

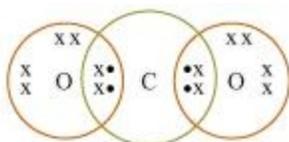
Board – CBSE

Class – 10<sup>th</sup>

Topic – Carbon and Its Compounds

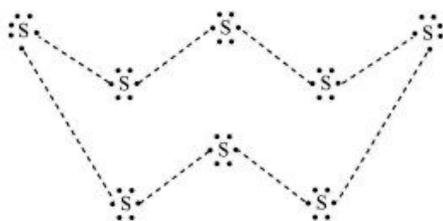
1. What would be the electron dot structure of carbon dioxide which has the formula CO<sub>2</sub>?

**Ans.** Electron dot structure of CO<sub>2</sub> is



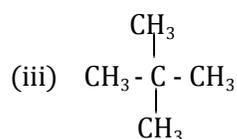
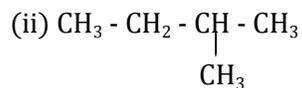
2. What would be the electron dot structure of a molecule of sulphur which is made up of eight atoms of sulphur? (Hint – the eight atoms of sulphur are joined together in the form of a ring.)

**Ans.** Electron dot structure of a sulphur molecule



3. How many structural isomers can you draw for pentane?

**Ans.** Three structural isomers are possible for pentane.



4. What are the two properties of carbon which lead to the huge number of carbon compounds we see around us?

**Ans.** The two features of carbon that give rise to a large number of compounds are as follows.

(i) Catenation – It is the ability to form bonds with other atoms of carbon.

(ii) Tetravalency – With the valency of four, carbon is capable of bonding with four other atoms.

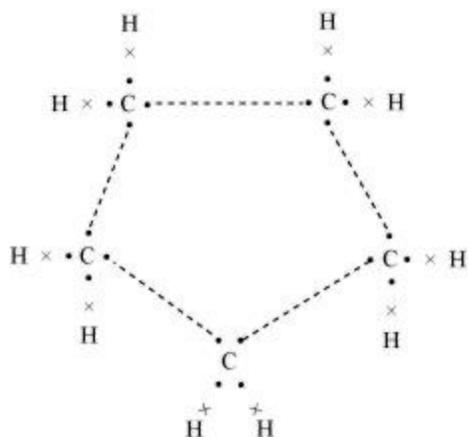
5. Why is the conversion of ethanol to ethanoic acid an oxidation reaction?



Since the conversion of ethanol to ethanoic acid involves the addition of oxygen to ethanol, it is an oxidation reaction.

6. What will be the formula and electron dot structure of cyclopentane?

**Ans.** The formula for cyclopentane is  $\text{C}_5\text{H}_{10}$ . Its electron dot structure is given below.

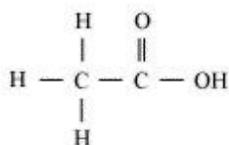


7. Draw the structures for the following compounds.

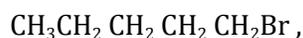
- (i) Ethanoic acid                  (ii) Bromopentane\*  
 (iii) Butanone                  (iv) Hexanal

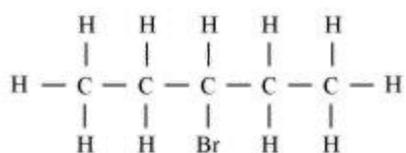
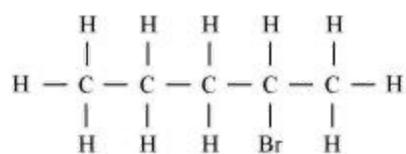
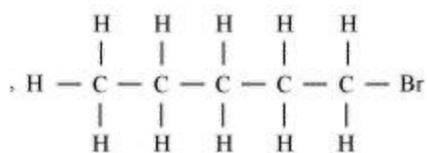
\*Are structural isomers possible for bromopentane?

**Ans.** (i)  $\text{CH}_3\text{COOH}$ ,

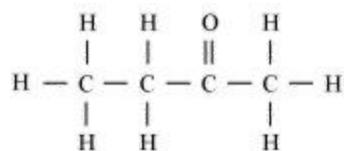


(ii) There are many structural isomers possible for bromopentane. Among them, the structures of three isomers are given.

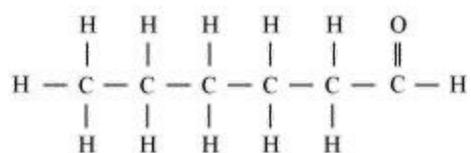




(iii)  $\text{CH}_3\text{CH}_2\text{COCH}_3$



(iv)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO}$



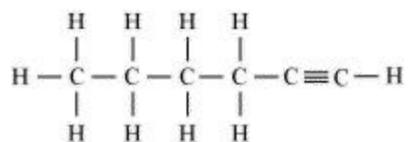
8. How would you name the following compounds?

(i)  $\text{CH}_3 - \text{CH}_2 - \text{Br}$



(ii)  $\text{H} - \text{C} = \text{O}$

(iii)



**Ans.** (i) Bromoethane

(ii) Methanal (formaldehyde)

(iii) Hexyne

**9.** A mixture of oxygen and ethyne is burnt for welding. Can you tell why a mixture of ethyne and air is not used?

**Ans.**  $2\text{HC} \equiv \text{CH} + 5\text{O}_2 \rightarrow 4\text{CO}_2 + 2\text{H}_2\text{O} + \text{Heat}$

When ethyne is burnt in air, it gives a sooty flame. This is due to incomplete combustion caused by limited supply of air. However, if ethyne is burnt with oxygen, it gives a clean flame with temperature  $3000^\circ\text{C}$  because of complete combustion. This oxy-acetylene flame is used for welding. It is not possible to attain such a high temperature without mixing oxygen. This is the reason why a mixture of ethyne and air is not used.

**10.** How would you distinguish experimentally between an alcohol and a carboxylic acid?

**Ans.** We can distinguish between an alcohol and a carboxylic acid on the basis of their reaction with carbonates and hydrogen carbonates. Acid reacts with carbonate and hydrogen carbonate to evolve  $\text{CO}_2$  gas that turns lime water milky.

Metal Carbonate / Metal Hydrogen carbonate + Carboxylic acid

↓

Salt + Water + Carbon dioxide

Alcohols, on the other hand, do not react with carbonates and hydrogen carbonates.

**11.** What are oxidising agents?

**Ans.** Some substances such as alkaline potassium permanganate and acidified potassium dichromate are capable of adding oxygen to others. These are known as oxidising agents.

**12.** Would you be able to check if water is hard by using a detergent?

**Ans.** Detergents are ammonium or sulphonate salts of long chain carboxylic acids. Unlike soap, they do not react with calcium and magnesium ions present in hard water to form scum. They give a good amount of lather irrespective of whether the water is hard or soft. This means that detergents can be used in both soft and hard water. Therefore, it cannot be used to check whether the water is hard or not.

**13.** People use a variety of methods to wash clothes. Usually after adding the soap, they 'beat' the clothes on a stone, or beat it with a paddle, scrub with a brush or the mixture is agitated in a washing machine. Why is agitation necessary to get clean clothes?

**Ans.** A soap molecule has two parts namely hydrophobic and hydrophilic. With the help of these, it attaches to the grease or dirt particle and forms a cluster called micelle. These micelles remain suspended as a colloid. To remove these micelles (entrapping the dirt), it is necessary to agitate clothes.