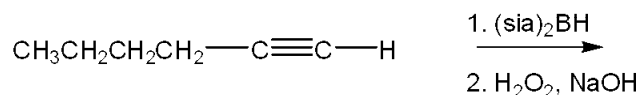
- 3,4-dibromohexane
 - 3,3-dibromohexane
 - (*Z*) 3,4-dibromohexene
 - 3,3,4,4-tetrabromohexane
7. What is the major organic product obtained from the following reaction?



- 2-hexanone
- hexanal
- 2-hexanol
- cis*-2-hexene

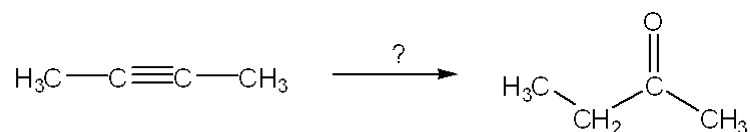
Due 4/4/2014 (5PM)

8. What is the major organic product obtained from the following reaction?



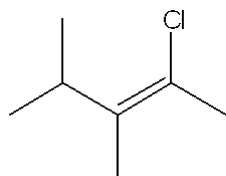
- 2-hexanone
- hexanal
- 2-hexanol
- cis*-2-hexene

9. What is the best choice of reagent(s) to perform the following transformation?



- H_2 /Lindlar catalyst
- Na/NH_3
- $(\text{sia})_2\text{BH}$; followed by H_2O_2 , NaOH
- BH_3 ; followed by H_2O_2 , NaOH

10. What is the IUPAC name of the following compound?



- (*E*)-1-chloro-1,2,3-trimethyl-1-butene
- (*Z*)-1-chloro-1,2,3-trimethyl-1-butene
- (*E*)-2-chloro-3,4-dimethyl-2-pentene
- (*Z*)-2-chloro-3,4-dimethyl-2-pentene

11. Which of the following bonds has the lowest bond dissociation enthalpy?

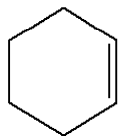
- C-H
- C-F
- C-Br
- C-I

12. Which of the following statements is *not* true?

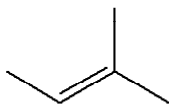
- homolytic cleavage of a bond in a neutral molecule gives two radicals
- radicals have one or more unpaired electrons
- movement of single electrons is depicted using a "fishhook arrow"
- the C-F bond is the weakest bond between carbon atom and a halogen

Due 4/4/2014 (5PM)

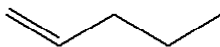
13. What is the characteristic of a radical chain initiation step?
- radicals are formed
 - substitution products are formed
 - a radical reacts with a molecule to give a new radical and a new molecule
 - two radicals combine to give a molecule
14. Which of the following alkenes undergoes allylic bromination to form a single monobrominated product?



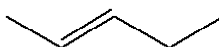
1



2

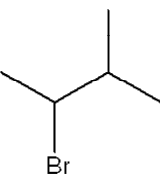
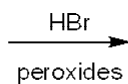
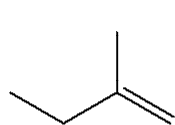


3

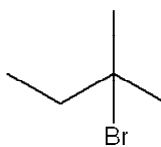


4

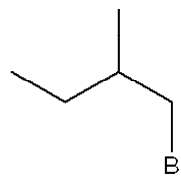
- 1
 - 2
 - 3
 - 4
15. Which of the following statements is *not* true?
- Bromine radicals add to the least substituted end of a carbon-carbon double bond of an alkene.
 - The major anti-Markovnikov product obtained upon addition of HBr to alkenes in the presence of a peroxide is formed in a radical termination step.
 - Two radicals combine in radical termination steps.
 - Alkoxy radicals remove a hydrogen atom from HBr to give an alcohol and a bromine atom.
16. What is the major organic product obtained from the following reaction?



