
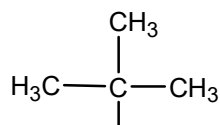


## INTRODUCTION

- Which of the following molecules has the smallest dipole moment?  
A)  $\text{NH}_3$                       B)  $\text{H}_2\text{O}$                       C)  $\text{CHCl}_3$                       D)  $\text{CCl}_4$
- Which of the following molecules has an ionic bond?  
A)  $\text{H}_2\text{O}$                       B)  $\text{Cl}_2$                       C)  $\text{C}_2\text{H}_6$                       D)  $\text{KCl}$
- The type of bond in C-O is  
A) Ionic bond                      B) Covalent bond  
C) Polar covalent bond                      D) Coordinate covalent bond
- Lewis acid is a species that can  
A) donate a proton                      B) accept a share in an electron pair  
C) accept a proton                      D) donate a share in an electron pair
- Lewis base is a species that can  
A) donate a proton                      B) accept a share in an electron pair  
C) accept a proton                      D) donate a share in an electron pair
- The number of  $\sigma$  bonds in the following structure is  
  
A) 15                      B) 12                      C) 10                      D) 5
- The number of sigma bonds in  $\text{H}_2\text{C}=\text{CH}-\text{CH}_3$  is:  
A) 6                      B) 7                      C) 8                      D) 9
- The shape of carbon-carbon bond in alkanes is:  
A) Tetrahedral                      B) Trigonal                      C) Linear                      D) Octahedral
- The type of hybridization of the selected carbon is  
$$\begin{array}{c} \downarrow \\ \text{H}_2\text{C}=\text{CH}-\text{CH}_3 \end{array}$$
  
A)  $\text{sp}$                       B)  $\text{sp}^2$                       C)  $\text{sp}^3$                       D)  $\text{sp}^3\text{d}$

## ALKANES

- The carbon bearing a positive charge is called  
A) Free radical                      B) carbanion                      C) carbocation                      D) anion
- The name of the following group is



- A) Butyl                      B) Isopropyl                      C) Isobutyl                      D) *t*-Butyl

12. When carbon is bonded to three other carbon atoms, it is called a

- A) primary carbon                      B) secondary carbon  
C) tertiary carbon                      D) quaternary carbon

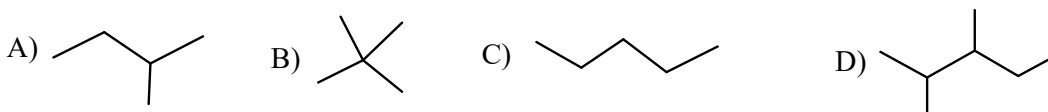
13. The compound with the highest boiling point is

- A)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$     B)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \end{array}$     C)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_3 \end{array}$     D)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

14. The compound with the highest boiling point is:

- A) *n*-Hexane                      C) 2-Methylpentane  
B) *n*-Pentane                      D) 2,2-Dimethylbutane

15. The compound with the least boiling point is:



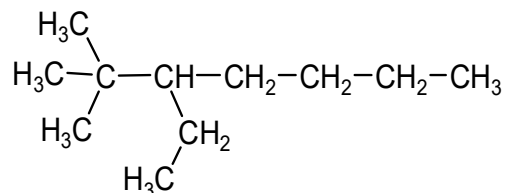
16. The number of isomers for the molecular formula  $\text{C}_4\text{H}_{10}$  is:

- A) 4                      B) 3                      C) 2                      D) 1

17. The product of the following reaction   $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{Mg/dry ether}}$  is:

- A) Pentane.                      B) Propane.                      C) Isobutane.                      D) *n*-Butane

18. The IUPAC name for the following formula is



- A) 5-Ethyl-6,6-dimethylheptane                      B) 3-Ethyl-2,2-dimethylheptane  
C) 2,2-Dimethyl-3-ethylheptane                      D) 6,6-Dimethyl-5-ethylheptane

19. The following name is incorrect

- A) 2-ethylpropane                      B) 2,2-dimethylpentane  
C) 2-methylhexane                      D) *n*-pentane

20. At room temperature, alkanes from  $\text{C}_5$  to  $\text{C}_{17}$  are

A) gases

B) liquids

C) solids

D) semisolids

**21. Reaction of alkanes with halogens / light is an example of**

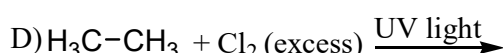
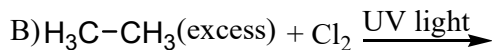
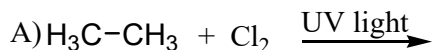
A) Free radical substitution reaction.

