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STUDY MATERIAL SCIENCE
CLASS-VII

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Physical and chemical changes :

When baking soda (NaHCO3) reacts with vinegar which contains acetic acid carbon dioxide comes out, which turns lime water milky, therefore it is a chemical change. In all these activities, we saw that in each change, one or more new substances are formed. When the magnesium ribbon was burnt, the ash was the new substance formed.

The reaction of copper sulphate with iron produced two new substances, i.e. iron sulphate and copper. Vinegar and baking soda together produced carbon dioxide which turned lime water milky. So, all those changes in which one or more new substances formed, are called chemical changes. These are permanent changes which can usually not be reversed to form the original substance.

In addition to new products, the following may accompany a chemical change:

- Heat, light or any other radiation (e.g. ultraviolet) may be given off or absorbed.
- The sound may be produced.
- A change in smell may take place or a new smell may be given off.
- A colour change may take place.
- A gas may be formed.

Chemical Changes in Our Daily Life

Chemical changes are very important in our lives. Indeed, every new material is discovered by studying chemical changes, e.g. If metal is to be extracted from an ore such as iron from iron ore, we need to carry out a series of chemical changes. Medicine is the end product of a chain of chemical reactions. Important and useful new materials such as plastics and detergents are produced by chemical reactions.

Let us consider some more examples of chemical changes. We saw from the activity that burning of magnesium ribbon is a chemical change. Burning of coal, wood or leaves is also a chemical change. In fact, burning of any substance is a chemical change. Burning is always accompanied in the production of heat and light.

- An explosion of a firework (or crackers) is also a chemical change which produces heat, light, sound and unpleasant gases that pollute the atmosphere.
- When food gets spoiled, it produces a foul smell. This shows that new substances have been formed in the spoiled food which has a foul smell. So, the spoilage of food is a chemical change.
- If we cut an apple into slices and kept in the open for some time, we will find that the cut surface of apple acquires a brown colour. This change in colour is due to the formation of the new substance by the action of oxygen (or air). So, this change in colour is a chemical change.
- Similarly, the cut surface of potato or brinjal turns black on keeping in air for some time due to the chemical change.
- When an acid reacts with a base, then a neutralisation reaction takes place in which two new

substances, salt and water, are formed. So, neutralisation is a chemical change.

- During photosynthesis, the plants intake carbon dioxide and water in the presence of chlorophyll and sunlight to form two new substances, glucose (food) and oxygen. So, photosynthesis is a chemical change.
- In the process of digestion, the various food materials break down to form new substances which can be absorbed by the body, so the process of digestion is a chemical change.