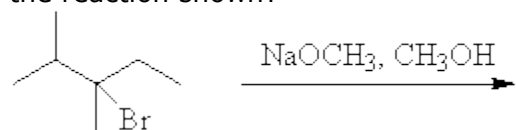


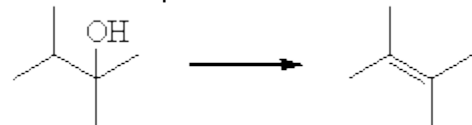
Vollhardt-Schore, Organic Chemistry 5e Ch 11

1. What would be the *major* product from the reaction shown?



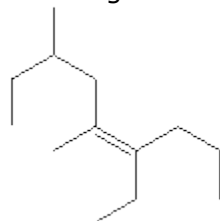
- A.
- B.
- C.
- D.
- E.

2. Which reagent would you choose to *best* accomplish the reaction shown?



- A. HBr
- B. $\text{CH}_3\text{CO}_2\text{H}$
- C. HI
- D. HCl
- E. H_2SO_4

3. What is the correct IUPAC name for the following molecule?



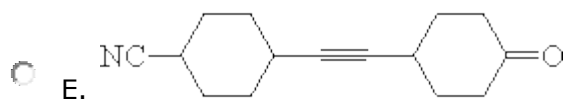
- A. *cis* -4,6-dimethyl-3-propyl-3-octene
- B. *trans* -4-ethyl-5,7-dimethyl-4-nonene
- C. (*Z*)-4-ethyl-5,7-dimethyl-4-nonene
- D. (*E*)-6-ethyl-3,5-dimethyl-5-nonene
- E. (*Z*)-4,6-dimethyl-3-propyl-3-octene

4. Which of the following molecules most likely generated this IR spectral data?

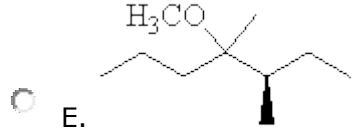
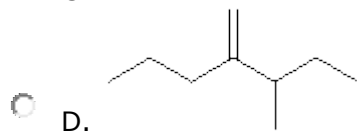
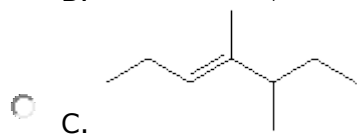
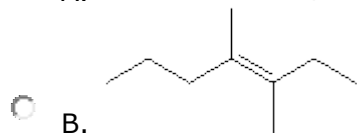
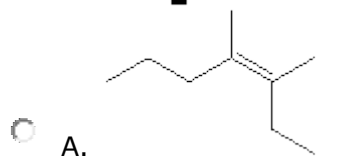
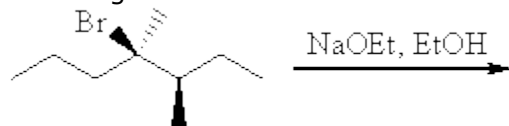
Wavenumber (cm^{-1}) 3300 (broad), 3000, 2200, 2100, 1700

Note: This only includes selected peaks.

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



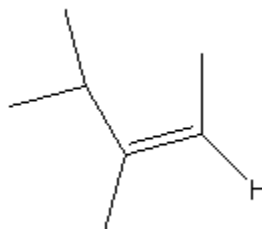
5. What is the *major* product of the following reaction?



6. What is the maximum number of hydrogens that could be present in a seven-carbon compound? (Assume that no rings or double bonds are present.)

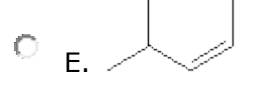
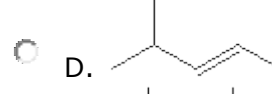
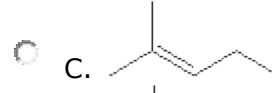
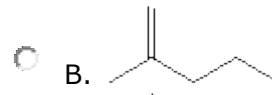
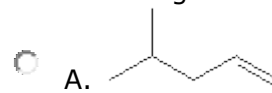
- A. 10
- B. 12
- C. 14
- D. 15
- E. 16

7. Name the alkene shown here.

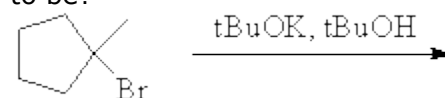


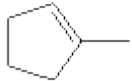
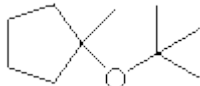
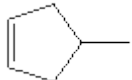
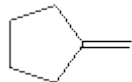
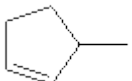
- A. (Z)-2-isopropyl-2-butene
- B. (Z)-3,4-dimethyl-2-pentene
- C. (E)-2,3-dimethyl-3-pentene
- D. (Z)-2,3-dimethyl-3-pentene
- E. (E)-3,4-dimethyl-2-pentene

8. The hydrogenation of alkenes is an exothermic process that can be used to establish the relative stability of a carbon-carbon double bond. Which of the following compounds would you expect to have the largest heat of hydrogenation?

