1. To prepare But-2-yne from 2, 2, 3, 3-Tetrachlorobutane, reagent used is :

(a) Zinc dust / Δ (b) Sodamide
(c) Alc. KOH (d) aq. KOH

2. Which of the following compounds on hydrolysis gives propyne ?

(a) CaC_2 (b) Mg_2C_3
(c) Al_4C_3 (d) Cu_2Cl_2

3. Which of the following will react most readily with bromine?

(a) $CH \equiv CH$ (b) $CH_2 = CH_2$
(c) $CH_3CH = CH_2$ (d) $CH_3CH_2CH_3$.

4. Most Acidic hydrogen is present in:

(a) ethyne (b) ethene
(c) benzene (d) ethane

5. The product/s obtained when 1-pentyne is reacted with H_2O, H^+, Hg^{+2} is/are

(a) $CH_3COCH_2CH_2CH_3$ (b) $CH_3CH_2COCH_2CH_3$
(c) $CH_3CH_2CH_2COOH + HCOOH$ (d) $CH_3CH_2CH_2CH_2COOH$.

6. $CH_3 - C \equiv C - CH_3 \xrightarrow[(2)\ Br_2]{(1)\ H_2/Pd/CaCO_3 \text{ or } BaSO_4} X$

(a) (d)-2, 3-Dibromobutane (b) (l)-2, 3-Dibromobutane
(c) (dl)-2, 3-Dibromobutane (d) meso-2, 3-Dibromobutane

7. Acetylene reacts with excess of hypochlorous acid to produce

(a) Acetylene tetrachloride (b) Acetylene chlorohydrin
(c) Acetaldehyde (d) Dichloroacetaldehyde.

8. 1-Butyne can be converted into 1-bromo-1-butene by reacting it with which of the following reagent?

(a) HBr (b) HBr and $(C_6H_5\ COO)_2$
(c) Br_2 and H_2O (d) Br_2 and CCI_4

9. When 1-butyne is treated with excess of HBr, the expected product is

(a) 1, 2-Dibromobutane (b) 2, 2-Dibromobutane
(c) 1, 1-Dibromobutane (d) All the above

10. Acetylene on treatment with dil. H_2SO_4 having $HgSO_4$ gives :

(a) acetaldehyde (b) acetic acid
(c) ethanol (d) ethylene

11. A five carbon atom alkyne forms a sodium salt on treatment with sodamide. The alkyne is

(a) $CH_3CH_2CH_2C \equiv CH$ (b) $CH_3C \equiv CCH_2CH_3$

(c) $(CH_3)_2$ CHC ≡ CH (d) Either (a) or (c).

12. Which of the following reagents will distinguish between 1-butyne and 2-butyne?

(a) Br_2/ CCI_4 (b) $AgNO_3$ + NH_4OH

(c) Dil. Cold $KMnO_4$ (d) $KMnO_4$

13. $CH \equiv CH \xrightarrow[\text{Pressure}]{Ni(CN)_2} X$. Here *X* in the reaction

(a) Benzene (b) Ethane

(c) Cycloctatetraene (d) Cyclohexane

14. Acetylene gives

(a) White precipitate with $AgNO_3$ and red precipitate with Cu_2Cl_2

(b) White precipitate with Cu_2Cl_2 and red precipitate with $AgNO_3$

(c) White precipitate with both the reagents

(d) Red precipitate with both the reagents

15. Which of the *C* - *C* bond is strongest

(a) Formed by $sp^3 - sp^3$ hybridised carbon atoms (as in alkanes)

(b) Formed by $sp^2 - sp^2$ hybridised carbon atoms (as in alkenes)

(c) Formed by $sp - sp$ hybridised carbon atoms (as in alkynes)

(d) All are equal

16. A gas decolourises bromine in CCl_4 and forms a precipitate with ammoniacal silver nitrate. The gas is

(a) C_2H_2 (b) C_2H_4

(c) C_2H_6 (d) CH_4

17. When acetylene reacts with *HCl* in the presence of $HgCl_2$, the product is

(a) Methyl chloride (b) Dichloroethane

(c) Vinyl chloride (d) Ethylidine chloride

18. When treated with ammoniacal cuprous chloride, which one among the following forms copper derivative

(a) C_2H_6 (b) C_2H_4

(c) C_2H_2 (d) C_6H_6

19. Which of the following is used to distinguish ethylene and acetylene

(a) Alkaline $KMnO_4$

(b) Bromine water

(c) Ammoniacal cuprous chloride

(d) Conc. H_2SO_4

20. $\begin{matrix} CH \\ \| \\ CH \end{matrix}$ reacts with acetic acid in presence of Hg^{2+} to give