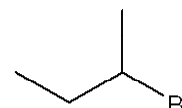
1



2



3

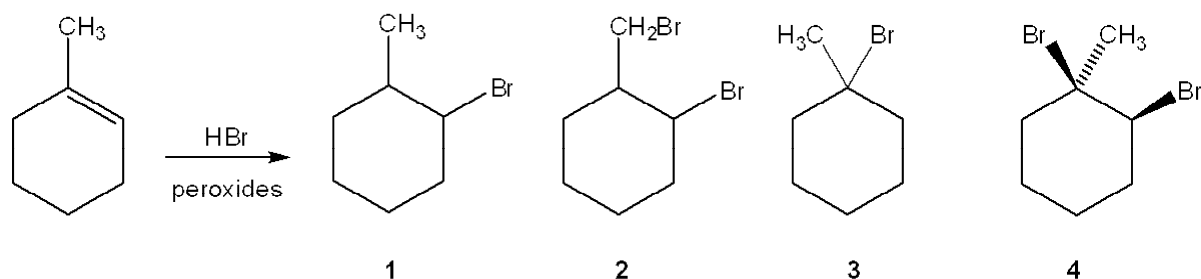


4

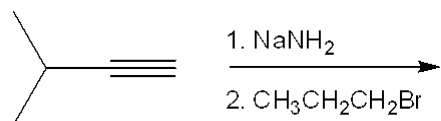
- 1
 - 2
 - 3
 - 4
17. Which of the following bonds has the **lowest** bond dissociation enthalpy?
- C-H
 - C-F
 - C-Br
 - C-I

Due 4/4/2014 (5PM)

18. What is the **geometry** of the central carbon atom of a *tert*-butyl radical?
- tetrahedral
 - trigonal planar
 - trigonal pyramidal
 - square planar
19. What is the major product obtained from the reaction of 2-methyl-2-butene with hydrogen bromide in the presence of peroxides?
- 2,3-dibromo-2-methylbutane
 - 2-bromo-3-methylbutane
 - 2-bromo-2-methylbutane
 - (*E*)-1-bromo-2-methyl-2-butene
20. What is the major organic product obtained from the following reaction?



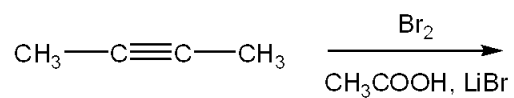
- 1
 - 2
 - 3
 - 4
21. What is the approximate C-C-C bond angle in propyne?
- 90°
 - 109°
 - 120°
 - 180°
22. What is the major organic product obtained from the following reaction?



- 2-methyl-3-hexene
- 2-methyl-3-heptyne
- 2-bromo-3-methylbutane
- 2-methyl-2-butene

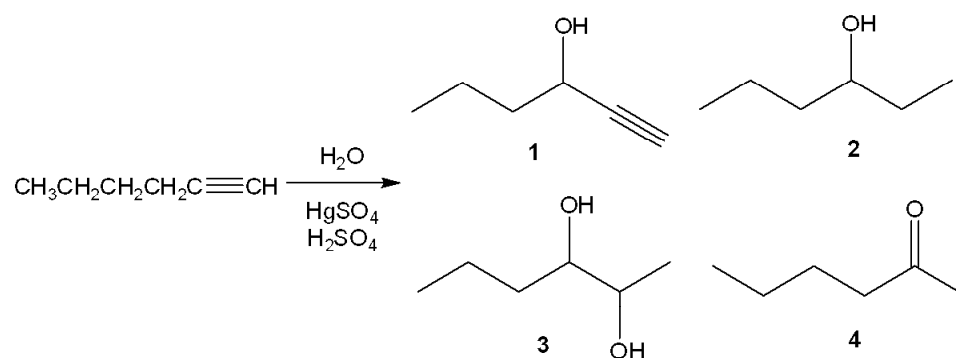
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23. What is the major organic product obtained from the following reaction?



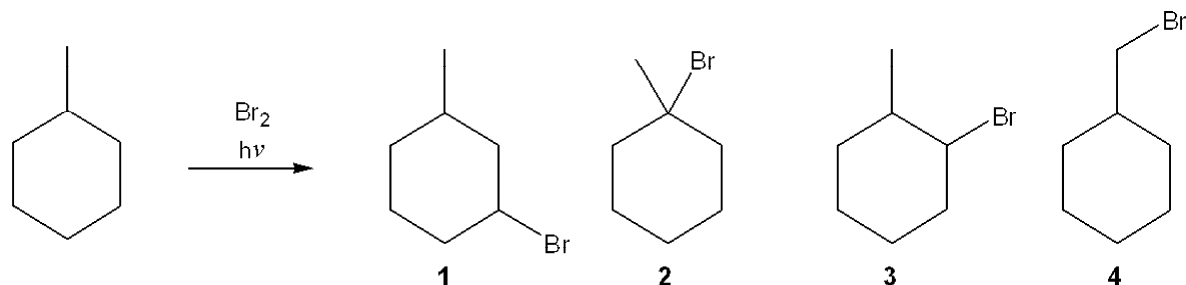
- a. (*E*) 1,2-dibromobutene
- b. (*Z*) 1,2-dibromobutene
- c. (*E*) 2,3-dibromobutene
- d. (*Z*) 2,3-dibromobutene

24. What is the major organic product obtained from the following reaction?



- a. 1
- b. 2
- c. 3
- d. 4

25. What is the major organic product obtained from the following reaction?



- a. 1
- b. 2
- c. 3
- d. 4