

## SCIENCE

### Carbon and its Compounds

44. Give two examples of covalent compounds which you have studied. State any four properties in which covalent compounds differ from ionic compounds.

Ans:  $\text{CCl}_4$  (carbon tetra chloride) and  $\text{C}_6\text{H}_6$  (Benzene) are covalent compounds.

Property	Covalent compounds	Ionic compounds
Physical state	(i) They exist as solids, liquids and gases	(i) They exist as solids.
Melting & Boiling point	(ii) They have low melting and boiling points.	(ii) They have high melting and boiling points.
Solubility	(iii) They are generally insoluble in water.	(iii) They are mostly soluble in water.
Conductor	(iv) They do not conduct electricity in molten state or in aqueous solution.	(iv) They conduct electricity in molten state and in aqueous solution.

46. List in tabular form three physical properties on the basis of which ethanol and ethanoic acid can be differentiated.

Ans: Physical properties:

Ethanol	Ethanoic acid
1. It has specific smell.	1. It has vinegar like smell.
2. It has burning taste.	2. It is sour in taste.
3. It does not freeze in winters	3. It freezes in winters.

47. List in tabular form chemical properties on the basis of which ethanol and ethanoic acid can be differentiated.

Ans: Chemical properties:

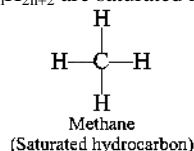
Ethanol	Ethanoic acid
1. It does not react with $\text{NaHCO}_3$ .	1. It gives $\text{CO}_2$ with $\text{NaHCO}_3$ .
2. It burns with blue flame.	2. It does not burn with blue flame.
3. It does not affect blue litmus.	3. It turns blue litmus red.

48. What are hydrocarbons? Write the name and general formula of (i) saturated hydrocarbons, (ii) unsaturated hydrocarbons, and draw the structure of one hydrocarbon of each type. How can an unsaturated hydrocarbon made saturated?

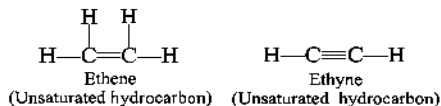
Ans: Compounds of carbon and hydrogen atoms

only are called hydrocarbons.

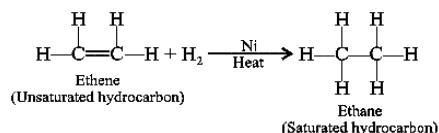
(i) Alkanes,  $\text{C}_n\text{H}_{2n+2}$  are saturated hydrocarbons.



(ii) Alkenes  $\text{C}_n\text{H}_{2n}$  and Alkynes,  $\text{C}_n\text{H}_{2n-2}$  are unsaturated hydrocarbons.



Unsaturated hydrocarbons can be made saturated by hydrogenation.



49. What are detergents chemically? List two merits and two demerits of using detergents for cleansing. State the reason for the suitability of detergents for washing, even in the case of water having calcium and magnesium ions.

Ans: Detergents chemically are sodium or potassium salts of sulphonic acid of benzene or alkene.

Merits:

- They work well with hard water.
- They are more effective than soaps.

Demerits:

- They are expensive.
- Some of them having branching are non-biodegradable, therefore create water pollution.

Detergents are suitable for hard water having  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions because they do not form insoluble salts with  $\text{Mg}^{2+}$  and  $\text{Ca}^{2+}$  ions.

50. (a) What is a soap? Why are soaps not suitable for washing clothes when the water is hard?

(b) Explain the action of soap in removing an oily spot from a piece of cloth.

Ans: (a) Soap is a sodium or potassium salt of fatty acid. Soaps are not suitable for washing clothes when the water is hard because  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions react with soap to form calcium and magnesium salts of fatty acids which are insoluble in water.

(b) Soap has hydrophilic (water-loving) and hydrophobic (water hating) hydrocarbon part which attracts oil and stabilizes the emulsion. Hydrophilic part of soap attracts water and oil and dirt is washed away from the cloth.

51. (a) In tabular form, differentiate between ethanol and ethanoic acid under the following heads:

- |                             |                 |
|-----------------------------|-----------------|
| (i) Physical state          | (ii) Taste      |
| (iii) $\text{NaHCO}_3$ test | (iv) Ester test |
|                             | (Contd.....)    |