

## Hydrocarbon – Alkyne

## 11. Preparation of Alkyne

- Q 1. Which molecule is less reactive towards Electrophilic addition reaction  
 (A)  $\text{CH}_3 - \text{CH} = \text{CH}_2$  (B)  $\text{CH}_2 = \text{CH}_2$   
 (C)  $\text{HC} \equiv \text{CH}$  (D)  $\text{CH}_3 - \text{C} \equiv \text{CH}$
- Q 2. In the reaction  

$$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH} - \text{CH}_3 \\ | \quad | \\ \text{Br} \quad \text{Br} \end{array} \xrightarrow[1\text{st step}]{\text{Alc. KOH}}$$

$$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{C} - \text{CH}_3 \\ | \\ \text{Br} \end{array} \xrightarrow[2\text{nd step}]{\text{Alc. KOH}}$$

$$\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$$
 Which statement is correct about above reaction  
 (A) 1st elimination is slower than 2<sup>nd</sup> elimination  
 (B) 1st elimination has same orientation of 2<sup>nd</sup> elimination  
 (C) Acidic strength of hydrogen is more Dominating in 2<sup>nd</sup> step  
 (D) None of these
- Q 3. In the reaction  

$$\begin{array}{c} \text{Br} \\ | \\ \text{CH}_3 - \text{C} - \text{CH}_2 - \text{CH}_3 \\ | \\ \text{Br} \end{array} \xrightarrow{\text{Alc. KOH}} \text{A}$$

$$\xrightarrow{\text{B}} \text{HC} \equiv \text{C} - \text{CH}_2 - \text{CH}_3$$
 A & B are  

$$\text{CH}_3 - \text{C} = \text{CH} - \text{CH}_3 \text{ \& \& } \text{KOH}$$
 (A) 
$$\begin{array}{c} \text{Br} \\ | \\ \text{CH}_3 - \text{C} - \text{CH}_2 - \text{CH}_3 \\ | \\ \text{Br} \end{array}$$
  
 (B)  $\text{H}_2\text{C} = \text{C} - \text{CH}_2 - \text{CH}_3$  &  $\text{Alc KOH}$   
 $\text{CH}_2 = \text{C} - \text{CH}_2 - \text{CH}_3$  &  $\text{NaNH}_2$   
 (C) 
$$\begin{array}{c} \text{Br} \\ | \\ \text{CH}_3 - \text{C} = \text{CH} - \text{CH}_3 \\ | \\ \text{Br} \end{array}$$
 &  $\text{NaNH}_2$   
 (D) 
$$\begin{array}{c} \text{Br} \\ | \\ \text{CH}_3 - \text{C} - \text{CH}_2 - \text{CH}_3 \\ | \\ \text{Br} \end{array}$$
- Q 4. Which carbides produce Alkyne on hydrolysis?  
 (A)  $\text{Mg}_2\text{C}_3$  (B)  $\text{Al}_4\text{C}_3$   
 (C)  $\text{CaC}_2$  (D)  $\text{Zn}_2\text{C}$
- Q 5. Which of these will not react with acetylene ?  
 (A)  $\text{NaOH}$  (B) ammonical  $\text{AgNO}_3$   
 (C)  $\text{Na}$  (D)  $\text{HCl}$
- Q 6. Which of the following form ionic alkynides with  $\text{R} - \text{C} \equiv \text{C} - \text{H}$   
 (A)  $\text{NaNH}_2$  (B)  $\text{Ag}(\text{NH}_3)_2 \text{Cl}$   
 (C)  $\text{Cu}(\text{NH}_3)_4 \text{Cl}_2$  (D) All of these
- $$\text{HC} \equiv \text{CH} + \text{NaNH}_2 + \text{CH}_3\text{I} \xrightarrow[2\text{eq.}]{2\text{eq.}}$$
 Product, is
- Q 7.  
 (A)  $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$   
 (B)  $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$   
 (C) 
$$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} = \text{CH}_2 \end{array}$$
  