(a) $\begin{matrix} CH_3 \\ | \\ CH(CH_3COO)_2 \end{matrix}$ (b) $\begin{matrix} CH(CH_3COO)_2 \\ | \\ CH(CH_3COO)_2 \end{matrix}$

(c) $\overset{CH_3}{\underset{CH_2(CH_3COO)}{|}}$ (d) None of these

21. Which will undergo reaction with ammoniacal $AgNO_3$

(a) $\left.\begin{matrix}CH_3\\CH_3\end{matrix}\right\rangle CH-CH_2-CH=CH-CH_3$

(b) $CH_3-CH=CH-C\equiv CH$

(c) $CH_3-CH_2-CH=CH-CH_2-CH_3$

(d) $CH_2=CH-CH_2-CH_3$

(e) None

22. $\overset{CH}{\underset{CH}{|||}} \xrightarrow{O_3/NaOH} X \xrightarrow{Zn/CH_3COOH} Y$ 'Y' is

(a) $\overset{CH_2OH}{\underset{CH_2OH}{|}}$ (b) CH_3CH_2OH

(c) CH_3COOH (d) CH_3OH

23. What is the product when 2-butyne is treated with liquid NH_3 in presence of lithium

(a) *n*-butane (b) *cis*-2-butene

(c) *trans*-2-butene (d) 1-butene

24. Number of acidic hydrogen atoms in butyne-1 are

(a) 2 (b) 3

(c) 1 (d) 4

25. Addition of *HCN* to ethyne in presence of $Ba(CN)_2$ as catalyst gives

(a) 1, 1-dicyano ethane (b) Ethyl cyanide

(c) Vinyl cyanide (d) Divinyl cyanide

26. Which of the following is weakly acidic

(a) $CH_2=CH_2$ (b) C_6H_6

(c) $CH_3-C\equiv CH$ (d) $CH_3-C\equiv C-CH_3$

27. Acetylene can be obtained by the reaction

(a) $HCOOK \xrightarrow{\text{electrolysis}}$

(b) $CHI_3+6Ag+CHI_3 \xrightarrow{\Delta}$

(c) $CH_3CH_2OH \xrightarrow[443\,^\circ C]{\text{Conc. } H_2SO_4}$

(d) $Be_2C+H_2O \rightarrow$

28. What happens when a mixture of acetylene an hydrogen is passed over heated Lindlar's catalyst

(a) Ethane and water are formed

(b) Ethylene is formed

(c) Acetylene and ethane are formed

(d) None of these

29. $CH \equiv CH \xrightarrow[H_2SO_4]{HgSO_4} \xrightarrow[H_2O]{CH_3MgBr} \xrightarrow{P/Br_2}$

(a) $CH_3CH(Br)CH_3$ (b) $CH_3CH_2CH_2Br$

(c) $CH_2 = CH - Br$ (d) $BrCH = CH - CH_3$

30. Carbide, which react with water to give propyne is

(a) CaC_2 (b) SiC

(c) Mg_2C_3 (d) Al_4C_3

(e) Be_2C

1. (a) $CH_3-\underset{Cl}{\overset{Cl}{C}}-\underset{Cl}{\overset{Cl}{C}}-CH_3 \xrightarrow{Zn\,dust} CH_3-C\equiv C-CH_3$ (But -2-yne)

2. (b) $2Mg^{+2}(\bar{C}\equiv C-C^{3-}) \xrightarrow{H_3O^+} Mg(OH)_2 + CH\equiv C-CH_3$ (Propyne)

3. (c)

4. (a) Most Acidic hydrogen is present in ethyne.

5. (a)

6. (c) $CH_3-C\equiv C-CH_3 \xrightarrow[\text{Lindlar's}]{(1)\ H_2/Pd/CaCO_3} \underset{\text{Cis}}{\overset{H_3C}{\underset{H}{}}C=C\overset{CH_3}{\underset{H}{}}} \xrightarrow[\text{Anti addition}]{Br_2}$ (dℓ) - 2, 3 dibromo butane

7. (d) $H-C\equiv C-H + HO-Cl \longrightarrow \underset{Cl}{\overset{}{CH}}=\underset{OH}{\overset{}{CH}} \xrightarrow{HOCl} Cl_2CH-\underset{OH}{\overset{H}{C}}-O-H \xrightarrow[-H_2O]{} Cl_2CH-\overset{H}{C}=O$

unstable

8. (b) 1-Butyne can be converted into 1-bromo-1-butene by antimarkownikoff. Addition of H-Br in presence of peroxide.

