14. Elements, Compounds and mixtures

(i) To date, scientists have discovered ..... elements.

Ans :118

(ii) Some kinds of matter are made of two or more substances. They are called ..... .

Ans : 'Mixtures'

(iii) A substance whose molecules are made of one of more atoms which are exactly alike, is called an ..... .

Ans : Element

(iv)..... named the small particles of elements 'atom'

Ans : Democritus

(v) The substance formed by a chemical combination of two or more elements is a..... .

Ans : Compound

2. Write whether the following statements are true or false.

(i) One molecule of water is made of two atoms of hydrogen and two atom of oxygen.

Ans : False. One molecule of water is made of two atoms of hydrogen and one atom of oxygen.

(ii) The wire that we see in the electric bulb in our house is made of the element tungsten.

Ans : True.

(iii) Hydrogen is a combustible substance, that is, it burns.

Ans : True.

(iv) Oxygen is notimportant for burn.

Ans : False. Oxygen is important for burn.

1. Who are my companions ?

Group 'A'	Group 'B'
1.Stainless steel	(a) Non-betal
2. Silver	(b) Compound
3. Bhajani mixture for milling	(c) Mixture
4. Salt	(d) Element
5. Coal	(e) Alloy
6. Hydrogen	(f) Metal

Ans :

Group 'A'	Ans
1.Stainless steel	Alloy
2. Silver	Metal
3. Bhajani mixture for milling	Mixture
4. Salt	Compound
5. Coal	Element
6. Hydrogen	Non-metal

2. Write the names of elements from the following symbols :

Zn,Cd, Xe,Br,Ti,Cu, Fe, Si, Ir, Pt.

Ans :

No.	Symbol	Element
1	Zn	Zinc
2	Cd	Cadmium
3	Xe	Xenon
4	Br	Bromine
5	Ti	Titanium
6	Cu	Copper (Cuprus)
7	Fe	Iron (Ferrum)
8	Si	Silicon
9	Ir	Iridium
10	Pt	Platinum

3. What are the molecular formula of the following com pounds ?

Hydrochloric acid, Sulphuric acid, Sodium chloride, Glucose, Methane.

Ans :

No.	Compound	Ans
1	Hydrochloric acid	HCl
2	Sulphuric acid	H_2SO_4
3	Sodium chloride	NaCl
4	Glucose	$C_6H_{12}O_6$
5	Methane	CH_4

4. Give scientific reasons.

(a) Buttermilk is churned to get butter.

Ans : Churning is one of the method of separation. The particles of butter are all spread out in the buttermilk. By stirring they aggregate due to centrifugal force and form one solid lump. To separate the butter, the buttermilk is therefore churned.

(b) In chromatography, the ingredients of a mixture rise up to a limited height when water rises up to the upper end of the paper.

Ans : In chromatography method, two mutually opposite properties of substances are used. These are (1) the solubility of the substance in the solvent that moves up and (2) the ability of the substance to stick to the stationary filter paper. These properties are different for different substances. Since water is a solvent, it rises rapidly across the chromatography filter paper. But the solutes will not rise with that speed. Therefore, the ingredients of a mixture rise up to a limited height when water rises up to the upper end of the paper.

(c) A wet cloth is wrapped around a water storage container in summer.

Ans : The moisture in the wet cloth evaporates during summer season. During its evaporation it absorbs some amount of heat from the water storage container. The water

inside the container thus becomes cooler. Hence, a wet cloth is wrapped around a water storage container in summer.

5. Explain the difference.

(a) Metals and non-metals

Ans :

Metals	Non-metals
1. Metals have lustre.	1. Non-metals do not have lustre.
2. Metals are malleable.	2. Non- metals are not malleable.
3. Metals are ductile.	3. Non-metals are not ductile.
4. Metals are good conductors of heat &electricity.	4. Non-metals are not good conductors of heat & electricity.
5. Metals are in solid state. at normal temperature, (Exception Mercury)	5. Non-metals are either in solid state or in gaseous state. at normal temperature, (Exception :Bromine-in liquid form)
6. Normally metals have high density. e.g. Gold, Silver, Mercury	6. Normally non-metals have less density. e.g., Oxygen, Hydrogen.

(b) Mixture and compounds.

Ans :

Mixtures	Compounds
1. A Mixture is obtained by just mixing two or more substances in any proportion.	1. A compound is made of two or more elements chemically combined in a fixed proportion.
2. A mixture can be further subdivided into simpler substances by simple physical processes.	2. A compound can be further subdivided into simpler substances by chemical means only.
3.The constituents of a mixture retain their original properties. e.g., air, sea water,	3. The properties of a compound are entirely different from the properties of its constituents. e.g. common salt, sugar, water.