 (D) None of these
- Q 8. Which of the following can react with internal Alkynes?  
 (A)  $\text{Ag}(\text{NH}_3)_2 \text{Cl}$  (B)  $\text{Cu}(\text{NH}_3)_4 \text{Cl}_2$   
 (C)  $\text{NaNH}_2$  (D) None of these
- Q 9. In the reaction, 'X' is  

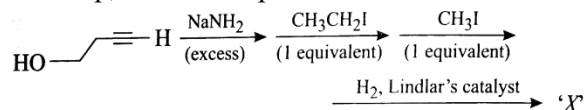
$$\text{HC} \equiv \text{CH} + 2\text{AgNO}_3 \xrightarrow{\text{NH}_4\text{OH}} \text{'X'} + 2\text{NH}_4\text{NO}_3 + 2\text{H}_2\text{O}$$
 (A)  $\text{Ag}_2\text{C}_2$  (B)  $\text{Ag}_2\text{C}$   
 (C)  $\text{AgC}$  (D)  $\text{AgOH}$
- Q 10. Which of the following alkynes is most acidic ?  
 (A)  $\text{CH}_3 - \text{C} \equiv \text{CH}$   
 (B)  $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$   
 (C)  $\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{CH}$   
 (D)  $\text{HC} \equiv \text{CH}$
- Q 11. Ammoniacal silver nitrate forms a white precipitate easily with  
 (A)  $\text{CH}_3\text{CH} = \text{CH}_2$  (B)  $\text{CH}_3 - \text{C} \equiv \text{CH}$   
 (C)  $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$  (D)  $\text{H}_2\text{C} = \text{CH}_2$
- Q 12. The reagent(s) for the following conversion,  

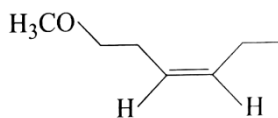
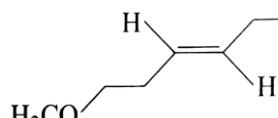
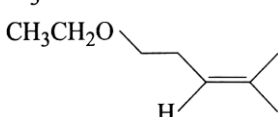
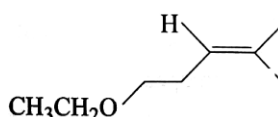
$$\text{Br} - \text{CH}_2 - \text{CH}_2 - \text{Br} \xrightarrow{?} \text{H} - \text{C} \equiv \text{C} - \text{H}$$

Is/are

- (A) alcoholic KOH  
 (B) alcoholic KOH followed by  $\text{NaNH}_2$   
 (C) aqueous KOH followed by  $\text{NaNH}_2$   
 (D)  $\text{Zn}/\text{CH}_3\text{OH}$

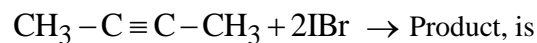
Q 13. In the following sequential transformation, considering only the major products formed in each step, what is the product 'X' ?

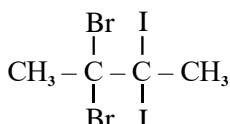
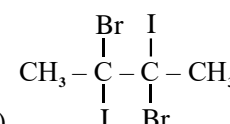
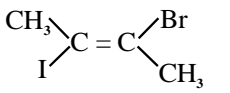


- (A) 
- (B) 
- (C) 
- (D) 

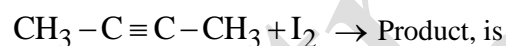
## 12. Reaction of Alkyne

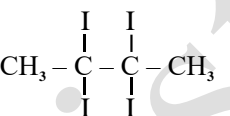
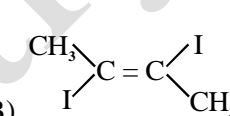
- Q 1. Acetylene gas has garlic like smell due to presence of  
 (A) Impurities like ethylene  
 (B) Impurities like  $\text{H}_2\text{S}$ ,  $\text{PH}_3$   
 (C) smell of Acetylene  
 (D) Alkynes have no smell
- Q 2. Which of the following react with NaOH  
 (A)  $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3$   
 (B)  $\text{CH}_3-\text{C}\equiv\text{CH}$   
 (C)  $\text{CH}_3-\text{CH}=\text{CH}_2$   
 (D) None of these
- Q 3. In the reaction



