



PUBLIC SCHOOL DARBHANGA

SESSION (2020-21)

Class-6

Matter and its nature

Composition of Matter

On the basis of composition, substances are classified as pure or impure.

Pure Substances

Pure substances are single substances eg. hydrogen, oxygen, nitrogen, carbon, iron, water and carbon dioxides. Each of them has a different set of behaviour (i.e. Properties characteristics of it. A pure substance is either an element or a compound.

Elements An element is a substance that cannot be broken down into similar substances by chemical means. When we say by chemical means we means a process involving a chemical change.

When any new substances are formed in change. It is called a change for example, carbon when burnt in air, form a new substances-carbon dioxide. So this is a chemical change. In contrast to chemical change, no new substances are formed in chemical change.

Common examples of elements are hydrogen, oxygen, nitrogen, Carbon, sulphur, aluminium, iron, copper, silver, gold, At present about 114 elements are known.

Metals are generally hard solids. Sodium are soft solid and mercury. A liquid are exceptions. Metal have a lustre called metallic lustre. They are ductile, i.e they can be bent without being broken. They are malleable i.e they can be beaten or pressed into sheets and foils They are sonorous they produce a metallic sound when hit by a hard object.

Calcium, sodium, magnesium, aluminium, zinc, iron, tin copper, mercury, silver, gold and platinum are examples of metals. Metals helps us in many ways. We use them in the construction of houses, railway track, automobiles, locomotives, aircraft factories and machinery. They are also used for

agricultural tools, surgical equipment, electrical appliances, utensils and cutlery. In addition they play a key role in the transmission of electricity from the place where it is generated to the place where it is used.

Non Metals

Non-metals exist in all the three states-solid (eg. carbon, sulphur, phosphorus and iodine). liquid (bromine) and gaseous eg.(hydrogen, oxygen, nitrogen and chlorine).

Contrast to metals they have no lustre they are dull looking (except iodine and graphite) They are brittle if solid, i.e they break when bent, beaten or pressed. They are nonsonorous.

Non-metals are also of great importance to us. The air that we breathe is made up mainly of nitrogen (about 79%) and oxygen (about 20%) we would not be able to live without oxygen. Water, which is also essential for our existence, is made up of hydrogen and oxygen. Chlorine is used to kill germs present in drinking water. Iodine is used to heal wounds and sprains. Sulphur is used to cure skin diseases. Carbon is the main constituent of coal. All living things Plants and animals-mainly contain substances made of carbon.

Compounds In contrast to an element, a compound can be split or broken down into simpler substances by chemical means. For example, water can be split into hydrogen and oxygen so water is a compound. Similarly, Carbon dioxide is a compound as it can be split into carbon and oxygen.

Impure substances(mixtures)

An impure substance, or a mixture, contains two or more substances in any proportion. Also, these substances can be separated from one another. A mixture may contain elements compounds, or elements and compounds. A mixture should not be confused with a compound. The proportion of constituent elements in a compound is fixed. But that of the components of a mixture is not. For examples, any amount of salt or sugar can be mixed with any amount of water to form a mixture.

Most materials that we use or come across are mixtures. Some of them are useful and other need purification (i.e separation) before use. Some examples of naturally occurring and man-made useful mixtures are given below.

Air: Air contains the element nitrogen and oxygen, and the compound the carbon dioxide and moisture (water).

Natural water: Natural water contain dissolved air, which is essential for aquatic animals.

Food: While eating you realise that food is a grand mix.

Sugar solution and soft drinks: A solution of sugar or glucose in water is invigorating soft drinks (or fizzy drinks) contain carbon dioxide dissolved in water, to which are added some sweetening and flavouring agents. They are highly refreshing.

Medicine: Most medicines are mixtures. On the label of a medicine bottle, you will find the substances or ingredients it contains.

Alloys An alloy is a metal mixed with other metal(s) and /or non-metal(s).

Steel, the most common alloy, contains iron with small amount of carbon and manganese. whereas bronze contains copper and tin.