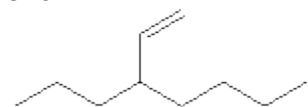


9. What would you *expect* the major product from the following reaction below to be?



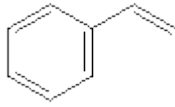
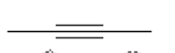
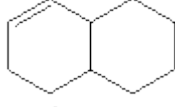
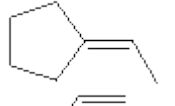

- A. 
- B. 
- C. 
- D. 
- E. 

10. What is the *best* name for the alkene shown?

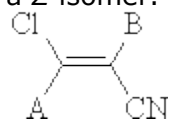


- A. 3-butyl-1-hexene
- B. (4-octyl)-ethene
- C. 3-propyl-1-heptene
- D. 4-vinyloctane
- E. 4-ethenyloctane

11. Which molecule below has no C-C bonds that are able to freely rotate?

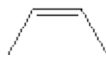
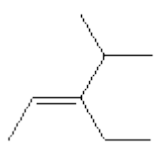
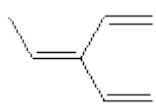
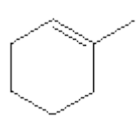
- A. 
- B. 
- C. 
- D. 
- E. 

12. Consider the alkene below. Choose substituents A and B (listed in order below) for the compound that would give a *Z* isomer.

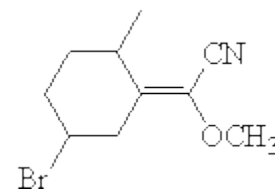
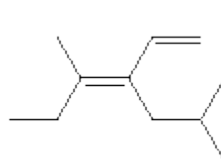


- A. -Br, -NHCH₃
- B. -F, -CHO
- C. -I, -OCH₃
- D. -COOH, -CH₂NH₂
- E. -Br, -COOH

13. Which of the following *must* be named according to the *E/Z* system?

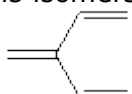
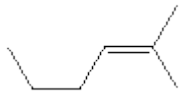
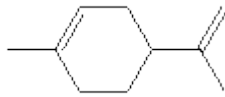
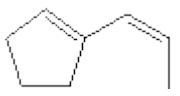
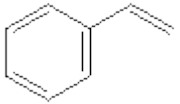
- A. 
- B. 
- C. 
- D. 
- E. H₂C=C=CH₂

14. Assign the compounds (from left to right) as *Z* or *E*.

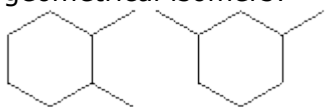
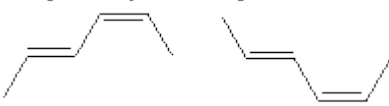
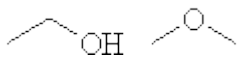
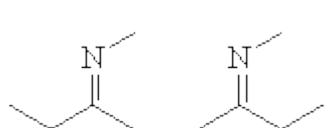
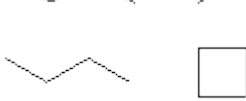


- A. *Z, Z*
- B. *Z, E*
- C. *E, Z*
- D. *E, E*
- E. Neither is *E* nor *Z*.

15. Which of the following can exist as *cis/trans* isomers?

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

16. Which of the following represents a pair of geometrical isomers?

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

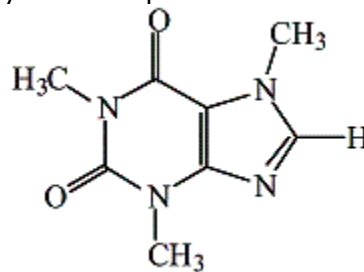
17. Which of the following has the greatest IR stretching frequency?

- A. C-H
- B. O-H
- C. N-H
- D. C-Cl
- E. C-Br

18. Which of the following molecules will have no IR bands at frequencies greater than 3000 cm^{-1} ?

- A. CH_3COOH
- B. $\text{CH}_2=\text{CHCH}_3$
- C. $\text{CH}_3\text{CH}_2\text{OH}$
- D. $\text{CH}_3\text{CH}_2\text{NH}_2$
- E. CH_3OCH_3

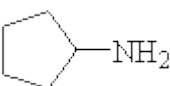
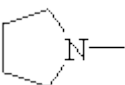
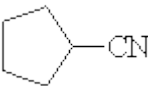
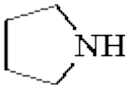
19. Which of the following IR bands would you *not* expect to find in caffeine?



- A. 3400 cm^{-1}
- B. 1710 cm^{-1}
- C. 1650 cm^{-1}
- D. 3100 cm^{-1}
- E. 2950 cm^{-1}

20. An unknown compound is known to contain a single nitrogen atom. Its IR spectrum shows no peaks between 3300

and 3500 cm^{-1} or between 2110 and 2260 cm^{-1} . Which of the following is the structure of the compound?

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