B) Nucleophilic substitution reaction.

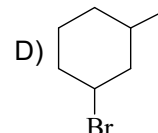
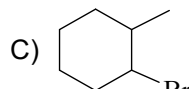
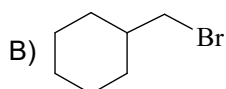
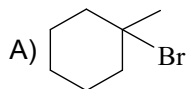
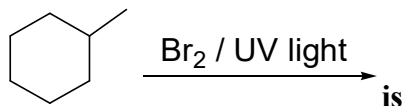
C) Electrophilic addition reaction.

D) Elimination reaction.

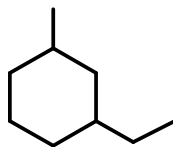
**22. The monochlorinated ethane can be obtained under the following experimental conditions**



**23. The major product of the following reaction**



**24. The IUPAC name for the following formula is**



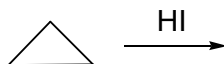
A) 1-Ethyl-3-methylcyclohexane

B) 1-Ethyl-5-methylcyclohexane

C) 3-Methyl-1-ethylcyclohexane

D) 1-Ethyl-3-methylhexane

**25. The product of the following reaction is**



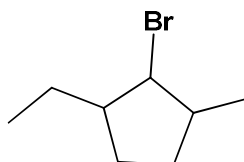
A)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{I}$

B)  $\text{CH}_3\text{CH}_3$

C)  $\text{CH}_3\text{CH}_2\text{CH}_3$

D)  $\text{CH}_3\overset{\text{I}}{\text{C}}\text{HCH}_3$

**26. The name of the following compound is:**



A) 1-Ethyl-3-methyl, 2-bromocyclopentane

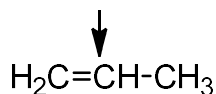
- B) 1-Bromo-2-methyl-5-ethylcyclopentane
- C) 1-Bromo- 2-ethyl- 5-methylcyclopentane
- D) 1-Methyl- 2-Bromo- 3-ethylcyclopentane

## ALKENES

27. The shape of carbon- carbon double bond in alkenes is:

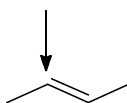
- A) Tetrahedral
- B) Trigonal
- C) Linear
- D) Octahedral

28. The geometry of the selected carbon is:



- A) Bent
- B) Linear.
- C) Tetrahedral
- D) Trigonal planar

29. The type of hybridization of the indicated carbon in the following structure is:



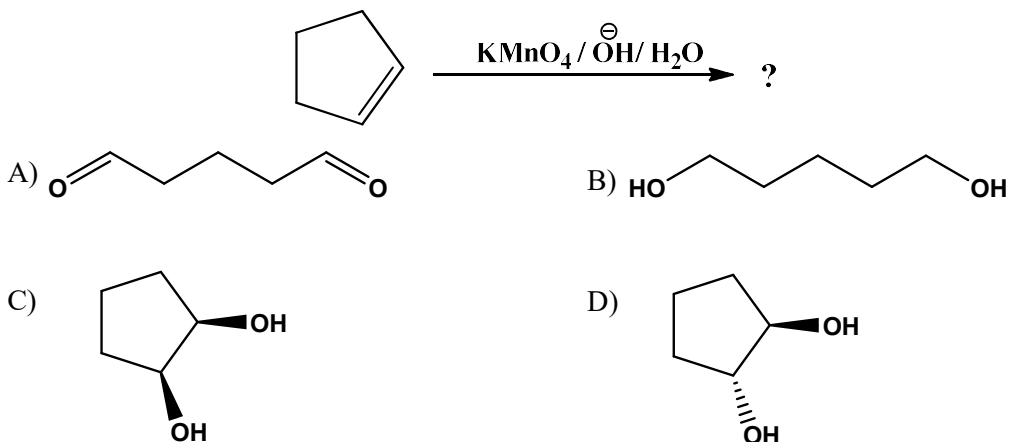
- A) sp
- B) sp<sup>3</sup>
- C) sp<sup>3</sup>d
- D) sp<sup>2</sup>