(c) Atoms & Molecules

Ans :

Atoms	Molecules
1.An atom is smallest particle in an element that has the properties of element.	1. Molecules are formed by the combination of two or more atoms.

2. It is not possible to breakdown the atom further retaining the properties of the element. e.g., copper, sulphur, Hydrogen	2. Molecules can be subdivided to individual atoms. e.g., water molecule can be further divided into oxygen and hydrogen atoms.
3.The atoms are bonded together in a molecule.	3. When similar molecules combine together in any numbers, a simple product is formed.
4. An atom is not stable by itself.	4. A molecule is usually stable to exist by itself.

(d) Separation by distillation & by separating funnel

Ans :

Separation by distillation	Separation by separating funnel
1. The method of distillation is used For separation of solutes from the solution.	1. The method of separating funnel is used For separation of two immiscible liquids
2. Heat is given during the separation.	2. Heat is not given during the process.

6. Write answers to the following questions in your own words.

(a) How are the components of mixtures separated by simple methods?

Ans : There are various methods to separate the mixtures. Some of these straining (filtering), sifting, picking, sorting, winnowing, combing with a magnet and sublimation are used in our daily life .

(1) Filtering or straining : We use the method of filtering, separate insoluble substances from the solution.

(2) Sifting : Sifting is done to separate solids of various sizes. The larger particles and the smaller particles can be separated by sifting.

(3) Picking & sorting : By this method, a substances that are needed/or not needed are separated out.

(4) Winnowing : The substances which are highter in weight and those that are unwanted are removed from the mixture. The grains in the farm are particularly cleaned by the process of winnowing.

(5) Combing with a magnet : The magnet is combed through it for removing these iron particles. if there is adulteration of semolina with iron, The mixture that contains iron particles is specially combed with a magnet .

(b) Which elements (metals and non-metals), compounds and mixtures do we use in our day-to-day life ?

Ans :Metals : Iron, Gold, Silver, Copper.

Non-metals : Hydrogen, Carbon, Nitrogen, Oxygen

compounds : Sugar, Salt, Oil

Mixtures : Soap, Alloys like steel, Brass, 22 Carat gold

(c) In everyday life, where and for what purpose do we use centrifugation ?

Ans : Use of centrifuge machine is never done in our common house-hold work. By using method of centrifugation the particles of smaller size are separated due to centrifugal force. Based on this principle, we use stirrer for making buttermilk from yoghurt. The stirrer helps to separate particles of butter from the suspension of the buttermilk. Due to centrifugal force, the particles of butter aggregate and are thus easily removed.

(d) Where are the methods of separation by distillation and by separating funnel used ? Why?

Ans :(1) Distillation : Distillation is the separation method used to separate impurities or dissolved salts from the solution. By this method, the solute and the solvent are

separated. For removing salt from sea water, distillation method is used. This helps in making potable water from sea water.

(2) Using separating funnel : When two liquids in a mixture which are immiscible with each other are to be separated, the method using separating funnel is used. This method can be used for separation of mixture of kerosene and water.

(e)Which precaution will you take while using the method of distillation and separation by separating funnel ?

Ans : In the method of distillation, the entire apparatus should be properly set up. The distillation flask should be carefully heated. The condenser tube should be properly cooled.

In the separating funnel experiment care should be taken to well manipulate the stopcock. The malfunctioning stopcock many a times releases the liquids inadvertently. The separation of lower phase liquid should be done with precision by opening and closing the stopcock.

Q.7 Answer in one sentence only :

(i) Which of the following are mixtures - water, sherbet, iron, steel, coal, air, salt, copper, brass, soil.

Ans : Sherbet, Steel, Air, Brass and soil are the mixtures.

(ii) Which elements are present in air ?

Ans : Oxygen, Nitrogen, Crypton, Hydrogen, Xenon, etc. are the elements present in the air.

(iii) Is carbon dioxide an element?

Ans : No. Carbon dioxide is a compound. It contains, one atom of carbon and two atoms of oxygen.

(iv) How many elements is sugar made of ?

Ans : Sugar is made up of carbon, Hydrogen and Oxygen.

(v) What does the name carbon dioxide imply-how many and which elements is this substance made of ?

Ans : In the molecule of carbon dioxide, there are elements of carbon and oxygen. One atom of carbon andtwo atoms of oxygen from carbon dioxide.

(vi) Which of these are compounds, which are elements- water, oxygen, carbon dioxide ?

Ans : Water and carbon dioxide are compounds while oxygen in an element.

(vii) What is the smallest particle of a compound called ?

Ans : The smallest particle of a compound is called a molecule.

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