- (A) 
- (B) 
- (C) 
- (D) None of these

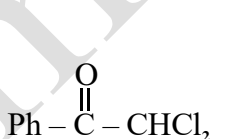
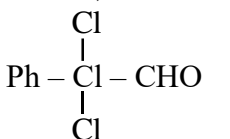
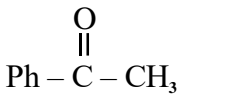
Q 4. In the reaction



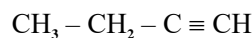
- (A) 
- (B) 
- (C)  $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$  (D) None of these

Q 5. In the reaction



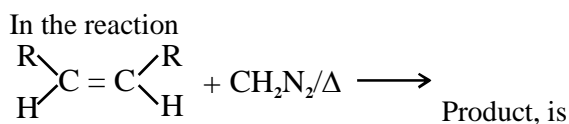
- (A) 
- (B) 
- (C) 
- (D)  $\text{Ph}-\text{CH}_2-\text{CHO}$

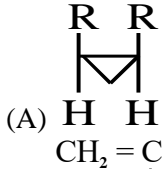
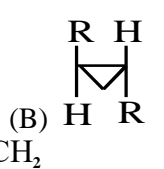

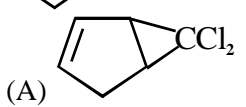
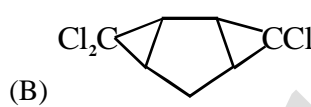
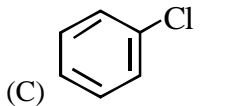
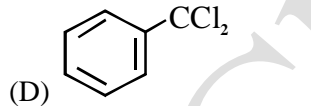
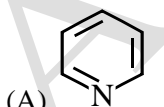
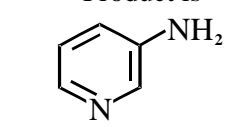
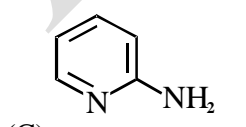
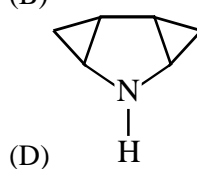
Q 6.



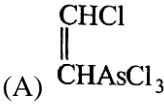
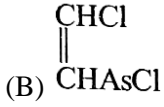
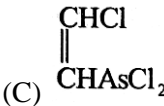
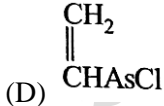
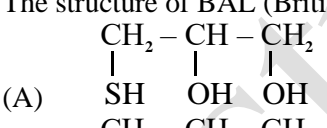
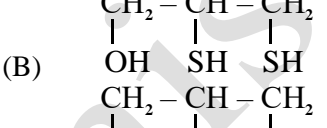
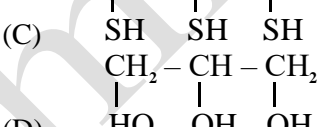
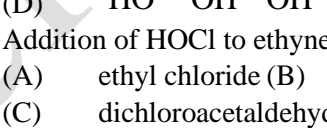
- one equi. of  $\text{Br}_2$  → A  
 one equi. of  $\text{BBr}$  → B  
 Two equi. of  $\text{HBr}$  → C  
 one equi. of  $\text{HBr}$  in presences of  $\text{R}_2\text{O}_2$  → D  
 $\text{H}_2$  (excess)pt → E  
 $\text{H}_2/\text{Pd}/\text{BaSO}_4$  → F  
 quinoline → G  
 1.  $\text{NaNH}_2/\text{NH}_3$   
 2.  $\text{CH}_3\text{I}$  → G  
 1.  $\text{NaNH}_2/\text{NH}_3$   
 2.  $(\text{CH}_3)_3\text{CBr}$  → H+I  
 $\text{Ag}(\text{NH}_3)_2\text{Cl}$  → J

Q 7.