30. The product of the following reaction is:

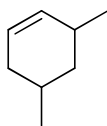


- A)
- B)
- C)
- D)

31. What is the product of the following reaction?

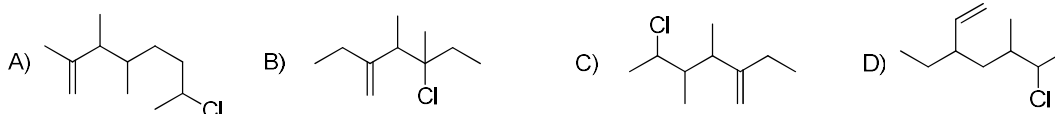


32. What is the correct IUPAC name of the given structure?

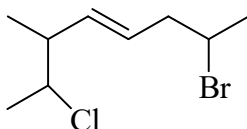


- A) 4, 6-Dimethylcyclohexene  
 B) 3, 5-Dimethylcyclohexane  
 C) 1, 5-Dimethylcyclohexene  
 D) 3, 5-Dimethylcyclohexene

33. The structure of 5-chloro-2-ethyl-3,4-dimethyl-1-hexene is



34. The Correct name of the following compound is:



- A) 2-bromo-5-Chloro-2-ethyl-4-octene.  
 B) 7-bromo-2-chloro-3-methyl-4-octene.  
 C) 2-bromo-7-chloro-6-methyl-4-octene  
 D) 6-bromo-3-Chloro-2-ethyl-4-heptene.

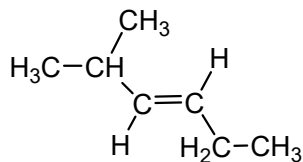
35. Which of the following compounds shows geometrical isomerism?

- A)  $\text{HC}\equiv\text{C}-\text{CH}_3$     B)  $\text{H}_2\text{C}=\underset{\text{CH}_3}{\text{C}}-\text{CH}_3$     C)  $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$     D)  $\text{CH}_3-\underset{\text{CH}_3}{\text{C}}=\overset{\text{CH}_3}{\text{C}}-\text{CH}_3$

48. The compound which cannot exhibit geometrical isomerism is

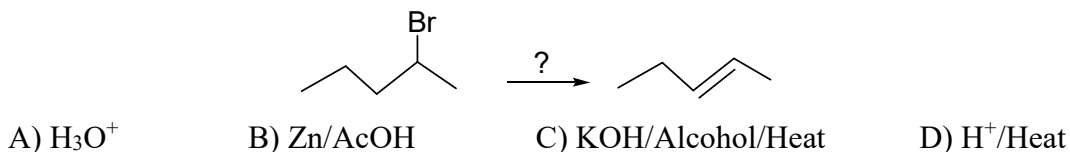
- A) Cyclohexane  
 B) 1,2-Dichlorocyclohexane  
 C) 2-Butene  
 D) 2-Pentene

36. The IUPAC name of the following structure is

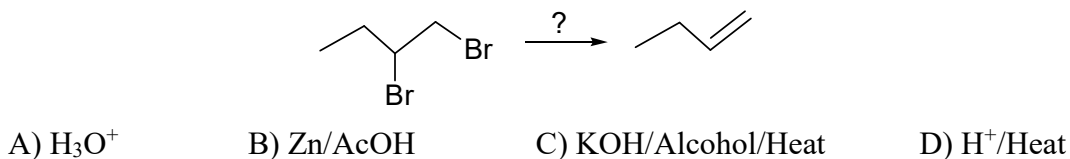


- A) *cis*-2-Methyl-3-hexene  
 B) *cis*-5-Methyl-3-hexene  
 C) *trans*-5-Methyl-3-hexene  
 D) *trans*-2-Methyl-3-hexene

