

# CHEMISTRY

## 5. PRINCIPLES OF METALLURGY

1. What is an ore ? On what basis a mineral is chosen as an ore ?
2. Write the names of any two ores of iron.
3. Define the terms : i) gangue ii) slag.
4. Mention two methods which produce very pure metals.
5. What is the role of furnace in metallurgy ?
6. What is metallurgy ?
7. What is the Bronze an alloy of ?
8. What are minerals ?
9. What is flux ?
10. What are the ores of magnesium ?
11. What are the fuel and flux for haematite ore?
12. Give some examples for corrosion.
13. Which pyrochemical process is useful to convert zinc blende into oxide ore ?
14. Why will stainless steel not rust ?
15. Why is sodium metal stored in kerosene ?

## 6. CARBON AND ITS COMPOUNDS

1. Write two uses of nano tubes
2. Match the following :

a) Alkanes	i) $C_nH_{2n}$
b) Alkenes	ii) $C_nH_{2n+2}$
c) Alkynes	iii) $C_nH_{2n-2}$

A) a -ii , b-i , c-iii      B) a -i , b- ii , c- iii      C) a-iii , b-i, c-ii
3.  $CH_3OH, C_2H_5OH, C_3H_7OH, \dots\dots\dots$ 
  - a) Is there any name to this type of given series ?
  - b) What would be the next compound in the given series ?
4. write characteristic properties of Homologous series of carbon compounds
5. Name the simplest hydrocarbon.
6. Name the carboxylic acid used as a preservative.
7. Name the product other than water formed on burning of ethanol in air.
8. A mixture of oxygen and ethyne is burnt for welding ; can you tell why a mixture of ethyne and air is not used?
9. Name the simplest ketone and write its molecular formula.
10. What do we call the Self linking property of carbon ?

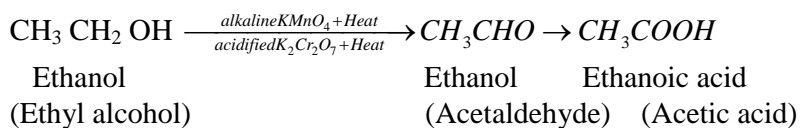
11. Name the product obtained when ethanol is oxidized by either chromic anhydride or alkaline potassium permanganate.
12. Write the IUPAC name of the next homologous of  $\overset{CH_3(OH)}{CH_2}CH_3$ .
13. Explain how sodium ethoxide is obtained from ethanol. Give chemical equations.
14. Describe with chemical equation how ethanoic acid may be obtained from ethanol.
15. What happens when a small piece of sodium is dropped into ethanol ?
16. "Diamond is the hardest natural substance but is brittle." Why?
17. What is polymerization ?
18. Write IUPAC names of the following compounds.

19. a) 
$$\begin{array}{c} CH_3 \quad CH_3 \\ | \quad | \\ CH_3 - C - C - CH_3 \\ | \quad | \end{array}$$
 b) What is glycerol? b)
20. Draw  $\begin{array}{c} Cl \\ | \\ CH_3 - CH - CH_2 COOH \end{array}$  the structure of 3 - methyl pentan-3-ol.

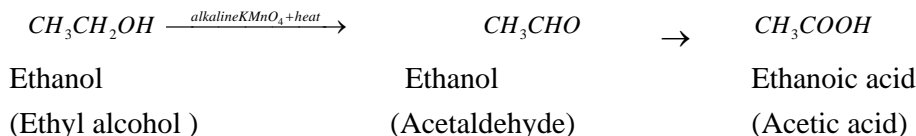


## 6. CARBON AND ITS COMPOUNDS (KEY)

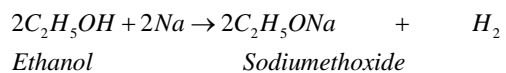
- Nano tubes are electrical conductors and can be used as molecular wires.
  - In integrated circuits nanotubes are used instead of copper to connect the components together.
- A
- a) Homologous series                      b) C<sub>4</sub>H<sub>9</sub>OH
- Characteristics of homologous series :
  - They have one general formula.  
**Ex :** alkanes (C<sub>n</sub>H<sub>2n+2</sub>), alkynes (C<sub>n</sub>H<sub>2n-2</sub>), alcohols (C<sub>n</sub>H<sub>2n+1</sub>) OH, etc.
  - Successive compounds in the series possess a difference of (-CH<sub>2</sub>) unit.
  - They have similar chemical properties due to the same functional group.
- The simplest hydrocarbon is alkane called Methane (CH<sub>4</sub>). It's an aliphatic, saturated compound of Hydrogen and Carbon.
- Vinegar with chemical formula CH<sub>3</sub>COOH is used as preservative. 5 - 8% of solution of acetic acid or ethanoic acid in water is called vinegar and it is used widely as preservative in pickles.
- C<sub>2</sub>H<sub>5</sub>OH + 3O<sub>2</sub> → 2CO<sub>2</sub> + 3H<sub>2</sub>O + Energy  
So, the product other than water formed on burning of ethanol in air is carbon dioxide (CO<sub>2</sub>).
- Ethyne when burnt in the presence of oxygen gives enough heat that can be used for welding.
  - Whereas if it is burnt in air which contains nitrogen, CO<sub>2</sub> and other inactive gaseous contents, sufficient oxygen is not available for burning ethyne to give the required heat.
- Acetone is the simplest ketone. Its molecular formula is CH<sub>3</sub>COCH<sub>3</sub> ' Its IUPAC name is propanone.
- The property of self combination (or linking) of carbon atoms to form long chains is useful to us because it gives rise to an extremely large number of carbon compounds (or organic compounds). This is known as catenation.
- Ethanol (Ethyl alcohol) undergoes oxidation to form the product of Acetaldehyde and finally Acetic acid.



- The IUPAC name of the next homologous of CH<sub>3</sub>OHCH<sub>2</sub>CH<sub>3</sub> is HO-CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub> 1 - butanol.
- As ethanol is similar to water molecule (H<sub>2</sub>O) with C<sub>2</sub>H<sub>5</sub> group in place of hydrogen, it reacts with metallic sodium to liberate hydrogen and form sodium ethoxide.  
2 C<sub>2</sub>H<sub>5</sub>OH + 2Na → 2 C<sub>2</sub>H<sub>5</sub>ONa + H<sub>2</sub>  
(Ethanol)                      (Sodium ethoxide)
- Ethyl alcohol (Ethanol) undergoes oxidation to form the product Acetaldehyde and finally acetic acid (Ethanoic acid).

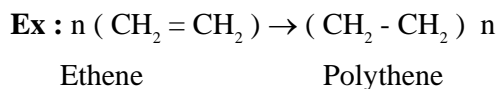


15. Ethanol reacts with sodium to liberate hydrogen and form sodium ethoxide.



16. Diamond is the hardest natural substance but is brittle and can be broken due to the property of cleavage.

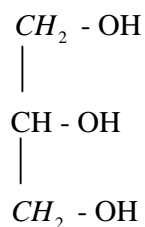
17. The reaction in which a large number of identical and simple molecules join together to form a large molecule is called 'polymerization'.



18. a) 2, 2, 3, 3 - tetra methyl butane

b) 3-chloro butan-1-oic acid.

19. The trihydroxy alcohol is called glycerol.



20.