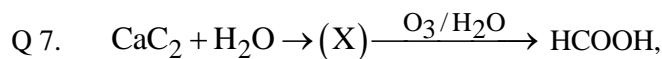


- Q 8. In the reaction  $R-C\equiv C-R + CH_2N_2/\Delta \rightarrow$  Product, is
- (A)  (B) 
- (C)  (D) None of these
- Q 9. In the reaction  $\text{Cyclopentadiene} + CHCl_3 / NaOH \rightarrow$
- (A)  (B) 
- (C)  (D) 
- Q 10. In the reaction  $R_2C=CH_2 + \text{Carbene} \rightarrow$  d - l pair
- The type of carbene is
- (A) Singlet (B) Triplet  
(C) Any carbene (D) None of these
- Q 11. In the reaction  $\text{Pyrrole} + CH_2N_2/\Delta \rightarrow$
- Product is
- (A)  (B) 
- (C)  (D) 

## 13. Reaction of Alkynes

- Q 1. Structural formula for lewisite is
- (A)  (B) 
- (C)  (D) 
- Q 2. The structure of BAL (British anti lewisite) is
- (A)  (B) 
- (C)  (D) 
- Q 3. Addition of HOCl to ethyne gives
- (A) ethyl chloride (B) vinyl chloride  
(C) dichloroacetaldehyde (D) ethylidene chloride
- Q 4. Identify the product in the reaction  $\text{Ph}-C\equiv C-\text{Me} \xrightarrow{H_3O^+, Hg^{2+}} ?$
- (A)  $\text{PhCH}_2\text{CH}_2\text{CHO}$  (B)  $\text{PhCOCH}_2\text{CH}_3$   
(C)  $\text{PhCH}_2\text{COCH}_3$  (D)  $\text{PhCOCOME}$
- Q 5. The reagents to carry out the following conversion  $\text{Me}-\text{C}\equiv\text{C}-\text{Me} \rightarrow \text{Me}-\text{CH}_2-\text{C}(=\text{O})-\text{Me}$  are
- (A)  $\text{HgSO}_4 / \text{dil. H}_2\text{SO}_4$   
(B)  $\text{BH}_3; \text{H}_2\text{O}_2 / \text{NaOH}$   
(C)  $\text{NaNH}_2 / \text{CH}_3\text{I}; \text{HgSO}_4 / \text{dil. H}_2\text{SO}_4$   
(D)  $\text{OsO}_4; \text{HIO}_4$
- Q 6. Identify the alkyne in the following sequence of reactions?
- Alkyne  $\xrightarrow[\text{Lindlar's catalyst}]{\text{H}_2}$  (A)  $\xrightarrow{\text{Ozonolysis}}$  (B)  $\xleftarrow[\text{Only}]{\text{Wacker Process}}$   $\text{H}_2\text{C}=\text{CH}_2$
- (A)  $\text{H}_3\text{C}-\text{C}\equiv\text{C}-\text{CH}_3$

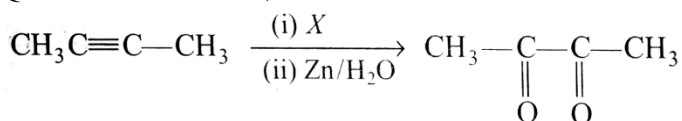
- (B)  $\text{H}_3\text{C}-\text{CH}_2-\text{C}\equiv\text{CH}$   
 (C)  $\text{H}_2\text{C}=\text{CH}-\text{C}\equiv\text{CH}$   
 (D)  $\text{HC}\equiv\text{C}-\text{CH}_2-\text{C}\equiv\text{CH}$



(X) is

- (A)  $\text{C}_2\text{H}_4$  (B)  $\text{C}_2\text{H}_2$   
 (C)  $\text{C}_2\text{H}_6$  (D)  $\text{Ca}(\text{OH})_2$

Q 8. In the reaction,



X is

- (A)  $\text{HNO}_3$  (B)  $\text{O}_2$   
 (C)  $\text{O}_3$  (D)  $\text{KMnO}_4$