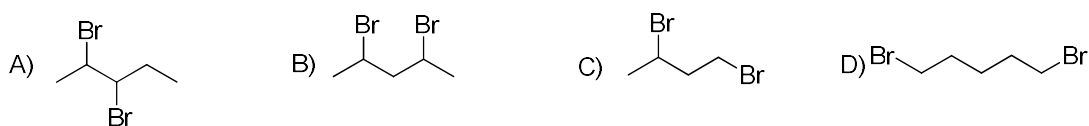
37. What is the following reagent needed for the following transformation?



38. What is the reagent needed for the following transformation?



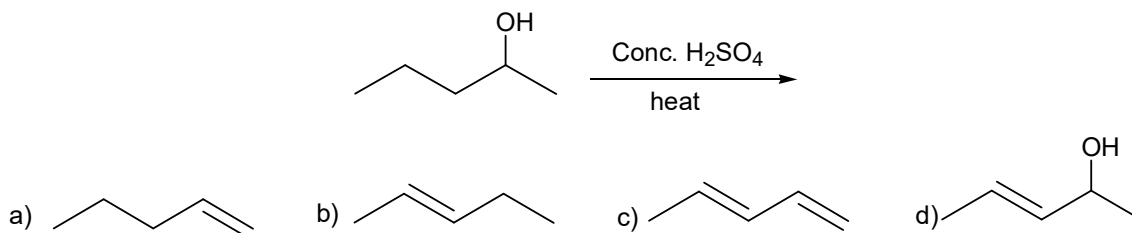
39. Which of the following dibromides would yield 2-butyne upon dehydrohalogenation?



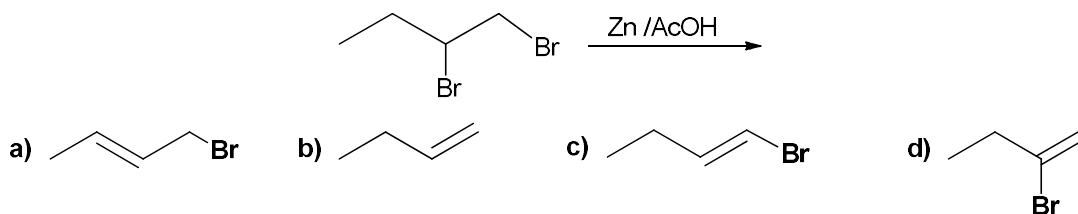
40. The product of the following reaction  $\text{CH}_3-\underset{\text{H}}{\text{C}}=\text{CH}_2 \xrightarrow{\text{H}_3\text{O}^+}$  is



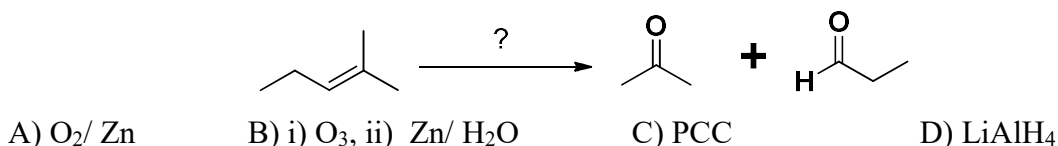
41. The major product of the following reaction is:



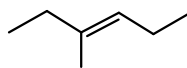
42. The product of the following reaction is:

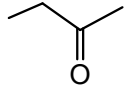
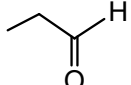
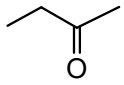
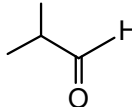
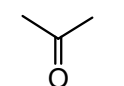
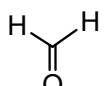
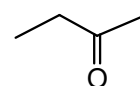