9. (b) $CH_3-CH_2-C\equiv C-H \xrightarrow{HBr} CH_3-CH_2-\underset{Br}{\overset{}{C}}=CH_2 \xrightarrow{HBr} CH_3-CH_2-\underset{Br}{\overset{Br}{C}}-CH_3$

10. (a) $H-C\equiv C-H + H_2O \xrightarrow{Hg^{+2}} CH_2=\underset{OH}{\overset{}{CH}} \rightleftharpoons CH_3CHO.$

11. (d)

12. (b) 1-butyne and 2-Butyne can be distinguish by ammonical silver nitrate solution.

13. (c)

$4\,CH\equiv CH \xrightarrow[Pressure]{Ni(CN)_2}$ 

Cyclo octatatraene

14. (a) $CH_3\equiv CH + \underset{\text{(Ammonical)}}{AgNO_3} \rightarrow \underset{\text{White ppt.}}{Ag-C\equiv C-Ag}$

$CH_3\equiv CH + \underset{\text{(Ammonical)}}{CuCl_2} \rightarrow \underset{\text{Red ppt.}}{Cu-C\equiv C-Cu}$

15. (c) $sp-sp > sp^2-sp^2 > sp^3-sp^3$

Order of bond strength

16. (a) $CH \equiv CH + 2Br_2 \xrightarrow{CCl_4} \underset{Br}{\overset{Br}{\overset{|}{CH}}} - \underset{Br}{\overset{Br}{\overset{|}{CH}}}$

$CH \equiv CH + NH_4OH + AgNO_3 \rightarrow \underset{\text{Di-silver acetylide white ppt.}}{Ag - C \equiv C - Ag}$

17. (c) $CH \equiv CH + HCl \xrightarrow{HgCl_2} \underset{\text{Vinyl chloride}}{CH_2 = CH - Cl}$

18. (c) $2NH_4OH + Cu_2Cl_2 \rightarrow 2CuOH + 2NH_4Cl$

$NH_4OH + CuOH \rightarrow \underset{\text{Diammine copper (I) hydroxide}}{[Cu(NH_3)_2]OH}$

$2[Cu(NH_3)_2]OH + HC \equiv CH \rightarrow \underset{\text{copper acetylide Red ppt.}}{Cu - C \equiv C - Cu} + 4NH_3 + 2H_2O$

19. (c)Acetylene reacts with ammonical cuprous chloride to give brown *ppt* where as ethylene does not give this reaction.

20. (a) Reaction of acetic acid with acetylene is catalysed by Hg^{2+} salts.

$HC \equiv CH \xrightarrow[Hg(OOCCH_3)_2]{CH_3COOH} \underset{\text{vinyl acetate}}{CH_2 = CHOOCCH_3}$

$\xrightarrow[Hg(OOCCH_3)_2]{CH_3COOH} \underset{\text{ethylidene diacetate}}{CH_3 - CH(OOCCH_3)_2}$

21. (b) $CH_3 - CH = CH - C \equiv C - H$. Acidic hydrogen (H atom attached to triple bond) is present therefore it gives reaction with ammoniacal $AgNO_3$.

22. (a) $(CH \equiv CH) \xrightarrow[NaOH]{O_3} CH - CH \xrightarrow{Hydrolysis}$

$\underset{\text{Glyoxal}}{CHO - CHO} \xrightarrow[CH_3COOH]{Zn} \begin{matrix} CH_2 - OH \\ | \\ CH_2 - OH \end{matrix}$

23. (c) Reduction of alkynes with liquid NH_3 / Li gives trans alkenes.

24. (c)The hydrogen atom which is attached to triple bond is acidic.

25. (c) $CH \equiv CH + HCN \xrightarrow{Ba(CN)_2} \underset{\text{Vinyl cyanide}}{CH_2 = CH - C \equiv N}$

26. (d) $CH_3 - C \equiv C - CH_3$ has not acidic character.

27. (b) Acetylene can be obtained by the reaction of silver and chloroform (or iodo form)

$2CHI_3 + 6Ag \xrightarrow{\Delta} \underset{\text{acetylene}}{C_2H_2} + 6AgI$

28. (b) $\underset{\text{Acetylene}}{CH \equiv CH} + H_2 \xrightarrow[\text{Catalyst pd. } BaSO_4]{\text{Lindlar}} \underset{\text{Ethylene}}{CH_2 = CH_2}$

29. (a) $CH \equiv CH \xrightarrow[H_2SO_4]{HgSO_4} CH_3CHO \xrightarrow{CH_3MgBr}$

$$CH_3-\underset{\displaystyle H}{\overset{\displaystyle OMgBr}{\overset{|}{\underset{|}{C}}}}-CH_3 \xrightarrow{H_2O} CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle OH}{\overset{|}{\underset{|}{C}}}}-H \xrightarrow{P/Br_2} CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle Br}{\overset{|}{\underset{|}{C}}}}-H$$

30. (c) $Mg_2C_3 + 4H_2O \rightarrow CH_3C \equiv CH + 2Mg(OH)_2$