WORKSHEET 2

CHAPTER 4 – CARBON AND ITS COMPOUNDS

A. Tick (✓) the correct option.

1. Which of the following statements about covalent compounds is not correct?
   a. Covalent compounds are poor conductors of electricity.
   b. Covalent compounds are formed by sharing of electrons.
   c. Covalent compounds are soluble in non-polar solvents.
   d. Covalent compounds have high melting and boiling points.
2. The general formula of alkenes is
   a. C_nH_{2n} b. C_nH_{2n+2} c. C_nH_{2n-2} d. C_nH_{2n+1}
3. What is the functional group present in butanone?
   a. Ketone b. Aldehyde c. Carboxylic acid d. Alcohol
4. Which of the following will not undergo addition reaction?
   a. Acetylene b. Ethylene c. Ethane d. Propyne
5. Presence of which of the following salts causes hardness of water?
   a. Sodium carbonate b. Magnesium sulphate c. Potassium chloride d. Sodium chloride

B. Fill in the blanks.

1. A double bond is formed by sharing of _____ electrons.
2. There are _____ covalent bonds in ethane.
3. Fullerenes are a class of carbon _____ .
4. _____ hydrocarbons have double or triple between carbon atoms.
5. Soaps are _____ salts of long-chain carboxylic acids.

C. State whether the following statements are true or false.

1. Ammonia is a covalent compound.
2. General formula of saturated cyclic hydrocarbons is C_nH_{2n}.
3. Saturated hydrocarbons generally give a sooty flame.
4. In a soap molecule, the tail is hydrophilic while the head is hydrophobic.
5. Detergents are non-biodegradable.

Name: ..... Teacher's signature: .....

Class: ..... X ..... Date: .....

© On Board! Books

D. Match the following.

1. Alkaline $KMnO_4$	Higher homologue of butane
2. Methane	Product of esterification
3. Pentane	Simplest hydrocarbon
4. Ethyl acetate	Non-polar solvent
5. Chloroform	Oxidising agent

E. Answer the following.

Very Short Answer Questions

1. What is denatured alcohol?
2. Give any two advantages of detergents over soaps.

Short Answer Questions

1. Write chemical equations for the following reactions.
   a. Saponification of ethyl acetate
   b. Reaction of ethanol with sodium metal
   c. Hydrogenation of alkenes
   d. Combustion of methane
2. Give three differences between saturated and unsaturated hydrocarbons.

Long Answer Questions

1. How does ethanoic acid react with
   a. Sodium hydroxide
   b. Sodium bicarbonate
2. Name any five additives used in detergents. Also give the function of each.

© On Board! Books

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

1. d 2. a 3. a 4. c 5. b

B. Fill in the blanks.

1. 4 2. 7
3. allotropes 4. Unsaturated 5. Sodium or potassium

C. State whether the following statements are true or false.

1. T 2. T 3. F 4. F 5. T

D. Match the following.

1. Alkaline $KMnO_4$	Oxidising agent
2. Methane	Simplest hydrocarbon
3. Pentane	Higher homologue of butane
4. Ethyl acetate	Product of esterification
5. Chloroform	Non-polar solvent

E. Answer the following questions.

Very Short Answer Questions

1. To prevent the misuse of alcohol in industries, it is made unfit for drinking by adding poisonous substances such as methanol, copper sulphate and pyridine. This alcohol is known as denatured alcohol.
2. The advantages of detergents over soaps are as follows:

   (i) Unlike soaps, detergents can be used in hard water.

   (ii) Detergents have a stronger cleansing power than soaps.

Short Answer Questions

1. a. $CH_3COOC_2H_5 \xrightarrow{NaOH} C_2H_5OH + CH_3COONa$

   b. $2C_2H_5OH + 2Na \rightarrow 2C_2H_5ONa + H_2$

   c. $R_2C{=}CR_2 \xrightarrow{\text{Nickel catalyst/ } H_2} R_2CH{-}CHR_2$

   d. $CH_4 + 3O_2 \rightarrow CO_2 + 2H_2O + \text{Heat}$

2.

Saturated hydrocarbons	Unsaturated hydrocarbons
In saturated hydrocarbons, all the carbon atoms are bonded to other carbon atoms through carbon-carbon single bonds.	In unsaturated hydrocarbons, there exists C=C or C≡C bonds.
Saturated hydrocarbons are represented by the general formula C_nH_{2n+2}.	Unsaturated hydrocarbons have the general formula C_nH_{2n} for alkenes and C_nH_{2n-2} for alkynes.
Saturated hydrocarbons undergo substitution reactions.	Unsaturated hydrocarbons undergo addition reactions.

© On Board! Books

Long Answer Questions

1. a. Ethanoic acid is a carboxylic acid. It is a weak acid, and hence the reaction between ethanoic acid and sodium hydroxide is an acid-base reaction. So, when ethanoic acid reacts with sodium hydroxide, it forms a salt (sodium ethanoate or sodium acetate) and water.

$$CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$$

   b. Ethanoic acid reacts with sodium bicarbonate to form salt, water and carbon dioxide. The salt formed is sodium ethanoate/sodium acetate.

$$CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + 2CO_2 + H_2O$$

2. The additives used in detergents and their functions are as follows:
   a. ***Builder:*** The commonly used builder is sodium tripolyphosphate or sodium carbonate which removes hardness producing Ca^{2+} and Mg^{2+} ions and maintains the alkalinity.
   b. ***Sodium silicate:*** It acts as a drying agent.
   c. ***Carboxymethylcellulose:*** It keeps dirt suspended in water.
   d. ***Sodium sulphate:*** It acts as a diluent.
   e. ***Bleaching agent:*** A bleaching agent (such as sodium peroxoborate) imparts whiteness.

© On Board! Books