43. What is the best reagent needed for the reaction below?

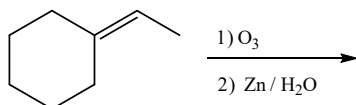


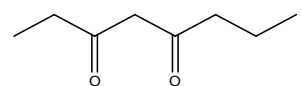
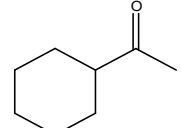
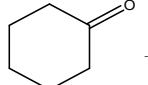
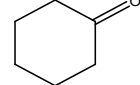
44. Ozonolysis of the following compound gives



- A)  + 
- B)  + 
- C)  + 
- D)  + 

45. Complete the following equation and choose the major product:



- A) 
- B) 
- C)  + CH3CHO
- D)  + CH3COOH

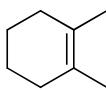
46. Ozonolysis of 2-methyl-1-octene gives:

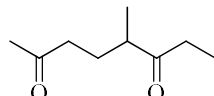
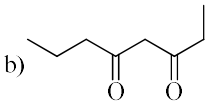
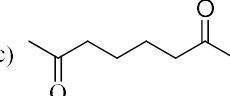
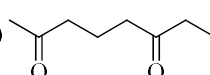
- A) Alcohol and aldehyde. B) Aldehyde and ketone.  
 C) Diketone D) Dialdehyde

47. Ozonolysis of 2,3-Dimethyl-2-pentene results in the formation of

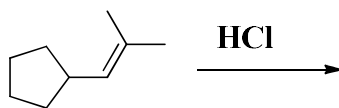
- A) Two aldehydes B) Two ketones  
 C) One aldehyde and one ketone D) Dialdehyde

48. Ozonolysis of the following compound gives:

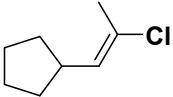
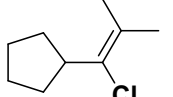
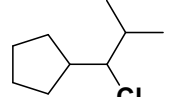
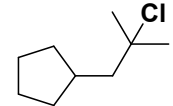


- a)     b)     c)     d) 

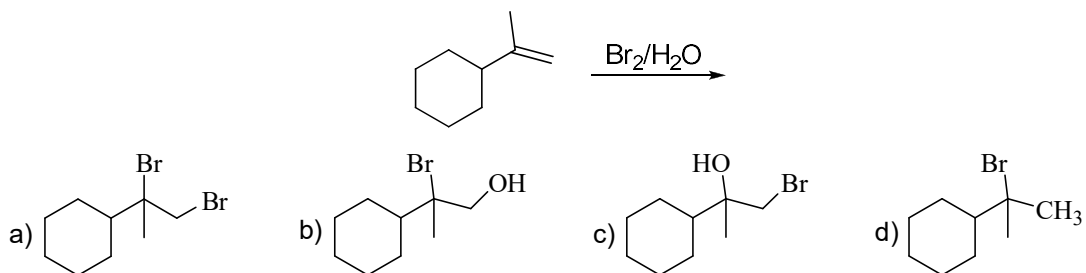
49. The product of the following reaction



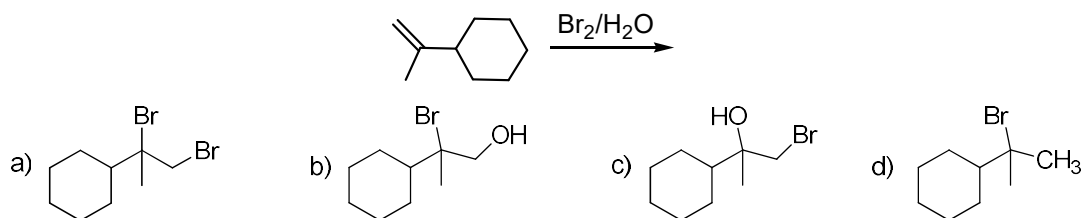
is

- A)     B)     C)     D) 