Q 9. When propyne is treated with aqueous  $\text{H}_2\text{SO}_4$

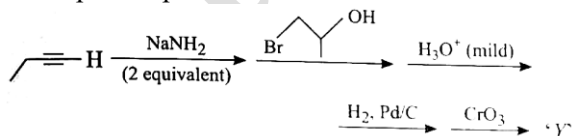
in presence of  $\text{HgSO}_4$  the major product is

- (A) propanal (B) propyl hydrogensulphate  
 (C) acetone (D) propanol

Q 10. The product(s) obtained via oxymercuration ( $\text{HgSO}_4 + \text{H}_2\text{SO}_4$ ) of 1-butyne would be

- (A)  $\text{CH}_3-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$   
 (B)  $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CHO}$   
 (C)  $\text{CH}_3\text{CH}_2\text{COOH} + \text{HCHO}$   
 (D)  $\text{CH}_3\text{CH}_2\text{COOH} + \text{HCOOH}$

Q 11. In the following sequential transformation, considering only the major products formed in each step, what is the correct statement with respect to product 'Y' is ?



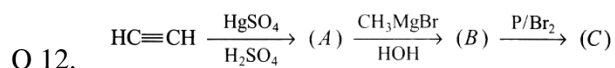
(A)

It gives a positive Tollen's test and is a functional isomer of 'X'

(B) It gives a positive Tollen's test and is a geometrical isomer of 'X'

(C) It gives a positive iodoform test and is a functional isomer of 'X'

(D) It gives a positive iodoform test and is a geometrical isomer of 'X'



In this reaction, the final product (C) is

- (A)  $\text{CH}_3\text{CH}(\text{Br})\text{CH}_3$   
 (B)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$   
 (C)  $\text{CH}_2=\text{CHBr}$   
 (D)  $\text{BrHC}=\text{CH}-\text{CH}_3$

Q 13. Propyne on ozone treatment followed by oxidative degradation gives

- (A) 2 moles of  $\text{HCOOH}$   
 (B) 2 moles of  $\text{CH}_3\text{COOH}$   
 (C) 2-oxopropanal  
 (D)  $\text{CH}_3\text{COOH} + \text{HCOOH}$

Q 14. Butyne on reaction with hot alkaline  $\text{KMnO}_4$  gives

- (A)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$   
 (B)  $\text{CH}_3\text{CH}_2\text{COOH} + \text{CO}_2$   
 (C)  $\text{CH}_3\text{CH}_2\text{COOH} + \text{CO}_2$   
 (D)  $\text{CH}_3\text{CH}_2\text{COOH} + \text{HCOOH}$

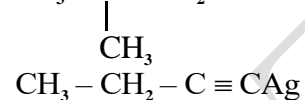
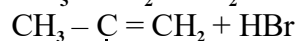
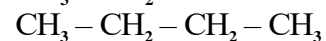
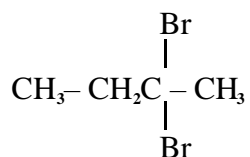
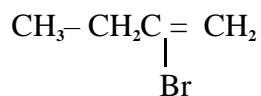
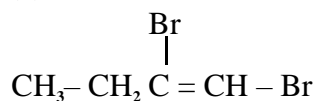
## Answer Key

## 11. Preparation of Alkyne

- (1). C            (2). B            (3). C  
 (4). C            (5). D            (6). A  
 (7). A            (8). C            (9). A  
 (10). D           (11). B           (12). B  
 (13). A

## 12. Reaction of Alkynes

- (1). B            (2). B            (3). A  
 (4). B            (5). A  
 (6).



- (7). A            (8). B            (9). C  
 (10). B           (11). A

## 13. Reaction of Alkynes

- (1). C            (2). B            (3). C  
 (4). B            (5). C            (6). A  
 (7). B            (8). C            (9). C  
 (10). A           (11). C           (12). A  
 (13). D           (14). D