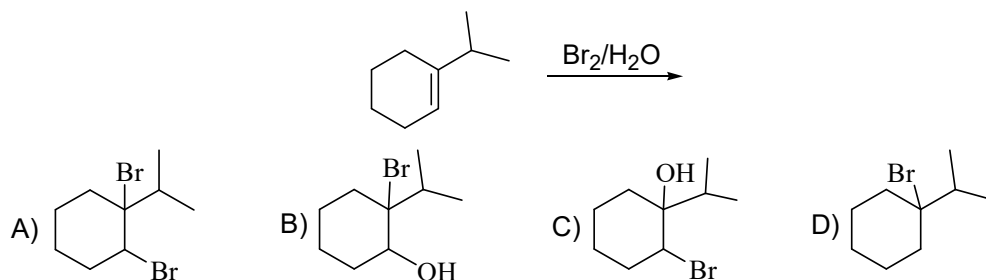
50. The product of the reaction shown below is



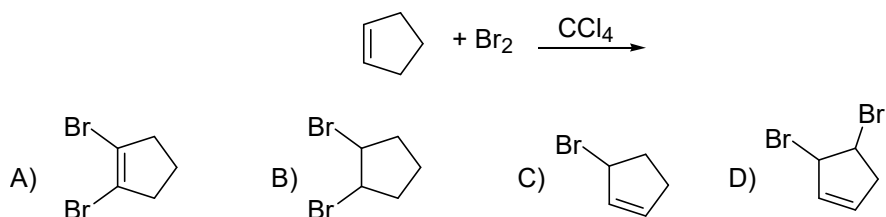
51. The major product of the reaction shown below is:



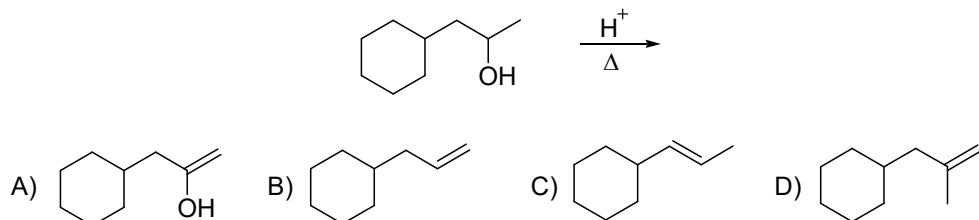
52. The product of the reaction shown below is



53. Complete the following equation and choose the major product:

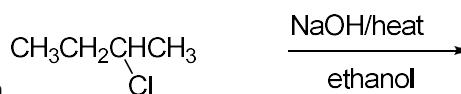


54. Complete the following equation and choose the major product:



55. The major product for the following reaction

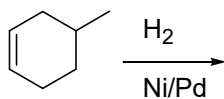
is:





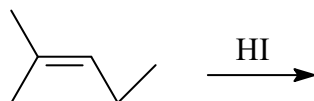
- A)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_3$     B)  $\text{CH}_3\text{-CH=CH-CH}_3$     C)  $\text{CH}_3\text{-}\underset{\text{OH}}{\text{CH}}\text{-CH}_2\text{-CH}_3$     D)  $\text{CH}_3\text{-CH-CH=CH}_2$

56. Complete the following equation and choose the right product:



- A)    B)    C)    D)

57. The major product of the reaction is:

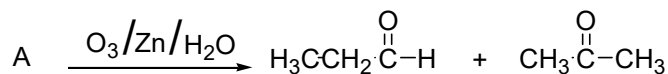


- A) 3-Iodo-2-methylpentane    B) 2-Iodo-2-methylpentane  
C) 2-Iodoisopentane    D) 3-Iodoisopentane

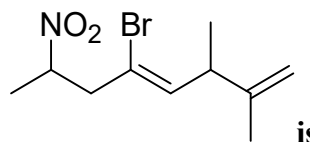
58. The incorrect answer about the Compound  $\text{H}_3\text{C-CH=CH-CH}_3$  is:

- A) Can exist as *trans* or *cis*  
B) The name of the compound: 2-butene  
C) Addition of the water gives two structural isomers  
D) Hydrogenation gives Butane

59. What is the structural formula of A in the following Reaction?



- A)  $\text{CH}_3\text{CH}_2\text{-CH}=\text{CH-CH}_3$     B)  $\text{CH}_3\text{CH}_2\text{-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{=C-CH}_2\text{CH}_3$   
C)  $\text{CH}_3\text{CH}_2\text{-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{=C-CH}_3$     D)  $\text{CH}_3\text{CH}_2\text{-C}=\overset{\text{CH}_3}{\text{C}}\text{-CH}_3$



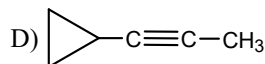
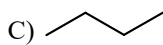
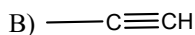
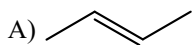
69. The IUPAC name for the following compound is

- A) 5-Bromo-2,3-dimethyl-7-nitro-1,4- octadiene  
B) 5-Bromo-2,3-dimethyl-7-nitro-1,4- dioctene  
C) 3-Bromo-6,7-dimethyl-2-nitro-4,7-octadiene

D) 2,3-Dimethyl-5-bromo-7-nitro-1,4-dioctene

## ALKYNES

60. Which of the following compounds is more acidic:



61. Addition of 2 moles HBr to 1-pentyne gives:

A) 1-Bromopentene

C) 2,2-Dibromopentene

B) 1,2-Dibromopentane

D) 2,2-Dibromopentane

62. The addition of 2 moles HBr to 1-Butyne gives:

A) 2,3-Dibromobutane

B) 1,3-Dibromobutane

C) 1,1-Dibromobutane

D) 2,2-Dibromobutane

63. Acetylene is the Common name for?

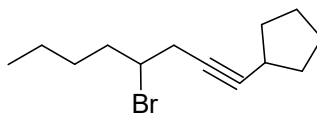
A) Ethene

B) Ethyne

C) Propene

D) Ethane

64. The correct IUPAC name of



A) 1-Cyclopentanyl-4-bromo-1-yne

B) 8-Cyclopentanyl-5-bromo-1-yne

C) 4-Bromo-1-cyclopentanyl-1-octyne

D) 2-Bromo-3-cyclopentanyl-1-octyne

65. The product of the following reaction is :



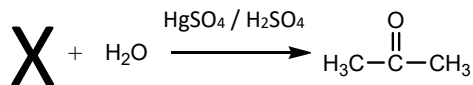
A) *cis*-2-Butene

C) *trans*-2-Butene

B) *trans*-2-pentene

D) Butane

66. What is the starting material (X) used in the following reaction?



A) 1-propanol

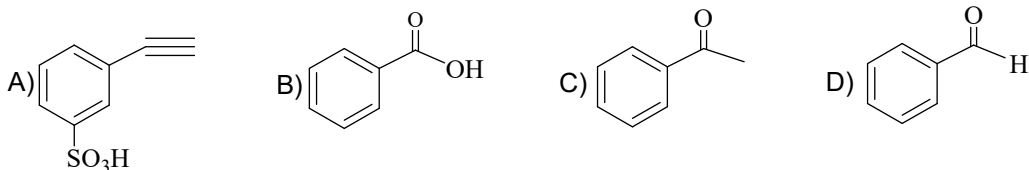
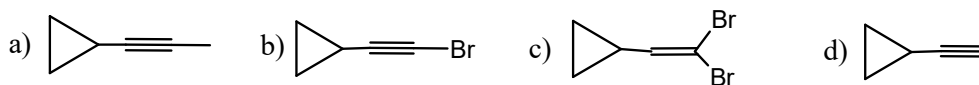
B) Propyne

C) 2-propanol

D) Propene

67. The unknown compound X is:





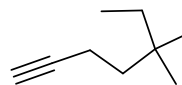
69. Reaction of alkynes with HBr is an example of

- A) Electrophilic substitution reaction. B) Free radical addition reaction.  
C) Electrophilic addition reaction. D) Nucleophilic substitution reaction

70. The **incorrect answer** about the Acetylene is:

- A) The carbon atoms are sp hybridized  
B) oxidizes to give Ethene  
C) Reacts with the base NaNH<sub>2</sub>  
D) Follow the general formula C<sub>n</sub>H<sub>2n-2</sub>

82. What is the correct name for the following compound?



- A) 3,3-Dimethyl-1-heptyne B) 5,5-Dimethyl-1-heptene  
C) 5,5-Dimethyl-1-heptyne D) 5-Ethyl-5-methyl-1-hexyne